

FINAL

# Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS) Iowa Army Ammunition Plant, Middletown, Iowa

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## Executive Summary

This report presents the results of the site inspection (SI) conducted for per- and polyfluoroalkyl substances (PFAS) at the Iowa Army Ammunition Plant (IAAAP) in Des Moines County, Iowa. It was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District under Contract Number W912QR-21-D-0019, Delivery Order W912QR21F0421, between USACE and Jacobs. The investigation was performed to evaluate whether PFAS in groundwater—specifically, PFAS with USEPA regional screening levels (perfluorooctane sulfonate [PFOS], perfluorooctanoic acid [PFOA], perfluorobutanesulfonic acid [PFBS], perfluorohexanesulfonic acid [PFHxS], perfluorononanoic acid [PFNA], and hexafluoropropylene oxide dimer acid [HFPO-DA])—have been identified at the Inert Disposal Area (IDA), IAAP-20/20G (Headquarters Army Environmental System #19105.1025/1026); the Fire Training Pit (FTP), IAAP-039/039G (Headquarters Army Environmental System #19105.1042/1043); and Former Fire Station 200-131-3 (also known as Building 200-131-3) at concentrations that would warrant further investigation or action.

The IAAAP consists of 19,011 acres adjacent to Middletown, Iowa. It is an active Joint Munitions Command facility currently operated by civilian contractor American Ordnance, LLC. The current mission of the IAAAP is to load, assemble, and pack ammunition items (including projectiles, mortar rounds, warheads, and demolition charges) and munitions components (such as fuses, primers, and boosters) (U.S. Army 2007).

Due to explosives-contaminated surface water leaving the installation boundaries, the IAAAP was placed on the National Priorities List in August 1990, and a Federal Facility Agreement signed by U.S. Environmental Protection Agency Region 7 and the U.S. Army became effective in December 1990. Recently, PFAS has been identified as an emerging contaminant. A preliminary assessment (PA) for PFAS was conducted at the IAAAP in March 2020 in which three areas of potential interest (AOPIs)—the FTP, the IDA, and Former Fire Station 200-131-3—were identified (Arcadis 2020). These three AOPIs were included in the SI and investigated to determine the presence of PFAS at concentrations that would warrant further investigation or action (CH2M 2020). Historical details of each AOPI are as summarized below:

- FTP
  - An unlined, open depression approximately 50 by 25 feet operated from 1982 to 1987.
  - Activities included setting 55-gallon drums of solvent or fuels on fire and then extinguishing them.
  - A previous document references aqueous film forming foam (AFFF) being used to extinguish the fires (URS 2004).
  - A remedial investigation (RI) completed in 1996 determined that soil and groundwater were contaminated with VOCs, SVOCs, metals, and dioxins and furans due to fire training activities in the unlined pit.
  - Contaminated soil was excavated in 1998, and the area was backfilled. The contaminated soil was disposed of in Trench 6 of the IDA.
  - Currently, the AOPI is an empty lot with grass and weed cover; several small buildings are present within 500 feet.

- IDA
  - Used from 1941 to 2011, the IDA covers approximately 20 acres that includes the Inert Landfill Trenches 1–5, the Cap Extension Area, Trench 6, Trench 7 (the Corrective Action Management Unit), and associated sedimentation ponds.
  - The IDA is included in Installation Remediation Program site IAAP-020/020G because contaminated soil from the FTP was disposed of in Trench 6 of the IDA.
  - Trenches 1 through 5 were capped in 1998, and Trench 6 Landfill and Trench 6 North were capped in 2011.
  - Maintenance and leachate management plans have been established, and areas of the IDA are under active monitoring and are being evaluated for remediation.
- Former Fire Station 200-131-3
  - A release of AFFF occurred at Former Fire Station 200-131-3 in 2006.
  - It is unknown when operations began at Former Fire Station 200-131-3; however, operations moved from this location in 2012 to the current fire station.
  - A composite soil sample was collected at the location of the AFFF release on February 8, 2017, and the presence of PFOS and PFOA was confirmed.

SI field activities were conducted in December 2020, in accordance with the final Uniform Federal Policy–Quality Assurance Project Plan (UFP-QAPP) for a Site Inspection for Per- and Polyfluoroalkyl Substances (PFAS) (CH2M 2020). Five groundwater samples were collected from the three AOPIs (IDA, FTP, and Former Fire Station 200-131-3) and analyzed for 22 PFAS. Sample locations were biased to areas that were most likely to have been impacted by a potential release.

To assess the potential presence of contamination at AOPIs, analytical results from groundwater samples were compared against conservative project action limits (PALs). In accordance with DoD guidance (DoD 2022), these PALs were USEPA regional screening levels based on a target cancer risk of  $1 \times 10^{-6}$  and a target hazard quotient of 0.1 (USEPA 2022). PFAS were present in every sample collected at the three AOPIs, and there were exceedances of PALs at all three AOPIs.

Based on the presence of PFAS at the three AOPIs, a release of PFAS likely occurred at each AOPI, requiring an expanded SI or RI that would provide further information on the extent and magnitude of the impacted material.

In addition, a fourth AOPI was identified in a revised 2020 version of the PA (Arcadis 2020b); this revised PA was completed and submitted after the 2020 SI field activities were conducted. This additional AOPI is the current fire station, and an SI will be completed to evaluate PFAS impacts (Arcadis 2020b).

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## Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
6:2 FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid
8:2 FTS	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid
µg/kg	micrograms per kilogram
ADONA	4,8-dioxa-3H-perfluorononanoic acid
AFFF	aqueous film forming foam
amsl	above mean sea level
AOPI	areas of potential interest
bgs	below ground surface
CEA	Cap Extension Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M	CH2M HILL, Inc.
DL	detection limit
DoD	Department of Defense
ERG	Environmental Research Group
ETFOSAA	n-ethylperfluoro-1-octanesulfonamidoacetic acid
FTP	Fire Training Pit
GenX	hexafluoropropylene oxide dimer acid
IAAAP	Iowa Army Ammunition Plant
IDA	Inert Disposal Area
IDW	investigation-derived waste
ILF	Inert Landfill
IROD	Interim Record of Decision
IRP	Installation Remediation Program
MEFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
MS	matrix spike
MSD	matrix spike duplicate
ng/L	nanogram per liter
ORP	oxidation-reduction potential
OU	Operable Unit
PA	preliminary assessment
PAL	project action limit

## Site Inspection Report: PFAS

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PARCCS	precision, accuracy, representativeness, comparability, and completeness and sensitivity
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluoro-n-butanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluoro-n-decanoic acid
PFDoA	perfluoro-n-dodecanoic acid
PFHpA	perfluoro-n-heptanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFNA	perfluoro-n-nonanoic acid
PFPeA	perfluoro-n-pentanoic acid
PFHxA	perfluoro-n-hexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFTeDA	perfluoro-n-tetradecanoic acid
PFTrDA	perfluoro-n-tridecanoic acid
PFUdA	perfluoro-n-undecanoic acid
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SI	site inspection
SVOC	semivolatile organic compound
UFP-QAPP	Uniform Federal Policy–Quality Assurance Project Plan
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

# 1. Introduction

This report presents the results of the site inspection (SI) at three areas of potential interest (AOPIs) at the Iowa Army Ammunition Plant (IAAAP), Middletown, Iowa: the Inert Disposal Area (IDA), IAAP-20/20G (Headquarters Army Environmental System #19105.1025/1026); the Fire Training Pit (FTP), IAAP-039/039G (Headquarters Army Environmental System #19105.1042/1043); and Former Fire Station 200-131-3.

IAAAP is an active Joint Munitions Command facility currently operated by civilian contractor American Ordnance, LLC. CH2M HILL, Inc. (CH2M), now a wholly owned subsidiary of Jacobs, conducted this work for the U.S. Army Corps of Engineers (USACE) Louisville District under Contract Number W912QR-12-D-0005, Delivery Order 0006. Jacobs is continuing this work under Contract W912QR-21-D-0019, Delivery Order W912QR21F0421. The focus of this SI is per- and polyfluoroalkyl substances (PFAS) in groundwater, specifically, PFAS with USEPA regional screening levels (perfluorooctane sulfonate [PFOS], perfluorooctanoic acid [PFOA], perfluorobutanesulfonic acid [PFBS], perfluorohexanesulfonic acid [PFHxS], perfluorononanoic acid [PFNA], and hexafluoropropylene oxide dimer acid [HFPO-DA]). The data collected were used to determine whether there is PFAS contamination at the IDA, the FTP, and Former Fire Station 200-131-3 at concentrations that would warrant further investigation or action.

## 1.1 Site Background

The IAAAP consists of 19,011 acres adjacent to Middletown, in Des Moines County, Iowa (Figure 1-1). It is located approximately 8 miles west of Burlington. Burlington, which has a population of 25,436, is the largest city in Des Moines County. The installation is bordered by U.S. Highway 34 to the north, upland agricultural farms to the east and west, and the Skunk River Valley to the south. The IAAAP is an active Joint Munitions Command facility operated by civilian contractor American Ordnance, LLC. The current mission of the IAAAP is to load, assemble, and pack ammunition items (including projectiles, mortar rounds, warheads, and demolition charges) and munitions components (such as fuses, primers, and boosters) (U.S. Army 2007). The IAAAP consists of production lines, landfills, disposal areas, burn areas, a demolition area, and a fire training area. The remaining land is woodlands or property that is leased for agricultural usage. The IAAAP and the three AOPI locations are shown on Figure 1-1.

Due to explosives-contaminated surface water leaving the installation boundaries, the IAAAP was placed on the National Priorities List in August 1990. In September 1990, a Federal Facility Agreement was signed by U.S. Environmental Protection Agency (USEPA) Region 7 and the U.S. Army; it became effective in December 1990. In recent years, PFAS has been identified as an emerging contaminant. To address the potential for PFAS contamination, a preliminary assessment (PA) for was conducted at the IAAAP (Arcadis 2020a) in which AOPIs were identified and were investigated for the nature and extent of potential PFAS contamination.

The PA was conducted to identify locations across the IAAAP installation where PFAS (specifically PFAS compounds that had regulatory screening limits at the time of the PA—PFOS, PFOA, and PFBS) were used and to determine whether there was a reason to suspect a release at each location. Efforts included document reviews, internet keyword searches, and an installation site visit that included interviews with installation personnel and site reconnaissance to identify specific areas of suspected PFAS releases (Arcadis 2020a). Eleven areas at IAAAP had been previously identified as potential PFAS sources, but following the site research conducted during the PA, PFAS use or release was no longer suspected at eight of the areas (non-AOPIs). The 2020 PA (Arcadis 2020a) identified three AOPIs (the FTP, the IDA, and Former Fire Station 200-131-3), which were included in this SI.

The FTP was an unlined, open depression approximately 50 by 25 feet that was operated from 1982 to 1987 (Arcadis 2020a). The depression was approximately 2 feet deep (Tetra Tech 2006, 2012). The activities in this area included setting 55-gallon drums of solvent or fuels on fire in the depression and then extinguishing them. While there are no records explicitly stating the use of aqueous film forming foam (AFFF), a previous document references foam being used to extinguish the fires (URS 2004). The FTP is included in IRP site IAAP-039/039G, and a remedial investigation (RI) completed in 1996 determined soil and groundwater were contaminated with VOCs, SVOCs, metals, and dioxins and furans due to the pit having been unlined during use. In 1998, the contaminated soil was excavated from the FTP, the pit was backfilled, and then contaminated soil was disposed of in Trench 6 of the IDA. PFAS has never been sampled for in any media at the FTP. The FTP is currently an empty lot with grass and weed cover; several small buildings present within 500 feet.

The IDA was in use from 1941 to 2011 and covers approximately 20 acres that includes the Inert Landfill (ILF) Trenches 1–5, the Cap Extension Area (CEA), Trench 6, Trench 7 (the Corrective Action Management Unit), and the associated sedimentation ponds. Trench 6 is divided into two areas, Trench 6 North and Trench 6 Landfill (also known as the Soil Repository). The IDA is located approximately 0.7 mile northwest of Mathes Lake and is surrounded by vacant land with vegetation and trees. The IDA is included in Installation Remediation Program (IRP) site IAAP-020/020G, which was identified due to approximately 74,000 cubic yards of soil from the FTP having been placed into Trench 6 (Tetra Tech 2008). Trenches 1 through 5 were capped in 1998, and Trench 6 Landfill and Trench 6 North were capped in 2011. A cap maintenance and leachate management plan has been established, and areas of the IDA are under active monitoring and are being evaluated for remediation. PFAS has never previously been sampled or analyzed for in any media at the IDA.

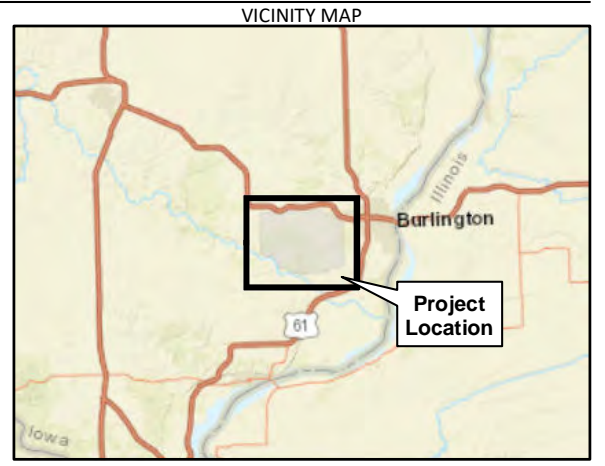
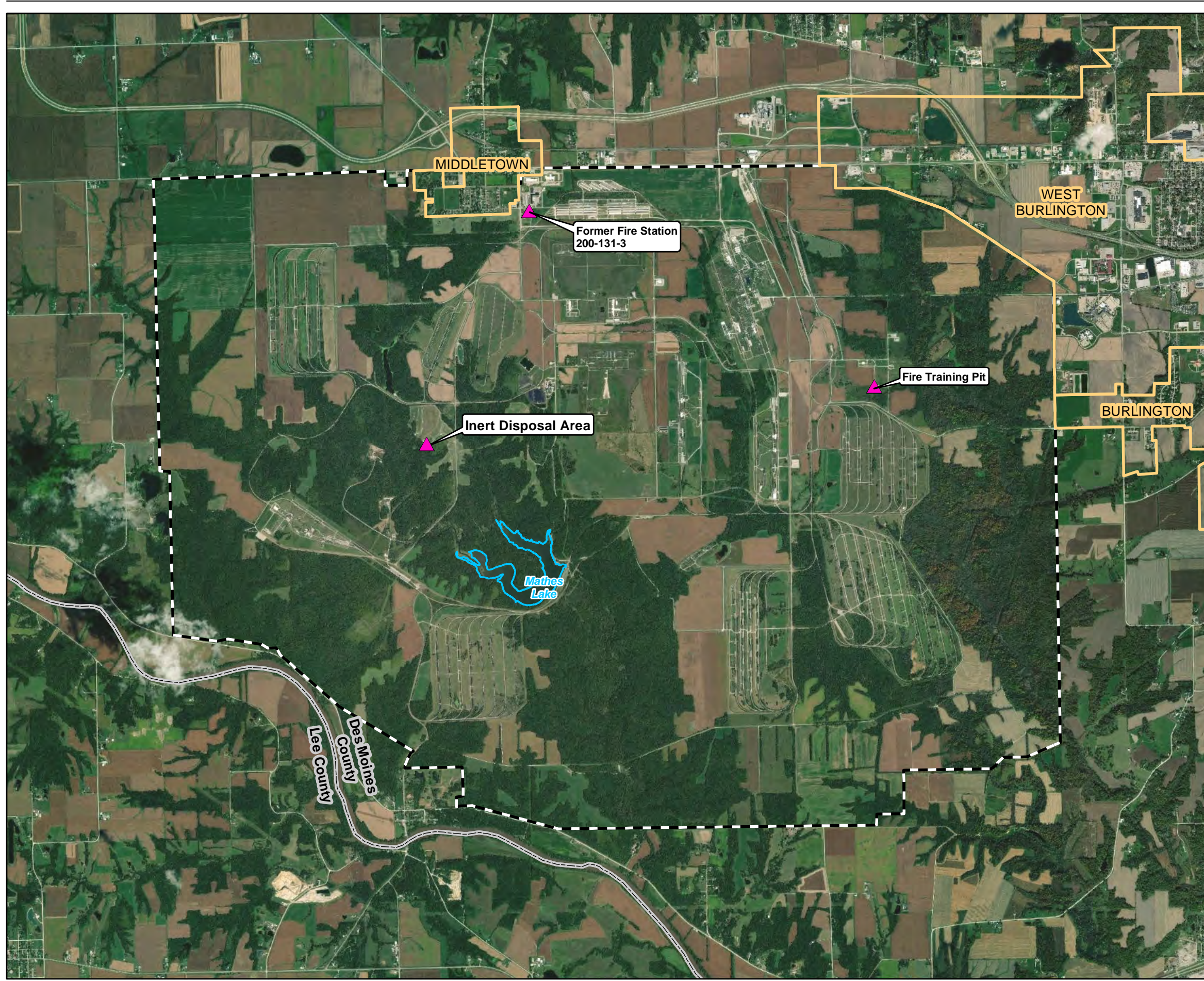
A release of AFFF occurred at Former Fire Station 200-131-3, also known as Building 200-131-3, in 2006. A 3-gallon container of AFFF was used outside Former Fire Station 200-131-3 for training purposes. It is unknown when operations began at Former Fire Station 200-131-3; however, operations moved from this location in 2012 to the current fire station. A composite soil sample was collected at the location of the AFFF release at the Former Fire Station 200-131-3 on February 8, 2017, and the presence of PFOS and PFOA. Sample analysis, completed by TestAmerica (Sacramento, California), references analysis via USEPA Method 537 (modified). The analytical data do not define the method modifications; however, the timeline of the analysis would apply to QSM version 5.1. Former Fire Station 200-131-3 does not overlap with any existing IRP sites. Building 200-131-3 is on the northeast corner of the intersection of Texas Avenue and South Drive. There are approximately 70 gallons of AFFF stored at the current fire station. However, the AFFF product (FireAde AR-AFFF) at the current fire station is a new formulation that reportedly does not contain PFOS or PFOA (Fire Service Plus 2014).

In addition, a fourth AOPI was identified in a revised 2020 version of the PA (Arcadis 2020b); this revised PA was completed and submitted after the 2020 SI field activities were conducted. This additional AOPI is the current fire station, and an SI will be performed to evaluate PFAS impacts (Arcadis 2020b).

### 1.2 Objective of Site Inspection

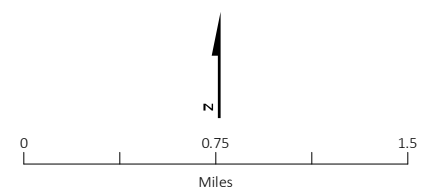
The SI activities were initiated for groundwater at the three AOPIs (IDA, FTP, and Former Fire Station 200-131-3) identified in the PA (Arcadis 2020a) and were conducted in a manner consistent with USEPA (2005) guidance for SIs and currently accepted guidance (e.g., ITRC 2020; USEPA 2020) for PFAS investigations. The objective of this SI was to determine the presence or absence of PFAS in groundwater only; soil may be evaluated at a later time at the three AOPIs if deemed necessary. Following this SI and in accordance with the 2018 Army guidance, if there is PFAS contamination exceeding the project action limits (PALs) in the IDA, FTP, or Former Fire Station 200-131-3, indicating a release has occurred, either an expanded SI or an RI will be conducted to refine the nature and extent of contamination.





- LEGEND**
- ▲ Area of Potential Interest (AOPI) Location
  - Mathes Lake
  - Plant Boundary
  - City Boundary
  - County Boundary

Note:  
1. 2015 Esri World Imagery Basemap



**FIGURE 1-1**  
Area of Potential Interest  
Iowa Army Ammunition Plant  
Middletown, Iowa



## 2. Site Description and Regulatory History

### 2.1 Background

This background section consists of the site description, operational history, and the rationale for performing SI activities at the three AOPIs (IDA, FTP, and Former Fire Station 200-131-3).

#### 2.1.1 Fire Training Pit

##### 2.1.1.1 Site Description

The FTP is located on the eastern side of the IAAAP (Figure 1-1). The FTP is in an area with an empty lot, but there are several smaller buildings within 500 feet (Figure 2-1). The site is classified as Industrial both for Current and Future Land Uses (Arcadis 2020a). Perennial streams are located immediately south and east of this area.

Geology at the IAAAP is described in detail in Section 2.2. At the FTP, the shallow geology consists of overburden that ranges in thickness from roughly 10 to 30 feet below ground surface (bgs). Discontinuous sand and gravel seams are present in some areas to a depth of 12 to 15 feet bgs (JAYCOR 1996; Tetra Tech 2006). A stiff clay layer is present within the glacial till near the FTP and is considered an aquitard based on a very low vertical hydraulic conductivity (JAYCOR 1996). The upper portion of the bedrock near the overburden and bedrock interface is weathered and contains fractures (JAYCOR 1996).

Based on groundwater gauging data, overburden groundwater flows south and east toward a tributary of Spring Creek. Hydraulic gradients are low, approximately 0.05 foot/foot. Bedrock groundwater flow is to the east with hydraulic gradients between 0.01 and 0.04 foot/foot. Historically, downward vertical gradients were observed at well pairs based on May 2015 groundwater elevation data.

##### 2.1.1.2 Operational and Remediation History

The FTP was built in the early 1970s and consisted of an unlined depression that was used for firefighting training from 1982 to 1987. Fire extinguishing training procedures included setting 55-gallon drums filled with solvents and fuels on fire and then subsequently extinguishing them. Installation personnel do not have records explicitly stating AFFF having been used for this training; however, a previous document referenced foams that were used to extinguish these fires (URS 2004). Though other foams were commercially available for firefighting activities, AFFF was used specifically for fighting Class B, fuel-based fires. Activities at the FTP were discontinued in 1988.

The FTP was initially investigated during the facility-wide site investigation in 1991 and 1992. Results of the site investigation recommended further investigation inside the FTP.

A two-phase RI conducted in 1995 consisted of soil and groundwater sampling (JAYCOR 1993, 1996); based on historical site use, samples were analyzed for explosives, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Results indicated that VOCs, SVOCs, and metals contamination was present in soil to 15 feet bgs (JAYCOR 1996). However, concentrations decreased with depth and distance from the FTP. The highest SVOC and VOC concentrations were observed immediately south of the center of the FTP. Additional soil sampling performed in 1996 for analysis of VOCs and SVOCs indicated furans and dioxins in soil attributed to combustion byproducts (Tetra Tech 2006).

Soil removal actions were completed at the FTP in 1998 and in 2003 to address VOCs, SVOCs, and metals that were present in soil above Operable Unit 1 (OU-1) remediation goals. In 1998, approximately 5,200

cubic yards of contaminated soil was removed, and approximately 2,600 cubic yards of the removed soil was thermally treated using low-temperature thermal desorption (ECC 2000). In the pit area, soil was removed to 22 feet bgs, and prior to backfilling, approximately 2 to 4 feet of sand was placed across the bottom of the excavation to allow for potential groundwater extraction, if necessary. The remainder of the excavation was backfilled with clay (ECC 2000). Contaminated soil was disposed of in the Trench 6 Landfill of the IDA. In 2003, 616 cubic yards of contaminated soil and debris was removed and disposed of in the IDA. All verification sample concentrations were below excavation criteria for each parameter, and the excavations were deemed clean for backfilling (ECC 2005).

### 2.1.1.3 Current Conditions

VOCs, SVOCs, and metals in soil at the FTP have been remediated to OU1 remediation goals.

Groundwater sampling data through 2010 show explosives, VOCs, and arsenic present in the overburden groundwater at the FTP. The current distribution and concentrations of these chemicals in the groundwater at the FTP are currently being assessed under sitewide RI activities (CH2M 2017). The presence or absence of PFAS constituents in groundwater is unknown because PFAS sampling was not required during previous investigations.

### 2.1.2 Inert Disposal Area

#### 2.1.2.1 Site Description

The IDA encompasses approximately 20 acres and includes ILF Trenches 1–5, the CEA, Trench 6, Trench 7 (Corrective Action Management Unit), and the associated sedimentation ponds (Figure 2-2). Trench 6 is divided into two areas, Trench 6 North and Trench 6 Landfill (also known as the Soil Repository). It is located approximately 0.7 mile northwest of Mathes Lake (Figure 1-1). The site is surrounded by vacant land with vegetation and trees. The IDA land use is classified as Industrial for both Current and Future Land Uses (Arcadis 2020a).

The subsurface at the IDA is characterized by fill material, waste, and glacial till. The fill, generally consisting of silty clay, is a combination of impermeable cap and contouring layers that overlie ILF Trenches 1–5, Trench 6, and the CEA. The till underlies and surrounds the fill/waste and consists primarily of silty clay and clay with occasional discontinuous silty sand and sandy silt layers. The unconsolidated units are underlain by bedrock (interbedded shaley dolomitic limestone), which was encountered at depths ranging from 76 to 138 feet bgs (Tetra Tech 2012).

Shallow groundwater occurs at depths ranging from approximately 10 to 36 feet bgs in the overburden aquifer and shallow groundwater flow generally mimics surface topography. The low permeability of the clay-till matrix generally limits lateral and vertical flow of groundwater. Deep groundwater occurs at depths ranging from approximately 36 to 59 feet bgs in the bedrock aquifer, reflecting semiconfined conditions in some areas. In December 2020, groundwater was observed to flow southeast with a hydraulic gradient of approximately 0.05 foot/foot. An overall downward vertical gradient is indicated by groundwater elevations in the shallow overburden and bedrock monitoring wells at the IDA (Tetra Tech 2012).

#### 2.1.2.2 Operational and Remediation History

The IAAAP conducted waste management operations, including landfilling, at the IDA from 1941 until 2011. It included a sanitary landfill, a building, metal salvaging operations, the Former Blue Sludge Lagoon, a wastewater drying bed, a CEA, and an earthen-bermed holding area used for sludge. ILF Trenches 1–5 and Trench 6 North received waste materials such as residential and cafeteria refuse, plastic,



tin cans, scrap lumber, and unsalvageable paper and cardboard until the mid-1990s. Between 1998 and 2007, OU1 remedial actions resulted in the excavation of approximately 211,000 cubic yards of contaminated soil, which was taken to the Trench 6 Landfill, Trench 7, and the CEA for disposal or taken to the ILF to be used as base grade for the ILF cap (USACE 2007). The ILF trenches were covered with approximately 73,000 cubic yards of low-level contaminated soils (soils with cumulative risks less than  $10^{-6}$  but at concentrations exceeding groundwater leaching remediation goals) from OU-1 sites to provide an appropriate grade as a base for the Resource Conservation and Recovery Act (RCRA) synthetic cover (Tetra Tech 2008). The Trench 6 Landfill received approximately 74,000 cubic yards of moderately contaminated soils from OU-1 sites (Tetra Tech 2008).

The IDA has been under investigation since 1981. Groundwater was initially assessed when four monitoring wells were installed in 1981. In 1984, the sludge from the Former Blue Sludge Lagoon was excavated, removed, and placed in a nearby dewatering bed in preparation for casting the sludge into concrete blocks for disposal. The excavated area was backfilled and capped with clay soil, and vegetative cover was established. Additional investigation was conducted in 1989 to monitor groundwater in the vicinity of Trench 5 (Terracon 1989). Also, in 1989, the Ash Disposal Cell in the northern portion of Trench 5 was capped and closed in accordance with RCRA Subtitle C requirements as described in the *Closure and Post-closure Plans for Trench 5 of the Inert Landfill* (USACE 1988).

An SI was conducted in 1991 where soil, sediment, and surface water samples were collected to identify contamination that could have resulted from past activities at the ILF, the Former Blue Sludge Lagoon, the Former Burning Ground, and the Former Metal Storage Yard (JAYCOR 1993). From 1992 through 1993, RI field work was conducted at the site in an effort to characterize the lateral and vertical extent of contamination in soil, determine the extent of migration of contaminants in groundwater, and assess whether runoff or leachate from the IDA was impacting the tributary of Long Creek located approximately 1,000 feet west of the IDA (JAYCOR 1996). In April 1993, additional monitoring wells were installed as part of the Phase II RI effort. Soil samples were collected from the new wells at the soil-groundwater interface and analyzed for VOCs, SVOCs, pesticides, polychlorinated biphenyl, explosives, and metals based on historical site use. In November 1993, an accelerated groundwater quality assessment was conducted to evaluate the effects of past hazardous waste management practices at the Ash Disposal Cell. As part of this assessment, additional shallow overburden wells were installed around the RCRA Subtitle C cap for the Ash Disposal Cell at the northern end of Trench 5 to provide better coverage in the downgradient direction from the Ash Disposal Cell (Earth Tech 1994). Five rounds of groundwater sampling were conducted in seven wells between December 1993 and April 1994 and the sampling results were documented in the *Accelerated Groundwater Quality Assessment for the Ash Disposal Cell in Trench 5 and Line 6* (Earth Tech 1994). In 1995, two surface soil samples were collected from the Former Burning Ground to determine if the area was contributing to the VOCs in the surface water samples collected in 1991. Three sludge samples were also collected from the Former Sludge Drying Bed and analyzed for Toxicity Characteristic Leaching Procedure metals, per USEPA Region 7 request (JAYCOR 1996).

Between September 1997 and April 2007, additional shallow overburden and bedrock monitoring wells were installed, as necessary, to provide adequate spatial coverage around the footprint of the closed areas at the IDA. Beginning in 1997, the Army implemented a non-time critical removal action to begin consolidating contaminated soils, excavated from four sites at the IAAAP, to within the IDA, in accordance with the action memorandum for the Inert Landfill (CDM 1997). As part of this removal, cleanup and closure activities were initiated at the IDA, including removal of the Former Blue Sludge Lagoon and Sludge Drying Bed/Holding Pond material and removal of contaminated soil at the Former Burning Ground. Prior to removal of soils from the IDA Metals Storage Yard and Burning Grounds, a predesign investigation was conducted in 1998, and the results were presented in the *Pre-design Excavation Delineation 1 Summary Report* (USACE 1998). In 1998, Trenches 1 through 5 were designated the ILF and

capped with a synthetic cover system, which included the Ash Disposal Cell portion of Trench 5 pursuant to the action memorandum for the Inert Landfill (CDM 1997). Trench 6 North was not capped in 1998 so that it could continue to be used as access to the Trench 6 Landfill to the south, and as a staging area for other construction activities. A synthetic liner and a leak detection system were installed in the Trench 6 Landfill in 1998. A former soil borrow area, Trench 7, adjacent to Trench 6, was similarly lined and equipped with leak detection capabilities. This lined borrow area, designated by the USEPA as a Corrective Action Management Unit, was used for the stockpiling and treatment of high-level contaminated soil.

In 2008, an Interim Record of Decision (IROD) was signed for OU-4 for Trench 6, Trench 7, and the CEA of the IDA. In 2011, closure of the Trench 6 Landfill and Trench 6 North was performed by covering the trench with a RCRA Subtitle C-style cap, which includes a contouring layer, a geosynthetic clay liner, a low-density polyethylene geomembrane, a geocomposite drainage layer, compacted select fill, topsoil, and a vegetative cover. Prior to construction of the cap, the soil placed in the Trench 6 Landfill was stabilized with Class C fly ash to form a stable base for cap construction (Tetra Tech 2012). In 2016, a boundary fence was installed at the IDA.

### 2.1.2.3 Current Conditions

In accordance with the 2008 OU-4 IROD for Trench 6, Trench 7, and the CEA of the IDA, long-term monitoring is required to evaluate the performance of the landfill cover systems at Trench 6 and the CEA. Currently, groundwater and surface water sampling are being conducted to ensure compliance with RCRA post-closure care and CERCLA IROD groundwater monitoring requirements. Samples are analyzed for explosives, metals, VOCs, SVOCs, total organic carbon, total organic halogens, radionuclides, and gross alpha/beta activity. Because the current long-term monitoring network includes only 13 wells in the overburden aquifer and 2 wells in the bedrock aquifer, a comprehensive groundwater sampling event for all existing wells was conducted under the sitewide RI activities (CH2M 2017). The presence or absence of PFAS constituents in groundwater is unknown because PFAS sampling was not required during previous investigations and is not a requirement of long-term monitoring.

Routine cover inspection, repairs, and maintenance are required for the CEA cap. Routine cover inspection, repairs, and maintenance are required for the Trench 6 cap, along with monitoring of the leachate collection and leak detection system. Land use controls and post-closure monitoring will continue at the IDA in accordance with CERCLA and RCRA requirements.

### 2.1.3 Former Fire Station 200-131-3

#### 2.1.3.1 Site Description

Former Fire Station 200-131-3 is located in the northern central portion of the IAAAP (Figure 1-1). Building 200-131-3 is on the northeast corner of the intersection of Texas Avenue and South Drive (Figure 2-3). The Former Fire Station 200-131-3 is in an area that is classified as Industrial for both Current and Future Land Uses (Arcadis 2020a).

The soil is composed mainly of a low-permeability clay. During the December 2020 gauging, a shallow hydraulic gradient was measured at approximately 0.0035 foot/foot. Groundwater flow is generally to the southwest and the southeast.

#### 2.1.3.2 Operational and Remediation History

It is unknown when operations began, but Former Fire Station 200-131-3 was operated until 2012, after which fire station operations were moved to the current fire station at the IAAAP. During operation in

2006, a 3-gallon container of AFFF was used in the parking lot outside the building for training purposes (Tetrahedron 2017).

In 2017, a composite soil sample was collected from runoff areas of the parking lot, at the approximate location of the 2006 AFFF release. The sample was analyzed for PFOS and PFOA. The results indicated PFOS and PFOA concentrations of 12,000 parts per trillion and 140 parts per trillion, respectively, which is approximately one and three orders of magnitude less than the May 2022 industrial scenario RSLs for soil based on a target cancer risk of  $1 \times 10^{-6}$  and target hazard quotient of 0.1 (USEPA 2022; DoD 2022).

Former Fire Station 200-131-3 was identified as an AOPI due to the use of AFFF in 2006.

### 2.1.3.3 Current Conditions

Based on historical site operations, an SI was not previously warranted for Former Fire Station 200-131-3. However, this site was reevaluated due to the emergence of PFAS as a contaminant and the detection of PFOS and PFOA in soil. Notably, PFOA (0.14 J micrograms per kilogram [ $\mu\text{g}/\text{kg}$ ]) and PFOS (12  $\mu\text{g}/\text{kg}$ ) concentrations in the soil sample were very low and did not exceed the soil RSL (126  $\mu\text{g}/\text{kg}$ ) at the time the soil sample was collected in 2017 and did not warrant an SI at the time.

## 2.2 Physical Setting

### 2.2.1 Climate

Des Moines County has a typical Midwestern climate of hot/humid summers and cold/wet winters. According to the National Weather Service, between 1981 and 2010, the average annual temperature in this area was 53°F. The average annual precipitation in this area is 42.2 inches. During the winter, precipitation frequently occurs as snow, and during the rest of the year it is mainly rain, often heavy. The highest rainfall amounts tend to occur between May and July. Snowmelt during spring, combined with frozen or saturated soil conditions that reduce infiltration, can result in high runoff and substantial erosion. In addition, severe thunderstorms in summer can also result in a high volume of precipitation over a short period of time and also create high runoff volumes (H&S 2016).

### 2.2.2 Topography

IAAAP is located in the Southern Iowa Drift Plain. The highest elevation in the county, 862 feet above mean sea level (amsl), is located about 13 miles north of IAAAP, near the town of Yarmouth, Iowa. The lowest elevation, about 520 feet amsl, is located where the Skunk River enters the Mississippi River at the southeastern boundary of the county. Vertical relief between lowlands and adjoining uplands generally range from 50 to 120 feet.

Where it is not dissected by drainages, the topography at IAAAP is generally flat in the uplands and slopes gently toward the south. Elevations at IAAAP range from 732 feet amsl along the northern extent of the installation to about 544 feet amsl throughout the extensive southern area of Long Creek and Skunk River.

### 2.2.3 Soil

With exception of alluvial deposits associated with rivers and drainages, soil on IAAAP belongs to either the Mollisols or Alfisols soil orders. Mollisols are a relatively fertile soil and are characterized by a soft surface character, a high base saturation (generally indicative of fertile soil), and a dark color due to abundant humus. Alfisols are also a relatively fertile soil with moderate to high base saturation. Agriculture plays a major role in Des Moines County, with almost 56 percent of the county designated as prime farmland.

### 2.2.4 Geology

IAAAP is located in the Dissected Till Plain section of the Central Lowland Physiographic Province of the Southern Iowa Drift Plain Landform Region. The facility is underlain by a sequence of unconsolidated glacial deposits of Pleistocene age (collectively known as overburden) overlying sedimentary bedrock units. The overburden deposits near IAAAP include alluvium, loess, and glacial drift. The bedrock underlying IAAAP consists of a sequence of limestones interbedded with varying thicknesses of shales and sandstones ranging in age from Cambrian to Mississippian.

### 2.2.5 Hydrogeology

Des Moines County has four principal aquifers: the surficial (overburden) aquifer and the bedrock aquifers of Mississippian, Devonian, and Cambro-Ordovician units. The aquifers of concern for this RI at the IAAAP are the overburden aquifer and the youngest bedrock (Mississippian) aquifer. The overburden aquifer is comprised predominantly of the unconsolidated glacial drift (Kellersville Till) in the upland, northern portion of the IAAAP and the alluvium within the lower creek and river valleys in the southern portion of the IAAAP. Groundwater flow direction in the overburden aquifer typically mimics surface topography, with flow in southeasterly or southwesterly toward Brush Creek, Long Creek, Spring Creek, and the Skunk River. Although potentiometric surface maps based on field data show some localized variation from this flow direction. Groundwater flow within the bedrock aquifers primarily occurs within secondary permeability zones, including fractures, joints, or bedding planes. Overall flow direction is to the south and east toward the Skunk and Mississippi Rivers, when not intercepted by incised surface drainages.

## 2.3 Potential Chemicals of Interest

PFAS in groundwater are the potential chemicals of interest for this SI. The following bullets summarize the findings from the PA report (Arcadis 2020a):

- Three AOPs where potential PFAS impacts are possible and that warrant further investigation were identified.
- PFAS-impacted groundwater may pose unacceptable risk to current and/or future receptors.

## 2.4 Receptors and Pathways

The PA identified potential exposure pathways and receptors for each of the three AOPs. Ecological receptors have a potential exposure pathway by groundwater discharge to surface water bodies, and a complete exposure pathway exists for aquatic receptors (fish, amphibians, benthic invertebrates, semiaquatic mammals, and birds).

Several ecological receptors may be present at IAAAP. State-listed endangered, threatened, or special concern species that have been observed at IAAAP include the following (MWH 2004):

- Threatened plants
  - Virginia snakeroot
  - Downy wood-mint
  - Blue ash
  - Sharpwing monkeyflower
  - Slender ladies tresses
  - False hellebore
- Special concern plants

- Ragged fringed orchid
- Threatened animals
  - Indiana bat
  - Bald eagle
  - Orange throat darter

A summary of exposure pathways, media, and human receptors for each of the AOPs is provided below.

#### 2.4.1 Fire Training Pit

The PA identified the following routes by which PFAS compounds could migrate (Arcadis 2020a):

- Soil to groundwater due to desorption or dissolution
- Soil to surface water through runoff, dissolution, and adsorption
- Groundwater to surface water through groundwater discharge

This SI evaluated whether PFAS are present in groundwater. The PA stated that there are no current or future potential receptors of impacted water (groundwater or surface water) on the installation (Arcadis 2020a); however, based on applicable CERCLA policy and guidance, groundwater at IAAAP is generally classified as Class IIB, a potential source of drinking water (USEPA 1989). The PA also indicated that there is a potential for exposure to impacted groundwater through consumption of groundwater off the installation. Surface runoff is channeled through ditches and culverts along the roads at the site, which direct water south and east toward an intermittent tributary that subsequently connects to Spring Creek. Surface water flows off the IAAAP via Spring Creek; however, the surface water is not known to be used as a source of drinking water. If an RI is warranted for PFAS, then current and future receptors will be reevaluated, as appropriate.

#### 2.4.2 Inert Disposal Area

The PA identified the following routes by which PFAS compounds could migrate (Arcadis 2020a):

- Soil to groundwater due to desorption or dissolution
- Groundwater to surface water through groundwater discharge

This SI evaluated whether PFAS are present in groundwater. The PA stated that there are no current or future potential receptors of impacted water, either groundwater or surface water, on the installation (Arcadis 2020a); however, based on applicable CERCLA policy and guidance, groundwater at IAAAP is generally classified as Class IIB, a potential source of drinking water (USEPA 1989).

Surface water flows off the property via tributaries to the Skunk River, which is not known to be used as a source of drinking water for at least 5 miles from the release. If an RI is warranted for PFAS, then current and future receptors will be reevaluated, as appropriate.

#### 2.4.3 Former Fire Station 200-131-3

The PA identified the following routes by which PFAS compounds could migrate (Arcadis 2020):

- Soil to groundwater due to desorption or dissolution
- Groundwater to surface water through groundwater discharge

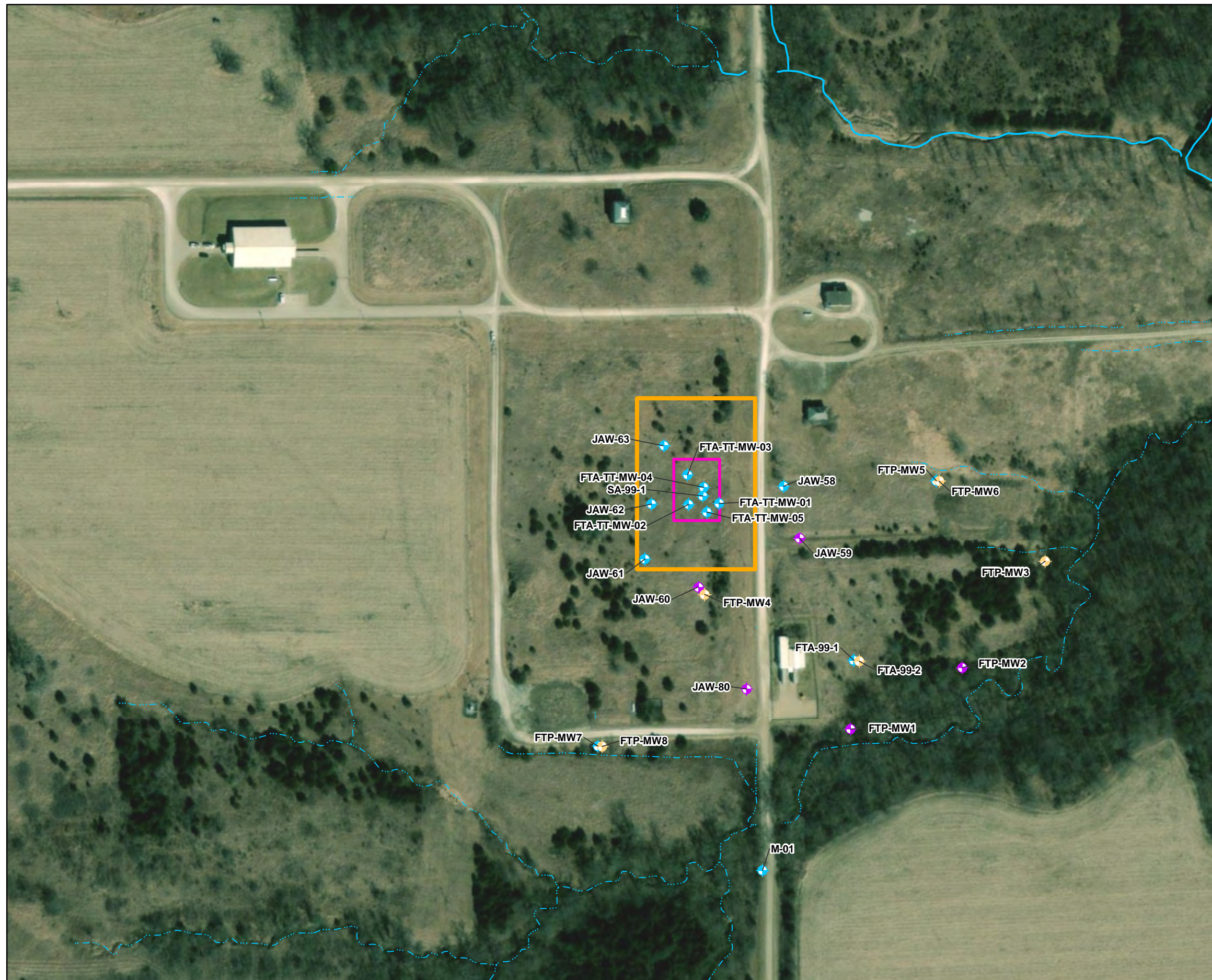
This SI evaluated whether PFAS are present in groundwater. The PA stated that there are no current or future potential receptors of impacted water, either groundwater or surface water, on the installation

## Site Inspection Report: PFAS

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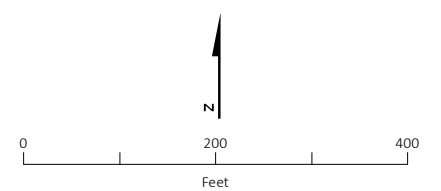
(Arcadis 2020a); however, based on applicable CERCLA policy and guidance, groundwater at IAAAP is generally classified as Class IIB, a potential source of drinking water (USEPA 1989). The PA also indicated that there is a potential for exposure to groundwater through consumption of impacted groundwater off the installation. As shown on Figure 2-3, the former fire station is in close proximity to the plant boundary. There are no public or private wells in close proximity to this AOPI. The closest well, which is on the IAAAP property, is approximately 0.4 miles cross-gradient. Another well is 0.75 miles down and cross-gradient of the AOPI, located in Middletown (Arcadis 2020a). Surface water flows via tributaries to the Skunk River, which is not known to be used as a source of drinking water for at least 5 miles from the release. If an RI is warranted for PFAS, then current and future receptors will be reevaluated, as appropriate.





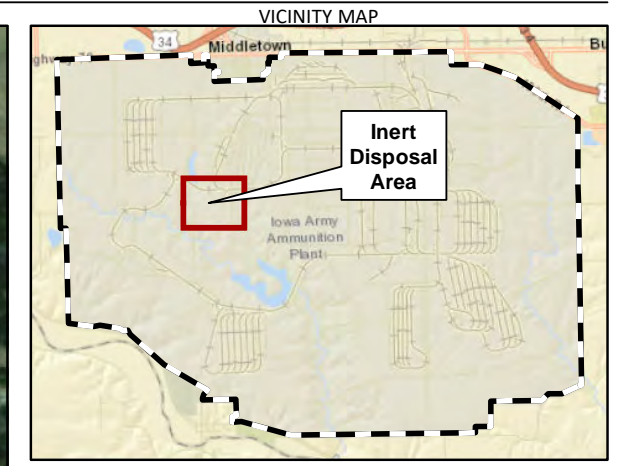
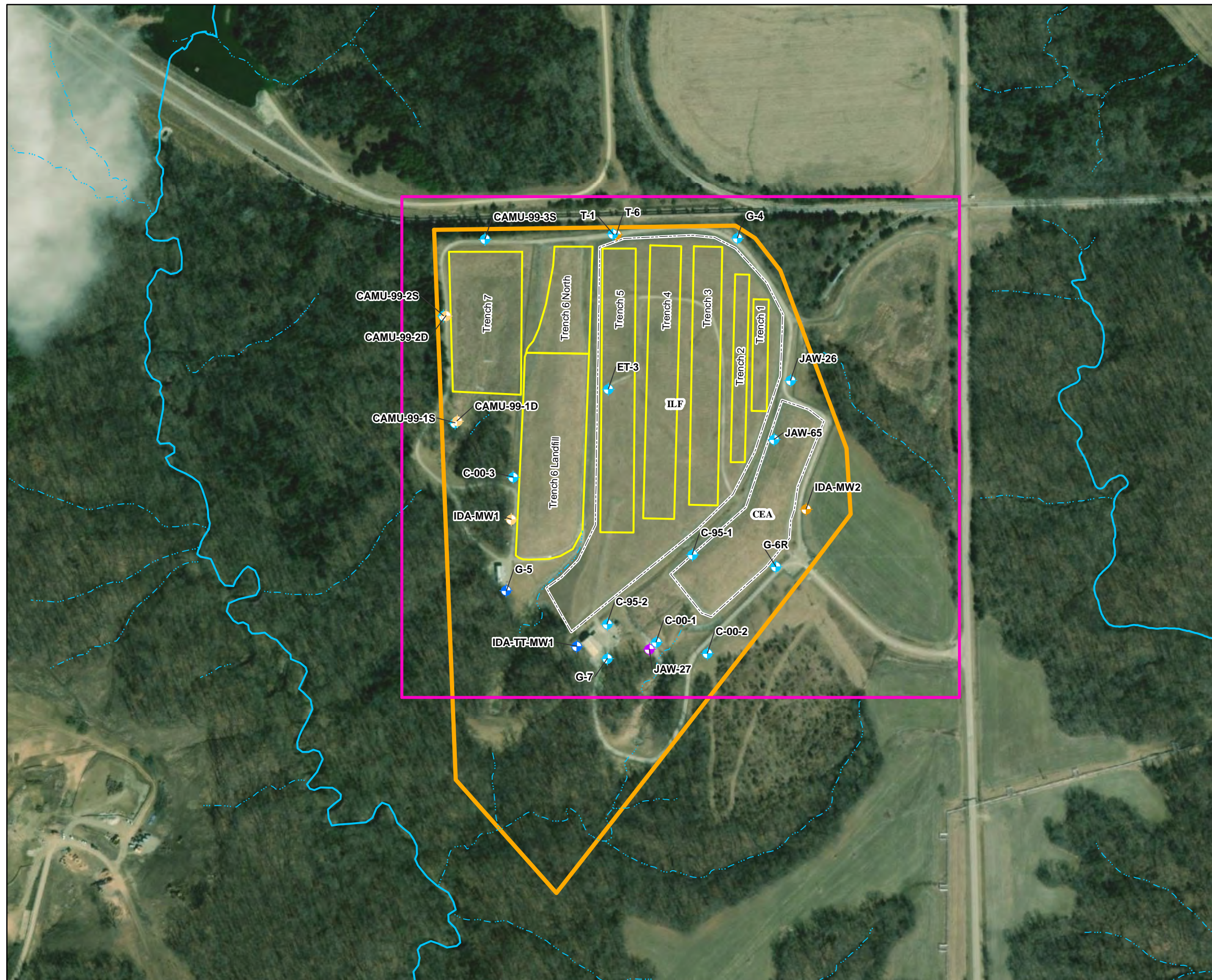
- LEGEND**
- Shallow Overburden Well
  - Intermediate Overburden Well
  - Shallow Bedrock Well
  - Deep Bedrock Well
  - Interface Well
  - Intermittent Stream
  - Perennial Stream
  - AOPI
  - Fire Training Pit IRP Site Boundary (HQAES # IAAP-039/039G)
  - Plant Boundary

Note:  
1. 2020 Esri World Imagery Basemap



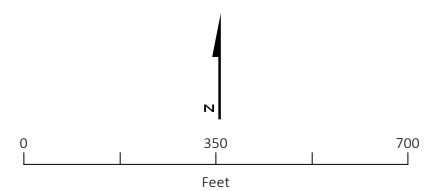
**FIGURE 2-1**  
Fire Training Pit  
Iowa Army Ammunition Plant  
Middletown, Iowa





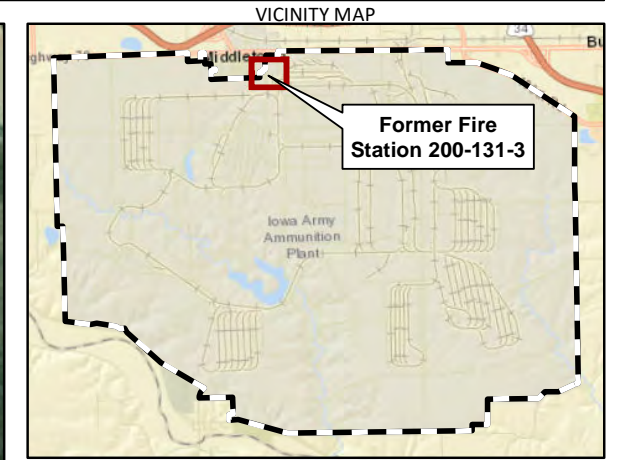
- LEGEND**
- Shallow Overburden Well
  - Intermediate Overburden Well
  - Shallow Bedrock Well
  - Deep Bedrock Well
  - Interface Well
  - Intermittent Stream
  - Perennial Stream
  - AOPI
  - Inert Disposal Area IRP Site Boundary (HQAES # IAAP-020/020G)
  - Plant Boundary
  - CEA & ILF Boundary

Note:  
1. 2020 Esri World Imagery Basemap



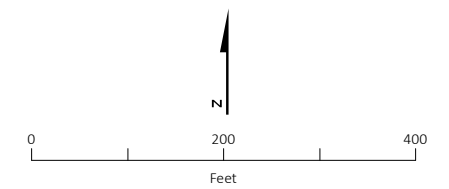
**FIGURE 2-2**  
**Inert Disposal Area**  
Iowa Army Ammunition Plant  
Middletown, Iowa





- LEGEND**
- Shallow Overburden Well
  - Area of Potential Interest (AOPI) Location
  - Plant Boundary

Note:  
1. 2020 Esri World Imagery Basemap



**FIGURE 2-3**  
**Former Fire Station 200-131-3**  
Iowa Army Ammunition Plant  
Middletown, Iowa



### 3. Site Inspection Activities

The field team mobilized to the three AOPIs on November 30, 2020, through December 11, 2020, to perform the field activities described below. The SI was performed following the methods and procedures stipulated in the final *Uniform Federal Policy–Quality Assurance Project Plan for a Site Inspection for Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa* (CH2M 2020). The following subsections provide the details of the inspection activities conducted at the site.

#### 3.1 Field Activities

##### 3.1.1 Sampling Locations and Rationale

Groundwater sample collection was required at the three AOPIs to assess the presence or absence of PFAS contamination. Groundwater sample locations were selected upgradient, within, and downgradient of potential release areas, as recommended by the USEPA during the project scoping session held on January 30, 2019. The overburden aquifer was sampled as the first encountered groundwater-bearing zone at IAAAP and therefore the aquifer most likely to have been affected by PFAS if it is present at the AOPIs. For the FTP and the IDA, existing wells were used to collect appropriate samples, while no wells existed at the Former Fire Station 200-131-3, five new wells were installed and sampled.

All groundwater samples were analyzed for a target list of 22 PFAS that includes 18 analytes defined in EPA Method 537 version 1.1 and 4 additional PFAS identified in the Army's 2018 PFAS guidance. The groundwater samples at each of the AOPIs are listed below:

FTP (Figure 3-1). Five existing wells were sampled:

- Upgradient well: JAW-63
- Potential release area well: FTA-TT-MW-03
- Downgradient wells: JAW-60, FTA-99-1, and FTP-MW5

IDA and Trench 6 (Figure 3-2). Five existing wells were sampled:

- Upgradient well: T-1
- Potential release area wells: ET-3 and C-00-3
- Downgradient wells: C-00-1 and G-5

Potential release area well C-00-3 and downgradient well G-5 were selected for the IDA in place of a well recommended by USEPA (well C-95-1) to provide locations closer to the Trench 6 area, which is the area of interest at the IDA.

Former Fire Station 200-131-3 (Figure 3-3). No monitoring well network existed at the Former Fire Station 200-131-3. Therefore, five new monitoring wells were installed December 1–3, 2020; the locations are shown on Figure 3-3. Soil samples were not collected from these well borings. Because the groundwater flow direction was uncertain, wells were placed to cover the anticipated downgradient direction and locations to both sides of the anticipated flow direction (“cross-gradient”). The cross-gradient wells provide additional hydraulic gradient information and can support nature and extent delineation. Well locations relative to the AFFF release are believed to be as follows:

- Upgradient well: FFS-MW01 (northeast of AFFF release)
- Potential release area well: FFS-MW02 (adjacent to AFFF release)
- Downgradient well: FFS-MW03 (southwest of AFFF release)

- Down/cross-gradient well: FFS-MW04 (west of AFFF release)
- Cross-gradient well: FFS-MW05 (southeast of AFFF release)

Figure 3-1, 3-2, and 3-3 show the monitoring well locations where the groundwater samples were collected from at the FTP, IDA, and Former Fire Station 200-131-3, respectively.

### 3.1.2 Monitoring Well Installation

Five overburden monitoring wells were installed at Former Fire Station 200-131-3. Installation of new monitoring wells was not required at the IDA and FTP sites because a monitoring well network had been installed at these locations as part of the IRP.

Monitoring wells were drilled and installed using combined direct-push technology using Geoprobe 8040DT. The boreholes were advanced from ground surface to depths from 23 feet bgs to 28 feet bgs. Continuous soil samples were collected from the borings used for the new monitoring wells and logged for lithologic descriptions. Lithologic descriptions of overburden glacial deposits and bedrock were performed by a geologist and recorded on soil boring logs. Subsurface soils were classified according to the Unified Soil Classification System. Photoionization detector screening of soils was conducted during drilling, and results were recorded on the boring logs. The boring logs are included in Appendix A.

The new monitoring wells were constructed in accordance with EM-1110-1-4000 (USEPA 1988) and State of Iowa regulations. Monitoring wells consist of a 2-inch-nominal-diameter Schedule 40 PVC screen, riser, and bottom plug. Well screens are machine-slotted, 0.010 inch, and 10 feet from 10 to 20 feet bgs. Monitoring wells were installed within the top of the overburden aquifer. A certified-clean 20/40 quartz sand filter pack was placed around the annular space of the well screen from 8 feet bgs, 2 feet above the top of the screen, to the bottom of the boring. A 2-foot bentonite seal was placed above the top of the sand pack. A bentonite grout was placed in the remaining annular space. The five new monitoring wells were completed flush to ground surface with a watertight steel cover and a locking watertight cap. Table 3-1 summarizes the monitoring well construction details and the measured groundwater levels for the new monitoring wells. Appendix A contains the well completion logs.

**Table 3-1. Monitoring Well Construction Details—Former Fire Station 200-131-3**

*Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS) Iowa Army Ammunition Plant, Middletown, Iowa*

Well Location	Screen Interval (feet bgs)	Filter Pack Interval (feet bgs)	Borehole Depth (feet bgs)	Well Casing Diameter (inches)	Top of Casing Elevation (feet amsl)
FFS-MW01	10 to 20	8 to 23	23	2	727.40
FFS-MW02	10 to 20	8 to 23	23	2	727.75
FFS-MW03	10 to 20	8 to 28	28	2	726.90
FFS-MW04	10 to 20	8 to 23	23	2	726.48
FFS-MW05	10 to 20	8 to 23	23	2	725.92

Borehole diameter for monitoring wells was 6 inches.

### 3.1.3 Well Development

After installation of the monitoring wells, the wells were developed by a combination of bailing, surging, and pumping in accordance with the Uniform Federal Policy–Quality Assurance Project Plan (UFP-QAPP) (CH2M 2020). Development occurred no sooner than 24 hours following well installation. A surge-and-purge method was used to develop the entire vertical screen interval. Development continued until water quality parameters stabilized within the specified criteria ( $\pm 3^{\circ}\text{C}$  temperature,  $\pm 0.1$  pH,  $\pm 3$  percent conductivity,  $\pm 10$  millivolts oxidation-reduction potential,  $\pm 10$  percent dissolved oxygen or 0.5 milligram per liter of dissolved oxygen,  $\pm 10$  percent turbidity or  $\leq 5$  nephelometric turbidity units) with three consecutive readings. Groundwater purged during development was containerized in 55-gallon drums. Appendix A contains the well development logs.

### 3.1.4 Groundwater Monitoring and Sampling

Water levels were measured and recorded in each of the five groundwater monitoring wells from each of the three AOPIs (15 total) prior to sampling. The groundwater samples were collected in laboratory-prepared sampling containers and submitted for analysis. Monitoring wells were sampled using low-flow procedures. General groundwater quality parameters (pH, specific conductance, turbidity, dissolved oxygen, temperature, and oxidation-reduction potential) were collected using a water quality meter and recorded on purge logs. Groundwater quality parameters were allowed to stabilize for three consecutive readings before each well was sampled. Purge logs are included in Appendix A.

### 3.1.5 Laboratory Analysis

The samples were collected and shipped via overnight carrier to Pace Analytical Services, LLC (formerly Shealy Environmental Services Inc.), in West Columbia, South Carolina, for PFAS analysis for 22 individual PFAS compounds, which was performed in accordance with the Department of Defense's (DoD's) *Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) Compliant with Table B-15 of DoD Quality Systems Manual version 5.3* (DoD 2019a). Investigation-derived waste (IDW) other than PFAS compounds was submitted to TestAmerica in Arvada, Colorado, for waste characterization analysis.

## 3.2 Surveying

New monitoring wells were surveyed by State of Iowa–licensed professional surveyor Bruner, Cooper & Zuck. The surveyors set up horizontal and vertical control for the site. Accuracy of the control was held to the Third Order Class I as outlined in the *Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Constructions (A/E/C) and Facility Management* (Federal Geographic Data Committee 2002).

The surveyor provided coordinates of the points  $x$ ,  $y$ , and  $z$  to the nearest 0.01 foot. Horizontal coordinates conformed to North American Datum (NAD) 83 and the vertical elevations were referenced to National Geodetic Vertical Datum (NAVD) 88 with ties to the Iowa State Plane Coordinate System. Appendix B contains the monitoring well coordinates.

## 3.3 Decontamination

Decontamination and waste management activities were conducted in accordance with the final *Basewide Environmental and Waste Management Plan* (CH2M 2018). IDW generated during the SI included drill cuttings from the monitoring well installations, well development and purge water, and decontamination fluids used to decontaminate nondisposable sampling equipment. New, United Nations–approved 55-gallon steel drums were used to contain waste generated during the field activities.

Downhole and nondisposable sampling equipment was decontaminated immediately after each use. Water generated during decontamination of sampling equipment was collected and transferred to a 55-gallon steel drum. Reusable heavy equipment, such as drilling rods and augers, was decontaminated before and in between the collection of each sample using a high-pressure steam cleaner with potable-grade water. Pressure washing was conducted at temporary decontamination pads. Decontamination fluids were captured and containerized in 55-gallon steel drums.

IDW was temporarily stored at the installation-approved staging location and properly labeled. The soil and aqueous drums were sampled by CH2M for waste characterization. Based on the analytical results, IDW was classified as nonhazardous and was picked up on September 2, 2021. Copies of the waste manifests are included in Appendix C.

### 3.4 Sample Analysis and Quality Assurance/Quality Control

Groundwater samples collected during this SI were analyzed for 22 PFAS chemicals. This list includes the 18 analytes defined in USEPA Method 537 version 1.1 and 4 additional analytes listed in the Army's 2018 PFAS guidance. In accordance with DoD's memorandum on *Establishing a Consistent Methodology for the Analysis of Per- and Polyfluoroalkyl Substances in Media Other than Drinking Water* (DoD 2019b), the groundwater samples were analyzed via the method outlined in the *DoD Quality Systems Manual*, version 5.3, Table B-15 (DoD 2019a). Laboratory reports are included in Appendix D.

Field quality assurance/quality control samples were collected according to the following:

- Matrix spike (MS)/matrix spike duplicates (MSDs)—one MS/MSD sampling set was collected per matrix per parameter.
- Field duplicates—two field duplicate samples were collected.

Source/trip blanks—two source/trip blanks filled in the laboratory with verified "PFAS-free" water were transported to the sampling site and handled like an environmental sample (without being opened). They were then returned to the laboratory for analysis.

- Equipment blanks—two equipment blanks with "PFAS-free" water were collected.
- Temperature blanks—a temperature blank accompanied each cooler containing samples.

### 3.5 Data Quality Assessment

The quality of the field sampling efforts and laboratory results were evaluated for compliance with project data quality objectives through a review of overall precision, accuracy, representativeness, comparability, and completeness and sensitivity (PARCCS). Procedures used to assess PARCCS are in accordance with the respective analytical methods and the QAPP requirements.

Data validation was performed by the project chemist on 100 percent of project data in accordance with the project QAPP (Worksheets 28 and 36) following Stage 2B requirements. QAPP data validation guidelines were developed in accordance with the method requirements, professional judgment, and general DoD requirements.

Precision of the data was verified through the review of the field and laboratory data quality indicators, which include field duplicate, laboratory duplicate, laboratory control sample/sample duplicate, and MS/MSDs. There were a few instances where samples were qualified for field duplicate and laboratory duplicate precision; however, overall precision was in control.

Accuracy of the data was verified through the review of the calibration data, laboratory control sample/ sample duplicate, extracted internal standard, and MS/MSD recoveries, as well as the evaluation of method/calibration/field blank data. Although a few analytes were qualified as estimated due to MS/MSD recovery, overall accuracy was in control.

Sample data are representative of the site conditions at the time of sample collection. All samples were properly stored and preserved. Analytical data were reported from an analysis within the project-specified hold-time. There was no contamination of the laboratory and field blanks.

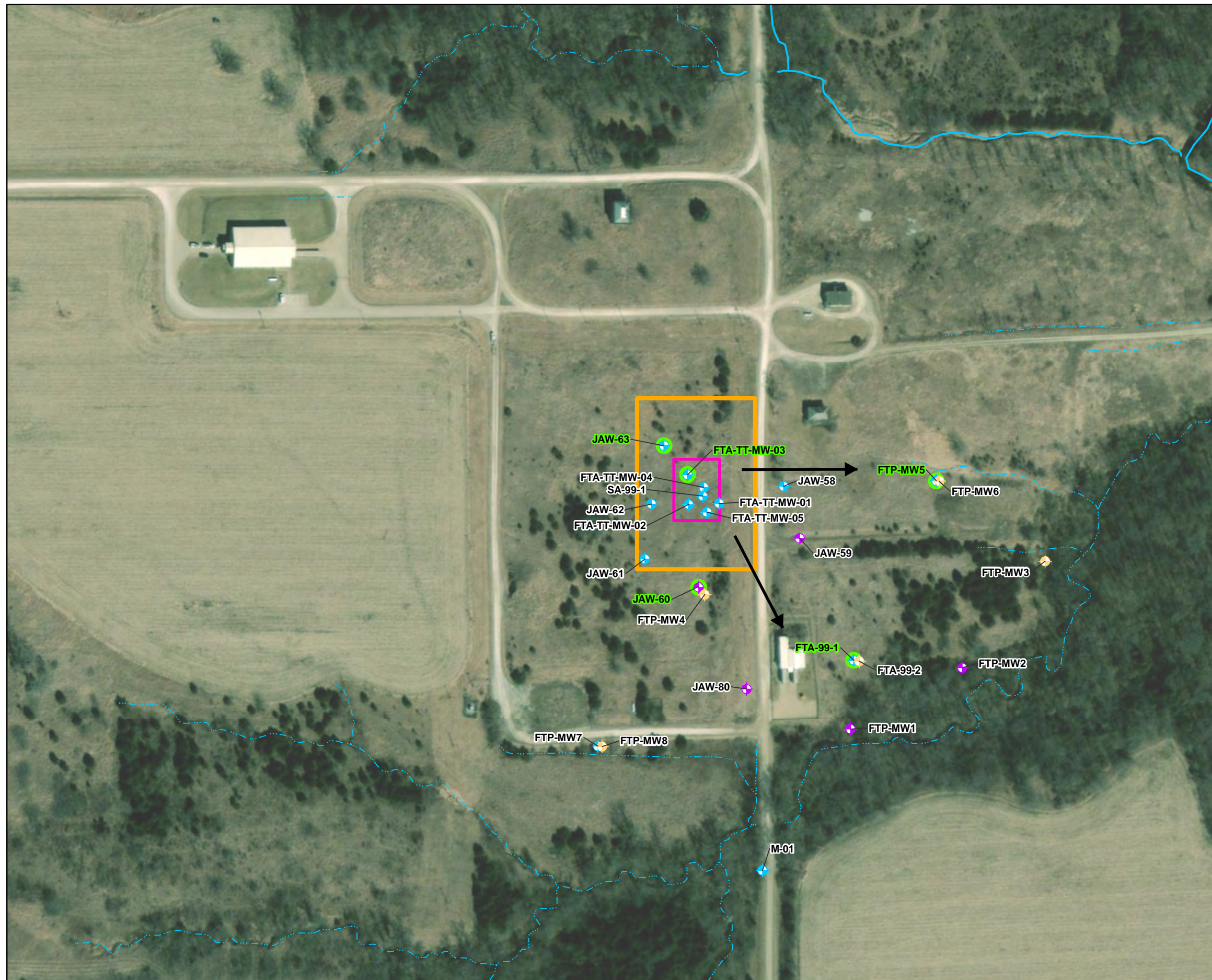
Comparability of the data was verified through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

The completeness objective of 90 percent was met. All results are usable for project objectives. There are no results rejected for project use.

This project was designed to allow risk-based decisions to be made based on the results of common EPA-approved analytical methodologies. Detection limit sensitivity achieved are the best possible based on sample variables.

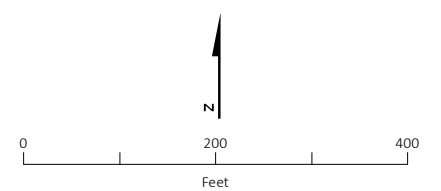
The data generated from sample analyses are of sufficient quality and quantity necessary for accomplishing project objectives. Sample results accurately indicate the presence and/or absence of target analyte contamination at sampled locations. Samples were collected and analyzed as specified in the project QAPP. A full report on data quality evaluation is found in Appendix D.





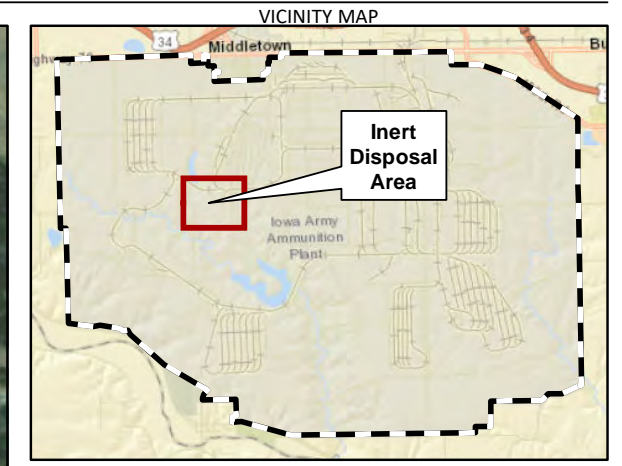
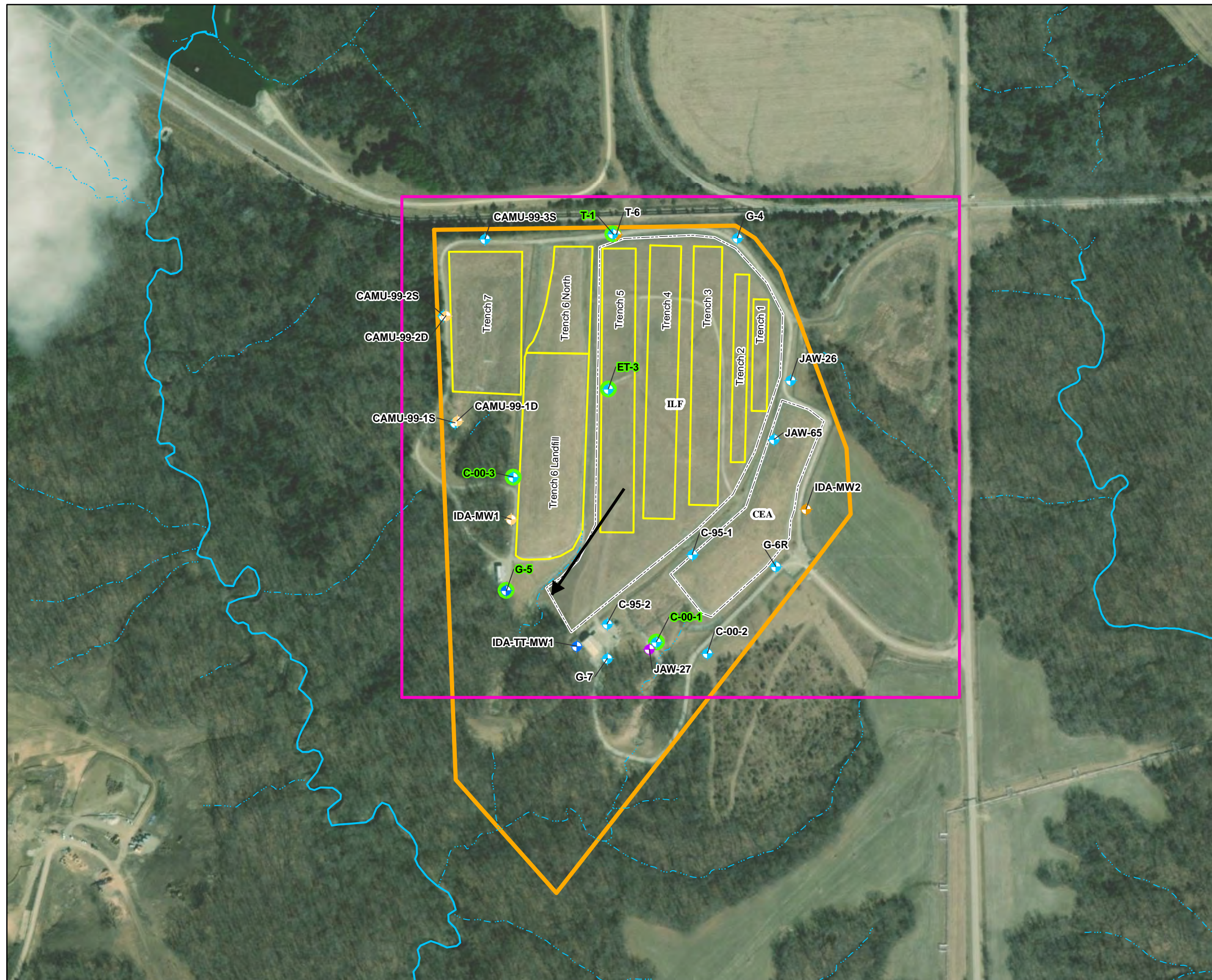
- LEGEND**
- Shallow Overburden Well
  - Intermediate Overburden Well
  - Shallow Bedrock Well
  - Deep Bedrock Well
  - Interface Well
  - Intermittent Stream
  - Perennial Stream
  - AOP
  - Fire Training Pit IRP Site Boundary (HQAES # IAAP-039/039G)
  - Plant Boundary
  - Groundwater Flow Direction (Shallow Aquifer)
  - Groundwater Sampling Location

Note:  
1. 2020 Esri World Imagery Basemap



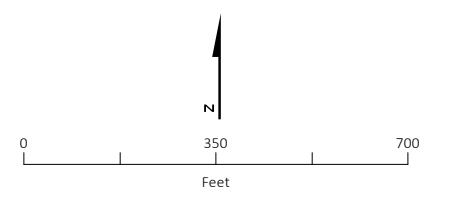
**FIGURE 3-1**  
Groundwater Sampling Locations and  
the Fire Training Pit  
Iowa Army Ammunition Plant  
Middletown, Iowa





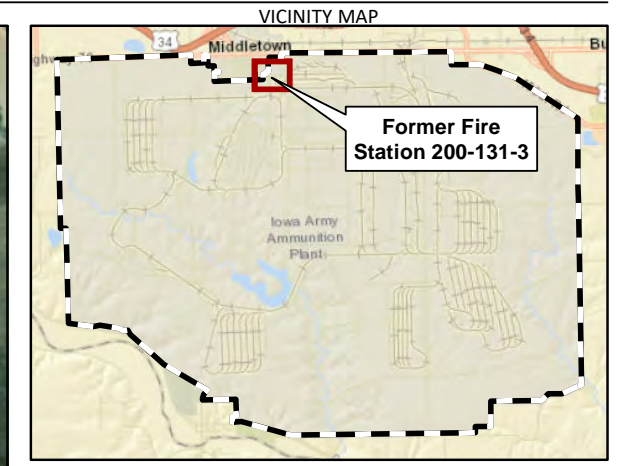
- LEGEND**
- Shallow Overburden Well
  - Intermediate Overburden Well
  - Shallow Bedrock Well
  - Deep Bedrock Well
  - Interface Well
  - Intermittent Stream
  - Perennial Stream
  - AOP
  - Inert Disposal Area IRP Site Boundary (HQAES # IAAP-020/020G)
  - Plant Boundary
  - CEA & ILF Boundary
  - Groundwater Flow Direction (Shallow Aquifer)
  - Groundwater Sampling Location
  - G-5

Note:  
1. 2020 Esri World Imagery Basemap



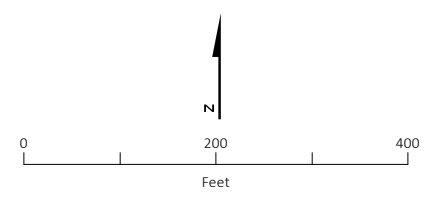
**FIGURE 3-2**  
**Groundwater Sampling Locations**  
**and the Inert Disposal Area**  
*Iowa Army Ammunition Plant*  
*Middletown, Iowa*





- LEGEND**
- Shallow Overburden Well
  - Area of Potential Interest (AOPI) Location
  - Plant Boundary
  - Groundwater Flow Direction (Shallow Aquifer)
  - Groundwater Sampling Location
- FFS MW-01**

Note:  
1. 2020 Esri World Imagery Basemap



**FIGURE 3-3**  
Monitoring Well Installation and Groundwater Sampling Locations  
Iowa Army Ammunition Plant  
Middletown, Iowa



## 4. Site Inspection Findings

To evaluate whether PFAS contamination is present at IAAAP or whether a release has likely occurred, analytical data were evaluated using a weight-of-evidence approach. If a chemical was detected in the groundwater, it was then compared against the PALs to evaluate whether concentrations were indicative of contamination in three AOPIs due to a site release and would warrant further investigation or action.

The PALs were originally selected during the SI planning process, as documented in the final UFP-QAPP (CH2M 2020), and have since been updated to reflect the May 2022 USEPA RSLs for tap water based on a hazard quotient of 0.1 (USEPA 2022) and on the Office of the Assistant Secretary of Defense's *Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program* (DoD 2022). The PALs for the 22 PFAS and their laboratory detection limits are presented in Table 15-1 of the UFP-QAPP.

Water levels were measured between December 1, 2020, and December 9, 2020, at five groundwater monitoring wells from each of the three AOPIs. The water levels are presented in Table 4-1 and on Figure 4-1 (FTP), Figure 4-2 (IDA), and Figure 4-3 (Former Fire Station 200-131-3). PFOS, PFOA, and PFBS detected in SI groundwater samples are summarized in Table 4-2, Table 4-3, and Table 4-4. All chemicals of interest detected in SI groundwater samples are summarized in Appendix D (Table D-1, Table D-2, and Table D-3). A select number of PFOS chemicals were detected above their respective detection limits (DLs) at the three AOPIs as discussed below.

### 4.1 Fire Training Pit

Nine PFAS were detected above the DLs at some or all locations at the FTA: 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS), PFBS, PFHxS, perfluoro-n-butanoic acid (PFBA), perfluoro-n-heptanoic acid (PFHpA), perfluoro-n-hexanoic acid (PFHxA), PFOA, perfluoro-n-pentanoic acid (PFPeA), and PFOS (Appendix D, Table D-1). As shown on Figure 4-4 and in Table 4-2, the concentrations of the following PFAS in groundwater exceed PALs at some or all groundwater samples:

- PFHxS: Concentrations in samples collected at five wells exceed the PAL by one to two orders of magnitude.
- PFOA: Concentrations in samples collected at two of five wells (FTA TT-MW-03 and JAW-60) exceed the PAL by one order of magnitude.
- PFOS: Concentrations in samples collected at all five wells exceed the PAL by one to three orders of magnitude.

### 4.2 Inert Disposal Area and Trench 6

Twelve PFAS were detected at one or more locations above their DLs: 6:2 FTS, n-ethylperfluoro-1-octanesulfonamidoacetic acid (ETFOSAA), PFBS, PFHxS, PFBA, PFHpA, PFHxA, perfluoro-n-nonanoic acid (PFNA), PFOA, PFPeA, perfluoro-n-tetradecanoic acid (PFTeDA), and PFOS (Appendix D, Table D-2). ETFOSAA and PFTeDA were both detected in the duplicate obtained at ET-3, but were not detected above the DL in the parent sample. As shown on Figure 4-5 and in Table 4-3, the concentrations of the following PFAS in groundwater exceed PALs at some or all groundwater samples:

- PFOA: Concentrations in both the parent and duplicate samples collected at ET-3 exceed the PAL by two orders of magnitude.
- PFOS: Concentrations in both the parent and duplicate samples collected at ET-3 exceed the PAL by one order of magnitude.

### 4.3 Former Fire Station 200-131-3

Nine PFAS were detected above their DLs at all five locations (in the five samples, as well as in the duplicate sample): 6:2 FTS, PFBS, PFHxS, PFBA, PFHpA, PFHxA, PFOA, PFPeA, and PFOS (Appendix D, Table D-3). As shown on Figure 4-6 and in Table 4-4, the concentrations of the following PFAS in groundwater exceed PALs at some or all groundwater samples:

- PFHxS: Concentrations in samples collected at four of five wells (FFS-MW01, FFS-MW02, FFS-MW03, and FFS-MW04) exceed the PAL by up to one order of magnitude.
- PFOA: Concentrations in samples collected at three of five wells (FFS-MW02, FFS-MW04, and FFS-MW05) exceed the PAL by up to one order of magnitude.
- PFOS: Concentrations in samples collected at all five wells exceed the PAL by one to two orders of magnitude.

**Table 4-1. Groundwater Elevations**

Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant,  
Middletown, Iowa

	Date	Depth to Water (feet BTOC)	Top of Casing Elevation (feet amsl)	Groundwater Elevation (feet amsl)
<i>Fire Training Pit</i>				
FTA-99-1	12/1/2020	15.41	671.18	655.77
FTA-TT-MW-03	12/1/2020	11.07	686.37	675.30
FTP-MW5	12/1/2020	15.08	670.59	655.51
JAW-60	12/1/2020	20.39	683.82	663.43
JAW-63	12/1/2020	15.54	691.08	675.54
<i>Inert Disposal Area</i>				
C-00-1	12/1/2020	10.88	684.63	673.75
C-00-3	12/1/2020	22.47	699.92	677.45
ET-3	12/1/2020	26.15	717.27	691.12
G-5	12/1/2020	35.68	692.58	656.90
T-1	12/4/2020	15.62	712.16	696.54
<i>Former Fire Station 200-131-3</i>				
FFS-MW01	12/7/2020	11.50	727.40	715.90
FFS-MW02	12/7/2020	14.26	727.75	713.49
FFS-MW03	12/7/2020	11.31	726.90	715.59
FFS-MW04	12/9/2020	10.86	726.48	715.62
FFS-MW05	12/9/2020	10.81	725.92	715.11

BTOC = below top of casing

**Table 4-2. Analytical Results of Per- and Polyfluoroalkyl Substances at the Fire Training Pit**

*Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa*

Location		FTA-99-1	FTA-TT-MW-03	FTP-MW5	JAW-60	JAW-63
Sample ID		FTA-99-1-1220	FTA-TT-MW-03-1220	FTP-MW5-1220	JAW-60-1220	JAW-63-1220
Sample Type		N	N	N	N	N
Sample Depth (ft)		7-17	5-30	8.9-13.9	24-34	10-20
Sample Date		12/10/2020	12/10/2020	12/10/2020	12/8/2020	12/9/2020
PFAS Analyte (ng/L)	Screening Level					
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
Perfluoro-1-butanesulfonic acid (PFBS)	600	24	210	5.2	94	5.7
Perfluorohexanesulfonic acid (PFHxS)	39	<b>360</b>	<b>1,400</b>	91	<b>1,500</b>	<b>110</b>
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-octanoic acid (PFOA)	6	5.6	<b>31</b>	3.9	<b>24</b>	1.5 J
Perfluorooctanesulfonic acid (PFOS)	4	<b>80</b>	<b>620</b>	<b>37</b>	<b>270</b>	<b>17</b>

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N = Normal

NA = Not analyzed

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

Bold indicates the analyte was detected.

Shading indicates the result exceeded screening criteria.

**Table 4-3. Analytical Results of Per- and Polyfluoroalkyl Substances at the Inert Disposal Area**

*Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa*

Location		C-00-1	C-00-3	ET-3		G-5	T-1
Sample ID		C-00-1-1220	C-00-3-1220	ET-3-1220	FD02-1220	G-5-1220	T-1-1220
Sample Type		N	N	N	FD	N	N
Sample Depth (ft)		12.35–22.35	31.75–41.75	15–30	15–30	40–50	25–35
Sample Date		12/9/2020	12/7/2020	12/8/2020	12/8/2020	12/7/2020	12/7/2020
PFAS Analyte (ng/L)	Screening Level						
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.5 U	3.6 U	3.5 U	3.4 UJ	3.4 U	3.4 U
Perfluoro-1-butanesulfonic acid (PFBS)	600	1.3 J	1.8 U	1.7 UJ	26 J	4.9	1.7 U
Perfluorohexanesulfonic acid (PFHxS)	39	1.1 J	1.8 U	12	14	1.8 J	1.7 U
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.8 U	1.7 U	1.0 J	1.7 U	1.7 U
Perfluoro-n-octanoic acid (PFOA)	6	2.9 J	1.8 U	110	110	1.7 U	1.7 U
Perfluorooctanesulfonic acid (PFOS)	4	2.0 J	1.8 U	9.8	9.1	1.7 U	1.7 U

FD = Field duplicate

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N = Normal

NA = Not analyzed

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

Bold indicates the analyte was detected.

Shading indicates the result exceeded screening criteria.

**Table 4-4. Analytical Results of Per- and Polyfluoroalkyl Substances at Former Fire Station 200-131-3**

*Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa*

Location		FFS-MW01	FFS-MW02		FFS-MW03	FFS-MW04	FFS-MW05
Sample ID		FFS-MW01-1220	FFS-MW02-1220	FD01-1220	FFS-MW03-1220	FFS-MW04-1220	FFS-MW05-1220
Sample Type		N	N	FD	N	N	N
Sample Depth (ft)		10-20	10-20	10-20	10-20	10-20	10-20
Sample Date		12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/9/2020	12/9/2020
PFAS Analyte (ng/L)	Screening Level						
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
Perfluoro-1-butananesulfonic acid (PFBS)	600	8.3	99	94	15 J	47	4.6
Perfluorohexanesulfonic acid (PFHxS)	39	39	<b>680</b>	<b>720</b>	45 J	<b>630</b>	17 J
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-octanoic acid (PFOA)	6	4.1	<b>19</b>	<b>19</b>	1.8 J	<b>27</b>	<b>9.1</b>
Perfluorooctanesulfonic acid (PFOS)	4	<b>14</b>	<b>18</b>	<b>19</b>	5.9 J	<b>94</b>	<b>8.5</b>

FD = Field duplicate

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N = Normal

NA = Not analyzed

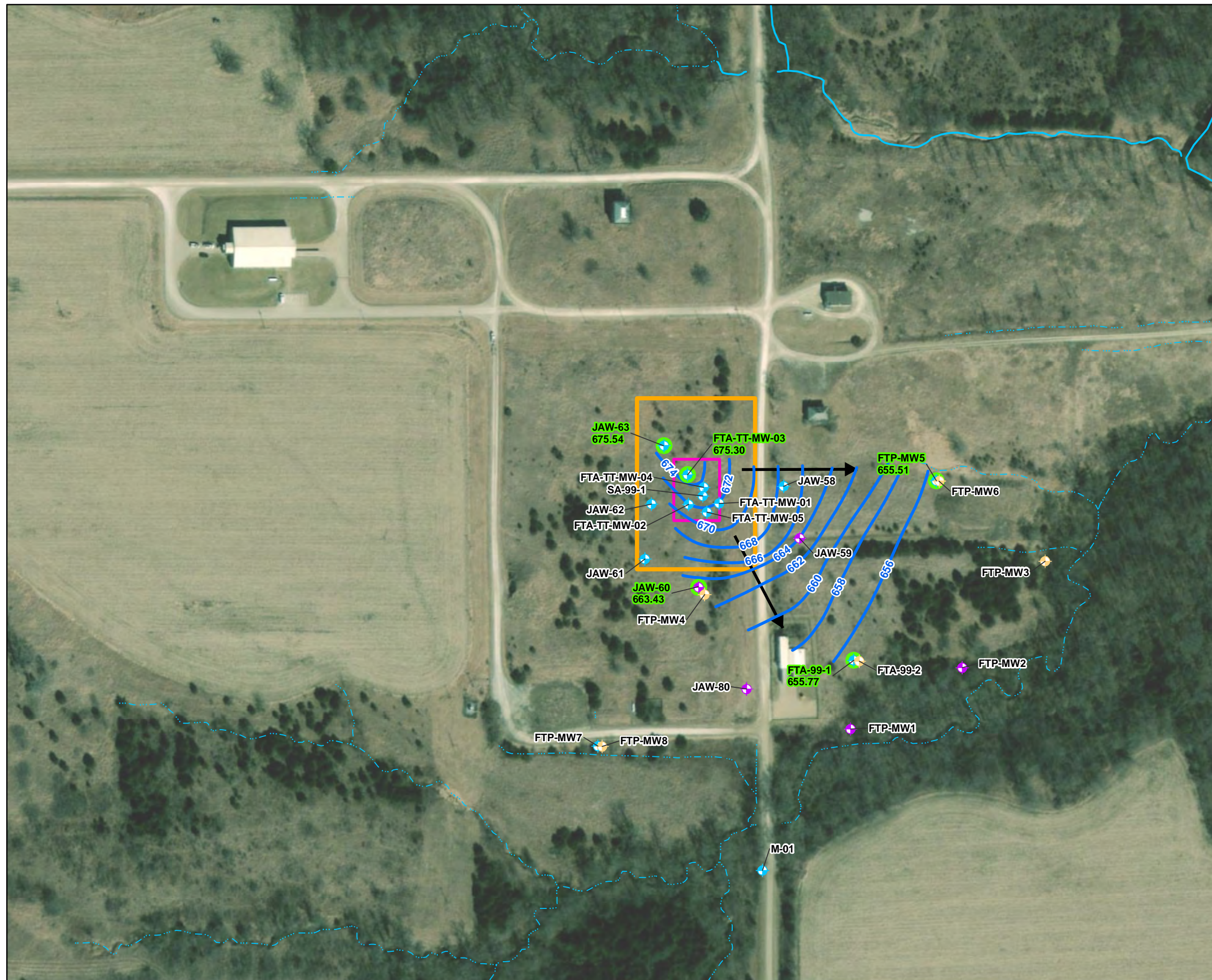
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

Bold indicates the analyte was detected.

Shading indicates the result exceeded screening criteria.



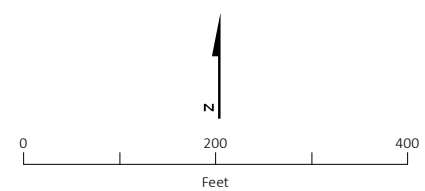


**LEGEND**

- Shallow Overburden Well
- Intermediate Overburden Well
- Shallow Bedrock Well
- Deep Bedrock Well
- Interface Well
- Intermittent Stream
- Perennial Stream
- AOPI
- Fire Training Pit IRP Site Boundary (HQAES # IAAP-039/039G)
- Plant Boundary
- Groundwater Flow Direction (Shallow Aquifer)
- Groundwater Elevation Contour (feet amsl)
- Groundwater Monitoring Location and Elevation (feet amsl)

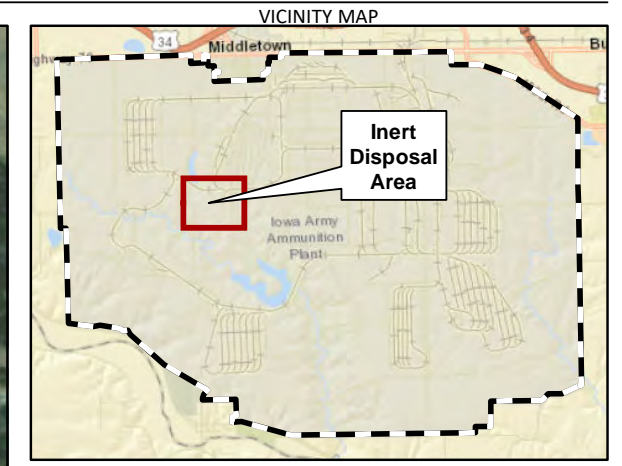
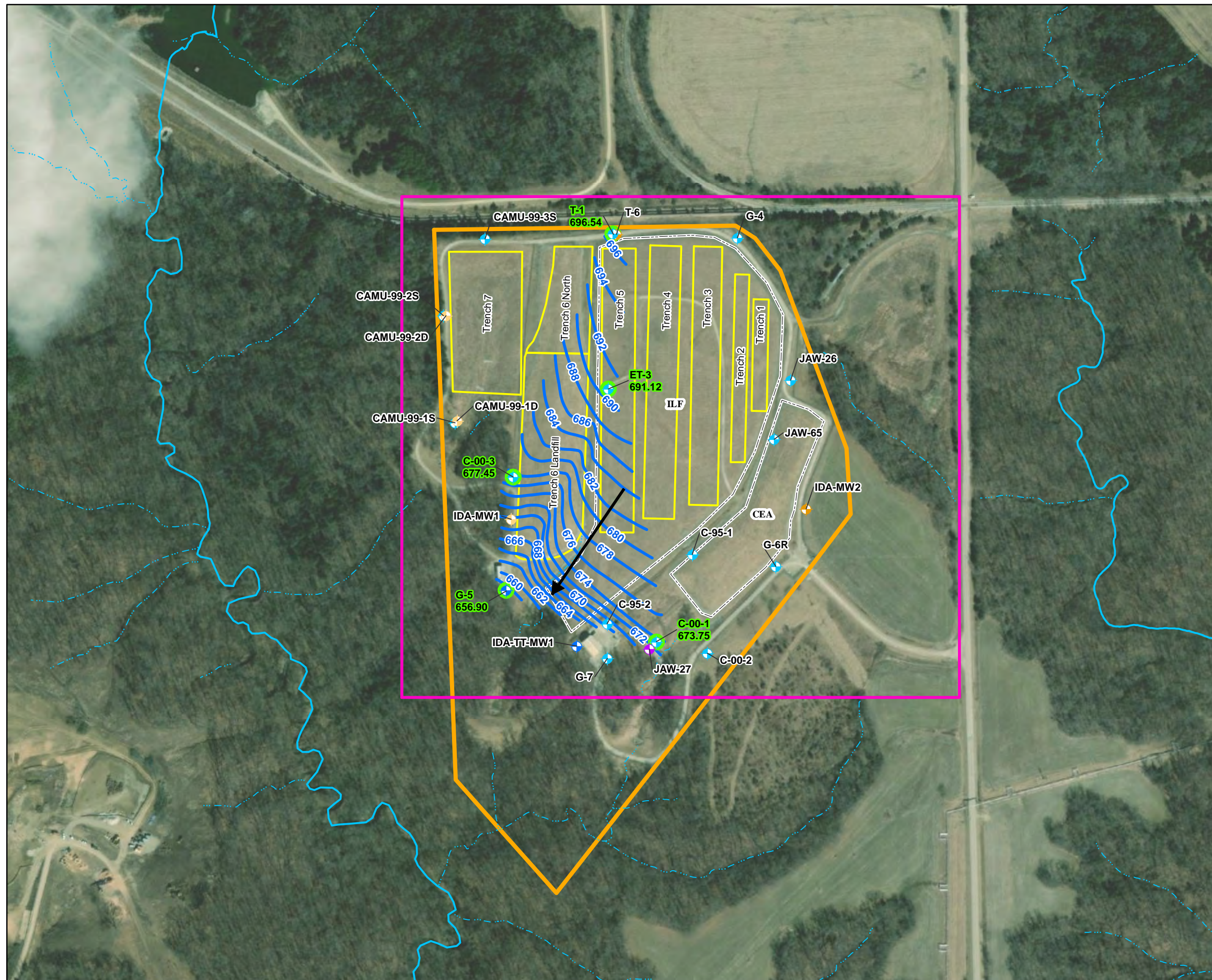
**JAW-60**  
663.43

Notes:  
1. 2020 Esri World Imagery Basemap  
2. amsl = Above mean sea level



**FIGURE 4-1**  
Groundwater Potentiometric Map at the  
Fire Training Pit  
Iowa Army Ammunition Plant  
Middletown, Iowa



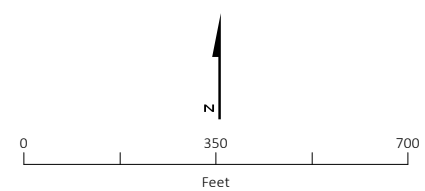


**LEGEND**

- Shallow Overburden Well
- Intermediate Overburden Well
- Shallow Bedrock Well
- Deep Bedrock Well
- Interface Well
- Intermittent Stream
- Perennial Stream
- AOP
- Inert Disposal Area IRP Site Boundary (HQAES # IAAP-020/020G)
- Plant Boundary
- CEA & ILF Boundary
- Groundwater Flow Direction (Shallow Aquifer)
- Groundwater Elevation Contour (feet amsl)
- Groundwater Monitoring Location and Elevation (feet amsl)

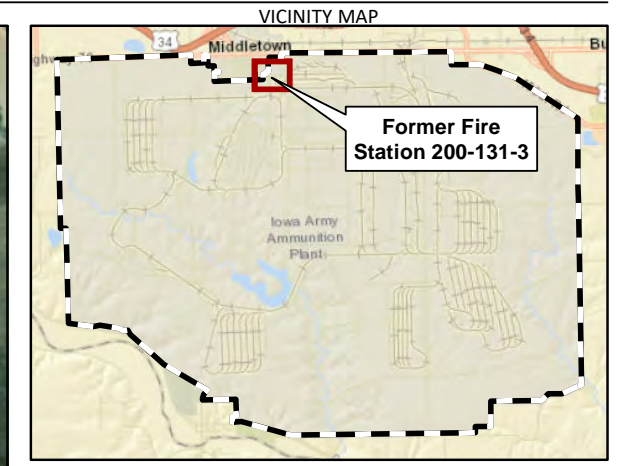
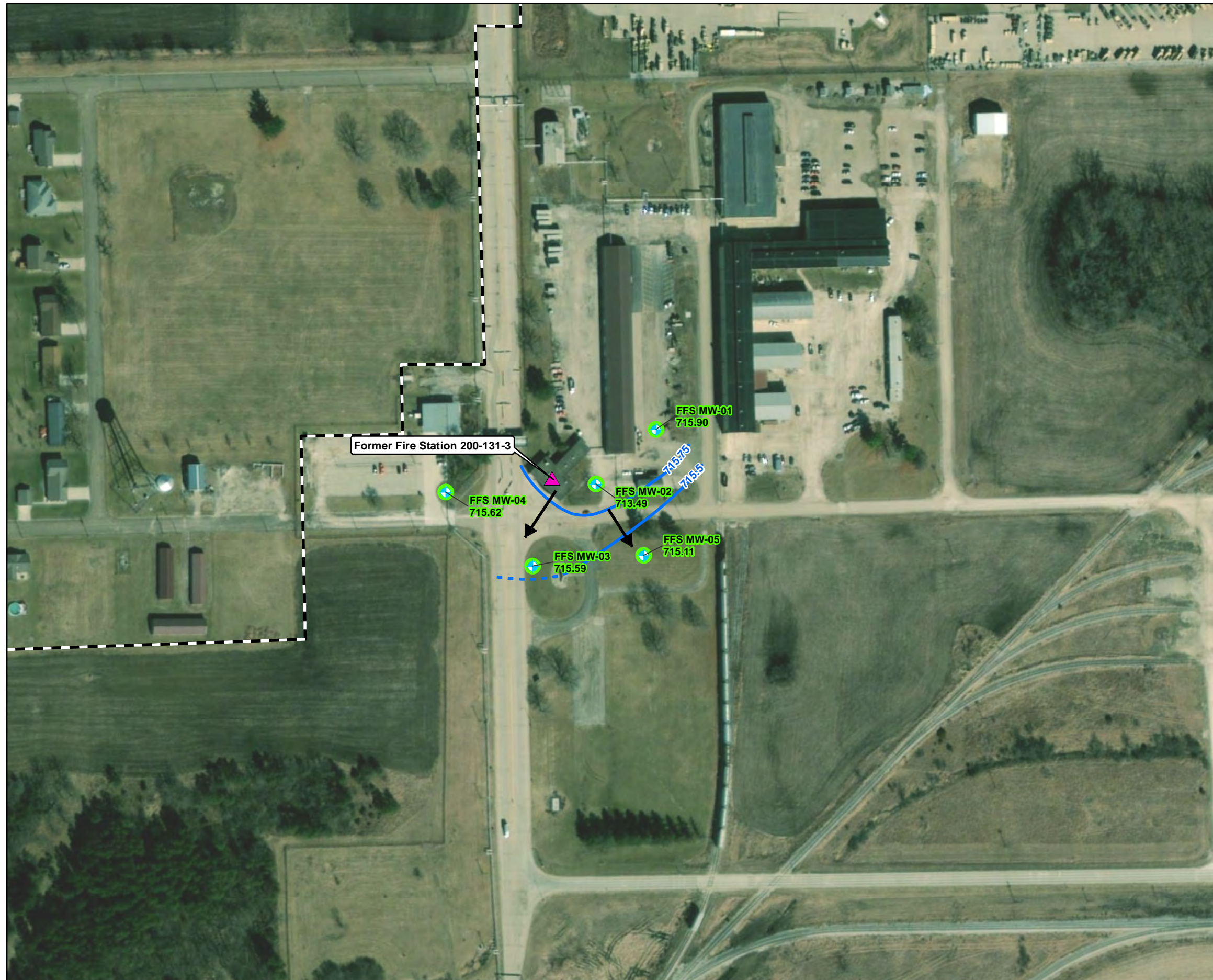
**Notes:**

1. 2020 Esri World Imagery Basemap
2. amsl = Above mean sea level



**FIGURE 4-2**  
**Groundwater Potentiometric Map at the**  
**Inert Disposal Area**  
 Iowa Army Ammunition Plant  
 Middletown, Iowa





**LEGEND**

- Shallow Overburden Well
- Area of Potential Interest (AOPI) Location
- Plant Boundary
- Groundwater Flow Direction (Shallow Aquifer)
- Groundwater Elevation Contour; Dashed Where Inferred (feet amsl)
- Groundwater Monitoring Location and Elevation (feet amsl)

**FFS MW-01**  
715.90

Notes:

1. 2020 Esri World Imagery Basemap
2. amsl = Above mean sea level
3. Groundwater elevation data from monitoring well FFS-MW-2 was not used to draw potentiometric contours. The potentiometric water level in this well may not have equilibrated with hydrostatic pressure at the time the water level was measured.

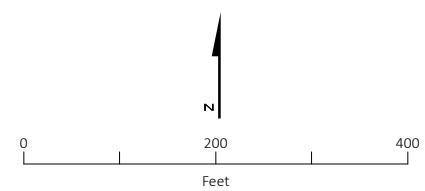
**FIGURE 4-3**  
Groundwater Potentiometric Map at the Former Fire Station 200-131-3  
Iowa Army Ammunition Plant  
Middletown, Iowa





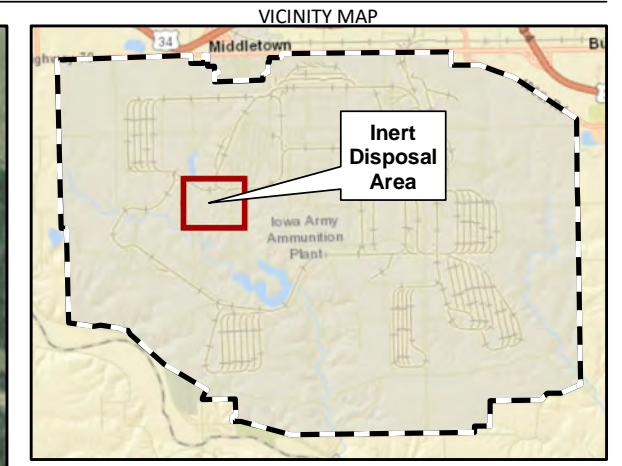
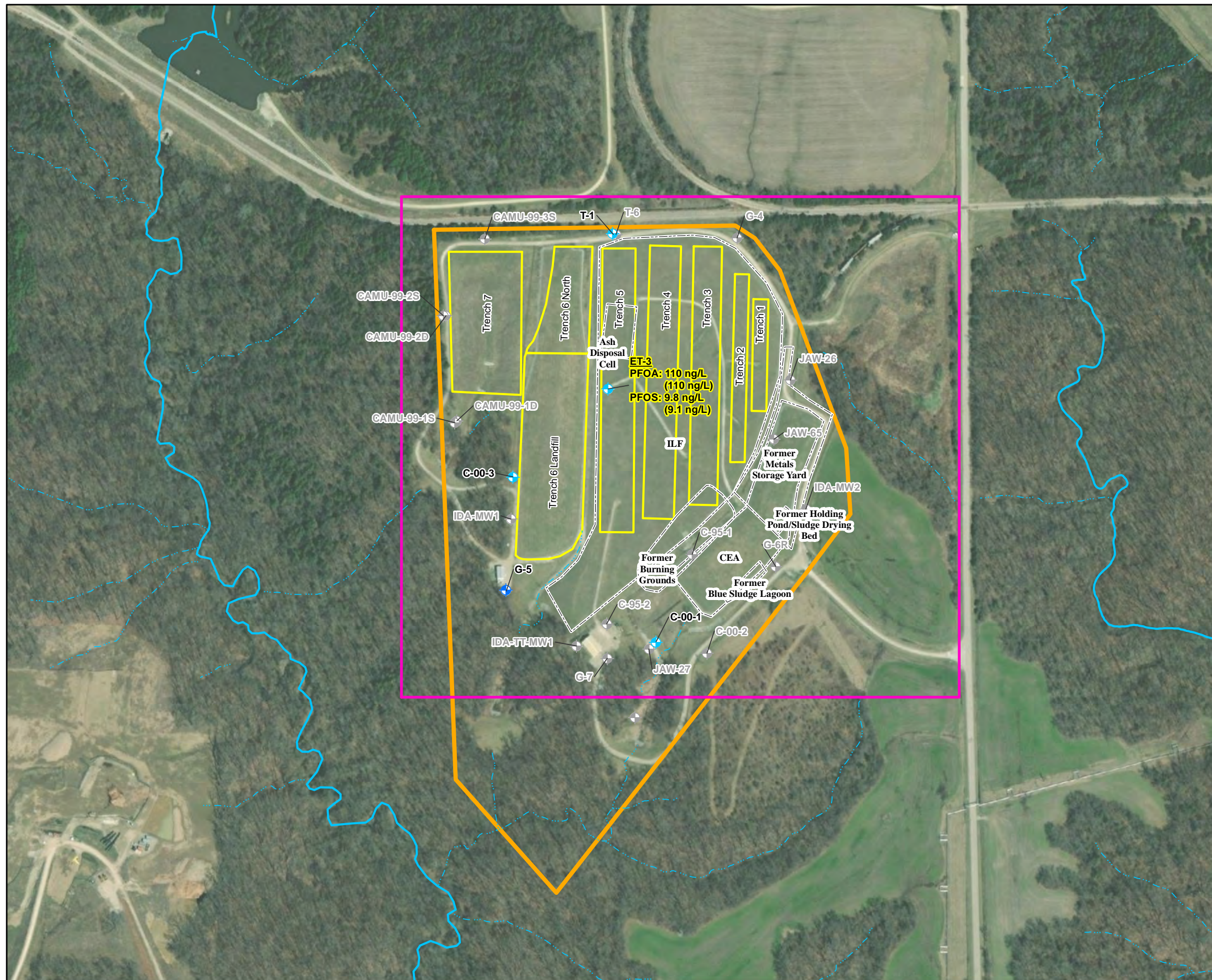
- LEGEND**
- Shallow Overburden Well
  - Interface Well
  - Well Not Sampled for PFAS
  - Intermittent Stream
  - Perennial Stream
  - AOPI
  - Fire Training Pit IRP Site Boundary (HQAES # IAAP-039/039G)
  - Plant Boundary
  - JAW-60** Exceedance of PFOS

- Notes:
1. PFAS = Per- and Polyfluoroalkyl Substances
  2. PFHxS = Perfluorohexanesulfonic acid
  3. PFOS = Polyfluorooctanesulfonic acid
  4. ng/L = Nanogram per liter
  5. 2021 Esri World Imagery Basemap



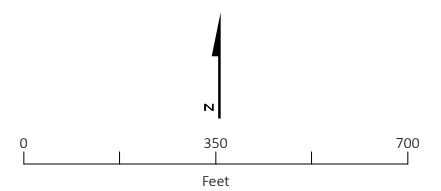
**FIGURE 4-4**  
**Per- and Polyfluoroalkyl Substances (PFAS)**  
**Groundwater Results at the Fire Training Pit**  
**Iowa Army Ammunition Plant**  
**Middletown, Iowa**





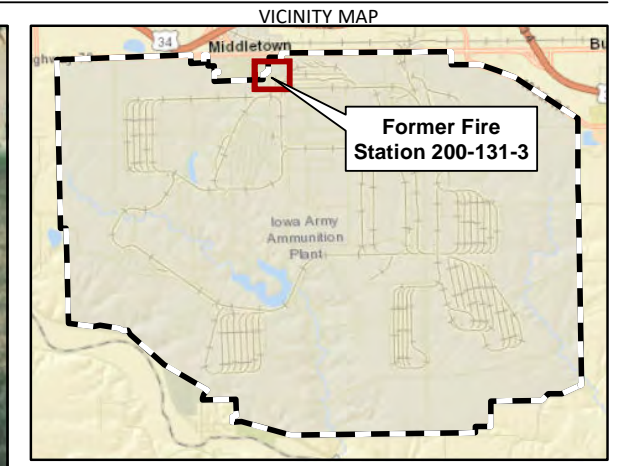
- LEGEND**
- Shallow Overburden Well
  - Intermediate Overburden Well
  - Well Not Sampled for PFAS
  - Intermittent Stream
  - Perennial Stream
  - AOP1
  - Inert Disposal Area IRP Site Boundary (HQAES # IAAP-020/020G)
  - Plant Boundary
  - CEA & ILF Boundary
  - ET-3** Exceedance of PFOA and PFOS
  - (110 ng/L)** Exceedance of PFOA and PFOS in Duplicate

- Notes:
1. PFAS = Per- and Polyfluoroalkyl Substances
  2. PFHxS = Perfluorohexanesulfonic acid
  3. PFOA = Polyfluoro-n-octanoic acid
  4. ng/L = Nanogram per liter
  5. (110 ng/L) = Denotes the duplicate result
  6. 2021 Esri World Imagery Basemap



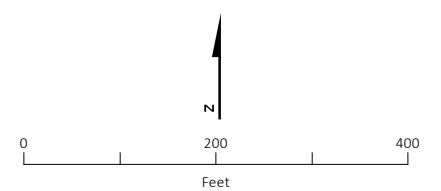
**FIGURE 4-5**  
**Per- and Polyfluoroalkyl Substances (PFAS)**  
**Groundwater Results at the Inert Disposal Area**  
 Iowa Army Ammunition Plant  
 Middletown, Iowa





- LEGEND**
- Shallow Overburden Well
  - Area of Potential Interest (AOPI) Location
  - Plant Boundary
  - FFS MW-01** Exceedance of PFHxS, PFOA, or PFOS
  - (720 ng/L)** Exceedance of PFHxS, PFOA, or PFOS in Duplicate

- Notes:
1. PFAS = Per- and Polyfluoroalkyl Substances
  2. PFHxS = Perfluorohexanesulfonic acid
  3. PFOS = Polyfluorootanesulfonic acid
  4. ng/L = Nanogram per liter
  5. (720 ng/L) = Denotes the duplicate result
  6. J = Denotes result is approximate
  7. 2021 Esri World Imagery Basemap



**FIGURE 4-6**  
**Per- and Polyfluoroalkyl Substances**  
**Groundwater Results at Former**  
**Fire Station 200-131-3**  
*Iowa Army Ammunition Plant*  
*Middletown, Iowa*



## 5. Conclusions and Recommendations

An SI was conducted at IAAAP in Des Moines County, Iowa to evaluate whether PFAS is present in groundwater at concentrations that would warrant further investigation or action. As presented in the PA (Arcadis 2020a), AOPIs were identified, of which it was determined that three of the AOPIs (the FTP, IDA, and Former Fire Station 200-131-3) required an SI. Seventeen groundwater samples were collected (five from each AOPI and two duplicate samples). The analytical data indicate that PFAS compounds were present in every sample that was collected at the three AOPIs, and there were exceedances of PALs consistent with DoD guidance (DoD 2022) at all three AOPIs.

Based on the presence of PFAS in excess of the PALs at the three AOPIs, a release of PFAS likely occurred at each AOPI, and an expanded SI or an RI should be conducted to delineate the affected areas.

In addition, a fourth AOPI was identified in a revised 2020 version of the PA (Arcadis 2020b); this revised PA was completed and submitted after the 2020 SI field activities were conducted. This additional AOPI is the current fire station, and an SI will be performed to further evaluate PFAS impacts (Arcadis 2020b).



## 6. References

- Arcadis. 2020a. *Preliminary Assessment of Per- and Polyfluoroalkyl Substances Iowa Army Ammunition Plant, Iowa*. March.
- Arcadis. 2020b. *Preliminary Assessment of Per- and Polyfluoroalkyl Substances Iowa Army Ammunition Plant, Iowa*. October.
- CDM (CDM Federal Programs Corporation). 1997. *Action Memorandum for the Inert Landfill at the Iowa Army Ammunition Plant, Middletown, Iowa*. September.
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# **Appendix A**

## **Field Documentation**



Iowa Army Ammunition Plant, Middletown, IA  
Project 679172CH

Boring ID  
FFS-MW01

Sheet 1 of 1

SOIL BORING LOG

Project: IAAAP PFAS S1

Site Location: Middletown, IA (IAAAP Former Fire Station)

Weather: 30s, sunny

Drilling Contractor: Roberts

Drilling Method and Equipment Used: DPT/Geoprobe 8040 DT

Water Level: N/A

Start Date & Time: 12/2/2020 at 8:30

End Date & Time: 12/2/2020 at 9:50

Logged By: Contractor/Geologist

Feet BGS	Sample Interval (ft)	Recovery (in)	#/Type	USCS Code	Soil Description	Comments
					USCS group symbol, USCS soil name, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0-3	N/A	1	CL	0-0.5' - Asphalt		
				0.5-3' - CL: Clay, black, dry to moist, soft, little silt, little fine sand, odor	80.0 ppm	
5	3-8	40	2	CL	3-5' - CL: Clay, gray with brown pockets, moist, stiff, little silt, trace fine sand, trace fine gravel	0-5' - Cleared with hand auger 3-8' - First interval recovered with DPT post hand clear 16.0 ppm
				CH	5-8' - CH: Clay, gray, moist, soft, medium to high plasticity, trace silt	1.8 ppm
10	8-13	60	3	CL	8-10' - CL: Clay, brown, moist, stiff, trace silt, trace fine gravel	0.7 ppm
				CL	10-13' - CL: Clay, light brown, moist, soft, medium plasticity, trace silt	1.7 ppm
15	13-18	60	4	CL	13-18' - CL: Clay, light brown, moist, soft, medium plasticity, trace silt, trace fine sand	1.1 ppm
						1.2 ppm
20	18-23	60	5	CL	18-21' - CL: Clay, light brown, moist, soft, medium plasticity, trace silt, trace fine sand	0.9 ppm
				CL	21-23' - CL: Clay, light brown, moist, stiff, trace silt, trace fine sand	0.7 ppm
25					End of boring at 23'	
30						





Iowa Army Ammunition Plant, Middletown, IA  
Project 679172CH

Boring ID  
FFS-MW02

Sheet 1 of 1

SOIL BORING LOG

Project: IAAAP PFAS S1

Site Location: Middletown, IA (IAAAP Former Fire Station)

Weather: high 20s to low 30s, sunny

Drilling Contractor: Roberts

Drilling Method and Equipment Used: DPT/Geoprobe 8040 DT

Water Level: N/A

Start Date & Time: 12/1/2020 at 9:20

End Date & Time: 12/1/2020 at 10:15

Logged By: Contractor/Geologist

Feet BGS	Sample Interval (ft)	Recovery (in)	#/Type	USCS Code	Soil Description	Comments
					USCS group symbol, USCS soil name, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
5	0-3	N/A	1	OL	0-3' - OL: Organic clay and silt, dark brown, dry, little subrounded gravel	0.0 ppm 0-5' - Cleared with hand auger 3-8' - First interval recovered with DPT post hand clear
	3-8	57	2	CL	3-6' - CL: Clay, dark brown to black, moist, very stiff, little silt	0.0 ppm
CL				6-8' - CL: Clay, light brown, moist, soft, medium plasticity, trace silt	0.2 ppm	
10	8-13	49	3	CH	8-10' - CH: Clay, light brown, moist, soft, medium to high plasticity	0.1 ppm
				CL	10-11' - CL: Clay, light brown, moist, stiff, little silt	0.0 ppm
				CL	11-13' - CL: Clay, dark brown to black, moist, soft, little silt	0.0 ppm
15	13-18	60	4	CL	13-15' - CL: Clay, dark brown, moist, stiff, few silt	0.0 ppm
				CL	15-18' - CL: Clay, gray, moist, soft, little silt	0.0 ppm
20	18-23	60	5	CL	18-21' - CL: Clay, gray, moist, soft, little silt	0.0 ppm
				CL	21-23' - CL: Clay, gray, moist, stiff, little silt	0.0 ppm
25					End of boring at 23'	
30						

Iowa Army Ammunition Plant, Middletown, IA  
Project 679172CHBoring ID  
FHS-MW03

Sheet 1 of 1

## SOIL BORING LOG

Project: IAAAP PFAS SI

Site Location: Middletown, IA (IAAAP Former Fire Station)

Weather: high 20s to low 30s, sunny

Drilling Contractor: Roberts

Drilling Method and Equipment Used: DPT/Geoprobe 8040 DT

Water Level: N/A

Start Date &amp; Time: 12/1/2020 at 7:50

End Date &amp; Time: 12/1/2020 at 9:00

Logged By: Contractor/Geologist

Feet BGS	Sample Interval	Ill.	3-in. Ductility (in)	#/Type	USCS Profile	Soil Description	Comments
						USCS group symbol, USCS soil name, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-3	N/A		1	OL	0-3' - OL: Organic clay and silt, dark brown, dry, loose, grass at ground surface	0.0 ppm
							0-5' - Cleared with hand auger
							3-8' - First interval recovered with DPT post hand clear
5	3-8	13		2	CL	3-5' - CL: Clay, light brown, dry, some silt, few fine sand, trace fine gravel	0.1 ppm
					CL	5-8' - CL: Clay, light brown to tan, moist, soft, trace silt	0.0 ppm
10	8-13	60		3	CL	8-13' - CL: Clay, dark brown, moist, soft, some silt, trace fine sand	0.0 ppm
							0.0 ppm
15	13-18	60		4	CL	13-18' - CL: Clay, light brown, moist, soft, some silt, trace fine sand, trace fine gravel	0.0 ppm
							0.0 ppm
20	18-23	0		N/A	N/A	18-23' - No Recovery	Driller could not remove stuck soil liner from drill rod and save the material in the liner for logging
25	23-28	60		5	CL	23-28' CL: Clay, gray, moist, very hard, little silt	0.0 ppm
							0.0 ppm
30						End of boring at 28'	





Iowa Army Ammunition Plant, Middletown, IA  
Project 679172CH

Boring ID  
FFS-MW04

Sheet 1 of 1

SOIL BORING LOG

Project: IAAAP PFAS S1

Site Location: Middletown, IA (IAAAP Former Fire Station)

Weather: mid to high 30s, sunny

Drilling Contractor: Roberts

Drilling Method and Equipment Used: DPT/Geoprobe 8040 DT

Water Level: N/A

Start Date & Time: 12/3/2020 at 8:45

End Date & Time: 12/3/2020 at 10:00

Logged By: Contractor/Geologist

Feet BGS	Sample Interval (ft)	Recovery (in)	#/Type	USCS Code	Soil Description	Comments
					USCS group symbol, USCS soil name, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
5	0-3	N/A	1	OL CL	0-0.5' - OL: Organic clay and silt, brown, moist, trace fine sand, trace fine gravel, grass and roots at ground surface 0.5-3' - CL: Clay, dark brown with gray pockets, moist, soft, some silt	0.0 ppm 0-5' - Cleared with hand auger 3-8' - First interval recovered with DPT post hand clear
	3-8	12	2	CL CL	3-4' - CL: Clay, dark brown with gray pockets, moist, soft, some silt 4-8' - CL: Clay, light brown, moist, stiff, little black mottles, little silt	0.1 ppm 0.0 ppm
10	8-13	30	3	CL	8-13' - CL: Clay, light brown to dark brown, moist, soft, trace silt, trace fine gravel	0.2 ppm 0.0 ppm
15	13-18	60	4	CL CH	13-14' - CL: Clay, dark brown, moist, soft, trace silt, trace fine sand 14-18' - CH: Clay, light brown, moist to wet, very soft, high plasticity, trace fine gravel	0.1 ppm 0.2 ppm
20	18-23	51	5	CL CL	18-20' - CL: Clay, light brown, moist, soft, trace fine gravel 20-23' - CL: Clay, light brown, moist, stiff, trace silt, trace fine gravel	0.1 ppm 0.0 ppm
25					End of boring at 23'	
30						

Iowa Army Ammunition Plant, Middletown, IA  
Project 679172CHBoring ID  
F-S-MW05

Sheet 1 of 1

## SOIL BORING LOG

Project: IAAAP PFAS SI

Site Location: Middletown, IA (IAAAP Former Fire Station)

Weather: 30s, sunny

Drilling Contractor: Roberts

Drilling Method and Equipment Used: DPT/Geoprobe 8040 DT

Water Level: N/A

Start Date &amp; Time: 12/2/2020 at 11:20

End Date &amp; Time: 12/2/2020 at 12:10

Logged By: Contractor/Geologist

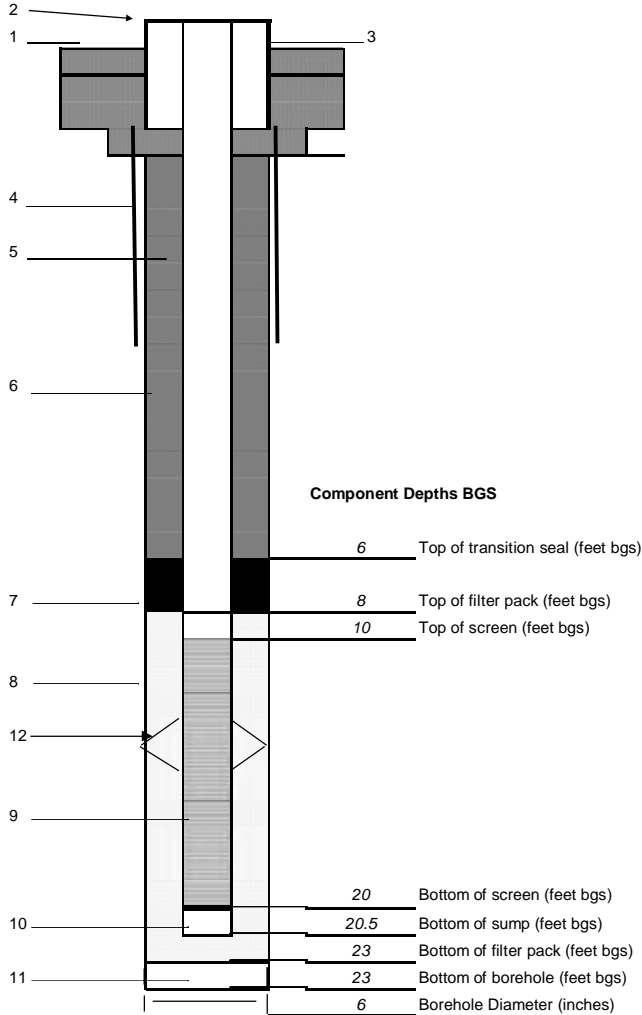
Feet BGS	Sample Interval (ft)	Recovery (in)	#/Type	USCS Code	Soil Description	Comments
					USCS group symbol, USCS soil name, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0-3	N/A	1	1	OL	0-3' - OL: Organic clay, dark brown, moist, soft, little silt, trace fine sand, trace fine gravel, grass and roots at ground surface	0.0 ppm
				CL		0-5' - Cleared with hand auger 3-8' - First interval recovered with DPT post hand clear
5	3-8	51	2	CL	3-5' - CL: Clay, light brown, moist, stiff to hard, trace silt, trace fine sand 5-8' - CL: Clay, light brown, moist, soft, trace silt, trace fine gravel	0.1 ppm
				CL		0.4 ppm
10	8-13	60	3	CL	8-13' - CL: Clay, dark brown to light brown, moist, stiff, trace silt, trace fine gravel	0.2 ppm
						0.1 ppm
15	13-18	60	4	CH	13-16' - CH: Clay, grayish brown, moist, very soft, high plasticity, trace fine gravel 16-18' - CL: Clay, light brown, moist, stiff, trace silt, trace fine gravel	0.0 ppm
				CL		0.2 ppm
20	18-23	60	5	CL	18-23' - CL: Clay, light brown, moist, stiff to hard, trace silt, trace fine gravel, trace fine gravel	0.1 ppm
						0.0 ppm
25					End of boring at 23'	
30						





PROJECT NUMBER 679172CH	WELL NUMBER FFS-MW01
WELL COMPLETION DIAGRAM	

PROJECT NAME : <u>IAAAP PFAS SI</u>	LOCATION NAME: <u>Former Fire Station</u>
NORTHING: <u>307930.167</u> EASTING: <u>2261506.083</u>	DRILLING CONTRACTOR: <u>Roberts</u>
START DATE: <u>12-02-2020</u> END DATE: <u>12-02-2020</u>	DRILLING METHOD: <u>Hollow Stem Auger</u>
BOREHOLE DIAMETER: <u>6</u> inches	DRILLING EQUIPMENT: <u>Geoprobe 8040DT</u>
TOTAL BOREHOLE DEPTH: <u>23</u> feet bgs	LOGGED BY: <u>Contractor/Geologist</u>



1- Ground elevation at well	<u>727.75</u>	<u>feet msl</u>
2- Top of casing elevation	<u>727.4</u>	<u>feet msl</u>
3- Surface completion type	<u>Flush-mount road box</u>	
a) Diameter	<u>8</u>	<u>inches</u>
b) Concrete pad dimensions	<u>18 x 18</u>	<u>inches</u>
c) Bollards	<u>None</u>	
4- Conductor casing type	<u>None</u>	
a) Diameter	<u>-</u>	<u>inches</u>
b) Length	<u>-</u>	<u>feet</u>
5- Well casing type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
6- Sanitary seal type	<u>Bentonite grout</u>	
a) Method of placement	<u>Gravity fed</u>	
b) Volume used	<u>20</u>	<u>gallons</u>
7- Transition seal type	<u>Bentonite plug</u>	
a) Quantity used	<u>1</u>	<u>50 lb bags</u>
8- Filter pack type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>6</u>	<u>50 lb bags</u>
9- Screen type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
c) Slot size	<u>0.010</u> inches	
10- Sump / end cap type	<u>Schedule 40 PVC end cap</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>0.5</u>	<u>feet</u>
11- Backfill type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>Included in quantity used for filter pack</u>	
12- Centralizer type	<u>None</u>	
a) Depths	<u>-</u>	<u>feet bgs</u>

NOTE: DRAWING NOT TO SCALE

**Well Development**

Start Date/Time:	<u>12-04-2020 / 13:20</u>
End Date/Time:	<u>12-04-2020 / 14:05</u>
Measured Depth to Water	<u>14.08</u> feet btoc
Development Method:	<u>Monsoon Pump</u>
Duration:	<u>35</u> minutes
Purge Volume:	<u>4</u> gallons
Volume of Water Injected:	<u>0</u> gallons
Calculated Casing Volume:	<u>0.88</u> gallons

Comments: bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride  
Boring advanced by DPT to 23 feet bgs for soil logging and augered to 20 feet bgs for well installation  
Purged dry during well development on 12-04-2020



PROJECT NUMBER

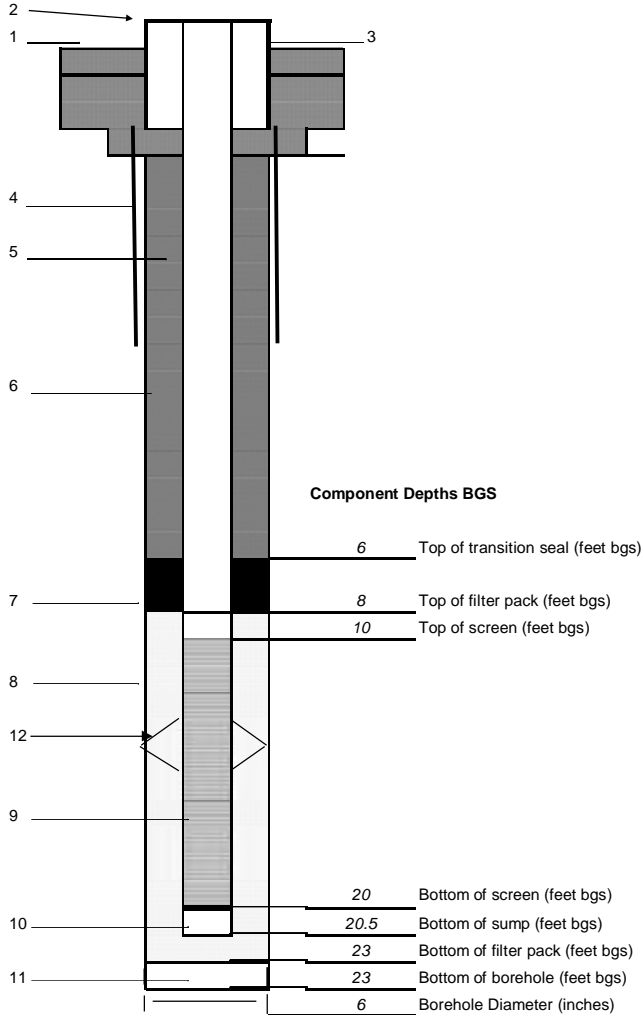
679172CH

WELL NUMBER

FFS-MW02

WELL COMPLETION DIAGRAM

PROJECT NAME : IAAAP PFAS SI LOCATION NAME: Former Fire Station  
 NORTHING: 307821.211 EASTING: 2261386.193 DRILLING CONTRACTOR: Roberts  
 START DATE: 12-01-2020 END DATE: 12-01-2020 DRILLING METHOD: Hollow Stem Auger  
 BOREHOLE DIAMETER: 6 inches DRILLING EQUIPMENT: Geoprobe 8040DT  
 TOTAL BOREHOLE DEPTH: 23 feet bgs LOGGED BY: Contractor/Geologist



1- Ground elevation at well	<u>728.02</u>	<u>feet msl</u>
2- Top of casing elevation	<u>727.75</u>	<u>feet msl</u>
3- Surface completion type	<u>Flush-mount road box</u>	
a) Diameter	<u>8</u>	<u>inches</u>
b) Concrete pad dimensions	<u>24 x 24</u>	<u>inches</u>
c) Bollards	<u>None</u>	
4- Conductor casing type	<u>None</u>	
a) Diameter	<u>-</u>	<u>inches</u>
b) Length	<u>-</u>	<u>feet</u>
5- Well casing type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
6- Sanitary seal type	<u>Bentonite grout</u>	
a) Method of placement	<u>Gravity fed</u>	
b) Volume used	<u>20</u>	<u>gallons</u>
7- Transition seal type	<u>Bentonite plug</u>	
a) Quantity used	<u>1</u>	<u>50 lb bags</u>
8- Filter pack type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>6.5</u>	<u>50 lb bags</u>
9- Screen type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
c) Slot size	<u>0.010</u>	<u>inches</u>
10- Sump / end cap type	<u>Schedule 40 PVC end cap</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>0.5</u>	<u>feet</u>
11- Backfill type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>Included in quantity used for filter pack</u>	
12- Centralizer type	<u>None</u>	
a) Depths	<u>-</u>	<u>feet bgs</u>

NOTE: DRAWING NOT TO SCALE

Well Development

Start Date/Time: 12-04-2020 / 12:15  
 End Date/Time: 12-04-2020 / 13:00  
 Measured Depth to Water: 12.47 feet btoc  
 Development Method: Monsoon Pump  
 Duration: 45 minutes  
 Purge Volume: 4.2 gallons  
 Volume of Water Injected: 0 gallons  
 Calculated Casing Volume: 1.21 gallons

Comments: bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride  
Boring advanced by DPT to 23 feet bgs for soil logging and augered to 20 feet bgs for well installation  
Purged dry during well development on 12-04-2020





PROJECT NUMBER

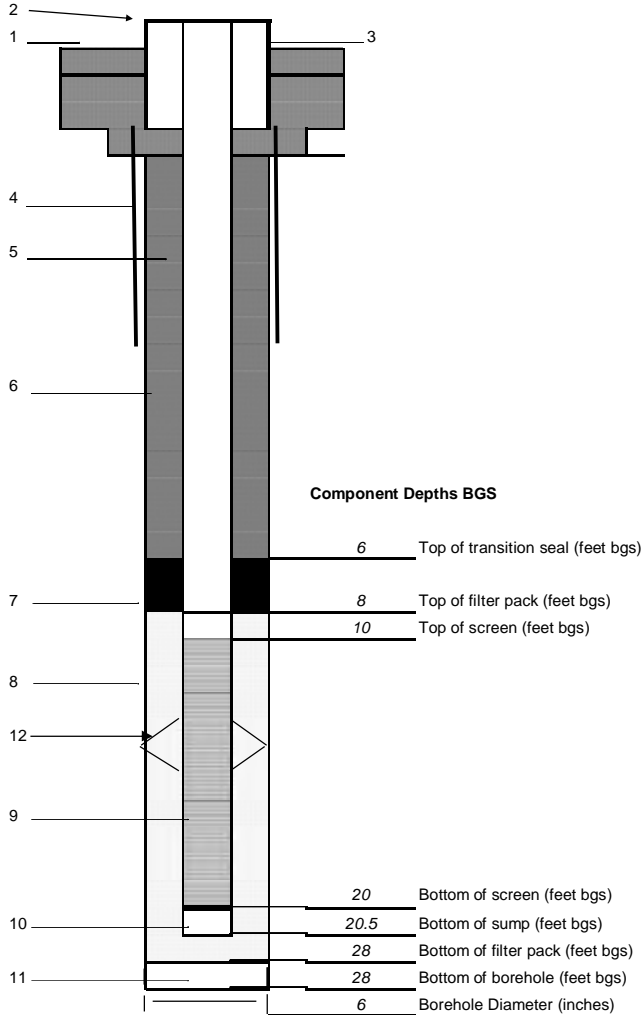
679172CH

WELL NUMBER

FFS-MW03

WELL COMPLETION DIAGRAM

PROJECT NAME : IAAAP PFAS SI LOCATION NAME: Former Fire Station  
 NORTHING: 307658.191 EASTING: 2261260.45 DRILLING CONTRACTOR: Roberts  
 START DATE: 12-01-2020 END DATE: 12-02-2020 DRILLING METHOD: Hollow Stem Auger  
 BOREHOLE DIAMETER: 6 inches DRILLING EQUIPMENT: Geoprobe 8040DT  
 TOTAL BOREHOLE DEPTH: 28 feet bgs LOGGED BY: Contractor/Geologist



Component Depths BGS

6	Top of transition seal (feet bgs)
8	Top of filter pack (feet bgs)
10	Top of screen (feet bgs)
20	Bottom of screen (feet bgs)
20.5	Bottom of sump (feet bgs)
28	Bottom of filter pack (feet bgs)
28	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

1- Ground elevation at well	725.25	feet msl
2- Top of casing elevation	726.9	feet msl
3- Surface completion type	<u>Flush-mount road box</u>	
a) Diameter	8	inches
b) Concrete pad dimensions	24 x 24	inches
c) Bollards	<u>None</u>	
4- Conductor casing type	<u>None</u>	
a) Diameter	-	inches
b) Length	-	feet
5- Well casing type	<u>Schedule 40 PVC</u>	
a) Diameter	2	inches
b) Length	10	feet
6- Sanitary seal type	<u>Bentonite grout</u>	
a) Method of placement	<u>Gravity fed</u>	
b) Volume used	20	gallons
7- Transition seal type	<u>Bentonite plug</u>	
a) Quantity used	1	50 lb bags
8- Filter pack type	<u>FiterSi industrial quartz sand</u>	
a) Quantity used	6.5	50 lb bags
9- Screen type	<u>Schedule 40 PVC</u>	
a) Diameter	2	inches
b) Length	10	feet
c) Slot size	0.010	inches
10- Sump / end cap type	<u>Schedule 40 PVC end cap</u>	
a) Diameter	2	inches
b) Length	0.5	feet
11- Backfill type	<u>FiterSi industrial quartz sand</u>	
a) Quantity used	<u>Included in quantity used for filter pack</u>	
12- Centralizer type	<u>None</u>	
a) Depths	-	feet bgs

NOTE: DRAWING NOT TO SCALE

Well Development

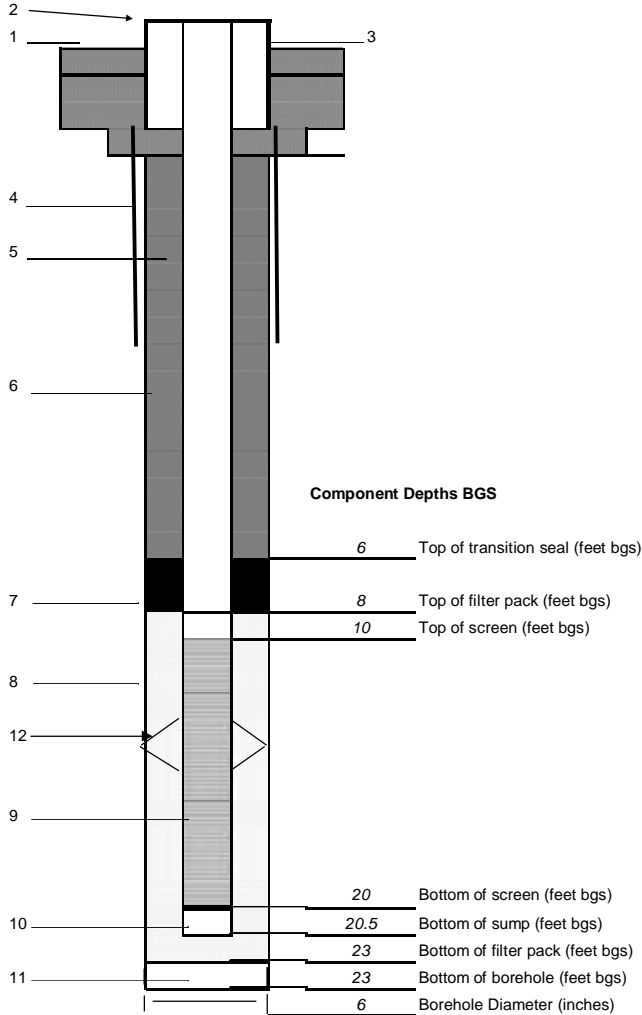
Start Date/Time: 12-04-2020 / 10:45  
 End Date/Time: 12-04-2020 / 11:45  
 Measured Depth to Water: 11.55 feet btoc  
 Development Method: Monsoon Pump  
 Duration: 60 minutes  
 Purge Volume: 5.3 gallons  
 Volume of Water Injected: 0 gallons  
 Calculated Casing Volume: 1.34 gallons

Comments: bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride  
Boring advanced by DPT to 28 feet bgs for soil logging and augered to 20 feet bgs for well installation



PROJECT NUMBER 679172CH	WELL NUMBER FFS-MW04
WELL COMPLETION DIAGRAM	

PROJECT NAME : <u>IAAAP PFAS SI</u>	LOCATION NAME: <u>Former Fire Station</u>
NORTHING: <u>307805.297</u> EASTING: <u>2261087.123</u>	DRILLING CONTRACTOR: <u>Roberts</u>
START DATE: <u>12-03-2020</u> END DATE: <u>12-03-2020</u>	DRILLING METHOD: <u>Hollow Stem Auger</u>
BOREHOLE DIAMETER: <u>6</u> inches	DRILLING EQUIPMENT: <u>Geoprobe 8040DT</u>
TOTAL BOREHOLE DEPTH: <u>23</u> feet bgs	LOGGED BY: <u>Contractor/Geologist</u>



1- Ground elevation at well	<u>726.73</u>	<u>feet msl</u>
2- Top of casing elevation	<u>726.48</u>	<u>feet msl</u>
3- Surface completion type	<u>Flush-mount road box</u>	
a) Diameter	<u>8</u>	<u>inches</u>
b) Concrete pad dimensions	<u>24 x 24</u>	<u>inches</u>
c) Bollards	<u>None</u>	
4- Conductor casing type	<u>None</u>	
a) Diameter	<u>-</u>	<u>inches</u>
b) Length	<u>-</u>	<u>feet</u>
5- Well casing type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
6- Sanitary seal type	<u>Bentonite grout</u>	
a) Method of placement	<u>Gravity fed</u>	
b) Volume used	<u>20</u>	<u>gallons</u>
7- Transition seal type	<u>Bentonite plug</u>	
a) Quantity used	<u>1</u>	<u>50 lb bags</u>
8- Filter pack type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>6</u>	<u>50 lb bags</u>
9- Screen type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>10</u>	<u>feet</u>
c) Slot size	<u>0.010</u>	<u>inches</u>
10- Sump / end cap type	<u>Schedule 40 PVC end cap</u>	
a) Diameter	<u>2</u>	<u>inches</u>
b) Length	<u>0.5</u>	<u>feet</u>
11- Backfill type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>Included in quantity used for filter pack</u>	
12- Centralizer type	<u>None</u>	
a) Depths	<u>-</u>	<u>feet bgs</u>

NOTE: DRAWING NOT TO SCALE

**Well Development**

Start Date/Time:	<u>12-04-2020 / 14:30</u>
End Date/Time:	<u>12-04-2020 / 15:05</u>
Measured Depth to Water	<u>15.81</u> feet btoc
Development Method:	<u>Monsoon Pump</u>
Duration:	<u>35</u> minutes
Purge Volume:	<u>2.2</u> gallons
Volume of Water Injected:	<u>0</u> gallons
Calculated Casing Volume:	<u>0.62</u> gallons

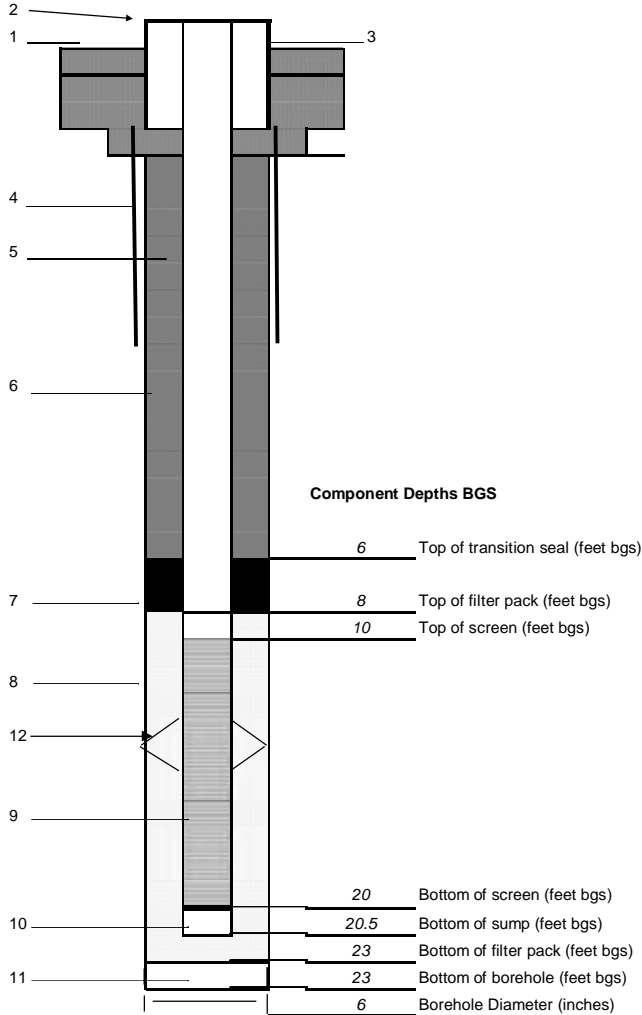
Comments: bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride  
Boring advanced by DPT to 23 feet bgs for soil logging and augered to 20 feet bgs for well installation  
Purged dry during well development on 12-04-2020





PROJECT NUMBER 679172CH	WELL NUMBER FFS-MW05
WELL COMPLETION DIAGRAM	

PROJECT NAME : <u>IAAAP PFAS SI</u>	LOCATION NAME: <u>Former Fire Station</u>
NORTHING: <u>307679.221</u> EASTING: <u>2261481.608</u>	DRILLING CONTRACTOR: <u>Roberts</u>
START DATE: <u>12-02-2020</u> END DATE: <u>12-02-2020</u>	DRILLING METHOD: <u>Hollow Stem Auger</u>
BOREHOLE DIAMETER: <u>6</u> inches	DRILLING EQUIPMENT: <u>Geoprobe 8040DT</u>
TOTAL BOREHOLE DEPTH: <u>23</u> feet bgs	LOGGED BY: <u>Contractor/Geologist</u>



1- Ground elevation at well	<u>726.29</u>	feet msl
2- Top of casing elevation	<u>725.92</u>	feet msl
3- Surface completion type	<u>Flush-mount road box</u>	
a) Diameter	<u>8</u>	inches
b) Concrete pad dimensions	<u>24 x 24</u>	inches
c) Bollards	<u>None</u>	
4- Conductor casing type	<u>None</u>	
a) Diameter	<u>-</u>	inches
b) Length	<u>-</u>	feet
5- Well casing type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	inches
b) Length	<u>10</u>	feet
6- Sanitary seal type	<u>Bentonite grout</u>	
a) Method of placement	<u>Gravity fed</u>	
b) Volume used	<u>20</u>	gallons
7- Transition seal type	<u>Bentonite plug</u>	
a) Quantity used	<u>1</u>	50 lb bags
8- Filter pack type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>6</u>	50 lb bags
9- Screen type	<u>Schedule 40 PVC</u>	
a) Diameter	<u>2</u>	inches
b) Length	<u>10</u>	feet
c) Slot size	<u>0.010</u>	inches
10- Sump / end cap type	<u>Schedule 40 PVC end cap</u>	
a) Diameter	<u>2</u>	inches
b) Length	<u>0.5</u>	feet
11- Backfill type	<u>FiterSil industrial quartz sand</u>	
a) Quantity used	<u>Included in quantity used for filter pack</u>	
12- Centralizer type	<u>None</u>	
a) Depths	<u>-</u>	feet bgs

NOTE: DRAWING NOT TO SCALE

**Well Development**

Start Date/Time:	<u>12-05-2020 / 11:25</u>
End Date/Time:	<u>12-05-2020 / 12:05</u>
Measured Depth to Water	<u>14.05</u> feet btoc
Development Method:	<u>Monsoon Pump</u>
Duration:	<u>30</u> minutes
Purge Volume:	<u>3.5</u> gallons
Volume of Water Injected:	<u>0</u> gallons
Calculated Casing Volume:	<u>0.89</u> gallons

Comments: bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride  
Boring advanced by DPT to 23 feet bgs for soil logging and augered to 20 feet bgs for well installation  
Purged dry during well development on 12-05-2020



## WELL DEVELOPMENT DATASHEET

Well ID: FFS-MW02 SHEET 1 OF 1

Project: IAGAR PEAS SI Date: 12-4-20  
 Location: middle town IA Start Time: 1330  
 Project #: 01.11.FW End Time: \_\_\_\_\_  
 Development Contractor/Geologist: \_\_\_\_\_ Geologist: \_\_\_\_\_  
 Field Notebook #: JS 120420 Log Book Notes Date Well Installed: \_\_\_\_\_

## Well Information and Purge Volume Calculation

Casing ID (inch)	Unit Casing Volume (A) (gal/ft)
0.75	0.02
1	0.04
1.5	0.09
2	0.16
3	0.37
4	0.65
5	1.02
6	1.47
7	2.00
8	2.61
10	4.08
12	5.88

Total Well Depth (B) (ft btoc): 19.50  
 Depth to Water (C) (ft btoc): 14.08  
 Length of Static Water Column in Well (feet):  
 (B - C = D) = 5.42

Unit Casing Volume (A) (gal/ft) x 16  
 Well Casing Volume (E) (gal):  
 (D x A = E) = 0.88  
 x 10

Total Purge Volume (F) (gal):  
 (E x 10 well volumes = F) = 8.8

Well Screened Interval (ft btoc): 10-20Approx. Sediment Depth in Well (ft): x. Hard Bottom

## Development Methods

Method:  Surging  Pumping  Bailing  Other Describe: \_\_\_\_\_  
 Surge time per interval (min): \_\_\_\_\_ Number of development intervals: \_\_\_\_\_  
 Pump:  Perist.  Bladder  Subm.  Other Describe: manifold  
 Purge time per interval (min): \_\_\_\_\_ Purge Flow Rate (gpm): \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_  
 Total purge time (min): \_\_\_\_\_ Pump Intake Depth (ft btoc): 19.25  
 Bailer:  Poly  Teflon  S steel  Other Describe: \_\_\_\_\_  
 Bailer Volume (gals): \_\_\_\_\_ (0.25 / 0.33) Required Bailer Volumes: \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_

## Criteria for Stable Parameters

Parameter	Working Range (YSI 556MPS)	Stability Criteria	Depth to Water Stabilization	
			Time	DTW
Temperature	-5 to 45°C	± 1.0 °C		
pH	0 to 14 NTU	± 0.1		
Conductivity	0 to 200 mS/cm	± 3%		
ORP	-999 to +999 mV	± 10 mV		
Dissolved Oxygen	0 to 50 mg/L	± 10% or 0.2 mg/L		
Turbidity	0 to 1000 NTU	± 10% (≤10 NTU)		

## Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
1	1330	14.08	-	7.16	0.636	222	7.06	16.33	29.8
2	1335	14.81	0.3	7.03	0.627	180	6.91	16.96	37.7
3	1340	15.52	1.2	7.01	0.620	60.8	7.13	17.22	45.8
4	1345	16.49	2.0	6.90	0.614	30.5	8.25	17.44	60.3
5	1350	17.30	2.5	6.96	0.615	19.2	8.25	17.44	69.3
6	1355	18.41	3.0	6.97	0.626	15.0	7.81	17.31	77.9
7	1400	18.81	3.5	6.96	0.621	14.0	7.58	17.87	82.7
8	1405	19.15	4.0	6.96	0.627	12.3	7.51	17.32	84.0
9			well dry						

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.

Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/3 minutes or .1 gal/min) and 2) continually measuring water levels in the well.

## Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other: \_\_\_\_\_  
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical?, Unknown, Very Pungent  
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: well purged dry, parameters stable, turbidity close to 10 mS, very faint fuel odor at times, 4 gal water generated





## WELL DEVELOPMENT DATASHEET

Well ID: FFS-mw02Project: IAAAP PFAS SIDate: 12-4-20Location: MiddleTown IAStart Time: 1215Project #: 011.FWEnd Time: 1300

Development Contractor/Geologist: \_\_\_\_\_ Geologist: \_\_\_\_\_

Field Notebook #: JS 120920 Log Book Max

Date Well Installed: \_\_\_\_\_

## Well Information and Purge Volume Calculation

Casing ID (inch):	Unit Casing Volume (A) (gal/ft):
0.75	0.02
1	0.04
1.5	0.09
2	0.16
3	0.37
4	0.65
5	1.02
6	1.47
7	2.00
8	2.61
10	4.08
12	5.88

Total Well Depth (B) (ft btoc): 19.87  
 Depth to Water (C) (ft btoc): -12.47  
 Length of Static Water Column in Well (feet):  
 (B - C = D) = 7.40

Unit Casing Volume (A) (gal/ft): x .163  
 Well Casing Volume (E) (gal):  
 (D x A = E) = 1.21  
x 10

Total Purge Volume (F) (gal):  
 (E x 10 well volumes = F) = 12.1

Well Screened Interval (ft btoc): 10-20Approx. Sediment Depth in Well (ft): x Hard Bottom

## Development Methods

Method:  Surging  Pumping  Bailing  Other Describe: \_\_\_\_\_  
 Surge time per interval (min): \_\_\_\_\_ Number of development intervals: \_\_\_\_\_  
 Pump:  Perist.  Bladder  Subm.  Other Describe: Man Soar  
 Purge time per interval (min): \_\_\_\_\_ Purge Flow Rate (gpm): \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_  
 Total purge time (min): \_\_\_\_\_ Pump Intake Depth (ft btoc): 19.5  
 Bailer:  Poly  Teflon  S. steel  Other Describe: \_\_\_\_\_  
 Bailer Volume (gals): \_\_\_\_\_ (0.25 / 0.33) Required Bailer Volumes: \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_

## Criteria for Stable Parameters

Parameter	Working Range (YSI 556MPS)	Stability Criteria	Depth to Water Stabilization	
			Time	DTW
Temperature	-5 to 45°C	± 1.0 °C		
pH	0 to 14 NTU	± 0.1		
Conductivity	0 to 200 mS/cm	± 3%		
ORP	-999 to +999 mV	± 10 mV		
Dissolved Oxygen	0 to 50 mg/L	± 10% or 0.2 mg/L		
Turbidity	0 to 1000 NTU	± 10% (≤10 NTU)		

## Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH ± .1	Cond (mS/cm) ± .3%	Turbidity (NTU) ± 10%	DO (mg/L) ± 10%	Temp (C) ± 1.0°C	ORP (mV) ± 10mV
1	1220	12.47	—	6.97	0.662	672	7.06	14.38	52.8
2	1225	13.64	.4	6.82	0.661	217	5.54	15.87	49.6
3	1230	15.08	1.3	6.77	0.712	60.9	7.53	16.38	55.5
4	1235	16.82	2.5	6.68	0.771	20.5	8.76	16.41	70.2
5	1240	17.90	3.5	6.85	0.691	16.2	9.07	16.29	69.6
6	1245	18.71	4.0	6.88	0.675	14.8	8.65	16.20	75.1
7	1250	19.27	4.2	6.84	0.665	15.4	8.23	16.73	60.3
8	1252								
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.

Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/3 minutes or .1 gal/min) and 2) continually measuring water levels in the well.

## Sensory Observations

Color: Clean Amber, Tan, Brown, Grey, Milky White, Other:  
 Odor: None Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical?, Unknown  
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Comments: Well went Dry after 7 rounds purging an Avg 0.13 gal/min. 3.5 well volumes purged. Turbidity Clear up After Round 3, 4.2 gallons purge water generated.



SOP-01 Attachment 1  
WELL DEVELOPMENT DATASHEET

Well ID: FFS-MW03 SHEET 1 OF 1

Project: IAAAP PFAS SI Date: 12-4-20  
 Location: Middletown IA Start Time: 1045  
 Project #: 01.11.FW End Time: 1145  
 Development Contractor/Geologist: \_\_\_\_\_ Geologist: \_\_\_\_\_  
 Field Notebook #: JS 120920 Logbook notes Date Well Installed: \_\_\_\_\_

Well Information and Purge Volume Calculation

Casing ID (inch)	Unit Casing Volume (A) (gal/ft)
0.75	0.02
1	0.04
1.5	0.09
2	0.16
3	0.37
4	0.65
5	1.02
6	1.47
7	2.00
8	2.61
10	4.08
12	5.88

Total Well Depth (B) (ft btoc): 19.80  
 Depth to Water (C) (ft btoc): -11.55  
 Length of Static Water Column in Well (feet):  
 (B - C = D) = 8.25  
 Unit Casing Volume (A) (gal/ft) x 0.163  
 Well Casing Volume (E) (gal)  
 (D x A = E) = 1.34  
 x 10  
 Total Purge Volume (F) (gal):  
 (E x 10 well volumes = F) = 13.4



Development Methods

Method:  Surging  Pumping  Bailing  Other Describe: \_\_\_\_\_  
 Surge time per interval (min): \_\_\_\_\_ Number of development intervals: \_\_\_\_\_  
 Pump:  Perist.  Bladder  Subm.  Other Describe: None  
 Purge time per interval (min): \_\_\_\_\_ Purge Flow Rate (gpm): \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_  
 Total purge time (min): \_\_\_\_\_ Pump Intake Depth (ft btoc): 19.5  
 Bailer:  Poly  Teflon  S steel  Other Describe: \_\_\_\_\_  
 Bailer Volume (gals): \_\_\_\_\_ (0.25 / 0.33) Required Bailer Volumes: \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_

Criteria for Stable Parameters

Parameter	Working Range (YSI 556MPS)	Stability Criteria	Depth to Water Stabilization	
			Time	DTW
Temperature	-5 to 45°C	± 1.0 °C		
pH	0 to 14 NTU	± 0.1		
Conductivity	0 to 200 mS/cm	± 3%		
ORP	-999 to +999 mV	± 10 mV		
Dissolved Oxygen	0 to 50 mg/L	± 10% or 0.2 mg/L		
Turbidity	0 to 1000 NTU	± 10% (≤10 NTU)		

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mv)
1	1110	11.55	-	7.09	0.593	168	6.58	15.07	11.2
2	1115	12.72	1.0	7.10	0.572	202	6.19	15.44	27.0
3	1120	13.85	1.8	7.01	0.572	23.7	8.26	15.64	41.9
4	1125	14.68	2.6	6.97	0.582	17.3	10.16	15.72	56.0
5	1130	15.53	3.4	6.99	0.597	15.9	10.49	15.79	63.5
6	1135	16.33	4.3	7.02	0.608	10.9	10.25	15.70	65.0
7	1140	17.05	4.8	7.02	0.607	8.73	9.76	15.66	69.4
8	1145	17.93	5.3	7.04	0.615	9.02	10.17	15.76	65.8
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.  
 Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/3 minutes or .1 gal/min) and 2) continuously measuring water levels in the well.

Sensory Observations

Color: Clear Amber, Tan, Brown, Gray, Milky White, Other: \_\_\_\_\_  
 Odor: None Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown  
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Comments: 4 hrs. Several days for wt to come up to 11.55.  
0.53 gal/hr purge water generated. All parameters stable except water level





## WELL DEVELOPMENT DATASHEET

Well ID: FFS-mw04 SHEET 1 OF 1

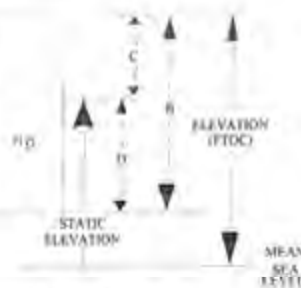
Project: IAAAP PFAS SI Date: 12-4-20  
 Location: midkham IA Start Time: 1430  
 Project #: CHH-FW End Time: 1505  
 Development Contractor/Geologist: \_\_\_\_\_ Geologist: \_\_\_\_\_  
 Field Notebook #: JS 120420 Log Book notes Date Well Installed: \_\_\_\_\_

## Well Information and Purge Volume Calculation

Casing ID (inch)	Unit Casing Volume (A) (gal/ft)
0.75	0.02
1	0.04
1.5	0.09
2	0.16
3	0.37
4	0.65
5	1.02
6	1.47
7	2.00
8	2.61
10	4.08
12	5.88

Total Well Depth (B) (ft bloc): 19.63  
 Depth to Water (C) (ft bloc): -15.81  
 Length of Static Water Column in Well (feet):  
 (B - C = D) = 3.82

Unit Casing Volume (A) (gal/ft) x 0.163  
 Well Casing Volume (E) (gal):  
 (D x A = E) = 0.62  
 x 10  
 Total Purge Volume (F) (gal):  
 (E x 10 well volumes = F) = 6.2

Well Screened Interval (ft bloc): 10-20 Approx. Sediment Depth in Well (ft): \_\_\_\_\_

## Development Methods

Method:  Surging  Pumping  Bailing  Other Describe: \_\_\_\_\_  
 Surge time per interval (min): \_\_\_\_\_ Number of development intervals: \_\_\_\_\_  
 Pump:  Perist.  Bladder  Subm.  Other Describe: MANIFOLD  
 Purge time per interval (min): \_\_\_\_\_ Purge Flow Rate (gpm): \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_  
 Total purge time (min): \_\_\_\_\_ Pump Intake Depth (ft bloc): 19.4  
 Bailer:  Poly  Teflon  S-steel  Other Describe: \_\_\_\_\_  
 Bailer Volume (gals): \_\_\_\_\_ (0.25 / 0.33) Required Bailer Volumes: \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_

## Criteria for Stable Parameters

Parameter	Working Range (YSI 556MPS)	Stability Criteria	Depth to Water Stabilization	
			Time	DTW
Temperature	-5 to 45°C	± 1.0 °C		
pH	0 to 14 NTU	± 0.1		
Conductivity	0 to 200 mS/cm	± 3%		
ORP	-999 to +999 mV	± 10 mV		
Dissolved Oxygen	0 to 50 mg/L	± 10% or 0.2 mg/L		
Turbidity	0 to 1000 NTU	± 10% (±10 NTU)		

## Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mv)
1	1440	15.81	-	7.20	1.107	134	5.64	14.19	86.8
2	1445	16.68	0.5	7.05	1.131	121	5.62	15.06	78.4
3	1450	17.51	1.0	6.90	1.153	40.2	6.08	15.16	77.6
4	1455	18.13	1.5	6.90	1.183	20.8	6.35	15.26	82.1
5	1500	18.82	2.0	6.90	1.186	14.3	6.38	15.75	81.8
6	1505	19.23	2.2	6.91	1.186	11.7	6.14	15.24	81.3
7	~	well dry							
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.

Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/3 minutes or .1 gal/min) and 2) continually measuring water levels in the well.

## Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other: \_\_\_\_\_  
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical?, Unknown  
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

## Comments:



SOP-01 Attachment 1  
WELL DEVELOPMENT DATASHEET

Well ID: PPS-MW05 SHEET 1 OF 1

Project: IAAAP PFA 51  
Location: Middletown IA  
Project #: 01-11-FW

Date: 12-5-20  
Start Time: 1125  
End Time: 1205

Development Contractor/Geologist: \_\_\_\_\_ Geologist

Field Notebook #: JS 120520 Logbook Notes Date Well Installed: \_\_\_\_\_

Well Information and Purge Volume Calculation

Casing ID (inch)	Unit Casing Volume (A) (gal/ft)
0.75	0.02
1	0.04
1.5	0.09
2	0.16
3	0.37
4	0.65
5	1.02
6	1.47
7	2.00
8	2.61
10	4.08
12	5.88

Total Well Depth (B) (ft btoc): 19.53  
Depth to Water (C) (ft btoc): -14.05  
Length of Static Water Column in Well (feet):  
(B - C = D) = 5.48  
Unit Casing Volume (A) (gal/ft): x 0.163  
Well Casing Volume (E) (gal):  
(D x A = E) = 0.89  
x 10  
Total Purge Volume (F) (gal):  
(E x 10 well volumes = F) = 8.9



Well Screened Interval (ft btoc): 10-20 Approx. Sediment Depth in Well (ft): \_\_\_\_\_

Development Methods

Method:  Surging  Pumping  Bailing  Other Describe: \_\_\_\_\_  
Surge time per interval (min): \_\_\_\_\_ Number of development intervals: \_\_\_\_\_  
Pump:  Perist.  Bladder  Subm.  Other Describe: Manison  
Purge time per interval (min): \_\_\_\_\_ Purge Flow Rate (gpm): \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_  
Total purge time (min): \_\_\_\_\_ Pump Intake Depth (ft btoc): 19.20  
Bailer:  Poly  Teflon  S.steel  Other Describe: \_\_\_\_\_  
Bailer Volume (gals): \_\_\_\_\_ (0.25 / 0.33) Required Bailer Volumes: \_\_\_\_\_ Total purge volume (gals): \_\_\_\_\_

Criteria for Stable Parameters

Parameter	Working Range (YSI 556MPS)	Stability Criteria	Depth to Water Stabilization	
			Time	DTW
Temperature	-5 to 45°C	± 1.0 °C		
pH	0 to 14 NTU	± 0.1		
Conductivity	0 to 200 mS/cm	± 3%		
ORP	-999 to +999 mV	± 10 mV		
Dissolved Oxygen	0 to 50 mg/L	± 10% or 0.2 mg/L		
Turbidity	0 to 1000 NTU	± 10% (≤10 NTU)		

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
1	1145	14.05	—	7.68	0.657	456	6.03	14.11	-43.5
2	1150	15.60		7.14	0.546	109	5.63	14.53	-16.4
3	1158	19.07		7.10	0.572	63.2	8.02	14.51	-2.3
4	1200	19.21	3.5	6.99	0.624	85.6	5.94	14.45	-12.6
5				Well Dry					
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.  
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/3 minutes or .1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, (Tan) Brown, Grey, Milky White, Other: \_\_\_\_\_  
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical?, Unknown  
Turbidity: (None) None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: Turbidity dropped to 63.2 NTU, 7.5 gal generated, well draws down, purges did not stabilize before going dry  
Air Monitoring: Breathing Zone & No H2S detected





# Groundwater Sampling Form

Project Name: IABAD PFASSE  
 Sample Source (Well No./Location): JAW-63 @ FTP  
 Weather Conditions: 38°F, Sunny, 30.12 inHg  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: Peristaltic pump, HDPE Tubing, 5/16" Ilex tubing

Project Number: 6791724  
 Date: 12-9-20  
01.11.19  
Screen 10-20

Sheet 1 of 2

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) 800  
 Well Depth: 23.12 (ft) 1V = 1.19 (gal) Water Level at time T<sub>0</sub> 15.72  
 Static Water Level: 15.51 (ft) Time Purging ends (T<sub>1</sub>) 845  
 Water Column: 7.31 (ft) Water Level at time T<sub>1</sub> 17.16  
 Diameter/Type: 2"n

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
800	-	7.62	0.623	9.27	220.2	15.72	9.72	84.1	No color, No odor, Fine suspended sed
805	1.5	7.51	0.561	10.93	204.8	15.91	5.25	67.4	SAA
810	3	7.27	0.520	11.17	193.4	16.13	4.52	40.0	SAA
815	4.5	7.13	0.475	11.27	209.3	16.28	4.71	21.9	SAA, Cloud
820	6	7.07	0.467	11.35	206.6	16.39	5.75	19.3	SAA
825	7.5	7.05	0.467	11.44	197.3	16.57	5.98	10.7	SAA
830	9	7.04	0.466	11.44	183.1	16.69	6.51	5.46	No color, No odor, clear
835	10.5	7.04	0.465	11.51	176.6	16.78	6.39	5.21	SAA

Flow Rate  
mL/min  
300  
300  
300  
300  
300  
300  
300  
300

Continued on pg 2

## Sample Information

Sample ID: JAW-63-1220  
 Analysis: PFAS QSM Versin 5.3, Table B-15  
 Date: 12-9-20  
 Time: 850  
 Field Filtering: X Filter Type X  
 Laboratory: SHealy Method of Shipment: Cooler w/ Ice  
 Remarks: 2 x 250mL HDPE Unpreserved Screen Cap Baffles collected

Air Monitoring: Breathing zone  
\* No H<sub>2</sub>S Detected



# Groundwater Sampling Form

Sheet 2 of 2

Project Name: IAAAI PEAS SI  
 Sample Source (Well No./Location): JAW-63  
 Weather Conditions:  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment:

Project Number:  
 Date: 12-9-20

See pg 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) \_\_\_\_\_  
 Well Depth: (ft) \_\_\_\_\_ 1V = \_\_\_\_\_ (gal) \_\_\_\_\_ Water Level at time T<sub>0</sub> \_\_\_\_\_  
 Static Water Level: (ft) \_\_\_\_\_ Time Purging ends (T<sub>1</sub>) \_\_\_\_\_  
 Water Column: (ft) \_\_\_\_\_ See pg 1 \_\_\_\_\_ Water Level at time T<sub>1</sub> \_\_\_\_\_  
 Diameter/Type: \_\_\_\_\_

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm) <sup>F</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
840	12	7.02	0.462	11.48	173.5	16.95	6.46	3.60	SAA
845	13.5	7.02	0.411	11.48	172.8	17.16	6.45	3.72	SAB
Collect Sample @ 850 120920 SS									

## Sample Information

Sample ID: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Field Filtering: \_\_\_\_\_ Filter Type \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_  
 Remarks: \_\_\_\_\_

See pg 1



Project Name: IAAAR PFAS SI  
 Sample Source (Well No./Location): FTA-TL MW-03 @ FTP  
 Weather Conditions: 57°F. Sunny, 29.92 inHg  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: Peristaltic pump, HDPE Tubing, Silicon Flex tubing

Project Number: 679172CH d. 11.Fw  
 Date: 12-9-20  
 Screen: 5-30

Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): 1415  
 Well Depth: 29.46 (ft)  $V = 0.73$  (gal) Water Level at time T<sub>0</sub>: 11.15  
 Static Water Level: 11.15 (ft) Time Purging ends (T<sub>1</sub>): 1455  
 Water Column: 18.3 (ft) Water Level at time T<sub>1</sub>: 29.30  
 Diameter/Type: 1 inch

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>f</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1415	—	6.92	0.723	11.12	27.3	11.15	4.20	235	Grey, Black Suspended Sol, Chlorams, Band Rubber?
1420	1	6.76	0.840	13.08	-88.7	16.52	2.69	127	SAA
1425	2	6.64	0.836	12.93	-92.5	18.20	1.31	260	SAA
1430	3	6.71	0.822	13.00	-96.8	20.57	1.05	215	SAA
1435	4	6.78	0.854	12.87	-99.9	22.03	1.09	213	SAA
1440	5	6.81	0.844	12.75	-97.8	23.90	1.17	231	SAA Suspended Sol, Black Rubbe
1445	6	6.81	0.830	12.72	-92.0	26.22	1.21	218	SAA
1450	7	6.80	0.823	12.61	-88.4	27.81	1.37	195	SAA
1455		6.77	0.825	12.73	-84.7	29.30	1.61	78.8	SAA

Flow Rate ml/min

200  
200  
200  
200  
150  
200  
200  
200

Sample Information

Sample ID: FTA-TL-MW-03-1220  
 Analysis: PFAS QSM Verion 5.3, Table Q-15  
 Date: 12-10-20  
 Time: 905  
 Field Filtering: X Filter Type: X  
 Laboratory: Shelby Method of Shipment: Cooler w/ Ice  
 Remarks: 2x250 mL HDPE Impervious Screen Cap Bottles Collected, Samples are Turbid  
 Air Monitoring: Breathing Zone  
\* No Hits Detected



# Groundwater Sampling Form

Project Name: IAAA PFAS SI  
 Sample Source (Well No./Location): Jaw-60 @ FTP  
 Weather Conditions: 32°F, Cloudy, 30.16, 24%  
 Well Condition: \_\_\_\_\_  
 Sample Team: Geologist  
 Sample Equipment: \*Bladder pump, HDPE bladder, HDPE tubing, MP-10 Controller

Project Number: 679172CH a111.FW  
 Date: 12-08-20  
 Screen: -7.24-34

Sheet 1 of 2

Controller Settings  
 PSI: 30

pump in the Depth (BTOC)  
34.0 ft

Refill: 10 Discharge: 5

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): 940  
 Well Depth: 37.13 (ft) 1V = 2.68 (gal) Water Level at time T<sub>0</sub>: 20.15  
 Static Water Level: 20.68 (ft) Time Purging ends (T<sub>1</sub>): \_\_\_\_\_  
 Water Column: 16.45 (ft) Water Level at time T<sub>1</sub>: \_\_\_\_\_  
 Diameter/Type: 2 inch

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
940	-	7.28	0.851	9.37	225.1	20.15	10.02	69.6	No color, no odor, very dark white sediment suspended
945	1.5	7.17	0.643	10.76	207.2	22.95	4.13	103	SAH
950	3	7.15	0.625	10.95	195.0	23.61	4.33	121	SAH, More suspended Sol
955	4.5	7.16	0.619	10.84	190.6	24.08	4.35	83.2	SAH
1000	6	7.14	0.618	10.80	189.1	24.52	3.96	80.7	SAH
1005	7.5	7.14	0.616	10.75	188.1	24.81	3.61	79.8	SAH
1010	9	7.13	0.618	10.73	185.9	25.07	3.04	30.1	No color, no odor, very little suspended
1015	10.5	7.12	0.617	10.70	184.5	25.22	2.92	16.2	SAH

Flow Rate  
 mL/min

300  
300  
300  
300  
300  
300  
300  
300

Continued on pg 2

## Sample Information

Sample ID: JAW-60-1220  
 Analysis: PFAS QSM Version 5.3, Table B-15  
 Date: 12-08-20  
 Time: 1035  
 Field Filtering:  Filter Type:   
 Laboratory: Shawly Method of Shipment: Cooler w/ Ice  
 Remarks: 2 x 250 mL HDPE Vaportight Screw-cap Bottles collected

All monitoring → Breathing Zone  
 \* No Hits Detected





# Groundwater Sampling Form

Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): JAW-60 @ FTB  
 Weather Conditions:  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment:

Project Number:  
 Date: 12-8-20

Sheet 2 of 2

*See pg 1*

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) \_\_\_\_\_  
 Well Depth: \_\_\_\_\_ (ft) 1V = \_\_\_\_\_ (gal) Water Level at time T<sub>0</sub> \_\_\_\_\_  
 Static Water Level: \_\_\_\_\_ (ft) Time Purging ends (T<sub>1</sub>) \_\_\_\_\_  
 Water Column: \_\_\_\_\_ (ft) Water Level at time T<sub>1</sub> \_\_\_\_\_  
 Diameter/Type: \_\_\_\_\_

*See pg 1*

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1020	12	7.12	0.616	10.75	184.8	25.48	2.78	11.6	SAF
1025	13.5	7.12	0.617	10.73	183.4	25.63	2.63	10.2	SAF
1030	15	7.11	0.617	10.77	182.3	25.74	2.58	8.57	SAF
<i>Collect Sample @ 1035 120820 JS</i>									

*Flow Rate mL/min*  
 300  
 300  
 300

## Sample Information

Sample ID: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Field Filtering: \_\_\_\_\_ Filter Type \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_  
 Remarks: \_\_\_\_\_

*See pg 1*



# Groundwater Sampling Form

Project Name: I AAP PFAS 51  
 Sample Source (Well No./Location): FTA-99-1  
 Weather Conditions: 45°F, sunny  
 Well Condition: OKAY/casing too tall to close stuck up  
 Sample Team: Geologist  
 Sample Equipment: peristaltic pump

Project Number:  
 Date: 12/10/20

Sheet 1 of 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): 1005  
 Well Depth: 19.60 (ft) Water Level at time T<sub>0</sub>: 15.55  
 Static Water Level: 15.55 (ft) *well headspace: TV = (gal)* Time Purging ends (T<sub>1</sub>): 1035  
 Water Column: 19.60 (ft) *CH<sub>4</sub> = 0% LEL VOC = 0.0 ppm* Water Level at time T<sub>1</sub>: 16.10  
 Diameter/Type: 2" PVC *H<sub>2</sub>S = 0.0 ppm CO = 0 ppm O<sub>2</sub> = 20.0%*

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm) <sup>e</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1010	1.5	7.02	0.794	12.35	169.2	15.89	5.55	20.9	slightly cloudy
1015	2.75	7.08	0.707	12.47	179.3	16.02	3.94	13.4	SAA
1020	3.75	7.07	0.656	12.49	187.7	16.04	3.51	9.84	clearing
1025	5.25	7.07	0.652	12.67	181.5	16.07	3.46	9.04	SAA
1030	6.5	7.07	0.651	12.61	184.7	16.09	3.48	8.93	SAA
1035	8.0	7.06	0.649	12.63	183.9	16.10	3.45	8.96	SAA

## Sample Information

Sample ID: FTA-99-1-1220  
 Analysis: PFAS 537 ID  
 Date: 12/10/20  
 Time: 1040  
 Field Filtering: N/A Filter Type: N/A  
 Laboratory: Pace Method of Shipment: Fedex  
 Remarks: \_\_\_\_\_





# Groundwater Sampling Form

Project Name: IQAAR PFAS SI  
 Sample Source (Well No./Location): FIP-mw5 @ FIP  
 Weather Conditions: 44°F, Sunny, 29.96 inHg  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: Peristaltic pump, HDPE Tubing, Silicon Flex tubing

Project Number: 679172CH 01-11-FW  
 Date: 12-10-20  
 Screen: -7

Sheet 1 of 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): 1000  
 Well Depth: 16.83 (ft) IV = 0.3 (gal) Water Level at time T<sub>0</sub>: 14.97  
 Static Water Level: 14.97 (ft) Time Purging ends (T<sub>1</sub>): 1030  
 Water Column: 1.86 (ft) Water Level at time T<sub>1</sub>: 15.76  
 Diameter/Type: 2 inch

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1000	—	7.48	0.517	10.22	-1.8	14.97	7.37	97.2	light tan, no odor, suspended sed
1005	1	7.39	0.471	10.94	15.3	15.09	5.15	75.3	SAA
1010	2	7.35	0.466	11.43	24.5	15.20	3.78	30.2	no color, no odor, suspended sed
1015	3	7.35	0.466	11.45	25.8	15.52	2.95	15.1	SAA
1020	4	7.32	0.463	12.02	42.7	15.45	2.81	9.78	no color, no odor, clear
1025	5	7.32	0.461	12.14	44.5	15.68	2.74	9.22	SAA
1030	6	7.30	0.459	12.21	47.4	<del>15.76</del>	2.77	8.71	SAA
Collect Sample @ 1035 JS 12/10/20									

## Sample Information

Sample ID: FIP-mw5-1220  
 Analysis: PFAS BSM version 5.3, Table B-15  
 Date: 12-10-20  
 Time: 1035  
 Field Filtering:  Filter Type   
 Laboratory: Shawty Method of Shipment: Cooler w/ Ice  
 Remarks: 2350mL HDPE Unpreserved Screw Cap Bottle Collected

Air monitoring: Breathing zone  
 & no hits detected

Project Name: IAAAR PFAS SI  
 Sample Source (Well No./Location): T-1 @ IDA  
 Weather Conditions: 36°F, overcast, 30-11 inHg  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: HDPE Bubble pump, HDPE Tubing, MP-10 Controller

Project Number: 01.11.FW  
 Date: 12-7-20  
 Screen: 25-35

Sheet 1 of 1

Controller Settings  
 PSI: 85

Pump intake depth: 35ft BTOC

Rel: 11 10 Package 5

### Water Quality Parameter Information

Datum:  
 Well Depth: 38.11 (ft)  
 Static Water Level: 18.07 (ft)  
 Water Column: 20.04 (ft)  
 Diameter/Type: 4 inch

Well Volume:  
 1V = 13.08 (gal)

Time Purging begins (T<sub>0</sub>): 1535  
 Water Level at time T<sub>0</sub>: 15.10  
 Time Purging ends (T<sub>1</sub>): 1610  
 Water Level at time T<sub>1</sub>: 17.02

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) ±1% of full-scale reading (Instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ORP ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1535	—	6.99	0.880	11.11	102.0	15.10	4.48	25.2	<del>no carb, no odor, very little sediment</del> Sed visible
1540	2	6.86	0.916	11.67	79.7	15.49	1.03	17.3	SAA
1545	4	6.84	0.923	11.75	72.3	15.86	0.83	15.2	SAA
1550	6	6.80	0.929	11.81	63.7	16.05	0.55	14.7	SAA
1555	8	6.79	0.926	11.92	62.6	16.41	0.53	14.1	SAA
1600	9.5	6.79	0.927	11.97	62.2	16.60	0.53	15.0	SAA
1605	11	6.78	0.930	12.01	63.1	16.84	0.52	14.2	SAA
1610	12.5	6.77	0.931	12.06	62.5	17.02	0.52	14.7	SAA

Flow Rate  
 mL/min  
 400  
 400  
 400  
 400  
~~400~~ 300  
 300  
 300  
 300

Collect Sample @ 1615 120720 B

### Sample Information

Sample ID: T-1-1220  
 Analysis: PFAS 85m region 5.3, Table B-15  
 Date: 12-7-20  
 Time: 1615  
 Field Filtering: X Filter Type X  
 Laboratory: Shelby Method of Shipment: Cooler w/ Ice  
 Remarks: 2x250mL HDPE Screw top Sample Bubbles collected

Air Monitoring: Background Zone  
 \* No hits Detected



Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): ET-3 @ IDA  
 Weather Conditions: 35°F, Cloudy, 30.16/104%  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: Bottle Pump, HDPE Bottle, HDPE tubing, MP-10 Computer

Project Number: 679172CH 01.11.FW  
 Date: 12-08-20  
 Screen: 15-30  
 pump intake depth (ft):

Sheet 1 of 2

Computer Setting  
 PSI 30

Refill to Discharge 5

### Water Quality Parameter Information

Datum: Well Volume: Time Purging begins (T<sub>0</sub>) 12:00  
 Well Depth: 40.00 (ft)  $WV = 2.24$  (gal) Water Level at time T<sub>0</sub> 25.47  
 Static Water Level: 26.26 (ft) Time Purging ends (T<sub>1</sub>)  
 Water Column: 13.74 (ft) Water Level at time T<sub>1</sub>  
 Diameter/Type: 2 in

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>a</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1200	—	7.22	2.502	10.49	-118.0	25.47	5.78	173	light grey, faint turbidity, suspended black particles
1205	1.5	7.24	2.560	10.92	-129.5	26.44	2.11	15.9	no color, faint turbidity, few suspended black particles
1210	3	7.26	2.617	11.31	-143.4	27.12	0.89	12.7	SAA
1215	4.5	7.26	2.631	11.42	-147.5	27.42	0.72	15.4	SAA
1220	6	7.21	2.608	11.49	-144.9	27.76	0.67	20.7	SAA
1225	7.5	7.10	2.531	11.52	-131.2	28.13	0.68	24.9	SAA
1230	9	7.08	2.509	11.60	-128.7	28.60	0.70	17.8	SAA
1235	10.5	7.06	2.499	11.68	-126.6	28.97	0.71	8.15	SAA

*Flow Rate*  
 300  
 300  
 300  
 300  
 300  
 300  
 300  
 300

Continued on pg 2

### Sample Information

Sample ID: ET-3-1220  
 Analysis: PFAS QSM version 5.2, Table 8-15  
 Date: 12-08-20  
 Time: 12:45  
 Field Filtering:  Filter Type:   
 Laboratory: Shelby Method of Shipment: Cooler w/ice  
 Remarks: 4x 250mL HDPE unreserved screw cap bottles collected

QC: Field Dup: FD 02-1220  
12-08-20 @ 1245

Air Monitoring: Breathing Zone  
\* no hits detected



# Groundwater Sampling Form

Project Name: IAAAQ 1FAS SI  
 Sample Source (Well No./Location): ET-3 @ IDA  
 Weather Conditions:  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment:

Project Number:  
 Date: 12-8-20

Sheet 2 of 2

See pg 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): \_\_\_\_\_  
 Well Depth: \_\_\_\_\_ (ft) 1V = \_\_\_\_\_ (gal) Water Level at time T<sub>0</sub>: \_\_\_\_\_  
 Static Water Level: \_\_\_\_\_ (ft) Time Purging ends (T<sub>1</sub>): \_\_\_\_\_  
 Water Column: \_\_\_\_\_ (ft) Water Level at time T<sub>1</sub>: \_\_\_\_\_  
 Diameter/Type: \_\_\_\_\_

See pg 1

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm) <sup>F</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
<u>1240</u>	<u>12</u>	<u>7.04</u>	<u>2.489</u>	<u>11.58</u>	<u>-124.7</u>	<u>29.38</u>	<u>0.68</u>	<u>8.52</u>	<u>SAA</u>
	<u>Collect Sample @ 1245 120820 JS</u>								

Flow Rate  
mL/min  
300

## Sample Information

Sample ID: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Field Filtering: \_\_\_\_\_ Filter Type: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_  
 Remarks: \_\_\_\_\_

See pg 1



# Groundwater Sampling Form

Project Name: JARAD PFAS SI  
 Sample Source (Well No./Location): C-00-3@IDA  
 Weather Conditions: 35, overcast, 30.11.14  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: HDPE Shaker Pump, HDPE Tubing, MP-10 Controller

Project Number: 01.11.14  
 Date: 12-7-20  
Screen - 7 33.53-43.53  
pump intake depth B.T.O.L: 39 ft

Sheet 1 of 2  
Controller Settings  
PSI: 35  
Refill 10 Discharge 5

## Water Quality Parameter Information

Datum:  
 Well Depth: 44.60 (ft)  
 Static Water Level: 22.39 (ft)  
 Water Column: 22.21 (ft)  
 Diameter/Type: 2 inch

Well Volume:  
 $V = 3.62$  (gal)

Time Purging begins (T<sub>0</sub>): 1340  
 Water Level at time T<sub>0</sub>: 21.50  
 Time Purging ends (T<sub>1</sub>): 1430  
 Water Level at time T<sub>1</sub>: 30.86

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
<u>1340</u>	<u>-</u>	<u>7.41</u>	<u>0.557</u>	<u>9.88</u>	<u>82.7</u>	<u>21.50</u>	<u>5.76</u>	<u>107</u>	<u>Very light tan, suspended sed, no odor</u>
<u>1345</u>	<u>1.5</u>	<u>7.15</u>	<u>0.568</u>	<u>11.28</u>	<u>77.7</u>	<u>22.88</u>	<u>1.91</u>	<u>121</u>	<u>SAF</u>
<u>1350</u>	<u>3</u>	<u>7.11</u>	<u>0.568</u>	<u>11.46</u>	<u>77.4</u>	<u>24.02</u>	<u>1.47</u>	<u>123</u>	<u>SAF</u>
<u>1355</u>	<u>4.5</u>	<u>7.07</u>	<u>0.567</u>	<u>11.61</u>	<u>77.2</u>	<u>24.87</u>	<u>1.04</u>	<u>109</u>	<u>SAF</u>
<u>1400</u>	<u>6</u>	<u>7.06</u>	<u>0.565</u>	<u>11.66</u>	<u>76.0</u>	<u>25.93</u>	<u>0.91</u>	<u>85.4</u>	<u>SAF</u>
<u>1405</u>	<u>7.5</u>	<u>7.05</u>	<u>0.565</u>	<u>11.65</u>	<u>74.1</u>	<u>26.75</u>	<u>0.88</u>	<u>59.3</u>	<u>SAF, clear</u>
<u>1410</u>	<u>9</u>	<u>7.06</u>	<u>0.566</u>	<u>11.66</u>	<u>70.8</u>	<u>27.51</u>	<u>0.80</u>	<u>26.7</u>	<u>No color, no odor, very little suspended sediment</u>
<u>1415</u>	<u>10.5</u>	<u>7.05</u>	<u>0.566</u>	<u>11.66</u>	<u>69.7</u>	<u>28.40</u>	<u>0.79</u>	<u>24.9</u>	<u>SAF</u>

Flow Rate  
 mL/min  
300  
300  
300  
300  
300  
300  
300  
300

Continuation of page 2

## Sample Information

Sample ID: C-00-3-120  
 Analysis: PFAS USM version 5.3, Table B-15  
 Date: 12-7-20  
 Time: 1435  
 Field Filtering: X Filter Type: X  
 Laboratory: Shaw Method of Shipment: Cooler w/ ice  
 Remarks: 2 X 250 mL HDPE Screw top Sample Bottles Collected

Air monitoring: Breathing Zone  
\* no hits detected





# Groundwater Sampling Form

Project Name: IAAAP PFAS SI

Project Number:

Sheet 2 of 2

Sample Source (Well No./Location): C-00-3 @ IDA

Date: 12/7/2020

Weather Conditions:

See pg 1

Well Condition:

Sample Team: Geologist

Sample Equipment:

## Water Quality Parameter Information

Datum:

Well Volume:

Time Purging begins (T<sub>0</sub>)

Well Depth: (ft)

1V =

(gal)

Water Level at time T<sub>0</sub>

Static Water Level: (ft)

See pg 1

Time Purging ends (T<sub>1</sub>)

Water Column: (ft)

Water Level at time T<sub>1</sub>

Diameter/Type:

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm) <sup>2</sup> ±1% of full-scale reading (Instrument repeatability) or default ±20	TEMP.(C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1420	12	7.05	0.565	11.65	68.8	29.15	0.79	20.1	SAA
1425	13.5	7.04	0.567	11.63	69.9	30.01	0.78	19.7	SAA
1430	15	7.04	0.567	11.58	68.8	30.86	0.77	19.2	SAA
Collect Sample @ 1435						120720 SS			

300  
300  
300

## Sample Information

Sample ID: \_\_\_\_\_

Analysis: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Field Filtering: \_\_\_\_\_ Filter Type \_\_\_\_\_

Laboratory: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_

Remarks: \_\_\_\_\_

See pg 1



# Groundwater Sampling Form

Project Name: IHAAP PFAS SI  
 Sample Source (Well No./Location): C-00-1 @ IHA  
 Weather Conditions: 45°F, Sunny, 30-12 kph  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: Peristaltic Pump, HDPE Tubing, Silicon Flex Tubing

Project Number: 679172CH 01.11.Fw  
 Date: 12-9-20  
 Screen: 61-75 #?

Sheet 1 of 2

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): 10:15  
 Well Depth: 25.37 (ft) 1V = 2.37 (gal) Water Level at time T<sub>0</sub>: 10.84  
 Static Water Level: 10.84 (ft) Time Purging ends (T<sub>1</sub>): 11:10  
 Water Column: 14.53 (ft) Water Level at time T<sub>1</sub>: 15.12  
 Diameter/Type: 2 in

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>a</sup> ±1% of full-scale reading (Instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1015	—	7.22	0.731	11.21	144.4	10.84	4.87	52.7	No color, No odor, Fine Suspended Sol
1020	1.5	7.12	0.694	13.68	133.9	11.37	2.94	38.9	SAA
1025	3	7.01	0.691	13.79	138.0	11.81	2.85	29.4	SAA
1030	4.5	6.96	0.685	13.83	149.5	12.35	3.15	23.5	SAA
1035	6	6.97	0.689	13.27	146.3	12.76	4.01	18.8	SAA Clear
1040	7.5	6.95	0.688	13.31	144.0	13.22	3.62	16.3	SAA
1045	9	6.90	0.687	13.30	139.1	13.40	2.93	15.7	SAA
1050	10.5	6.88	0.688	13.31	135.2	13.92	2.41	13.5	SAA

Flow Rate  
mL/min  
300  
300  
300  
300  
300  
300  
300  
300

Continued on pg 2

## Sample Information

Sample ID: C-00-1-1220  
 Analysis: PFAS BSM version 5.3, Table B-15  
 Date: 12-9-20  
 Time: 1115  
 Field Filtering:  Filter Type:   
 Laboratory: Sitely Method of Shipment: Cooler w/ Ice  
 Remarks: 2 x 250 mL HDPE unpressured Screen Cap Bottles Collected

Air Monitoring: Breathing Zone  
\* No Hits Detected



# Groundwater Sampling Form

Project Name: IAAAG PFAS SI  
 Sample Source (Well No./Location): C-00-1  
 Weather Conditions:  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment:

Project Number:  
 Date: 12-9-20

Sheet 2 of 2

See pg 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>): \_\_\_\_\_  
 Well Depth: (ft) \_\_\_\_\_ 1V = \_\_\_\_\_ (gal) Water Level at time T<sub>0</sub>: \_\_\_\_\_  
 Static Water Level: (ft) \_\_\_\_\_ Time Purging ends (T<sub>1</sub>): \_\_\_\_\_  
 Water Column: (ft) \_\_\_\_\_ Water Level at time T<sub>1</sub>: \_\_\_\_\_  
 Diameter/Type: \_\_\_\_\_

See pg 1

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1055	12	6.86	0.689	13.39	131.4	14.37	1.83	11.1	No color, no odor clear
1100	13.5	6.85	0.688	13.46	129.7	14.70	1.61	9.33	SAA
1105	15	6.85	0.689	13.47	130.4	15.03	1.57	9.02	SAA
1110	16.5	6.85	0.690	13.46	131.3	15.12	1.53	8.87	SAA
Collect Sample @ 1115 IS 120920									

Flow Rate  
 nL/min

300

300

300

300

## Sample Information

Sample ID: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Field Filtering: \_\_\_\_\_ Filter Type: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_  
 Remarks: \_\_\_\_\_

See pg 1





# Groundwater Sampling Form

Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): 6-5@IDA  
 Weather Conditions: 35°F, Cloudy, 30.11.14  
 Well Condition:  
 Sample Team: Geologist  
 Sample Equipment: HDPE Bladder pump, HDPE Tubing, mp-10 Controller

Project Number: 01.11.FW  
 Date: 12-7-20

Sheet 1 of 1

Screen - 40-50

Controller Settings

pump intake depth: 47.5 ft BTOL

40 PSI  
 Refill to Discharge 5

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) 11:40  
 Well Depth: 52.80 (ft) 1V = 11.03 (gal) Water Level at time T<sub>0</sub> 35.65  
 Static Water Level: 35.85 (ft) Time Purging ends (T<sub>1</sub>) 12:15  
 Water Column: 16.97 (ft) Water Level at time T<sub>1</sub> 36.33  
 Diameter/Type: 4 inch

Time	Volume Removed (L)	pH ±0.1	SPCOND (mS/cm) ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP (C) ±3%	Redox (mV) ORP ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance	Flow Rate ml/min
1140	—	6.75	0.836	8.92	82.1	35.63	4.66	30.0	Clear, no color, no odor, very little suspended solids	200
1145	1.5	6.79	0.828	10.22	64.0	35.67	1.25	19.1	SAA	300
1150	3	6.80	0.827	10.43	57.4	35.84	1.01	18.7	SAA	300
1155	4.5	6.78	0.823	10.78	53.5	35.91	0.90	23.3	SAA	300
1200	6	6.78	0.827	10.76	52.9	36.09	0.75	22.5	SAA	300
1205	7.5	6.77	0.826	10.79	53.5	36.18	0.74	18.7	SAA	300
1210	9	6.77	0.826	10.73	54.2	36.25	0.70	19.2	SAA	300
1215	10.5	6.77	0.827	10.78	55.3	36.33	0.69	18.4	SAA	300

Collect Sample @ 1220 120720 JS

## Sample Information

Sample ID: 6-5-1220  
 Analysis: PFAS QSM version 5.3, Table B-15  
 Date: 12-7-20  
 Time: 1220  
 Field Filtering: X Filter Type X  
 Laboratory: Steady Method of Shipment: Cooler w/ Ice  
 Remarks: 250mL unpreserved HDPE Bottle Collected X2

Air monitoring: Breakby Zone  
\* No H2S detected

3 Gal purge water generated



## Groundwater Sampling Form

Project Name: IAAAP PFAS SI

Project Number:

Sheet 1 of 1

Sample Source (Well No./Location): FFS-MW01

Date: 12/7/20

Weather Conditions: 34°F, cloudy

Well Condition: New

Sample Team: Geologist

Sample Equipment: peristaltic pump

## Water Quality Parameter Information

Datum:

Well Volume:

Time Purging begins (T<sub>0</sub>) 1515

Well Depth: 19.50 (ft)

Well headspace: 1V = 1.3 (gal)

Water Level at time T<sub>0</sub> 11.50

Static Water Level: 11.50 (ft)

Time Purging ends (T<sub>1</sub>) 1600

Water Column: 8.00 (ft)

CH<sub>4</sub> = 0% LEL VOC = 0.3 ppmWater Level at time T<sub>1</sub> 13.00

Diameter/Type: 2" PVC

H<sub>2</sub>S = 0.0 ppm CO = 0 ppm O<sub>2</sub> = 20.2%

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1520	1.5	7.04	0.822	13.95	139.3	11.90	4.55	27.2	clear
1525	2.5	7.01	0.817	14.33	139.2	12.21	4.52	15.8	
1530	3.5	7.00	0.820	14.35	140.5	12.35	4.46	11.2	
1535	4.5	6.99	0.816	14.43	143.1	12.52	4.72	10.1	
1540	5.75	6.98	0.814	14.49	144.8	12.60	4.89	9.97	
1545	7.0	6.94	0.812	14.55	146.1	12.79	4.95	9.82	
1550	8.0	6.92	0.810	14.53	145.9	12.88	4.97	9.78	
1555	9.0	6.92	0.809	14.56	146.6	13.00	4.99	9.71	↓

## Sample Information

Sample ID: FFS-MW01-1220

Analysis: PFAS

Date: 12/7/20

Time: 1600

Field Filtering: N/A Filter Type: N/A

Laboratory: Pace Method of Shipment: FedEx

Remarks:



# Groundwater Sampling Form

Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): FFS-MW02  
 Weather Conditions: cloudy, 36°F  
 Well Condition: New  
 Sample Team: Geologist  
 Sample Equipment: peristaltic pump

Project Number:  
 Date: 12/7/20

Sheet 1 of 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) 1340  
 Well Depth: 19.67 (ft) Water Level at time T<sub>0</sub> 14.26  
 Static Water Level: 14.26 (ft) Well headspace: 1V = \_\_\_\_\_ (gal) Time Purging ends (T<sub>1</sub>) 1415  
 Water Column: \_\_\_\_\_ (ft) CH<sub>4</sub> = 0% LEL VOC = 0.0 ppm  
 Diameter/Type: 2" PVC H<sub>2</sub>S = 0.0 ppm CO = 0 ppm O<sub>2</sub> = 20.1%  
 Water Level at time T<sub>1</sub> 15.35

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>c</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1345	1.5	6.92	0.807	12.69	115.0	14.72	4.61	22.8	clear
1350	2.5	6.88	0.821	12.91	109.3	14.91	4.76	12.3	↓
1355	3.5	6.84	0.884	13.09	118.3	15.10	4.79	9.26	
1400	4.5	6.81	0.893	13.06	123.8	15.19	4.88	8.23	
1405	5.5	6.79	0.899	13.20	125.1	15.25	4.98	8.09	
1410	6.75	6.78	0.901	13.18	125.3	15.31	4.99	7.94	
1415	8.0	6.78	0.901	13.19	125.6	15.35	5.02	7.98	

## Sample Information

Sample ID: FFS-MW02-1220 DVP = FD01-1220 @1425  
 Analysis: PFAS  
 Date: 12/7/20  
 Time: 1420  
 Field Filtering: N/A Filter Type: N/A  
 Laboratory: Palc Method of Shipment: Fedex  
 Remarks: \_\_\_\_\_





## Groundwater Sampling Form

Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): FFS-MW03  
 Weather Conditions: Cloudy, 36°F  
 Well Condition: New  
 Sample Team: Geologist  
 Sample Equipment: peristaltic

Project Number:  
 Date: 12/7/20

Sheet 1 of 1

## Water Quality Parameter Information

Datum: Well Volume: Time Purging begins (T<sub>0</sub>) 1230  
 Well Depth: 19.81 (ft) IV = (gal) Water Level at time T<sub>0</sub> 11.31  
 Static Water Level: 11.31 (ft) Well headspace: Time Purging ends (T<sub>1</sub>) 1310  
 Water Column: (ft) CH<sub>4</sub> = 0% LEL VOC = 0.0 ppm  
 Diameter/Type: 2" H<sub>2</sub>S = 0.0 ppm CO = 0 ppm O<sub>2</sub> = 20.8%  
 Water Level at time T<sub>1</sub> 12.75

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>e</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1235	1.5	6.78	0.705	13.92	176.3	11.89	3.09	22.5	clear to eye
1240	2.25	6.91	0.708	13.87	158.0	12.08	3.42	9.95	
1245	3.5	6.95	0.706	13.77	147.3	12.45	3.88	7.34	
1250	4.75	6.97	0.705	13.80	142.3	12.58	4.29	6.11	
1255	5.75	6.98	0.704	13.81	140.6	12.65	4.38	5.95	
1300	6.75	6.99	0.703	13.80	140.0	12.69	4.40	5.89	
1305	8.0	7.00	0.703	13.83	139.7	12.72	4.42	5.85	
1310	9.0	7.01	0.704	13.84	139.5	12.75	4.43	5.82	

## Sample Information

Sample ID: FFS-MW03-1220  
 Analysis: PFAS  
 Date: 12/7/20  
 Time: 1315  
 Field Filtering: N/A Filter Type: N/A  
 Laboratory: Face Method of Shipment: Fedex  
 Remarks:



# Groundwater Sampling Form



Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): FFS-MW04  
 Weather Conditions: 33°F, clear/sunny  
 Well Condition: New  
 Sample Team: Geologist  
 Sample Equipment: peristaltic pump

Project Number:  
 Date: 12/9/20

Sheet | of 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) 740  
 Well Depth: 19.70 (ft) IV = \_\_\_\_\_ (gal) Water Level at time T<sub>0</sub> 10.86  
 Static Water Level: 10.86 (ft) well headspace! VOC = 0.1 ppm  
 Water Column: 8.84 (ft) CH<sub>4</sub> = 0% VEL Time Purging ends (T<sub>1</sub>) 815  
 Diameter/Type: 2 in. PVC H<sub>2</sub>S = 0.0 ppm CO = 0 ppm Water Level at time T<sub>1</sub> 11.90  
 O<sub>2</sub> = 20.1%

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm) <sup>a</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
745	1.25	6.59	1.385	12.15	200.9	11.21	3.70	12.9	clear
750	2.5	6.74	1.375	12.47	176.1	11.43	2.83	9.89	SAA
755	3.5	6.79	1.358	12.26	160.3	11.64	2.92	8.14	SAA
800	4.75	6.82	1.349	12.31	169.4	11.73	2.95	7.21	SAA
805	6.0	6.83	1.346	12.38	171.4	11.80	3.01	6.61	SAA
810	7.25	6.84	1.344	12.45	165.1	11.85	3.04	6.42	SAA
815	8.5	6.84	1.343	12.50	162.2	11.90	3.02	6.55	✓ SAA

## Sample Information

Sample ID: FFS-MW04-1220  
 Analysis: PFAS 537 ID  
 Date: 12/9/20  
 Time: 820  
 Field Filtering: N/A Filter Type: N/A  
 Laboratory: Pace Method of Shipment: Fedex  
 Remarks: \_\_\_\_\_



## Groundwater Sampling Form

Project Name: IAAAP PFAS SI  
 Sample Source (Well No./Location): FFS-MW05  
 Weather Conditions: 38°F, sunny  
 Well Condition: New  
 Sample Team: Geologist  
 Sample Equipment: peristaltic pump

Project Number:  
 Date: 12/9/20

Sheet 1 of 1

## Water Quality Parameter Information

Datum: \_\_\_\_\_ Well Volume: \_\_\_\_\_ Time Purging begins (T<sub>0</sub>) 10:10  
 Well Depth: 19.56 (ft) Water Level at time T<sub>0</sub> 10.81  
 Static Water Level: 10.81 (ft) well headspace: 1V = \_\_\_\_\_ (gal) Time Purging ends (T<sub>1</sub>) 10:50  
 Water Column: 8.75 (ft) CH<sub>4</sub> = 0% LEL VOC = 0.0 ppm Water Level at time T<sub>1</sub> 12.78  
 Diameter/Type: 2 in. PVC H<sub>2</sub>S = 0.0 ppm CO = 0 ppm O<sub>2</sub> = 20.3%

Time	Volume Removed (L)	pH ±0.1	SPCOND. (mS/cm) <sup>a</sup> ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP. (C) ±3%	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) 10% or <5	Appearance
1015	1.25	7.11	0.719	14.06	70.6	11.89	2.67	25.3	trace fine sediment
1020	2.5	7.08	0.713	14.15	64.1	12.14	3.94	14.3	clearing
1025	3.75	7.07	0.710	14.09	62.7	12.32	4.83	13.2	SAA
1030	5	7.09	0.698	14.12	68.9	12.46	5.29	12.8	SAA
1035	6.25	7.10	0.660	14.27	87.3	12.57	5.62	11.2	SAA
1040	7.50	7.11	0.654	14.34	91.6	12.65	5.70	11.9	clear
1045	8.50	7.12	0.652	14.31	91.3	12.71	5.72	11.7	SAA
1050	<del>10.0</del> 10.0	7.12	0.650	14.35	92.1	12.78	5.74	11.5	SAA

## Sample Information

Sample ID: FFS-MW05-1220 MS + MSD  
 Analysis: PFAS 537 ~~537~~ IO  
 Date: 12/9/20  
 Time: 1055  
 Field Filtering: N/A Filter Type: N/A  
 Laboratory: PacL Method of Shipment: Fedex  
 Remarks: \_\_\_\_\_



**Appendix B**  
**Monitoring Well Coordinates**

Appendix B. Monitoring Well Location Coordinates at the Former Fire Station 200-131-3  
*Iowa Army Ammunition Plant, Middletown, Iowa*

<b>Sample Location</b>	<b>NORTHING (Feet)</b>	<b>EASTING (Feet)</b>	<b>GROUND ELEVATION (Feet NAD88)</b>	<b>TOC (Feet NAD88)</b>
FFS MW-01	307930.167	2261506.083	727.75	727.40
FFS MW-02	307821.211	2261386.193	728.02	727.75
FFS MW-03	307658.191	2261260.450	725.25	726.90
FFS MW-04	307805.297	2261087.123	726.73	726.48
FFS MW-05	307679.221	2261481.608	726.29	725.92

The northing and easting coordinates are based on the Iowa State Plane Coordinate System South Zone 1402  
NAD88 = North American Datum, State Plane Iowa South  
TOC = Top of Casing  
WGS = World Geodetic System 1984

**Appendix C**  
**Waste Documentation**



# NON-HAZARDOUS WASTE MANIFEST

7Q 2104124633

Please print or type (Form designed for use on elite (12 pitch) typewriter)

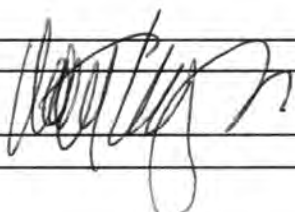
<b>NON-HAZARDOUS WASTE MANIFEST</b>	1. Generator's US EPA ID No. <b>NONREQUIRED</b>	Manifest Document No. <b>NH246331</b>	2. Page <b>1</b> of <b>1</b>
3. Generator's Name and Mailing Address <b>Iowa Army Ammunition Plant 17571 DMC Highway 79 Attn: Amanda Smith Middletown IA 52638</b>		Site Address : <b>17571 DMC Highway 79 Middletown, IA 52609</b>	
4. Generator's Phone ( <b>(319) 753-7463</b> ) <b>ATTN:Amanda Smith</b>			
5. Transporter 1 Company Name <b>Clean Harbors Environmental Services, Inc.</b>	6. US EPA ID Number <b>MAD039322250</b>	A. State Transporter's ID	
		B. Transporter 1 Phone <b>(781) 792-5000</b>	
7. Transporter 2 Company Name <i>Pioneer Tank Lines</i>	8. US EPA ID Number <i>MD0044176113</i>	C. State Transporter's ID	
		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address <b>Clean Harbors El Dorado LLC 309 American Circle El Dorado, AR 71730</b>	10. US EPA ID Number <b>ARD069748192</b>	E. State Facility's ID	
		F. Facility's Phone <b>(870) 863-7173</b>	
11. WASTE DESCRIPTION		Containers	13. Total Quantity
		No.	14. Unit Wt./Vol.
a. <b>NON HAZARDOUS, NON D.O.T. REGULATED, (WATER)</b>		<b>3</b>	<b>DM</b>
		<b>600</b>	<b>P</b>
b.			
c.			
d.			
G. Additional Descriptions for Materials Listed Above <b>11a.CH2212788</b>		H. Handling Codes for Wastes Listed Above	
15. Special Handling Instructions and Additional Information		<b>EMERGENCY PHONE #: (800) 483-3718</b> <b>GENERATOR: Iowa Army Ammunition Plant</b>	
<b>16. GENERATOR'S CERTIFICATION:</b> I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.			
Printed/Typed Name <b>Zach Hill</b>		Signature <i>Zach Hill</i>	Date <b>9   2   21</b>
17. Transporter 1 Acknowledgement of Receipt of Materials			
Printed/Typed Name <b>ARIC Warren</b>		Signature <i>ARIC Warren</i>	Date <b>9   2   21</b>
18. Transporter 2 Acknowledgement of Receipt of Materials			
Printed/Typed Name <b>SCOTT JOHNSON</b>		Signature <i>Scott Johnson</i>	Date <b>9   16   21</b>
19. Discrepancy Indication Space			
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.			
Printed/Typed Name <b>Stephanie Matheny</b>		Signature <i>Stephanie Matheny</i>	Date <b>10   8   21</b>

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b> (Continuation Sheet)		21. Generator ID Number	22. Page <b>2</b>	23. Manifest Tracking Number <b>NI 24631</b>		
24. Generator's Name <b>IOWA ARMY AMMUNITION PLANT</b>						
25. Transporter <b>3</b> Company Name <b>Safety Kleen Systems, Inc</b>		U.S. EPA ID Number <b>TXR000081205</b>				
26. Transporter _____ Company Name		U.S. EPA ID Number				
27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers		29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes
		No.	Type			
	<b>T</b>					
	<b>PO</b>					
32. Special Handling Instructions and Additional Information						
33. Transporter <b>3</b> Acknowledgment of Receipt of Materials						
Printed/Typed Name <b>ROBERT KUTZNER</b>		Signature 			Month Day Year <b>9 17 21</b>	
34. Transporter _____ Acknowledgment of Receipt of Materials						
Printed/Typed Name		Signature			Month Day Year	
35. Discrepancy						
36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						

GENERATOR

TRANSPORTER

DESIGNATED FACILITY

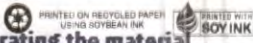
# NON-HAZARDOUS WASTE MANIFEST

7Q 2104124633

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>NONREQUIRED</b>		Manifest Document No. <b>NH2416332</b>	2. Page 1 of 1
3. Generator's Name and Mailing Address <b>Iowa Army Ammunition Plant 17571 DMC Highway 79 Attn: Amanda Smith Middletown IA 52638</b>				Site Address : <b>17571 DMC Highway 79 Middletown, IA 52638</b>	
4. Generator's Phone ( <b>(319) 753-7463</b> )		<b>ATTN:Amanda Smith</b>			
5. Transporter 1 Company Name <b>Clean Harbors Environmental Services, Inc.</b>		6. US EPA ID Number <b>MAD039322250</b>		A. State Transporter's ID	
				B. Transporter 1 Phone <b>(781) 792-5000</b>	
7. Transporter 2 Company Name <i>Pioneer Tank Lines</i>		8. US EPA ID Number <i>MAD044176113</i>		C. State Transporter's ID	
				D. Transporter 2 Phone	
9. Designated Facility Name and Site Address <b>Spring Grove Resource Recovery Inc. 4879 Spring Grove Avenue Cincinnati, OH 45232</b>		10. US EPA ID Number <b>OHD000816629</b>		E. State Facility's ID	
				F. Facility's Phone <b>(513) 681-5738</b>	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
a. <b>NON HAZARDOUS, NON D.O.T. REGULATED, (SOIL)</b>			<b>9</b>	<b>DM</b>	<b>2700 P</b>
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above <b>11a.CH1700766</b>			H. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information			<b>EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Iowa Army Ammunition Plant</b>		
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name <b>Zach Hill</b>				Signature <i>Zach Hill</i>	
				Date <b>9   2   21</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name <b>Eric Warren</b>				Signature <i>Eric Warren</i>	
				Date <b>9   2   21</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name <b>Scott Johnson</b>				Signature <i>Scott Johnson</i>	
				Date <b>9   16   21</b>	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.					
Printed/Typed Name				Signature	
				Date Month Day Year	

NON-HAZARDOUS WASTE GENERATOR FACILITY





UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)		21. Generator ID Number	22. Page 2	23. Manifest Tracking Number NIF 246332					
24. Generator's Name IOWA Army Ammunition Plant									
25. Transporter 3 Company Name		SAFETY KLEEN SYSTEMS, INC		U.S. EPA ID Number TXL00008205					
26. Transporter _____ Company Name		U.S. EPA ID Number							
GENERATOR	27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))		28. Containers		29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes	
				No.	Type				
	32. Special Handling Instructions and Additional Information								
TRANSPORTER	33. Transporter 3 Acknowledgment of Receipt of Materials		Printed/Typed Name		Signature		Month Day Year		
	34. Transporter _____ Acknowledgment of Receipt of Materials		Printed/Typed Name		Signature		Month Day Year		
DESIGNATED FACILITY	35. Discrepancy								
	36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								

**Appendix D**  
**Laboratory Reports and Data Quality Evaluation**

Table D-1. Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS) at the Fire Training Pit

Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa

Location	FTA-99-1	FTA-TT-MW-03	FTP-MW5	JAW-60	JAW-63	
Sample ID	FTA-99-1-1220	FTA-TT-MW-03-1220	FTP-MW5-1220	JAW-60-1220	JAW-63-1220	
Sample Type	N	N	N	N	N	
Sample Depth (ft)	7 - 17	5 - 30	8.9 - 13.9	24 - 34	10 - 20	
Sample Date	12/10/2020	12/10/2020	12/10/2020	12/8/2020	12/9/2020	
PFAS Analyte (ng/L)	Screening Level					
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 sulfonic acid)	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 sulfonic acid)	—	<b>12</b>	<b>61</b>	3.6 U	3.6 U	<b>2.7 J</b>
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (ETFOSAA)	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MEFOSAA)	—	3.5 U	3.4 U	3.6 U	3.6 U	3.5 U
Perfluoro-1-butanefluoro-1-butanesulfonic acid (PFBS)	600	<b>24</b>	<b>210</b>	<b>5.2</b>	<b>94</b>	<b>5.7</b>
Perfluorohexanesulfonic acid (PFHxS)	39	<b>360</b>	<b>1,400</b>	<b>91</b>	<b>1,500</b>	<b>110</b>
Perfluoro-n-butanoic acid (PFBA)	—	<b>8.7</b>	<b>21</b>	<b>16</b>	<b>20</b>	<b>2 J</b>
Perfluoro-n-decanoic acid (PFDA)	—	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-dodecanoic acid (PFDoA)	—	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-heptanoic acid (PFHpA)	—	<b>2.4 J</b>	<b>15</b>	1.8 U	<b>11</b>	1.8 U
Perfluoro-n-hexanoic acid (PFHxA)	—	<b>19</b>	<b>160</b>	<b>2.5 J</b>	<b>99</b>	<b>4.3</b>
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-octanoic acid (PFOA)	6	<b>5.6</b>	<b>31</b>	<b>3.9</b>	<b>24</b>	<b>1.5 J</b>
Perfluoro-n-pentanoic acid (PFPeA)	—	<b>4</b>	<b>25</b>	<b>4.2</b>	<b>15</b>	<b>1.0 J</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	—	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-tridecanoic acid (PFTrDA)	—	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-undecanoic acid (PFUdA)	—	1.8 U	1.7 U	1.8 U	1.8 U	1.8 U
Perfluorooctanesulfonic acid (PFOS)	4	<b>80</b>	<b>620</b>	<b>37</b>	<b>270</b>	<b>17</b>

Notes:

N = Normal

NA = Not analyzed

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

ng/L = Nanograms per Liter

**Bold** indicates the analyte was detected

**Shading** indicates the result exceeded screening criteria



Table D-2. Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS) at the Inert Disposal Area

Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS) Iowa Army Ammunition Plant, Middletown, Iowa

Location	C-00-1	C-00-3	ET-3		G-5	T-1	
Sample ID	C-00-1-1220	C-00-3-1220	ET-3-1220	FD02-1220	G-5-1220	T-1-1220	
Sample Type	N	N	N	FD	N	N	
Sample Depth (ft)	12.35 - 22.35	31.75 - 41.75	15 - 30	15 - 30	40 - 50	25 - 35	
Sample Date	12/9/2020	12/7/2020	12/8/2020	12/8/2020	12/7/2020	12/7/2020	
PFAS Analyte (ng/L)	Screening Level						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	—	3.5 U	3.6 U	3.5 U	3.4 U	3.4 U	3.4 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 sulfonic acid)	—	3.5 U	3.6 U	3.5 U	3.4 U	3.4 U	3.4 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 sulfonic acid)	—	<b>9.3</b>	<b>7.3</b>	<b>6.3 J</b>	<b>5.5 J</b>	3.4 U	3.4 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	—	3.5 U	3.6 U	3.5 U	3.4 U	3.4 U	3.4 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	—	3.5 U	3.6 U	3.5 U	3.4 U	3.4 U	3.4 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.5 U	3.6 U	3.5 U	3.4 UJ	3.4 U	3.4 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (ETFOSAA)	—	3.5 U	3.6 U	3.5 U	<b>2.9 J</b>	3.4 U	3.4 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MEFOSAA)	—	3.5 U	3.6 U	3.5 U	3.4 U	3.4 U	3.4 U
Perfluoro-1-butanesulfonic acid (PFBS)	600	<b>1.3 J</b>	1.8 U	1.7 UJ	<b>26 J</b>	<b>4.9</b>	1.7 U
Perfluorohexanesulfonic acid (PFHxS)	39	<b>1.1 J</b>	1.8 U	<b>12</b>	<b>14</b>	<b>1.8 J</b>	1.7 U
Perfluoro-n-butanoic acid (PFBA)	—	<b>6.3</b>	<b>1.9 J</b>	<b>380 J</b>	<b>390 J</b>	<b>9.4</b>	<b>2.4 J</b>
Perfluoro-n-decanoic acid (PFDA)	—	1.8 U	1.8 U	1.7 U	1.7 U	1.7 U	1.7 U
Perfluoro-n-dodecanoic acid (PFDoA)	—	1.8 U	1.8 U	1.7 U	1.7 U	1.7 U	1.7 U
Perfluoro-n-heptanoic acid (PFHpA)	—	1.8 U	1.8 U	<b>26</b>	<b>27 J</b>	1.7 U	1.7 U
Perfluoro-n-hexanoic acid (PFHxA)	—	<b>1.4 J</b>	1.8 U	<b>65</b>	<b>86 J</b>	1.7 U	1.7 U
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.8 U	1.7 U	<b>1.0 J</b>	1.7 U	1.7 U
Perfluoro-n-octanoic acid (PFOA)	6	<b>2.9 J</b>	1.8 U	<b>110</b>	<b>110</b>	1.7 U	1.7 U
Perfluoro-n-pentanoic acid (PFPeA)	—	<b>1.6 J</b>	1.8 U	<b>80 J</b>	<b>84 J</b>	1.7 U	1.7 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	—	1.8 U	1.8 U	1.7 U	<b>0.91 J</b>	1.7 U	1.7 U
Perfluoro-n-tridecanoic acid (PFTTrDA)	—	1.8 U	1.8 U	1.7 U	1.7 U	1.7 U	1.7 U
Perfluoro-n-undecanoic acid (PFUdA)	—	1.8 U	1.8 U	1.7 U	1.7 U	1.7 U	1.7 U
Perfluorooctanesulfonic acid (PFOS)	4	<b>2.0 J</b>	1.8 U	<b>9.8</b>	<b>9.1</b>	1.7 U	1.7 U

Notes:

FD = Field duplicate

N = Normal

NA = Not analyzed

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

ng/L = Nanograms per Liter

**Bold** indicates the analyte was detected

Shading indicates the result exceeded screening criteria

Table D-3. Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS) at the Former Fire Station 200-131-3

Site Inspection Report: Per- and Polyfluoroalkyl Substances (PFAS) Iowa Army Ammunition Plant, Middletown, Iowa

Location	FFS-MW01	FFS-MW02		FFS-MW03	FFS-MW04	FFS-MW05	
Sample ID	FFS-MW01-1220	FFS-MW02-1220	FD01-1220	FFS-MW03-1220	FFS-MW04-1220	FFS-MW05-1220	
Sample Type	N	N	FD	N	N	N	
Sample Depth (ft)	10 - 20	10 - 20	10 - 20	10 - 20	10 - 20	10 - 20	
Sample Date	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/9/2020	12/9/2020	
PFAS Analyte (ng/L)	Screening Level						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 sulfonic acid)	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 sulfonic acid)	—	<b>17 J</b>	<b>18</b>	<b>17</b>	<b>140 J</b>	<b>63</b>	<b>8.1 J</b>
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (ETFOSAA)	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MEFOSAA)	—	3.7 U	3.8 U	3.9 U	3.9 U	3.5 U	3.6 U
Perfluoro-1-butanesulfonic acid (PFBS)	600	<b>8.3</b>	<b>99</b>	<b>94</b>	<b>15 J</b>	<b>47</b>	<b>4.6</b>
Perfluorohexanesulfonic acid (PFHxS)	39	<b>39</b>	<b>680</b>	<b>720</b>	<b>45 J</b>	<b>630</b>	<b>17 J</b>
Perfluoro-n-butanoic acid (PFBA)	—	<b>110</b>	<b>54</b>	<b>55</b>	<b>34</b>	<b>130</b>	<b>110</b>
Perfluoro-n-decanoic acid (PFDA)	—	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-dodecanoic acid (PFDoA)	—	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-heptanoic acid (PFHpA)	—	<b>1.8 J</b>	<b>28</b>	<b>26</b>	<b>1.4 J</b>	<b>42</b>	<b>2.2 J</b>
Perfluoro-n-hexanoic acid (PFHxA)	—	<b>9.1</b>	<b>190</b>	<b>200</b>	<b>1.7 J</b>	<b>150</b>	<b>4.6</b>
Perfluoro-n-nonanoic acid (PFNA)	5.9	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-octanoic acid (PFOA)	6	<b>4.1</b>	<b>19</b>	<b>19</b>	<b>1.8 J</b>	<b>27</b>	<b>9.1</b>
Perfluoro-n-pentanoic acid (PFPeA)	—	<b>5.2</b>	<b>46</b>	<b>46</b>	<b>1.6 J</b>	<b>200</b>	<b>11</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	—	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-tridecanoic acid (PFTTrDA)	—	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluoro-n-undecanoic acid (PFUdA)	—	1.8 U	1.9 U	2.0 U	1.9 U	1.8 U	1.8 U
Perfluorooctanesulfonic acid (PFOS)	4	<b>14</b>	<b>18</b>	<b>19</b>	<b>5.9 J</b>	<b>94</b>	<b>8.5</b>

Notes:

FD = Field duplicate

N = Normal

NA = Not analyzed

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

ng/L = Nanograms per Liter

**Bold** indicates the analyte was detected

Shading indicates the result exceeded screening criteria



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## Report of Analysis

**CH2M - Jacobs**  
59 Lilac Ct.  
Pagosa Springs, CO 81147  
Attention: Doug Scott

Project Name: IAAAP PFAS  
Project Number: 679172CH.01.11.FW  
Lot Number: **VL11001**  
Date Completed: 01/05/2021

01/07/2021 12:03 AM  
Approved and released by:  
Project Manager II: **Cathy S. Dover**



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# PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

## Case Narrative CH2M - Jacobs Lot Number: VL11001

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP. DoD reporting conventions and qualifiers are not utilized in this data package.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. The extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

$$CF = DF * FV / V_0$$

FV is volume of extract (mL)

V<sub>0</sub> is initial sample volume (mL)

DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:

Concentration (ng/L) = C<sub>s</sub>\*CF,

$$\text{Where: } C_S = \left( \frac{A_s}{A_{is}} - b \right) * \left( \frac{C_{is}}{a} \right)$$

A<sub>s</sub> is peak response of target analyte in the sample

A<sub>is</sub> is peak response of internal standard in the sample

C<sub>s</sub> is concentration of target analyte in the sample

C<sub>is</sub> is concentration of internal standard in the sample (1ng/mL)

a is the slope from the ICAL linear regression

b is the y-intercept from the ICAL linear regression. If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Samples VL11001-009 (ET-3-1220) and VL11001-010 (FD02-1220), required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside control limits: VL11001-006 (FFS-MW01-1220), VL11001-009 (ET-3-1220), and VL11001-010 (FD02-1220). Re-extraction and re-analysis was performed with concurring results. The original analysis has been reported.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

# PACE ANALYTICAL SERVICES, LLC

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## Sample Summary

CH2M - Jacobs

Lot Number: VL11001

Project Name: IAAAP PFAS

Project Number: 679172CH.01.11.FW

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Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	G-5-1220	Aqueous	12/07/2020 1220	12/09/2020
002	FFS-MW03-1220	Aqueous	12/07/2020 1315	12/09/2020
003	FFS-MW02-1220	Aqueous	12/07/2020 1420	12/09/2020
004	FD01-1220	Aqueous	12/07/2020 1425	12/09/2020
005	C-00-3-1220	Aqueous	12/07/2020 1435	12/09/2020
006	FFS-MW01-1220	Aqueous	12/07/2020 1600	12/09/2020
007	T-1-1220	Aqueous	12/07/2020 1615	12/09/2020
008	JAW-60-1220	Aqueous	12/08/2020 1035	12/09/2020
009	ET-3-1220	Aqueous	12/08/2020 1245	12/09/2020
010	FD02-1220	Aqueous	12/08/2020 1245	12/09/2020
011	EB01-120820	Aqueous	12/08/2020 1425	12/09/2020
012	EB02-120820	Aqueous	12/08/2020 1510	12/09/2020
013	TB01-120820	Aqueous	12/08/2020	12/09/2020

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(13 samples)

# PACE ANALYTICAL SERVICES, LLC

## Detection Summary

CH2M - Jacobs

Lot Number: VL11001

Project Name: IAAAP PFAS

Project Number: 679172CH.01.11.FW

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	G-5-1220	Aqueous	PFBS	PFAS by ID	4.9		ng/L	6
001	G-5-1220	Aqueous	PFHxS	PFAS by ID	1.8	J	ng/L	6
001	G-5-1220	Aqueous	PFBA	PFAS by ID	9.4		ng/L	6
002	FFS-MW03-1220	Aqueous	6:2 FTS	PFAS by ID	140		ng/L	7
002	FFS-MW03-1220	Aqueous	PFBS	PFAS by ID	15		ng/L	7
002	FFS-MW03-1220	Aqueous	PFHxS	PFAS by ID	45		ng/L	7
002	FFS-MW03-1220	Aqueous	PFBA	PFAS by ID	34		ng/L	7
002	FFS-MW03-1220	Aqueous	PFHpA	PFAS by ID	1.4	J	ng/L	7
002	FFS-MW03-1220	Aqueous	PFHxA	PFAS by ID	1.7	J	ng/L	7
002	FFS-MW03-1220	Aqueous	PFOA	PFAS by ID	1.8	J	ng/L	7
002	FFS-MW03-1220	Aqueous	PFPeA	PFAS by ID	1.6	J	ng/L	7
002	FFS-MW03-1220	Aqueous	PFOS	PFAS by ID	5.9		ng/L	7
003	FFS-MW02-1220	Aqueous	6:2 FTS	PFAS by ID	18		ng/L	8
003	FFS-MW02-1220	Aqueous	PFBS	PFAS by ID	99		ng/L	8
003	FFS-MW02-1220	Aqueous	PFHxS	PFAS by ID	680		ng/L	8
003	FFS-MW02-1220	Aqueous	PFBA	PFAS by ID	54		ng/L	8
003	FFS-MW02-1220	Aqueous	PFHpA	PFAS by ID	28		ng/L	8
003	FFS-MW02-1220	Aqueous	PFHxA	PFAS by ID	190		ng/L	8
003	FFS-MW02-1220	Aqueous	PFOA	PFAS by ID	19		ng/L	8
003	FFS-MW02-1220	Aqueous	PFPeA	PFAS by ID	46		ng/L	8
003	FFS-MW02-1220	Aqueous	PFOS	PFAS by ID	18		ng/L	8
004	FD01-1220	Aqueous	6:2 FTS	PFAS by ID	17		ng/L	9
004	FD01-1220	Aqueous	PFBS	PFAS by ID	94		ng/L	9
004	FD01-1220	Aqueous	PFHxS	PFAS by ID	720		ng/L	9
004	FD01-1220	Aqueous	PFBA	PFAS by ID	55		ng/L	9
004	FD01-1220	Aqueous	PFHpA	PFAS by ID	26		ng/L	9
004	FD01-1220	Aqueous	PFHxA	PFAS by ID	200		ng/L	9
004	FD01-1220	Aqueous	PFOA	PFAS by ID	19		ng/L	9
004	FD01-1220	Aqueous	PFPeA	PFAS by ID	46		ng/L	9
004	FD01-1220	Aqueous	PFOS	PFAS by ID	19		ng/L	9
005	C-00-3-1220	Aqueous	6:2 FTS	PFAS by ID	7.3		ng/L	10
005	C-00-3-1220	Aqueous	PFBA	PFAS by ID	1.9	J	ng/L	10
006	FFS-MW01-1220	Aqueous	6:2 FTS	PFAS by ID	17	Q	ng/L	11
006	FFS-MW01-1220	Aqueous	PFBS	PFAS by ID	8.3		ng/L	11
006	FFS-MW01-1220	Aqueous	PFHxS	PFAS by ID	39		ng/L	11
006	FFS-MW01-1220	Aqueous	PFBA	PFAS by ID	110		ng/L	11
006	FFS-MW01-1220	Aqueous	PFHpA	PFAS by ID	1.8	J	ng/L	11
006	FFS-MW01-1220	Aqueous	PFHxA	PFAS by ID	9.1		ng/L	11
006	FFS-MW01-1220	Aqueous	PFOA	PFAS by ID	4.1		ng/L	11
006	FFS-MW01-1220	Aqueous	PFPeA	PFAS by ID	5.2		ng/L	11
006	FFS-MW01-1220	Aqueous	PFOS	PFAS by ID	14		ng/L	11
007	T-1-1220	Aqueous	PFBA	PFAS by ID	2.4	J	ng/L	12
008	JAW-60-1220	Aqueous	PFBS	PFAS by ID	94		ng/L	13



## Detection Summary (Continued)

Lot Number: VL11001

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
008	JAW-60-1220	Aqueous	PFHxS	PFAS by ID	1500		ng/L	13
008	JAW-60-1220	Aqueous	PFBA	PFAS by ID	20		ng/L	13
008	JAW-60-1220	Aqueous	PFHpA	PFAS by ID	11		ng/L	13
008	JAW-60-1220	Aqueous	PFHxA	PFAS by ID	99		ng/L	13
008	JAW-60-1220	Aqueous	PFOA	PFAS by ID	25		ng/L	13
008	JAW-60-1220	Aqueous	PFPeA	PFAS by ID	15		ng/L	13
008	JAW-60-1220	Aqueous	PFOS	PFAS by ID	270		ng/L	13
009	ET-3-1220	Aqueous	6:2 FTS	PFAS by ID	6.3	JQ	ng/L	14
009	ET-3-1220	Aqueous	PFHxS	PFAS by ID	12		ng/L	14
009	ET-3-1220	Aqueous	PFBA	PFAS by ID	380	Q	ng/L	14
009	ET-3-1220	Aqueous	PFHpA	PFAS by ID	26		ng/L	14
009	ET-3-1220	Aqueous	PFHxA	PFAS by ID	65		ng/L	14
009	ET-3-1220	Aqueous	PFOA	PFAS by ID	110		ng/L	14
009	ET-3-1220	Aqueous	PFPeA	PFAS by ID	80	Q	ng/L	14
009	ET-3-1220	Aqueous	PFOS	PFAS by ID	9.8		ng/L	14
010	FD02-1220	Aqueous	6:2 FTS	PFAS by ID	5.5	JQ	ng/L	15
010	FD02-1220	Aqueous	EtFOSAA	PFAS by ID	2.9	J	ng/L	15
010	FD02-1220	Aqueous	PFBS	PFAS by ID	26		ng/L	15
010	FD02-1220	Aqueous	PFHxS	PFAS by ID	14		ng/L	15
010	FD02-1220	Aqueous	PFBA	PFAS by ID	390	Q	ng/L	15
010	FD02-1220	Aqueous	PFHpA	PFAS by ID	27	Q	ng/L	15
010	FD02-1220	Aqueous	PFHxA	PFAS by ID	86	Q	ng/L	15
010	FD02-1220	Aqueous	PFNA	PFAS by ID	1.0	J	ng/L	15
010	FD02-1220	Aqueous	PFOA	PFAS by ID	110		ng/L	15
010	FD02-1220	Aqueous	PFPeA	PFAS by ID	84	Q	ng/L	15
010	FD02-1220	Aqueous	PFTeDA	PFAS by ID	0.91	J	ng/L	15
010	FD02-1220	Aqueous	PFOS	PFAS by ID	9.1		ng/L	15

(70 detections)

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-001</b>
Description: <b>G-5-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1220</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1101	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>4.9</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>9.4</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		111	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		91	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		95	50-150
13C8_PFOS		90	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-002</b>
Description: <b>FFS-MW03-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1315</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1122	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>140</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>45</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>34</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>1.7</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>5.9</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		112	50-150
13C2_8:2FTS		114	50-150
13C2_PFDaA		100	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		92	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		99	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		102	50-150
13C8_PFOs		91	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-003</b>
Description: <b>FFS-MW02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1420</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1143	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>7.5</b>	<b>3.8</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>680</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>54</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>28</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>190</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		82	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-004</b>
Description: <b>FD01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1154	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>720</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>55</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>200</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		93	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		89	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBa		101	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		95	50-150
13C6_PFDa		99	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		93	50-150
13C8_PFOs		88	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-005</b>
Description: <b>C-00-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1435</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1205	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>7.3</b>		<b>7.2</b>	<b>3.6</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanefluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>1.9</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		107	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		116	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		100	50-150
13C8_PFOS		82	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-006</b>
Description: <b>FFS-MW01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1600</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1059	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>	<b>Q</b>	<b>7.3</b>	<b>3.7</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>8.3</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>39</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefulfonic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>4.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>5.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	180	50-150
13C2_8:2FTS		121	50-150
13C2_PFDaA		102	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		111	50-150
13C8_PFOS		93	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-007</b>
Description: <b>T-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1615</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1110	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		108	50-150
13C2_8:2FTS		96	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		113	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		95	50-150
13C8_PFOS		99	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-008</b>
Description: <b>JAW-60-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1035</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1120	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1055	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1500</b>		<b>18</b>	<b>9.0</b>	<b>4.5</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>20</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>11</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>25</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTriDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>270</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_6:2FTS		115	50-150		105	50-150
13C2_8:2FTS		108	50-150		95	50-150
13C2_PFDaA		90	50-150		94	50-150
13C2_PFTeDA		88	50-150		96	50-150
13C3_PFBs		92	50-150		102	50-150
13C3_PFHxS		93	50-150		92	50-150
13C3-HFPO-DA		94	50-150		96	50-150
13C4_PFBa		97	50-150		109	50-150
13C4_PFHpA		93	50-150		97	50-150
13C5_PFHxA		99	50-150		99	50-150
13C5_PFPeA		98	50-150		100	50-150
13C6_PFDa		99	50-150		93	50-150
13C7_PFUdA		94	50-150		94	50-150
13C8_PFOA		89	50-150		98	50-150
13C8_PFOs		99	50-150		101	50-150
13C9_PFNa		100	50-150		94	50-150
d5-EtFOSAA		96	50-150		94	50-150
d3-MeFOSAA		102	50-150		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-009</b>
Description: <b>ET-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1106	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>6.3</b>	<b>JQ</b>	<b>6.9</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanefluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>12</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>380</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>65</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>80</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.8</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	382	50-150
13C2_8:2FTS	N	301	50-150
13C2_PFDaA		113	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		62	50-150
13C3_PFHxS		66	50-150
13C3-HFPO-DA	N	41	50-150
13C4_PFBA	N	9.6	50-150
13C4_PFHpA		52	50-150
13C5_PFHxA		53	50-150
13C5_PFPeA	N	22	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		74	50-150
13C8_PFOS		82	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		127	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-010</b>
Description: <b>FD02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1141	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>5.5</b>	<b>JQ</b>	<b>6.8</b>	3.4	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)</b>	<b>2991-50-6</b>	<b>PFAS by ID SOP</b>	<b>2.9</b>	<b>J</b>	<b>6.8</b>	3.4	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>390</b>	<b>Q</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>27</b>	<b>Q</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>86</b>	<b>Q</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-nonanoic acid (PFNA)</b>	<b>375-95-1</b>	<b>PFAS by ID SOP</b>	<b>1.0</b>	<b>J</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>84</b>	<b>Q</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-tetradecanoic acid (PFTeDA)</b>	<b>376-06-7</b>	<b>PFAS by ID SOP</b>	<b>0.91</b>	<b>J</b>	<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.4</b>	1.7	<b>0.85</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	327	50-150
13C2_8:2FTS	N	295	50-150
13C2_PFDaA		104	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		62	50-150
13C3_PFHxS		65	50-150
13C3-HFPO-DA	N	39	50-150
13C4_PFBA	N	9.6	50-150
13C4_PFHpA	N	46	50-150
13C5_PFHxA	N	47	50-150
13C5_PFPeA	N	21	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		64	50-150
13C8_PFOS		79	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		112	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-011</b>
Description: <b>EB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1152	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanefluoro sulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanefluoro sulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		86	50-150
13C2_PFDaA		85	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		91	50-150
13C8_PFOS		87	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-012</b>
Description: <b>EB02-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1510</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1203	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro-1-sulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanefluoro-1-sulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		89	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-013</b>
Description: <b>TB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1213	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro sulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanefluoro sulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		103	50-150
13C2_8:2FTS		89	50-150
13C2_PFDaA		91	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		94	50-150
13C8_PFOS		96	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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## QC Summary



# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		80	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		81	50-150
13C8_PFOS		86	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		79	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	18		1	121	70-150	12/23/2020 1256
11CI-PF3OUdS	15	18		1	118	70-150	12/23/2020 1256
8:2 FTS	15	21		1	135	67-138	12/23/2020 1256
6:2 FTS	15	16		1	108	64-140	12/23/2020 1256
GenX	32	35		1	108	70-150	12/23/2020 1256
ADONA	15	17		1	116	70-150	12/23/2020 1256
EtFOSAA	16	17		1	106	61-135	12/23/2020 1256
MeFOSAA	16	19		1	121	65-136	12/23/2020 1256
PFBS	14	17		1	119	72-130	12/23/2020 1256
PFHxS	15	17		1	119	68-131	12/23/2020 1256
PFBA	16	19		1	116	73-129	12/23/2020 1256
PFDA	16	19		1	117	71-129	12/23/2020 1256
PFDoA	16	17		1	109	72-134	12/23/2020 1256
PFHpA	16	18		1	116	72-130	12/23/2020 1256
PFHxA	16	18		1	110	72-129	12/23/2020 1256
PFNA	16	18		1	114	69-130	12/23/2020 1256
PFOA	16	18		1	113	71-133	12/23/2020 1256
PFPeA	16	19		1	119	72-129	12/23/2020 1256
PFTeDA	16	20		1	123	71-132	12/23/2020 1256
PFTrDA	16	18		1	113	65-144	12/23/2020 1256
PFUdA	16	19		1	118	69-133	12/23/2020 1256
PFOS	15	18		1	123	65-140	12/23/2020 1256

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		79	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		84	50-150
13C8_PFOS		77	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		75	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	13	11		1	87	70-150	12/27/2020 1112
11CI-PF3OUdS	ND	13	12		1	88	70-150	12/27/2020 1112
8:2 FTS	ND	13	12		1	86	67-138	12/27/2020 1112
6:2 FTS	ND	13	13		1	96	64-140	12/27/2020 1112
GenX	ND	28	25		1	90	70-150	12/27/2020 1112
ADONA	ND	13	14		1	105	70-150	12/27/2020 1112
EtFOSAA	ND	14	13		1	92	61-135	12/27/2020 1112
MeFOSAA	ND	14	15		1	104	65-136	12/27/2020 1112
PFBS	4.9	12	16		1	93	72-130	12/27/2020 1112
PFHxS	1.8	13	15		1	102	68-131	12/27/2020 1112
PFBA	9.4	14	23		1	94	73-129	12/27/2020 1112
PFDA	ND	14	15		1	107	71-129	12/27/2020 1112
PFDoA	ND	14	14		1	97	72-134	12/27/2020 1112
PFHpA	ND	14	14		1	99	72-130	12/27/2020 1112
PFHxA	ND	14	14		1	98	72-129	12/27/2020 1112
PFNA	ND	14	13		1	96	69-130	12/27/2020 1112
PFOA	ND	14	15		1	105	71-133	12/27/2020 1112
PFPeA	ND	14	15		1	106	72-129	12/27/2020 1112
PFTeDA	ND	14	14		1	97	71-132	12/27/2020 1112
PFTrDA	ND	14	13		1	95	65-144	12/27/2020 1112
PFUdA	ND	14	14		1	97	69-133	12/27/2020 1112
PFOS	ND	13	13		1	96	65-140	12/27/2020 1112

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		85	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	ND		1	0.00	20	12/27/2020 1133
11CI-PF3OUdS	ND	ND		1	0.00	20	12/27/2020 1133
8:2 FTS	ND	ND		1	0.00	20	12/27/2020 1133
6:2 FTS	140	110	+	1	24	20	12/27/2020 1133
GenX	ND	ND		1	0.00	20	12/27/2020 1133
ADONA	ND	ND		1	0.00	20	12/27/2020 1133
EtFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
MeFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
PFBS	15	20	+	1	26	20	12/27/2020 1133
PFHxS	45	57	+	1	22	20	12/27/2020 1133
PFBA	34	30		1	11	20	12/27/2020 1133
PFDA	ND	ND		1	0.00	20	12/27/2020 1133
PFDoA	ND	ND		1	0.00	20	12/27/2020 1133
PFHpA	1.4	1.2	J	1	9.7	20	12/27/2020 1133
PFHxA	1.7	1.4	J	1	14	20	12/27/2020 1133
PFNA	ND	ND		1	0.00	20	12/27/2020 1133
PFOA	1.8	1.6	J	1	13	20	12/27/2020 1133
PFPeA	1.6	1.6	J	1	2.5	20	12/27/2020 1133
PFTeDA	ND	ND		1	0.00	20	12/27/2020 1133
PFTrDA	ND	ND		1	0.00	20	12/27/2020 1133
PFUdA	ND	ND		1	0.00	20	12/27/2020 1133
PFOS	5.9	8.2	+	1	34	20	12/27/2020 1133

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		108	50-150
13C2_8:2FTS		114	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBa		105	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		99	50-150
13C6_PFDa		103	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		102	50-150
13C8_PFOs		91	50-150
13C9_PFNa		99	50-150
d5-EtFOSAA		101	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDoA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		86	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		90	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		86	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		83	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and > DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

**Chain of Custody  
and  
Miscellaneous Documents**

# PACE ANALYTICAL SERVICES, LLC



**PACE ANALYTICAL SERVICES, LLC**  
 106 Vantage Point Drive • West Columbia, SC 29172  
 Telephone No. 803-791-9700 Fax No. 803-791-9111  
 www.pacelabs.com

**Number** 114706

Client: **CH2M / Jacobs**  
 Address: **59 Lilac Ct.**  
 City: **Pagosa Springs** State: **CO** Zip Code: **81147**  
 Project Name: **IAAAP PFAS**  
 Report to Contact: **Doug Scott**  
 Sampler's Signature: *[Signature]*  
 Project Name: **David Kortjohn & Joe Spies**  
 Project No.: **679172CH.01.11.FW** P.O. No.: **148019968**  
 Sample ID / Description: **G-5-1220** Collection Date (Priority): **12/7/20**  
 (Conditions for each sample may be contained on one line)

Sample ID / Description	Collection Date (Priority)	Matrix	No. of Contaminants by Parameter Type						Analysis (Attach list if more space is needed)
			Asbestos	Lead	Cd	Cr	PCB	PAH	
G-5-1220	12/7/20	G							Analysis: (Attach list if more space is needed) Asbestos Lead Cd Cr PCB PAH VL11001 CED
FFS-MW03-1220	12/7/20	G							
FFS-MW02-1220	12/7/20	G							
FD01-1220	12/7/20	G							
C-00-3-1220	12/7/20	G							
FFS-MW01-1220	12/7/20	G							
T-1-1220	12/7/20	G							
Ⓢ JAW JAW-60-1220	12/8/20	G							
ET-3-1220	12/8/20	G							
FD02-1220	12/8/20	G							

Turn Around Time Required (Plan and approval required for expedited TAT):  
 Standard  Rush (Specify)

1. Requisitioned by: **J. Spies** Date: **12-8-20** Time: **1600**  
 2. Requisitioned by: **Joe Spies** Date: **12-8-20** Time: **1600**  
 3. Requisitioned by: **FedEx** Date: **12-8-20** Time: **1600**  
 4. Requisitioned by: **FedEx** Date: **12-8-20** Time: **1600**

Disposal by Lab:  Return to Client  Destroyed by Lab  
 Possible Hazard Identification:  Non-Hazard  Flammable  Sub Irritant  Poison  Unknown

1. Received by: **FedEx** 772292863972  
 2. Requisitioned by: **[Signature]**  
 3. Requisitioned by: **[Signature]**  
 4. Laboratory: **[Signature]**

LAB USE ONLY  
 Received on ice (Circle) Yes  No  Ion Peak Receipt Temp. **2.0** °C

Client: **CH2M / Jacobs** Address: **59 Lilac Ct.** City: **Pagosa Springs** State: **CO** Zip Code: **81147**  
 Project Name: **IAAAP PFAS** Report to Contact: **Doug Scott** Sampler's Signature: *[Signature]*  
 Project Name: **David Kortjohn & Joe Spies** Project No.: **679172CH.01.11.FW** P.O. No.: **148019968**  
 Sample ID / Description: **G-5-1220** Collection Date (Priority): **12/7/20**  
 (Conditions for each sample may be contained on one line)



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 www.pacelabs.com

**Number** 14708

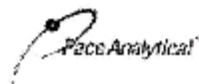
Client: CH2M/Jacobs		Report to: Contact: Doug Scott		Telephone No./E-mail: 1-(720)-445-2278 Doug.Scott@jacobs.com		Quote No.
Address: 59 Lilac Ct.		Sampler's Signature: <i>[Signature]</i>		Analysis: (Align if more space is needed)		Page 2 of 2
City: Pagosa Springs CO 81147		Printed Name: David Koetjahn & Joe Spies		Lot # Bar Code: VL11001		
Project Name: TANAP PFAS		Project No: 679172CH.011.FW		CSO		
Sample ID / Description: (Containers for each sample may be combined on one line.)		PO No: 148019768	Matrix:	Possible Hazard Identification		
EB01-120820	Collection Date: 12/8/20	Collection Time: 1425	GC	<input type="checkbox"/> Min Hazard	<input type="checkbox"/> Flammable	<input checked="" type="checkbox"/> Poison
EB02-120820	Collection Date: 12/8/20	Collection Time: 1510	GC	1. Received by Fed Ex 77292863972		
TB01-120820	Collection Date: 12/8/20	Collection Time: —	X	2. Received by		
				3. Received by		
				4. Laboratory: <i>[Signature]</i>		
Sample Disposal by Lab:			LAB USE ONLY			
<input type="checkbox"/> Return to Client			Received on: (Check) Yes No Ice Pack Residual Temp. °C			
Date: 12-8-20			Temp: 1600			
Date: 12-8-20			Date: 12-8-20			
Date: 12-8-20			Date: 12-8-20			
Date: 12-8-20			Date: 12-8-20			

**DISTRIBUTION:** WHITE & YELLOW Return to Laboratory with Sample(s); PINK Field/Client Copy

Document Number: MEG0018-D1



# PACE ANALYTICAL SERVICES, LLC



**Samples Receipt Checklist (SRC) (ME0018C-15)**  
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020  
Page 1 of 1

## Sample Receipt Checklist (SRC)

Client: CH2M Cooler Inspected by/date: KPB / 12/11/20 Lot #: VL11001

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt <u>2.0 / 2.0 °C / 1 / 1 °C / 1 / 1 °C / 1 / 1 °C</u>	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>5</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: <u>phone / email / face-to-face</u> (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	14. Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (1/4" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH <sub>3</sub> /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote #
<b>Sample Preservation</b> (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # <u>NA</u> .	
Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Sample(s) <u>NA</u> were received with TRC > 0.5 mg/L (If #19 is <u>no</u> ) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy ID: <u>NA</u> .	
SR barcode labels applied by: <u>KPB</u> Date: <u>12/11/20</u>	

Comments:

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Document No: ME0018C-01

Orig./Corrected temp. upon receipt:  
3.1 / 3.1 °C

Analyst Initials: KPB

Document Revised: 02/28/2020

# PFAS

# QC SUMMARY

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-001</b>
Description: <b>G-5-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1220</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1101	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>4.9</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>9.4</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		111	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		91	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		95	50-150
13C8_PFOS		90	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-002</b>
Description: <b>FFS-MW03-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1315</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1122	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>140</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>45</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>34</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>1.7</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>5.9</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		112	50-150
13C2_8:2FTS		114	50-150
13C2_PFDaA		100	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		92	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		99	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		102	50-150
13C8_PFOs		91	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-003</b>
Description: <b>FFS-MW02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1420</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1143	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>7.5</b>	<b>3.8</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>680</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>54</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>28</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>190</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		82	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-004</b>
Description: <b>FD01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1154	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>720</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>55</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>200</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		93	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		89	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBa		101	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		95	50-150
13C6_PFDa		99	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		93	50-150
13C8_PFOs		88	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-005</b>
Description: <b>C-00-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1435</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1205	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>7.3</b>		<b>7.2</b>	<b>3.6</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>1.9</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		107	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		116	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		100	50-150
13C8_PFOS		82	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-006</b>
Description: <b>FFS-MW01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1600</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1059	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>	<b>Q</b>	<b>7.3</b>	<b>3.7</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>8.3</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>39</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>4.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>5.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	180	50-150
13C2_8:2FTS		121	50-150
13C2_PFDaA		102	50-150
13C2_PFTeDA		90	50-150
13C3_PFBs		100	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBa		104	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		103	50-150
13C6_PFDa		101	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		111	50-150
13C8_PFOs		93	50-150
13C9_PFNa		101	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-007</b>
Description: <b>T-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1615</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1110	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanefluoro acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		108	50-150
13C2_8:2FTS		96	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBs		99	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBa		113	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		106	50-150
13C6_PFDa		94	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		95	50-150
13C8_PFOs		99	50-150
13C9_PFNa		93	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-008</b>
Description: <b>JAW-60-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1035</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1120	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1055	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1500</b>		<b>18</b>	<b>9.0</b>	<b>4.5</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>20</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>11</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>25</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>270</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_6:2FTS		115	50-150		105	50-150
13C2_8:2FTS		108	50-150		95	50-150
13C2_PFDaA		90	50-150		94	50-150
13C2_PFTeDA		88	50-150		96	50-150
13C3_PFBFS		92	50-150		102	50-150
13C3_PFHxS		93	50-150		92	50-150
13C3-HFPO-DA		94	50-150		96	50-150
13C4_PFBFA		97	50-150		109	50-150
13C4_PFHpA		93	50-150		97	50-150
13C5_PFHxA		99	50-150		99	50-150
13C5_PFPeA		98	50-150		100	50-150
13C6_PFDA		99	50-150		93	50-150
13C7_PFUdA		94	50-150		94	50-150
13C8_PFOA		89	50-150		98	50-150
13C8_PFOS		99	50-150		101	50-150
13C9_PFNA		100	50-150		94	50-150
d5-EtFOSAA		96	50-150		94	50-150
d3-MeFOSAA		102	50-150		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-009</b>
Description: <b>ET-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1106	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>6.3</b>	<b>JQ</b>	<b>6.9</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanefluoro-1-sulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>12</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>380</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>65</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>80</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.8</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	382	50-150
13C2_8:2FTS	N	301	50-150
13C2_PFDaA		113	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		62	50-150
13C3_PFHxS		66	50-150
13C3-HFPO-DA	N	41	50-150
13C4_PFBa	N	9.6	50-150
13C4_PFHpA		52	50-150
13C5_PFHxA		53	50-150
13C5_PFPeA	N	22	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		74	50-150
13C8_PFOs		82	50-150
13C9_PFNa		89	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		127	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-010</b>
Description: <b>FD02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1141	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>5.5</b>	<b>JQ</b>	<b>6.8</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)</b>	<b>2991-50-6</b>	<b>PFAS by ID SOP</b>	<b>2.9</b>	<b>J</b>	<b>6.8</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>390</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>27</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>86</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-nonanoic acid (PFNA)</b>	<b>375-95-1</b>	<b>PFAS by ID SOP</b>	<b>1.0</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>84</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-tetradecanoic acid (PFTeDA)</b>	<b>376-06-7</b>	<b>PFAS by ID SOP</b>	<b>0.91</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	327	50-150
13C2_8:2FTS	N	295	50-150
13C2_PFDaA		104	50-150
13C2_PFTeDA		77	50-150
13C3_PFBs		62	50-150
13C3_PFHxS		65	50-150
13C3-HFPO-DA	N	39	50-150
13C4_PFBa	N	9.6	50-150
13C4_PFHpA	N	46	50-150
13C5_PFHxA	N	47	50-150
13C5_PFPeA	N	21	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		64	50-150
13C8_PFOs		79	50-150
13C9_PFNa		83	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		112	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-011</b>
Description: <b>EB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1152	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanefluoro acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanefluoro acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		86	50-150
13C2_PFDaA		85	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		91	50-150
13C8_PFOS		87	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-012</b>
Description: <b>EB02-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1510</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1203	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanefluoro acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		89	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-013</b>
Description: <b>TB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1213	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanefluoro-1-octanesulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		103	50-150
13C2_8:2FTS		89	50-150
13C2_PFDaA		91	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		94	50-150
13C8_PFOS		96	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		81	50-150
13C8_PFOS		86	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		79	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



## PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	18		1	121	70-150	12/23/2020 1256
11CI-PF3OUdS	15	18		1	118	70-150	12/23/2020 1256
8:2 FTS	15	21		1	135	67-138	12/23/2020 1256
6:2 FTS	15	16		1	108	64-140	12/23/2020 1256
GenX	32	35		1	108	70-150	12/23/2020 1256
ADONA	15	17		1	116	70-150	12/23/2020 1256
EtFOSAA	16	17		1	106	61-135	12/23/2020 1256
MeFOSAA	16	19		1	121	65-136	12/23/2020 1256
PFBS	14	17		1	119	72-130	12/23/2020 1256
PFHxS	15	17		1	119	68-131	12/23/2020 1256
PFBA	16	19		1	116	73-129	12/23/2020 1256
PFDA	16	19		1	117	71-129	12/23/2020 1256
PFDaA	16	17		1	109	72-134	12/23/2020 1256
PFHpA	16	18		1	116	72-130	12/23/2020 1256
PFHxA	16	18		1	110	72-129	12/23/2020 1256
PFNA	16	18		1	114	69-130	12/23/2020 1256
PFOA	16	18		1	113	71-133	12/23/2020 1256
PFPeA	16	19		1	119	72-129	12/23/2020 1256
PFTeDA	16	20		1	123	71-132	12/23/2020 1256
PFTrDA	16	18		1	113	65-144	12/23/2020 1256
PFUdA	16	19		1	118	69-133	12/23/2020 1256
PFOS	15	18		1	123	65-140	12/23/2020 1256

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		79	50-150
13C2_8:2FTS		78	50-150
13C2_PFDaA		80	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		84	50-150
13C8_PFOS		77	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		75	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDaA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		85	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		86	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBa		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		90	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		86	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		83	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	13	11		1	87	70-150	12/27/2020 1112
11CI-PF3OUdS	ND	13	12		1	88	70-150	12/27/2020 1112
8:2 FTS	ND	13	12		1	86	67-138	12/27/2020 1112
6:2 FTS	ND	13	13		1	96	64-140	12/27/2020 1112
GenX	ND	28	25		1	90	70-150	12/27/2020 1112
ADONA	ND	13	14		1	105	70-150	12/27/2020 1112
EtFOSAA	ND	14	13		1	92	61-135	12/27/2020 1112
MeFOSAA	ND	14	15		1	104	65-136	12/27/2020 1112
PFBS	4.9	12	16		1	93	72-130	12/27/2020 1112
PFHxS	1.8	13	15		1	102	68-131	12/27/2020 1112
PFBA	9.4	14	23		1	94	73-129	12/27/2020 1112
PFDA	ND	14	15		1	107	71-129	12/27/2020 1112
PFDoA	ND	14	14		1	97	72-134	12/27/2020 1112
PFHpA	ND	14	14		1	99	72-130	12/27/2020 1112
PFHxA	ND	14	14		1	98	72-129	12/27/2020 1112
PFNA	ND	14	13		1	96	69-130	12/27/2020 1112
PFOA	ND	14	15		1	105	71-133	12/27/2020 1112
PFPeA	ND	14	15		1	106	72-129	12/27/2020 1112
PFTeDA	ND	14	14		1	97	71-132	12/27/2020 1112
PFTrDA	ND	14	13		1	95	65-144	12/27/2020 1112
PFUdA	ND	14	14		1	97	69-133	12/27/2020 1112
PFOS	ND	13	13		1	96	65-140	12/27/2020 1112

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		85	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		81	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBa		99	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		92	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	ND		1	0.00	20	12/27/2020 1133
11CI-PF3OUdS	ND	ND		1	0.00	20	12/27/2020 1133
8:2 FTS	ND	ND		1	0.00	20	12/27/2020 1133
6:2 FTS	140	110	+	1	24	20	12/27/2020 1133
GenX	ND	ND		1	0.00	20	12/27/2020 1133
ADONA	ND	ND		1	0.00	20	12/27/2020 1133
EtFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
MeFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
PFBS	15	20	+	1	26	20	12/27/2020 1133
PFHxS	45	57	+	1	22	20	12/27/2020 1133
PFBA	34	30		1	11	20	12/27/2020 1133
PFDA	ND	ND		1	0.00	20	12/27/2020 1133
PFDoA	ND	ND		1	0.00	20	12/27/2020 1133
PFHpA	1.4	1.2	J	1	9.7	20	12/27/2020 1133
PFHxA	1.7	1.4	J	1	14	20	12/27/2020 1133
PFNA	ND	ND		1	0.00	20	12/27/2020 1133
PFOA	1.8	1.6	J	1	13	20	12/27/2020 1133
PFPeA	1.6	1.6	J	1	2.5	20	12/27/2020 1133
PFTeDA	ND	ND		1	0.00	20	12/27/2020 1133
PFTrDA	ND	ND		1	0.00	20	12/27/2020 1133
PFUdA	ND	ND		1	0.00	20	12/27/2020 1133
PFOS	5.9	8.2	+	1	34	20	12/27/2020 1133

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		108	50-150
13C2_8:2FTS		114	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		102	50-150
13C8_PFOS		91	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		101	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11001

Project No.: 679172CH.01.

AnalyticalMethod: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
G-5-1220	92	111	93	79	91	91	103	105	96
FFS-MW03-1220	112	114	100	85	92	93	101	102	101
FFS-MW02-1220	98	103	93	79	87	86	97	98	92
FD01-1220	93	103	94	78	89	89	97	101	96
C-00-3-1220	89	107	94	85	97	94	104	116	101
FFS-MW01-1220	180 *	121	102	90	100	104	97	104	101
T-1-1220	108	96	90	83	99	93	103	113	97
JAW-60-1220	115	108	90	88	92	93	94	97	93
JAW-60-1220	105	95	94	96	102	92	96	109	97
ET-3-1220	382 *	301 *	113	87	62	66	41 *	9.6 *	52
FD02-1220	327 *	295 *	104	77	62	65	39 *	9.6 *	46 *
EB01-120820	98	86	85	81	89	92	96	98	93
EB02-120820	97	80	90	78	88	91	94	95	86
TB01-120820	103	89	91	82	93	95	98	98	95
VQ77367-001	87	94	84	87	80	73	91	84	84
VQ77367-002	79	78	80	83	82	75	85	81	79
G-5-1220MS	85	107	91	81	90	82	100	99	92
FFS-MW03-1220DUP	108	114	103	86	93	92	102	105	100
VQ77741-001	99	87	94	92	90	88	102	96	94
VQ77741-002	87	85	90	87	86	90	90	90	89

QC LIMITS

IDS1 = 13C2_6:2FTS	50-150
IDS2 = 13C2_8:2FTS	50-150
IDS3 = 13C2_PFD <sub>o</sub> A	50-150
IDS4 = 13C2_PFTeDA	50-150
IDS5 = 13C3_PFBs	50-150
IDS6 = 13C3_PFHxS	50-150
IDS7 = 13C3-HFPO-DA	50-150
IDS8 = 13C4_PFBa	50-150
IDS9 = 13C4_PFHpA	50-150

\* Recoveries outside QC limits  
D IDS Diluted Out

FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11001

Project No.: 679172CH.01.

AnalyticalMethod: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
G-5-1220	98	101	96	87	95	90	92	96	
FFS-MW03-1220	97	99	100	90	102	91	94	100	
FFS-MW02-1220	95	94	96	84	92	82	90	91	
FD01-1220	92	95	99	94	93	88	94	94	
C-00-3-1220	104	100	100	89	100	82	94	94	
FFS-MW01-1220	106	103	101	102	111	93	101	98	
T-1-1220	100	106	94	85	95	99	93	94	
JAW-60-1220	99	98	99	94	89	99	100	96	
JAW-60-1220	99	100	93	94	98	101	94	94	
ET-3-1220	53	22 *	92	105	74	82	89	112	
FD02-1220	47 *	21 *	91	97	64	79	83	101	
EB01-120820	94	96	94	94	91	87	95	87	
EB02-120820	92	92	89	88	89	82	88	87	
TB01-120820	95	96	92	95	94	96	94	89	
VQ77367-001	85	86	87	85	81	86	89	79	
VQ77367-002	83	80	81	78	84	77	81	75	
G-5-1220MS	94	92	91	83	93	88	89	91	
FFS-MW03-1220DUP	101	99	103	89	102	91	99	101	
VQ77741-001	95	99	100	92	93	85	97	91	
VQ77741-002	90	90	92	85	86	82	88	83	

QC LIMITS

IDS10 = 13C5_PFHxA	50-150
IDS11 = 13C5_PFPeA	50-150
IDS12 = 13C6_PFDA	50-150
IDS13 = 13C7_PFUdA	50-150
IDS14 = 13C8_PFOA	50-150
IDS15 = 13C8_PFOS	50-150
IDS16 = 13C9_PFNA	50-150
IDS17 = d5-EtFOSAA	50-150

\* Recoveries outside QC limits

D IDS Diluted Out

FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11001

Project No.: 679172CH.01.

Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS18								TOT OUT
G-5-1220	108								0
FFS-MW03-1220	105								0
FFS-MW02-1220	98								0
FD01-1220	101								0
C-00-3-1220	105								0
FFS-MW01-1220	103								1
T-1-1220	93								0
JAW-60-1220	102								0
JAW-60-1220	101								0
ET-3-1220	127								5
FD02-1220	112								7
EB01-120820	92								0
EB02-120820	88								0
TB01-120820	95								0
VQ77367-001	89								0
VQ77367-002	84								0
G-5-1220MS	98								0
FFS-MW03-1220DUP	110								0
VQ77741-001	97								0
VQ77741-002	86								0

QC LIMITS  
50-150

IDS18 = d3-MeFOSAA

\* Recoveries outside QC limits  
D IDS Diluted Out

FORM 3  
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11001

Project No.: 679172CH.01.

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): G-5-1220

Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2 Lab Sample ID: VL11001-001MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC #	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	13		11	87	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS)	13		12	88	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	13		12	86	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	13		13	96	64-140
Hexafluoropropylene oxide dimer acid (GenX)	28		25	90	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	13		14	105	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EFOSAA)	14		13	92	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	14		15	104	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	12	4.9	16	93	72-130
Perfluorohexanesulfonic acid (PFHxS)	13	1.8	15	102	68-131
Perfluoro-n-butanoic acid (PFBA)	14	9.4	23	94	73-129
Perfluoro-n-decanoic acid (PFDA)	14		15	107	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	14		14	97	72-134
Perfluoro-n-heptanoic acid (PFHpA)	14		14	99	72-130
Perfluoro-n-hexanoic acid (PFHxA)	14		14	98	72-129
Perfluoro-n-nonanoic acid (PFNA)	14		13	96	69-130
Perfluoro-n-octanoic acid (PFOA)	14		15	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	14		15	106	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	14		14	97	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	14		13	95	65-144
Perfluoro-n-undecanoic acid (PFUDA)	14		14	97	69-133
Perfluorooctanesulfonic acid (PFOS)	13		13	96	65-140

\* Values outside of QC Limits

FORM 3  
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11001  
 Project No.: 679172CH.01.  
 Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water  
 Client Sample ID: VQ77367-002 Lab Sample ID: VQ77367-002  
 Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2  
 Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PE30MS)	15	18	118	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	21	135	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	16	108	64-140
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	116	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PE30NS)	15	18	121	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	35	108	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	17	106	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	19	121	65-136
Perfluoro-1-butanefluoric acid (PFBS)	14	17	119	72-130
Perfluoro-n-butanoic acid (PFBA)	16	19	116	73-129
Perfluoro-n-decanoic acid (PFDA)	16	19	117	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	17	109	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	18	116	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	18	110	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	18	114	69-130
Perfluoro-n-octanoic acid (PFOA)	16	18	113	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	19	119	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	20	123	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	18	113	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	19	118	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	17	119	68-131
Perfluorooctanesulfonic acid (PFOS)	15	18	123	65-140

\* Values outside of QC Limits



FORM 3  
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11001  
 Project No.: 679172CH.01.  
 Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water  
 Client Sample ID: VQ77741-002 Lab Sample ID: VQ77741-002  
 Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2  
 Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PE30MS)	15	16	106	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	15	100	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	16	109	64-140
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	15	101	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PE30NS)	15	16	106	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	31	96	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	16	98	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	16	99	65-136
Perfluoro-1-butanefluoric acid (PFBS)	14	13	94	72-130
Perfluoro-n-butanoic acid (PFBA)	16	16	99	73-129
Perfluoro-n-decanoic acid (PFDA)	16	16	100	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	15	94	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	15	93	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	15	95	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	16	99	69-130
Perfluoro-n-octanoic acid (PFOA)	16	16	99	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	15	95	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	102	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	15	95	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	16	97	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	14	95	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	103	65-140

\* Values outside of QC Limits

FORM 4  
METHOD BLANK SUMMARY

CLIENT SAMPLE ID

VQ77367-001

Lab Name: <u>Shealy Environmental Services, Inc.</u> Project No.: <u>679172CH.01.</u> Analytical Method: <u>PFAS by ID SOP QSM B-15</u> Instrument ID: <u>Sciex_5060884 (QTRAP 4500)_LCMSMS2</u> Extraction Type: <u>SOP SPE</u> LC Column: <u>Gemini C18</u> ID: <u>2.00</u> (mm)	Lot No.: <u>VL11001</u> Lab Sample ID: <u>VQ77367-001</u> Matrix: <u>Water</u> Lab File ID: _____ Date Extracted: <u>12/22/2020</u> Date Analyzed: <u>12/23/2020</u> Time Analyzed: <u>12:45</u>
---	--

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
G-5-1220	VL11001-001		11:01
FFS-MW03-1220	VL11001-002		11:22
FFS-MW02-1220	VL11001-003		11:43
FD01-1220	VL11001-004		11:54
C-00-3-1220	VL11001-005		12:05
VQ77367-002	VQ77367-002		12:56
G-5-1220MS	VL11001-001MS		11:12
FFS-MW03-1220DUP	VL11001-002DU		11:33

FORM 4  
METHOD BLANK SUMMARY

CLIENT SAMPLE ID

VQ77741-001
-------------

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11001

Project No.: 679172CH.01.

Lab Sample ID: VQ77741-001

Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Water

Instrument ID: Sciex\_5060884 (QTRAP 4500) LCMSMS2

Lab File ID: \_\_\_\_\_

Extraction Type: SOP SPE

Date Extracted: 12/27/2020

LC Column: Gemini C18 ID: 2.00 (mm)

Date Analyzed: 12/28/2020

Time Analyzed: 10:38

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
FFS-MW01-1220	VL11001-006		10:59
T-1-1220	VL11001-007		11:10
JAW-60-1220	VL11001-008		11:20
JAW-60-1220	VL11001-008		10:55
ET-3-1220	VL11001-009		11:06
FD02-1220	VL11001-010		11:41
EB01-120820	VL11001-011		11:52
EB02-120820	VL11001-012		12:03
TB01-120820	VL11001-013		12:13
VQ77741-002	VQ77741-002		10:48

# RAW SAMPLE DATA

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-001</b>
Description: <b>G-5-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1220</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1101	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>4.9</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>9.4</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		111	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		91	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		95	50-150
13C8_PFOS		90	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720009.d  
 Injection Date: 27-Dec-2020 11:01:32 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 2  
 Lab Sample ID: VL11001-001 Lab Prep. Batch: 77367  
 Client ID: G-5-1220 Sample Group: VL11001  
 Sample Info: VL11001-001 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0372509$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	295	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.696 1.698 0 667337 22 >100:1 1001.00 962.20 105

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.696 1.698 0/0 168090 22 62:1 253.15 9.4300

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.072 2.077 0 663719 16 >100:1 1001.00 964.87 101

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 ND ND 1001.00 964.87 101 U

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.125 2.130 0 216960 17 >100:1 1001.00 942.36 90.5

**7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.136 2.130 1/1 33469 16 80:1 Target = 3.34 130.97 4.8787  
 298.9 > 99 44 2.125 2.130 8834 14 16:1 3.78 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.415 2.415 0 701673 17 >100:1 1001.00 951.98 97.6

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.415 ND ND 1001.00 951.98 97.6 U

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.522 2.522 0 1359134 18 >100:1 5005.00 5102.74 103

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.522 ND ND 5005.00 5102.74 103 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.772 2.773 0 563230 17 >100:1 1001.00 928.43 96.2

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.773 ND ND 1001.00 928.43 96.2 U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.781 2.782 0 162346 17 >100:1 1001.00 948.12 91

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.781 2.782 0/0 8115 22 63:1 Target = 3.80 0.19 47.191 1.7579  
 399 > 99 45 2.790 2.782 1435 24 4.9:1 5.65 (1.90-5.71) 0.25

**29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4**

377 > 251 45 2.809 ND ND 1001.00 948.12 91 U

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.108	1	103232	23	>100:1			5005.00	5360.36	92.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.115		ND								U
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.135	1	561609	22	>100:1			1001.00	948.88	94.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.135		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.513	3.507	1	141691	25	>100:1			1001.00	945.06	90.1	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.500		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.716		ND								U
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54		4.318		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.513	3.515	0	698007	20	>100:1			1001.00	929.48	91.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.515		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.857	3.850	1	97877	20	>100:1			5005.00	5276.35	111	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.850		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.865	3.858	1	607844	20	>100:1			1001.00	916.35	95.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.866		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.018	4.019	0	785695	18	>100:1			5005.00	5473.73	108	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.019		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.170	4.171	0	659219	18	>100:1			5005.00	4963.45	95.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.180		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.170	4.171	0	544086	19	>100:1			1001.00	860.79	86.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.171		ND								U
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.437	4.438	0	530575	19	>100:1			1001.00	876.52	92.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													
613 > 569	38		4.438		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.673		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.889	4.890	0	655802	18	>100:1			1001.00	778.45	79.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.890		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.865	3.858	1	643688	20	>100:1					95	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.415	0	677781	18	>100:1					94	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.141	3.135	1	574185	23	>100:1					95.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.698	0	630588	21	>100:1					104	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.513	3.507	1	154569	21	>100:1					94.4	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720009.d

Injection Date: 27-Dec-2020 11:01:32

Inst. ID: LCMSMS02

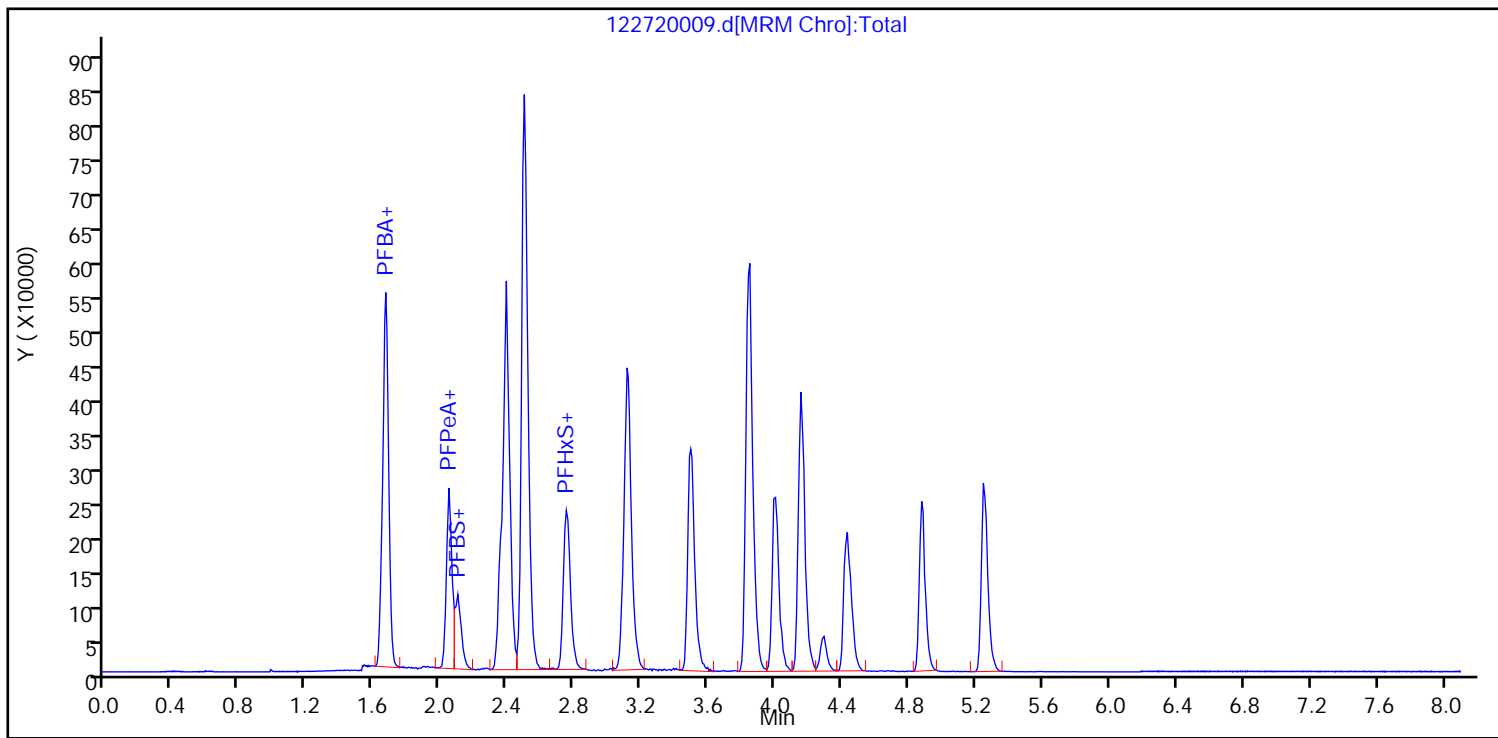
Client ID: G-5-1220

Lab ID: VL11001-001

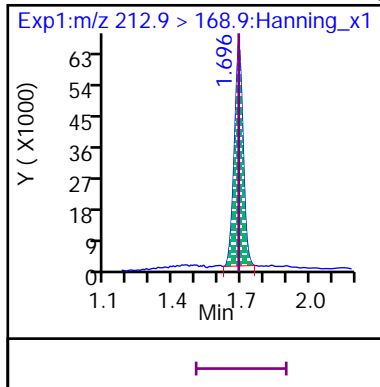
Sample Info: VL11001-001

Dil. Factor: 1

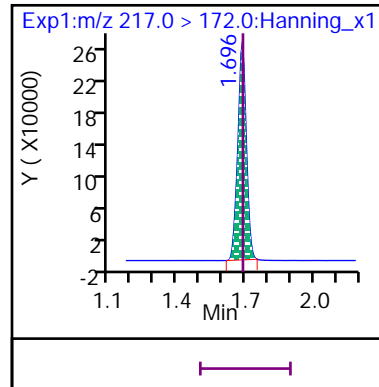
Operator: Matthew M. Miller



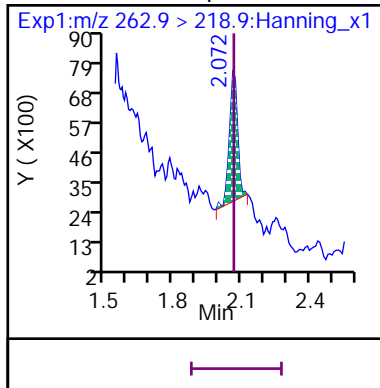
8 Perfluoro-n-butanoic acid (PFBA)



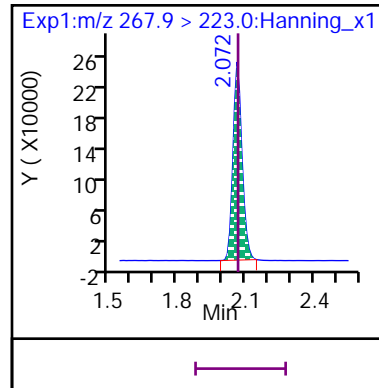
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

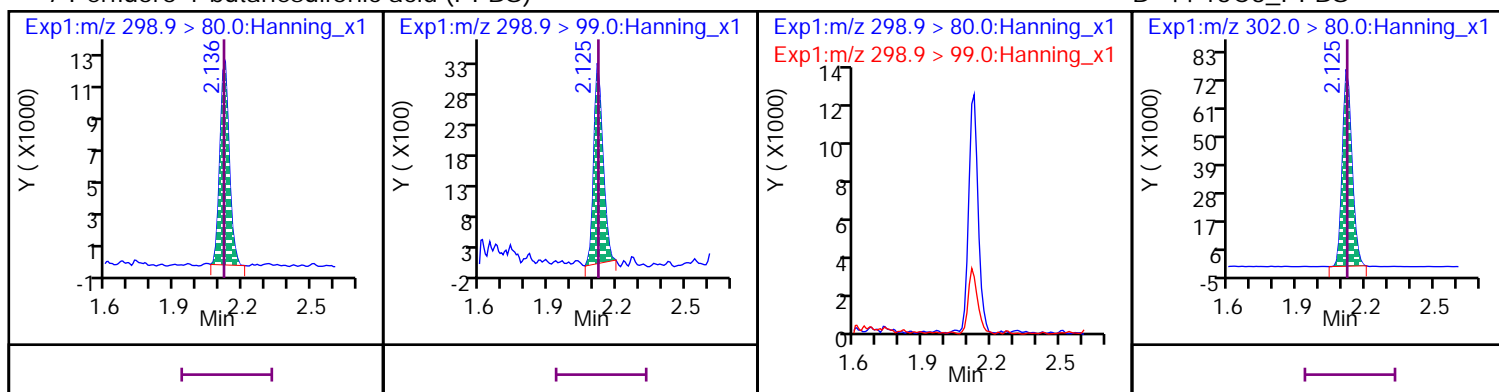


D 50 13C5\_PFPeA



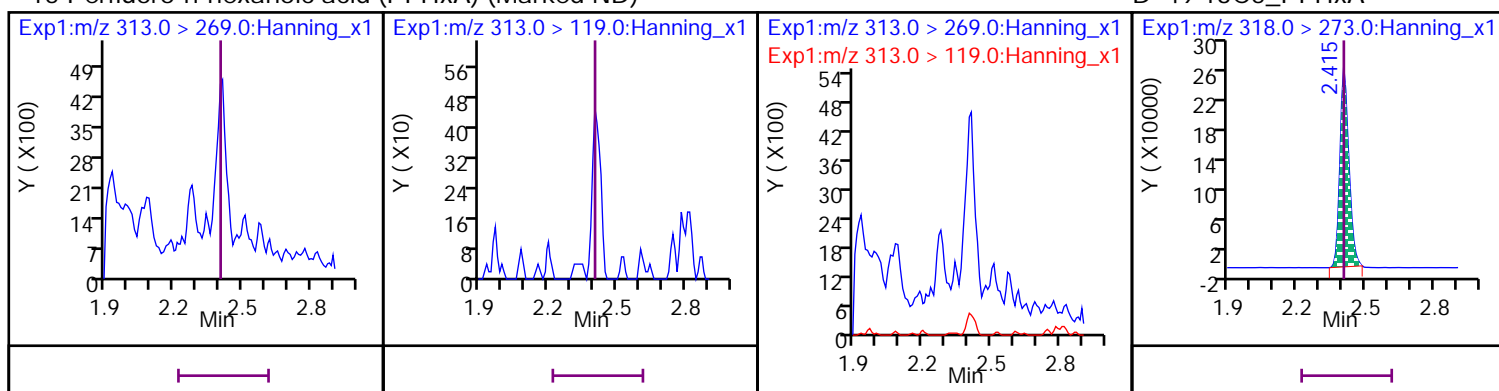
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



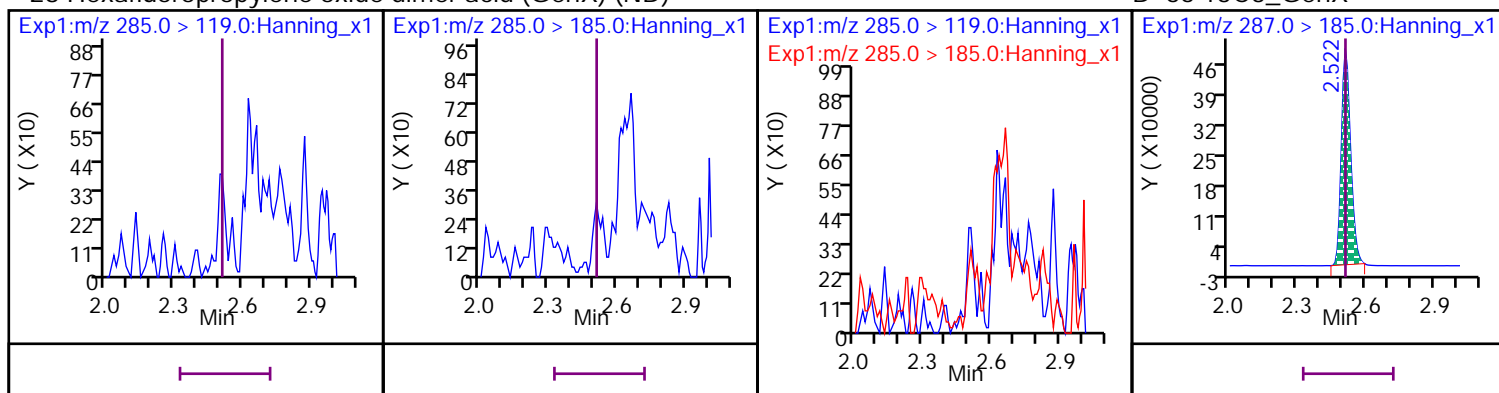
15 Perfluoro-n-hexanoic acid (PFHxA) (Marked ND)

D 49 13C5\_PFHxA



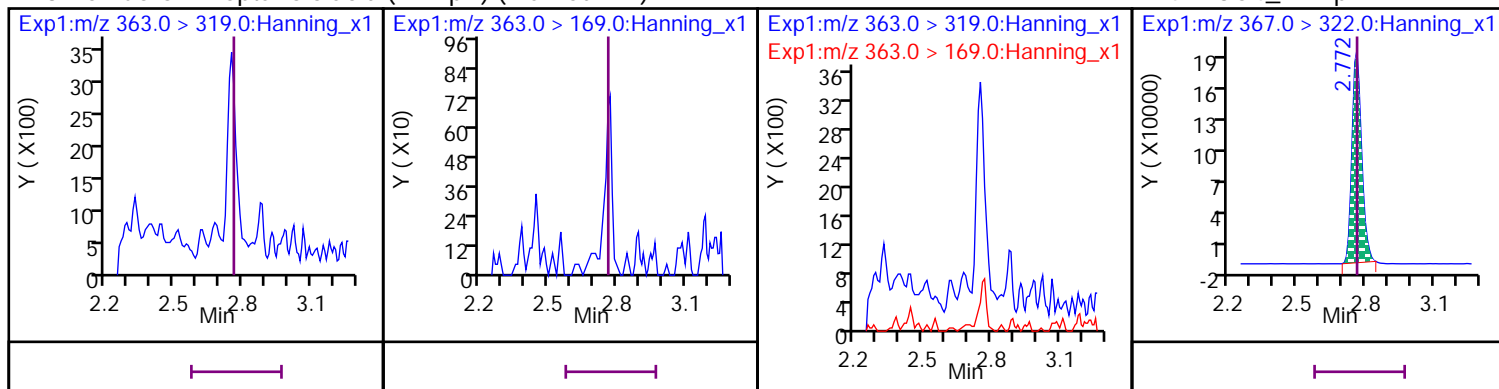
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



13 Perfluoro-n-heptanoic acid (PFHpA) (Marked ND)

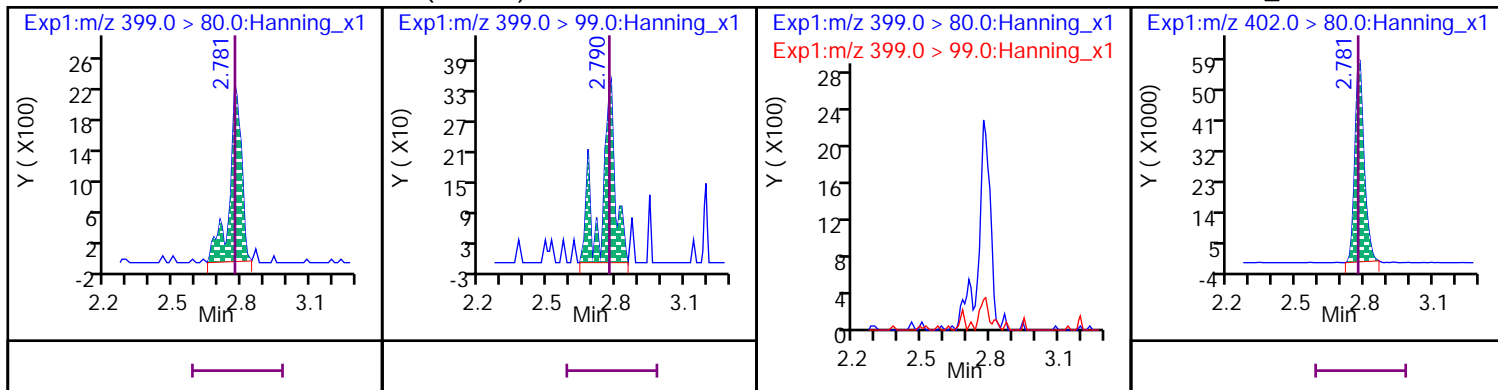
D 47 13C4\_PFHpA





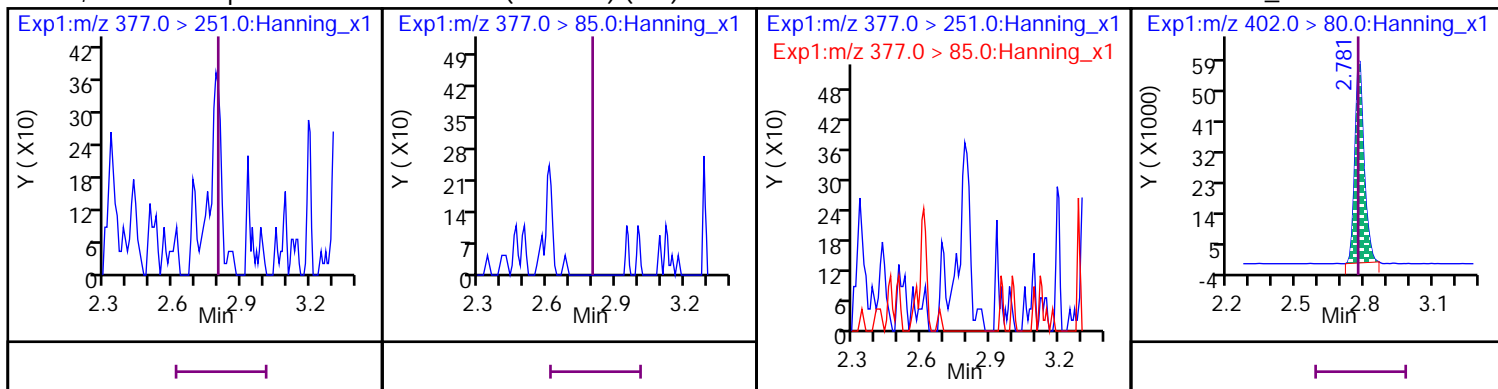
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



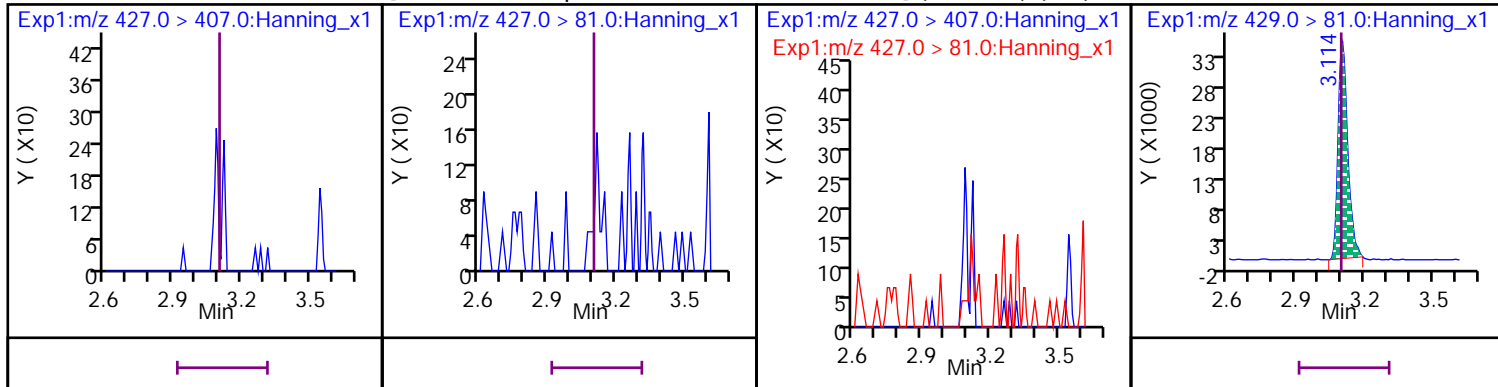
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



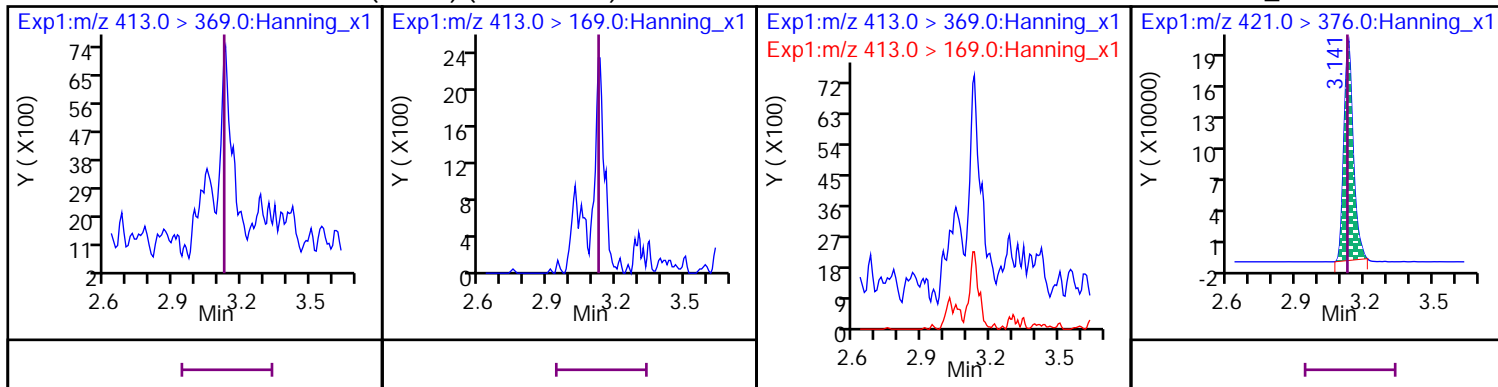
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



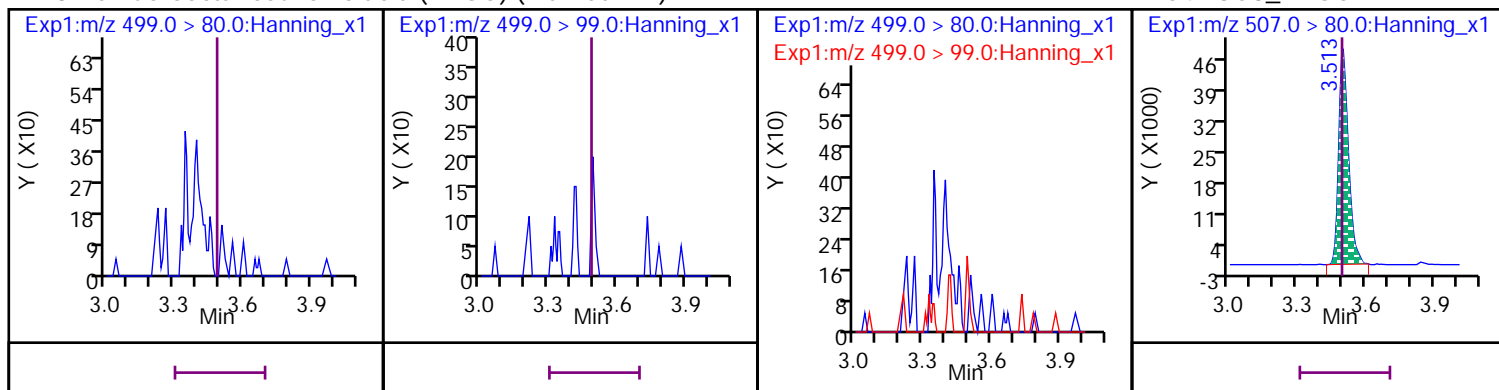
20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



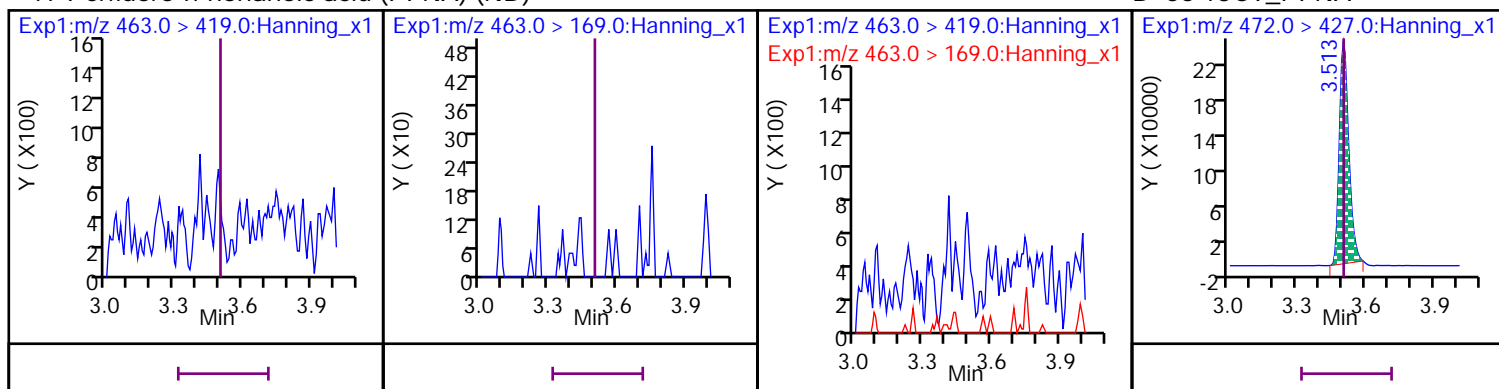
## 18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



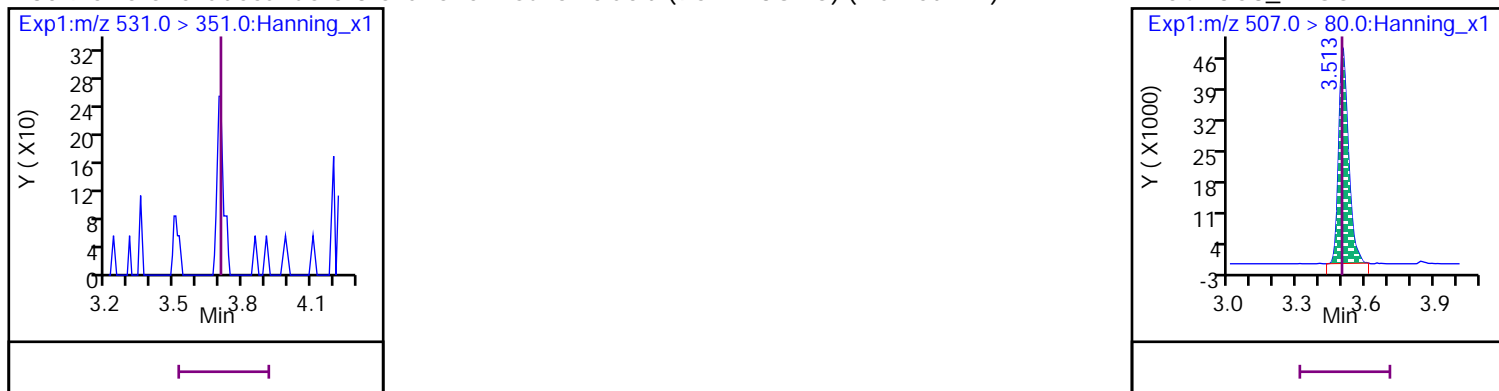
## 17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



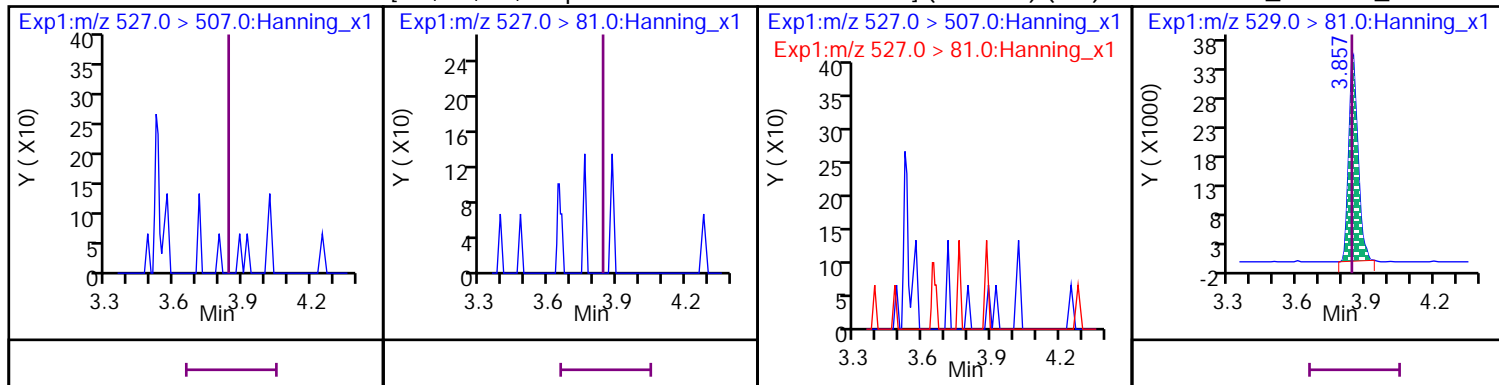
## 30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



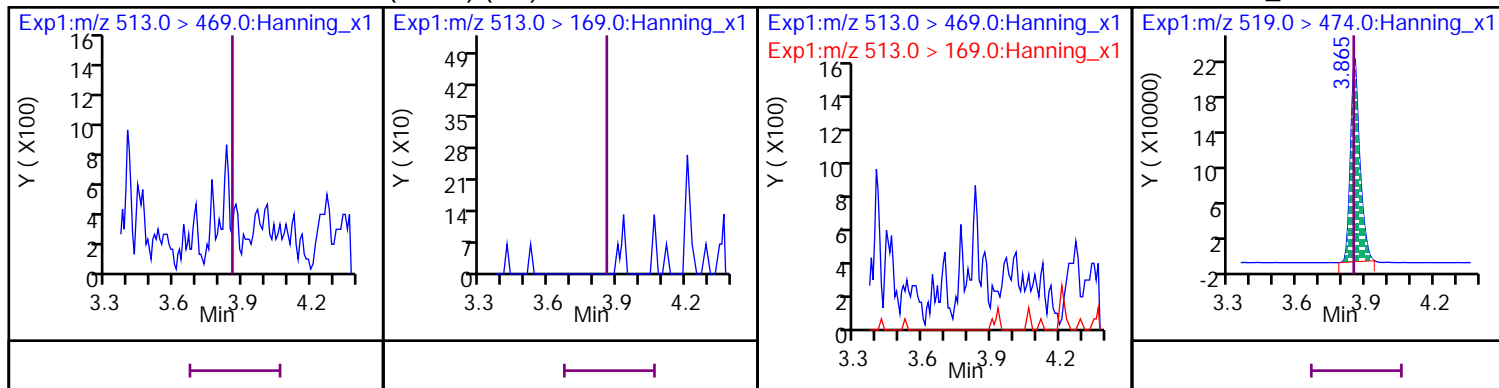
## 3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



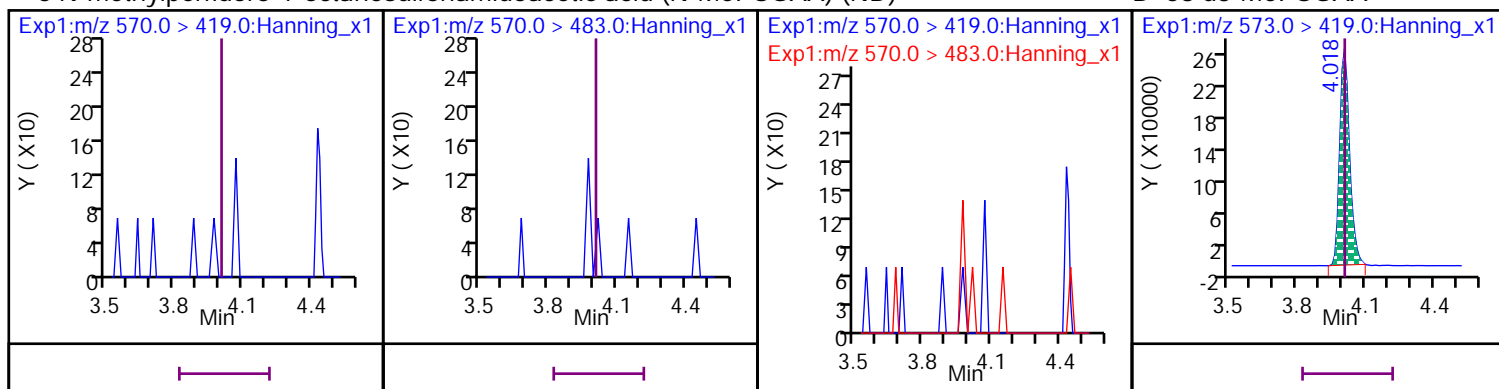
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



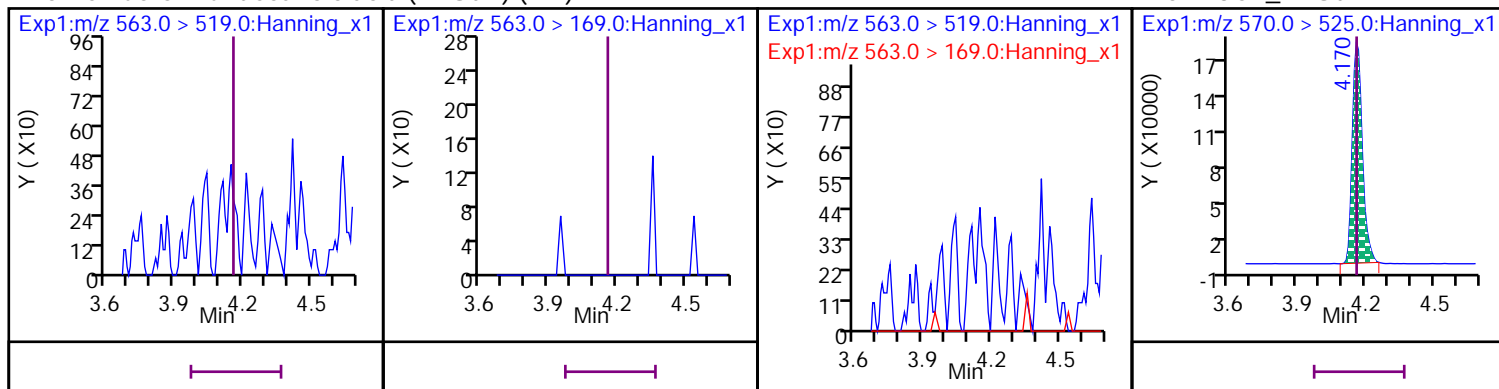
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



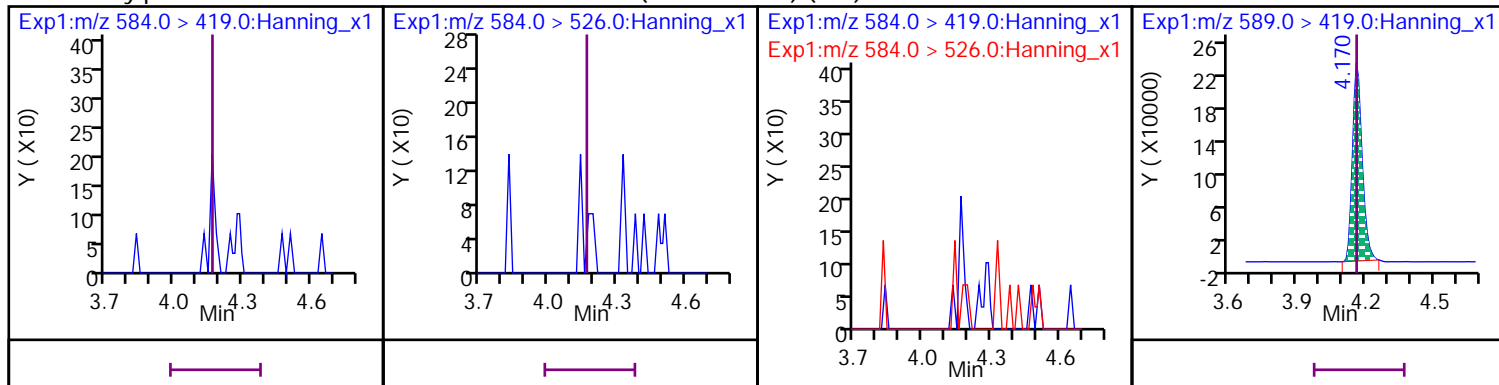
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

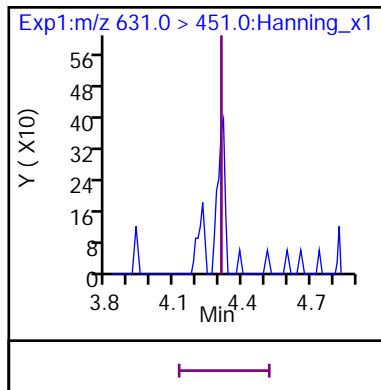


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

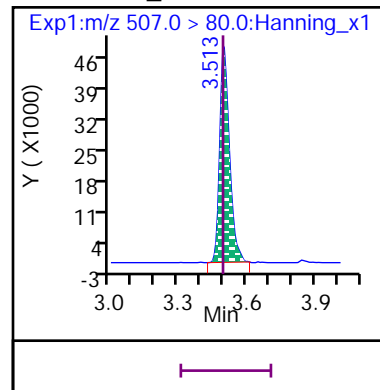
D 60 d5-EtFOSAA



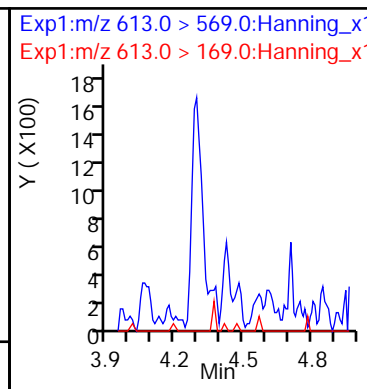
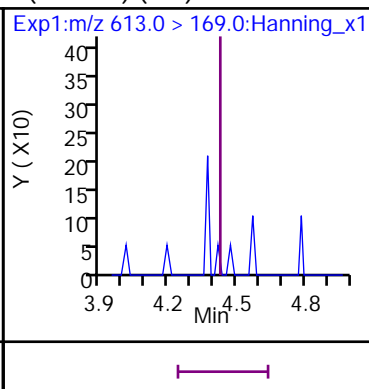
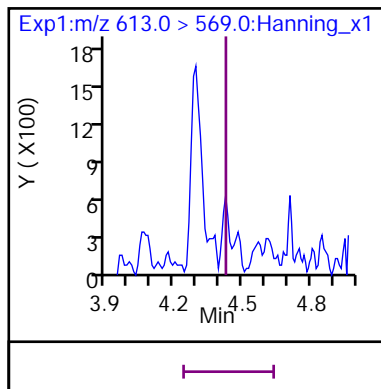
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



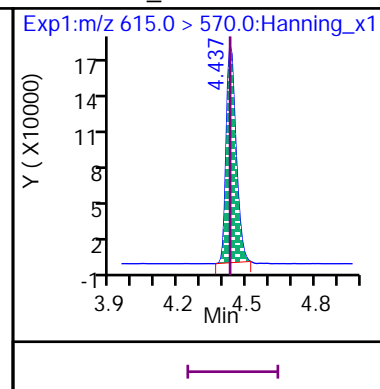
D 54 13C8\_PFOS



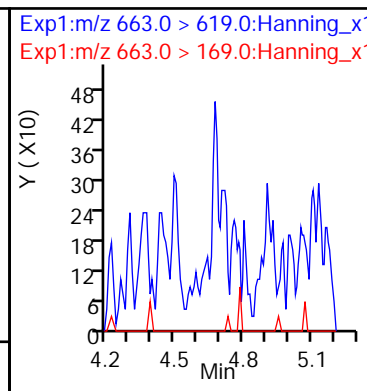
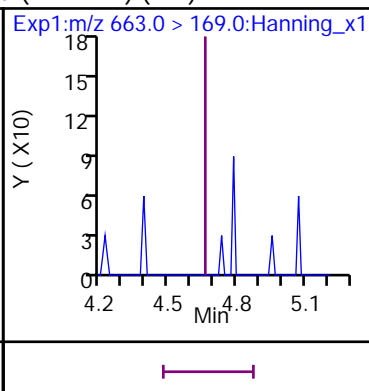
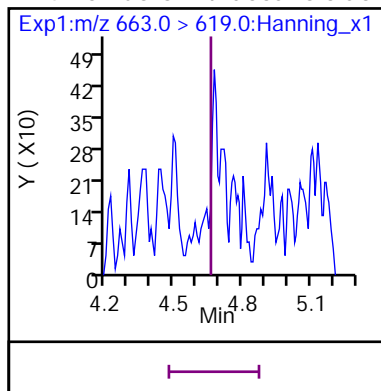
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



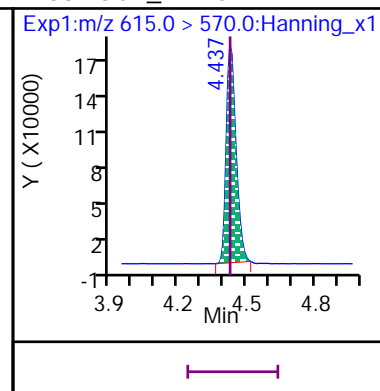
D 38 13C2\_PFDoA



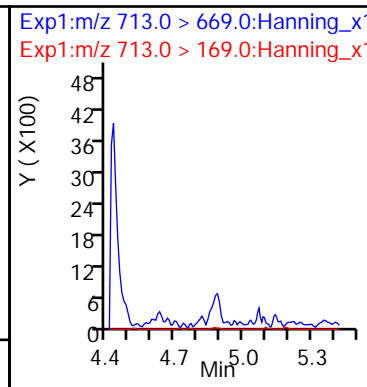
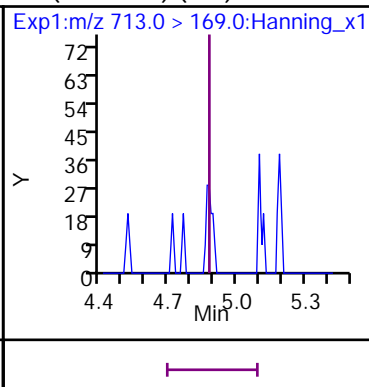
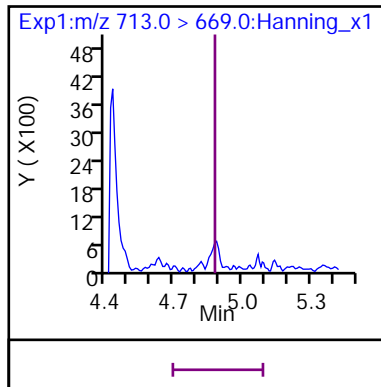
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



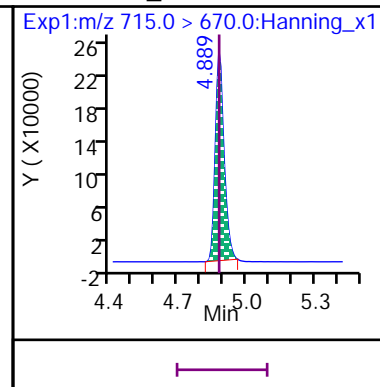
D 38 13C2\_PFDoA



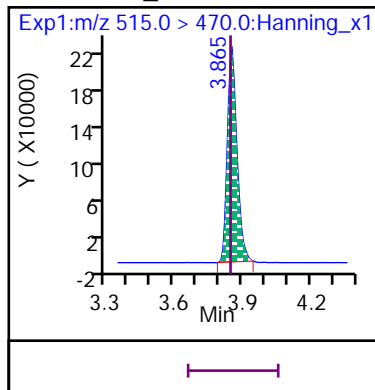
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



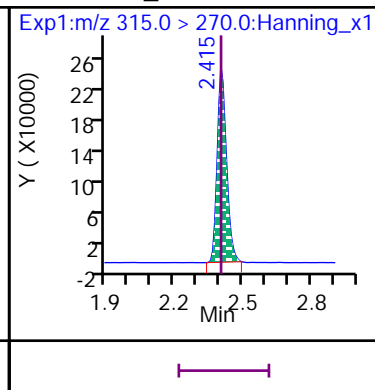
D 42 13C2\_PFTeDA



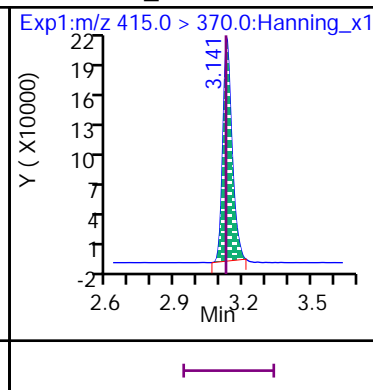
\* 37 13C2\_PFDA



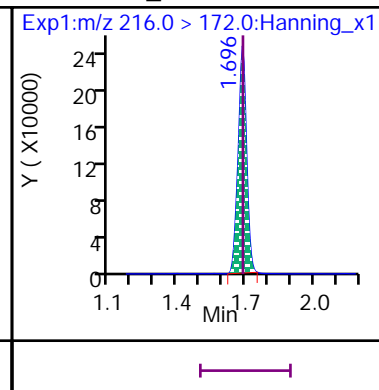
\* 39 13C2\_PFHxA



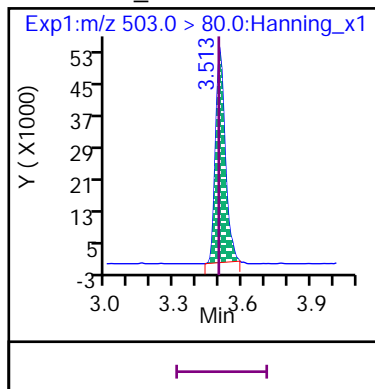
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS





# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-002</b>
Description: <b>FFS-MW03-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1315</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1122	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>140</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>45</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>34</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>1.7</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>5.9</b>		<b>3.8</b>	<b>1.9</b>	<b>0.96</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		112	50-150
13C2_8:2FTS		114	50-150
13C2_PFDaA		100	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		92	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		99	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		102	50-150
13C8_PFOs		91	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d  
Injection Date: 27-Dec-2020 11:22:43 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 4  
Lab Sample ID: VL11001-002 Lab Prep. Batch: 77367  
Client ID: FFS-MW03-1220 Sample Group: VL11001  
Sample Info: VL11001-002 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0422654$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	260	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.698 1.698 0 649449 23 >100:1 1001.00 936.41 102

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.730 1.698 2/2 513342 33 49:1 794.40 33.576

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.066 2.077 0 650199 16 >100:1 1001.00 945.21 98.7

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.077 0/0 25129 15 14:1 38.478 1.6263 J

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.129 2.130 0 220897 18 >100:1 1001.00 959.46 92.1

**7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.129 2.130 0/0 94753 18 97:1 Target = 3.34 364.17 15.392

298.9 > 99 44 2.129 2.130 28174 18 73:1 3.36 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.415 2.415 0 694587 19 >100:1 1001.00 942.36 96.6

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.415 2.415 0/0 26812 11 12:1 Target = 17.01 39.138 1.6542 J M

313 > 119 49 2.424 2.415 1164 10 8.3:1 23.03 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.522 2.522 0 1332190 18 >100:1 5005.00 5001.58 101

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.522 ND 5005.00 5001.58 101 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.772 2.773 0 592435 19 >100:1 1001.00 976.57 101

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 2.773 0/0 19838 18 8.5:1 Target = 3.79 32.315 1.3658 J

363 > 169 47 2.763 2.773 4608 16 45:1 4.30 (1.89-5.69)

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.781 2.782 0 166205 18 >100:1 1001.00 970.66 93.2

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.781 2.782 0/0 189049 26 >100:1 Target = 3.80 0.50 1073.84 45.386

399 > 99 45 2.781 2.782 55085 23 >100:1 3.43 (1.90-5.71) 0.35

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.809		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.108	1	125011	24	>100:1			5005.00	6491.25	112	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.114	3.115	0/-1	164282	24	>100:1	Target = 1.77		3241.54	137.00		
427 > 81	64	3.114	3.115		89414	22	>100:1	1.83 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.135	1	603882	21	>100:1			1001.00	1020.30	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													J
413 > 369	53	3.135	3.135	0/-1	26814	28	11:1	Target = 2.85	0.10	43.599	1.8427		
413 > 169	53	3.148	3.135		7020	18	28:1	3.81 (1.42-4.28)	0.12				M
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.514	3.507	1	142811	22	>100:1			1001.00	952.53	90.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.383	3.500	-7/-8	23416	54	79:1	Target = 6.80	0.12	138.51	5.8541		M
499 > 99	54	3.375	3.500		5393	53		4.34 (3.40-10.20)	0.08				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.716		ND								
<b>31 11-chloroicosafafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.318		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.514	3.515	0	712353	22	>100:1			1001.00	948.59	93.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.515		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.859	3.850	1	100683	19	>100:1			5005.00	5427.61	114	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.850		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.859	3.858	1	638555	21	>100:1			1001.00	962.65	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.866		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.020	4.019	1	759494	18	>100:1			5005.00	5291.19	105	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.019		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	1	688917	20	>100:1			5005.00	5187.05	99.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.180		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	1	564642	19	>100:1			1001.00	893.32	90.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.171		ND								
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.440	4.438	1	569617	19	>100:1			1001.00	941.02	99.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.438		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.673		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.891	4.890	1	707433	18	>100:1			1001.00	839.74	85.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.890		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.859	3.858	1	649239	19	>100:1					95.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.415	0	720734	20	>100:1					99.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.141	3.135	1	668967	22	>100:1					111	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.698	0	638326	22	>100:1					106	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.507	3.507	0	158155	21	>100:1					96.6	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d

Injection Date: 27-Dec-2020 11:22:43

Inst. ID: LCMSMS02

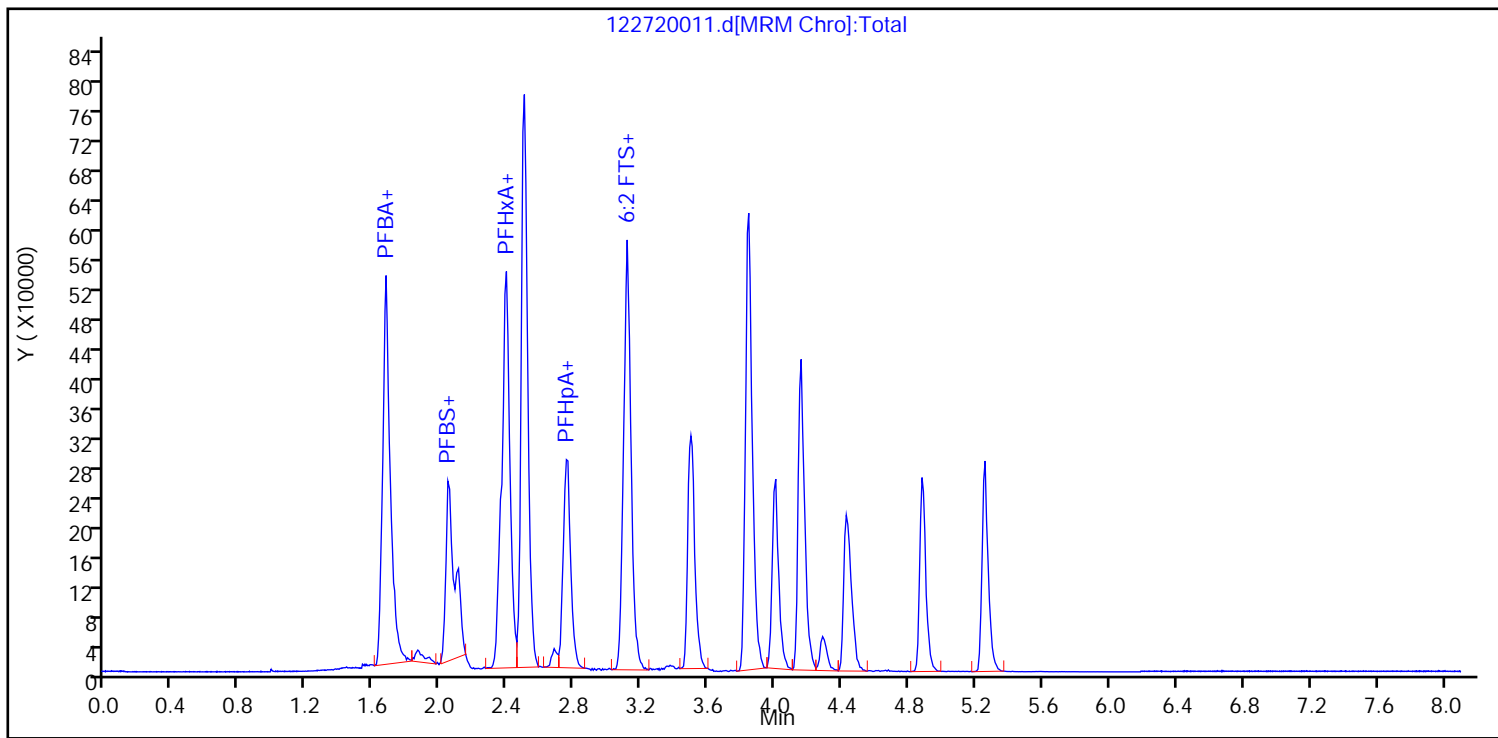
Client ID: FFS-MW03-1220

Lab ID: VL11001-002

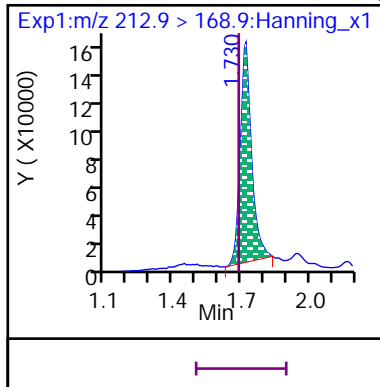
Sample Info: VL11001-002

Dil. Factor: 1

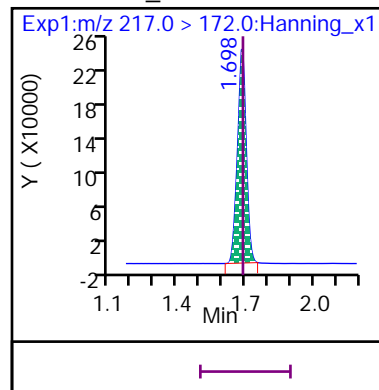
Operator: Matthew M. Miller



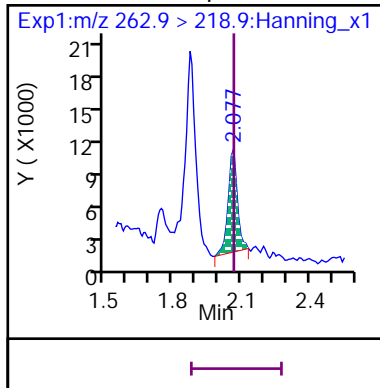
8 Perfluoro-n-butanoic acid (PFBA)



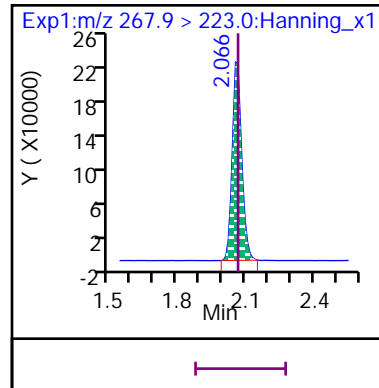
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



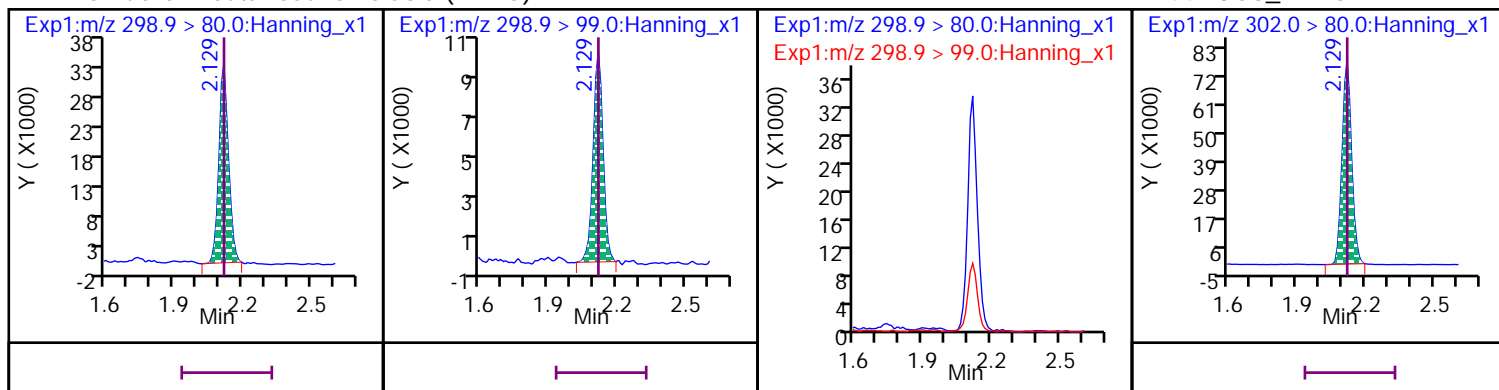
D 50 13C5\_PFPeA





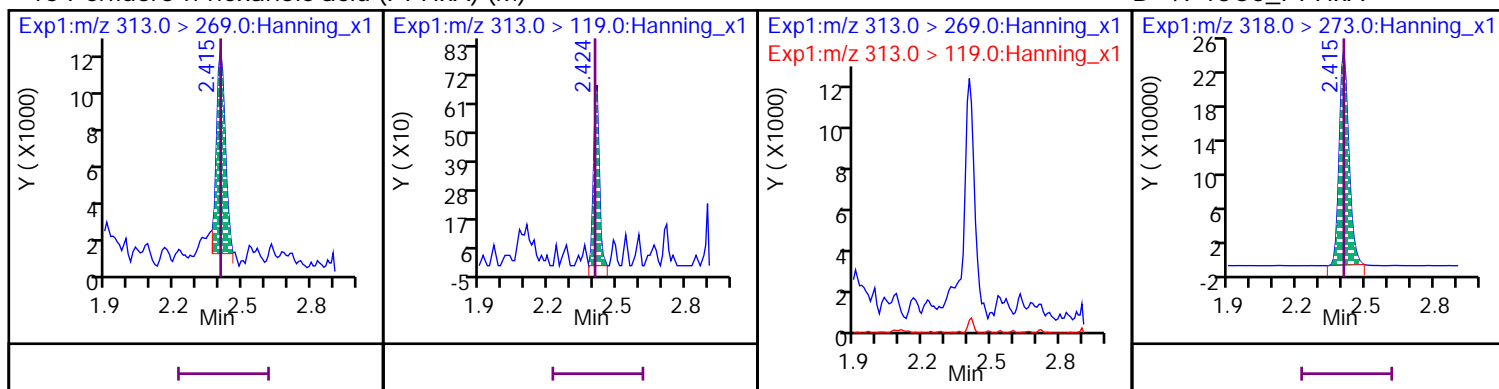
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



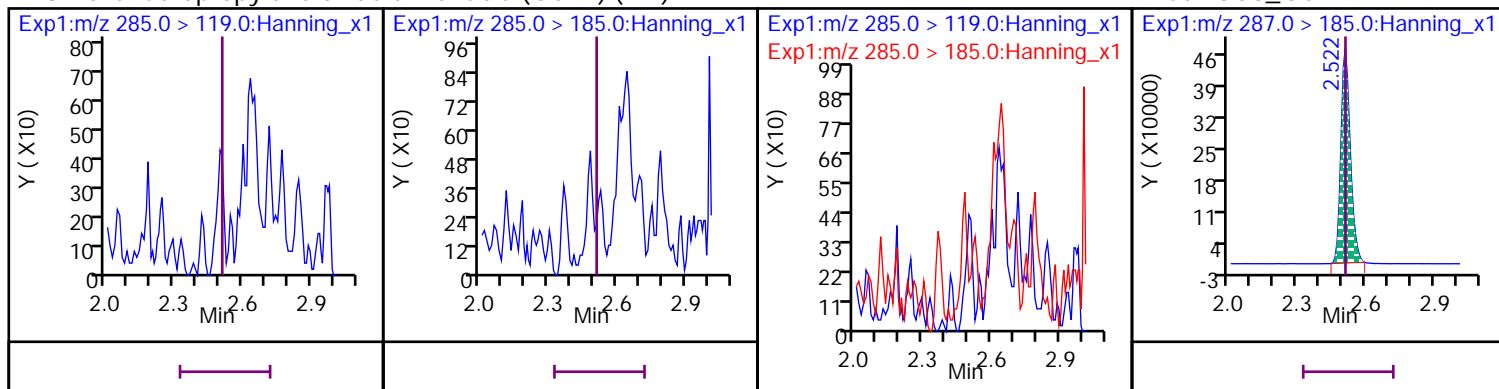
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



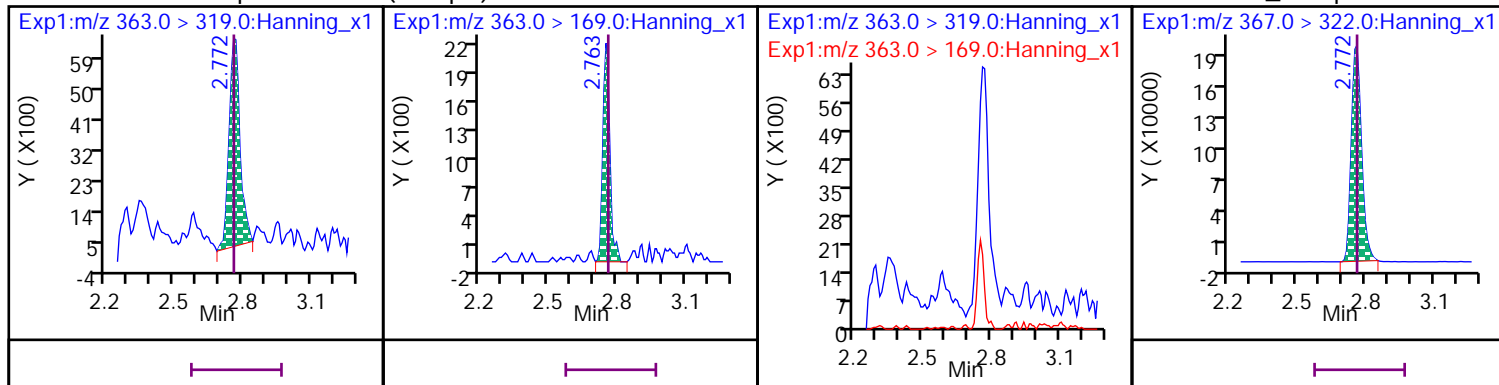
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



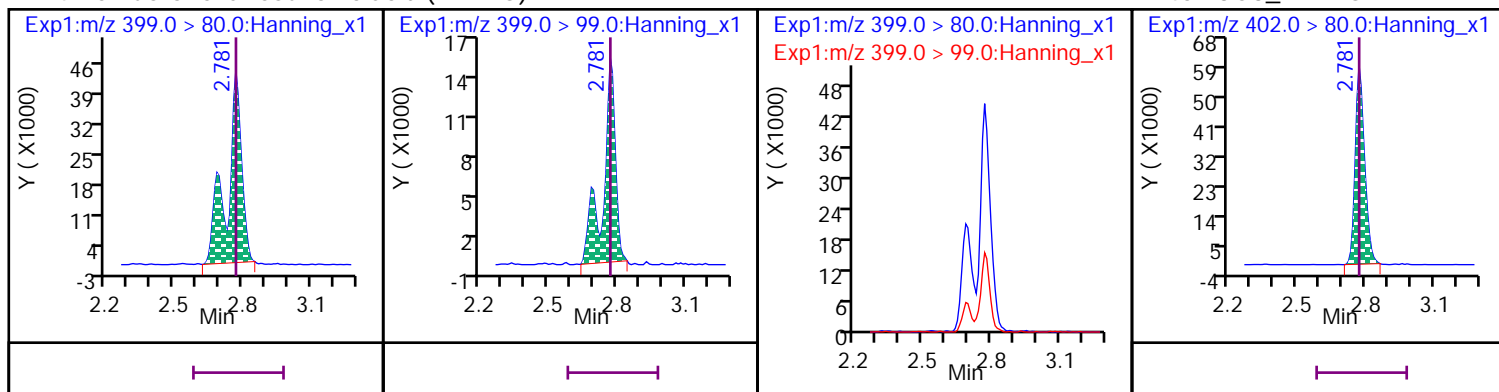
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



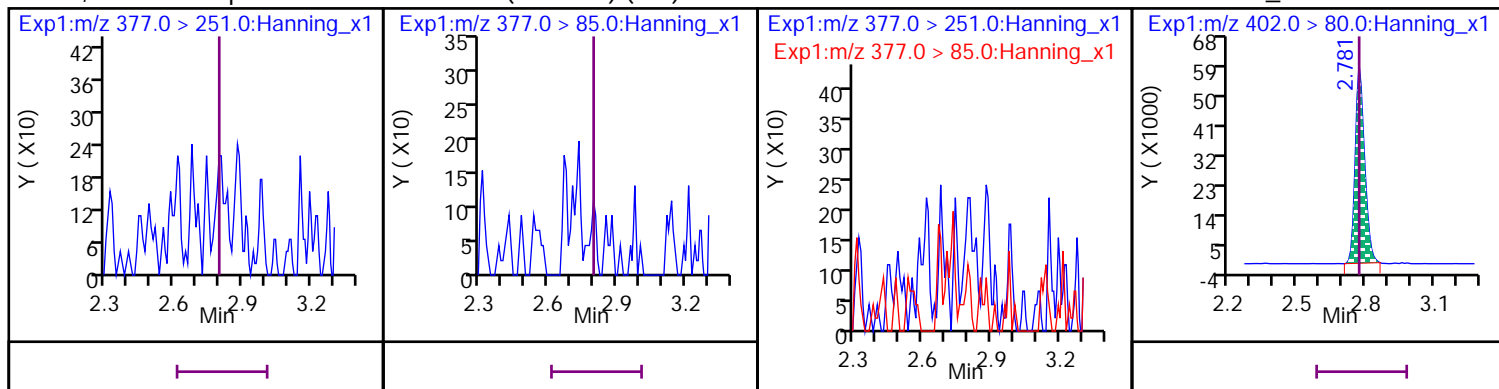
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



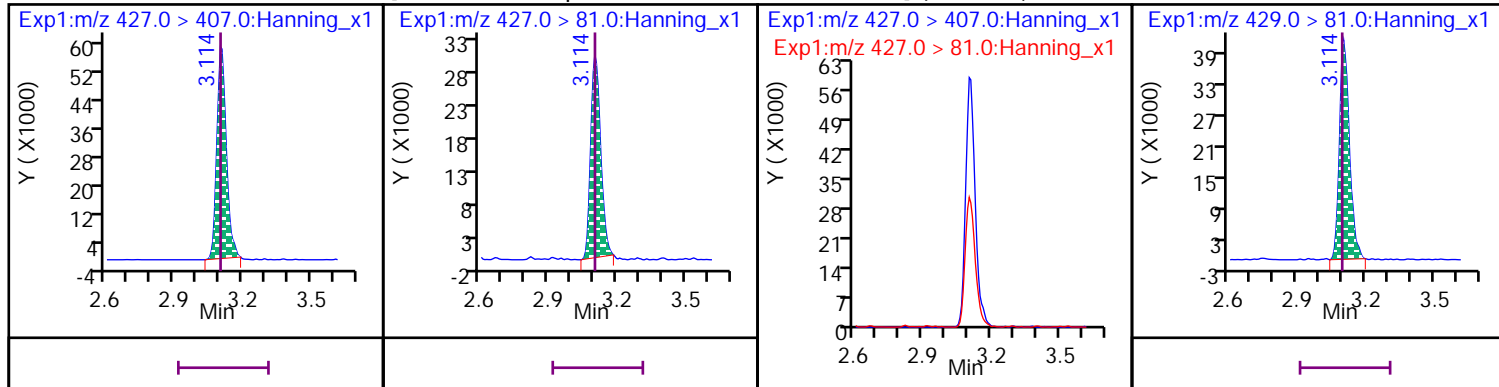
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



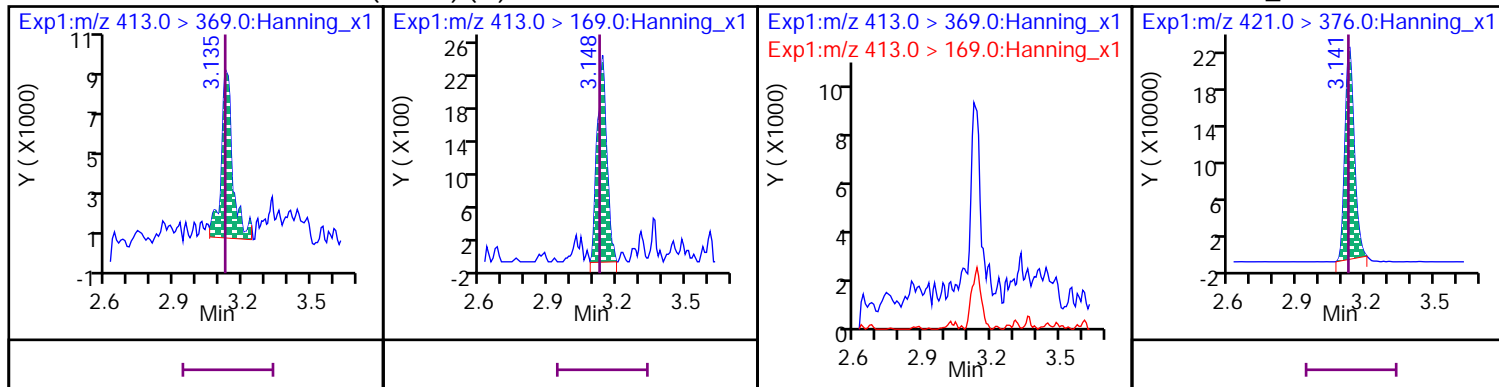
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



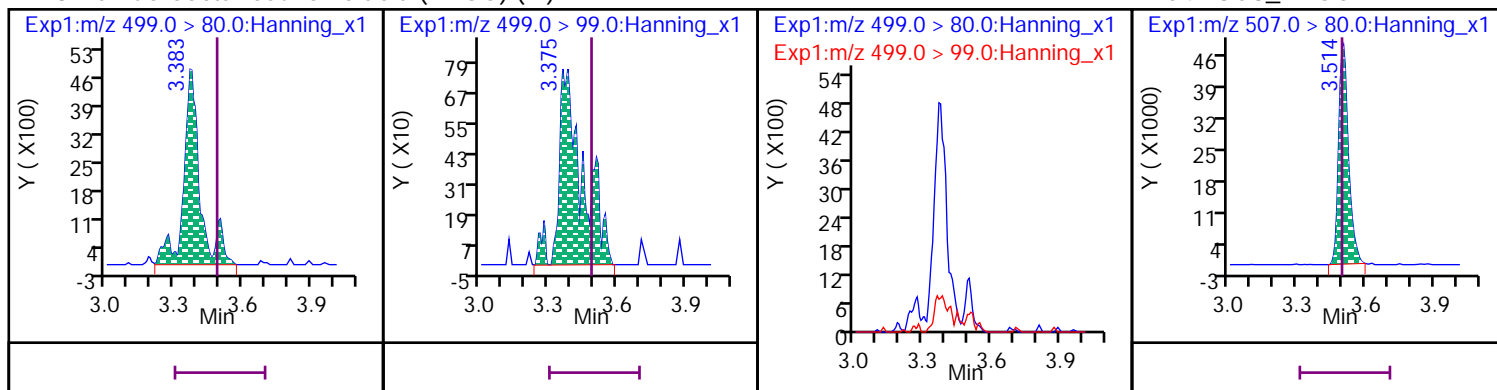
20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



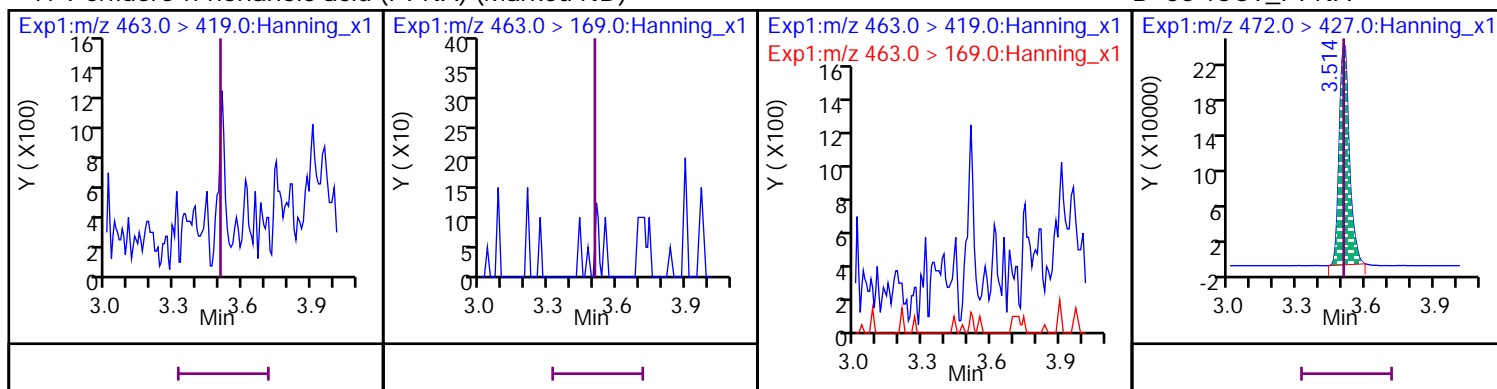
## 18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



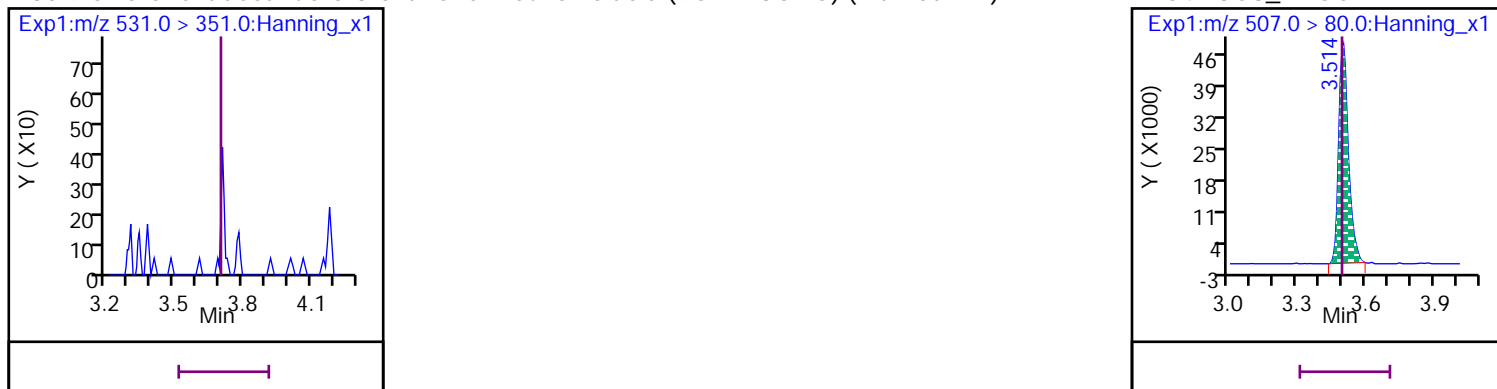
## 17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



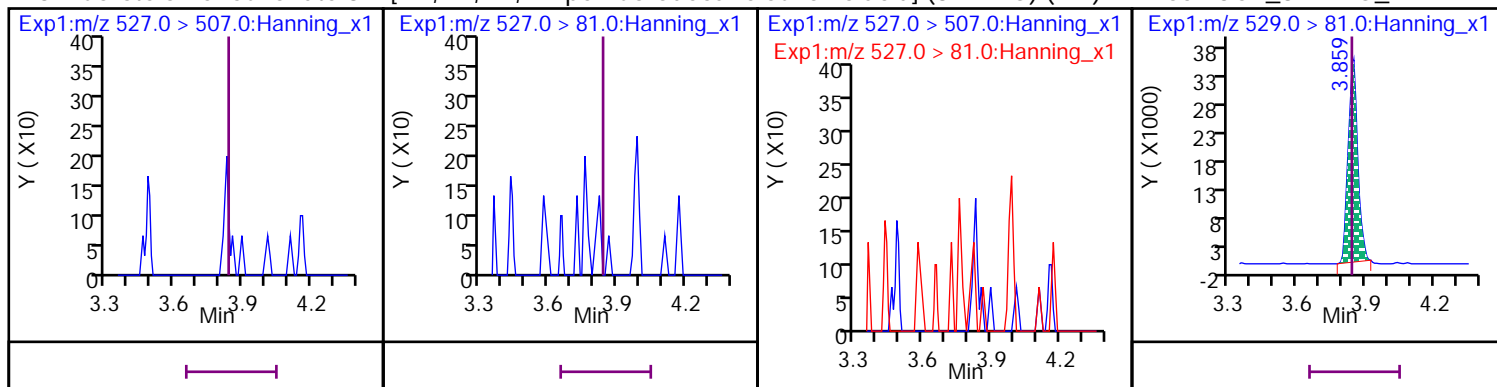
## 30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



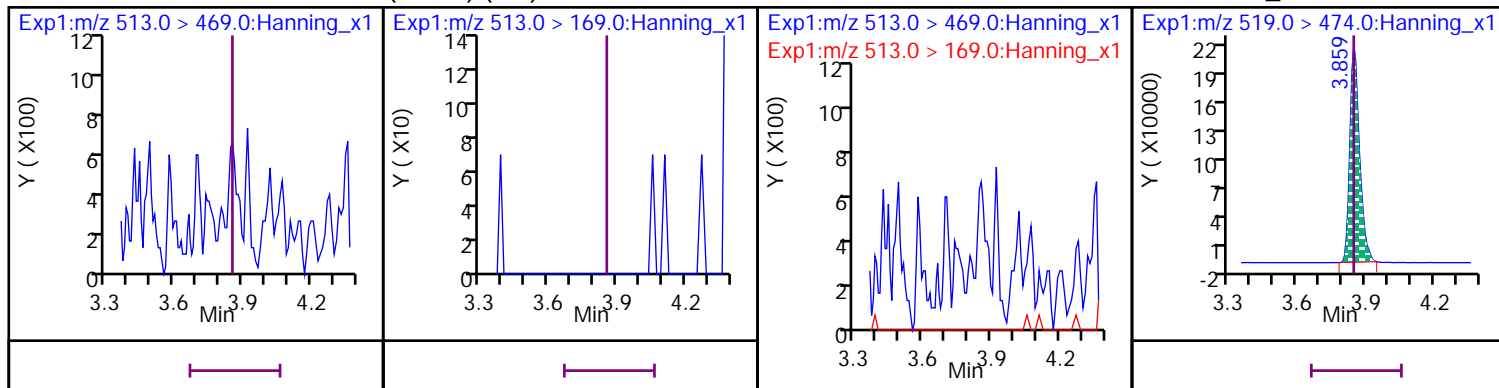
## 3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



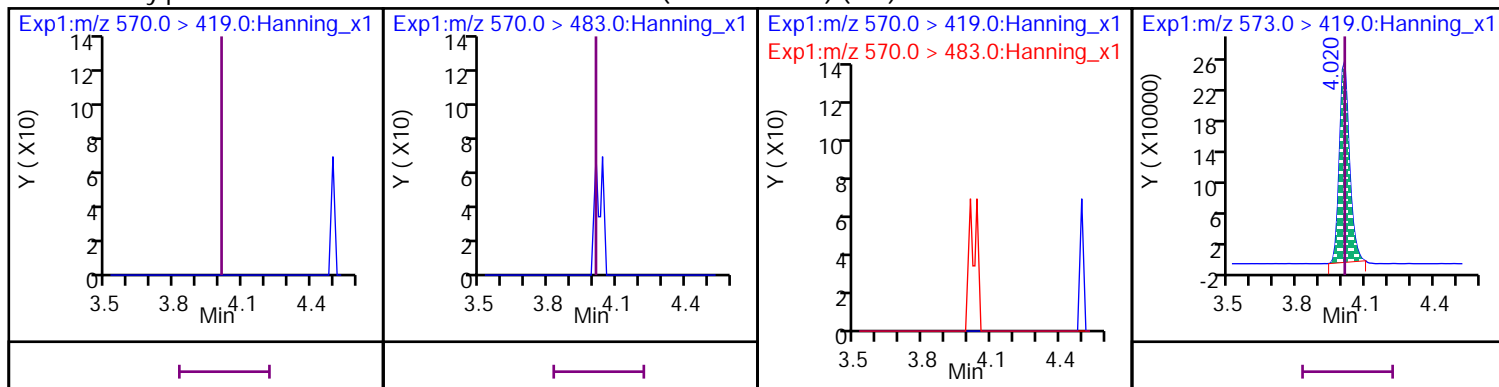
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



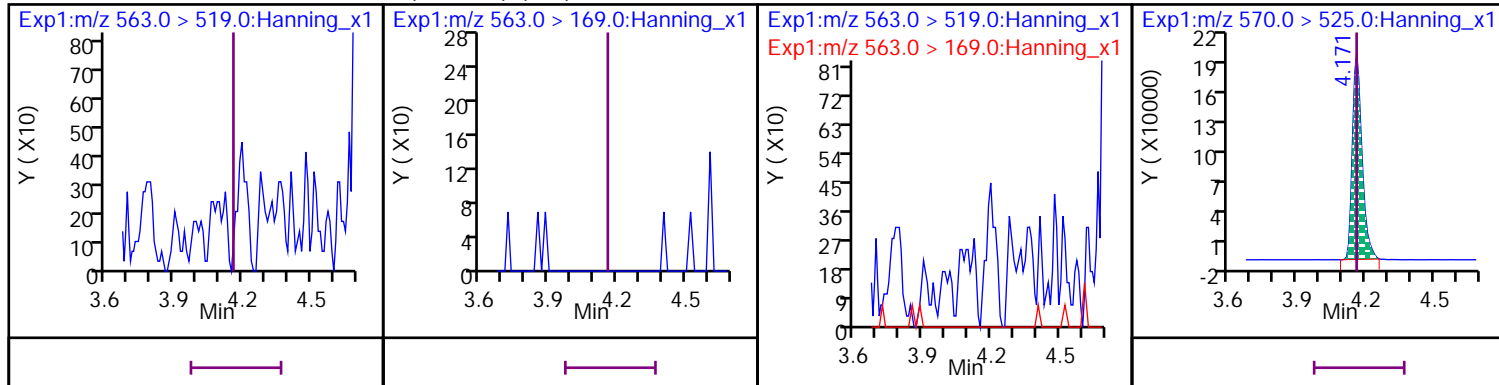
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



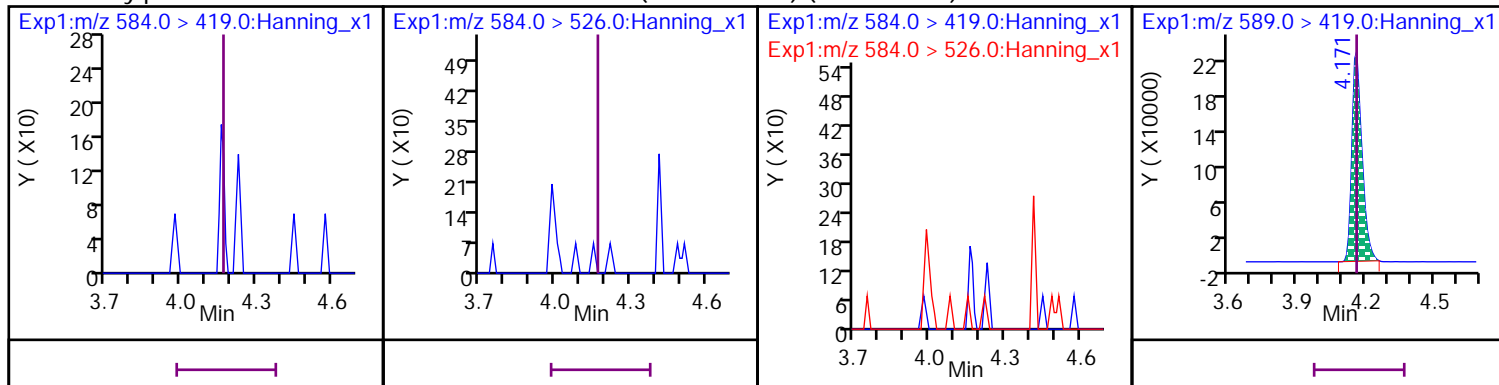
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

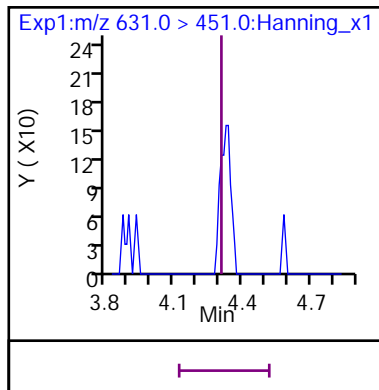


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

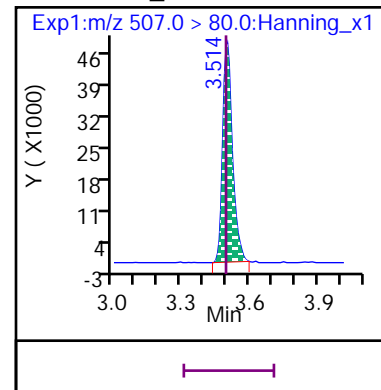
D 60 d5-EtFOSAA



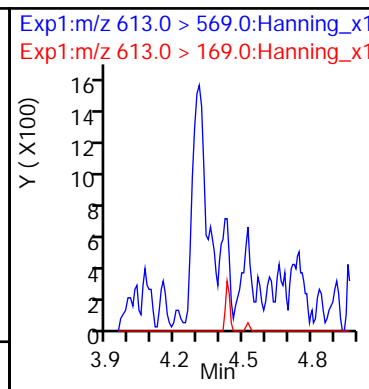
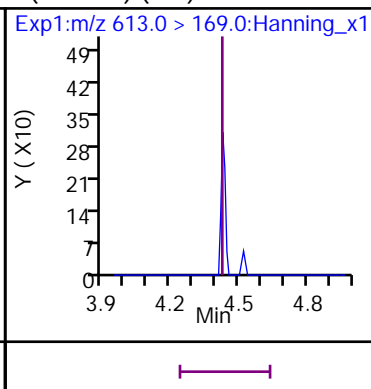
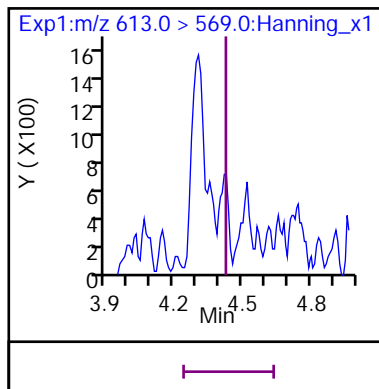
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



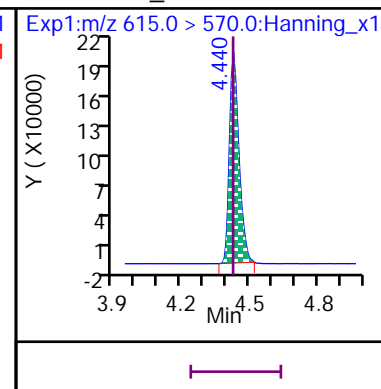
## D 54 13C8\_PFOS



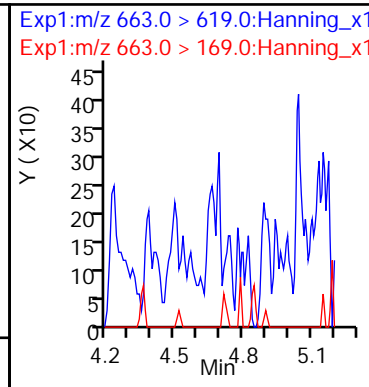
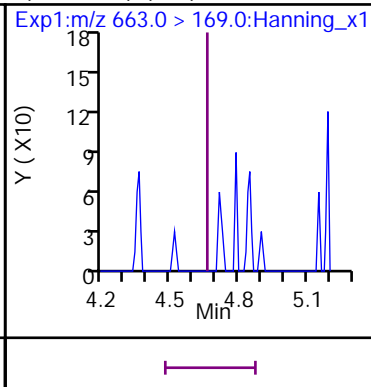
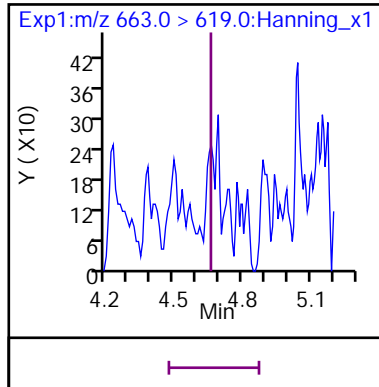
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



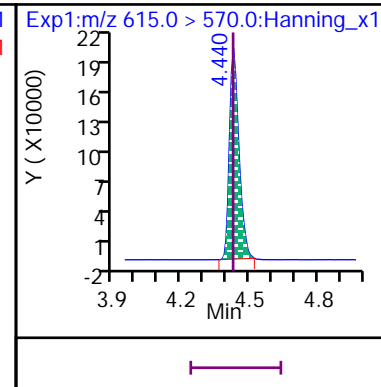
## D 38 13C2\_PFDoA



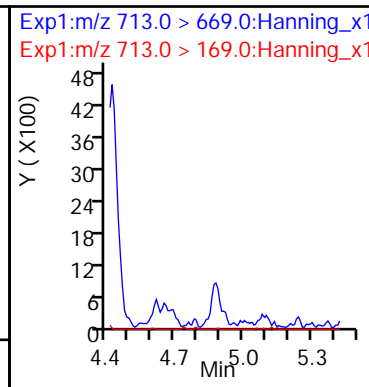
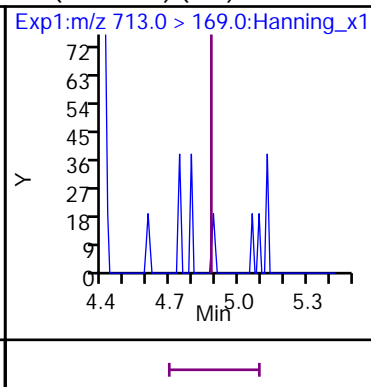
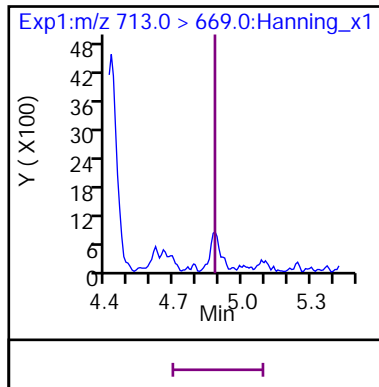
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



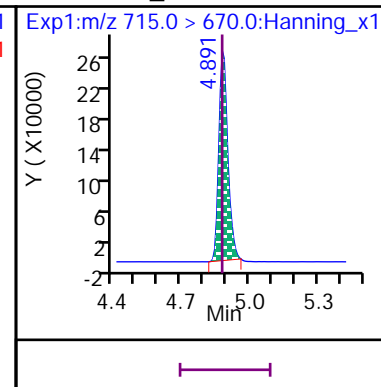
## D 38 13C2\_PFDoA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

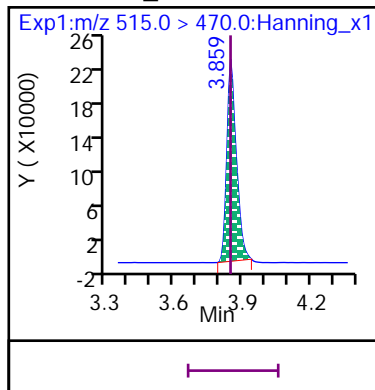


## D 42 13C2\_PFTeDA

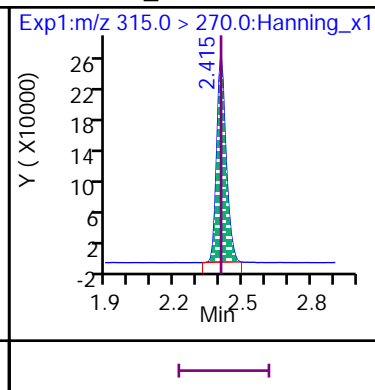




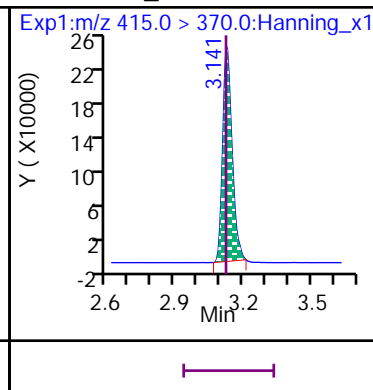
\* 37 13C2\_PFDA



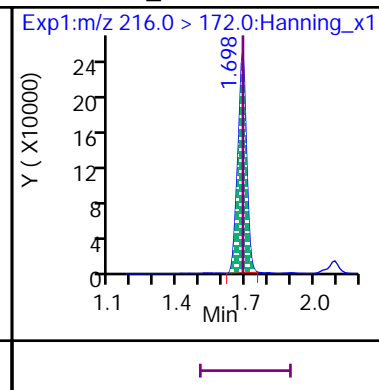
\* 39 13C2\_PFHxA



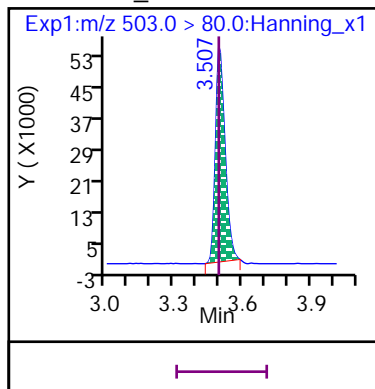
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d

Injection Date: 27-Dec-2020 11:22:43

Inst. ID: LCMSMS02

Client ID: FFS-MW03-1220

Lab ID: VL11001-002

Sample Info: VL11001-002

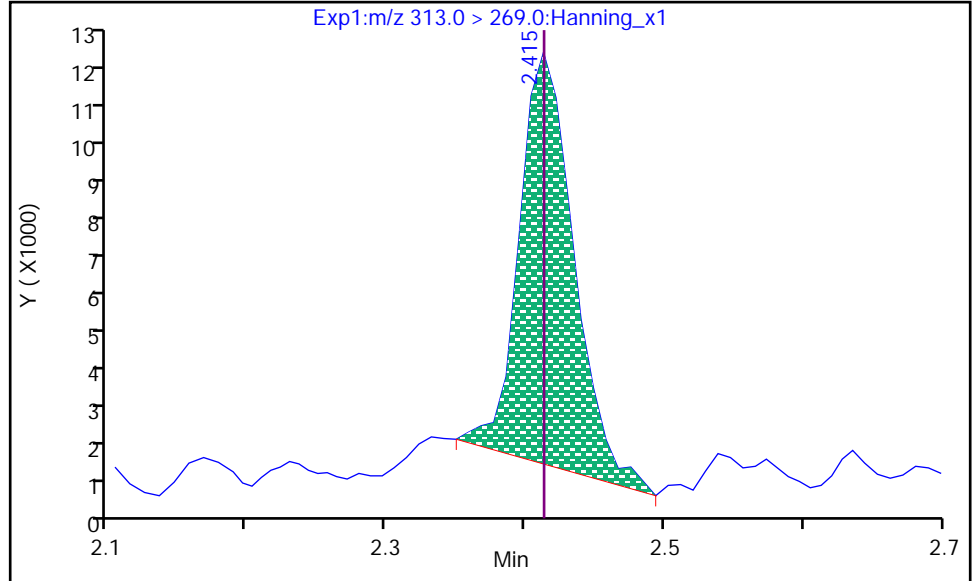
Dil. Factor: 1

Operator: Matthew M. Miller

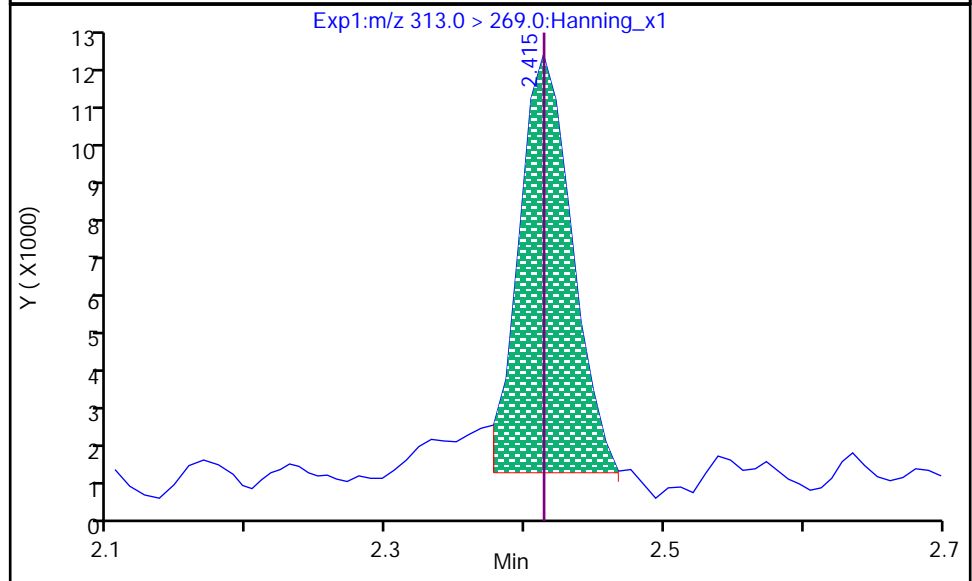
15 PFHxA, CAS: 307-24-4

RT: 2.415  
Area: 27566  
Conc: 1.7007  
Conc Units: ng/L

Processing Integration Results



RT: 2.415  
Area: 26812  
Conc: 1.6542  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:01

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d

Injection Date: 27-Dec-2020 11:22:43

Inst. ID: LCMSMS02

Client ID: FFS-MW03-1220

Lab ID: VL11001-002

Sample Info: VL11001-002

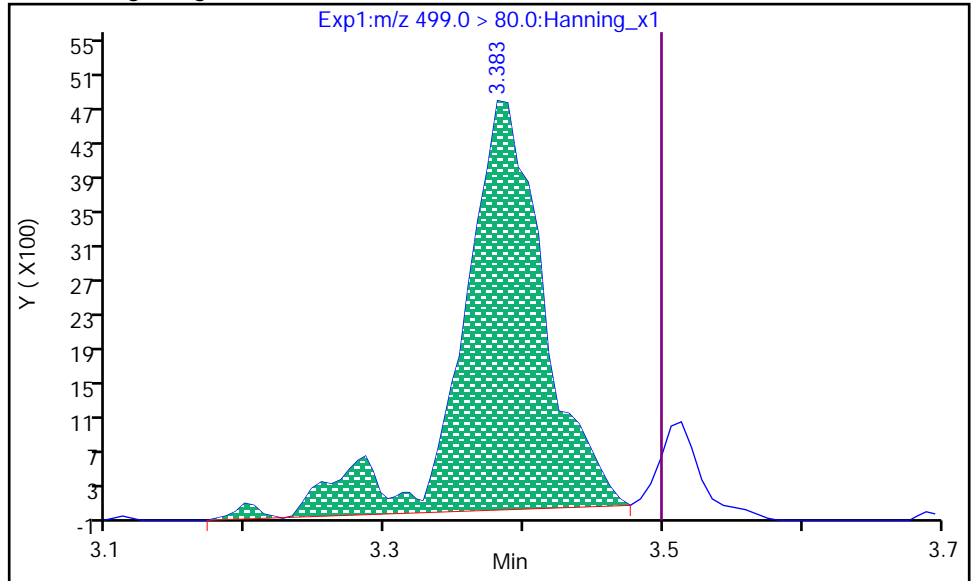
Dil. Factor: 1

Operator: Matthew M. Miller

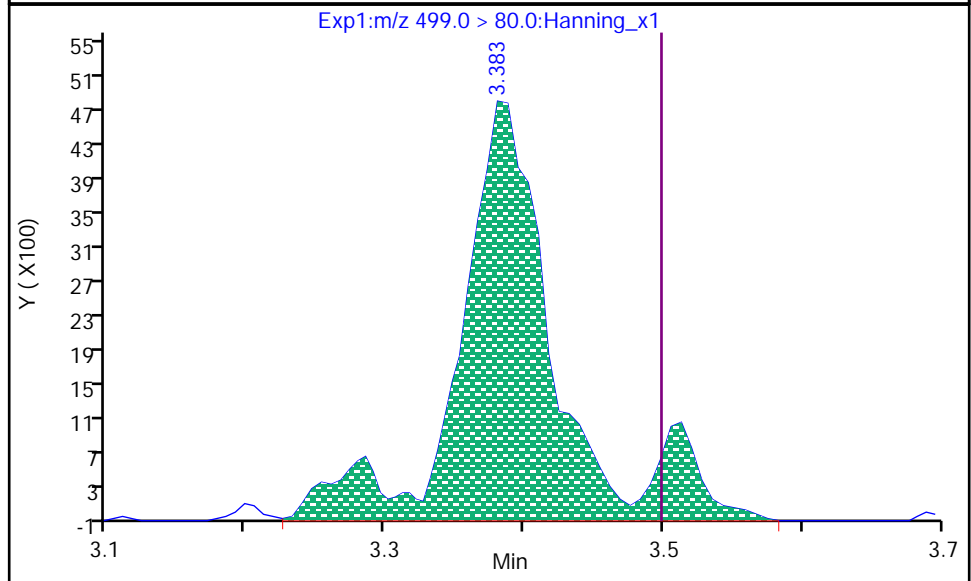
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.383  
Area: 19543  
Conc: 4.8858  
Conc Units: ng/L



RT: 3.383  
Area: 23416  
Conc: 5.8541  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:20

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d

Injection Date: 27-Dec-2020 11:22:43

Inst. ID: LCMSMS02

Client ID: FFS-MW03-1220

Lab ID: VL11001-002

Sample Info: VL11001-002

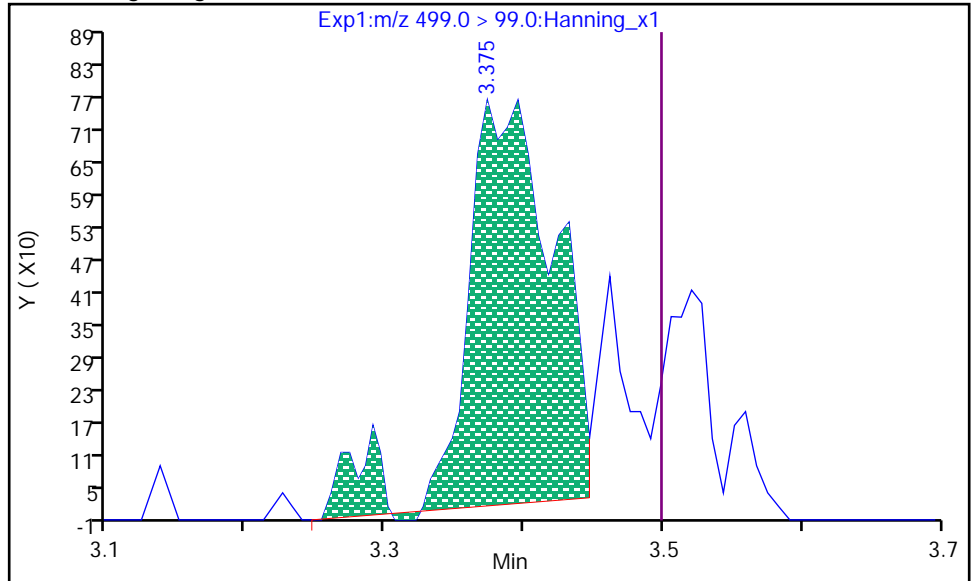
Dil. Factor: 1

Operator: Matthew M. Miller

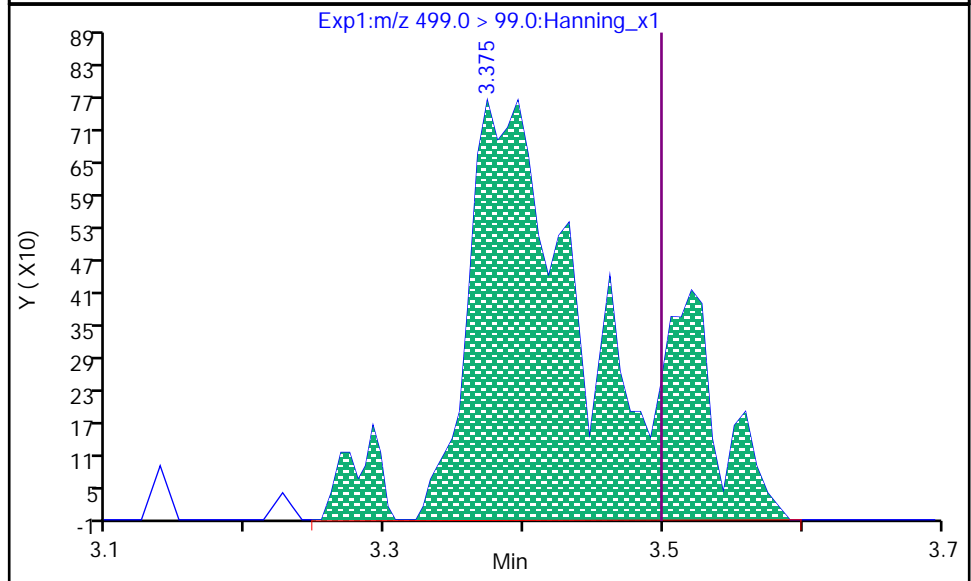
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.375  
Area: 3291  
Conc: 5.8541  
Conc Units: ng/L



RT: 3.375  
Area: 5393  
Conc: 5.8541  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:25

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720011.d

Injection Date: 27-Dec-2020 11:22:43

Inst. ID: LCMSMS02

Client ID: FFS-MW03-1220

Lab ID: VL11001-002

Sample Info: VL11001-002

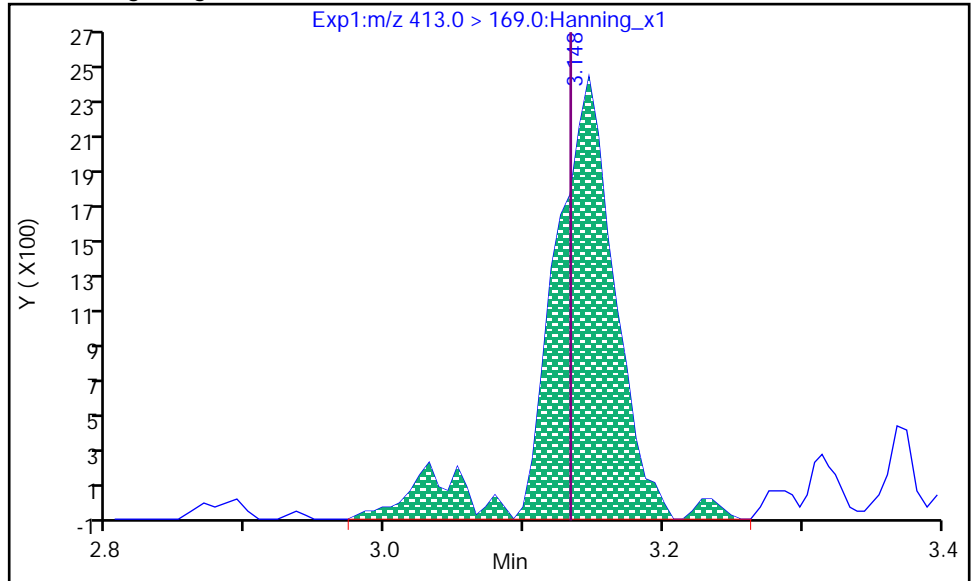
Dil. Factor: 1

Operator: Matthew M. Miller

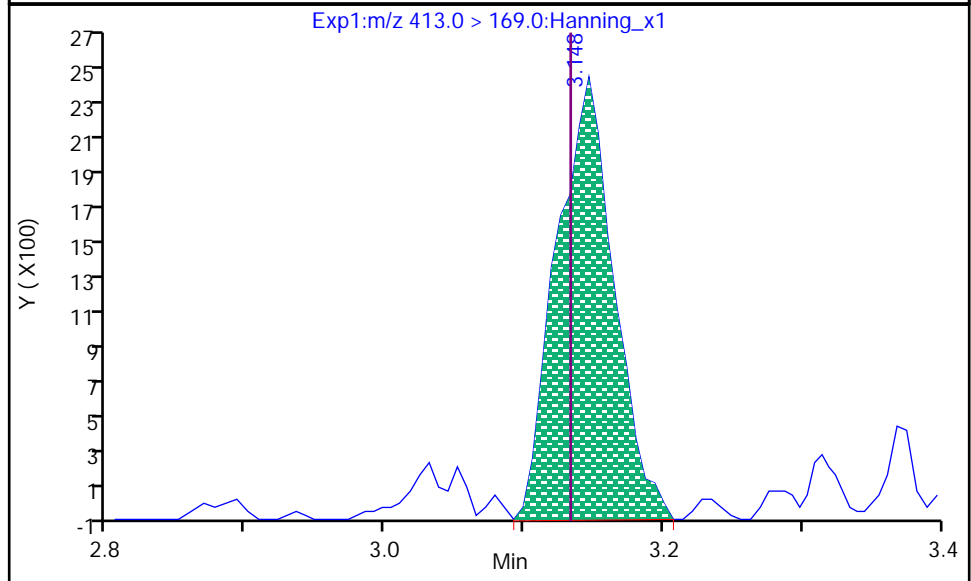
20 PFOA, CAS: 335-67-1

Processing Integration Results

RT: 3.148  
Area: 8000  
Conc: 1.8427  
Conc Units: ng/L



RT: 3.148  
Area: 7020  
Conc: 1.8427  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:12

Audit Action: Mint

Audit Reason: Invalid Integration



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-003</b>
Description: <b>FFS-MW02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1420</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1143	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>7.5</b>	<b>3.8</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>680</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>54</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>28</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>190</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>18</b>		<b>3.8</b>	<b>1.9</b>	<b>0.94</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		82	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d  
Injection Date: 27-Dec-2020 11:43:53 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 6  
Lab Sample ID: VL11001-003 Lab Prep. Batch: 77367  
Client ID: FFS-MW02-1220 Sample Group: VL11001  
Sample Info: VL11001-003 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0414680$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	265	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.696	1.698	0	626856	22	>100:1			1001.00	903.83	98.3	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.702	1.698	1/1	814247	28	64:1			1305.47	54.135		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.077	0	616146	16	>100:1			1001.00	895.71	93.6	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.077	0/0	681792	14	>100:1			1101.68	45.684		M
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.125	2.130	0	208192	16	>100:1			1001.00	904.28	86.8	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.130	0/0	582989	19	>100:1	Target = 3.34		2377.40	98.586		
298.9 > 99	44	2.125	2.130		161935	18	>100:1	3.60 (1.67-5.02)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.414	2.415	0	684694	18	>100:1			1001.00	928.94	95.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.414	2.415	0/0	3038241	15	>100:1	Target = 17.01		4499.04	186.57		M
313 > 119	49	2.414	2.415		157622	17	>100:1	19.27 (8.50-25.52)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.521	2.522	0	1287672	19	>100:1			5005.00	4834.44	97.3	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.522	ND									U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.763	2.773	0	536797	17	>100:1			1001.00	884.86	91.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.763	2.773	0/0	370289	16	73:1	Target = 3.79		665.70	27.605		M
363 > 169	47	2.763	2.773		90191	17	38:1	4.10 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.781	2.782	0	152580	19	>100:1			1001.00	891.09	85.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.781	2.782	0/0	2669033	27	>100:1	Target = 3.80	0.67	16515	684.83		
399 > 99	45	2.781	2.782		765663	28	>100:1	3.48 (1.90-5.71)	0.47				

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.809		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.108	1	109474	23	>100:1			5005.00	5684.48	97.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.107	3.115	0/-1	20851	21	>100:1	Target = 1.77		444.98	18.452		
427 > 81	64	3.121	3.115		11819	20	38:1	1.76 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.134	3.135	0	546800	22	>100:1			1001.00	923.86	92.3	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.134	3.135	0/0	256357	42	70:1	Target = 2.85	1.84	460.35	19.090		
413 > 169	53	3.067	3.135		105513	39	>100:1	2.42 (1.42-4.28)	2.26				M
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.506	3.507	0	129539	19	>100:1			1001.00	864.00	82.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.513	3.500	1/1	67817	62	>100:1	Target = 6.80	0.60	442.24	18.339		M
499 > 99	54	3.520	3.500		19129	35	50:1	3.54 (3.40-10.20)	0.24				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.716		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.318		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.513	3.515	0	684368	22	>100:1			1001.00	911.32	89.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.515		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.849	3.850	0	90960	28	>100:1			5005.00	4903.47	103	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.850		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.857	3.858	0	611386	21	>100:1			1001.00	921.69	96	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.866		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.018	4.019	0	710068	18	>100:1			5005.00	4946.85	97.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.019		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.169	4.171	0	626966	19	>100:1			5005.00	4720.61	90.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.180		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.169	4.171	0	528404	17	>100:1			1001.00	835.98	84.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.171		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.446	4.438	1	533015	20	>100:1			1001.00	880.56	93.3	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.438		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.673		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.897	4.890	1	653513	19	>100:1			1001.00	775.74	78.8	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.890		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.857	3.858	0	615447	18	>100:1					90.8	

Data File: \\ORGANICS\ILL\LCMSMS02.1\122720-DOD.b\122720013.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.414	2.415	0	681455	18	>100:1					94.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.141	3.135	1	569152	23	>100:1					94.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.698	0	608947	22	>100:1					101	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.513	3.507	1	150546	21	>100:1					92	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

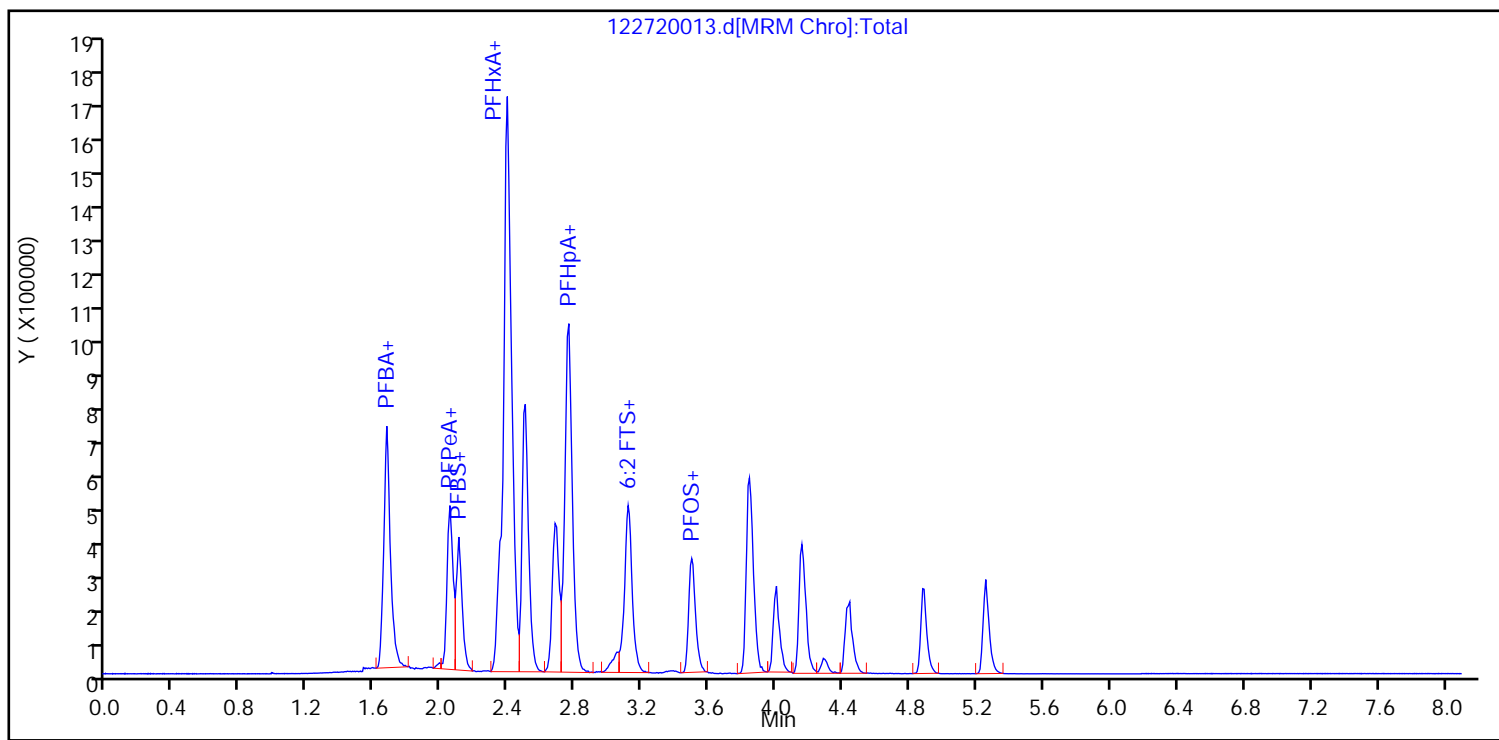
Client ID: FFS-MW02-1220

Lab ID: VL11001-003

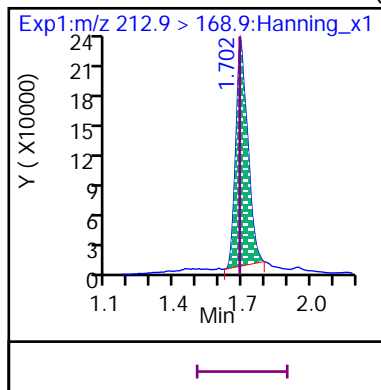
Sample Info: VL11001-003

Dil. Factor: 1

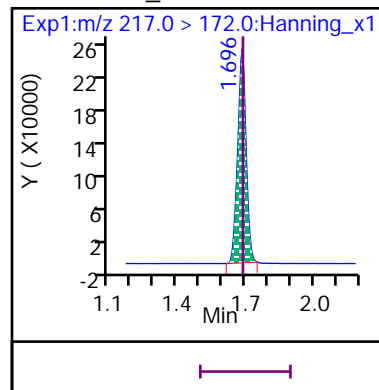
Operator: Matthew M. Miller



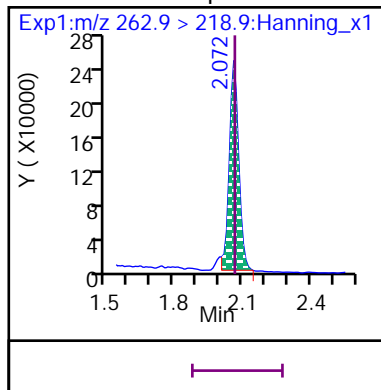
8 Perfluoro-n-butanoic acid (PFBA)



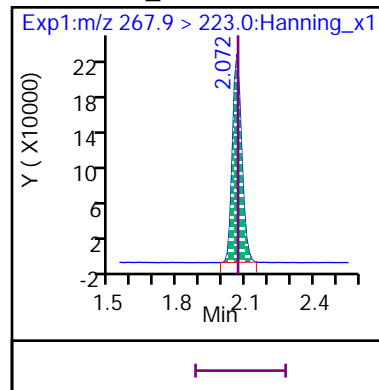
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)



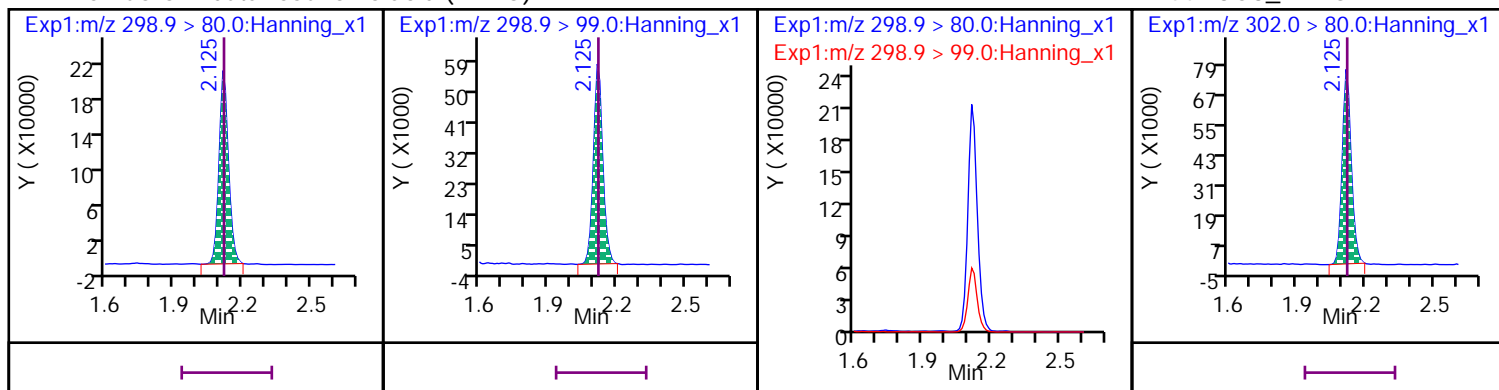
D 50 13C5\_PFPeA





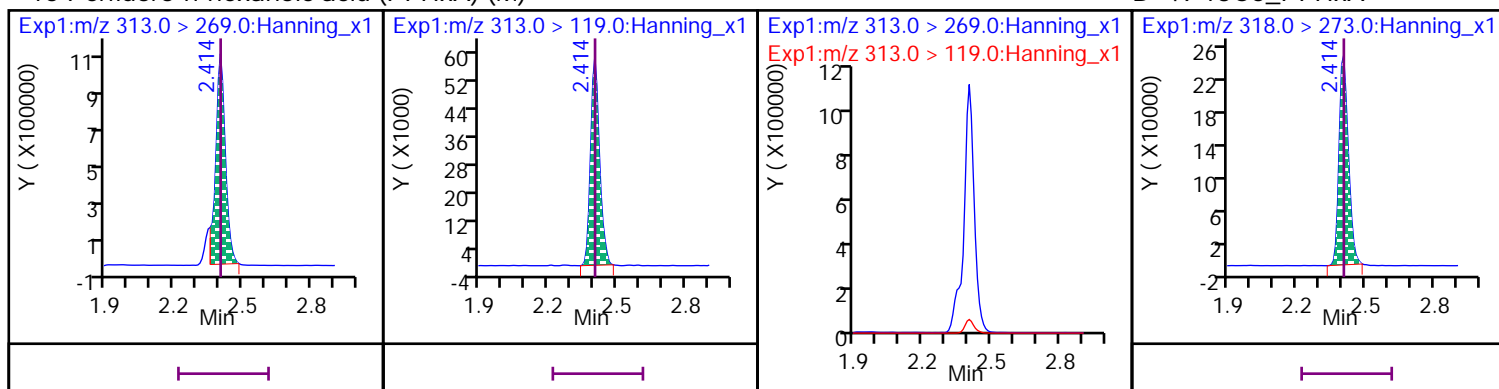
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



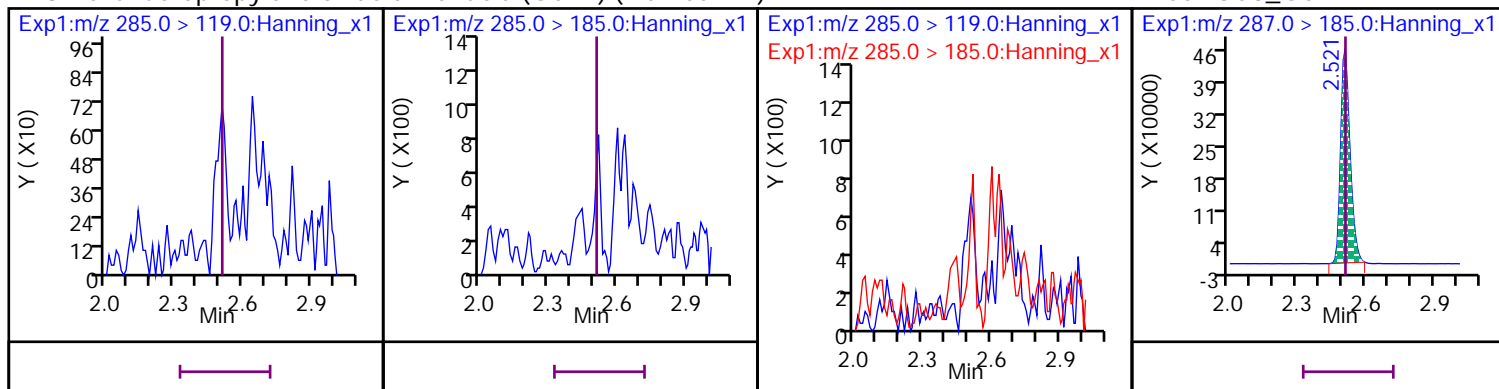
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



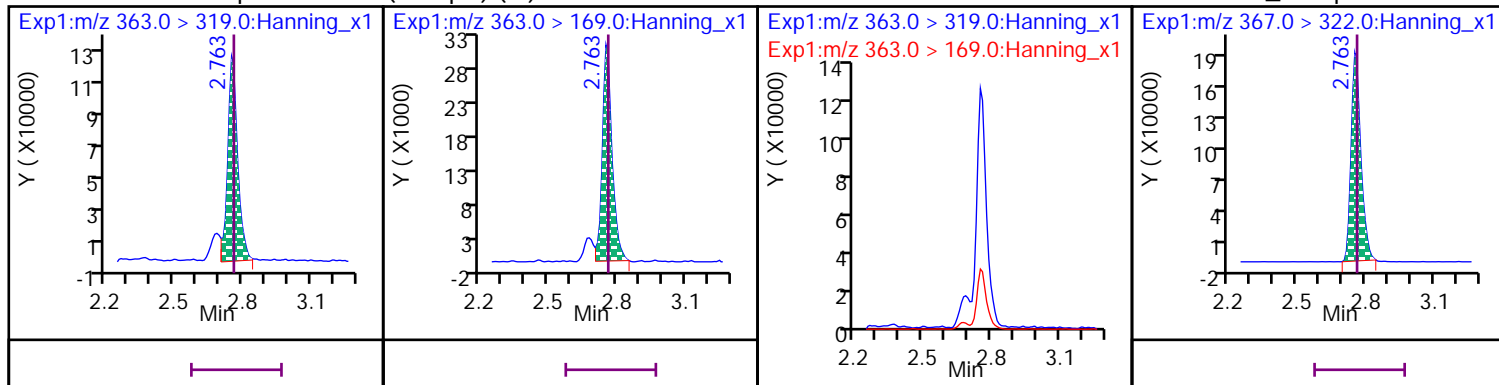
## 28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



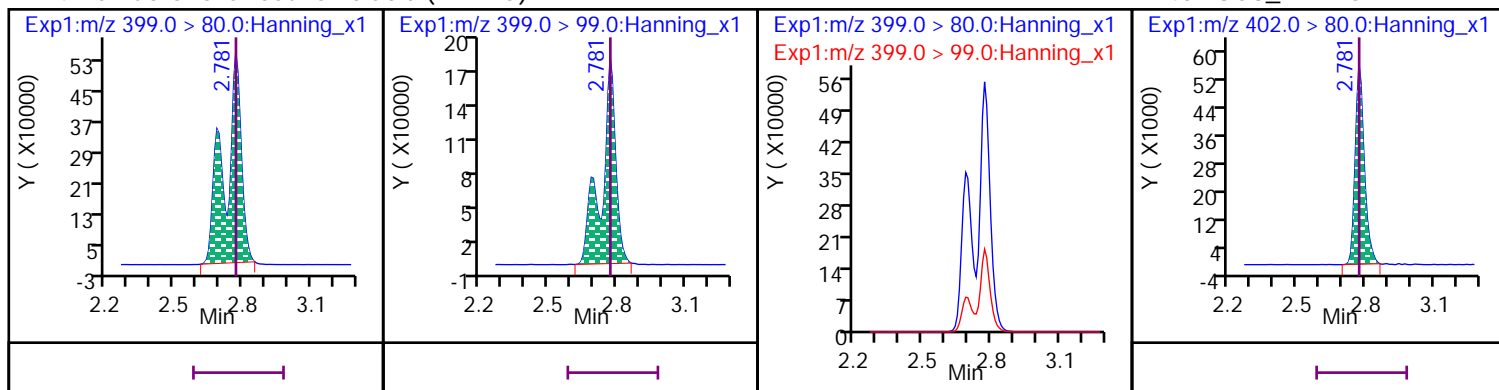
## 13 Perfluoro-n-heptanoic acid (PFHpA) (M)

D 47 13C4\_PFHpA



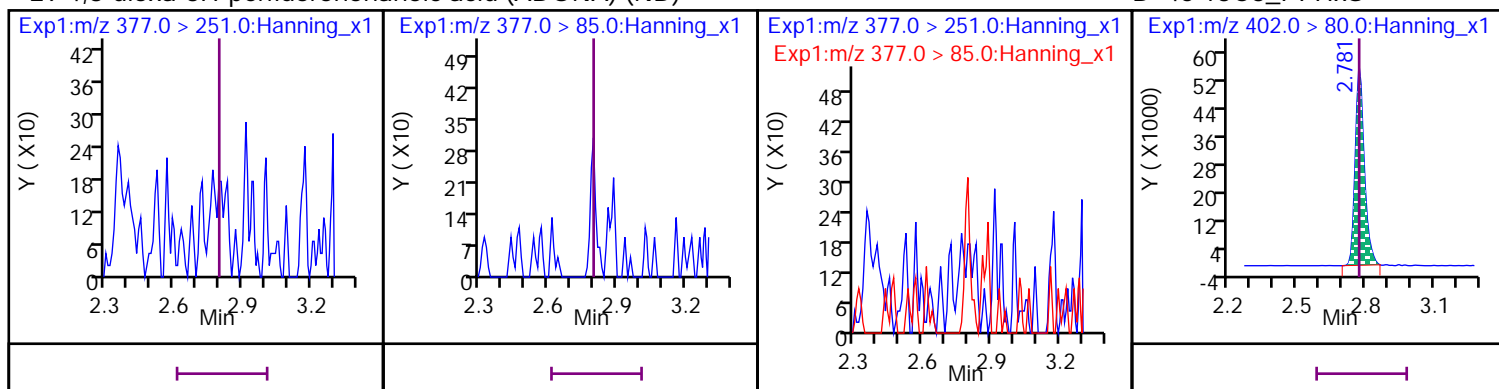
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



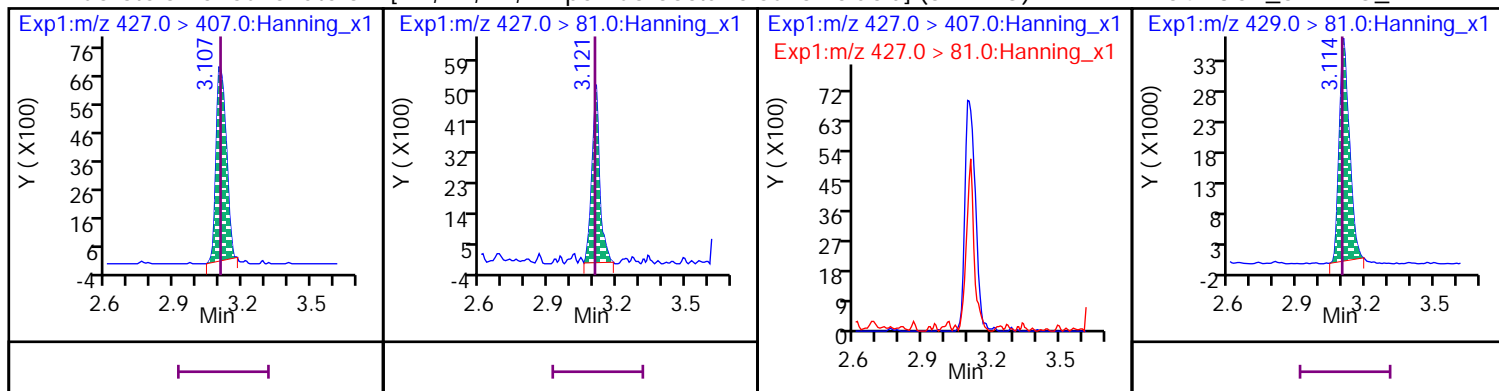
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



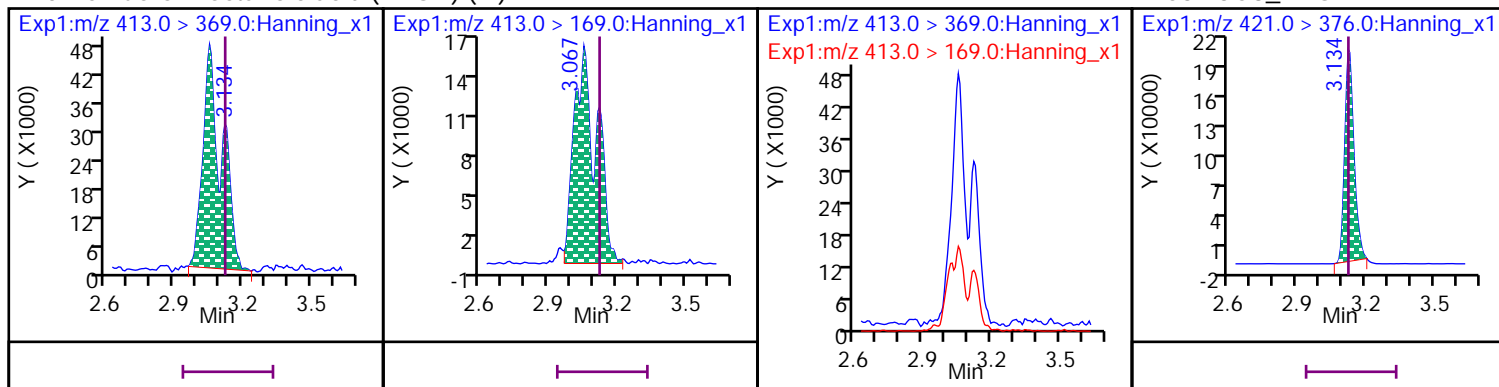
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



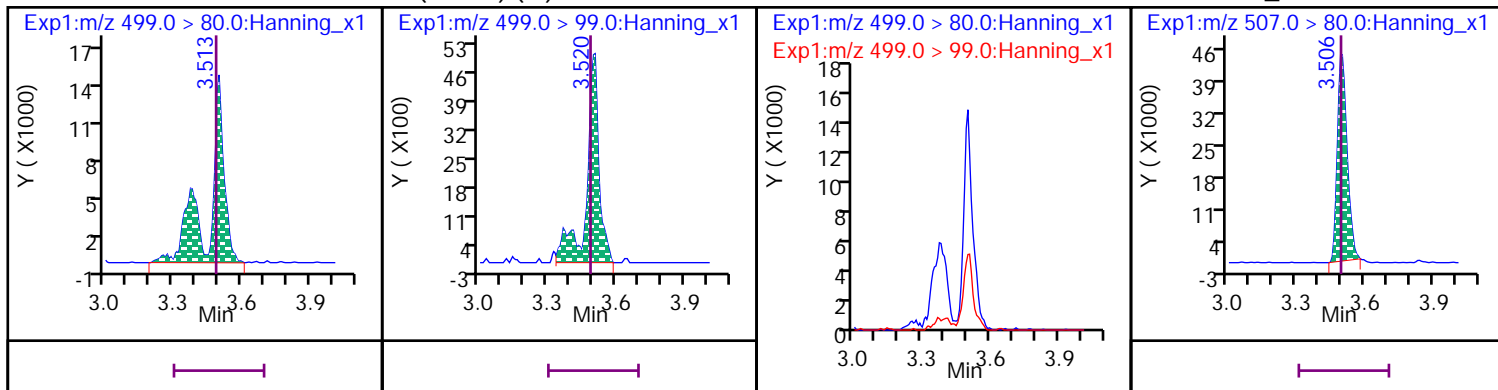
## 20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



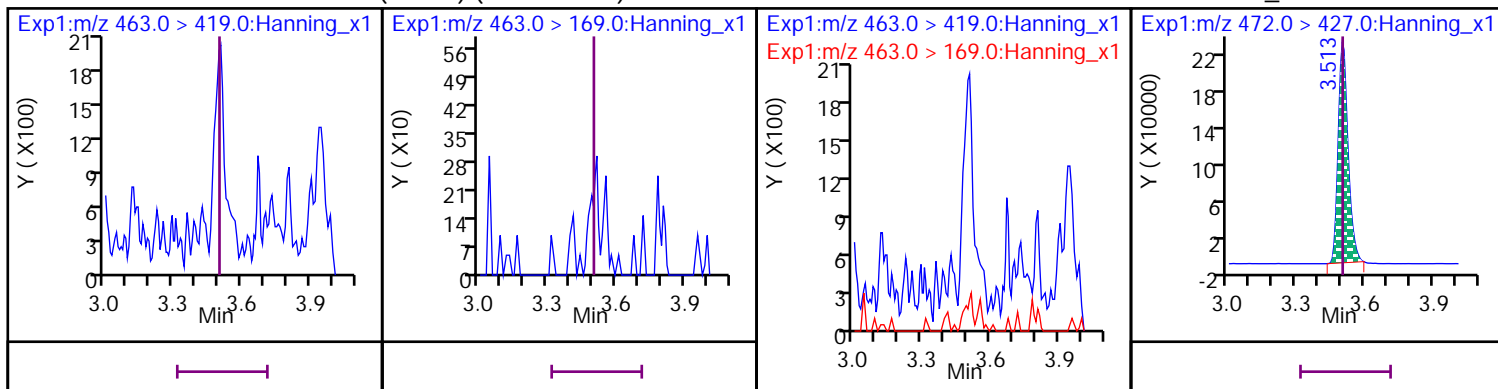
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



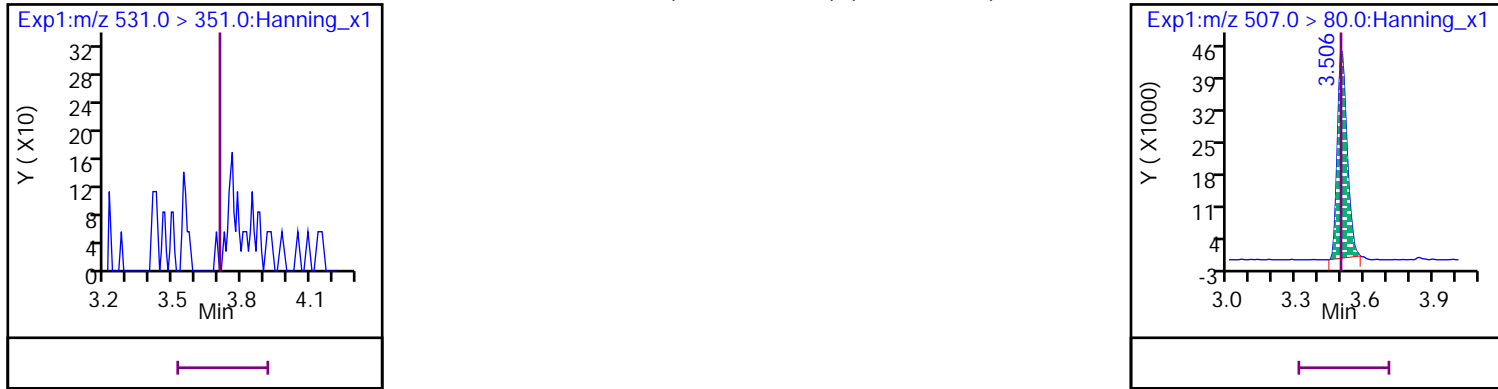
17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



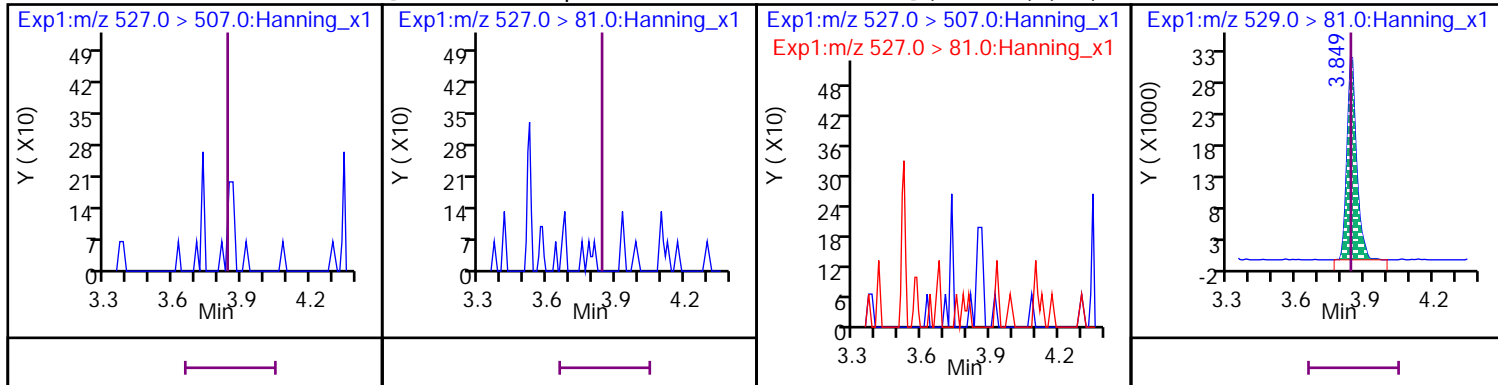
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



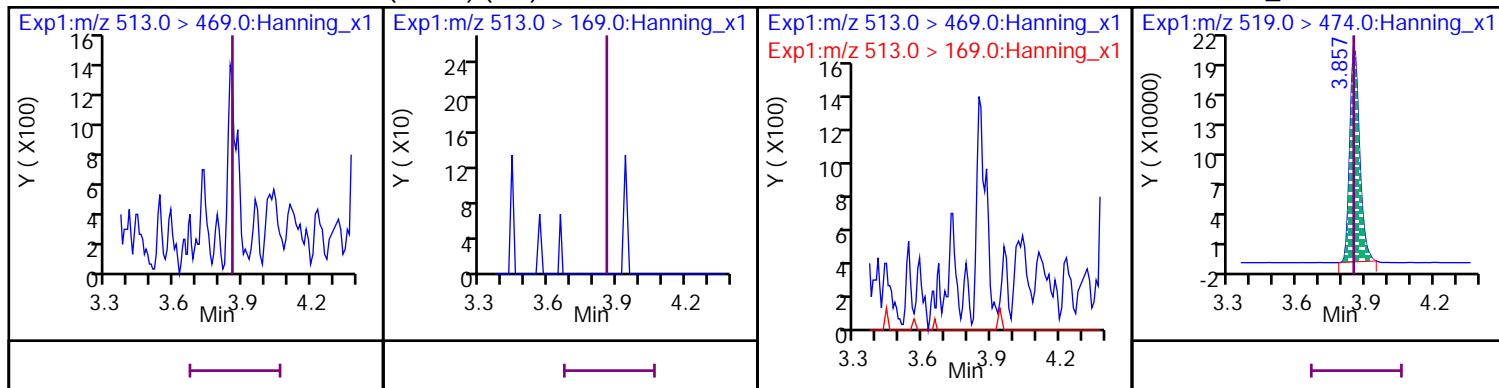
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



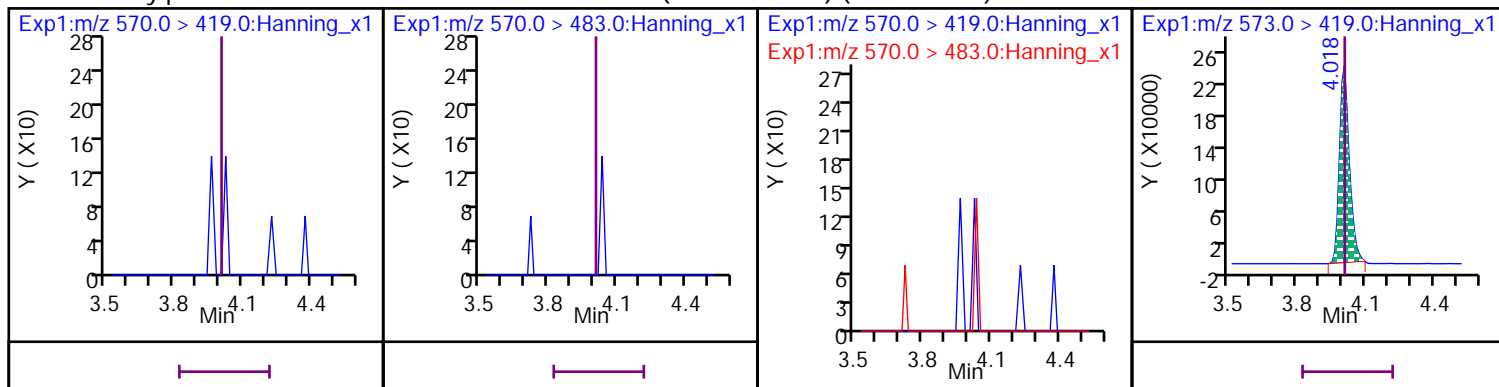
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



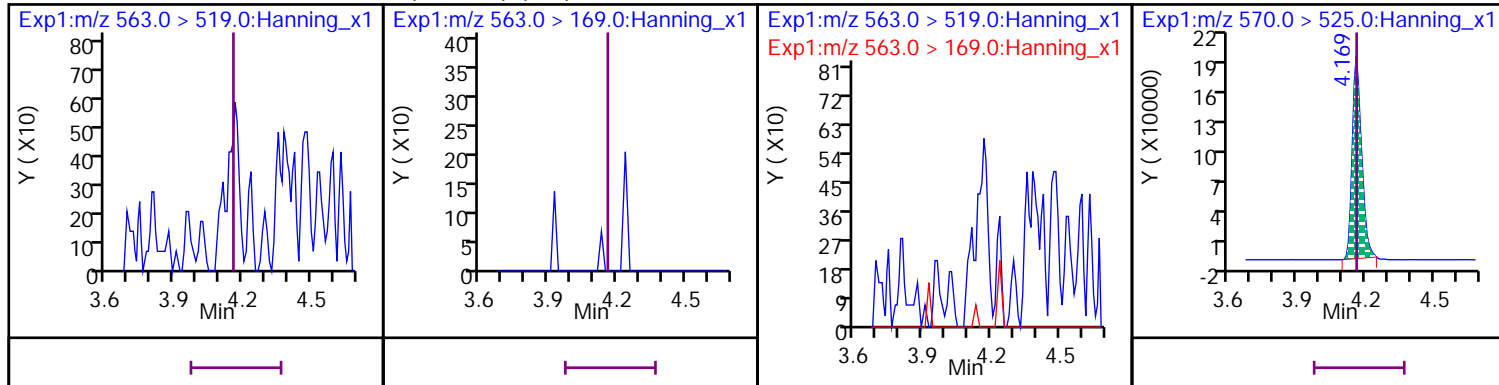
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



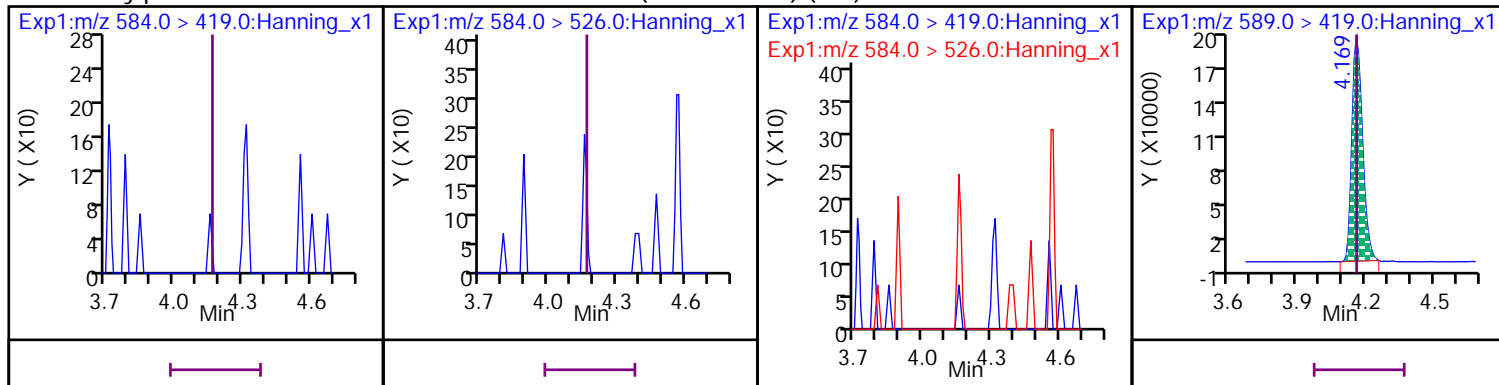
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

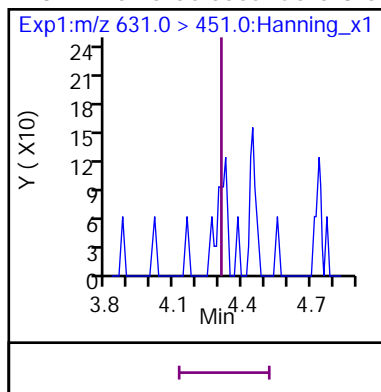


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

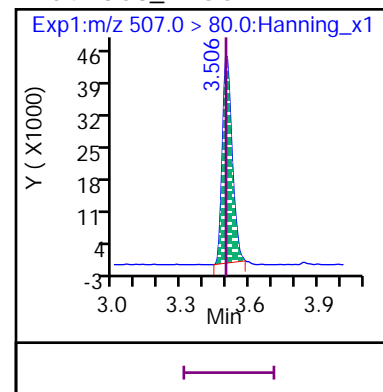
D 60 d5-EtFOSAA



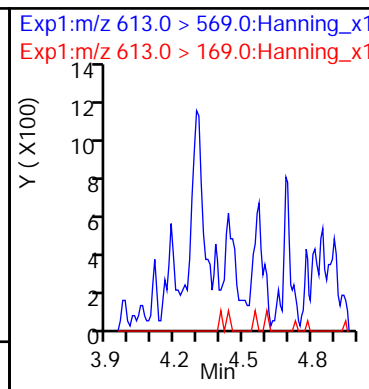
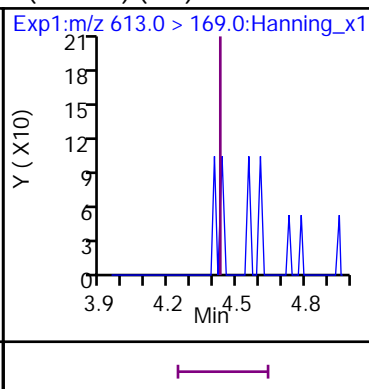
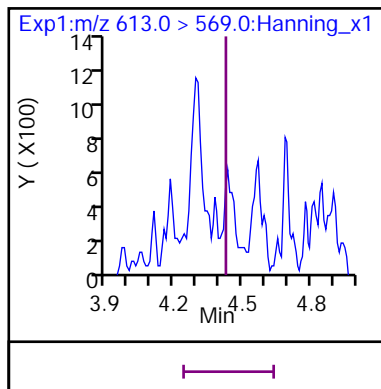
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



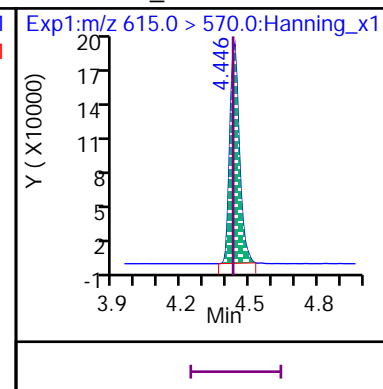
D 54 13C8\_PFOS



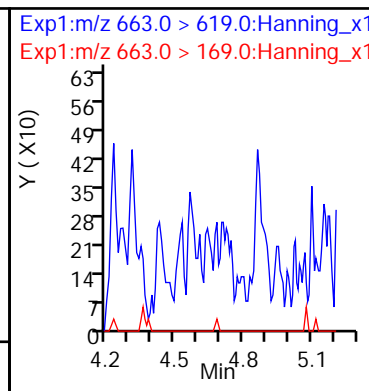
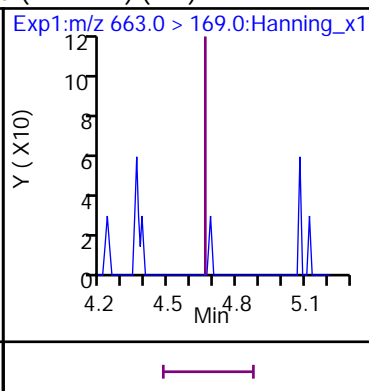
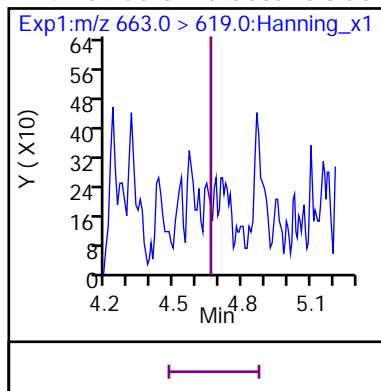
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



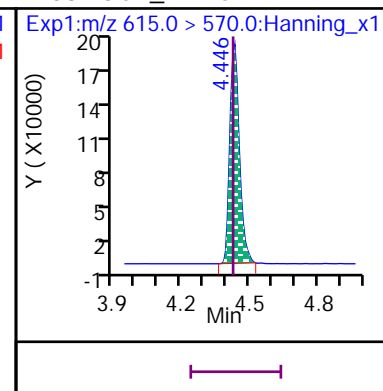
D 38 13C2\_PFDoA



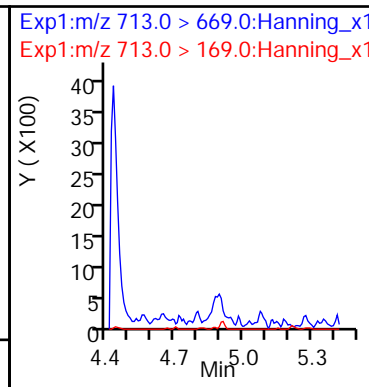
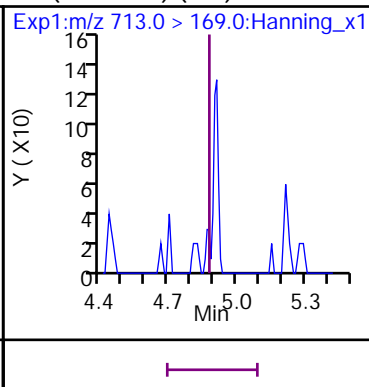
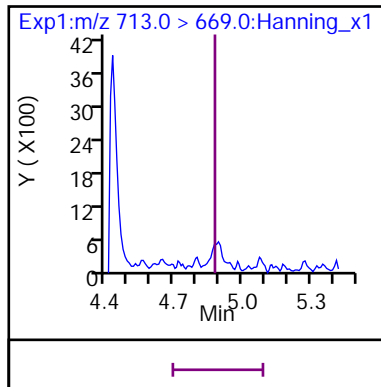
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



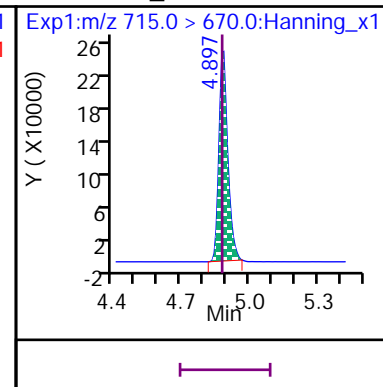
D 38 13C2\_PFTeDA



23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

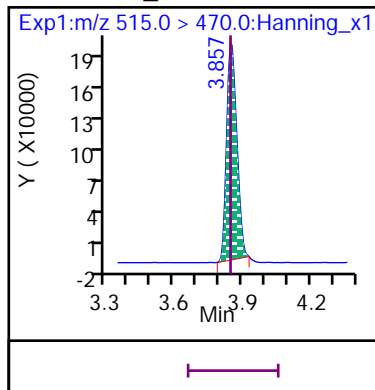


D 42 13C2\_PFTeDA

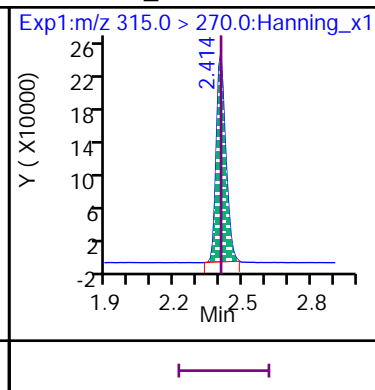




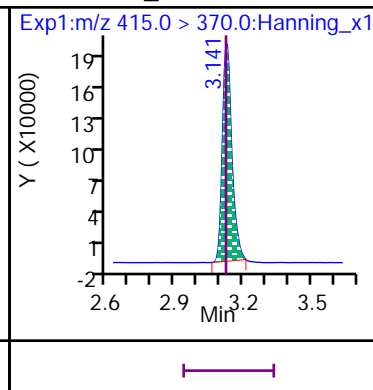
\* 37 13C2\_PFDA



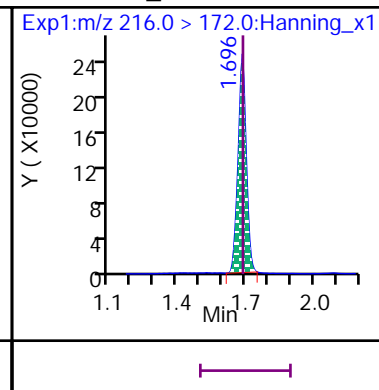
\* 39 13C2\_PFHxA



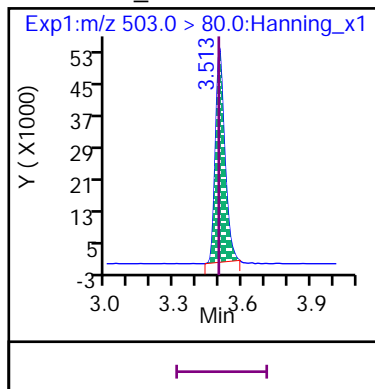
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

Client ID: FFS-MW02-1220

Lab ID: VL11001-003

Sample Info: VL11001-003

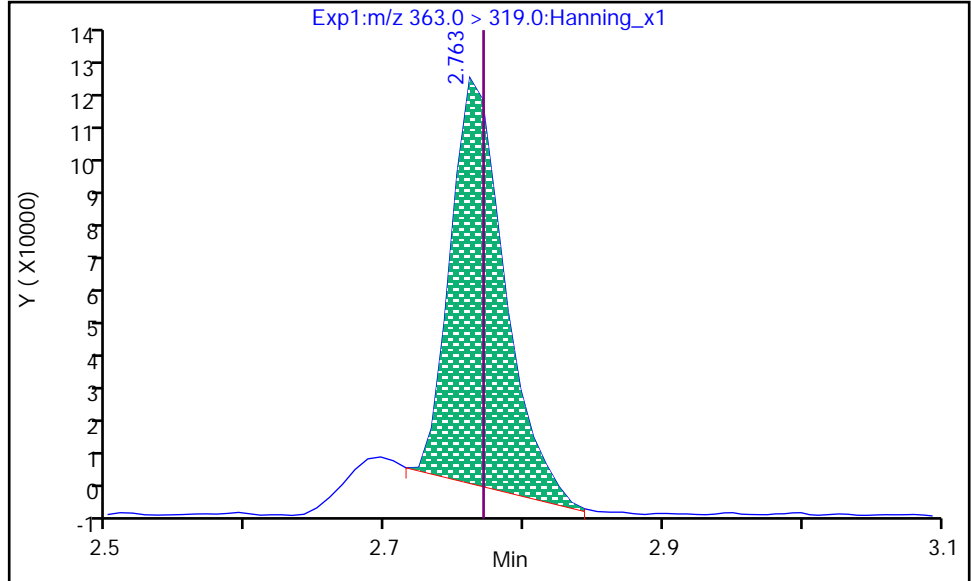
Dil. Factor: 1

Operator: Matthew M. Miller

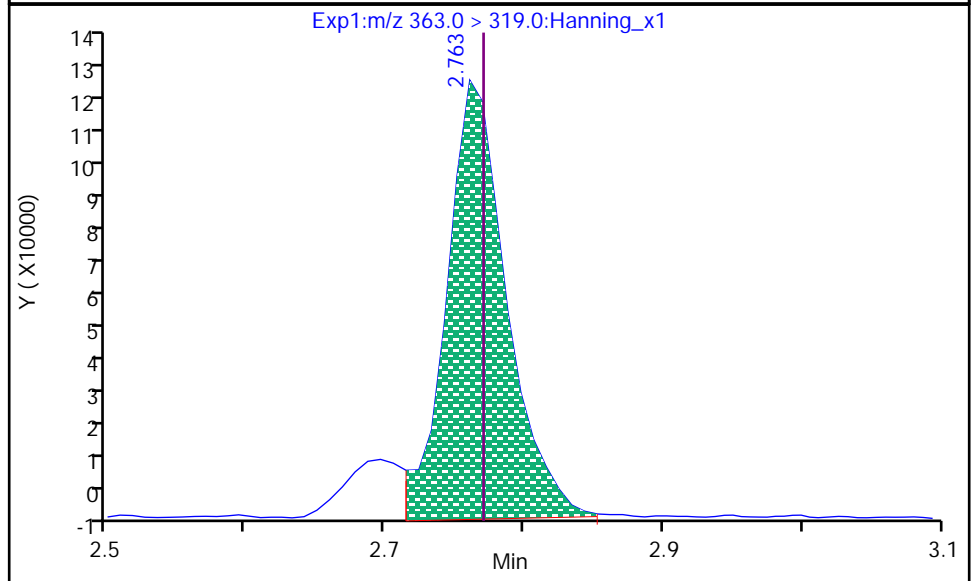
13 PFHpA, CAS: 375-85-9

RT: 2.763  
Area: 311634  
Conc: 23.232  
Conc Units: ng/L

Processing Integration Results



RT: 2.763  
Area: 370289  
Conc: 27.605  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:47:50

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

Client ID: FFS-MW02-1220

Lab ID: VL11001-003

Sample Info: VL11001-003

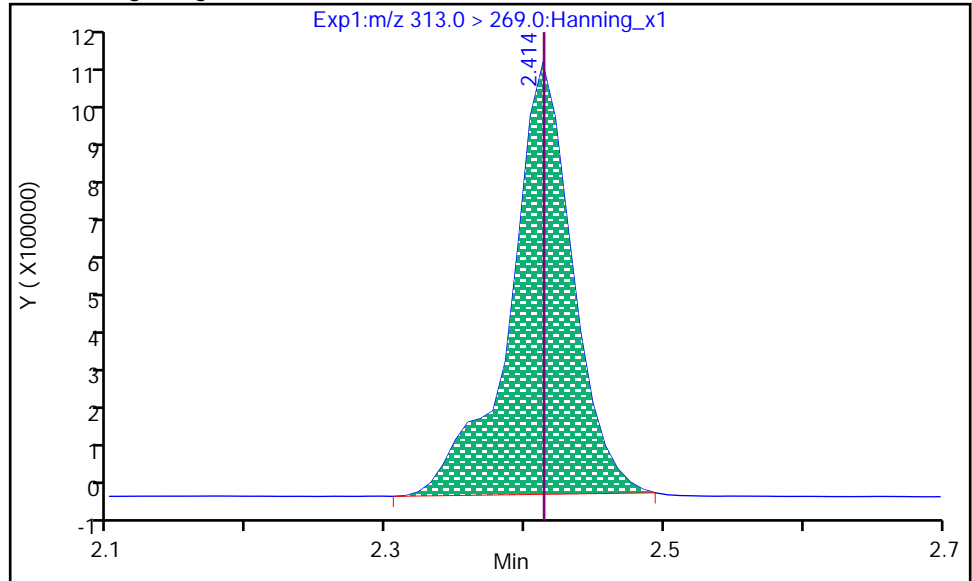
Dil. Factor: 1

Operator: Matthew M. Miller

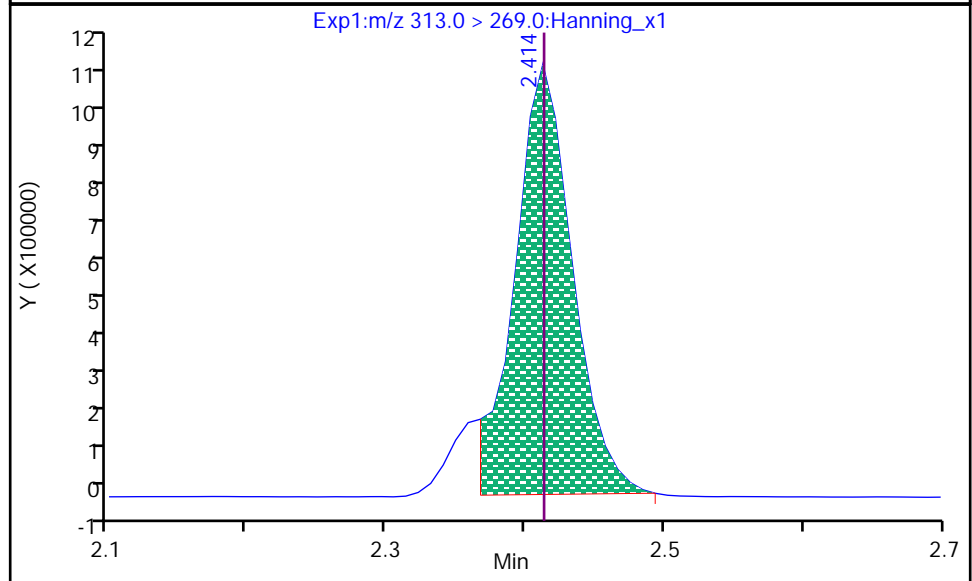
15 PFHxA, CAS: 307-24-4

RT: 2.414  
Area: 3328538  
Conc: 204.39  
Conc Units: ng/L

Processing Integration Results



RT: 2.414  
Area: 3038241  
Conc: 186.57  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:47:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

Client ID: FFS-MW02-1220

Lab ID: VL11001-003

Sample Info: VL11001-003

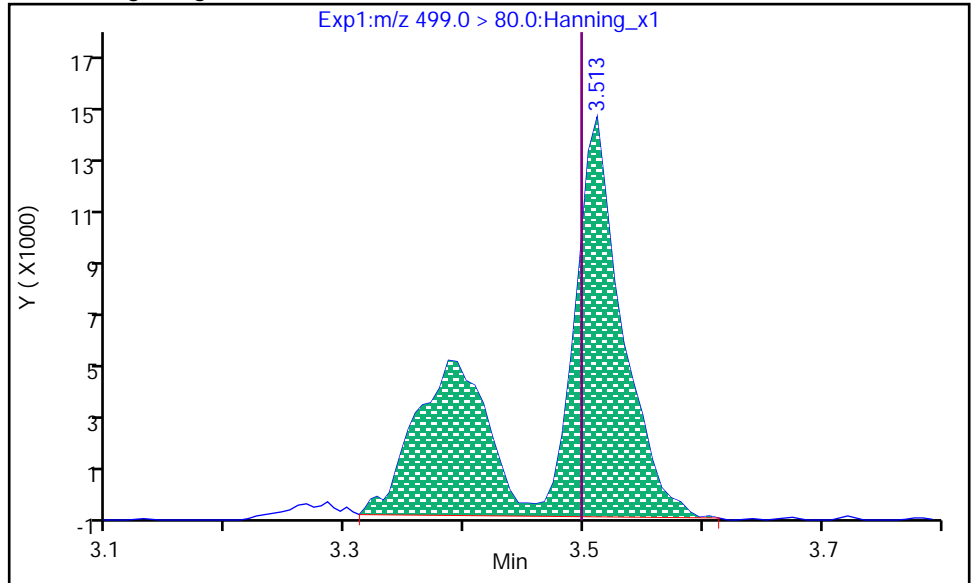
Dil. Factor: 1

Operator: Matthew M. Miller

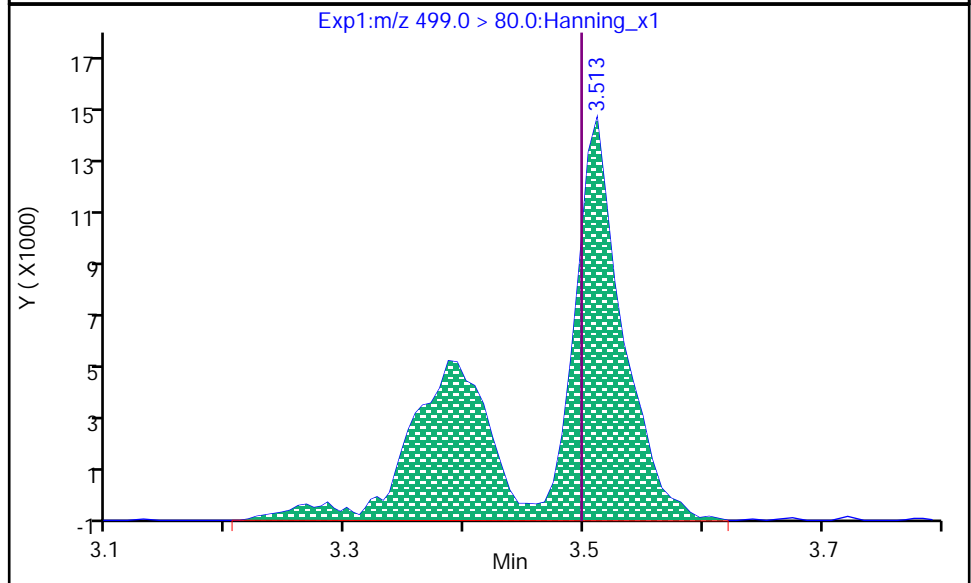
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.513  
Area: 63158  
Conc: 17.079  
Conc Units: ng/L



RT: 3.513  
Area: 67817  
Conc: 18.339  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:48:09

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

Client ID: FFS-MW02-1220

Lab ID: VL11001-003

Sample Info: VL11001-003

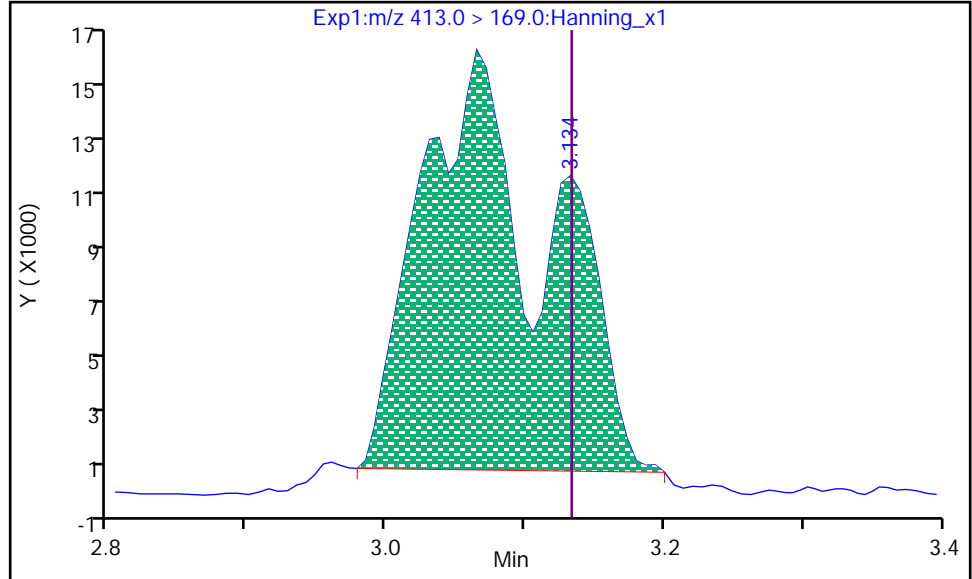
Dil. Factor: 1

Operator: Matthew M. Miller

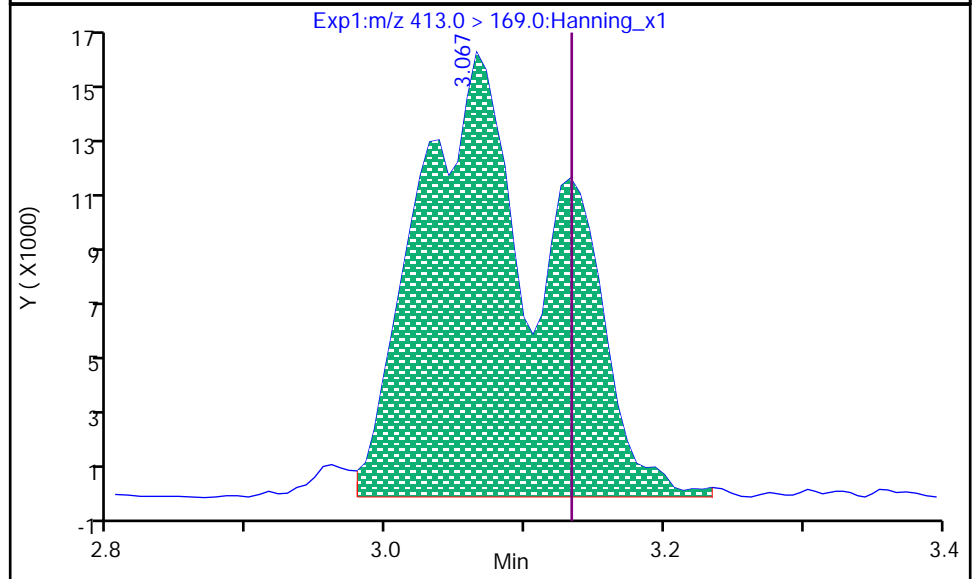
20 PFOA, CAS: 335-67-1

RT: 3.134  
Area: 93638  
Conc: 19.090  
Conc Units: ng/L

Processing Integration Results



RT: 3.067  
Area: 105513  
Conc: 19.090  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:48:02

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720013.d

Injection Date: 27-Dec-2020 11:43:53

Inst. ID: LCMSMS02

Client ID: FFS-MW02-1220

Lab ID: VL11001-003

Sample Info: VL11001-003

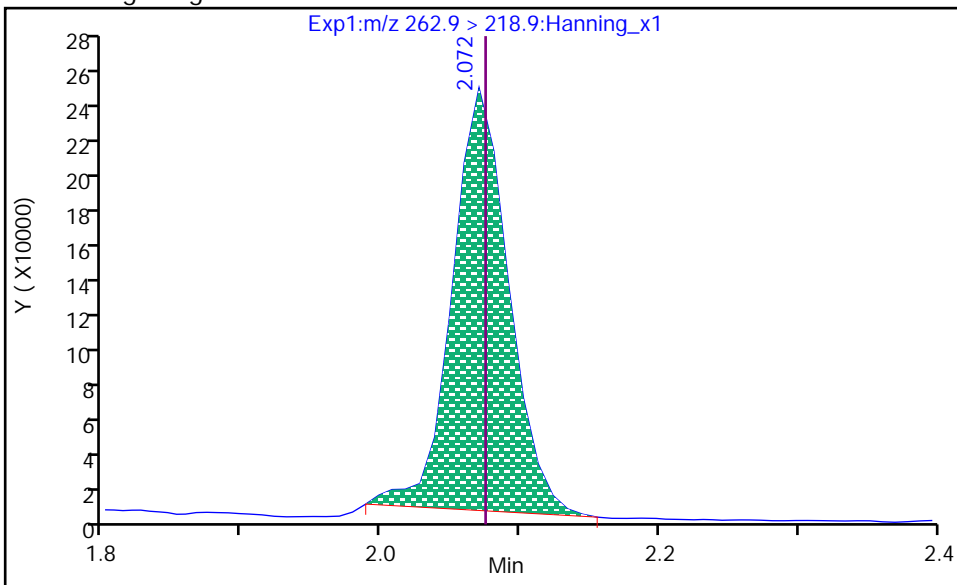
Dil. Factor: 1

Operator: Matthew M. Miller

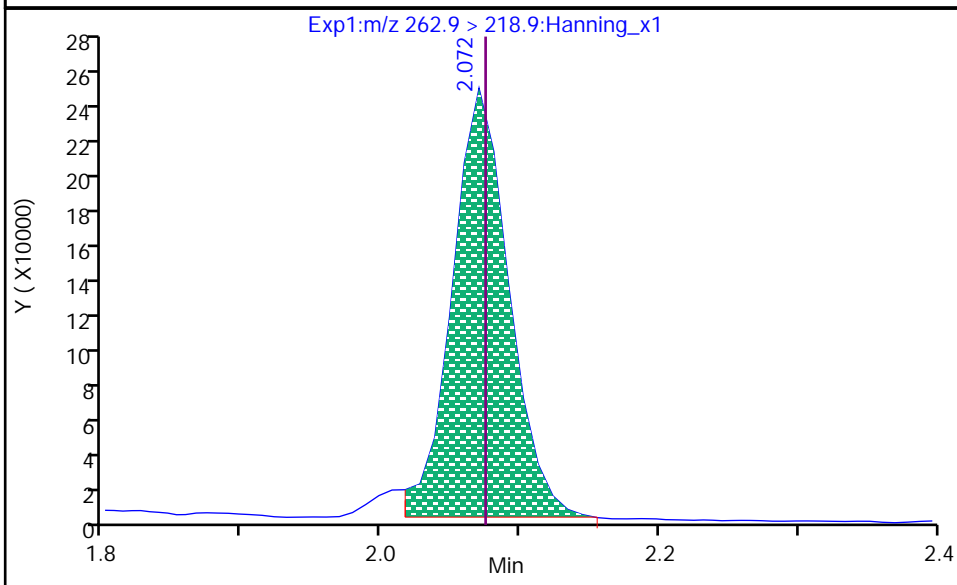
21 PFPeA, CAS: 2706-90-3

Processing Integration Results

RT: 2.072  
Area: 670139  
Conc: 44.904  
Conc Units: ng/L



RT: 2.072  
Area: 681792  
Conc: 45.684  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:47:32

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-004</b>
Description: <b>FD01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1154	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>		<b>7.7</b>	<b>3.9</b>	<b>1.9</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>720</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>55</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>200</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>46</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.9</b>	<b>2.0</b>	<b>0.97</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		93	50-150
13C2_8:2FTS		103	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		89	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBa		101	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		95	50-150
13C6_PFDa		99	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		93	50-150
13C8_PFOs		88	50-150
13C9_PFNa		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720014.d  
Injection Date: 27-Dec-2020 11:54:28 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 7  
Lab Sample ID: VL11001-004 Lab Prep. Batch: 77367  
Client ID: FD01-1220 Sample Group: VL11001  
Sample Info: VL11001-004 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0424286$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	259	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.698	0	643859	22	>100:1			1001.00	928.35	101	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.698	1/1	827770	32	64:1			1292.10	54.822		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	626578	17	>100:1			1001.00	910.88	95.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	677490	14	>100:1			1076.50	45.675		M
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	213779	16	>100:1			1001.00	928.54	89.2	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	1/0	558139	17	>100:1	Target = 3.34		2216.58	94.046		
298.9 > 99	44	2.130	2.130		160343	18	>100:1	3.48 (1.67-5.02)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.415	1	659787	17	>100:1			1001.00	895.15	91.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.415	1/0	2995454	16	>100:1	Target = 17.01		4603.13	195.30		
313 > 119	49	2.416	2.415		147804	18	>100:1	20.26 (8.50-25.52)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.522	1	1288267	18	>100:1			5005.00	4836.67	97.3	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.522	ND									U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.764	2.773	0	564266	18	>100:1			1001.00	930.14	96.3	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.773	1/1	365093	16	72:1	Target = 3.79		624.40	26.493		
363 > 169	47	2.764	2.773		87202	16	52:1	4.18 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	1	159481	18	>100:1			1001.00	931.39	89.4	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	1/0	2860183	28	>100:1	Target = 3.80	0.65	16932	718.38		
399 > 99	45	2.782	2.782		762346	27	>100:1	3.75 (1.90-5.71)	0.44				

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.809		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	103795	21	>100:1			5005.00	5389.60	92.8	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.109	3.115	0/-1	17462	21	>100:1	Target = 1.77		389.65	16.532		
427 > 81	64	3.115	3.115		10252	20	24:1	1.70 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	1	548276	22	>100:1			1001.00	926.35	92.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.135	1/0	255405	38	>100:1	Target = 2.85	1.83	457.40	19.407		
413 > 169	53	3.135	3.135		103035	41	92:1	2.47 (1.42-4.28)	2.14				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	138025	19	>100:1			1001.00	920.60	87.7	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.500	1/1	71984	59	>100:1	Target = 6.80	0.52	440.55	18.692		M
499 > 99	54	3.514	3.500		17936	43	>100:1	4.01 (3.40-10.20)	0.27				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.716		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.318		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.514	3.515	0	715481	22	>100:1			1001.00	952.75	94	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.515		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.850	3.850	0	90606	20	>100:1			5005.00	4884.38	103	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.850		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	0	631889	20	>100:1			1001.00	952.60	99.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.866		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	732112	20	>100:1			5005.00	5100.43	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.019		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	0	647488	17	>100:1			5005.00	4875.12	93.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.180		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	0	585902	19	>100:1			1001.00	926.95	93.6	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.171		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.438	4.438	0	535293	19	>100:1			1001.00	884.32	93.7	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.438		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.673		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.899	4.890	1	648042	19	>100:1			1001.00	769.24	78.2	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.890		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.858	1	707733	20						104	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	715640	20	>100:1					99.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	1	609691	23	>100:1					101	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	669480	23	>100:1					111	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.507	1	168275	21	>100:1					103	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720014.d

Injection Date: 27-Dec-2020 11:54:28

Inst. ID: LCMSMS02

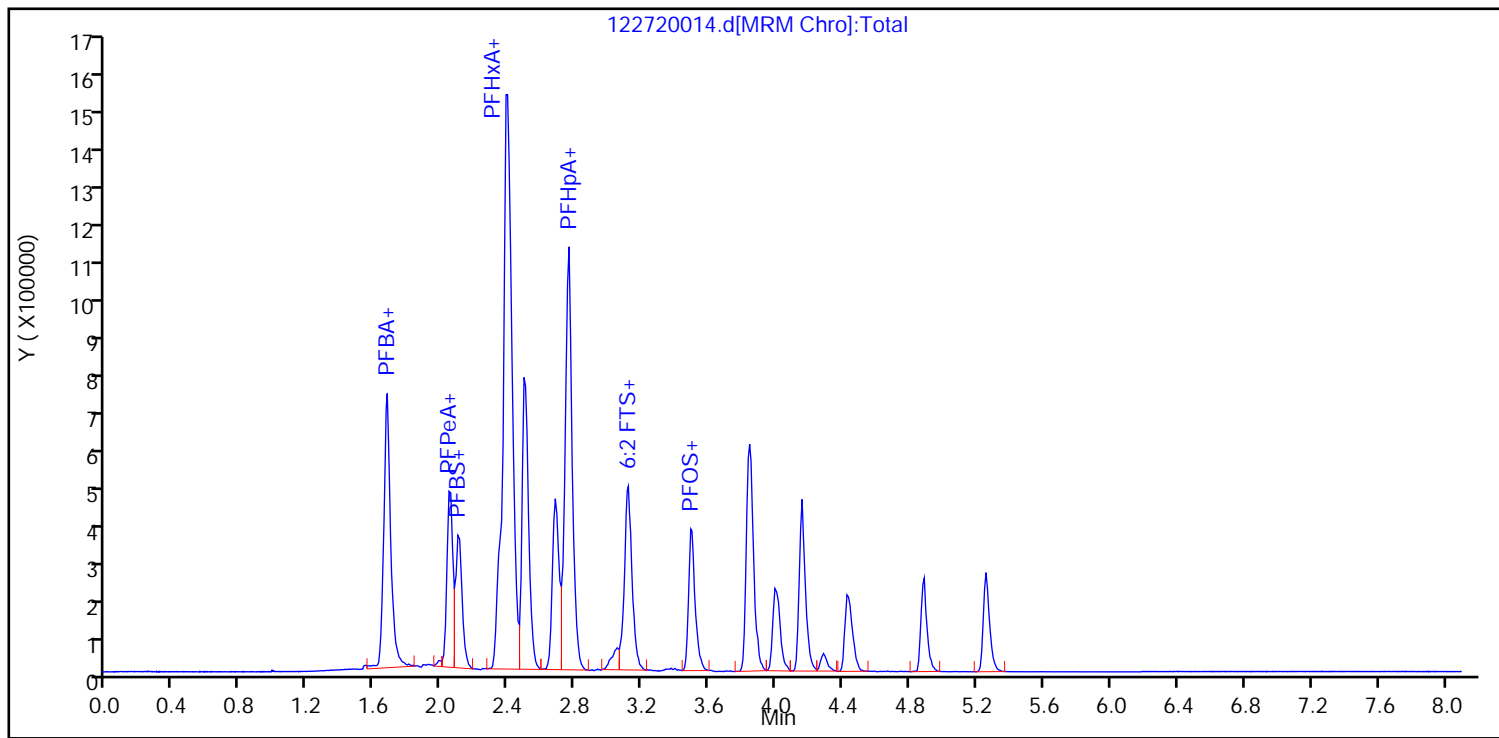
Client ID: FD01-1220

Lab ID: VL11001-004

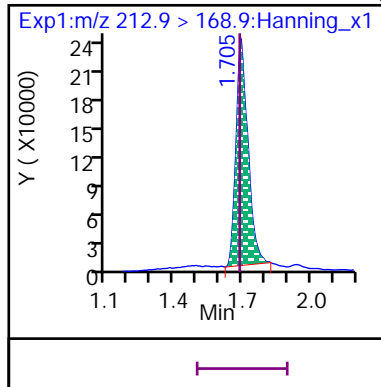
Sample Info: VL11001-004

Dil. Factor: 1

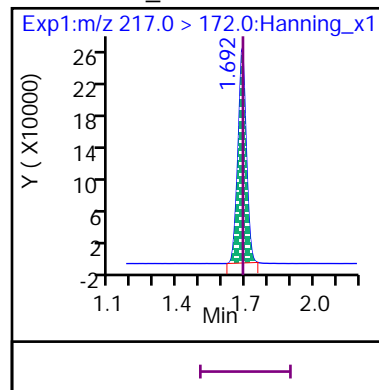
Operator: Matthew M. Miller



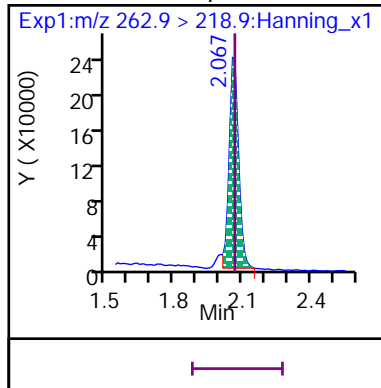
8 Perfluoro-n-butanoic acid (PFBA)



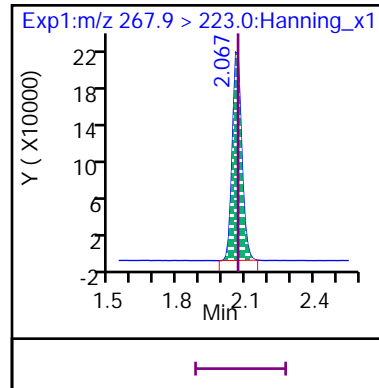
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

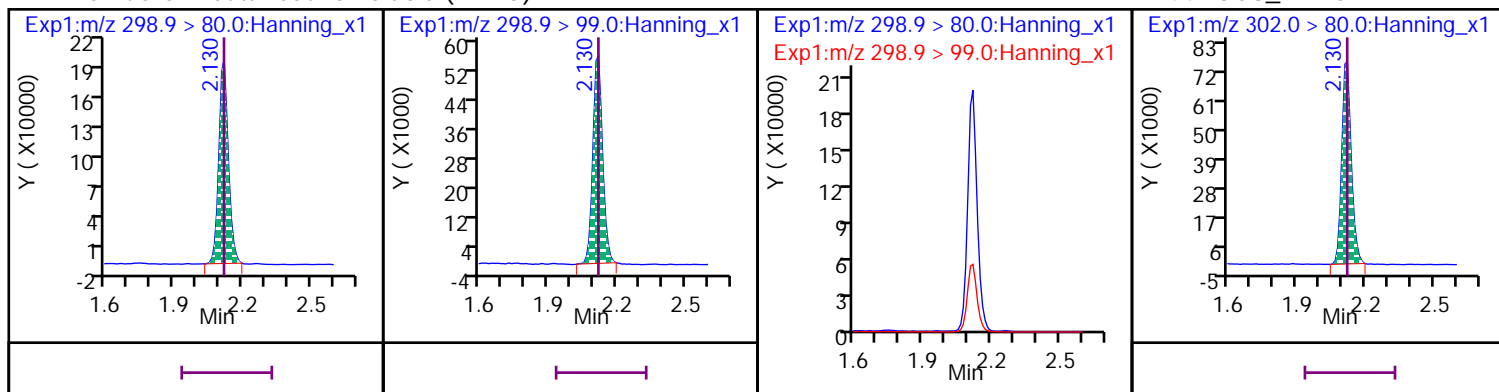


D 50 13C5\_PFPeA



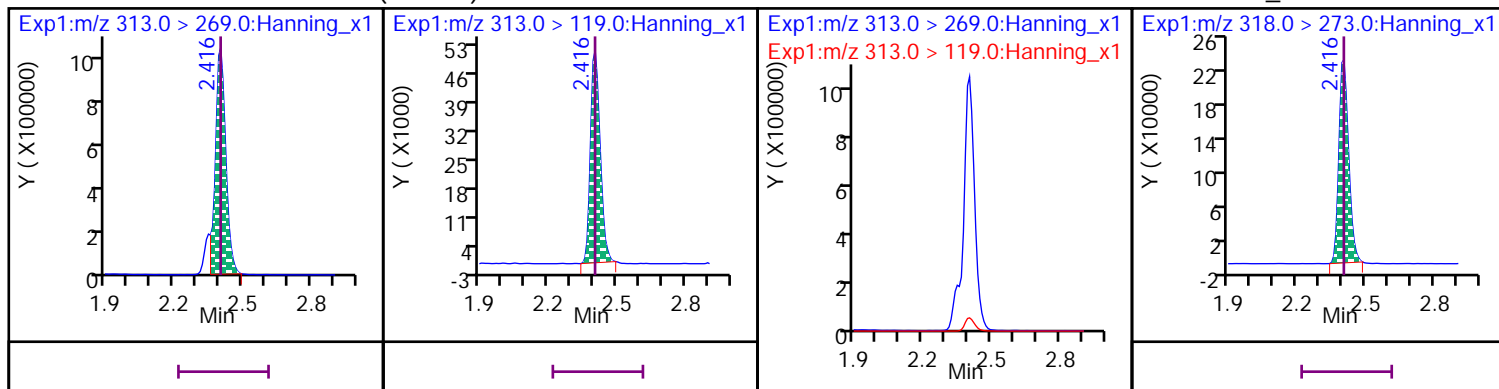
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



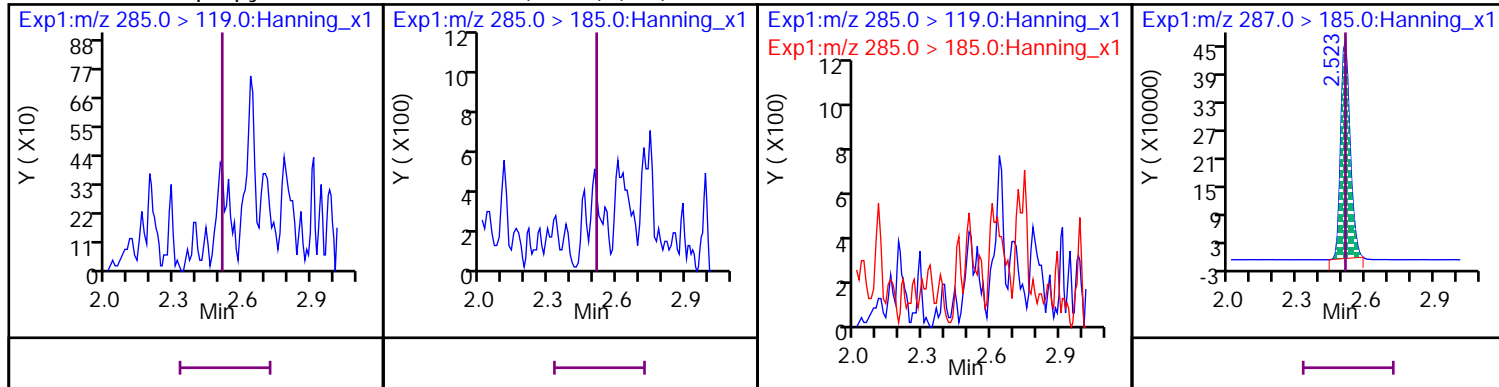
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



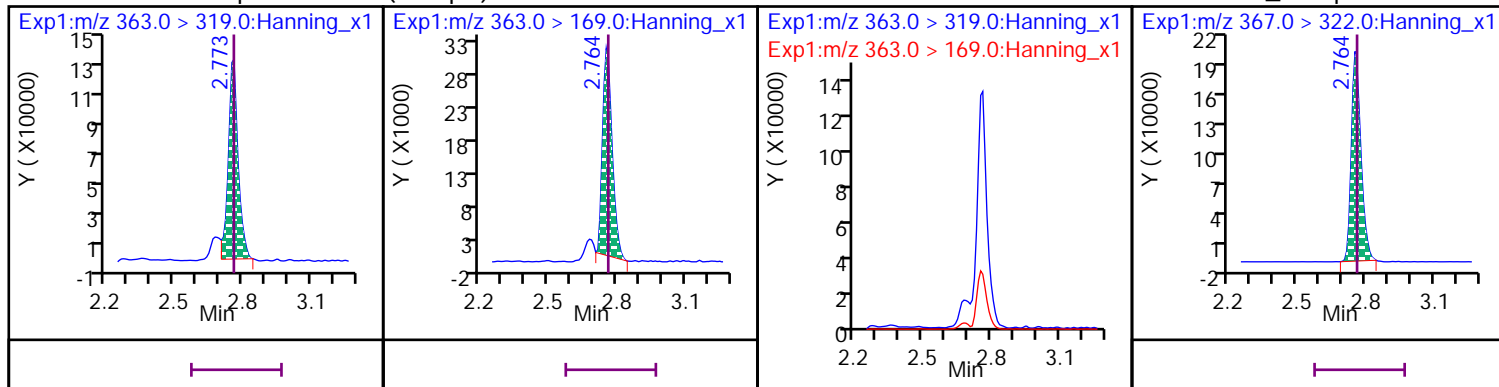
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



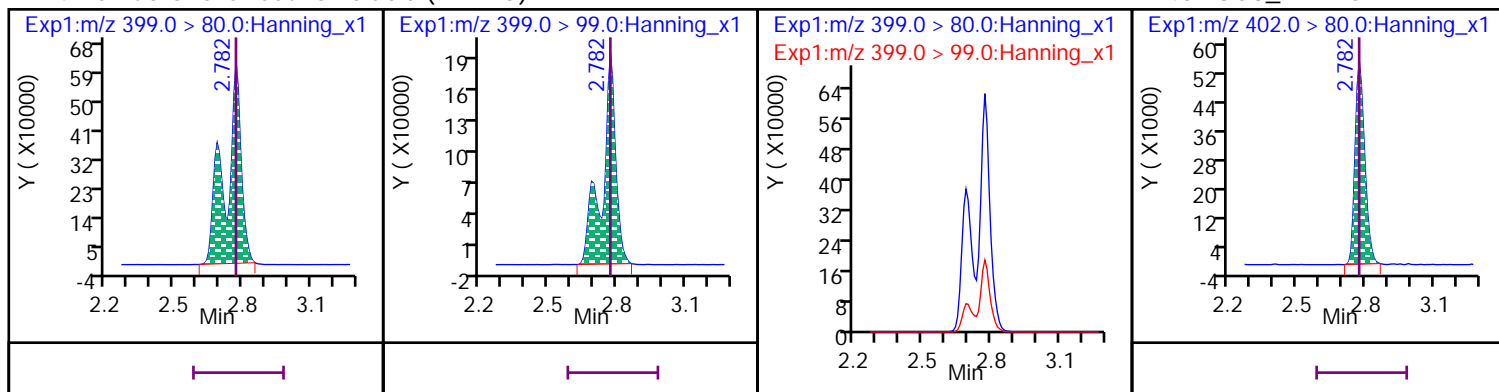
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



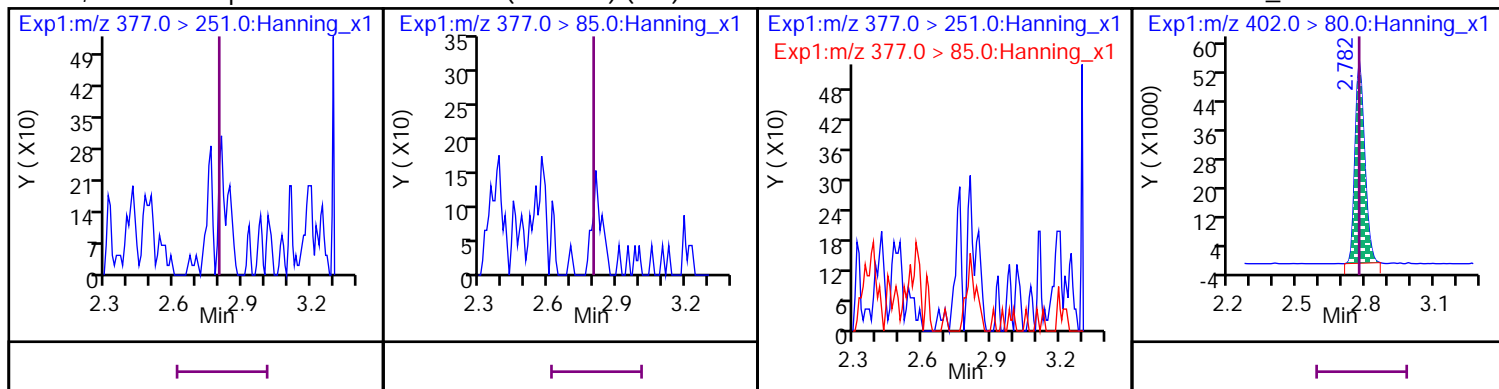
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



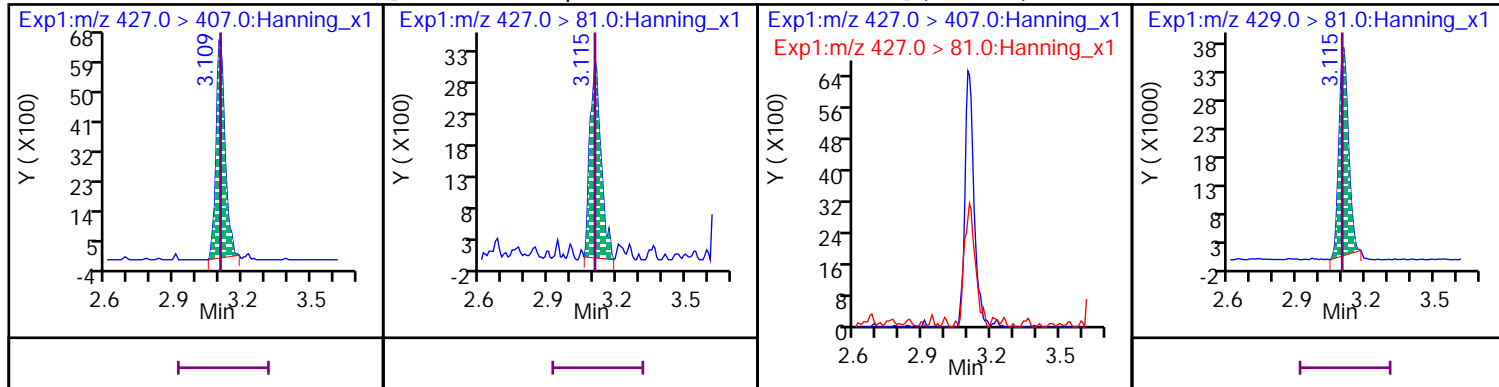
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



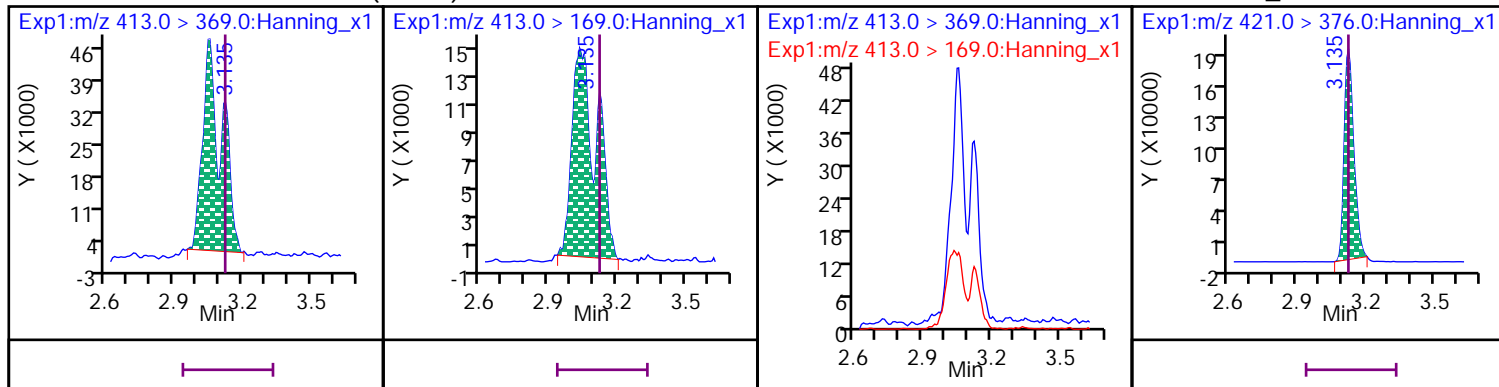
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



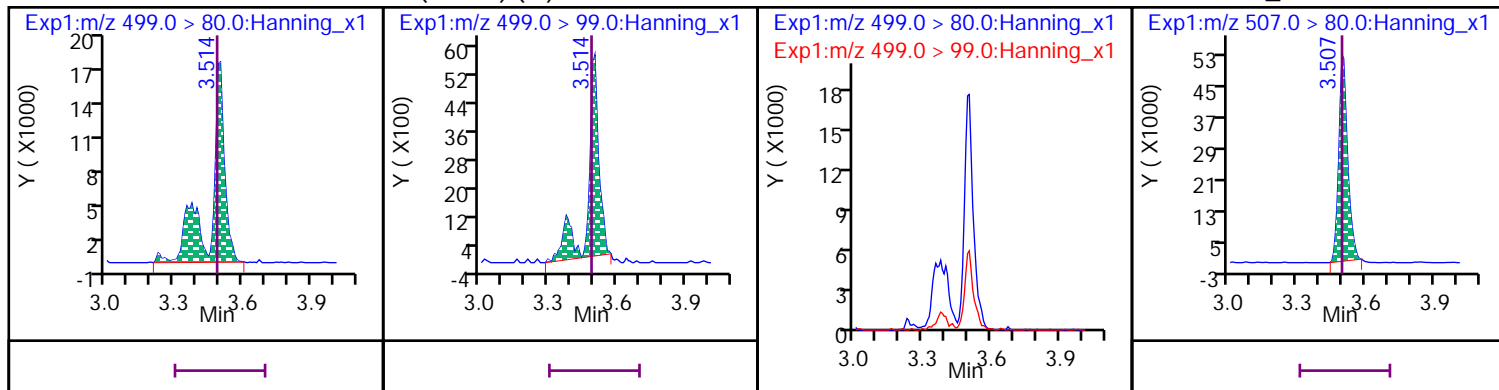
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



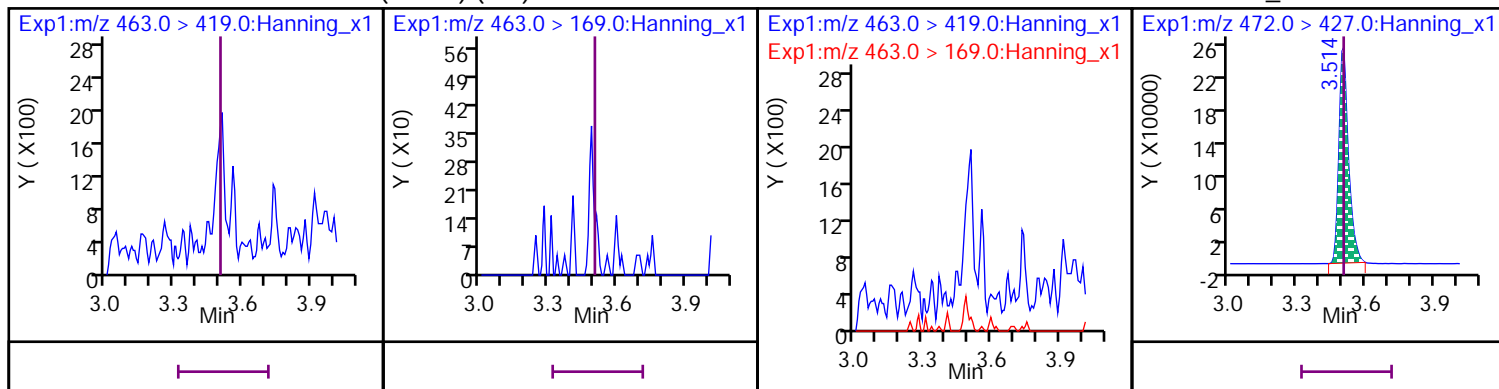
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



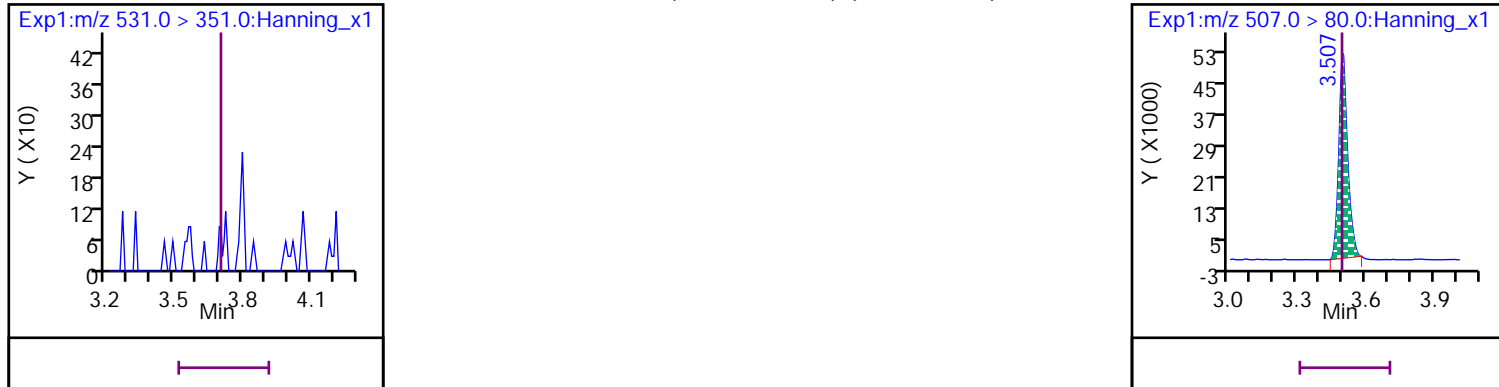
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



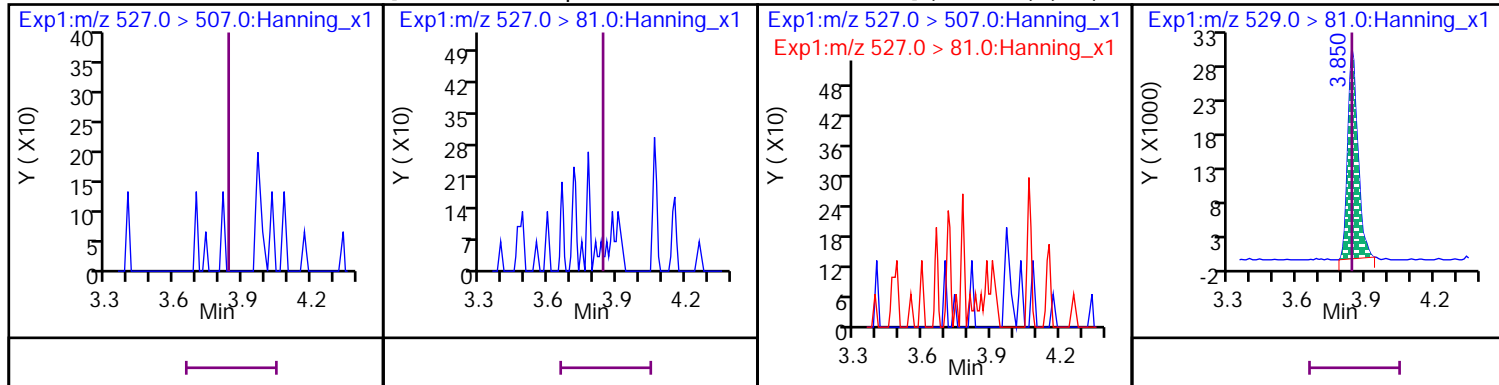
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



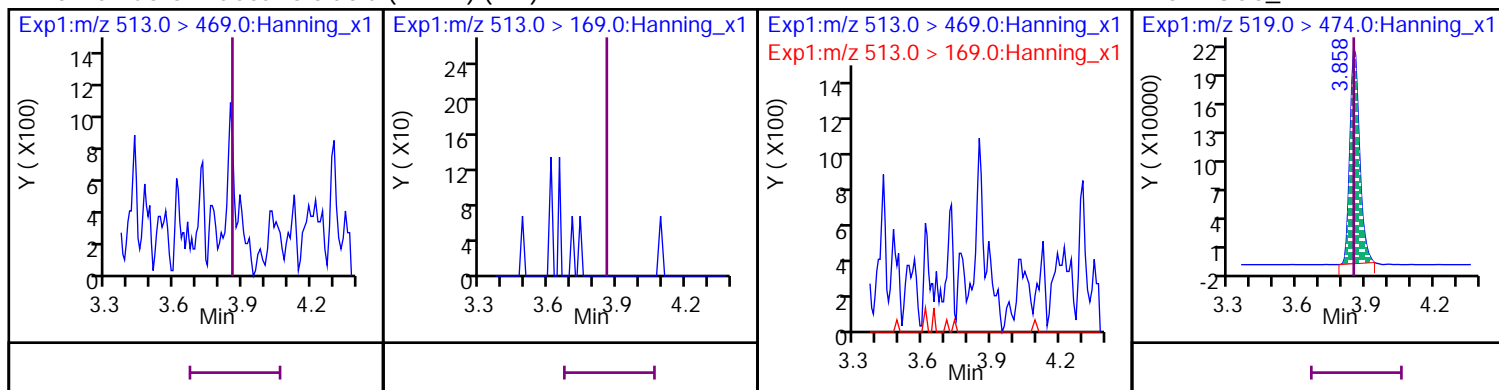
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



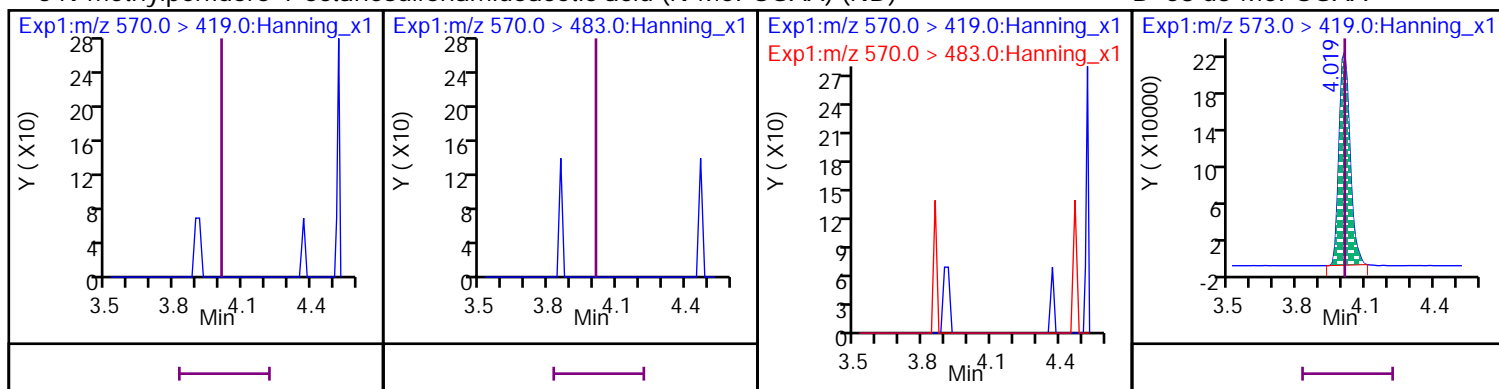
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



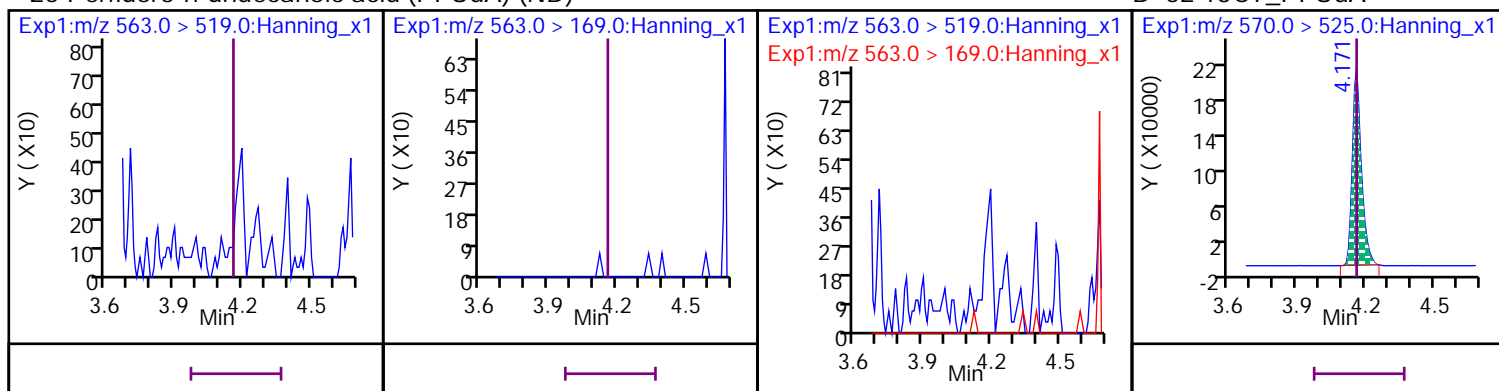
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



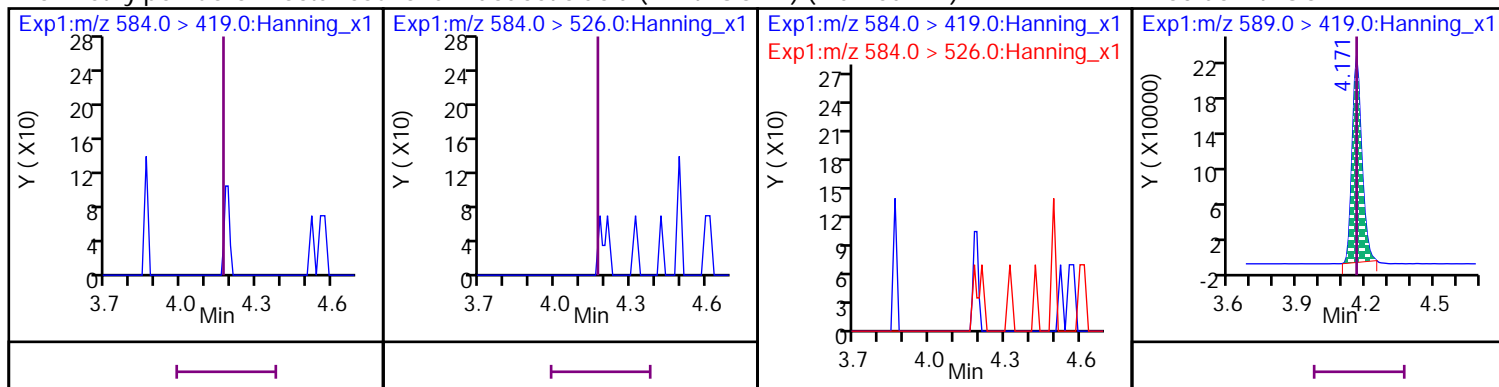
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



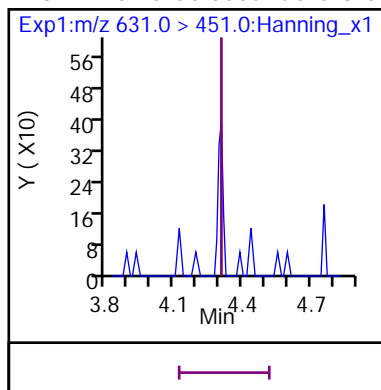
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

D 60 d5-EtFOSAA

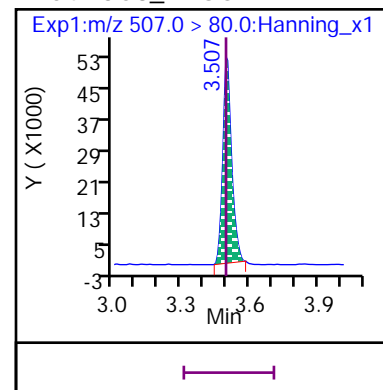




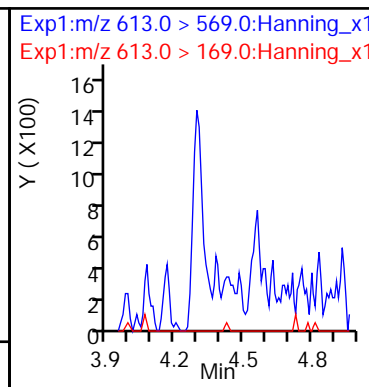
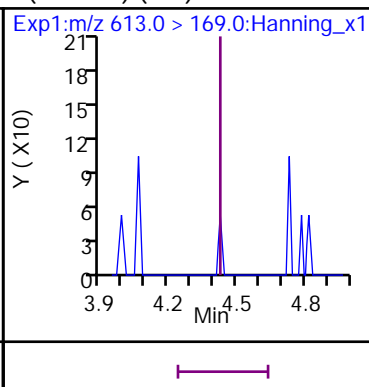
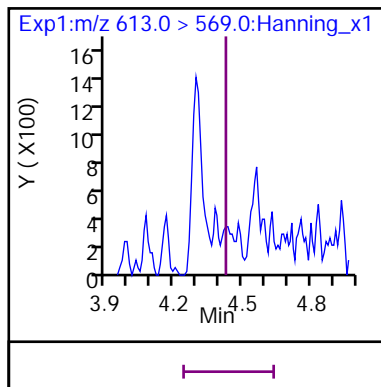
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



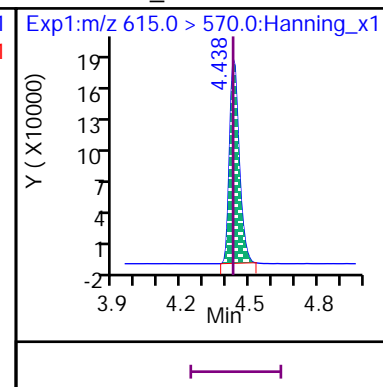
D 54 13C8\_PFOS



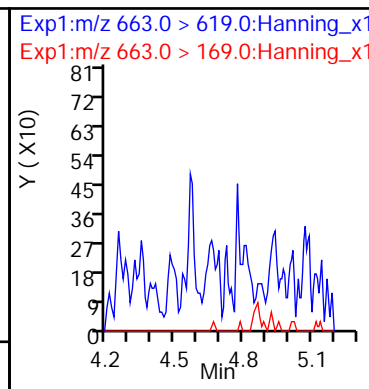
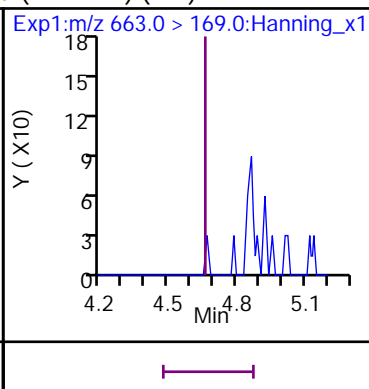
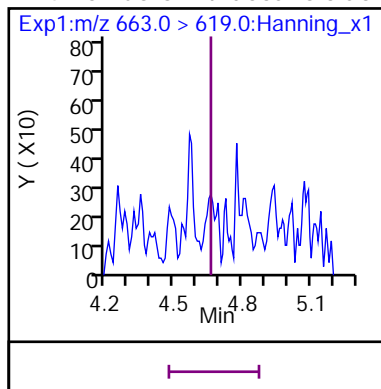
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



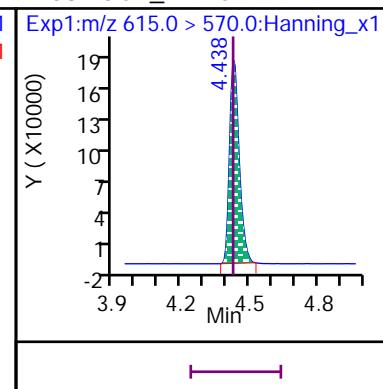
D 38 13C2\_PFDoA



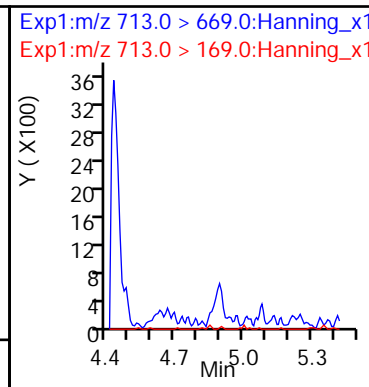
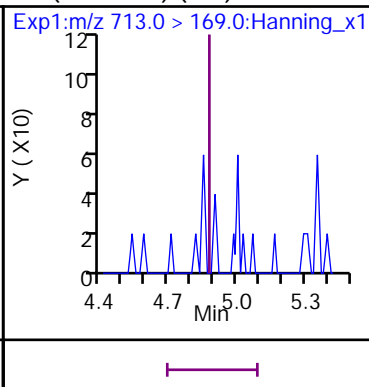
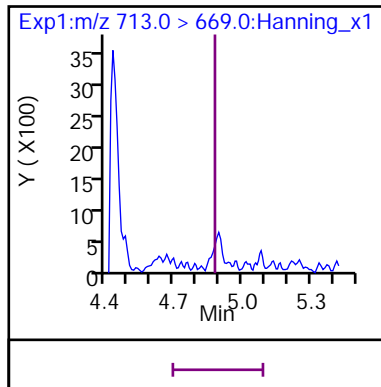
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



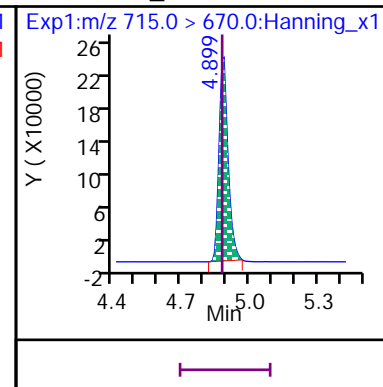
D 38 13C2\_PFDoA



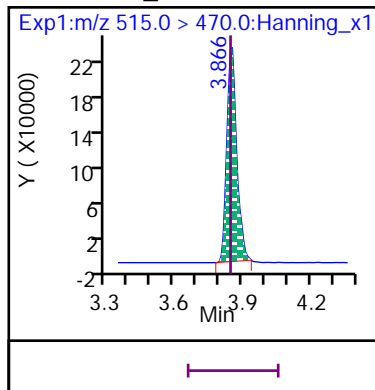
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



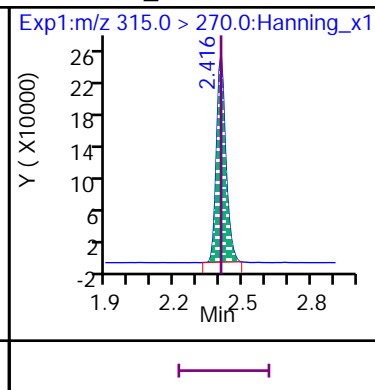
D 42 13C2\_PFTeDA



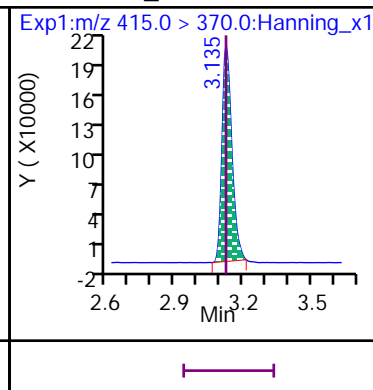
\* 37 13C2\_PFDA



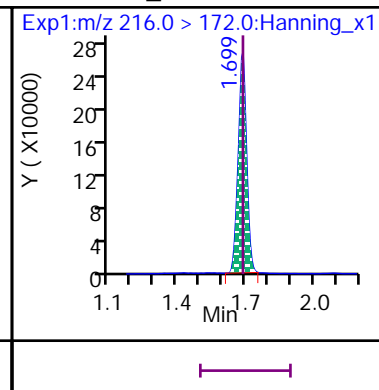
\* 39 13C2\_PFHxA



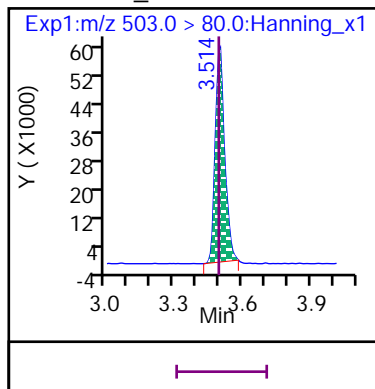
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720014.d

Injection Date: 27-Dec-2020 11:54:28

Inst. ID: LCMSMS02

Client ID: FD01-1220

Lab ID: VL11001-004

Sample Info: VL11001-004

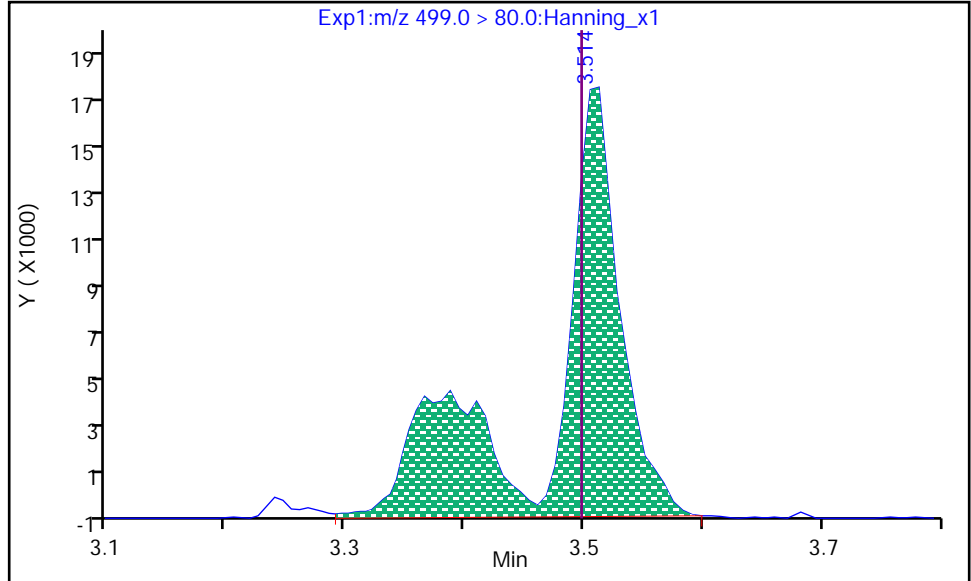
Dil. Factor: 1

Operator: Matthew M. Miller

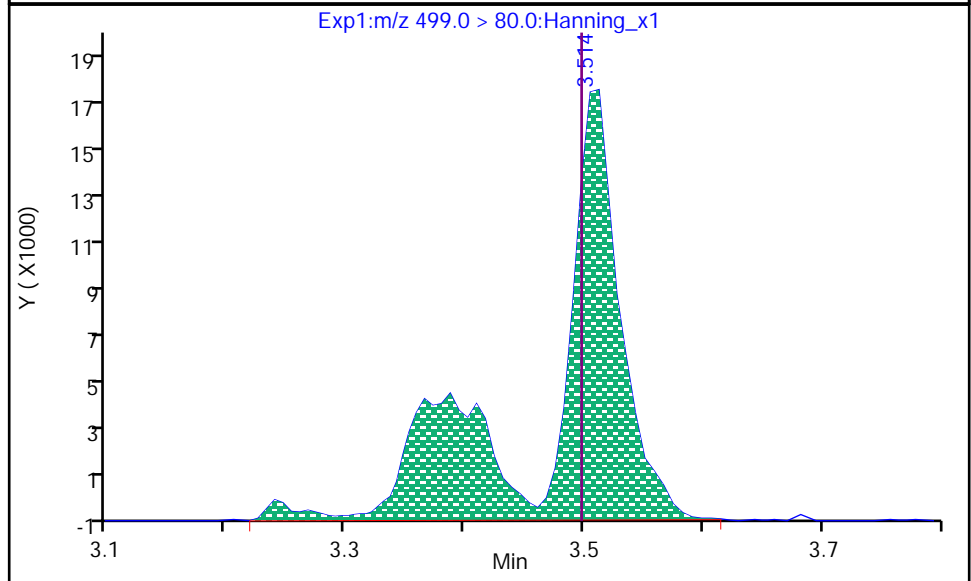
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.514  
Area: 69775  
Conc: 18.118  
Conc Units: ng/L



RT: 3.514  
Area: 71984  
Conc: 18.692  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:48:55

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720014.d

Injection Date: 27-Dec-2020 11:54:28

Inst. ID: LCMSMS02

Client ID: FD01-1220

Lab ID: VL11001-004

Sample Info: VL11001-004

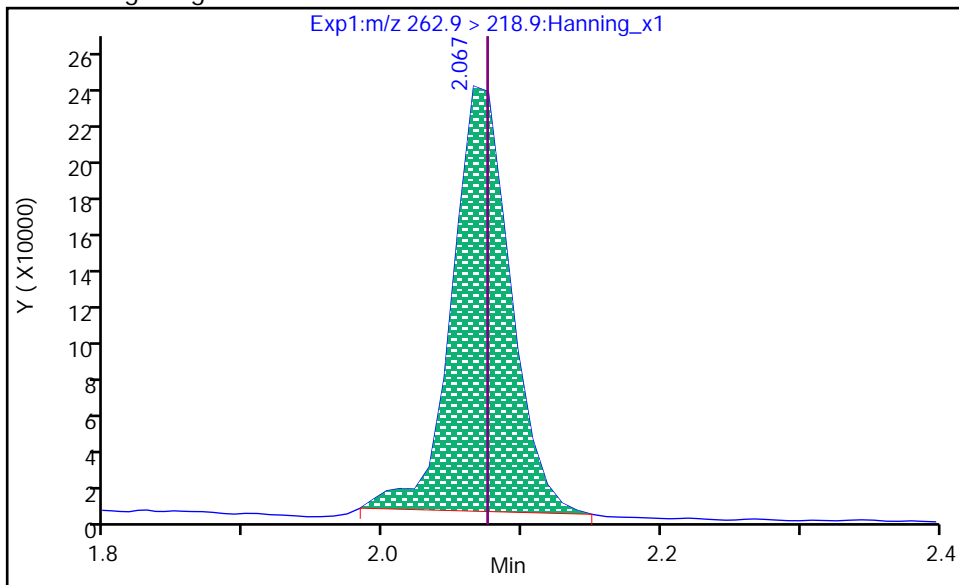
Dil. Factor: 1

Operator: Matthew M. Miller

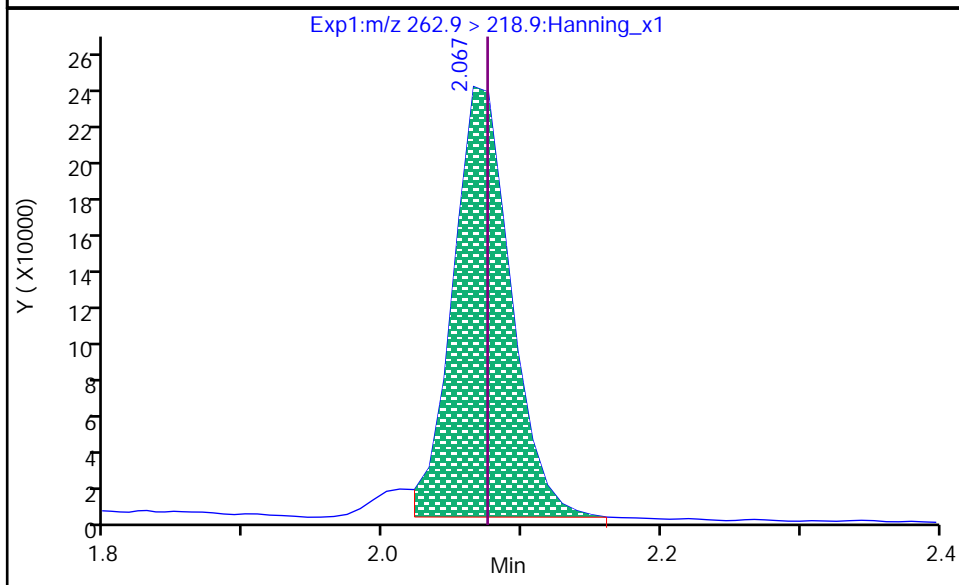
21 PFPeA, CAS: 2706-90-3

Processing Integration Results

RT: 2.067  
Area: 676288  
Conc: 45.594  
Conc Units: ng/L



RT: 2.067  
Area: 677490  
Conc: 45.675  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:48:35

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-005</b>
Description: <b>C-00-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1435</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/27/2020 1205	MMM	12/22/2020 1149	77367

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>7.3</b>		<b>7.2</b>	<b>3.6</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanefluoro sulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>1.9</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		107	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		116	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		100	50-150
13C8_PFOS		82	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720015.d  
Injection Date: 27-Dec-2020 12:05:06 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 8  
Lab Sample ID: VL11001-005 Lab Prep. Batch: 77367  
Client ID: C-00-3-1220 Sample Group: VL11001  
Sample Info: VL11001-005 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0393871$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	279	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.698	1.698	0	741196	23	>100:1			1001.00	1068.70	116	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.698	0/0	35585	21	11:1			48.252	1.9005		J
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.077	0	657971	16	>100:1			1001.00	956.51	99.9	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.077		ND								U
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.130	0	233355	16	>100:1			1001.00	1013.57	97.3	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.130		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.415	0	746083	18	>100:1			1001.00	1012.23	104	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.415		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.522	0	1373690	19	>100:1			5005.00	5157.38	104	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.522		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.763	2.773	0	592139	18	>100:1			1001.00	976.08	101	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.773		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.781	2.782	0	167647	17	>100:1			1001.00	979.08	94	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.782		ND								U
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.809		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.108	1	98923	23	>100:1			5005.00	5136.62	88.5	



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.108	3.115	0/-1	8555	20	70:1	Target = 1.77		186.19	7.3334		
427 > 81	64	3.114	3.115		5454	18	13:1	1.56 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	0	595028	24	>100:1			1001.00	1005.35	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.135		ND								U
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	129494	19	>100:1			1001.00	863.70	82.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.500		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.716		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54		4.318		ND								U
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.507	3.515	0	718616	21	>100:1			1001.00	956.93	94.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.515		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.850	3.850	0	94454	20	>100:1			5005.00	5091.82	107	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.850		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	0	637177	19	>100:1			1001.00	960.57	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.866		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	760868	19	>100:1			5005.00	5300.76	105	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.019		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	0	645710	18	>100:1			5005.00	4861.74	93.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.180		ND								U
<b>D 52 13C7_PFOdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	0	556130	18				1001.00	879.85	88.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.171		ND								U
<b>D 38 13C2_PFDdA CAS: SESI-0118</b>													
615 > 570		4.440	4.438	1	534701	19	>100:1			1001.00	883.34	93.6	
<b>11 Perfluoro-n-dodecanoic acid (PFDdA) CAS: 307-55-1</b>													
613 > 569	38		4.438		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTdA) CAS: 72629-94-8</b>													
663 > 619	38		4.673		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.891	4.890	1	703145	19	>100:1			1001.00	834.65	84.8	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.890		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.858	3.858	0	693077	21	>100:1					102	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.415	0	759770	19	>100:1					105	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	0	603778	22	>100:1					100	
<b>* 43 13C3_PFBa</b>													
216 > 172		1.698	1.698	0	727048	22	>100:1					120	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.507	3.507	0	165704	23	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720015.d

Injection Date: 27-Dec-2020 12:05:06

Inst. ID: LCMSMS02

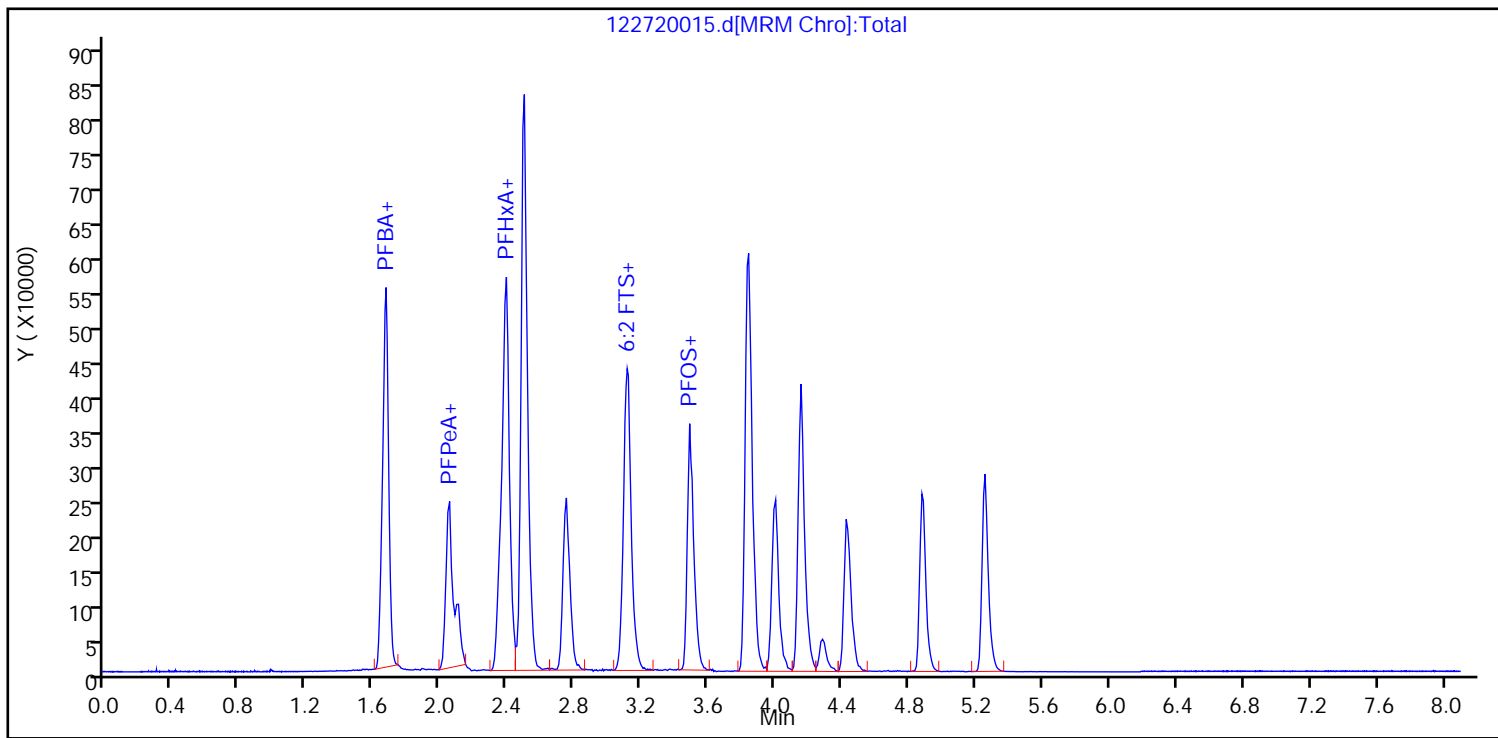
Client ID: C-00-3-1220

Lab ID: VL11001-005

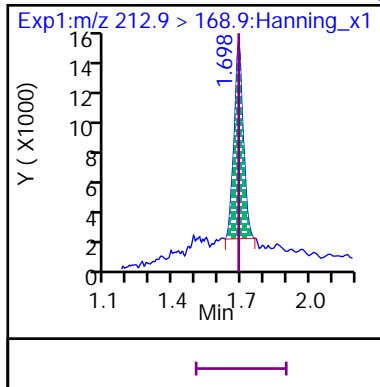
Sample Info: VL11001-005

Dil. Factor: 1

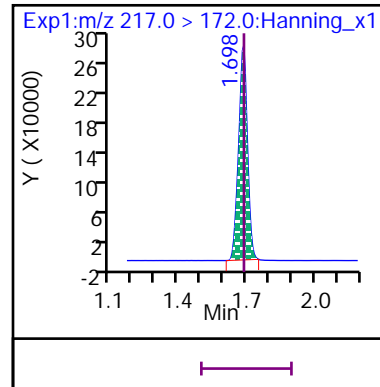
Operator: Matthew M. Miller



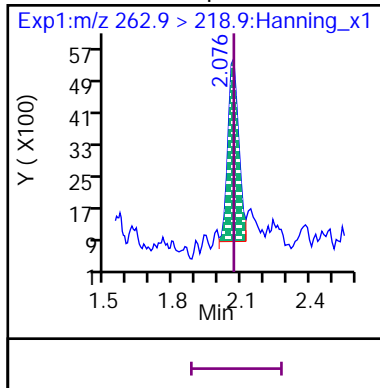
8 Perfluoro-n-butanoic acid (PFBA)



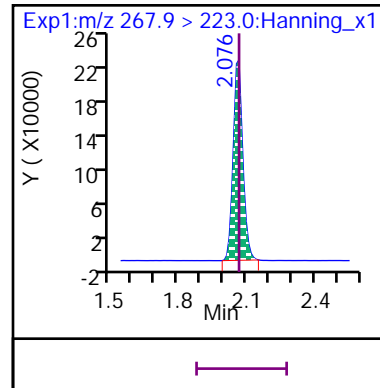
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

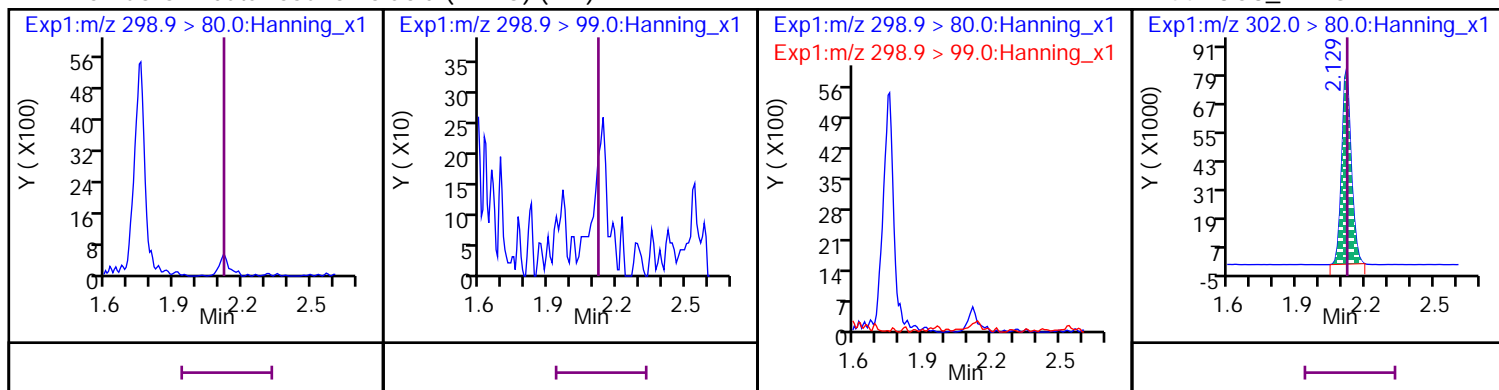


D 50 13C5\_PFPeA



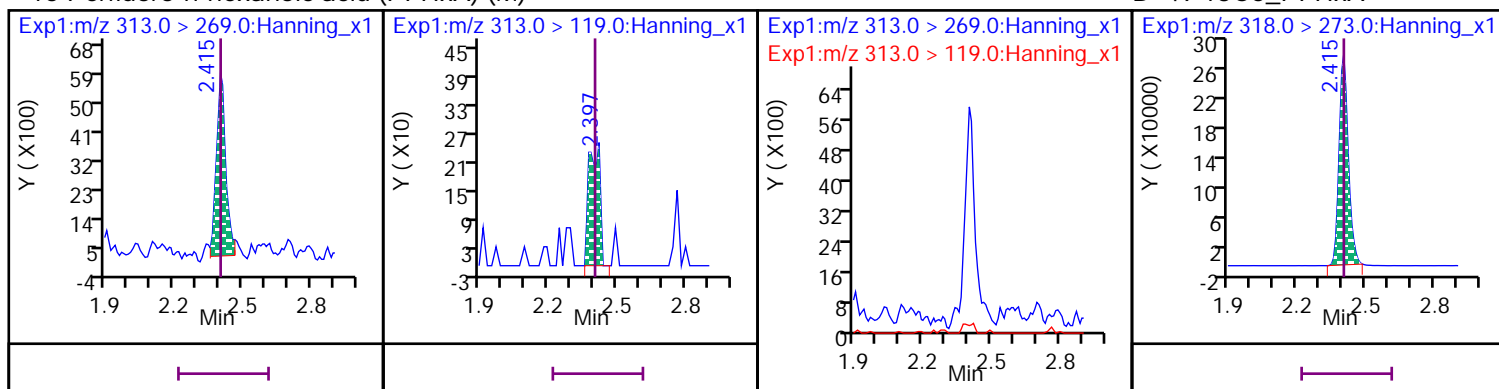
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



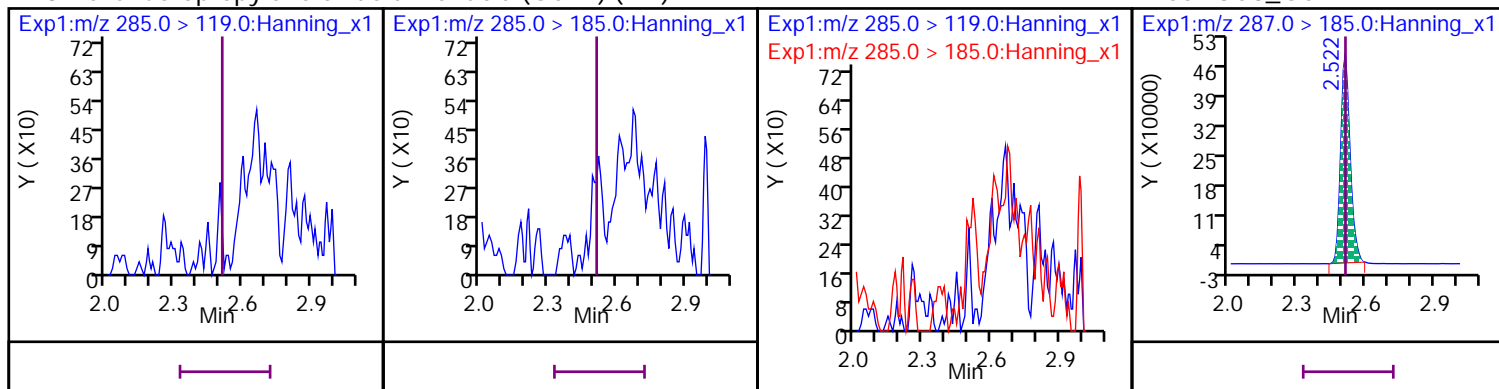
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



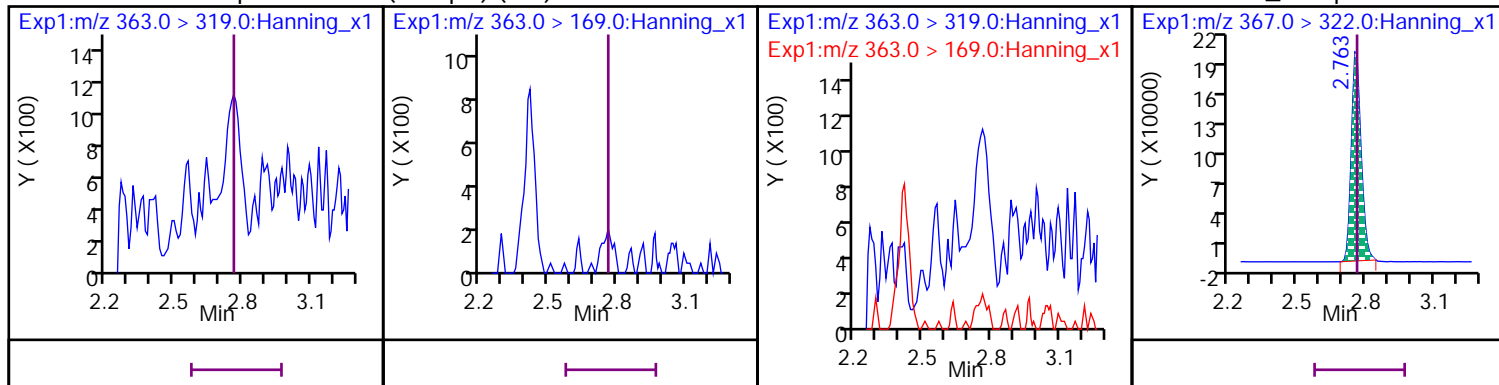
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



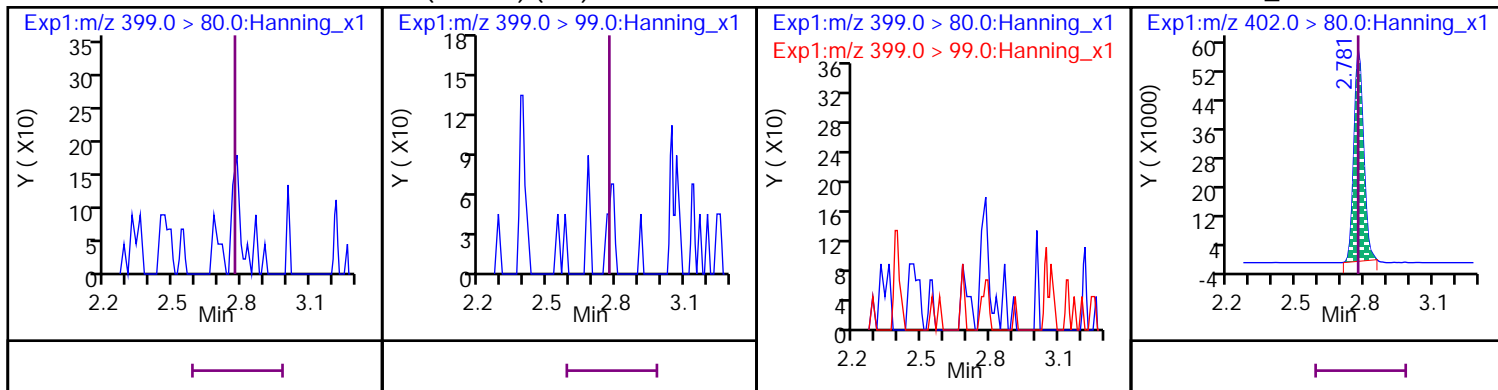
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



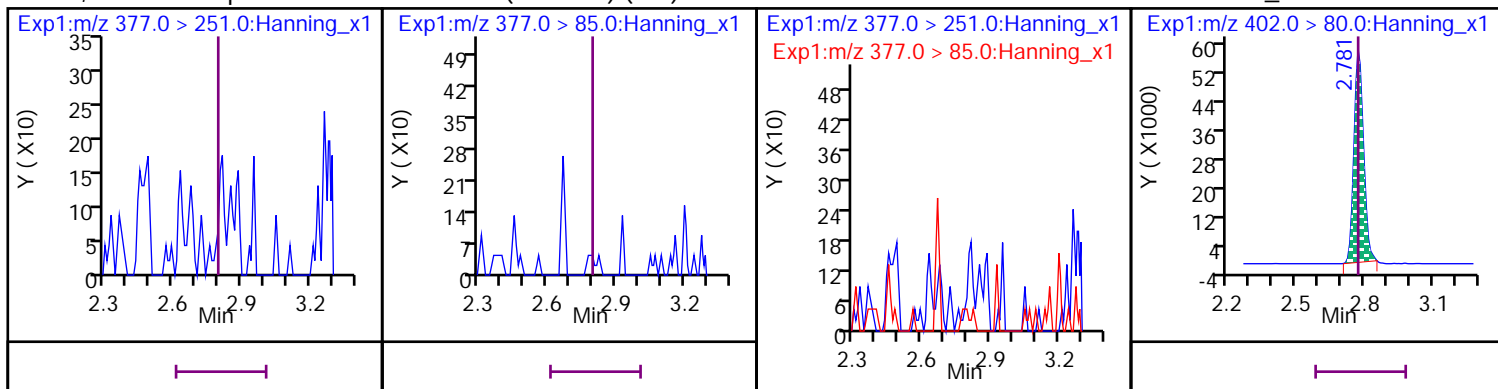
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



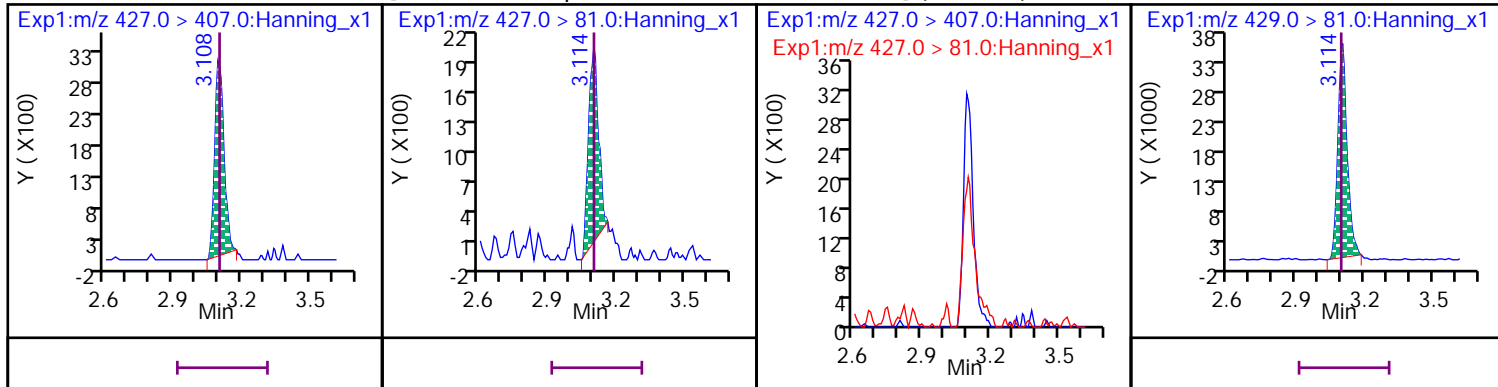
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



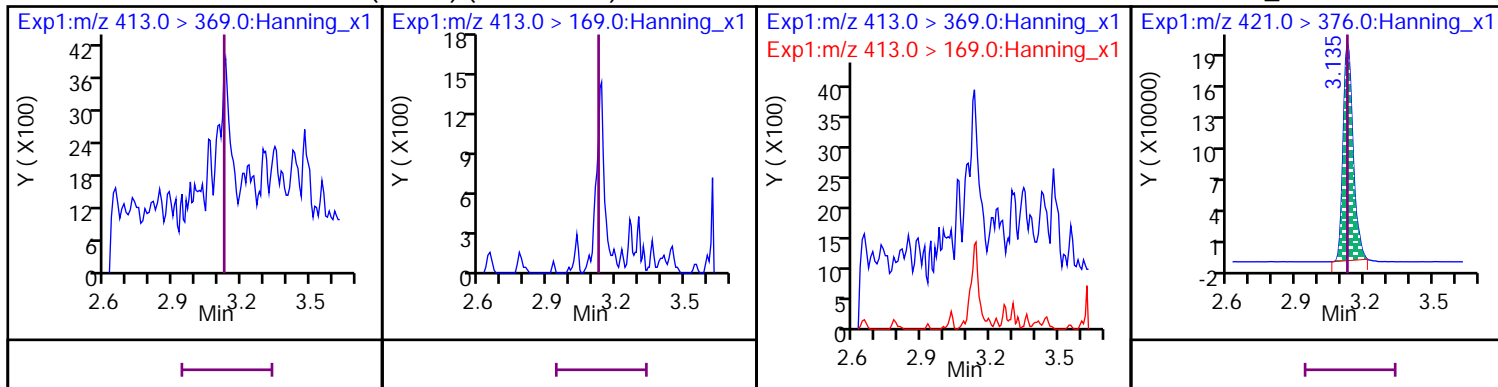
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



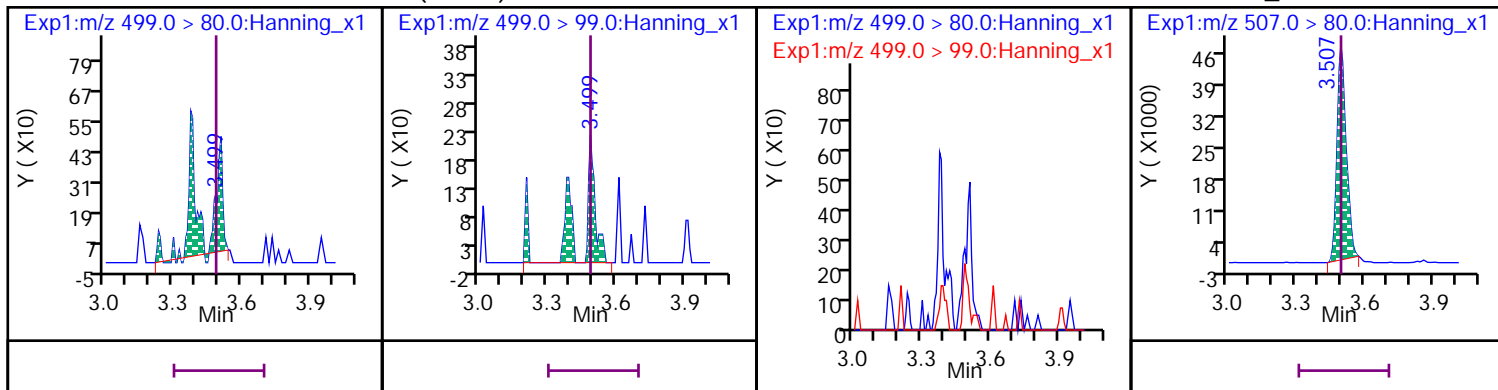
20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



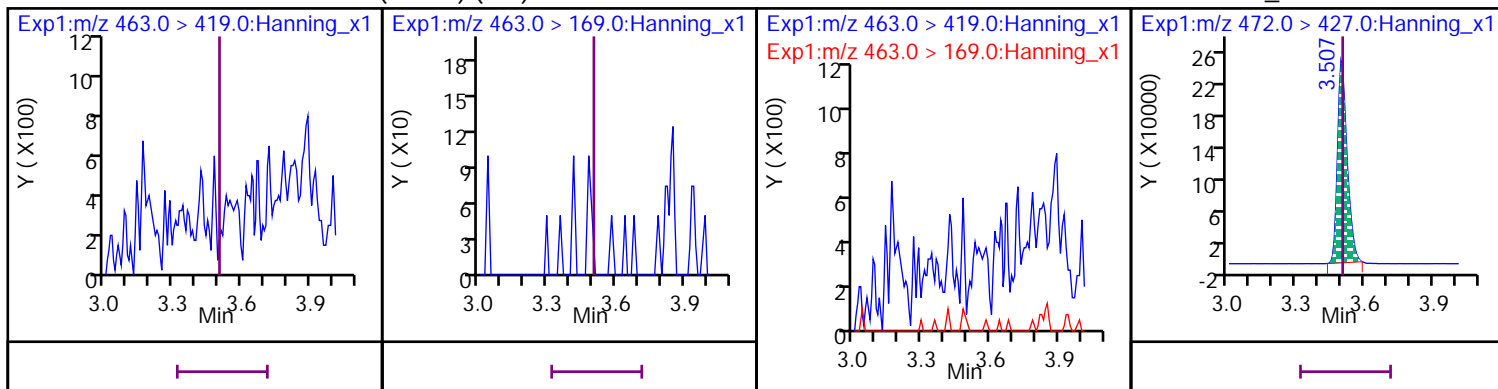
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



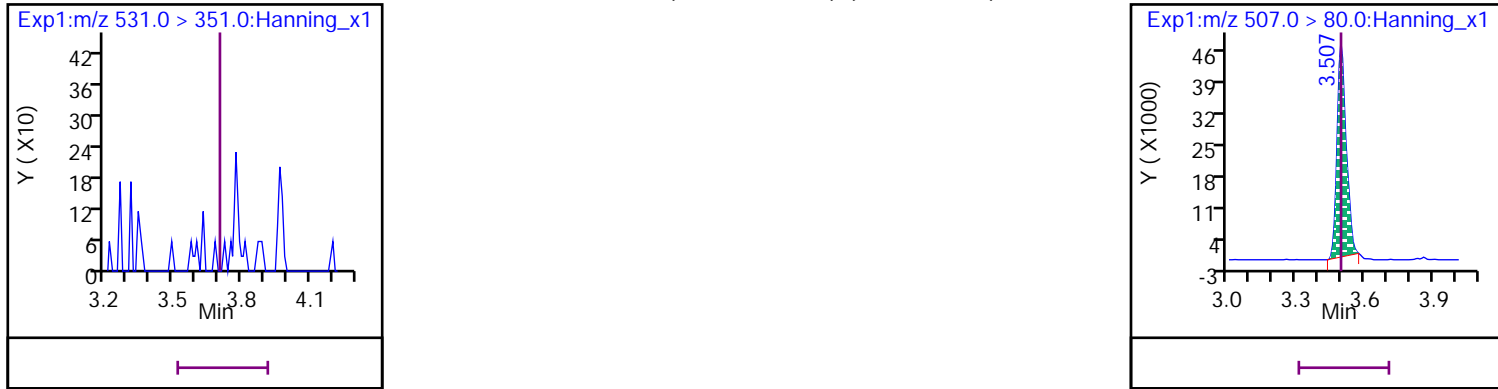
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



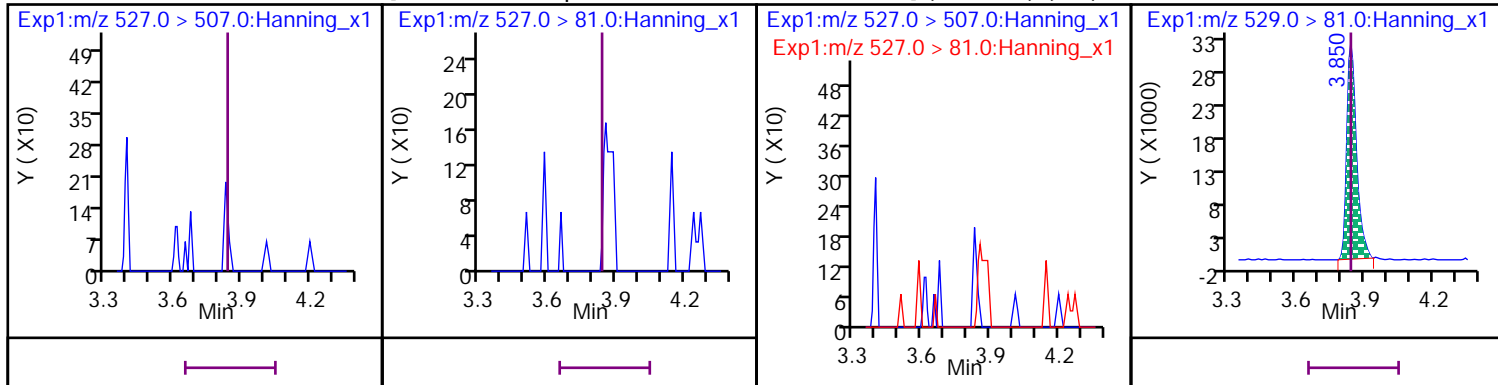
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

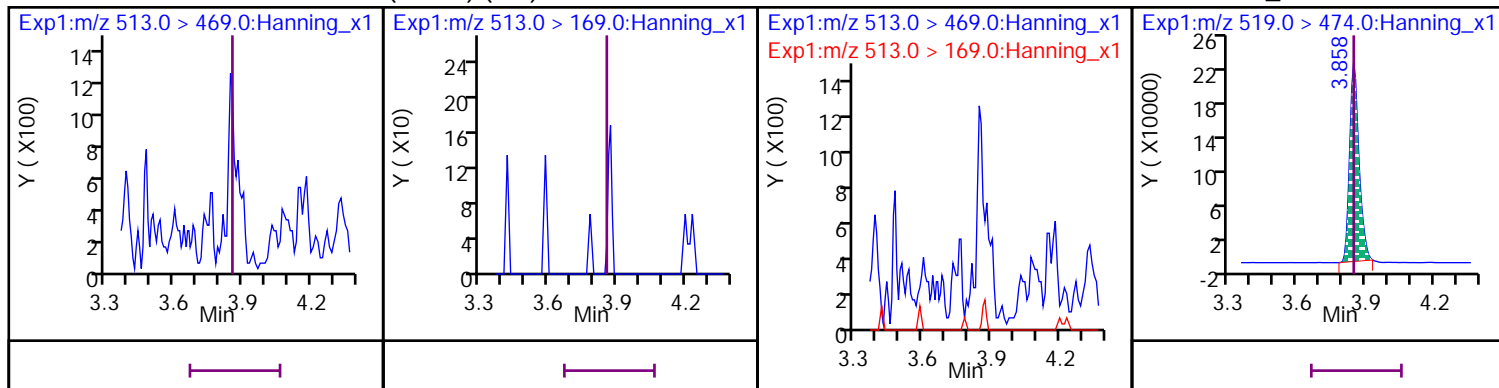
D 65 13C2\_8:2 FTS\_2





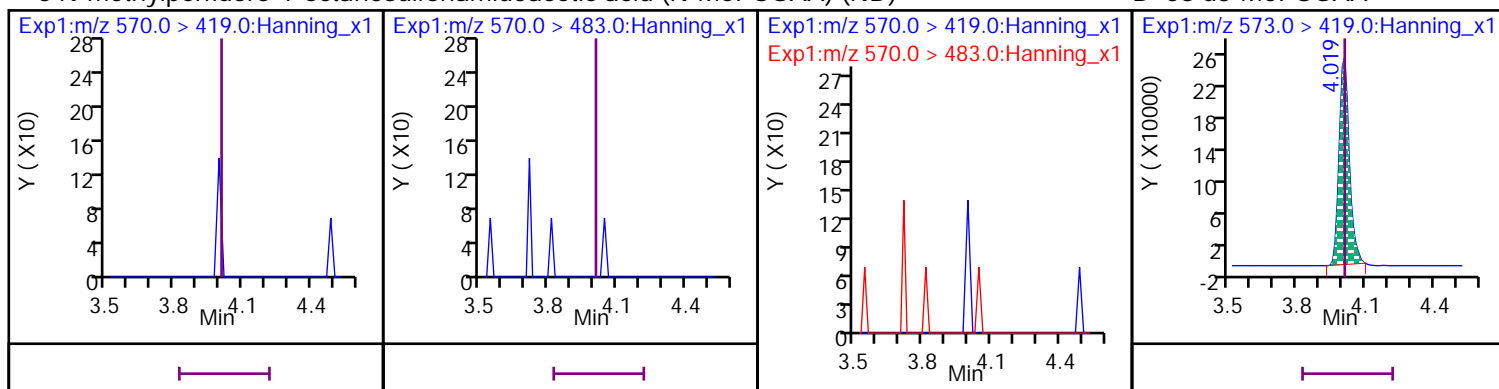
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



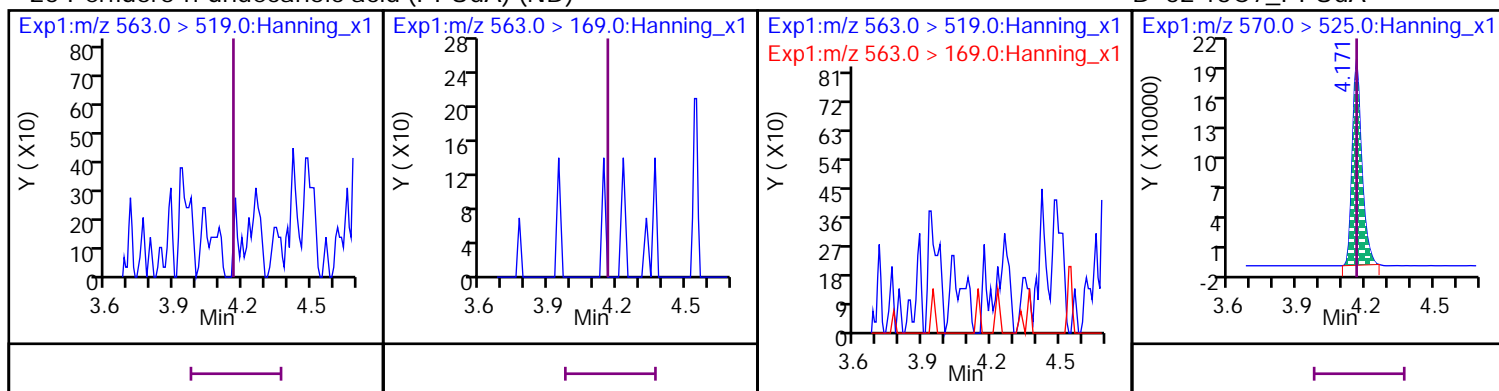
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



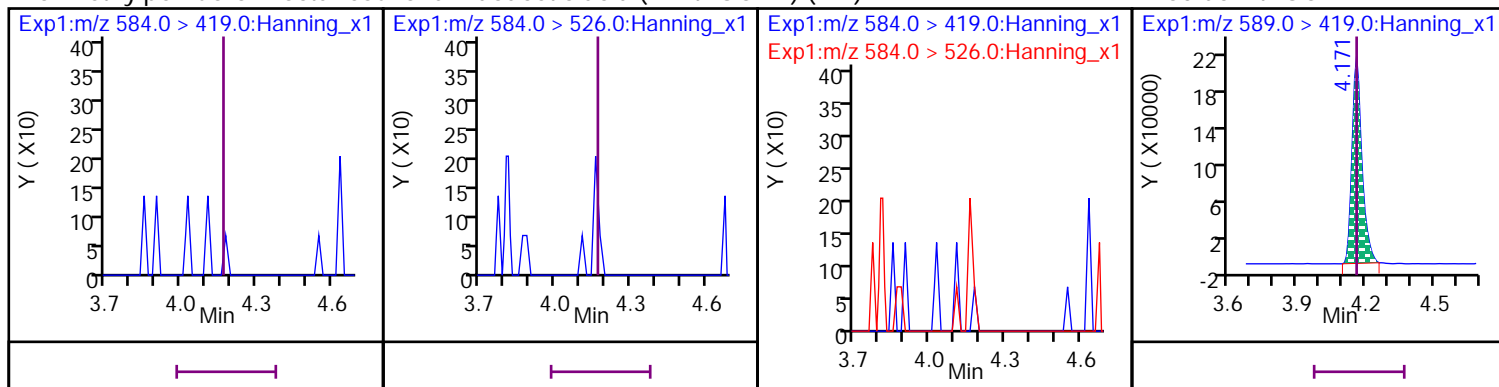
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

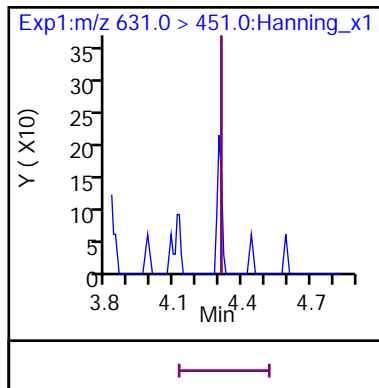


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

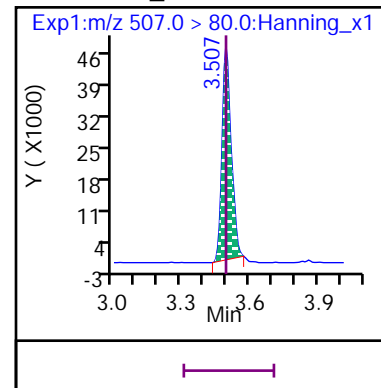
D 60 d5-EtFOSAA



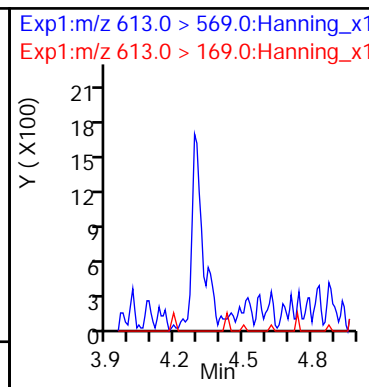
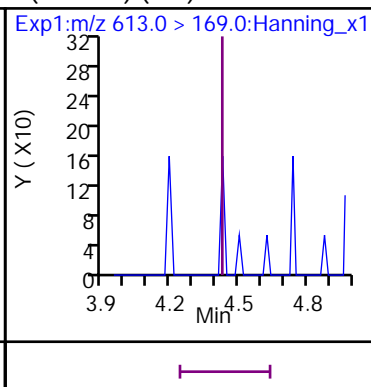
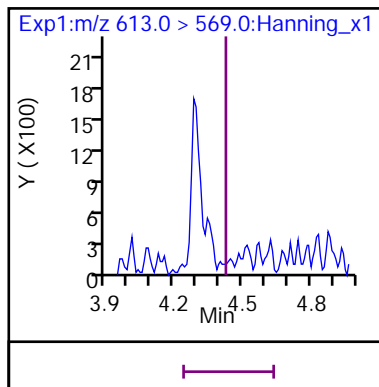
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) (Marked ND)



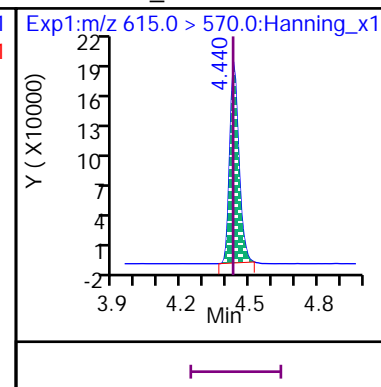
## D 54 13C8\_PFOS



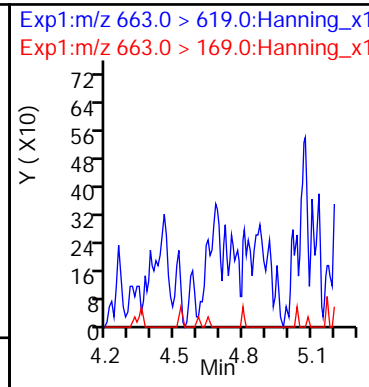
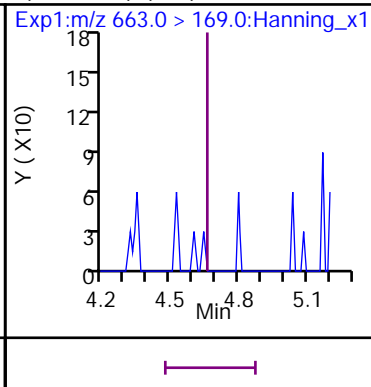
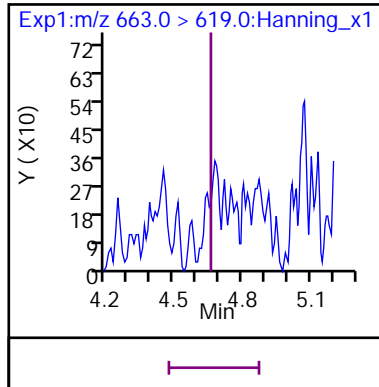
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



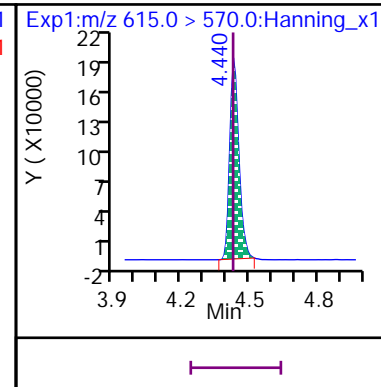
## D 38 13C2\_PFDoA



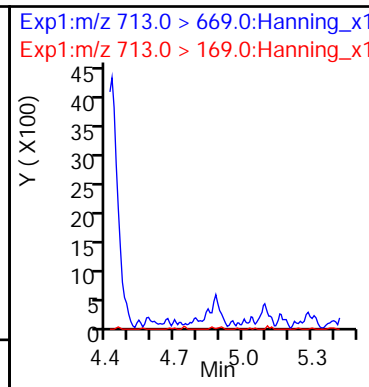
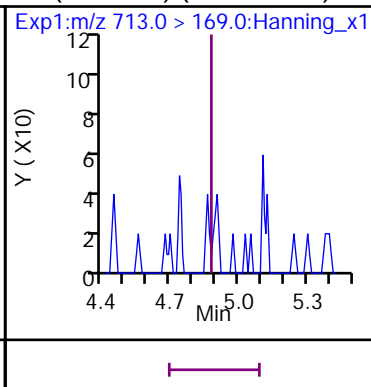
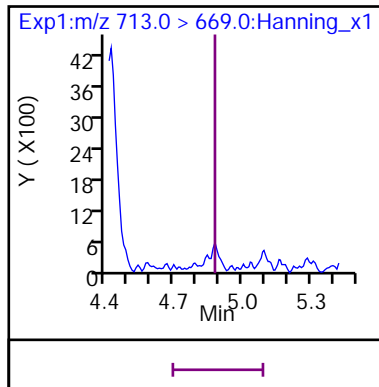
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



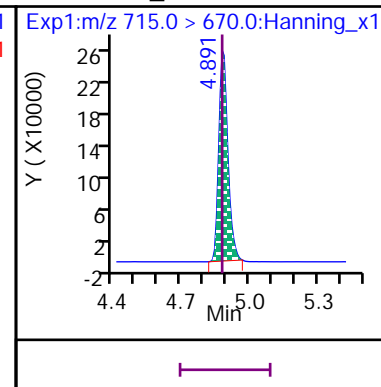
## D 38 13C2\_PFDoA



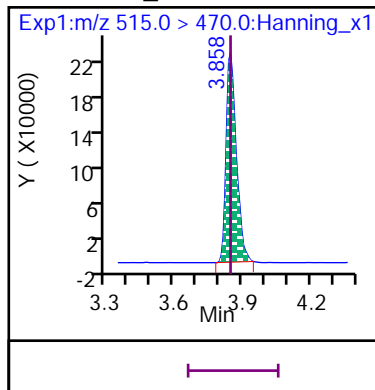
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



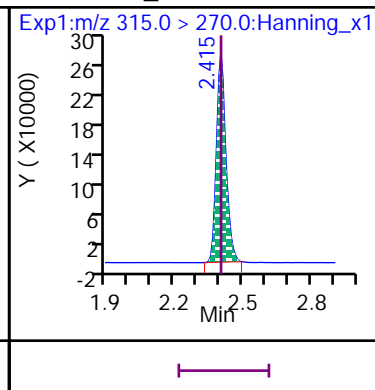
## D 42 13C2\_PFTeDA



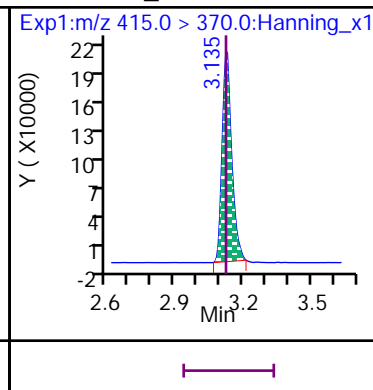
\* 37 13C2\_PFDA



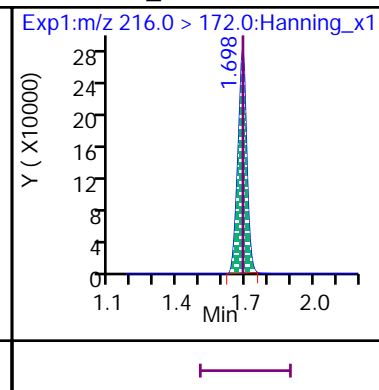
\* 39 13C2\_PFHxA



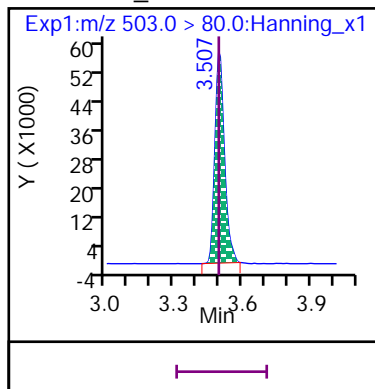
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-006</b>
Description: <b>FFS-MW01-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1600</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1059	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>17</b>	<b>Q</b>	<b>7.3</b>	<b>3.7</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>8.3</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>39</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.8</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>4.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>5.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.6</b>	<b>1.8</b>	<b>0.91</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	180	50-150
13C2_8:2FTS		121	50-150
13C2_PFDaA		102	50-150
13C2_PFTeDA		90	50-150
13C3_PFBs		100	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBa		104	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		103	50-150
13C6_PFDa		101	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		111	50-150
13C8_PFOs		93	50-150
13C9_PFNa		101	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820011.d  
 Injection Date: 28-Dec-2020 10:59:26 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 3  
 Lab Sample ID: VL11001-006 Lab Prep. Batch: 77741  
 Client ID: FFS-MW01-1220 Sample Group: VL11001  
 Sample Info: VL11001-006 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0401059$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	274	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 677864 22 >100:1 1001.00 977.38 104

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.731 1.696 3/2 1831073 35 60:1 2714.81 108.88

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.078 2.072 1 687627 17 >100:1 1001.00 999.62 103

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.078 2.072 1/0 88799 12 8.7:1 128.57 5.1565 M

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 238422 16 >100:1 1001.00 1035.58 100

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 58403 20 15:1 Target = 3.34  
 298.9 > 99 44 2.130 2.125 19880 21 39:1 2.93 (1.67-5.02) 207.97 8.3407

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 787814 18 >100:1 1001.00 1068.84 106

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.425 2.423 1/1 177081 12 47:1 Target = 17.01  
 313 > 119 49 2.416 2.423 9313 15 39:1 19.01 (8.50-25.52) 227.90 9.1401 M

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.532 2.530 1 1359752 17 >100:1 5005.00 5105.06 97.1

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND 9313 15 39:1 19.01 (8.50-25.52) 227.90 9.1401 M U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 639065 20 >100:1 1001.00 1053.44 101

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.773 2.772 1/0 29588 14 5.1:1 Target = 3.79  
 363 > 169 47 2.782 2.772 4188 15 10:1 7.06 (1.89-5.69) 44.680 1.7919 J

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.792 2.790 1 181080 19 >100:1 1001.00 1057.53 104

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.792 2.790 1/0 188073 26 >100:1 Target = 3.80 0.23 980.54 39.326  
 399 > 99 45 2.801 2.790 54614 26 >100:1 3.44 (1.90-5.71) 0.17

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.114	1	188125	23	>100:1			5005.00	9768.46	180*	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	34314	26	>100:1	Target = 1.77		424.91	17.041		
427 > 81	64	3.129	3.128		17604	21	41:1	1.94 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	697936	21	>100:1			1001.00	1179.22	111	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.148	1/0	72394	38	29:1	Target = 2.85	0.23	101.85	4.0847		
413 > 169	53	3.142	3.148		26227	39	49:1	2.76 (1.42-4.28)	0.17				M
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	141687	19	>100:1			1001.00	945.03	92.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	57915	55	53:1	Target = 6.80	3.75	345.29	13.848		
499 > 99	54	3.515	3.520		12524	44	21:1	4.62 (3.40-10.20)	0.72				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	776351	21	>100:1			1001.00	1033.81	101	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	121648	19	>100:1			5005.00	6557.79	121	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.875	3.865	1	677810	21	>100:1			1001.00	1021.83	101	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	817964	18	>100:1			5005.00	5698.53	103	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	717836	19	>100:1			5005.00	5404.79	98.1	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	654891	18	>100:1			1001.00	1036.10	102	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	621364	18	>100:1			1001.00	1026.51	102	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	731455	18	>100:1			1001.00	868.25	90	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.875	3.873	1	754330	19	>100:1					103	



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	814454	19	>100:1					111	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	746809	23	>100:1					125	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	675339	23	>100:1					111	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	173554	31	>100:1					106	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820011.d

Injection Date: 28-Dec-2020 10:59:26

Inst. ID: LCMSMS02

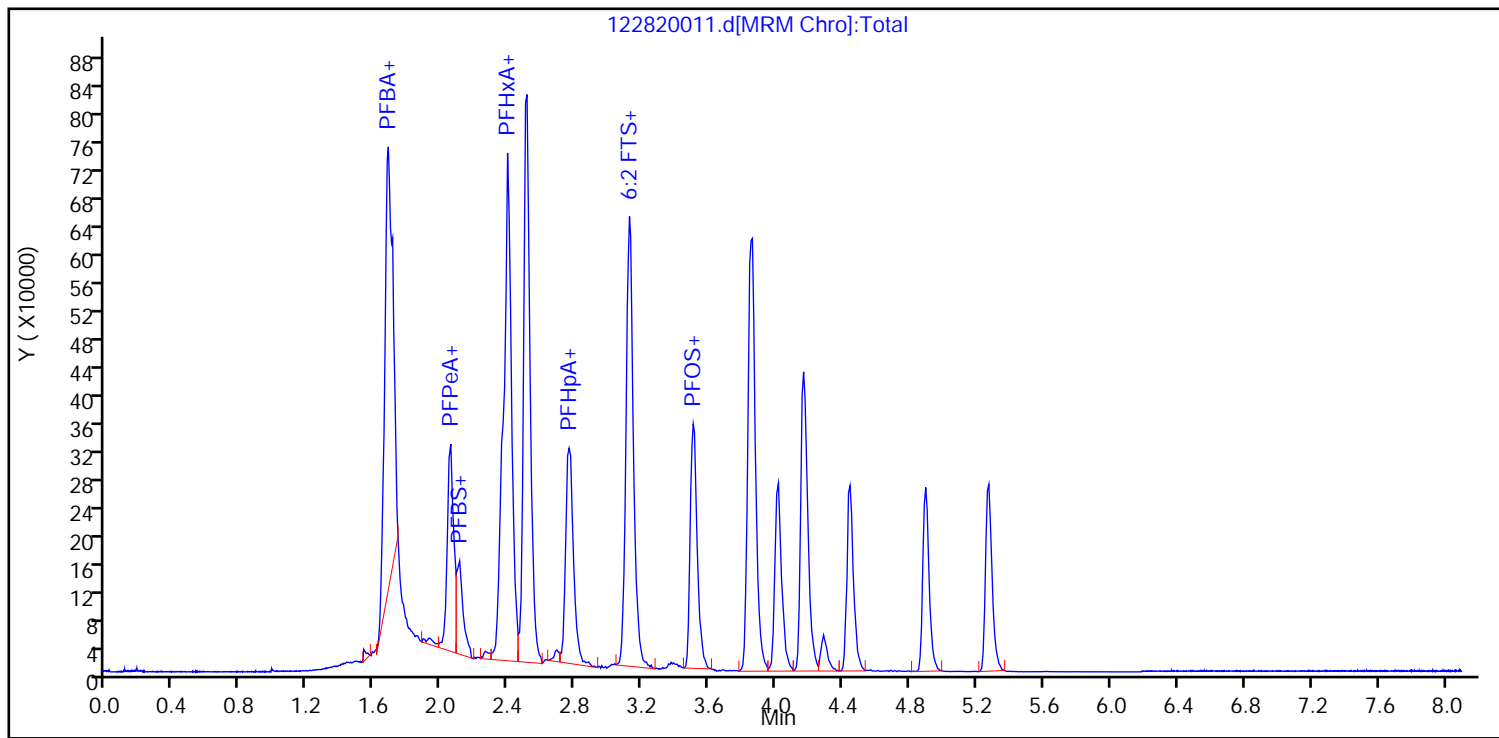
Client ID: FFS-MW01-1220

Lab ID: VL11001-006

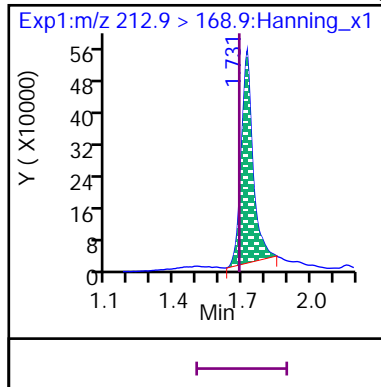
Sample Info: VL11001-006

Dil. Factor: 1

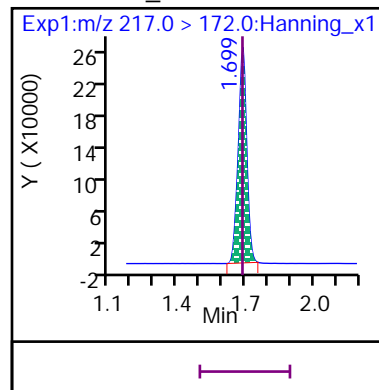
Operator: Matthew M. Miller



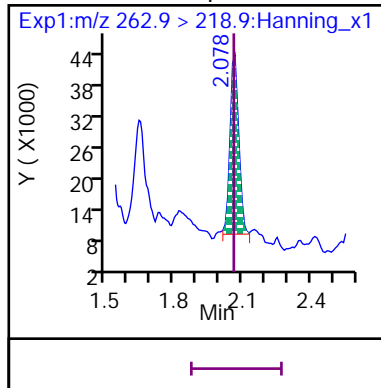
8 Perfluoro-n-butanoic acid (PFBA)



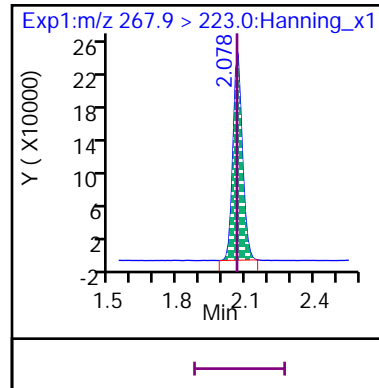
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

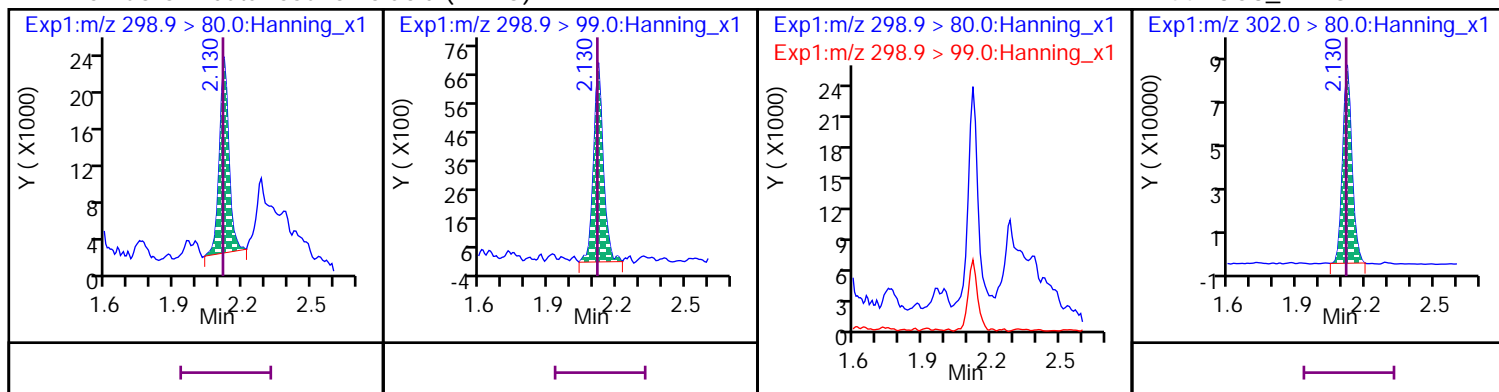


D 50 13C5\_PFPeA



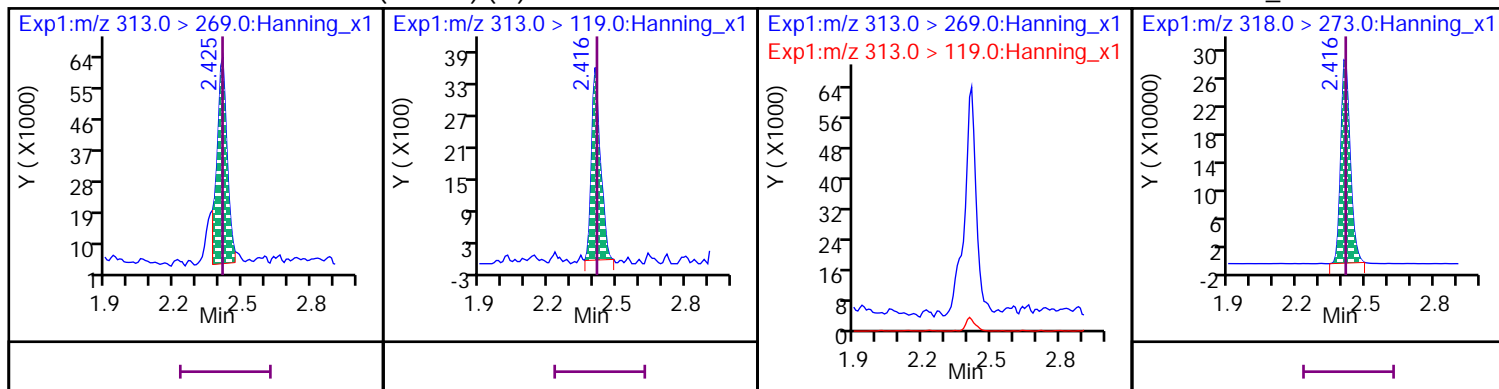
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



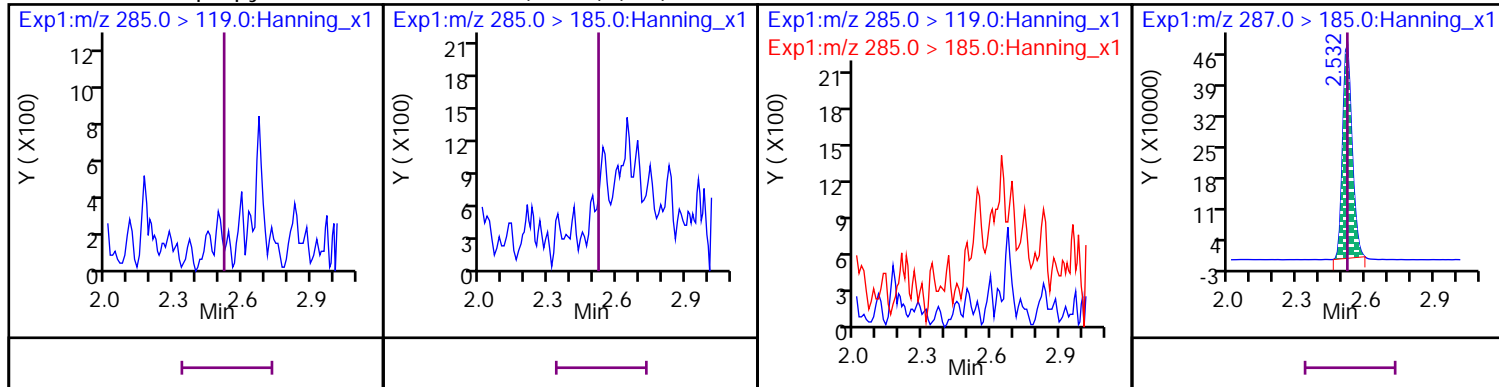
15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



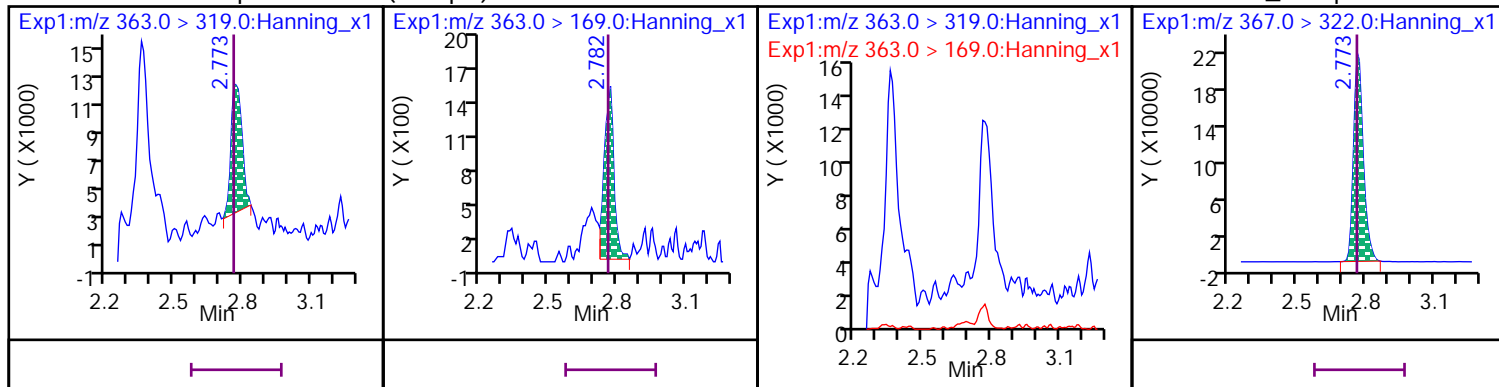
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



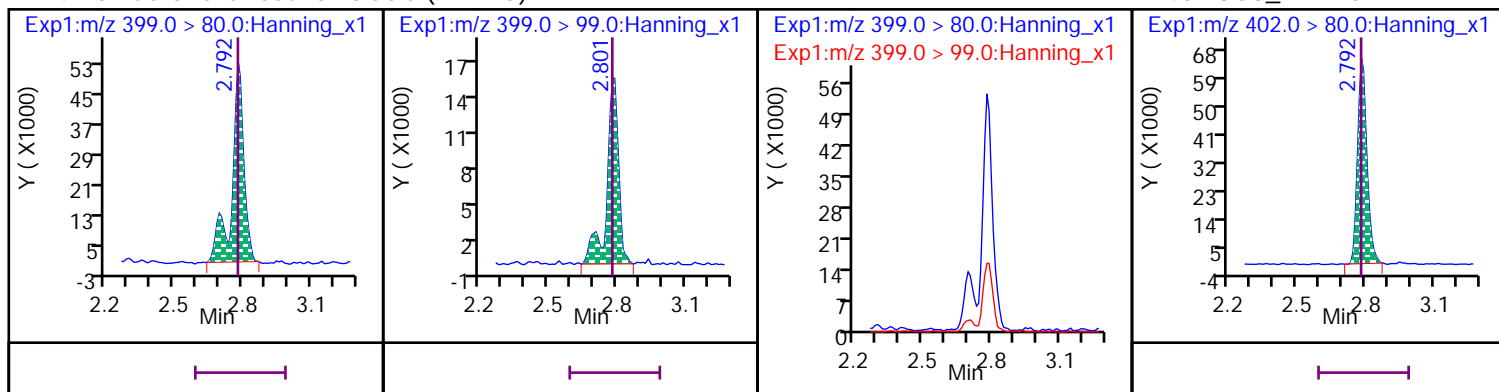
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



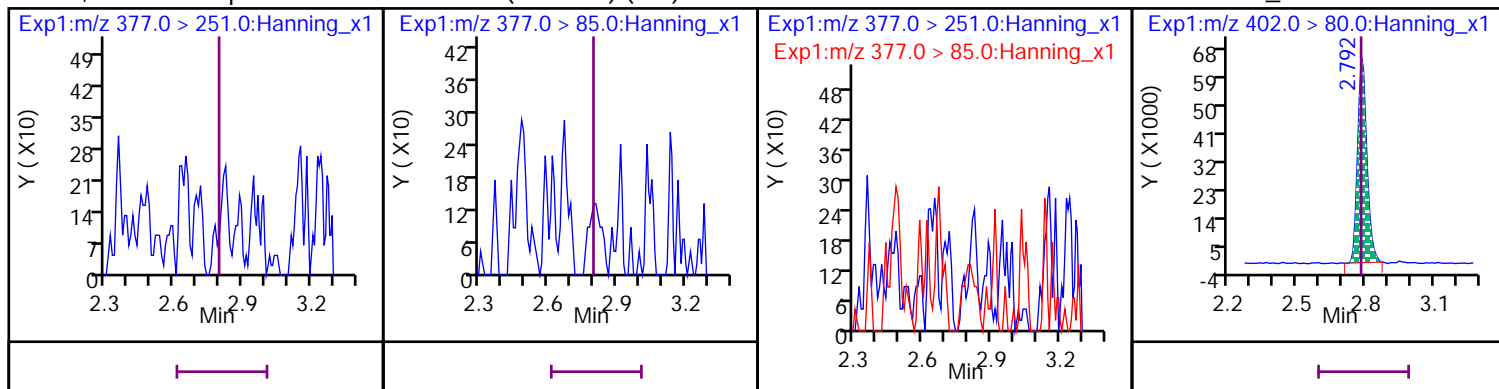
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



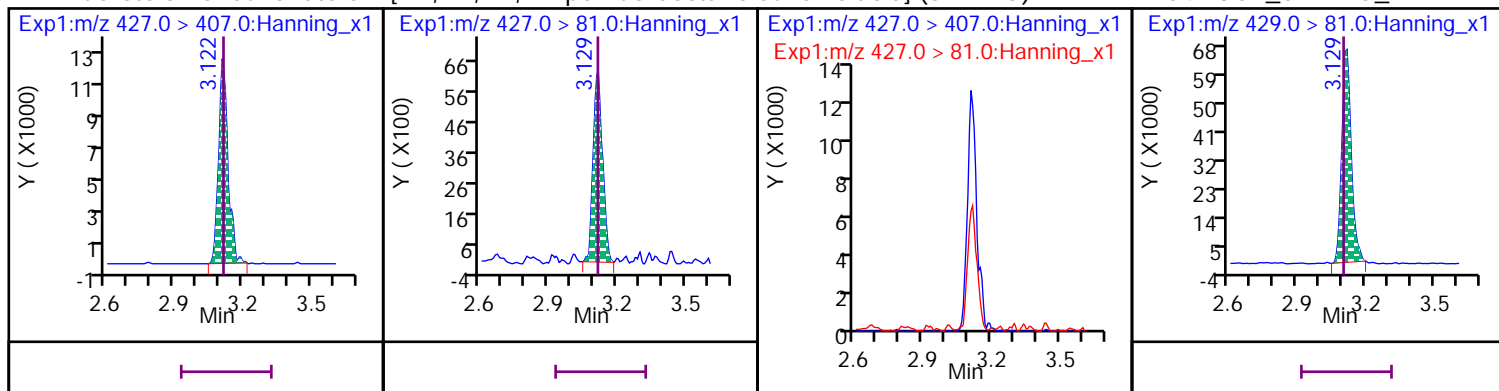
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



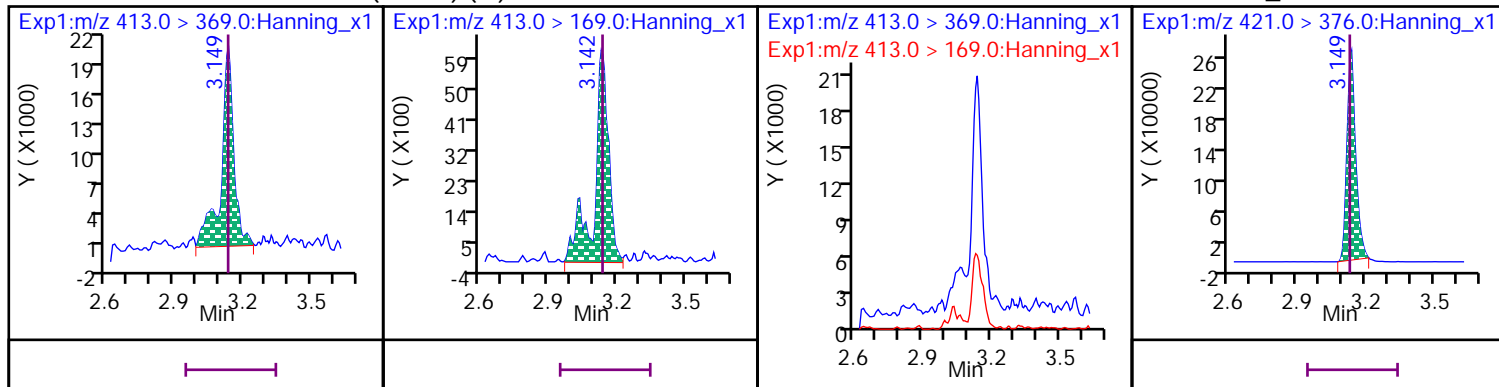
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



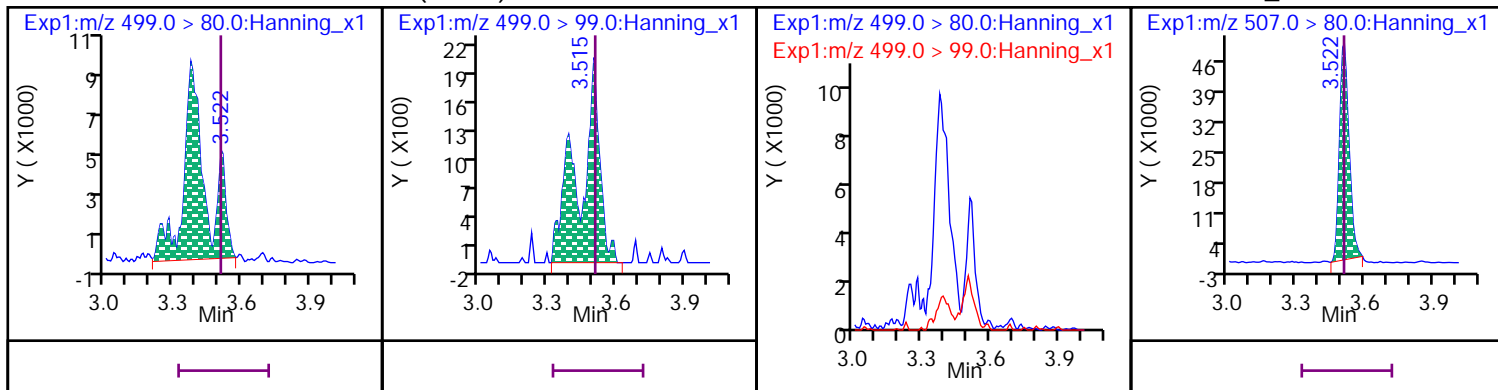
20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



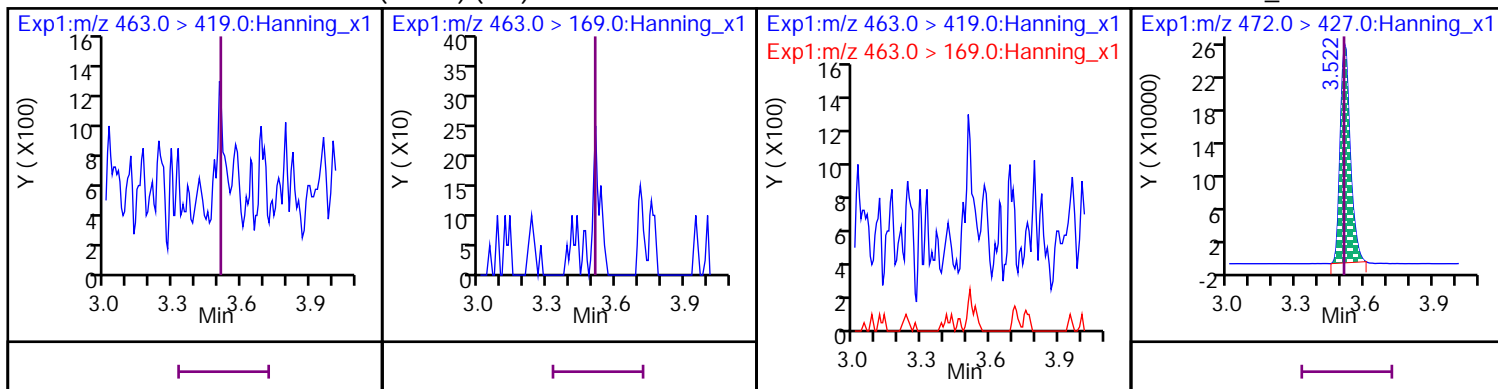
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



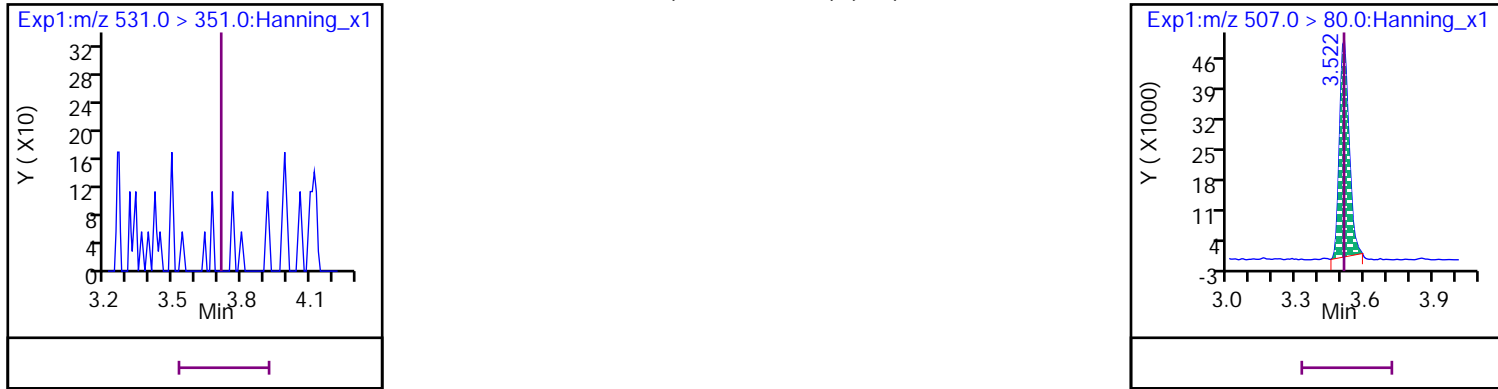
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



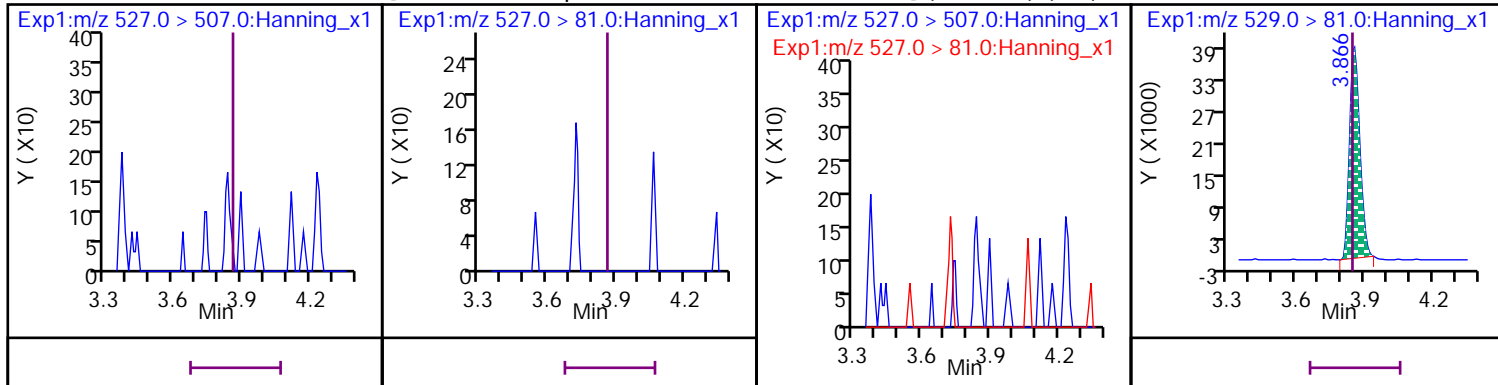
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



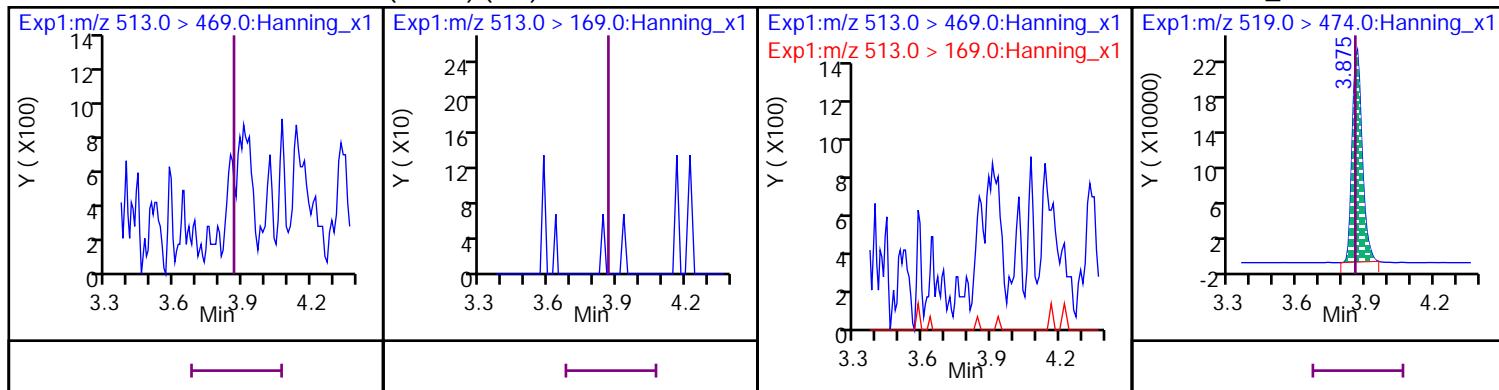
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



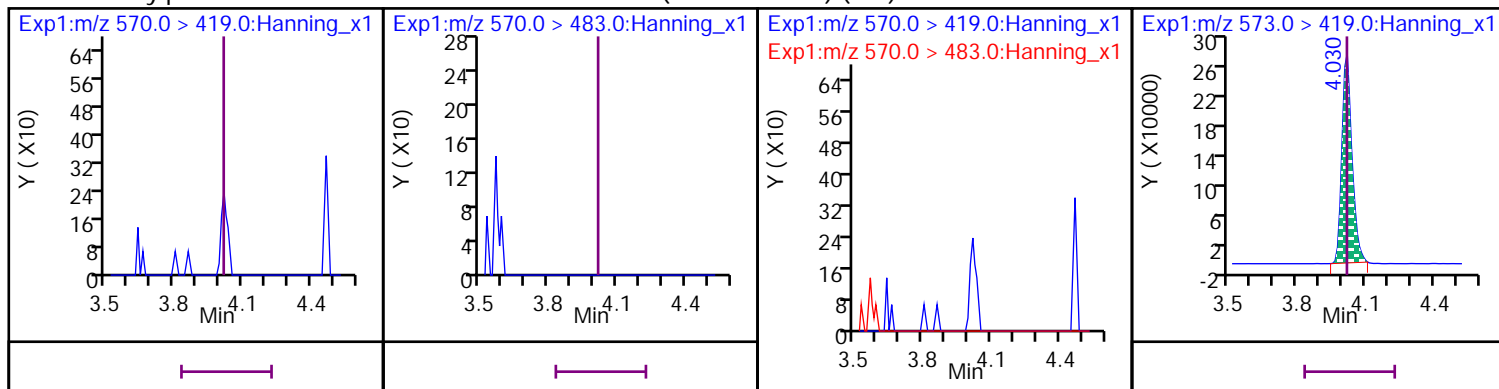
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



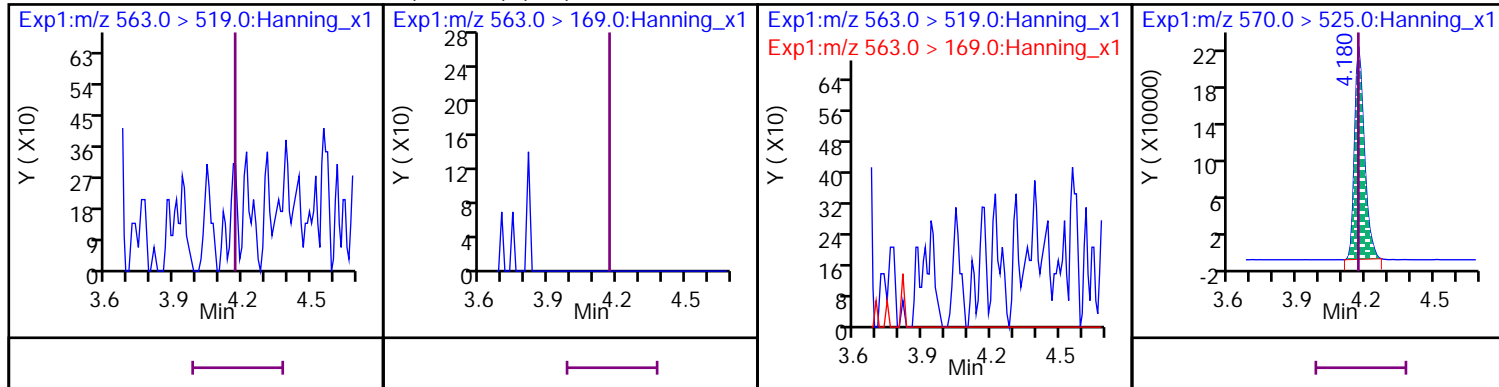
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



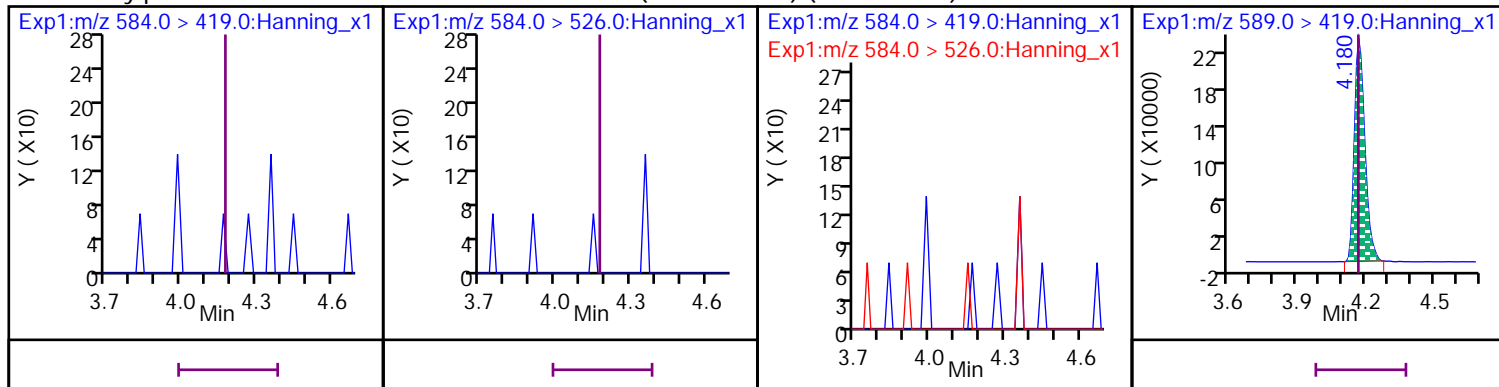
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



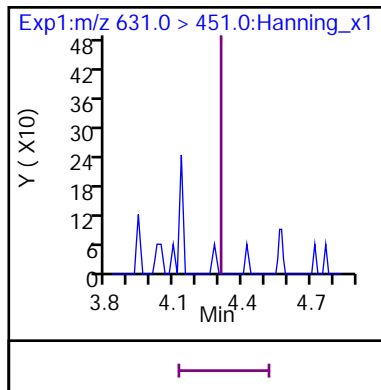
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

D 60 d5-EtFOSAA

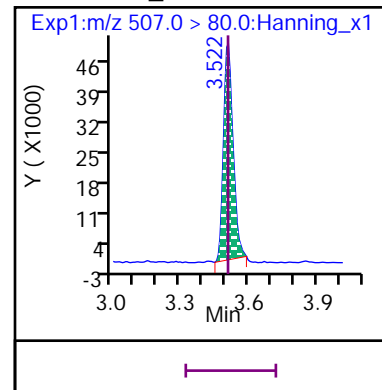




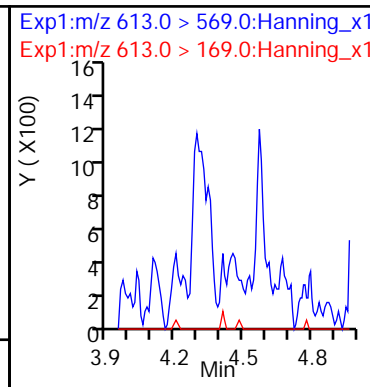
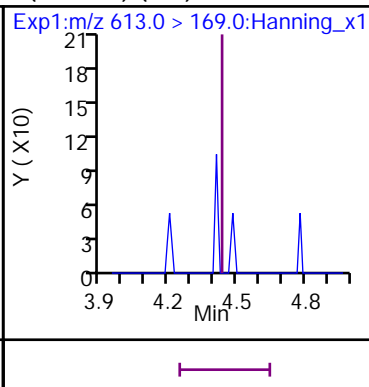
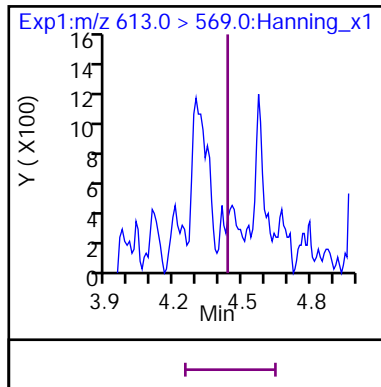
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



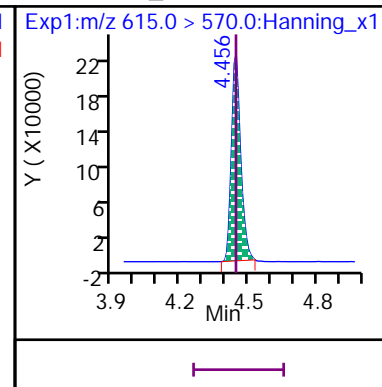
D 54 13C8\_PFOS



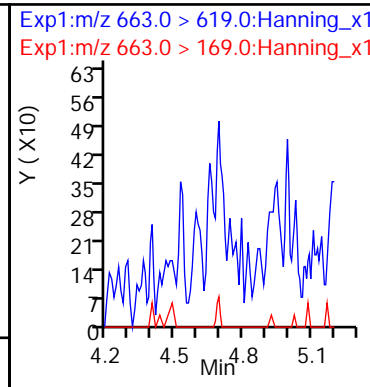
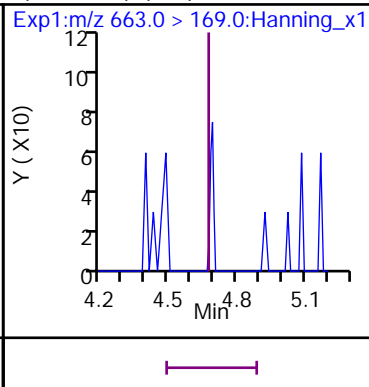
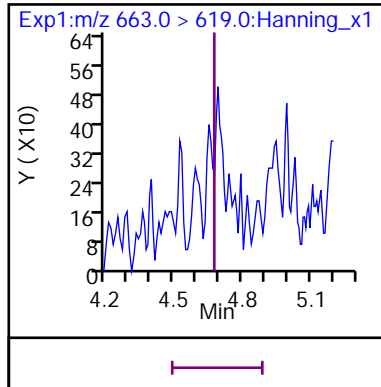
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



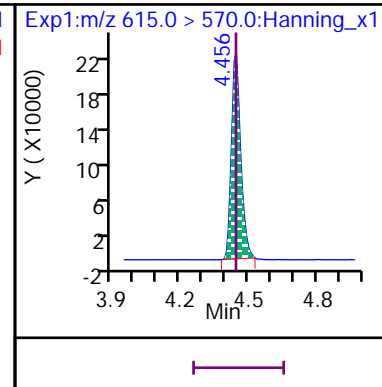
D 38 13C2\_PFDoA



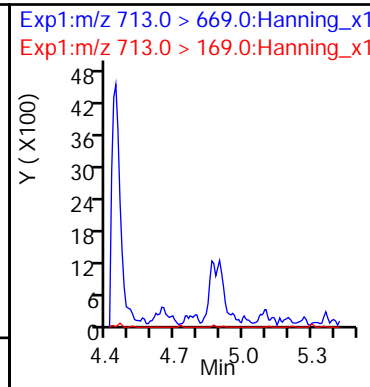
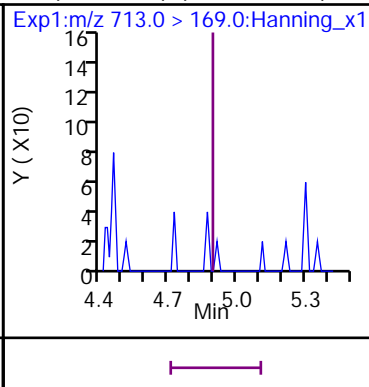
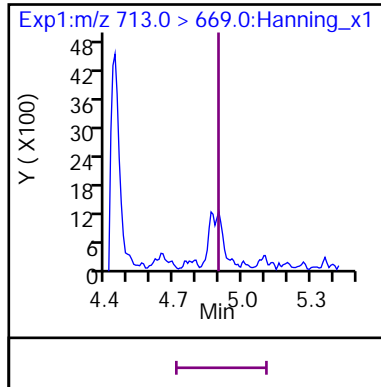
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



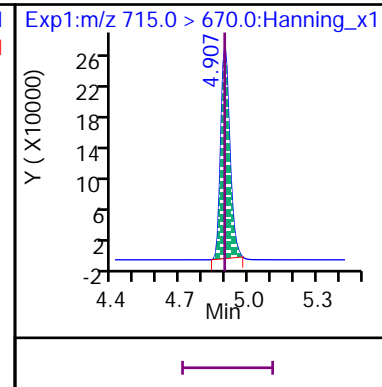
D 38 13C2\_PFTeDA



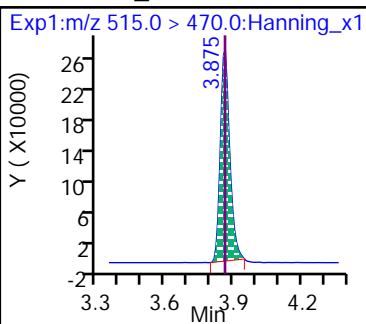
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



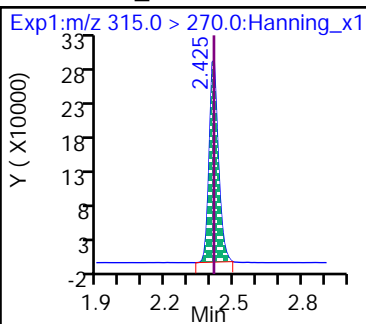
D 42 13C2\_PFTeDA



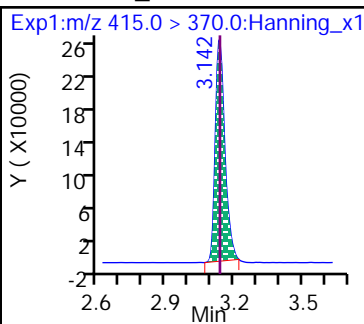
\* 37 13C2\_PFDA



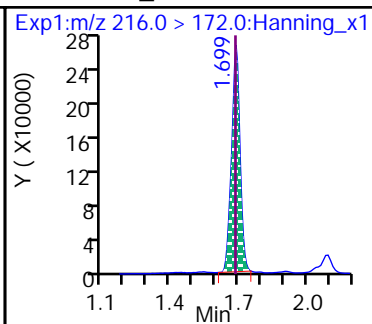
\* 39 13C2\_PFHxA



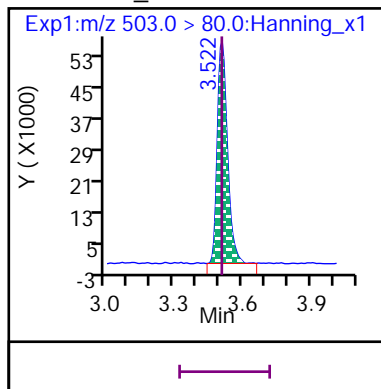
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820011.d

Injection Date: 28-Dec-2020 10:59:26

Inst. ID: LCMSMS02

Client ID: FFS-MW01-1220

Lab ID: VL11001-006

Sample Info: VL11001-006

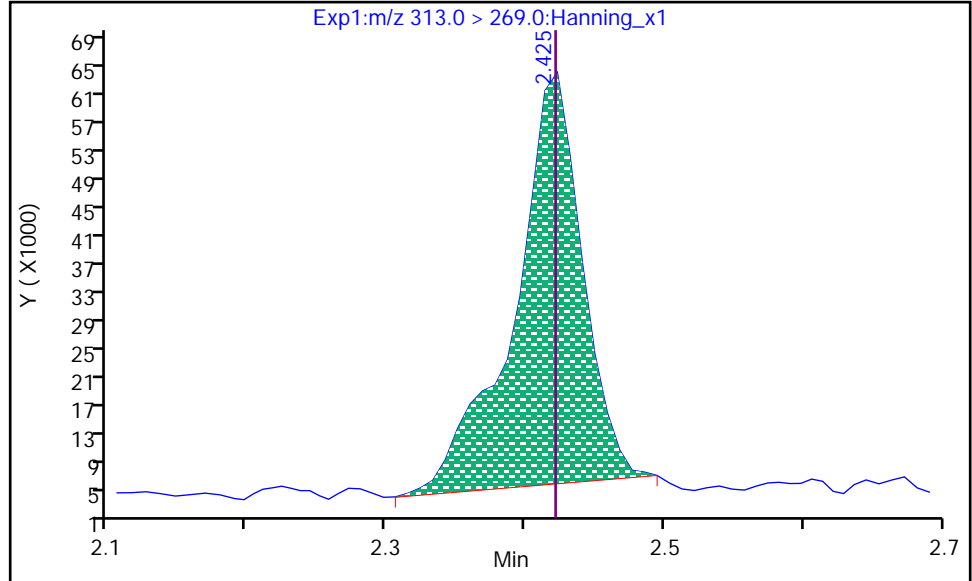
Dil. Factor: 1

Operator: Matthew M. Miller

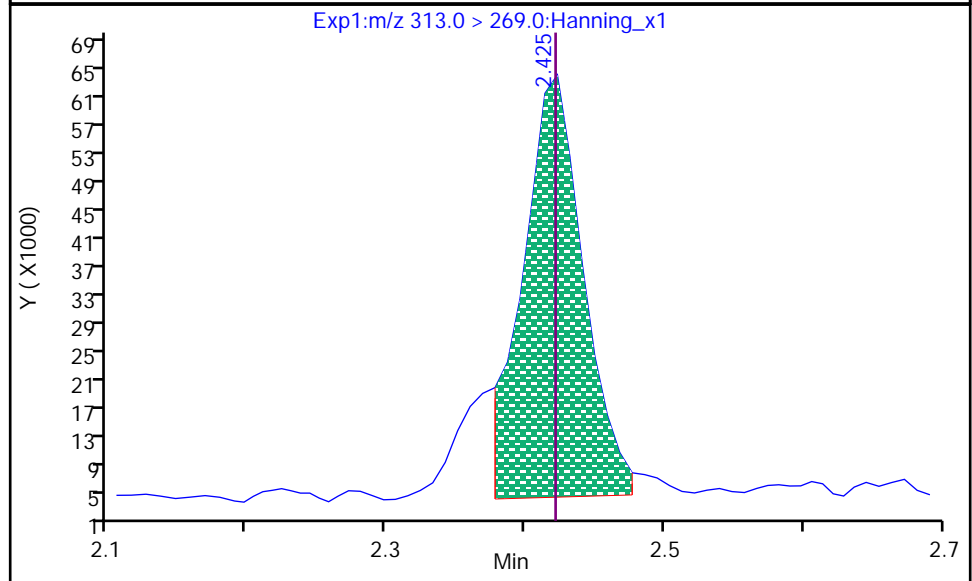
15 PFHxA, CAS: 307-24-4

RT: 2.425  
Area: 195375  
Conc: 10.084  
Conc Units: ng/L

Processing Integration Results



RT: 2.425  
Area: 177081  
Conc: 9.1401  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:28:10

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820011.d

Injection Date: 28-Dec-2020 10:59:26

Inst. ID: LCMSMS02

Client ID: FFS-MW01-1220

Lab ID: VL11001-006

Sample Info: VL11001-006

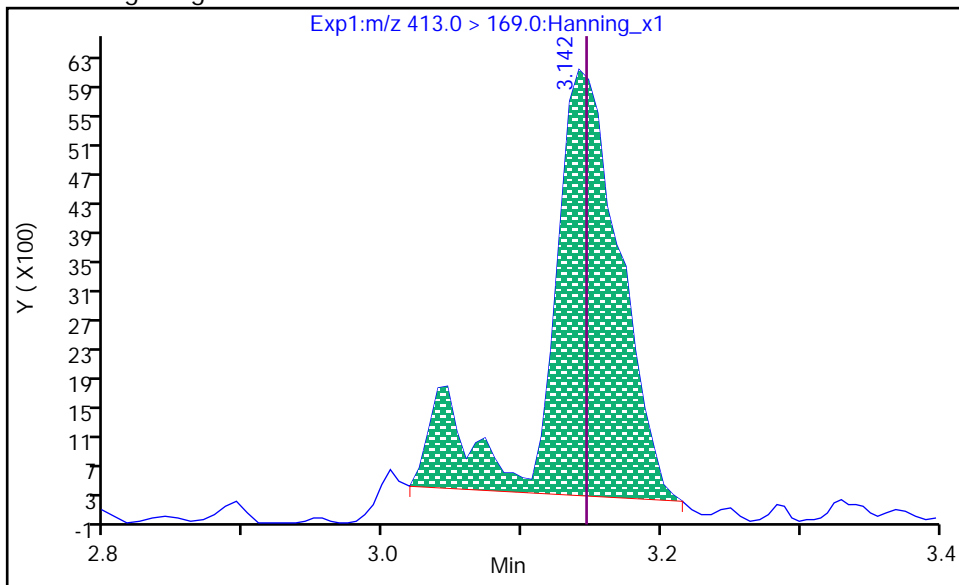
Dil. Factor: 1

Operator: Matthew M. Miller

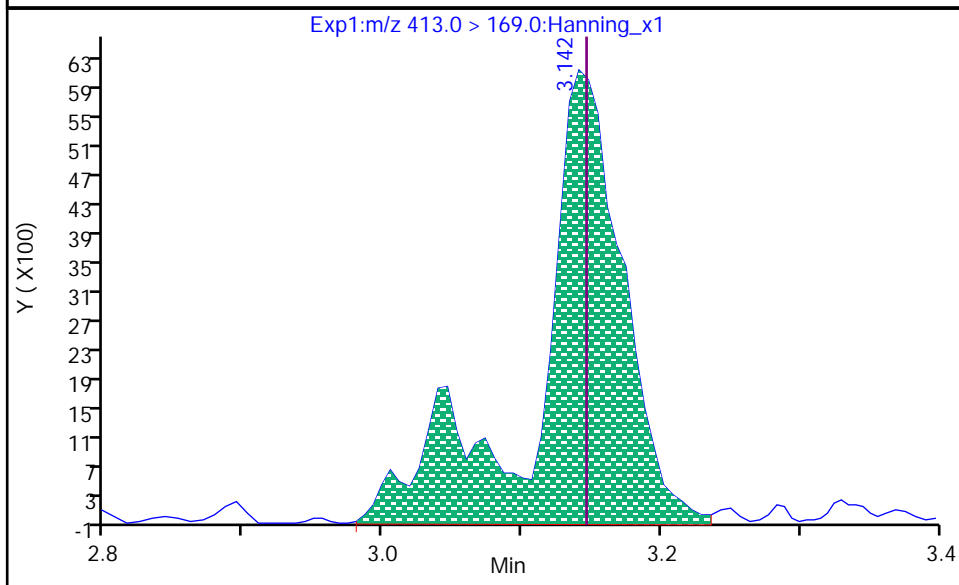
20 PFOA, CAS: 335-67-1

RT: 3.142  
Area: 20258  
Conc: 4.0847  
Conc Units: ng/L

Processing Integration Results



RT: 3.142  
Area: 26227  
Conc: 4.0847  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:28:23

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820011.d

Injection Date: 28-Dec-2020 10:59:26

Inst. ID: LCMSMS02

Client ID: FFS-MW01-1220

Lab ID: VL11001-006

Sample Info: VL11001-006

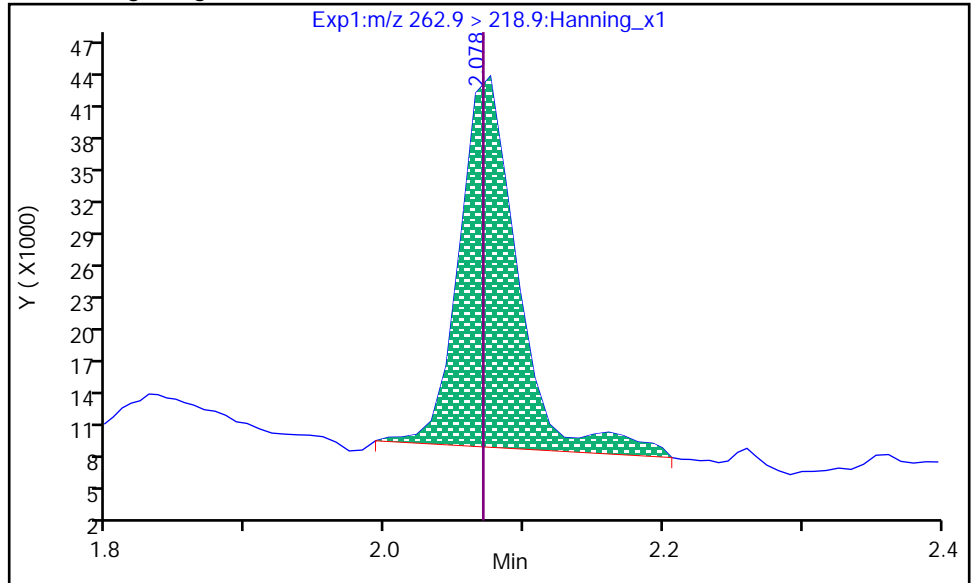
Dil. Factor: 1

Operator: Matthew M. Miller

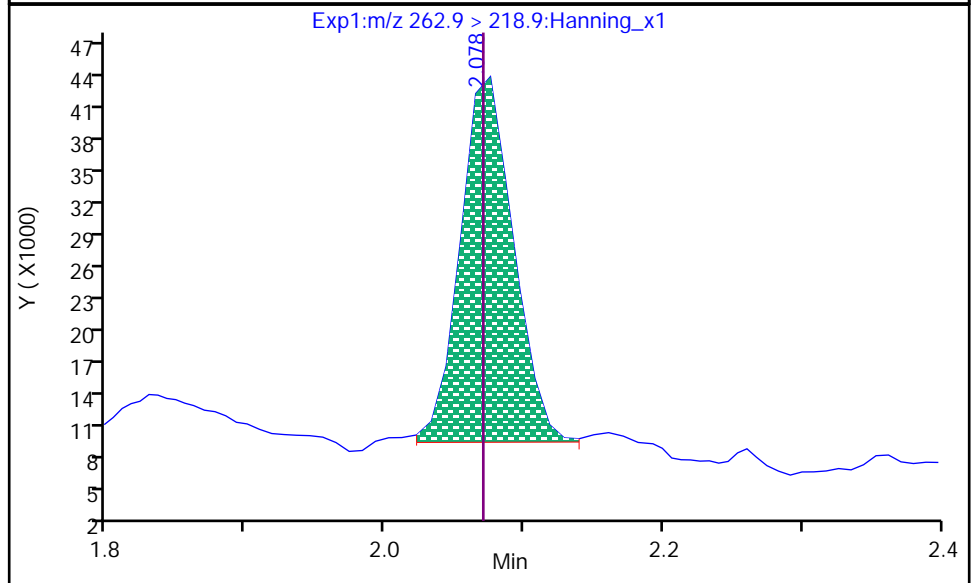
21 PFPeA, CAS: 2706-90-3

Processing Integration Results

RT: 2.078  
Area: 99027  
Conc: 5.7504  
Conc Units: ng/L



RT: 2.078  
Area: 88799  
Conc: 5.1565  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:28:02

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-007</b>
Description: <b>T-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/07/2020 1615</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1110	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		108	50-150
13C2_8:2FTS		96	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBs		99	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBa		113	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		106	50-150
13C6_PFDa		94	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		95	50-150
13C8_PFOs		99	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820012.d  
 Injection Date: 28-Dec-2020 11:10:00 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 4  
 Lab Sample ID: VL11001-007 Lab Prep. Batch: 77741  
 Client ID: T-1-1220 Sample Group: VL11001  
 Sample Info: VL11001-007 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous  
 Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0371250$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	296	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	736629	22	>100:1			1001.00	1062.11	113	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/0	47581	25	10:1			64.917	2.4101		J M
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	707765	16	>100:1			1001.00	1028.90	106	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.072		ND								U
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	236299	16	>100:1			1001.00	1026.36	99.2	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.125		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.423	0	744554	18	>100:1			1001.00	1010.15	100	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.423		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.530	1	1437817	19	>100:1			5005.00	5398.14	103	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.530		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	613259	19	>100:1			1001.00	1010.90	96.8	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.772		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	162177	19	>100:1			1001.00	947.14	93.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.790		ND								U
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.808		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	112347	25	>100:1			5005.00	5833.66	108	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.128		ND								U
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	596047	22	>100:1			1001.00	1007.07	94.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.148		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	150158	22	>100:1			1001.00	1001.53	98.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.520		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.722		ND								U
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUDS) CAS: 763051-92-9</b>													
631 > 451	54		4.317		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	709995	23	>100:1			1001.00	945.45	92.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.520		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	96278	19	>100:1			5005.00	5190.15	95.8	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.873		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	632308	19	>100:1			1001.00	953.23	94	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.873		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	736430	18	>100:1			5005.00	5130.51	93	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.029		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	685496	18	>100:1			5005.00	5161.30	93.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.187		ND								U
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	545640	17	>100:1			1001.00	863.25	84.8	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													
563 > 519	52		4.178		ND								U
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.447	4.455	0	550342	19	>100:1			1001.00	909.18	90	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													
613 > 569	38		4.446		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.688		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	676075	18	>100:1			1001.00	802.52	83.2	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.906		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	691367	19	>100:1					94.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	792228	18	>100:1					108	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	606604	21	>100:1					101	
<b>* 43 13C3_PFBa</b>													
216 > 172		1.699	1.696	1	743664	22	>100:1					122	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	175189	21	>100:1					107	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

J - Compound Concentration Below Quantitation Limit

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820012.d

Injection Date: 28-Dec-2020 11:10:00

Inst. ID: LCMSMS02

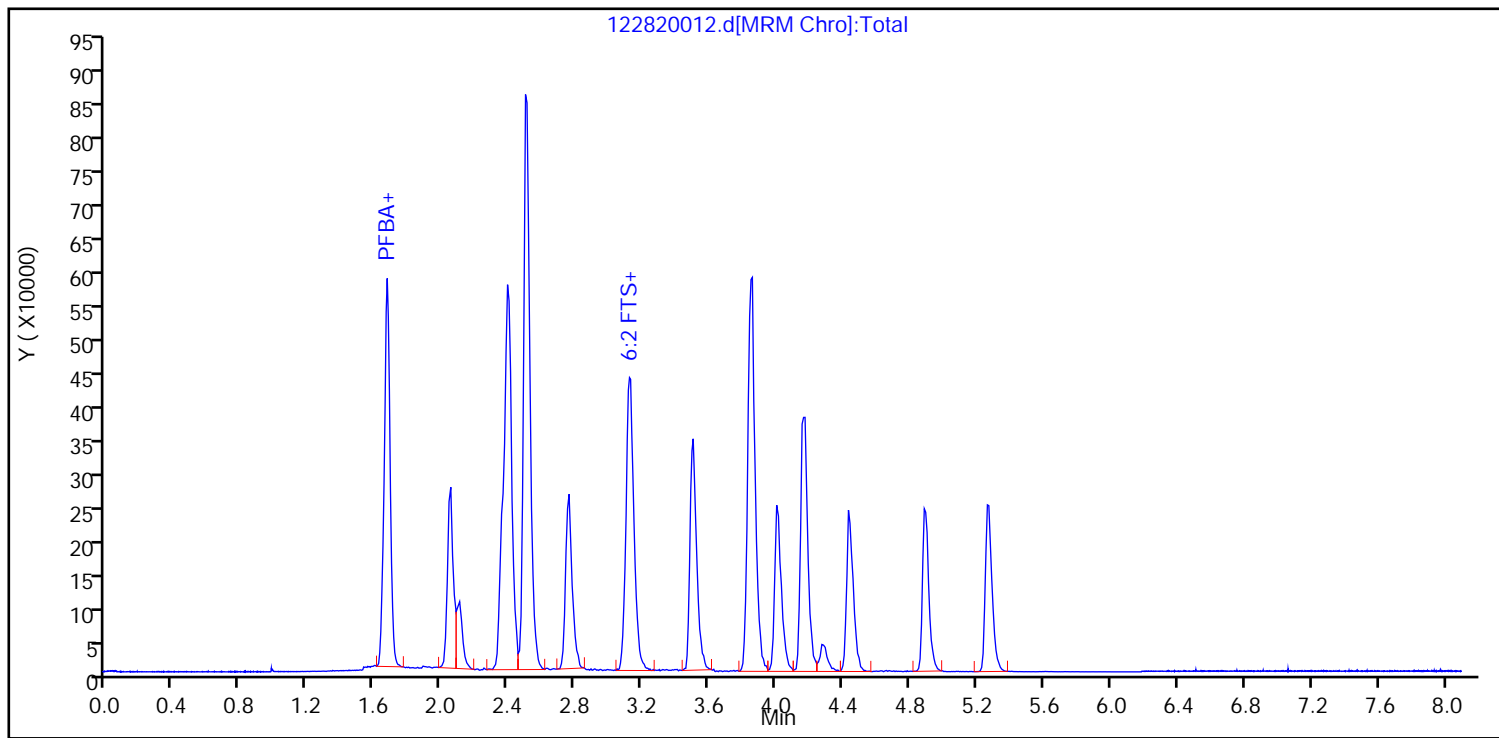
Client ID: T-1-1220

Lab ID: VL11001-007

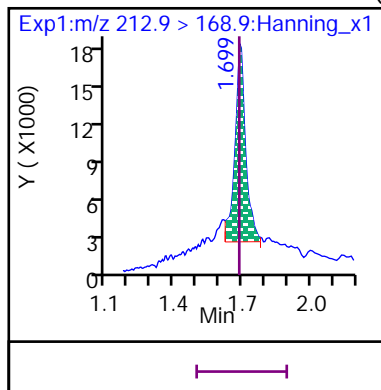
Sample Info: VL11001-007

Dil. Factor: 1

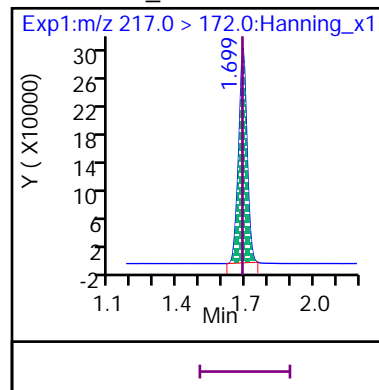
Operator: Matthew M. Miller



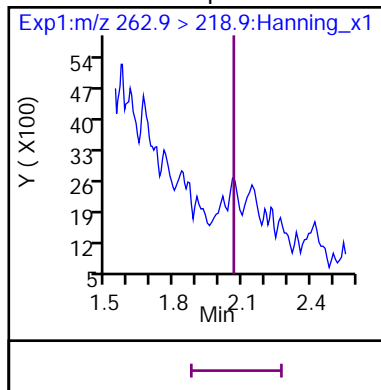
8 Perfluoro-n-butanoic acid (PFBA) (M)



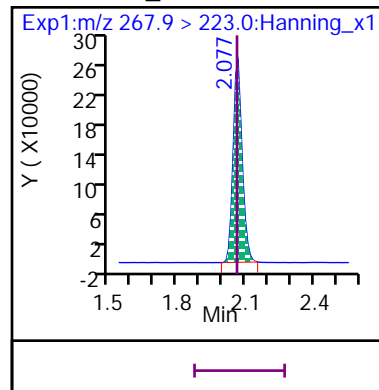
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

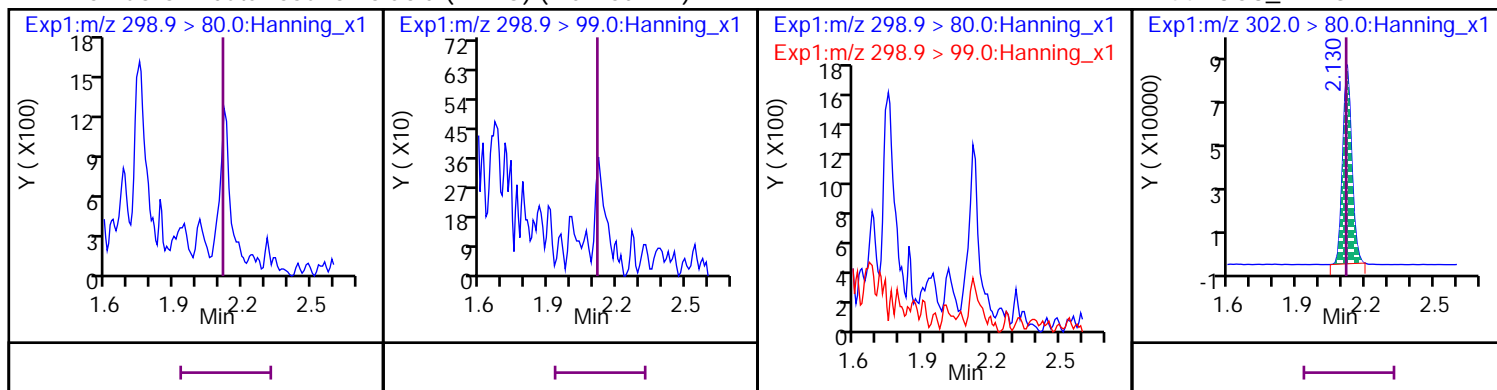


D 50 13C5\_PFPeA



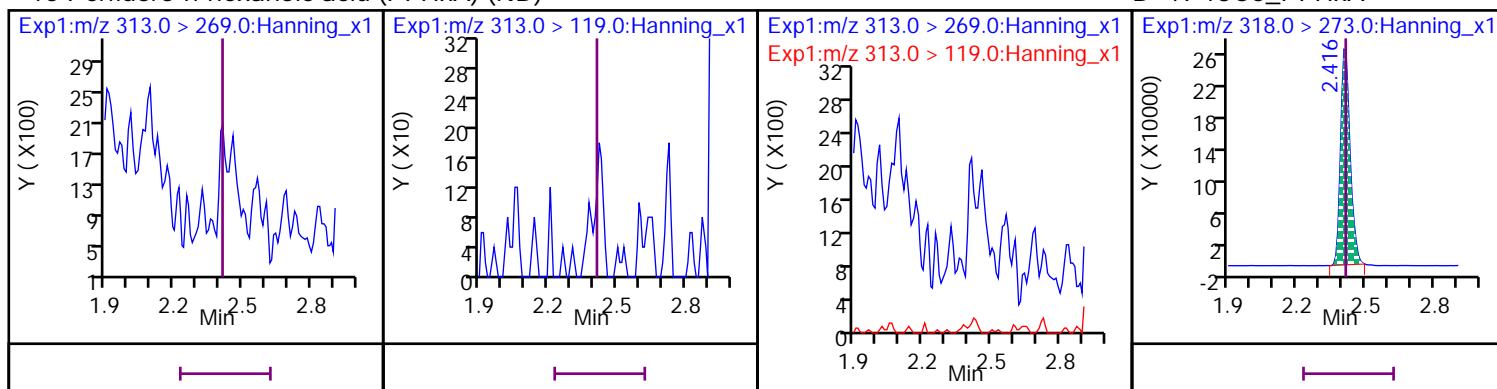
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (Marked ND)

D 44 13C3\_PFBS



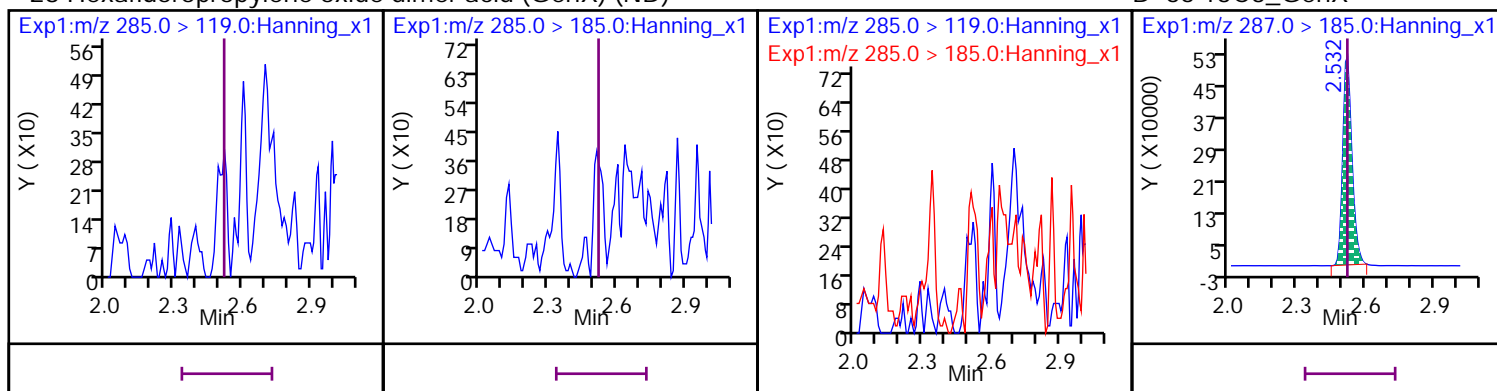
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



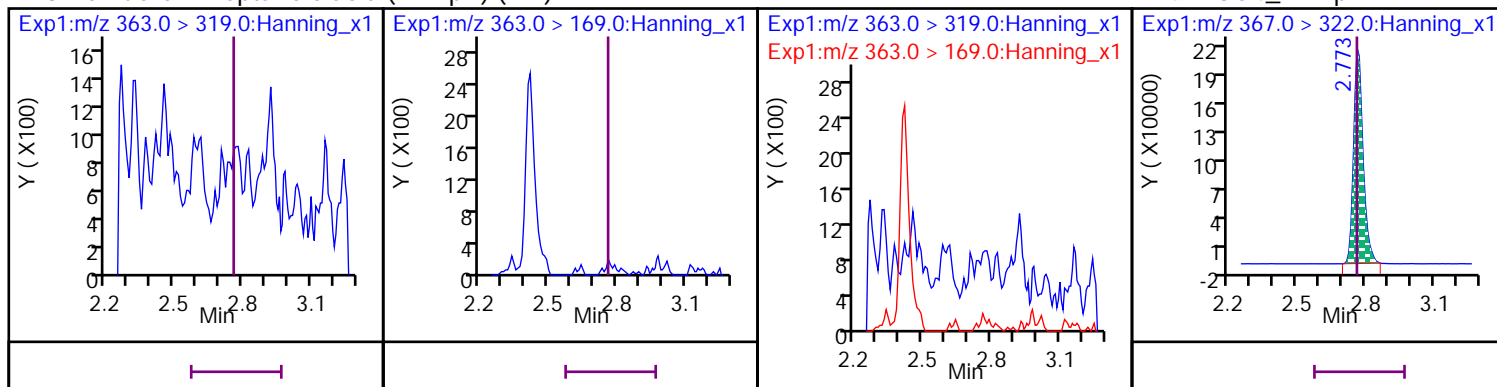
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



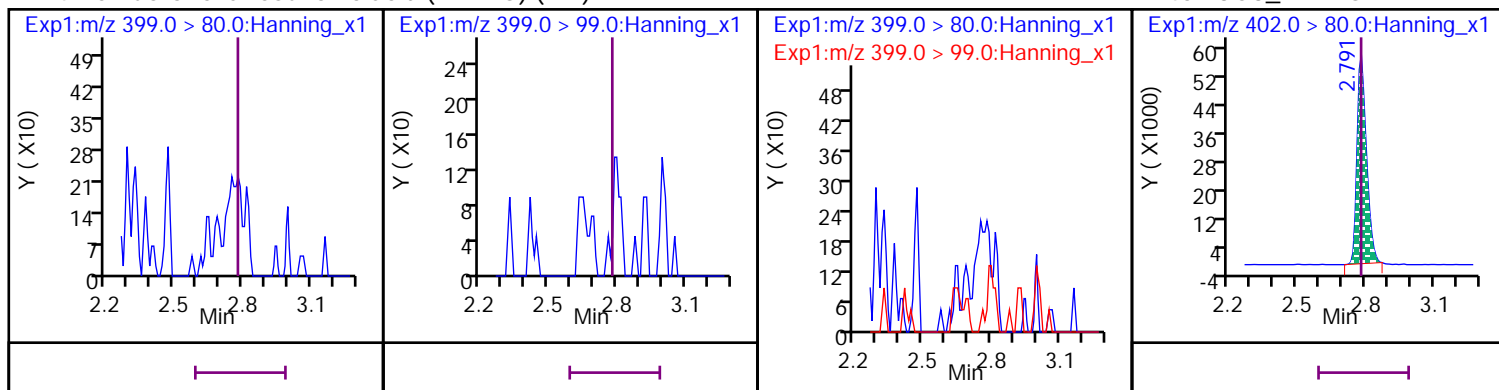
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



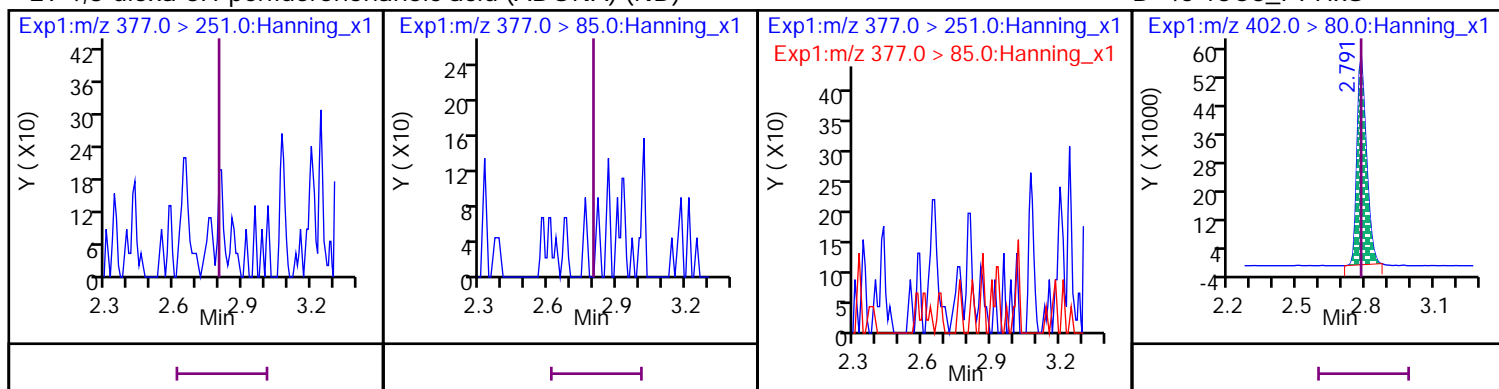
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



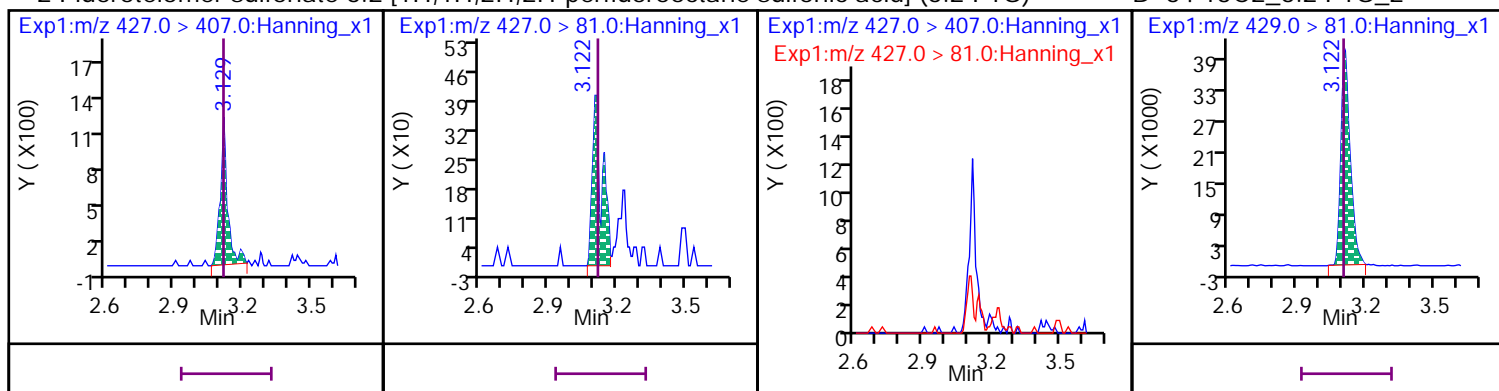
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



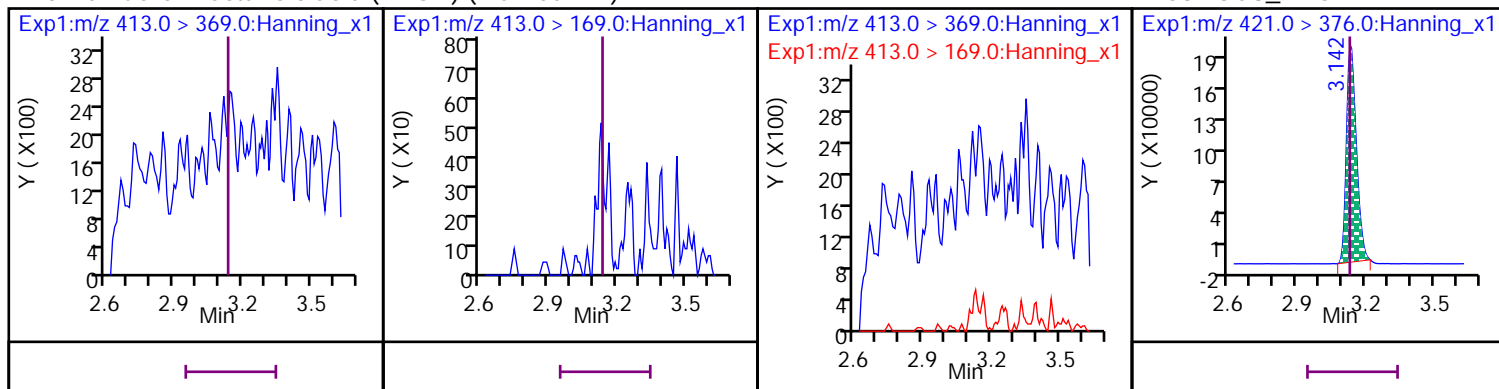
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

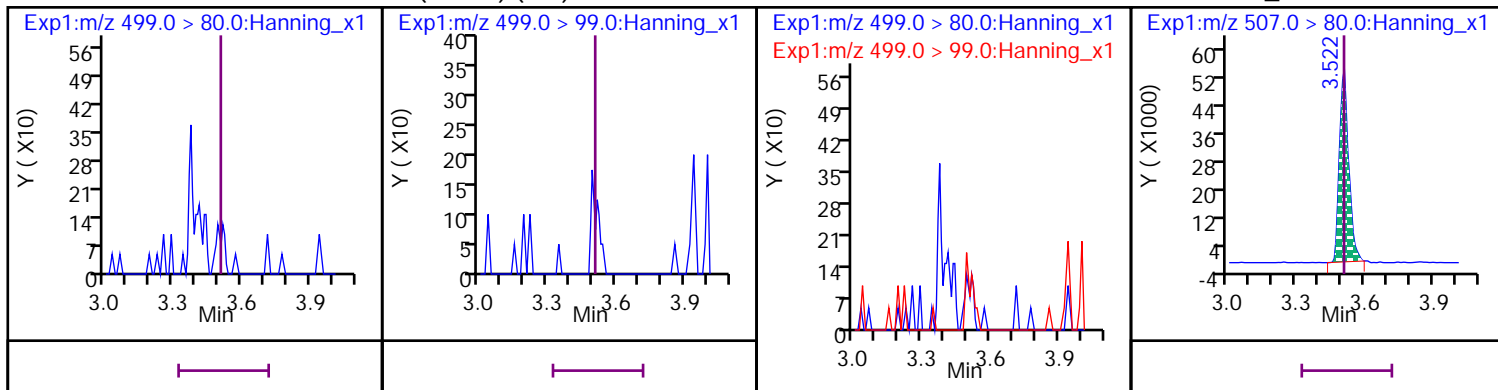
D 53 13C8\_PFOA





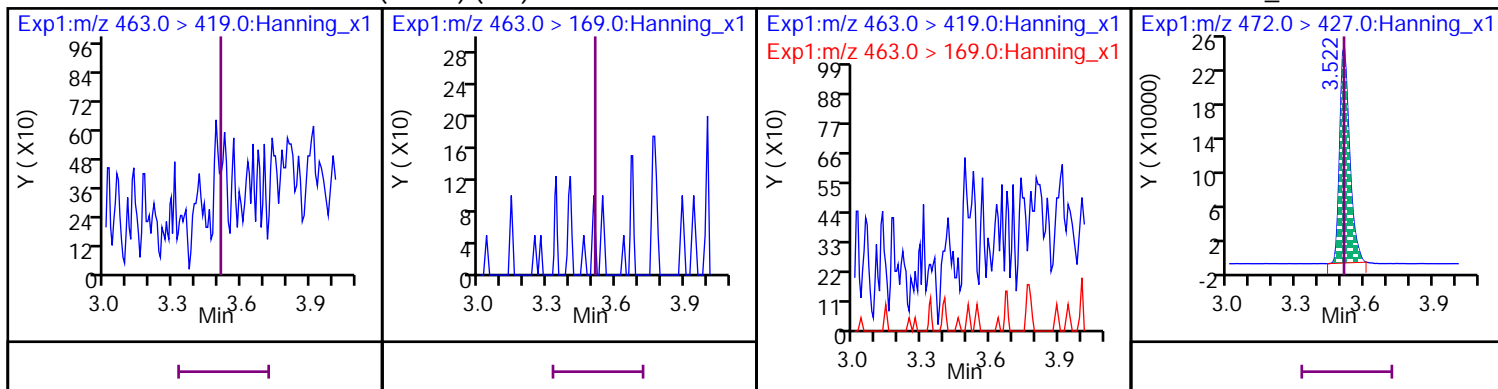
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



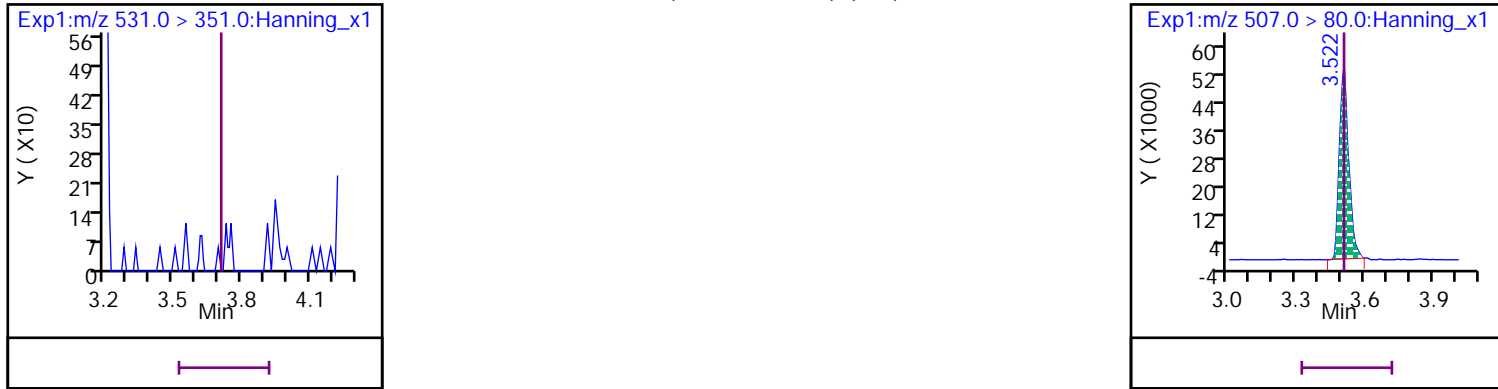
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



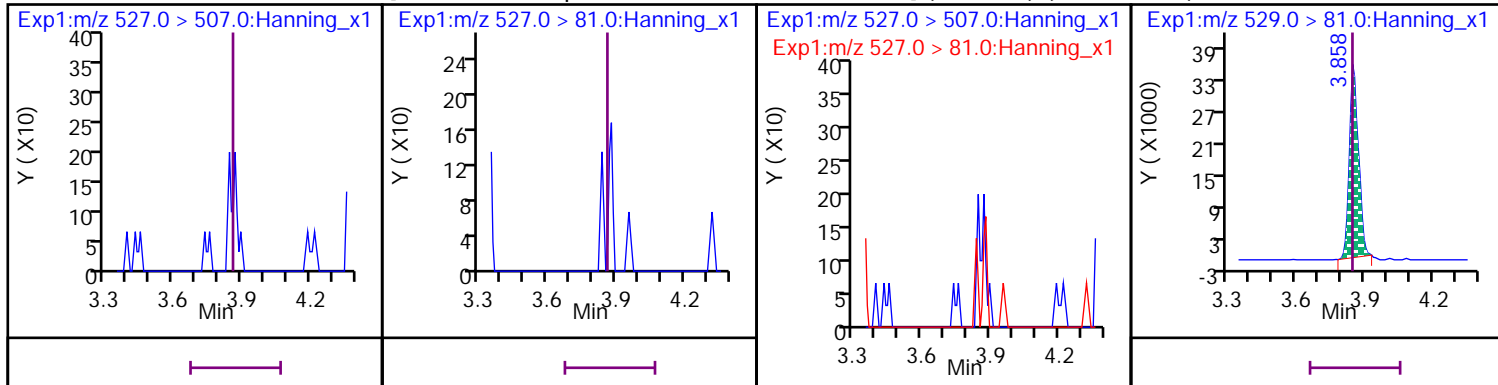
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



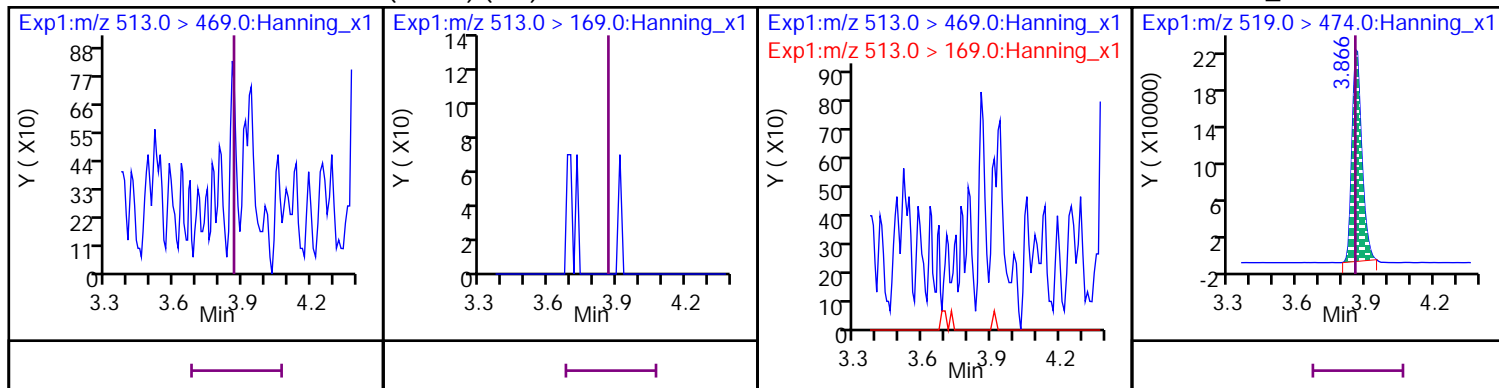
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ~~ND~~)

D 54 13C2\_8:2 FTS\_2



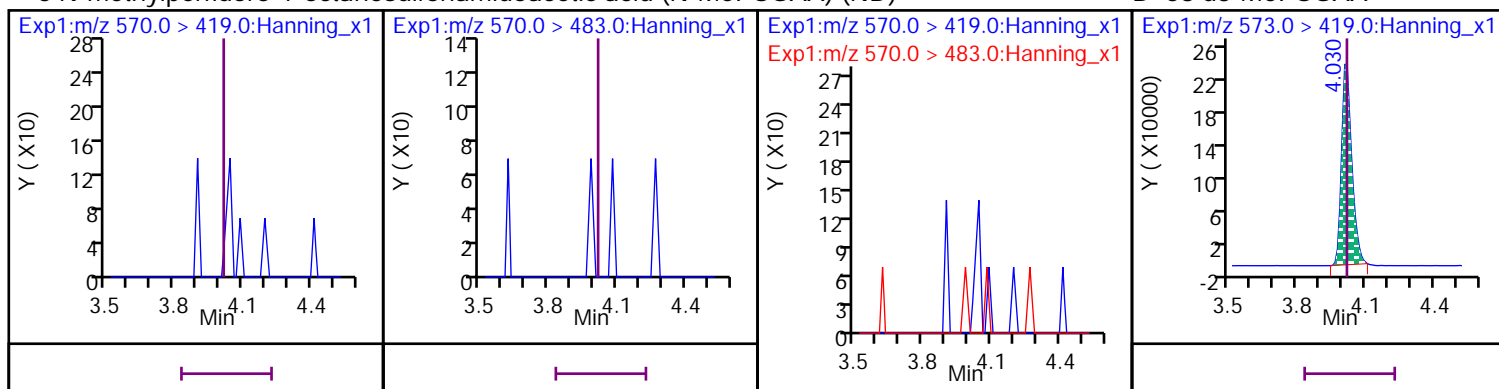
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



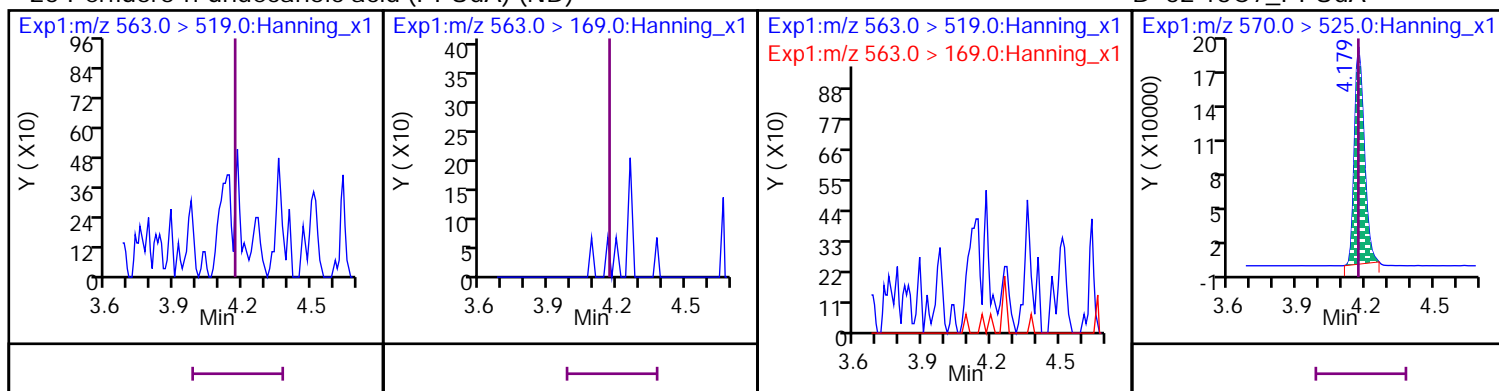
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



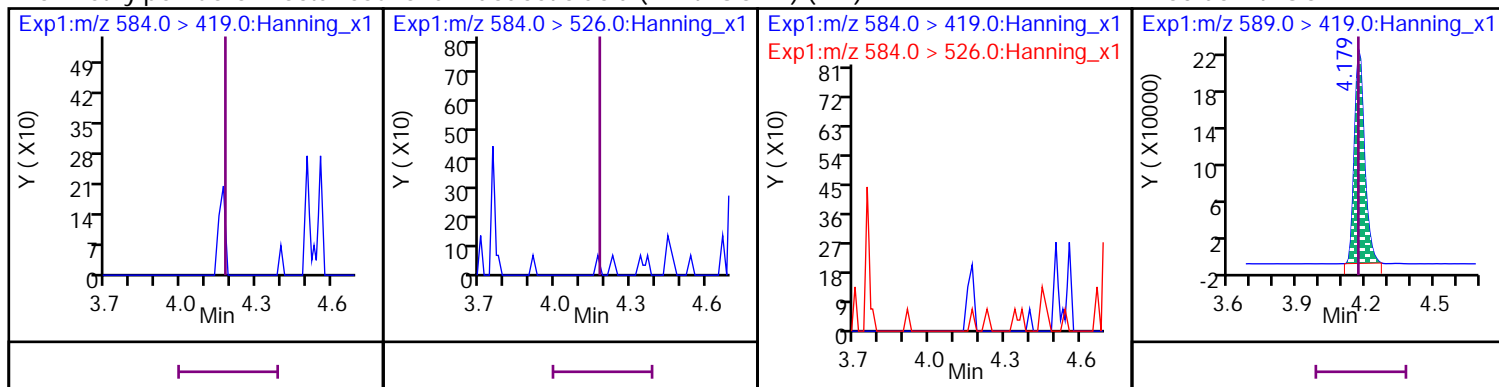
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

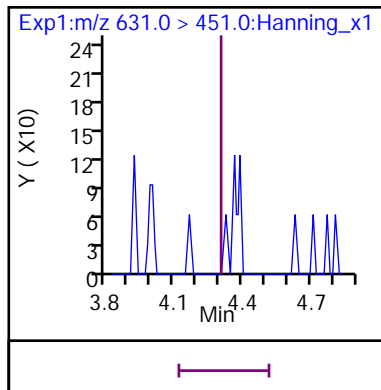


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

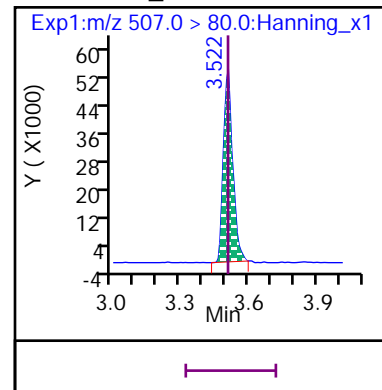
D 60 d5-EtFOSAA



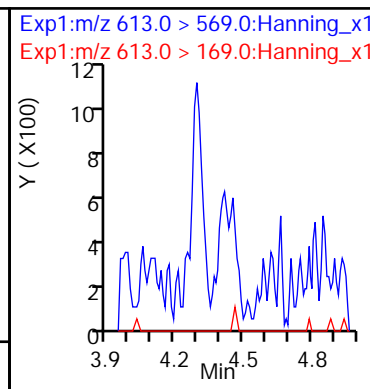
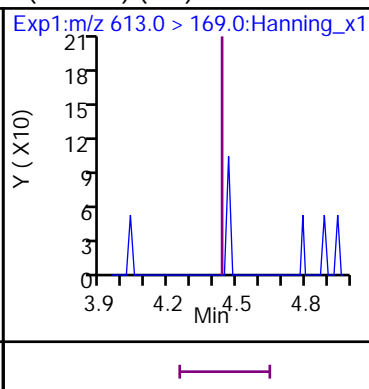
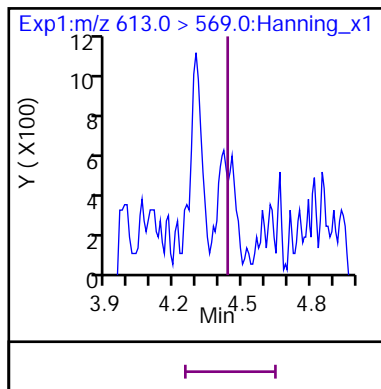
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



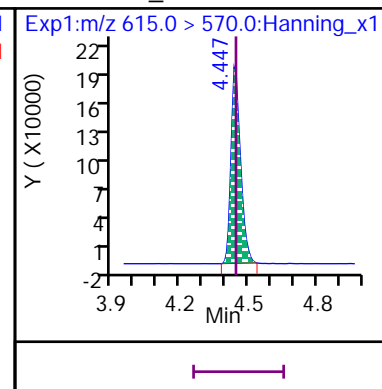
D 54 13C8\_PFOS



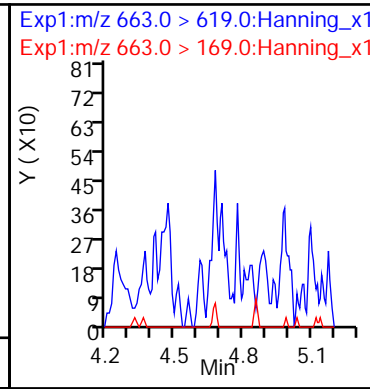
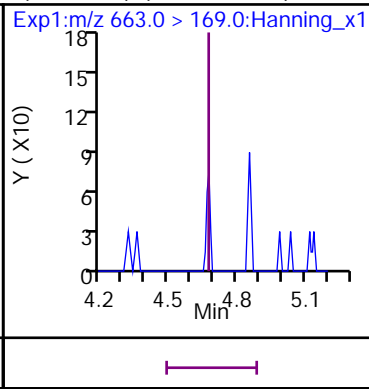
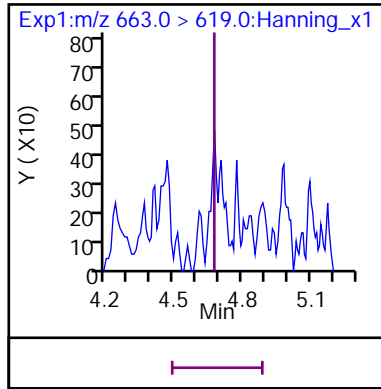
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



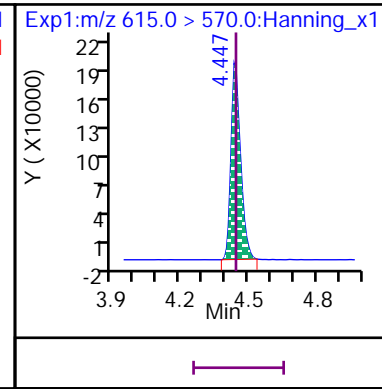
D 38 13C2\_PFDoA



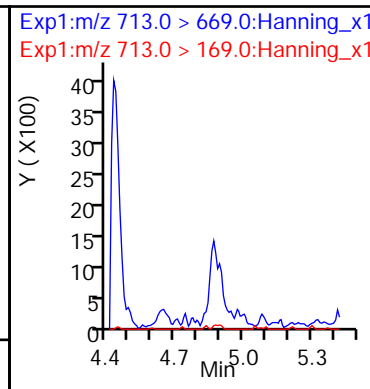
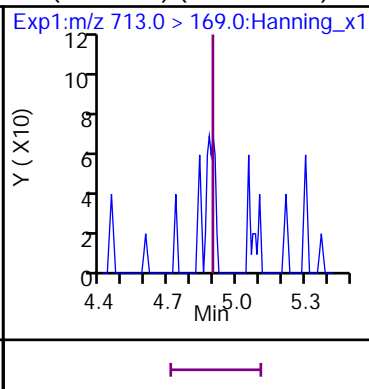
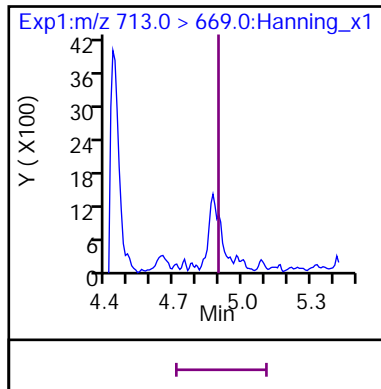
24 Perfluoro-n-tridecanoic acid (PFTeDA) (Marked ND)



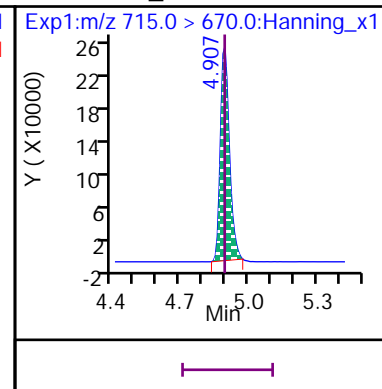
D 38 13C2\_PFDoA



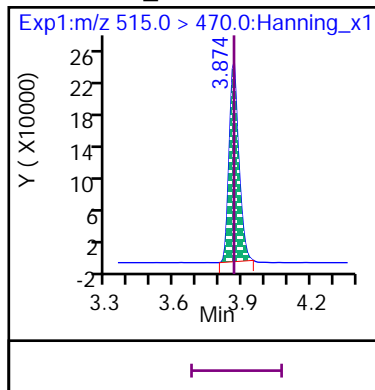
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



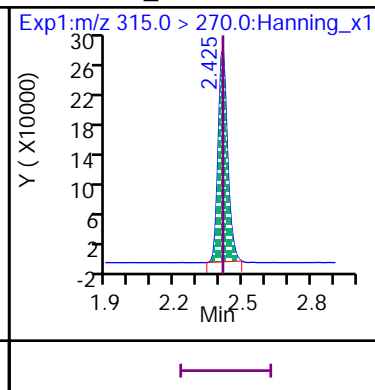
D 42 13C2\_PFTeDA



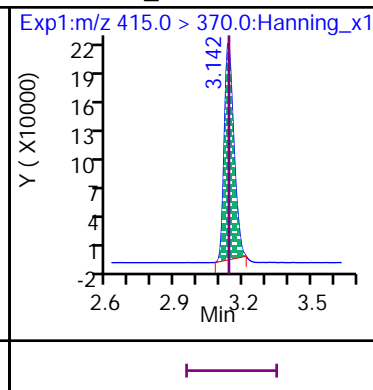
\* 37 13C2\_PFDA



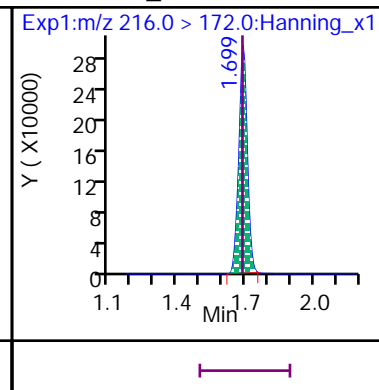
\* 39 13C2\_PFHxA



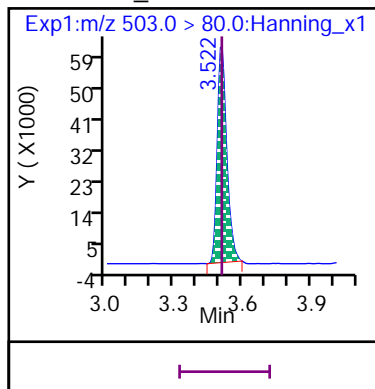
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820012.d

Injection Date: 28-Dec-2020 11:10:00

Inst. ID: LCMSMS02

Client ID: T-1-1220

Lab ID: VL11001-007

Sample Info: VL11001-007

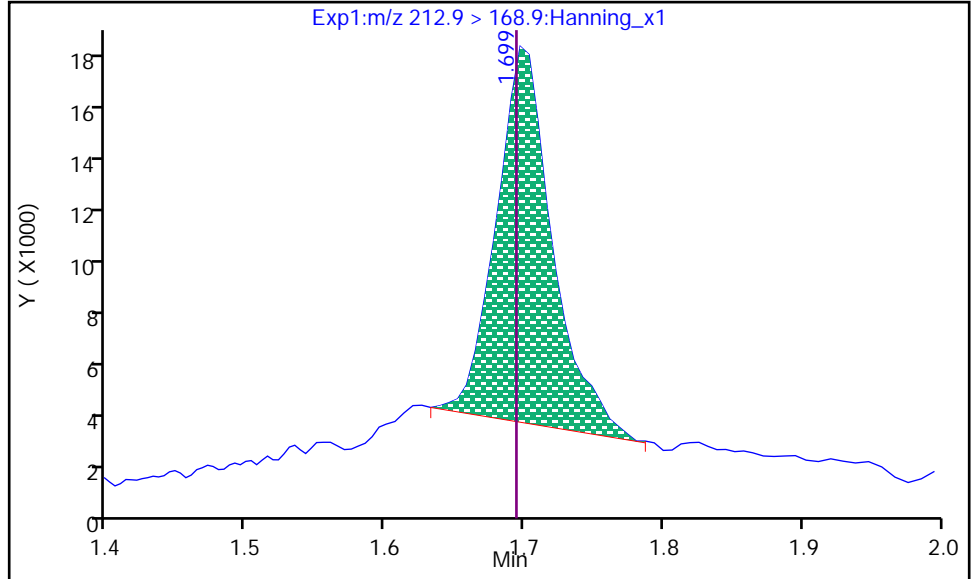
Dil. Factor: 1

Operator: Matthew M. Miller

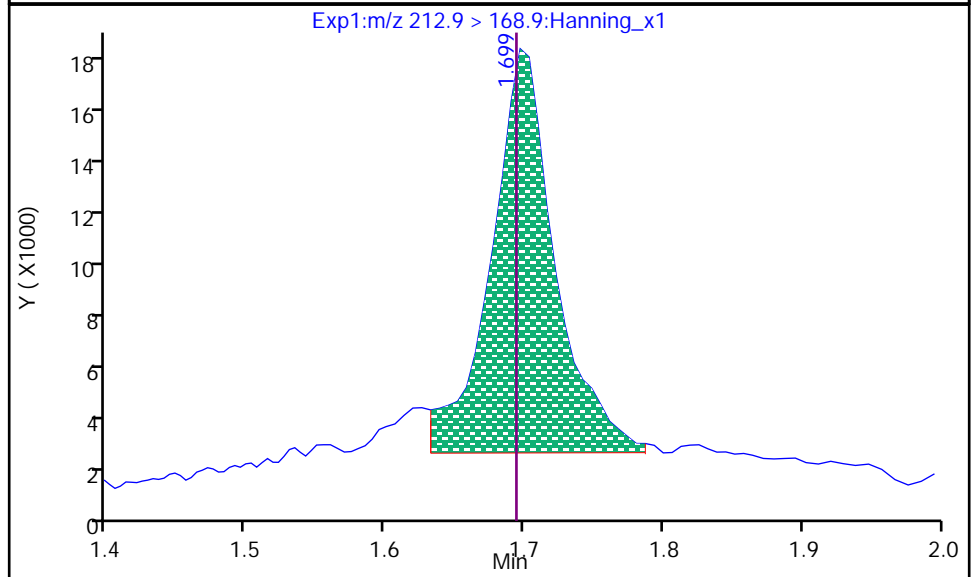
8 PFBA, CAS: 375-22-4

RT: 1.699  
Area: 38987  
Conc: 1.9748  
Conc Units: ng/L

Processing Integration Results



RT: 1.699  
Area: 47581  
Conc: 2.4101  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:28:47

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-008</b>
Description: <b>JAW-60-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1035</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1120	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1055	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1500</b>		<b>18</b>	<b>9.0</b>	<b>4.5</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>20</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>11</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>99</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>25</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>270</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_6:2FTS		115	50-150		105	50-150
13C2_8:2FTS		108	50-150		95	50-150
13C2_PFDaA		90	50-150		94	50-150
13C2_PFTeDA		88	50-150		96	50-150
13C3_PFBFS		92	50-150		102	50-150
13C3_PFHxS		93	50-150		92	50-150
13C3-HFPO-DA		94	50-150		96	50-150
13C4_PFBFA		97	50-150		109	50-150
13C4_PFHpA		93	50-150		97	50-150
13C5_PFHxA		99	50-150		99	50-150
13C5_PFPeA		98	50-150		100	50-150
13C6_PFDA		99	50-150		93	50-150
13C7_PFUdA		94	50-150		94	50-150
13C8_PFOA		89	50-150		98	50-150
13C8_PFOS		99	50-150		101	50-150
13C9_PFNA		100	50-150		94	50-150
d5-EtFOSAA		96	50-150		94	50-150
d3-MeFOSAA		102	50-150		101	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d  
 Injection Date: 28-Dec-2020 11:20:38 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 5  
 Lab Sample ID: VL11001-008 Lab Prep. Batch: 77741  
 Client ID: JAW-60-1220 Sample Group: VL11001  
 Sample Info: VL11001-008 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0396715$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	277	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	628817	22	>100:1			1001.00	906.66	96.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/0	309906	22	8.8:1			495.32	19.650		M
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	653532	16	>100:1			1001.00	950.06	98.1	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.072	1/0	254717	12	16:1			388.04	15.394		M
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	218727	18	>100:1			1001.00	950.03	91.8	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/0	607379	17	>100:1	Target = 3.34		2357.56	93.528		
298.9 > 99	44	2.130	2.125		176994	17	>100:1	3.43 (1.67-5.02)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	737433	18	>100:1			1001.00	1000.49	99.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.423	0/-1	1810324	16	>100:1	Target = 17.01		2489.02	98.743		M
313 > 119	49	2.416	2.423		88701	18	>100:1	20.40 (8.50-25.52)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.530	1	1322619	20	>100:1			5005.00	4965.64	94.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.530	ND									U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	591897	20	>100:1			1001.00	975.69	93.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	164592	21	50:1	Target = 3.79		268.35	10.646		
363 > 169	47	2.773	2.772		37598	20	18:1	4.37 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	161258	19	>100:1			1001.00	941.77	92.6	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	6412882	27	>100:1	Target = 3.80	0.19	37544	1489.43		E
399 > 99	45	2.791	2.790		1821602	27	>100:1	3.52 (1.90-5.71)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	119947	23	>100:1			5005.00	6228.30	115	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.128		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	557231	24	>100:1			1001.00	941.48	88.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.148	1/0	356468	34	>100:1	Target = 2.85	0.26	628.13	24.919		
413 > 169	53	3.142	3.148		130129	37	>100:1	2.73 (1.42-4.28)	0.41				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	150905	19	>100:1			1001.00	1006.51	99	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	1230913	65	>100:1	Target = 6.80	4.09	6890.41	273.35		
499 > 99	54	3.522	3.520		256112	65		4.80 (3.40-10.20)	0.98				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	767922	20	>100:1			1001.00	1022.58	100	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	108154	21	>100:1			5005.00	5830.36	108	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	665520	19				1001.00	1003.30	98.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	810674	19	>100:1			5005.00	5647.75	102	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	700345	19	>100:1			5005.00	5273.10	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	603192	18	>100:1			1001.00	954.31	93.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	551081	19	>100:1			1001.00	910.40	90.1	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	714371	18	>100:1			1001.00	847.98	87.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	736873	20	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	770979	18	>100:1					105	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	585689	25	>100:1					97.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	623017	22	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	171620	21	>100:1					105	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 E - Compound Concentration Exceeds Max. Calibration Range  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d

Injection Date: 28-Dec-2020 11:20:38

Inst. ID: LCMSMS02

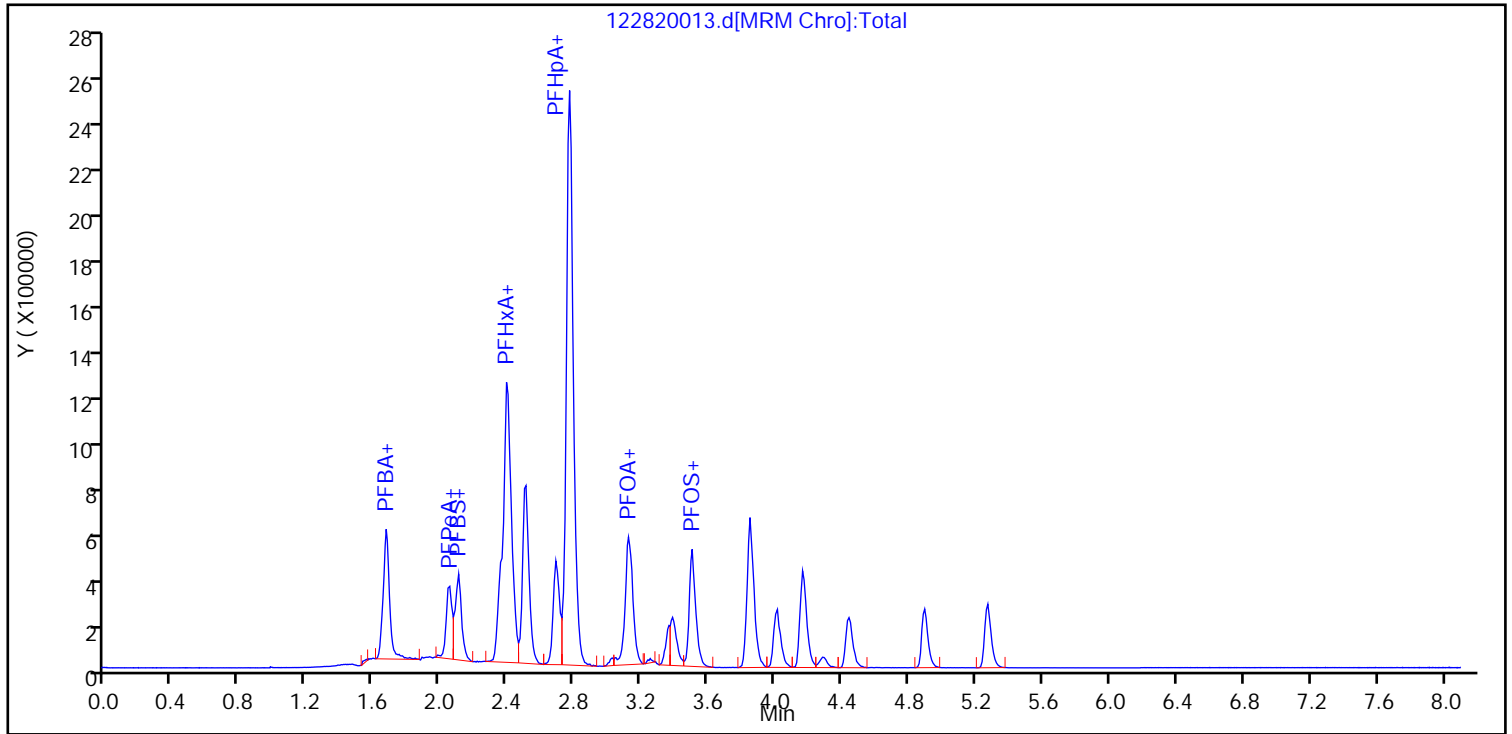
Client ID: JAW-60-1220

Lab ID: VL11001-008

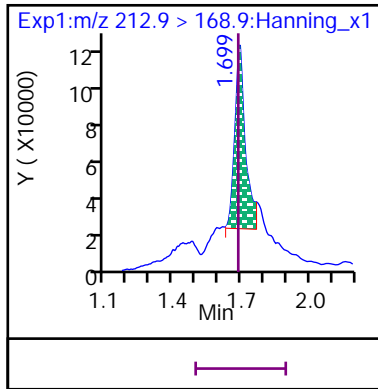
Sample Info: VL11001-008

Dil. Factor: 1

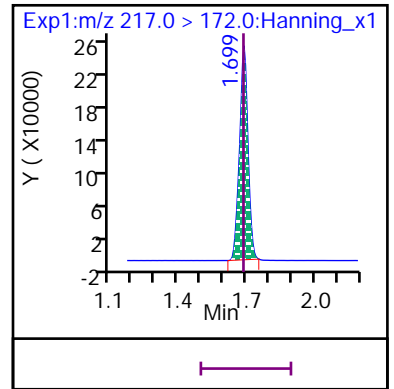
Operator: Matthew M. Miller



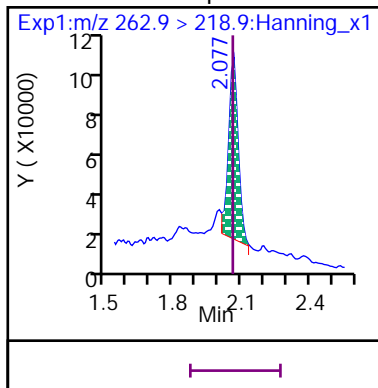
8 Perfluoro-n-butanoic acid (PFBA) (M)



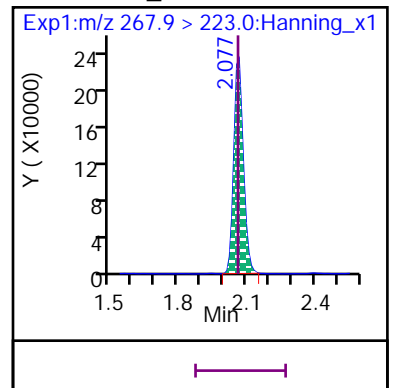
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

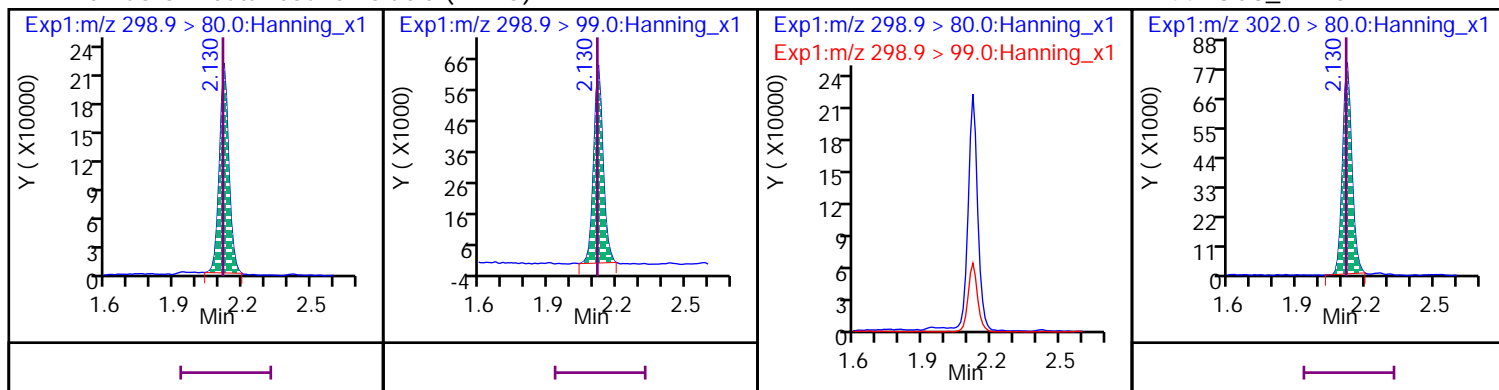


D 50 13C5\_PFPeA



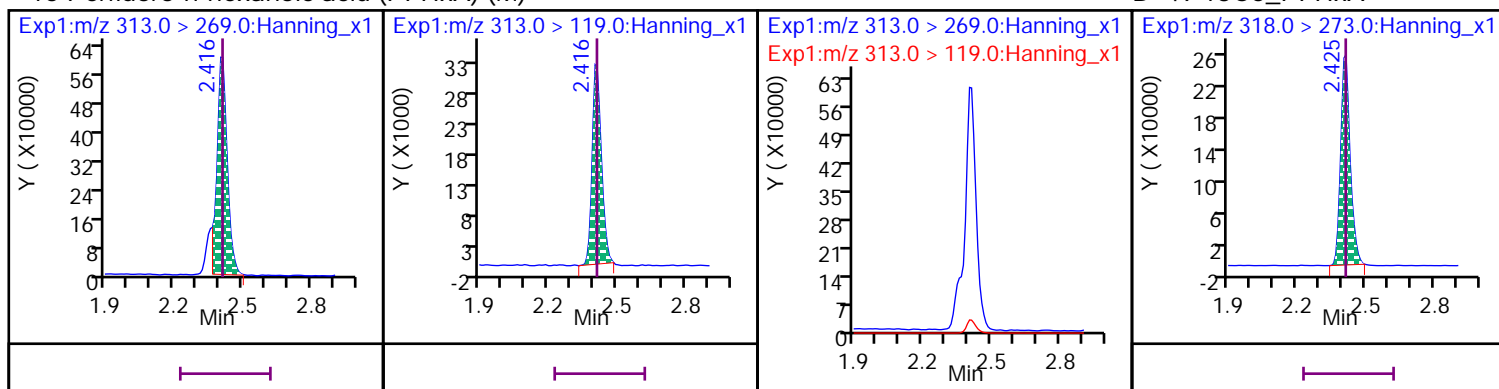
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



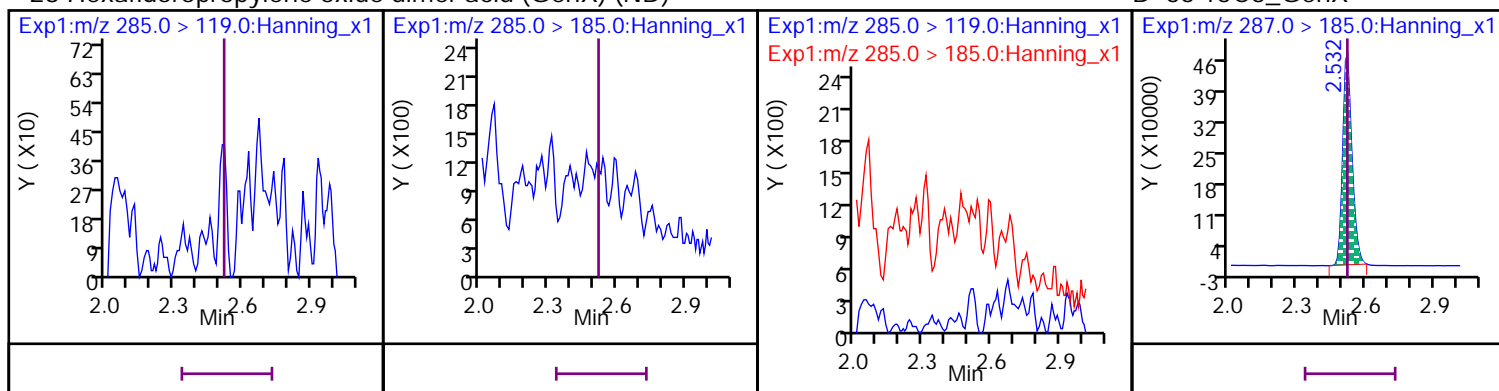
15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



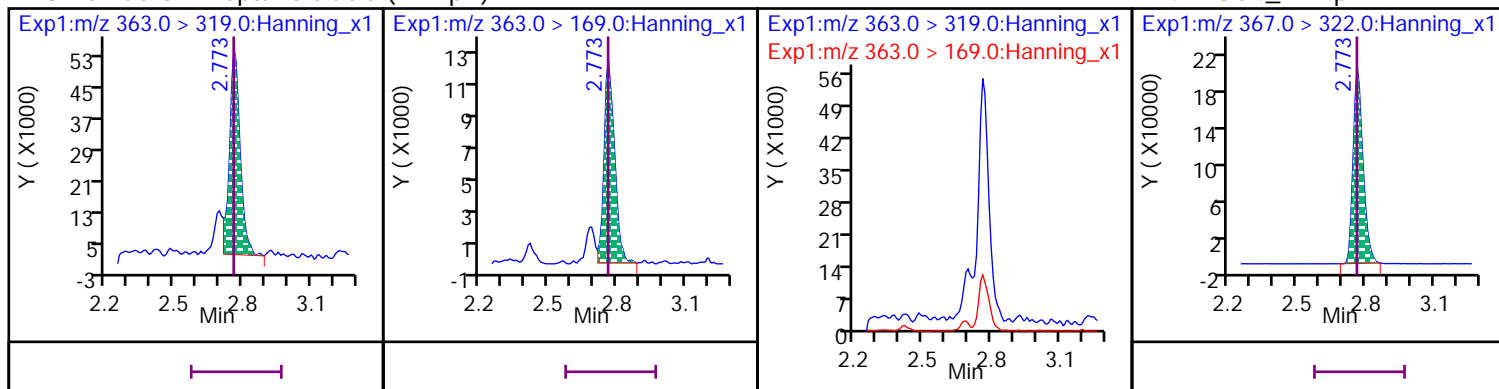
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



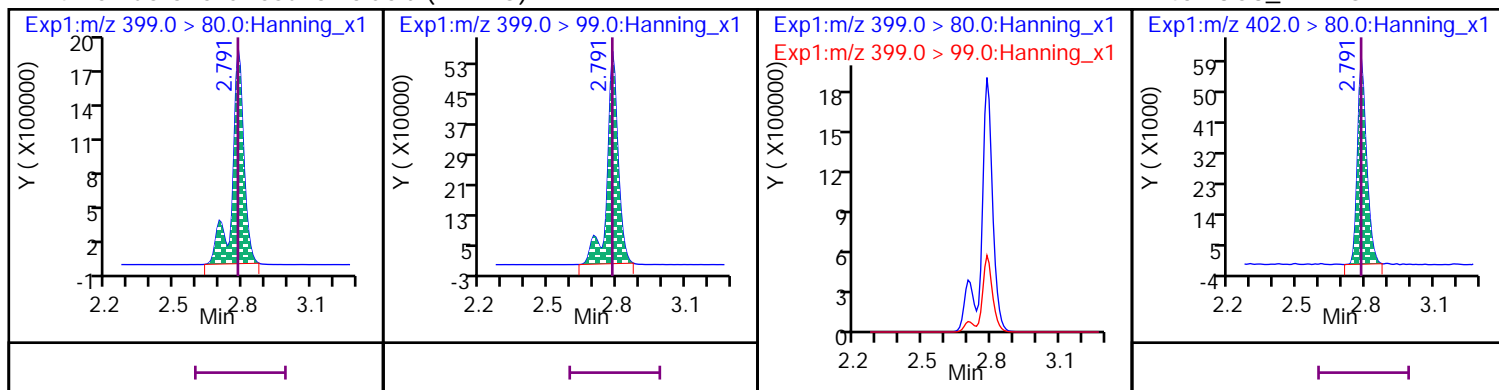
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



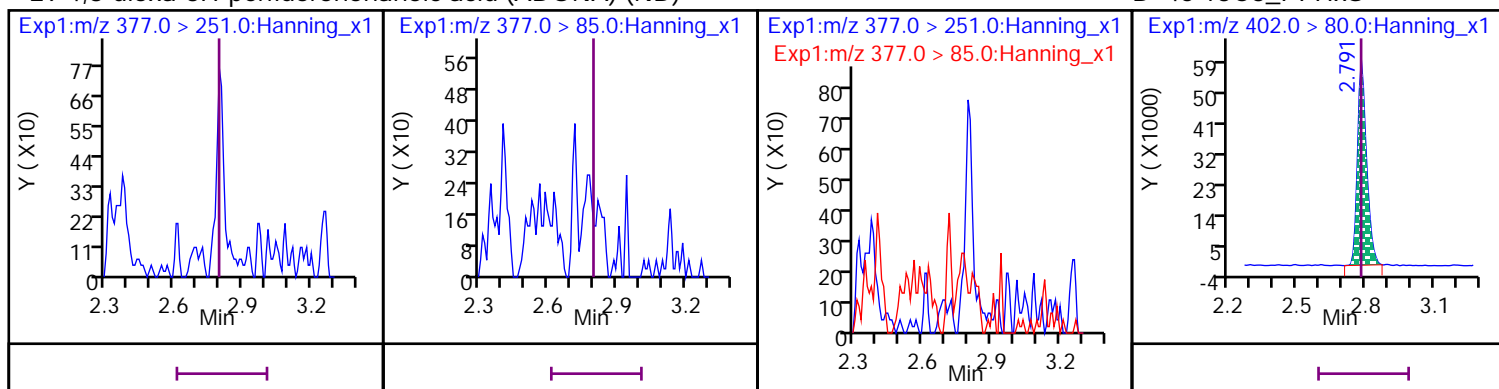
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



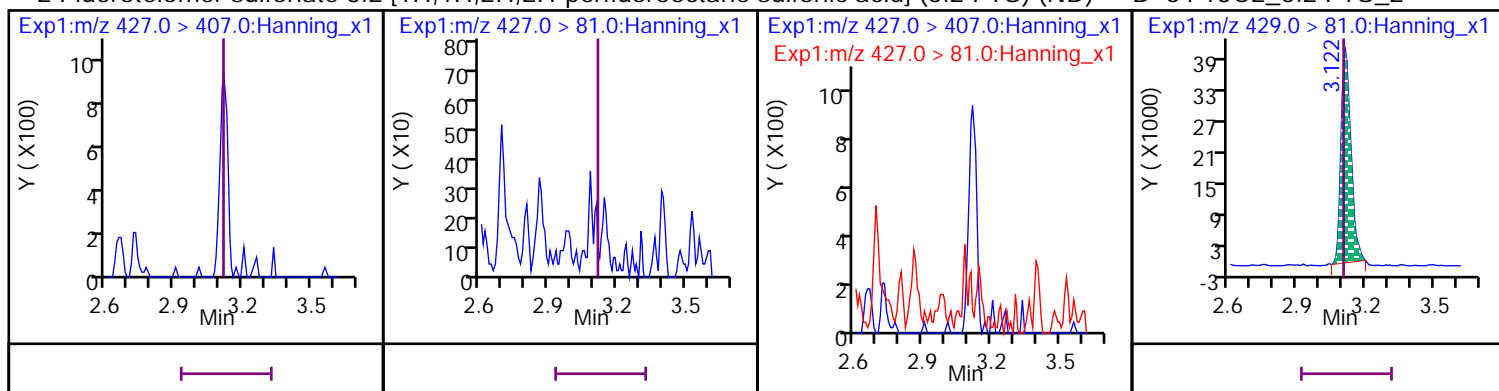
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



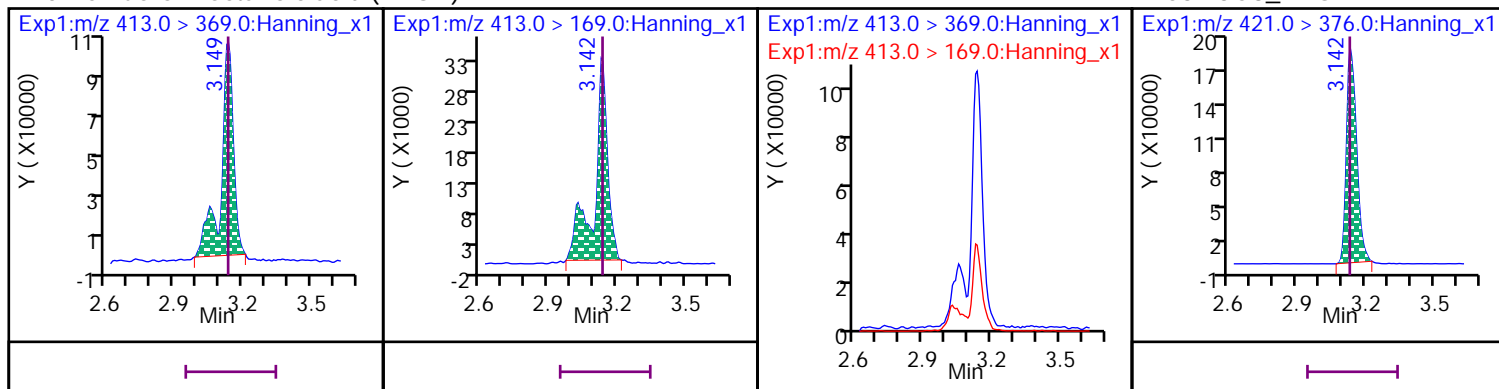
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



20 Perfluoro-n-octanoic acid (PFOA)

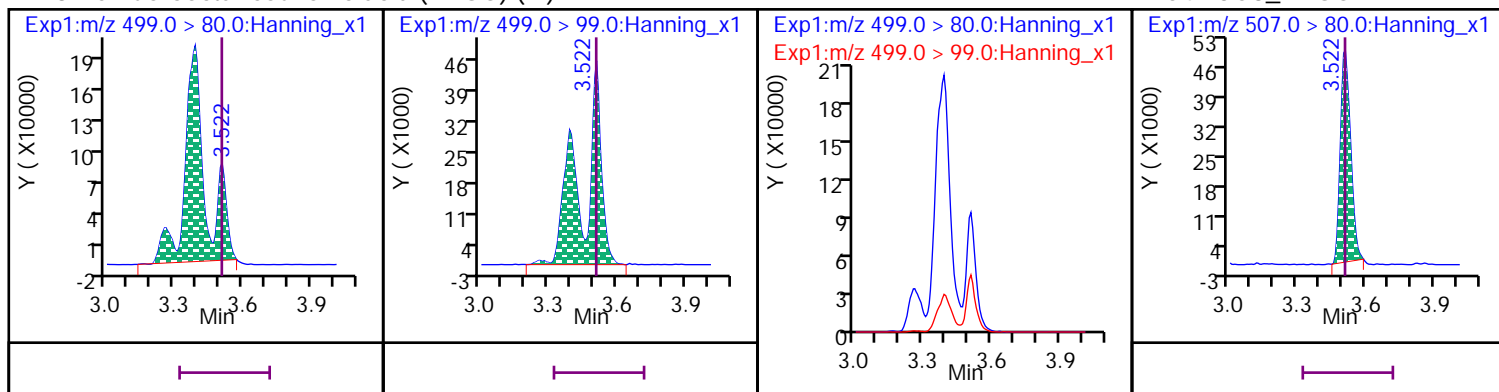
D 53 13C8\_PFOA





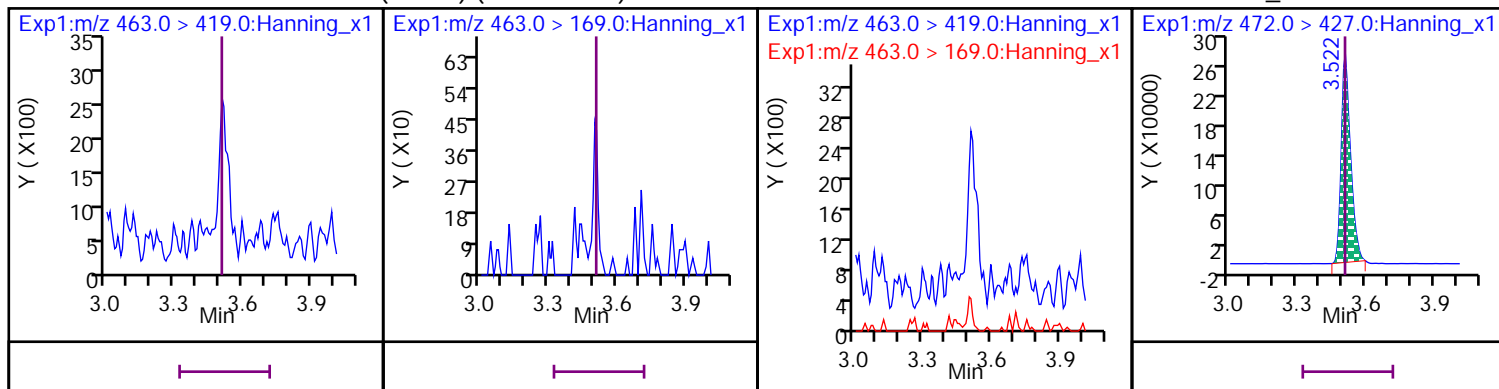
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



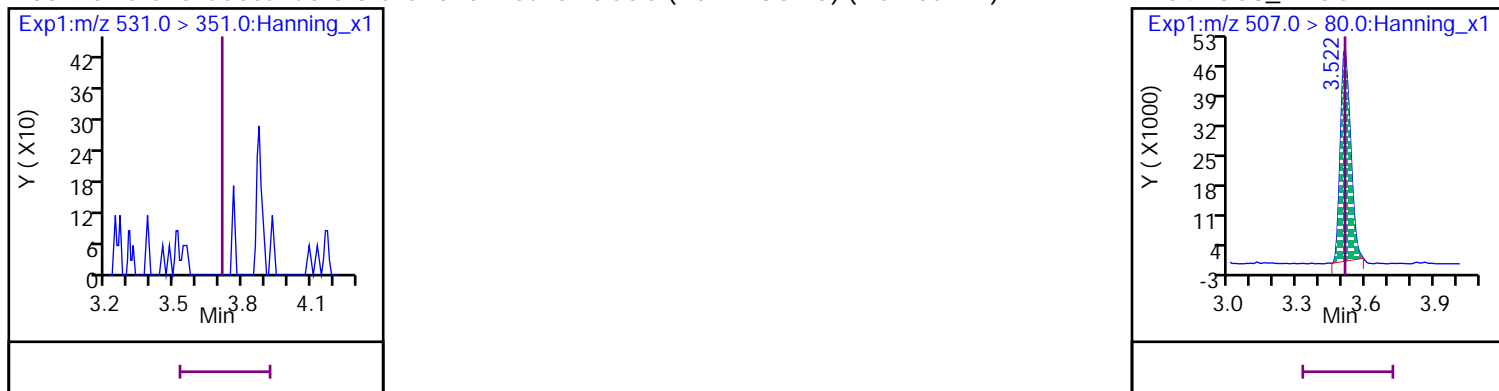
17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



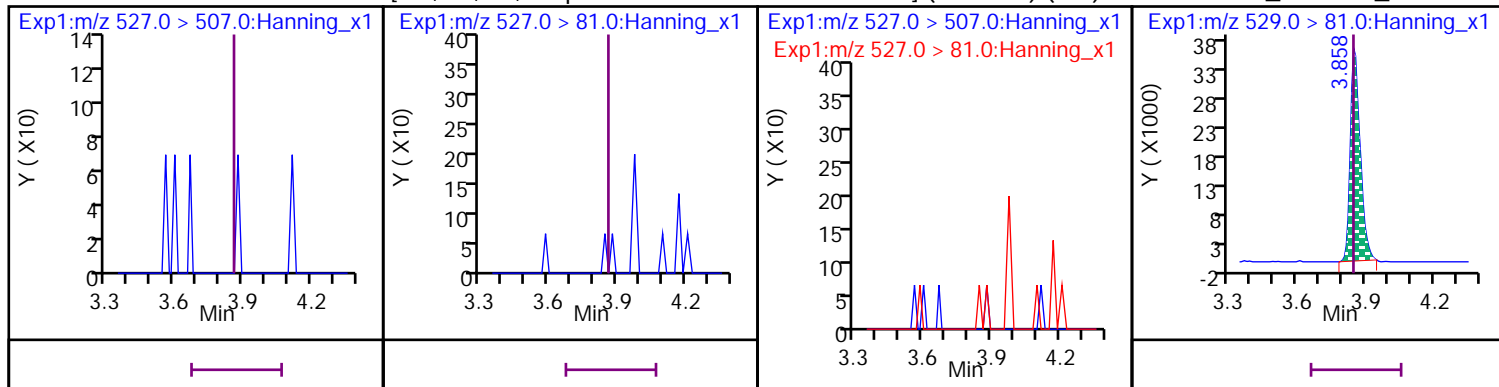
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



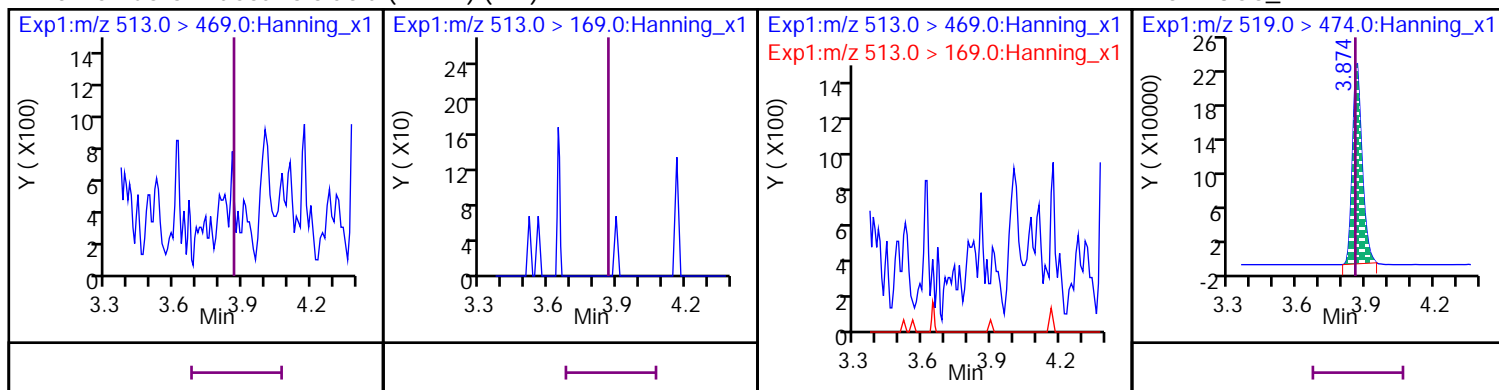
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



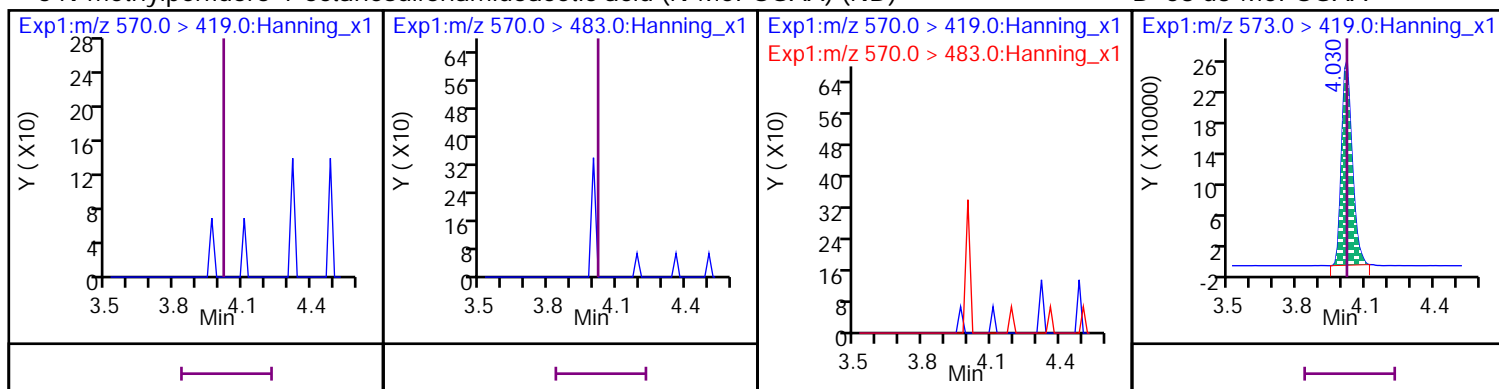
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



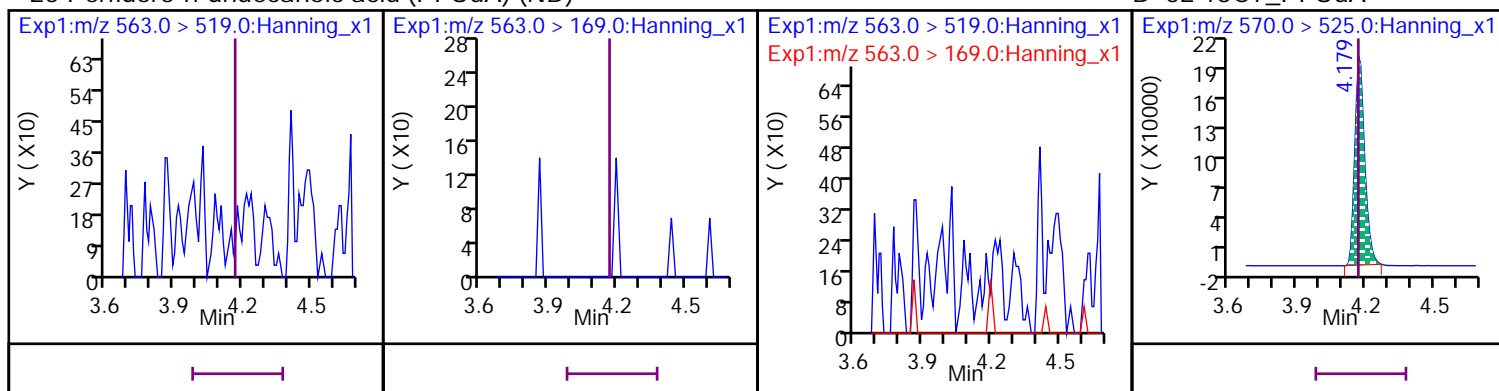
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



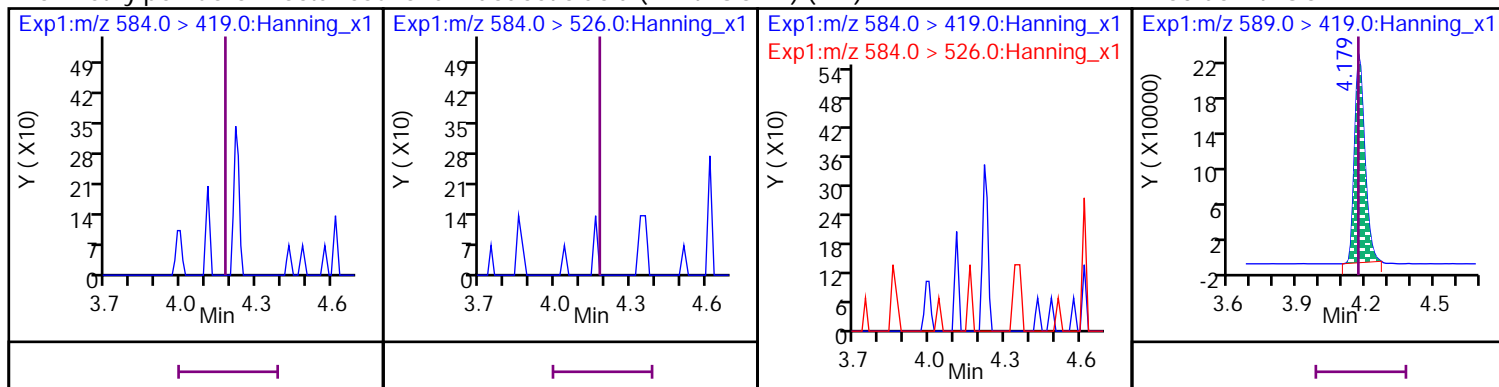
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

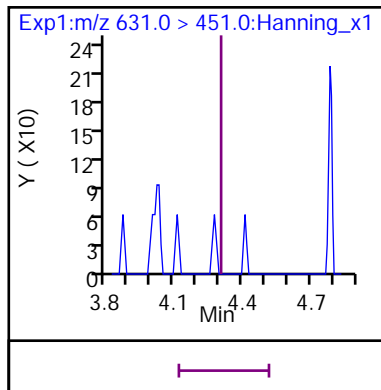


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

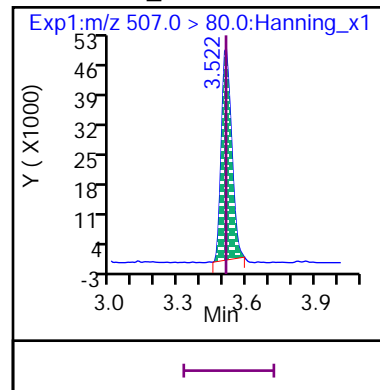
D 60 d5-EtFOSAA



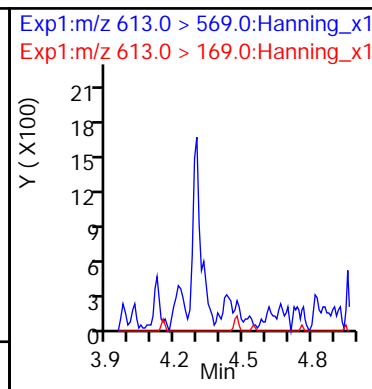
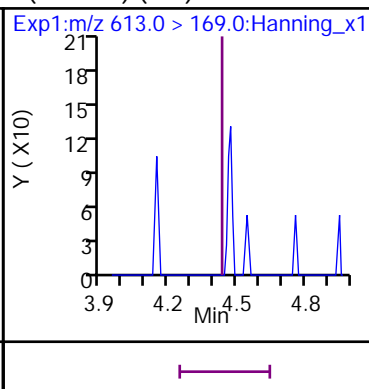
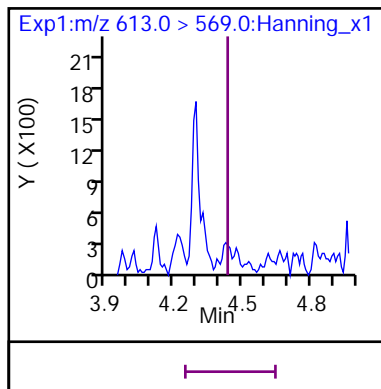
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



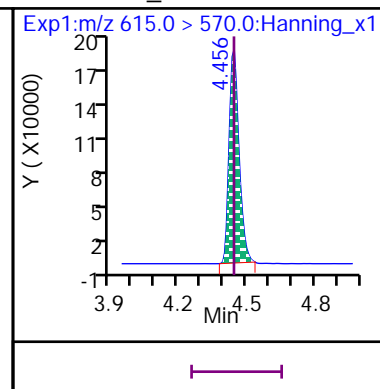
D 54 13C8\_PFOS



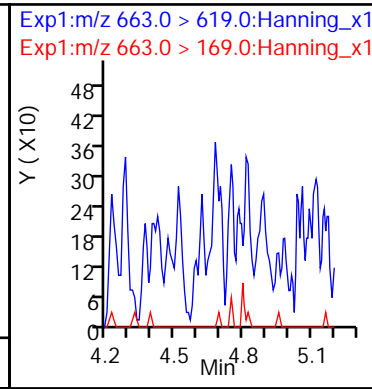
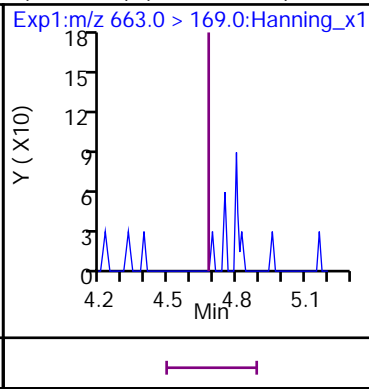
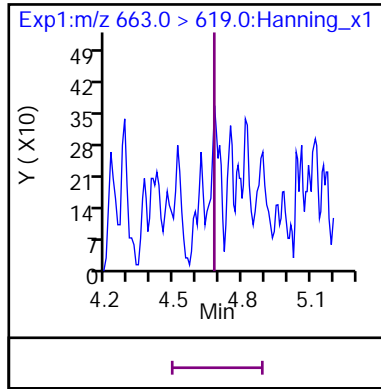
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



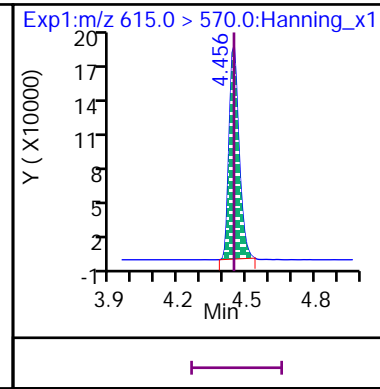
D 38 13C2\_PFDoA



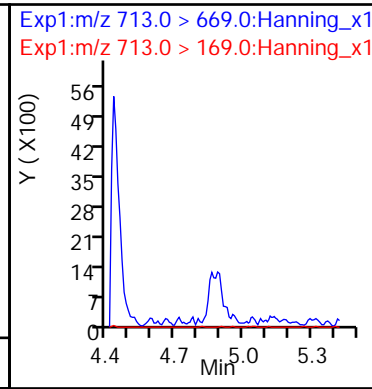
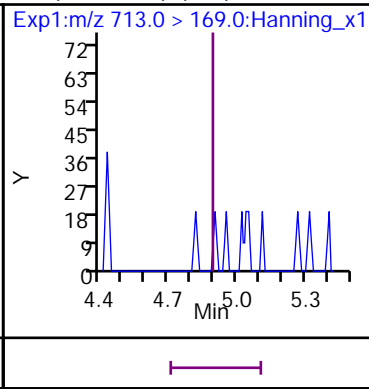
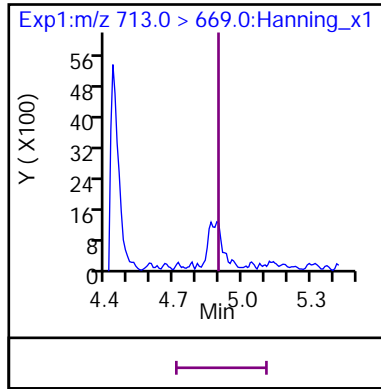
24 Perfluoro-n-tridecanoic acid (PFTeDA) (Marked ND)



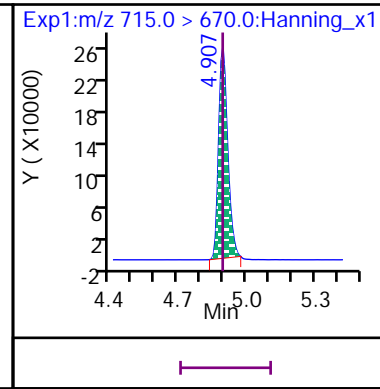
D 38 13C2\_PFDoA



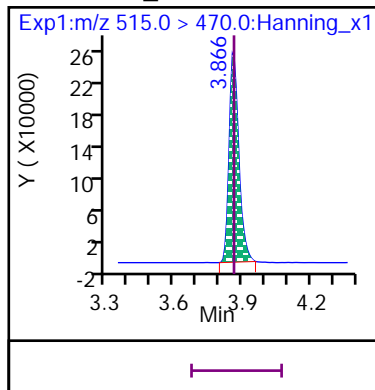
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



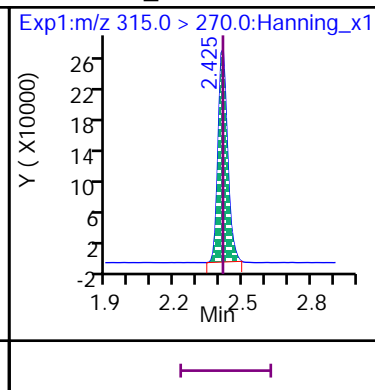
D 42 13C2\_PFTeDA



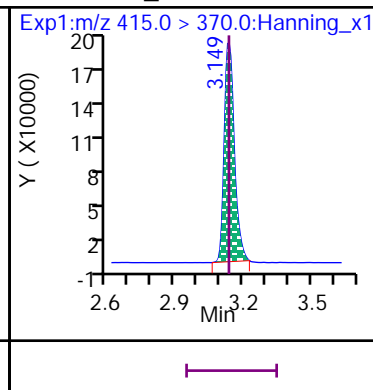
\* 37 13C2\_PFDA



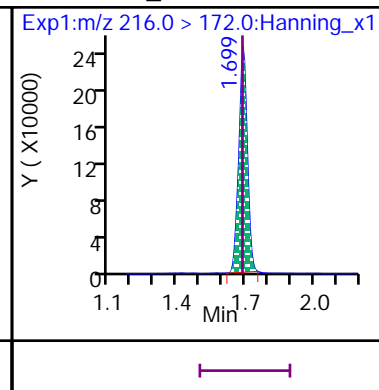
\* 39 13C2\_PFHxA



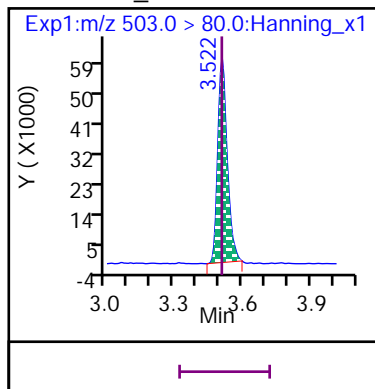
\* 41 13C2\_PFOA



\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d

Injection Date: 28-Dec-2020 11:20:38

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008

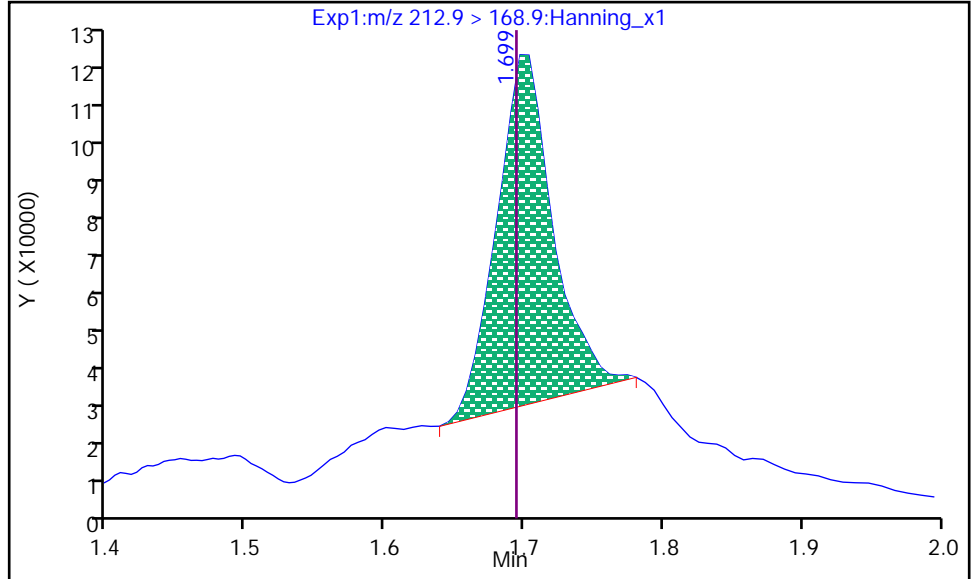
Dil. Factor: 1

Operator: Matthew M. Miller

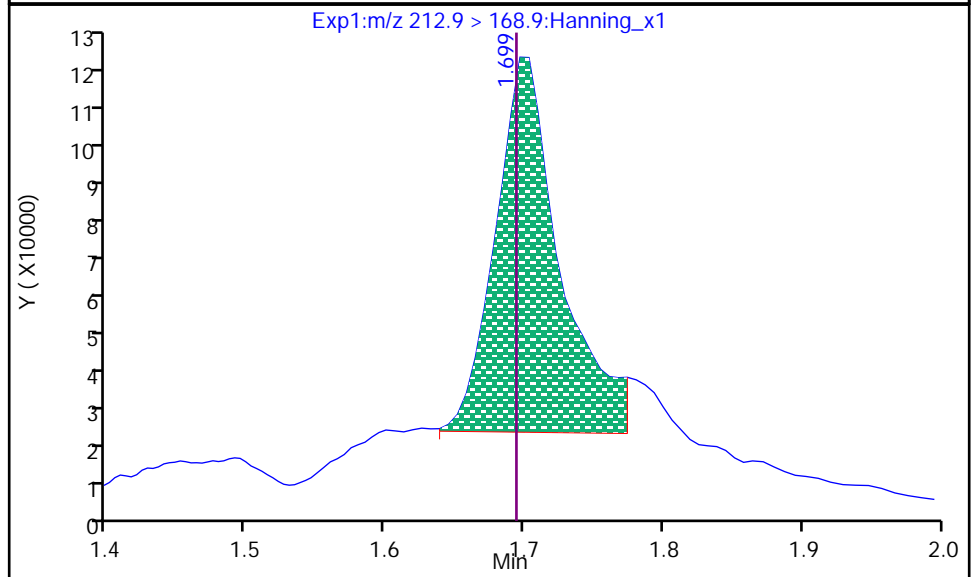
8 PFBA, CAS: 375-22-4

RT: 1.699  
Area: 254280  
Conc: 16.123  
Conc Units: ng/L

Processing Integration Results



RT: 1.699  
Area: 309906  
Conc: 19.650  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:29:17

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d

Injection Date: 28-Dec-2020 11:20:38

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008

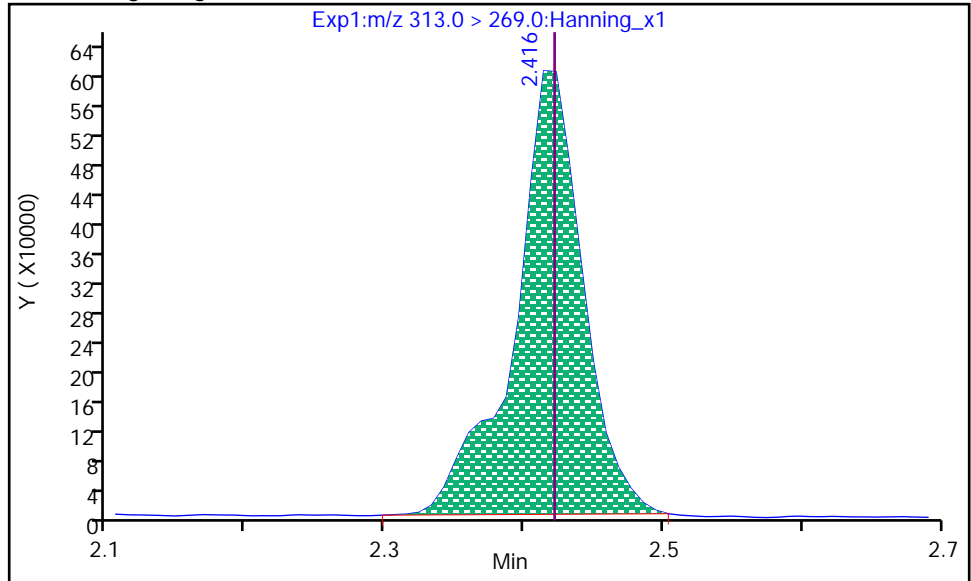
Dil. Factor: 1

Operator: Matthew M. Miller

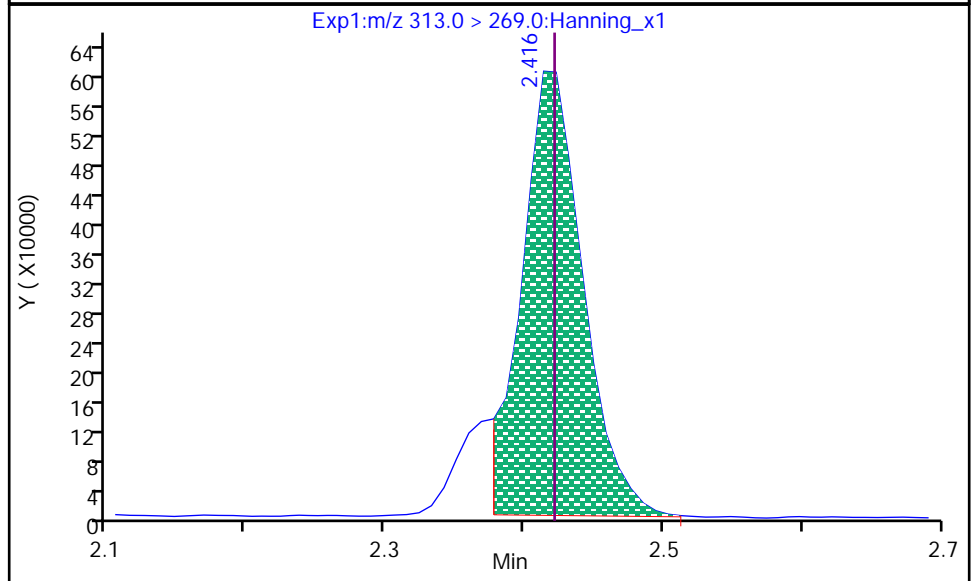
15 PFHxA, CAS: 307-24-4

Processing Integration Results

RT: 2.416  
Area: 2027856  
Conc: 110.61  
Conc Units: ng/L



RT: 2.416  
Area: 1810324  
Conc: 98.743  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:30:10

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d

Injection Date: 28-Dec-2020 11:20:38

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008

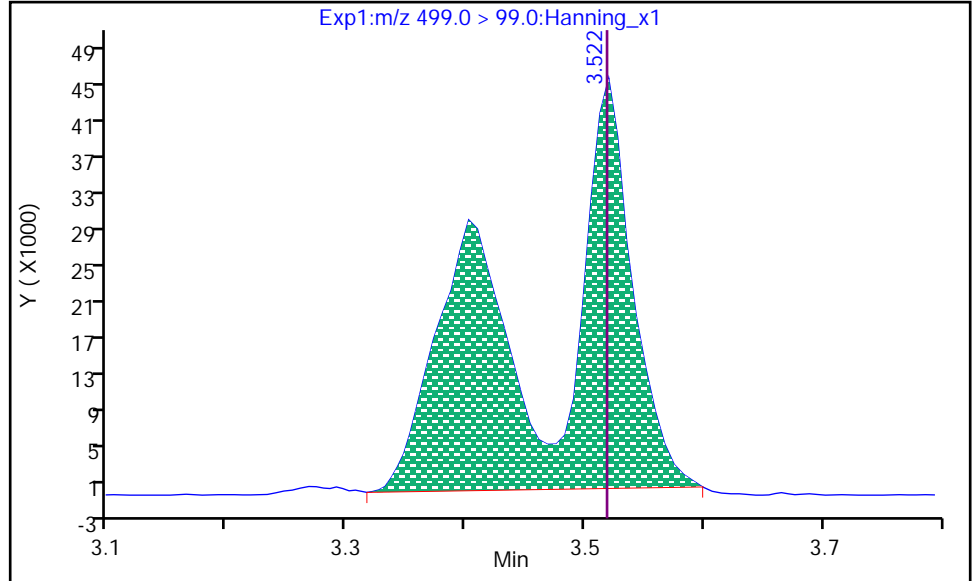
Dil. Factor: 1

Operator: Matthew M. Miller

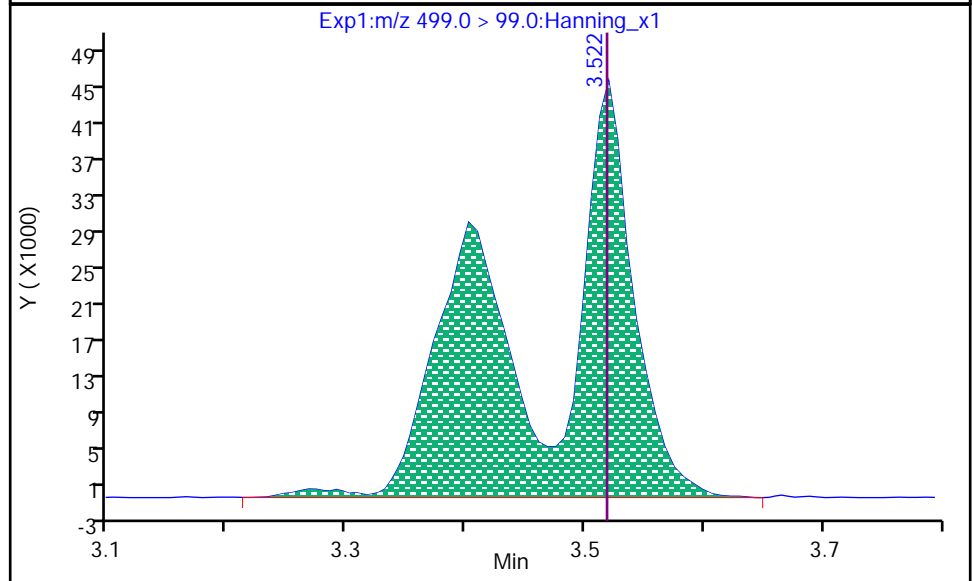
18 PFOS, CAS: 1763-23-1

RT: 3.522  
Area: 242564  
Conc: 273.35  
Conc Units: ng/L

Processing Integration Results



RT: 3.522  
Area: 256112  
Conc: 273.35  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:30:24

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820013.d

Injection Date: 28-Dec-2020 11:20:38

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008

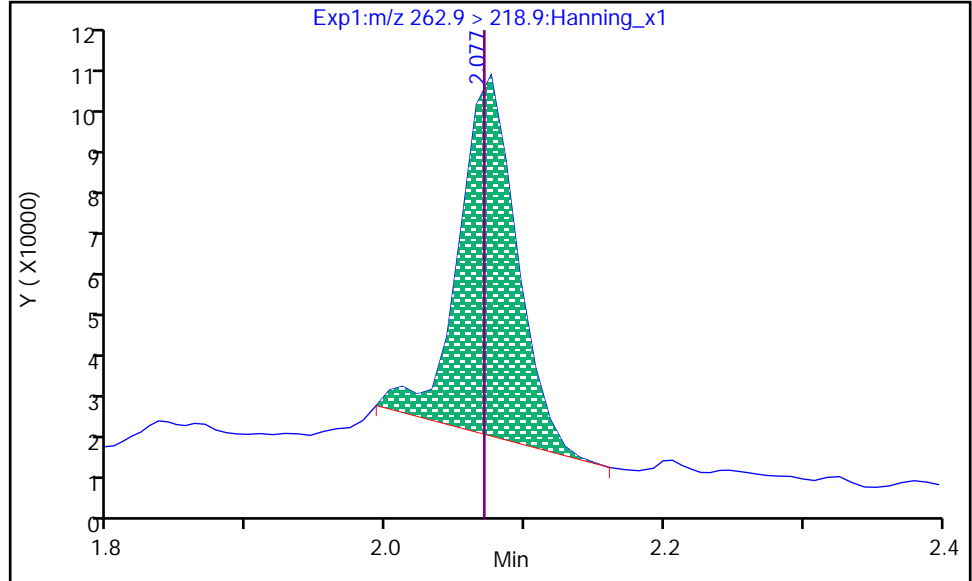
Dil. Factor: 1

Operator: Matthew M. Miller

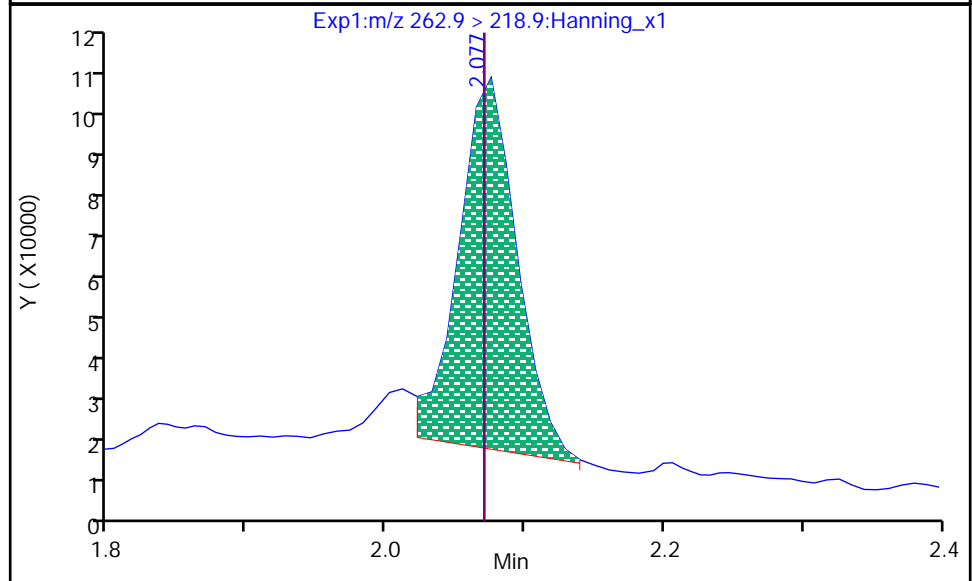
21 PFPeA, CAS: 2706-90-3

RT: 2.077  
Area: 246647  
Conc: 14.906  
Conc Units: ng/L

Processing Integration Results



RT: 2.077  
Area: 254717  
Conc: 15.394  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:30:01

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d  
 Injection Date: 29-Dec-2020 10:55:58 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 2  
 Lab Sample ID: VL11001-008 Lab Prep. Batch: 77741  
 Client ID: JAW-60-1220 Sample Group: VL11001  
 Sample Info: VL11001-008,5 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous  
 Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0361011$

Name	Value	Units	Description
DF	5		Dilution Factor
VF	10000	ul	Final Volume
VI	277	ml	Initial Sample Volume
AlsDf	1		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	730084	24	>100:1			1100.00	1052.67	109	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.709	0/-1	70416	23	5.8:1			106.52	19.228		M
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.080	0	686251	18	>100:1			1100.00	997.62	99.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.080	0/0	68027	18	15:1			108.45	19.576		M
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	245359	17	>100:1			1100.00	1065.71	102	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.133	0/0	133718	19	>100:1	Target = 3.34		508.45	91.779		
298.9 > 99	44	2.130	2.133		39227	19	>100:1	3.40 (1.67-5.02)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.429	0	744168	20	>100:1			1100.00	1009.63	98.5	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.420	0/0	441553	24	>100:1	Target = 17.01		661.10	119.33		
313 > 119	49	2.416	2.420		19861	22	>100:1	22.23 (8.50-25.52)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.536	0	1363708	20	>100:1			5500.00	5119.91	96.3	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.536	ND									U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.777	0	593299	20	>100:1			1100.00	978.00	96.7	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.786	0/0	36994	16	24:1	Target = 3.79		66.124	11.936		J
363 > 169	47	2.782	2.786		8437	17	23:1	4.38 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	171195	20	>100:1			1100.00	999.80	92.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.795	0/0	1373305	28	>100:1	Target = 3.80	0.17	8322.33	1502.23		
399 > 99	45	2.791	2.795		386878	28	>100:1	3.54 (1.90-5.71)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.823		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.132	0	110301	26	>100:1			5500.00	5727.42	105	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.139		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.159	0	592297	26	>100:1			1100.00	1000.73	97.5	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.159	0/0	89022	34	33:1	Target = 2.85	0.09	162.18	29.273		M
413 > 169	53	3.149	3.159		30463	37	45:1	2.92 (1.42-4.28)	0.30				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.533	0	154951	23	>100:1			1100.00	1033.50	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.533	0/0	272775	66	>100:1	Target = 6.80	3.91	1634.14	294.97		
499 > 99	54	3.529	3.533		54335	42	>100:1	5.02 (3.40-10.20)	0.83				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.740		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.334		ND								
<b>D 56 13C9_PFN A CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	742592	24	>100:1			1100.00	988.85	94.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.533		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.879	0	99385	23	>100:1			5500.00	5357.64	95	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.911		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.887	0	654385	21	>100:1			1100.00	986.51	93.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.887		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.034	0	734377	17	>100:1			5500.00	5116.21	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.043		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	664297	18	>100:1			5500.00	5001.68	93.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.203		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	605680	19	>100:1			1100.00	958.24	94.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.193		ND								
<b>D 38 13C2_PFDa CAS: SESI-0118</b>													
615 > 570		4.456	4.461	0	570642	19	>100:1			1100.00	942.72	93.6	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	753181	19	>100:1			1100.00	894.04	95.8	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.887	0	679255	20	>100:1					98.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.429	0	714424	21	>100:1					97.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.156	3.152	1	590636	26	>100:1					95.8	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	682828	24	>100:1					107	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.533	0	165816	22	>100:1					96.3	

### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d

Injection Date: 29-Dec-2020 10:55:58

Inst. ID: LCMSMS02

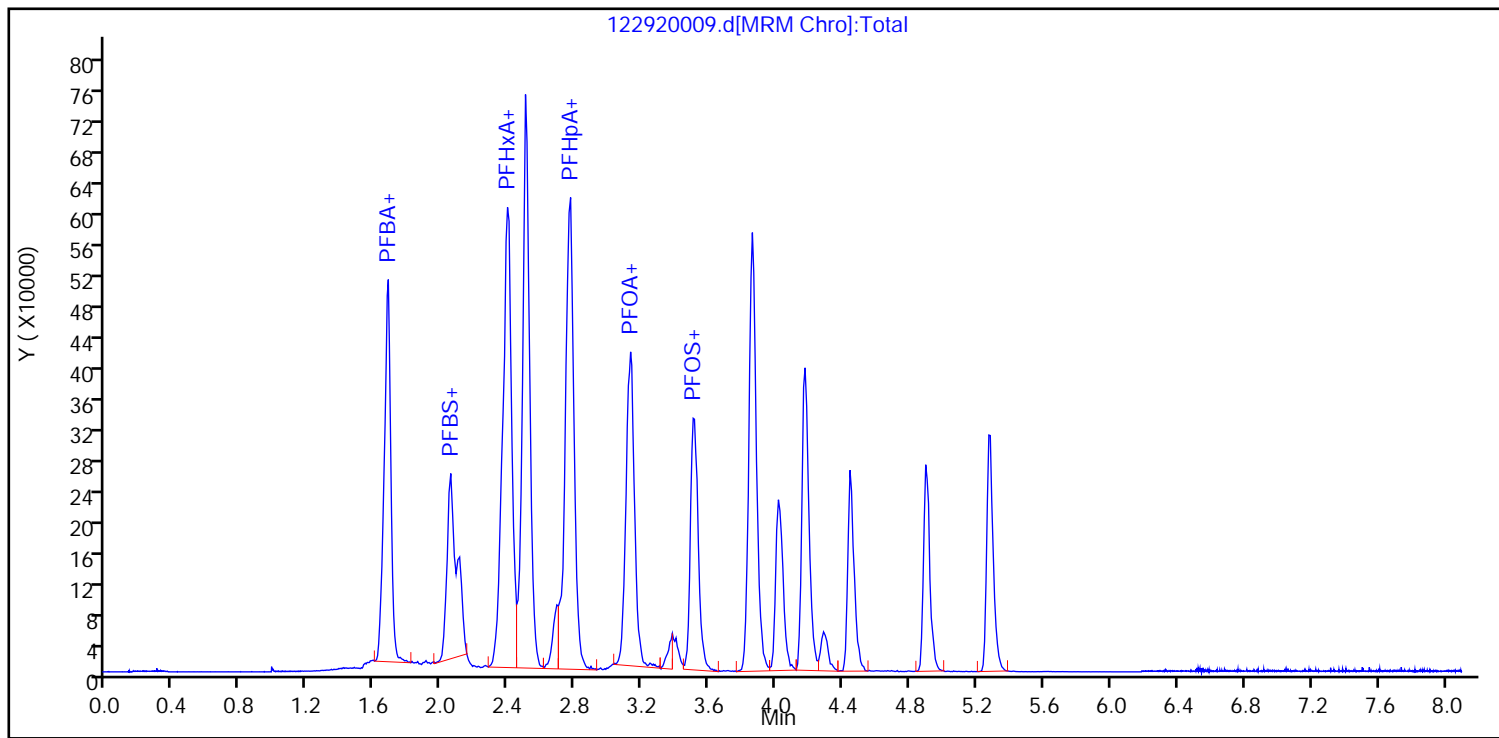
Client ID: JAW-60-1220

Lab ID: VL11001-008

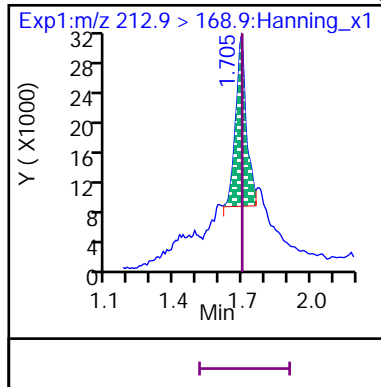
Sample Info: VL11001-008,5

Dil. Factor: 5

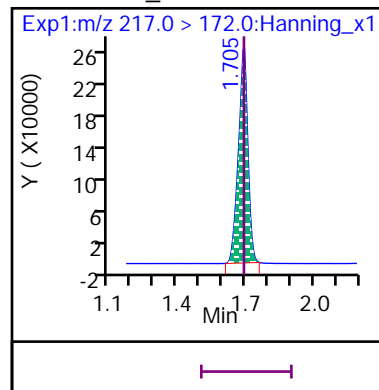
Operator: Matthew M. Miller



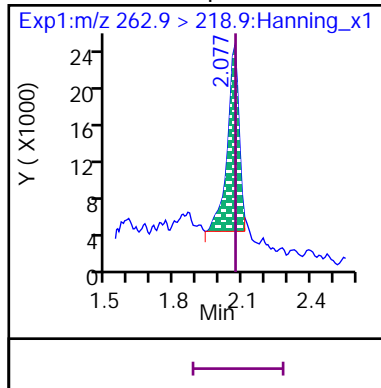
8 Perfluoro-n-butanoic acid (PFBA) (M)



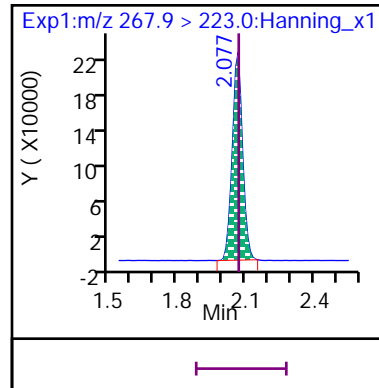
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)



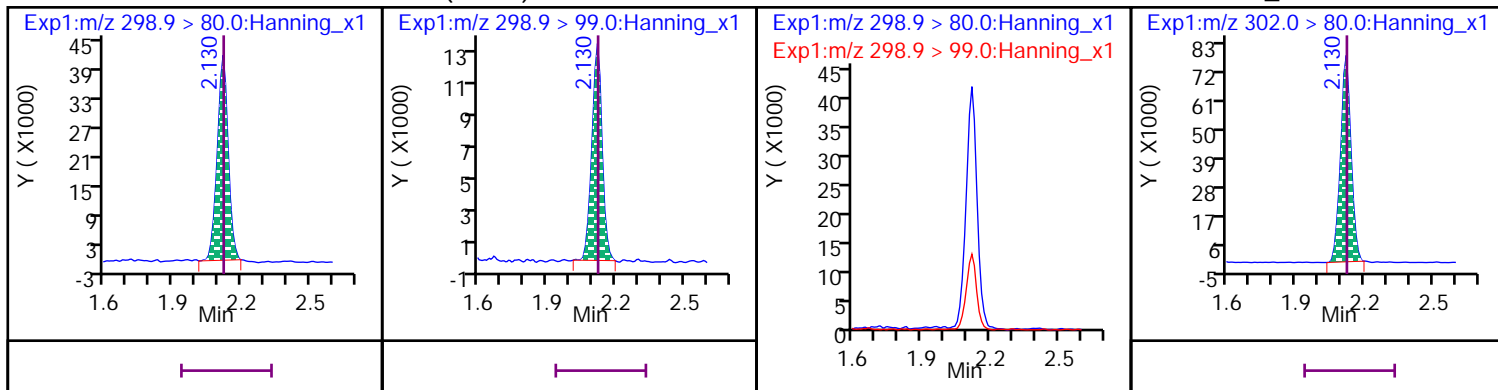
D 50 13C5\_PFPeA





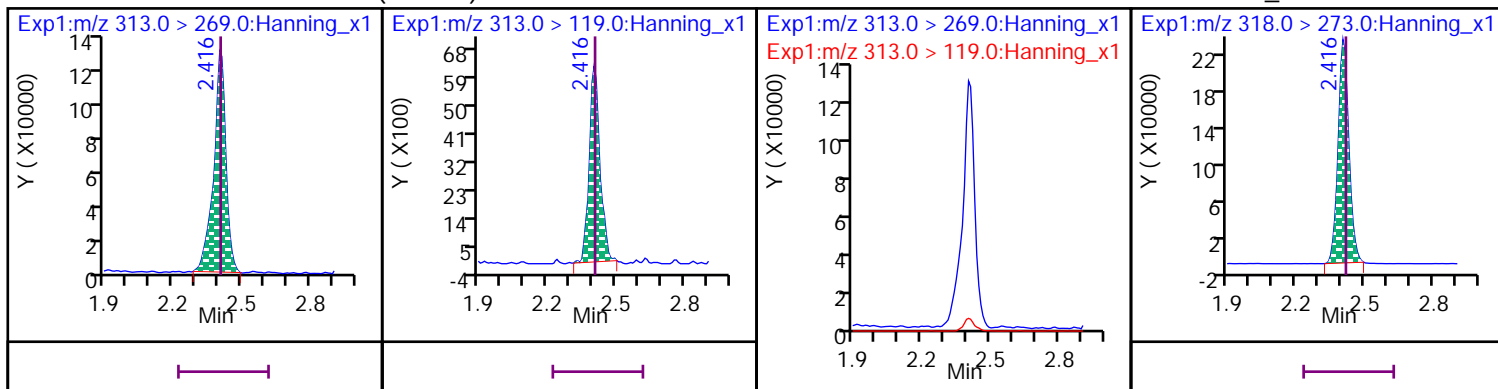
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



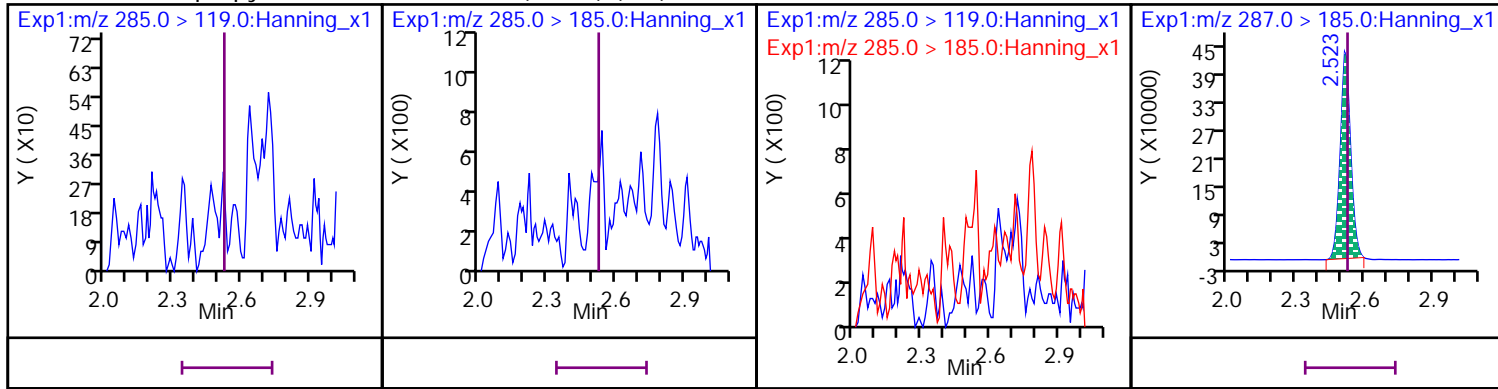
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



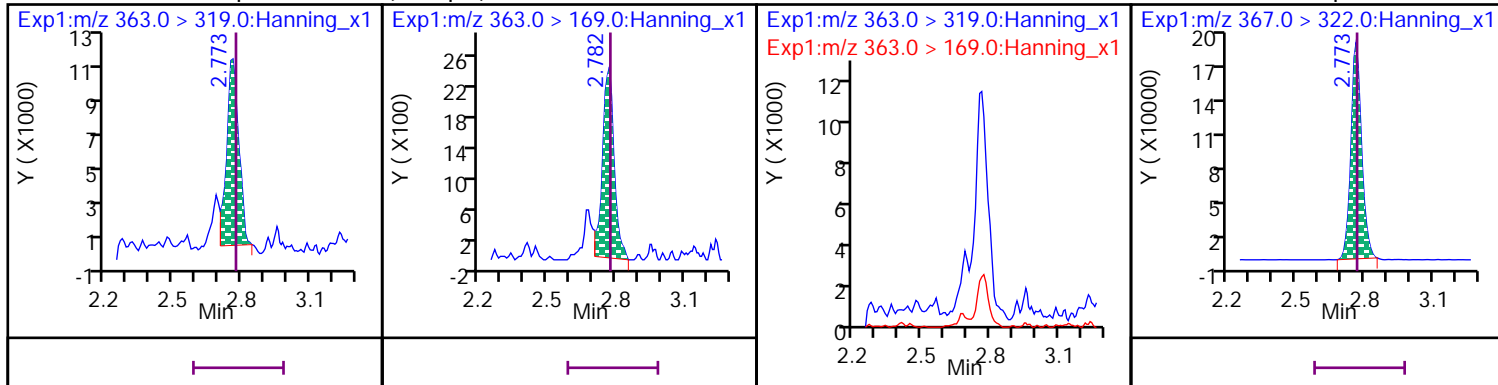
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



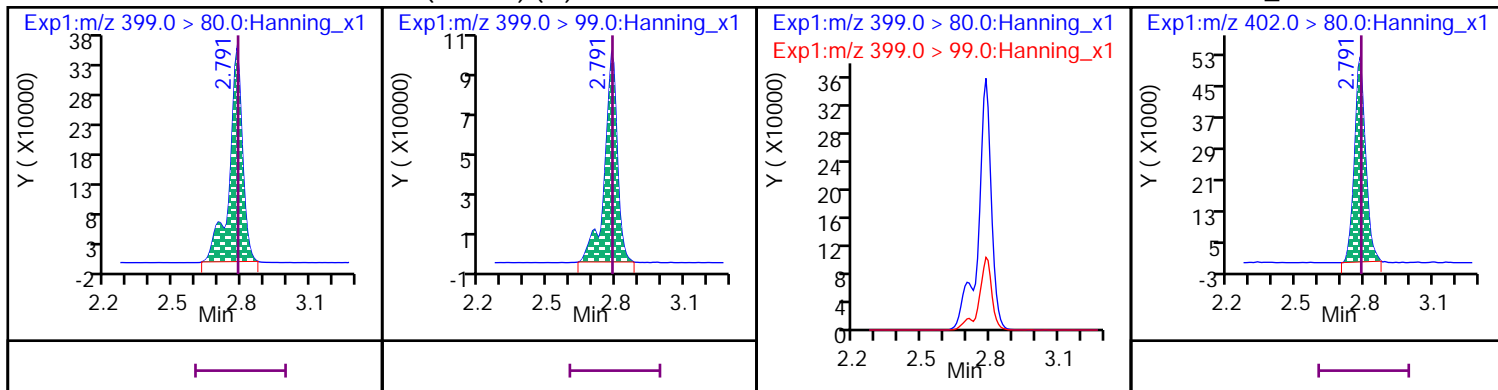
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



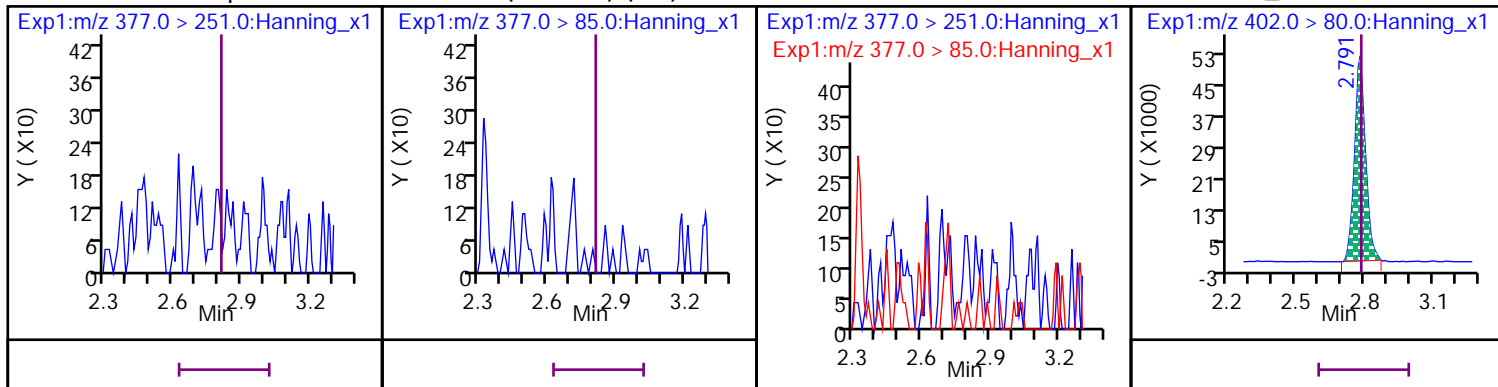
14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



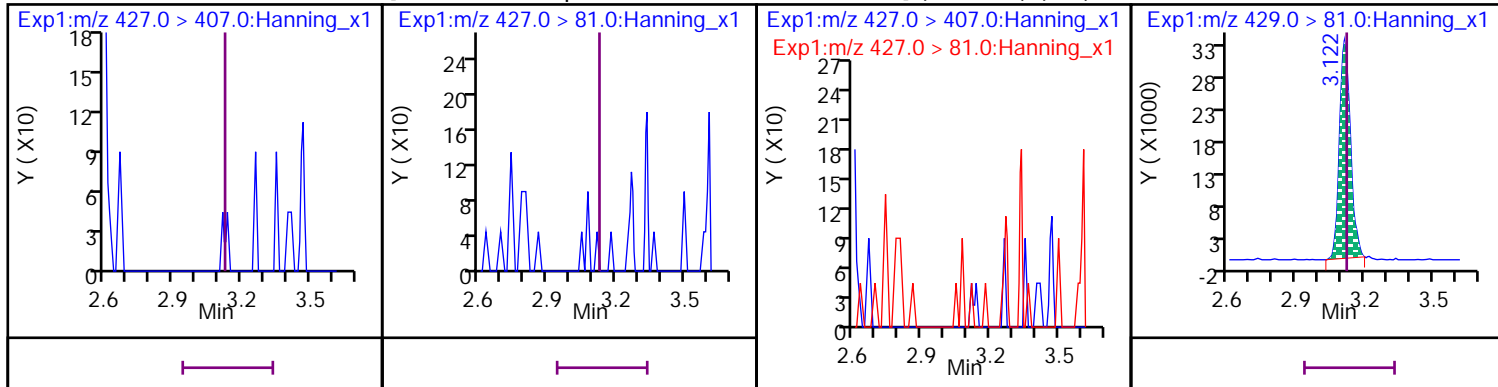
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



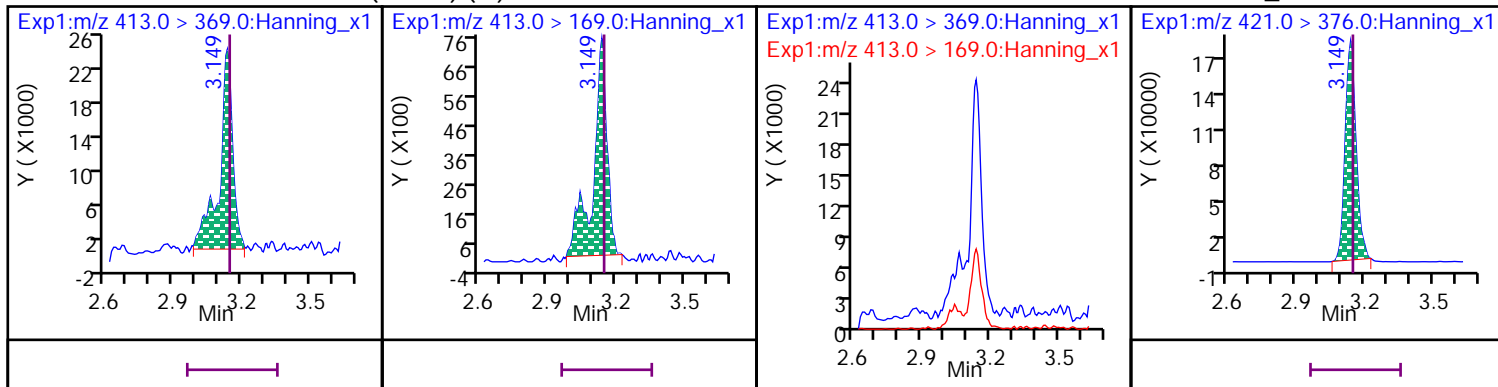
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



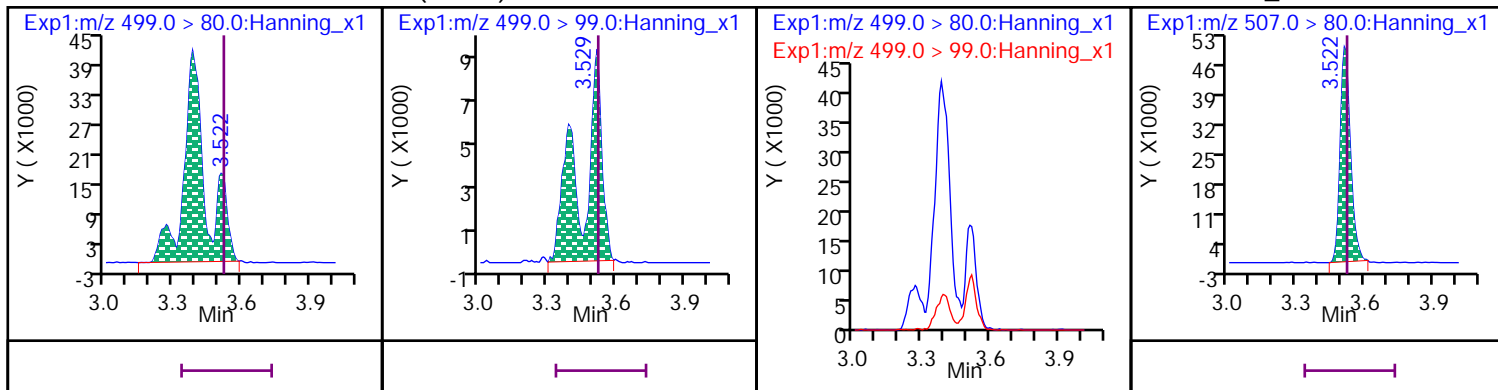
20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



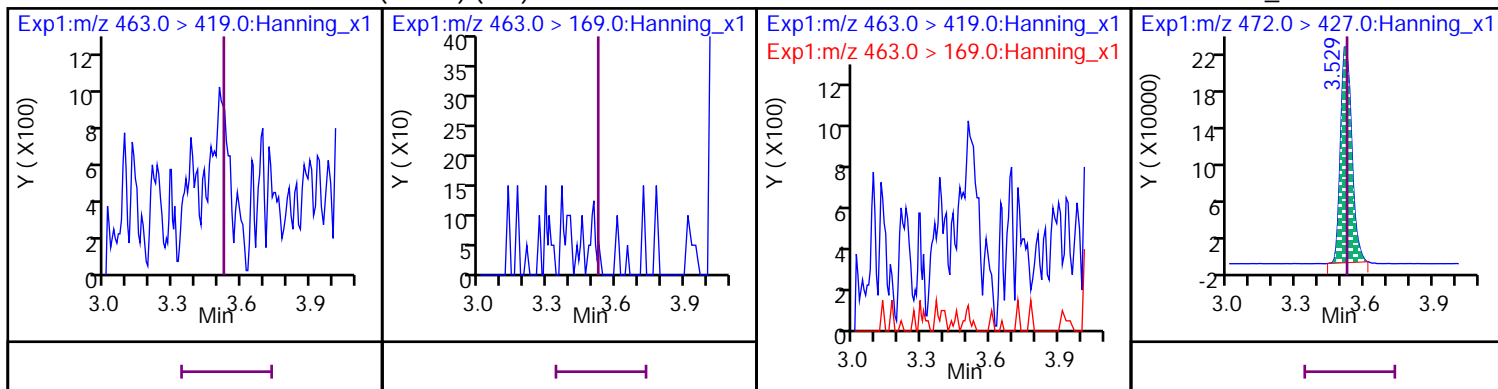
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



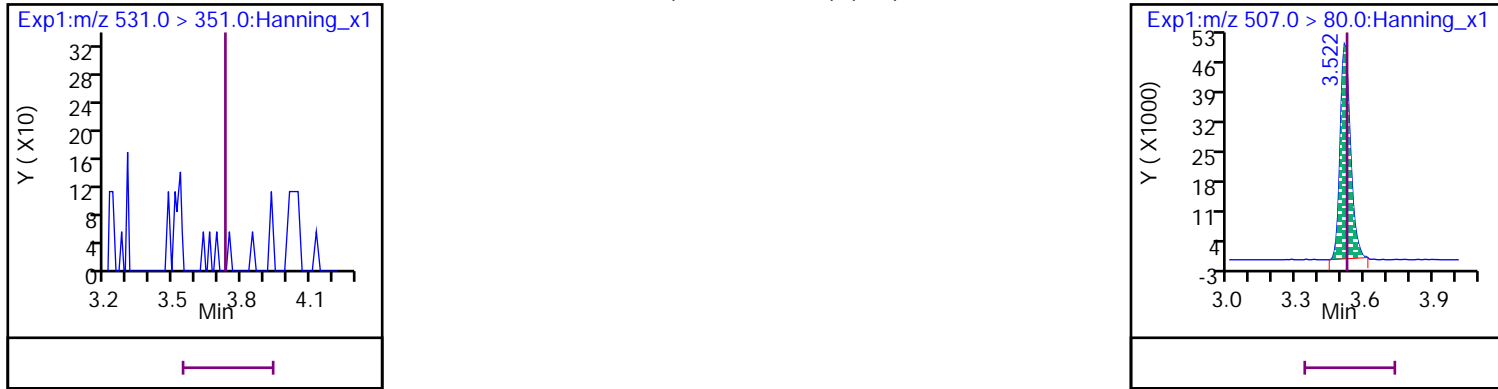
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



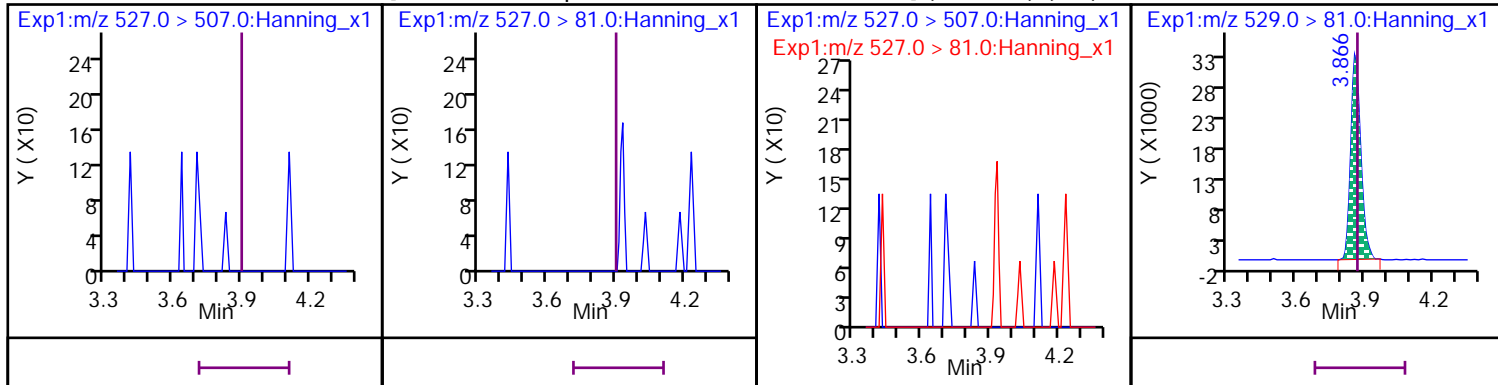
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



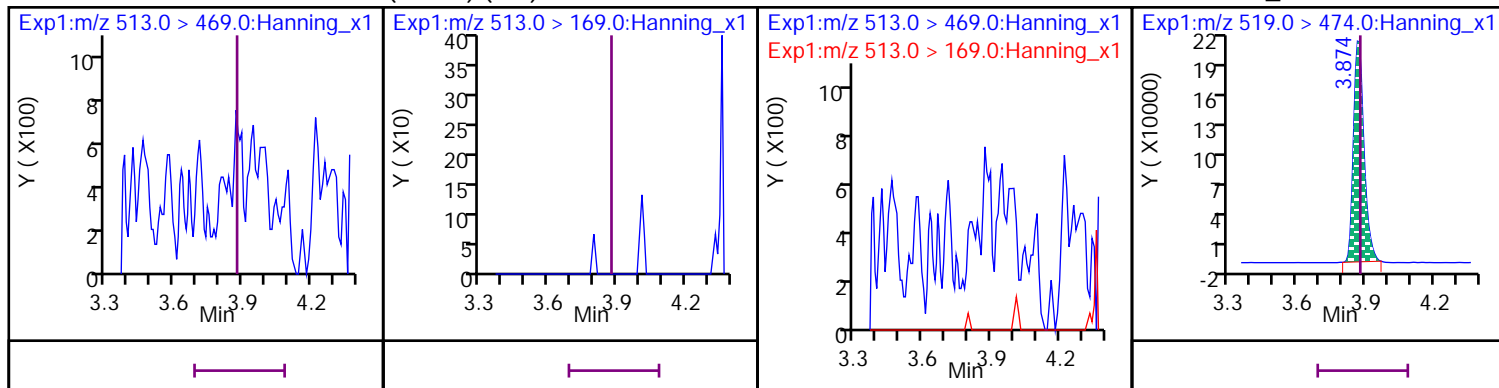
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



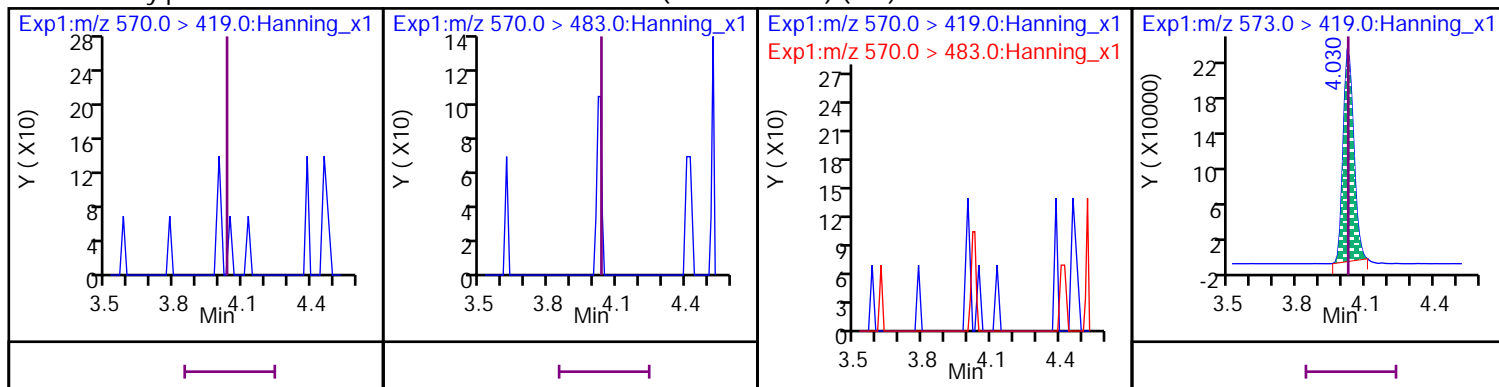
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



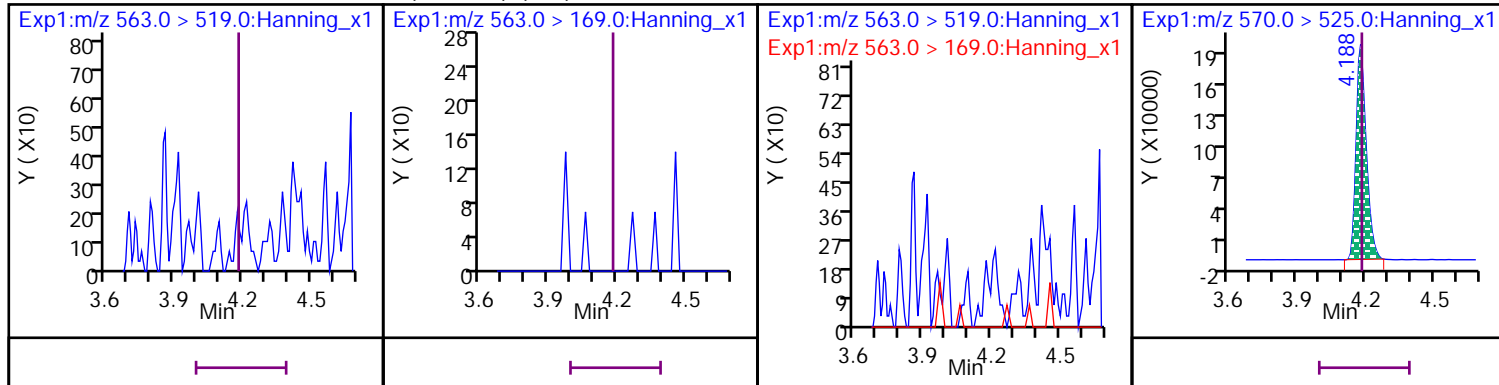
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



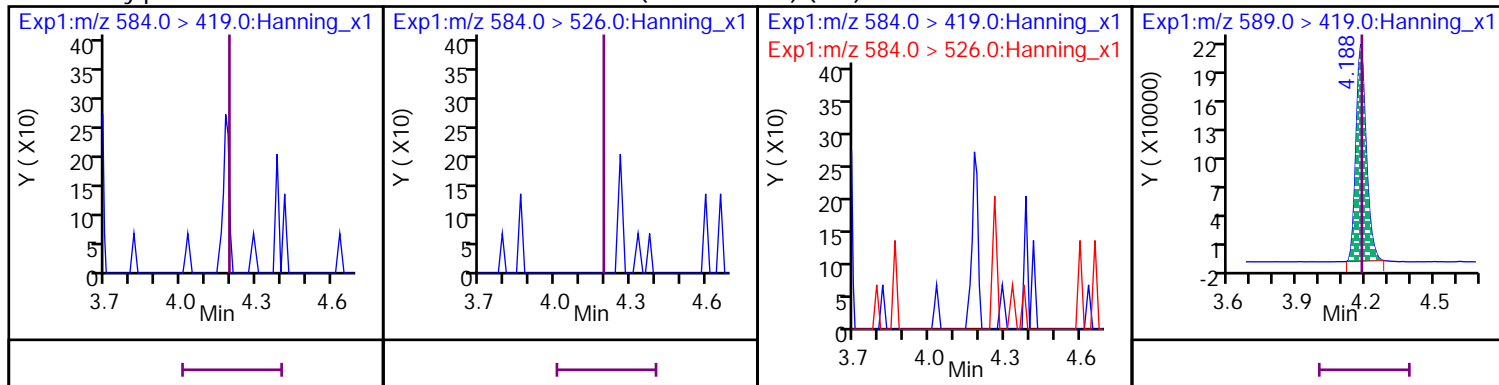
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

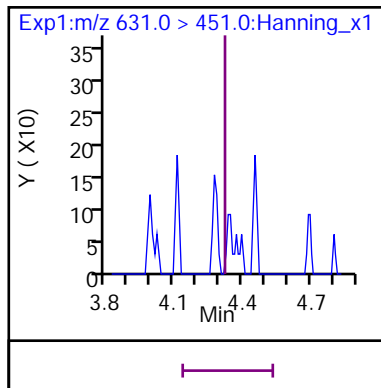


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

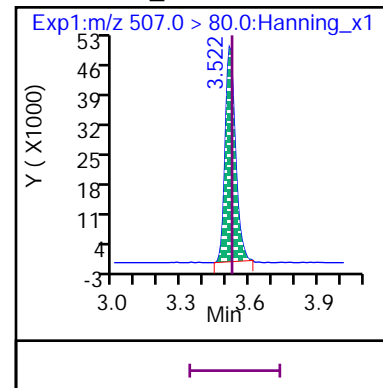
D 60 d5-EtFOSAA



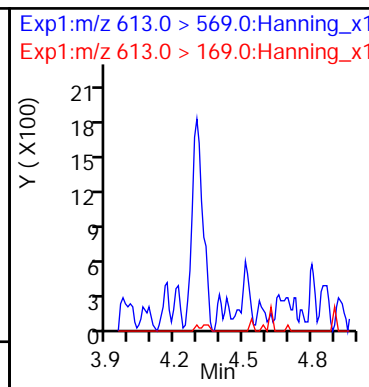
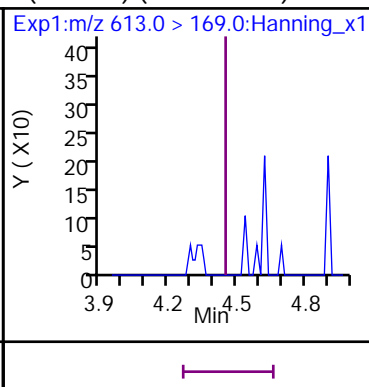
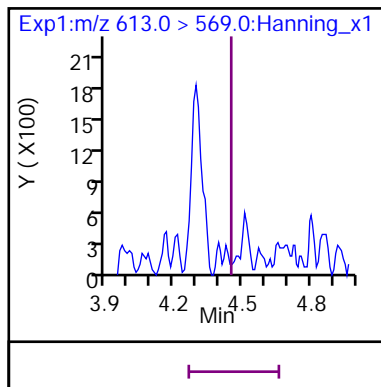
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



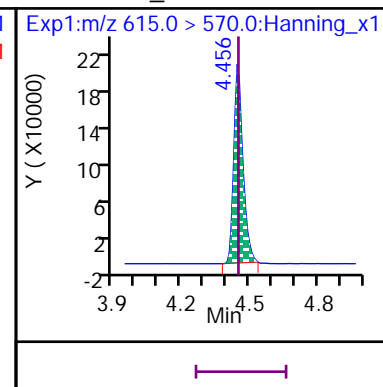
D 54 13C8\_PFOS



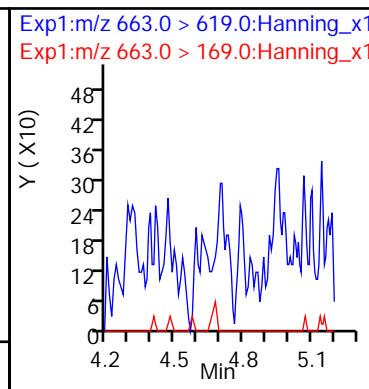
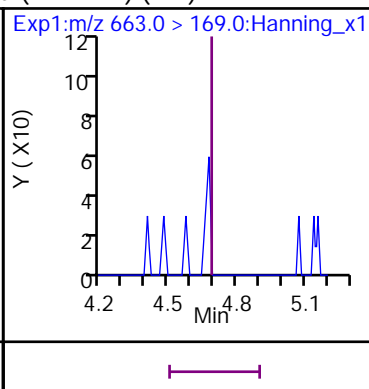
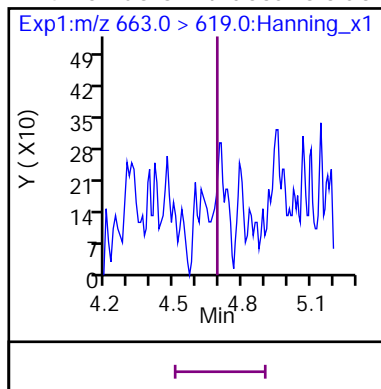
11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



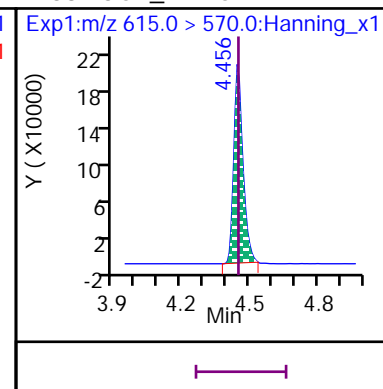
D 38 13C2\_PFDoA



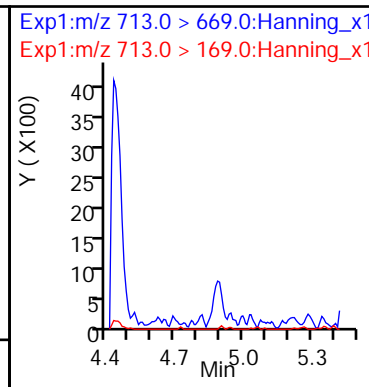
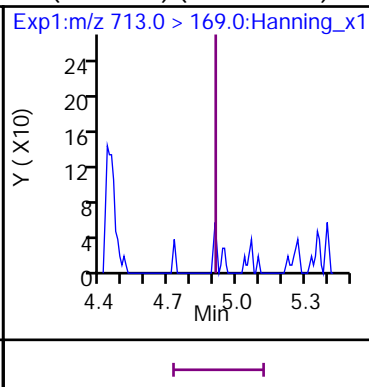
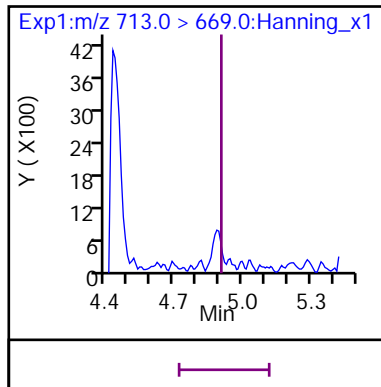
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



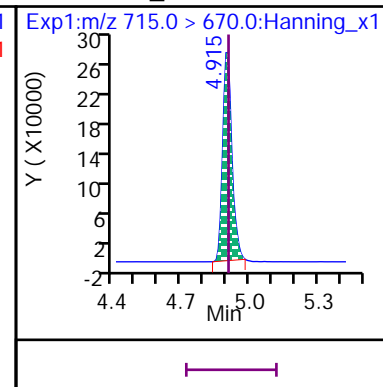
D 38 13C2\_PFDoA



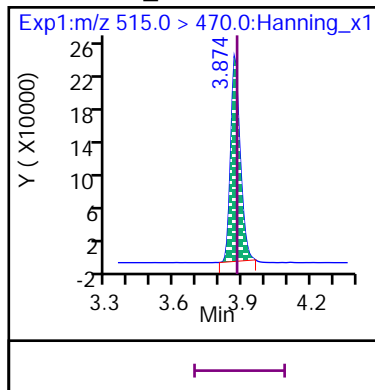
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



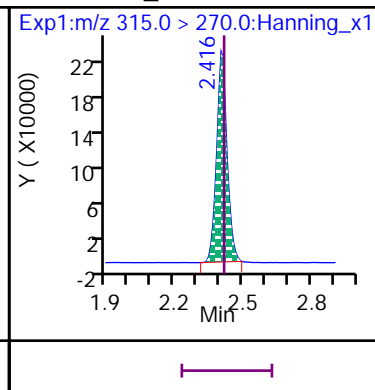
D 42 13C2\_PFTeDA



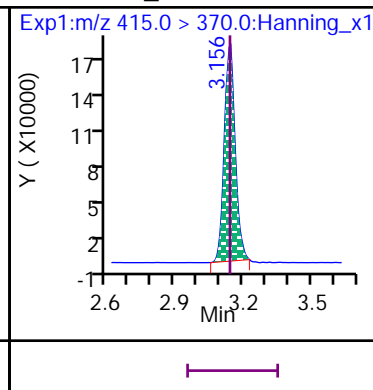
\* 37 13C2\_PFDA



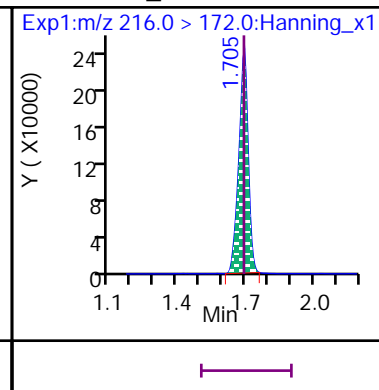
\* 39 13C2\_PFHxA



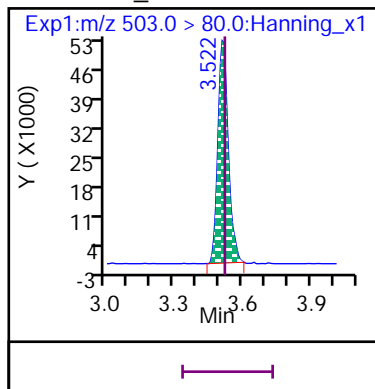
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d

Injection Date: 29-Dec-2020 10:55:58

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008,5

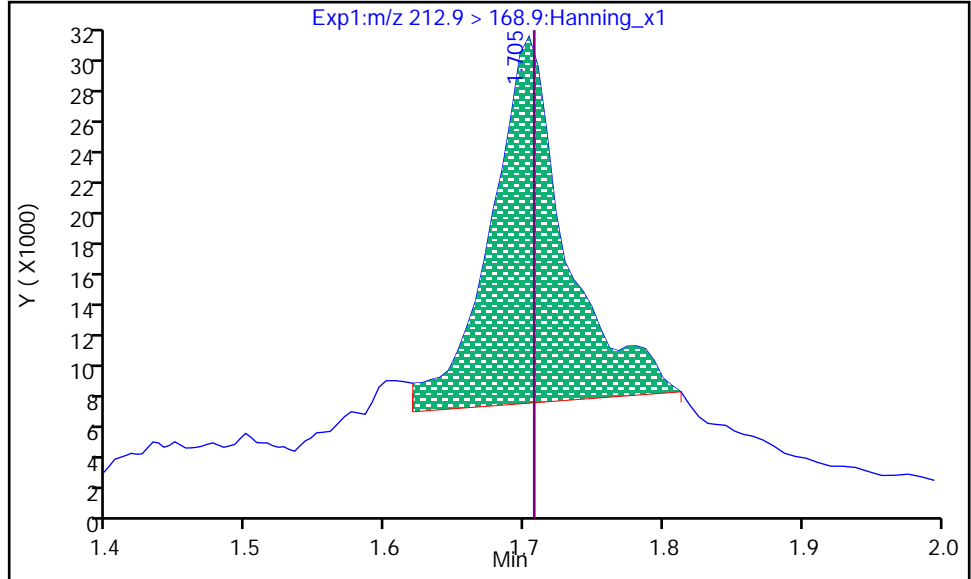
Dil. Factor: 5

Operator: Matthew M. Miller

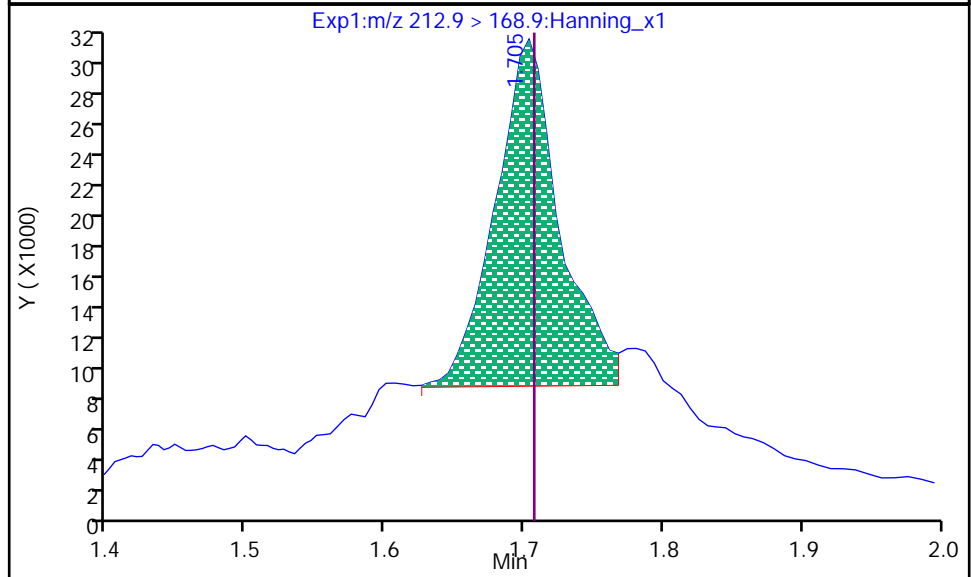
8 PFBA, CAS: 375-22-4

RT: 1.705  
Area: 87179  
Conc: 23.805  
Conc Units: ng/L

Processing Integration Results



RT: 1.705  
Area: 70416  
Conc: 19.228  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:39:09

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d

Injection Date: 29-Dec-2020 10:55:58

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008,5

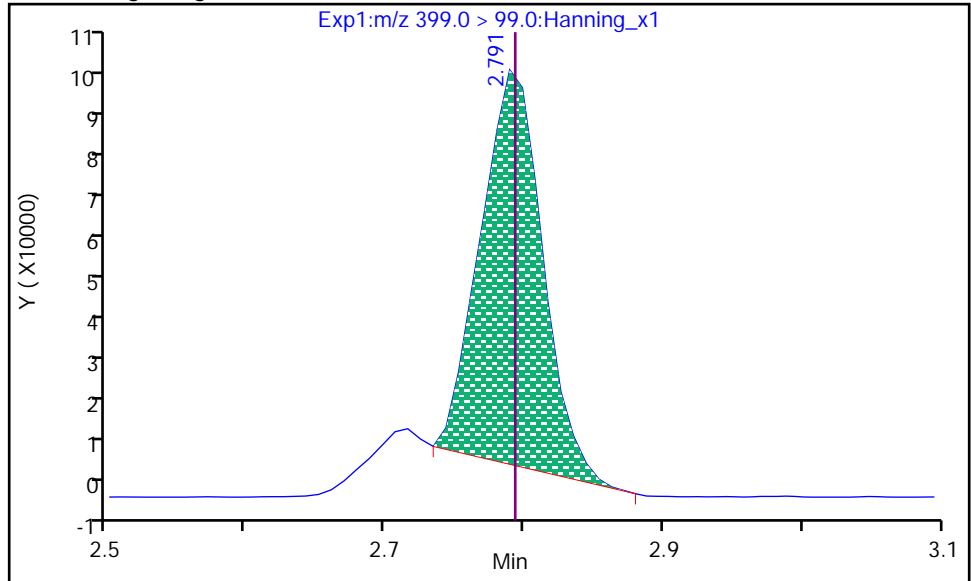
Dil. Factor: 5

Operator: Matthew M. Miller

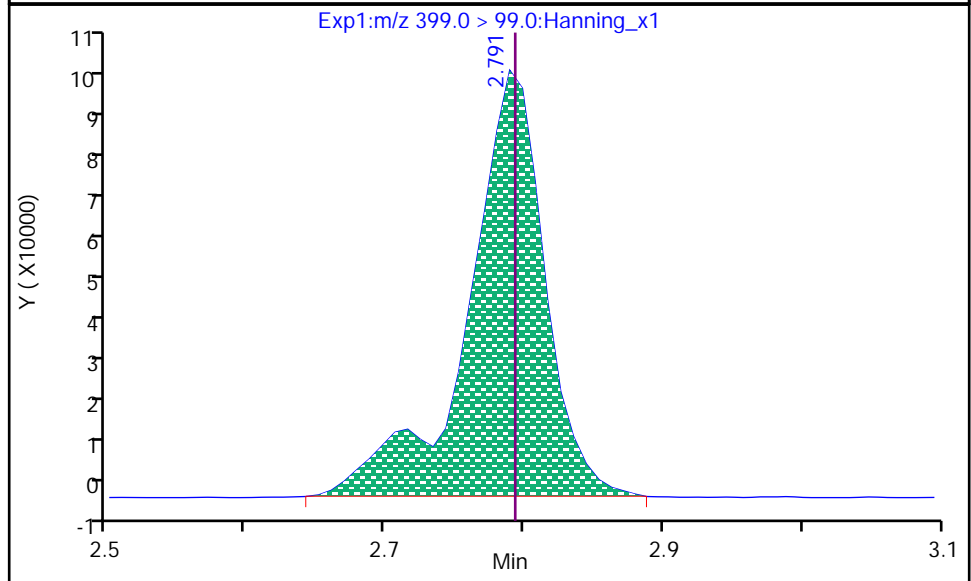
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.791  
Area: 288964  
Conc: 1502.23  
Conc Units: ng/L



RT: 2.791  
Area: 386878  
Conc: 1502.23  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:39:40

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d

Injection Date: 29-Dec-2020 10:55:58

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008,5

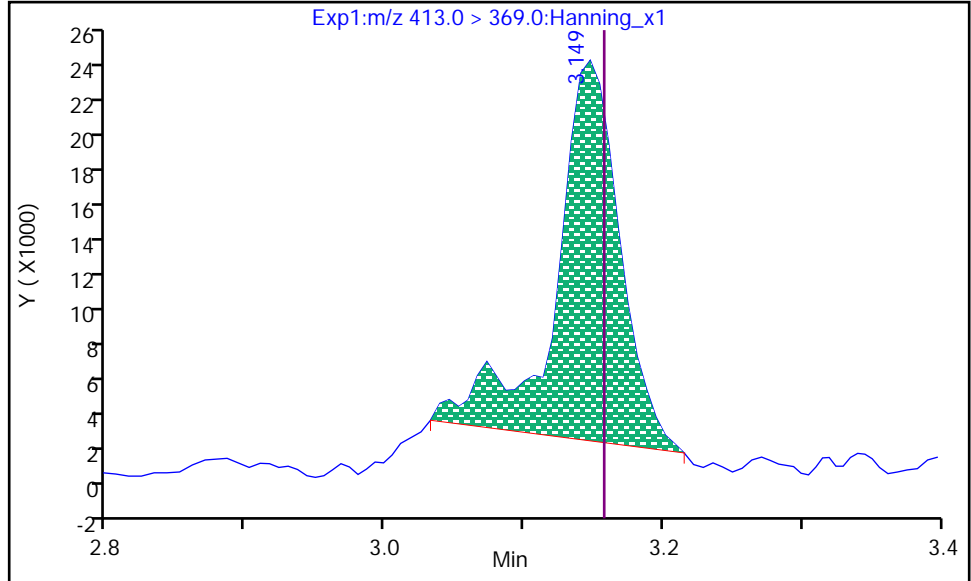
Dil. Factor: 5

Operator: Matthew M. Miller

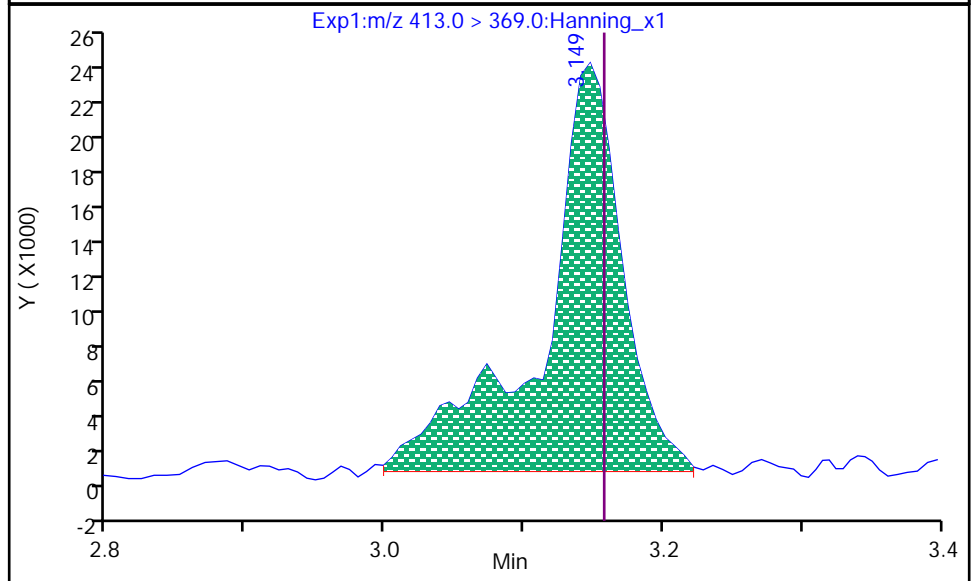
20 PFOA, CAS: 335-67-1

RT: 3.149  
Area: 66648  
Conc: 21.916  
Conc Units: ng/L

Processing Integration Results



RT: 3.149  
Area: 89022  
Conc: 29.273  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:39:48

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920009.d

Injection Date: 29-Dec-2020 10:55:58

Inst. ID: LCMSMS02

Client ID: JAW-60-1220

Lab ID: VL11001-008

Sample Info: VL11001-008,5

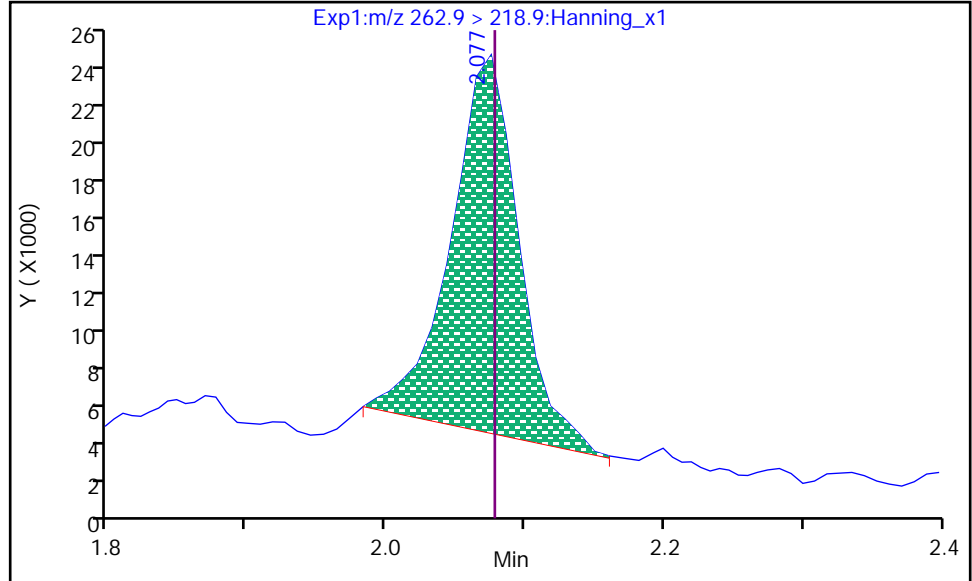
Dil. Factor: 5

Operator: Matthew M. Miller

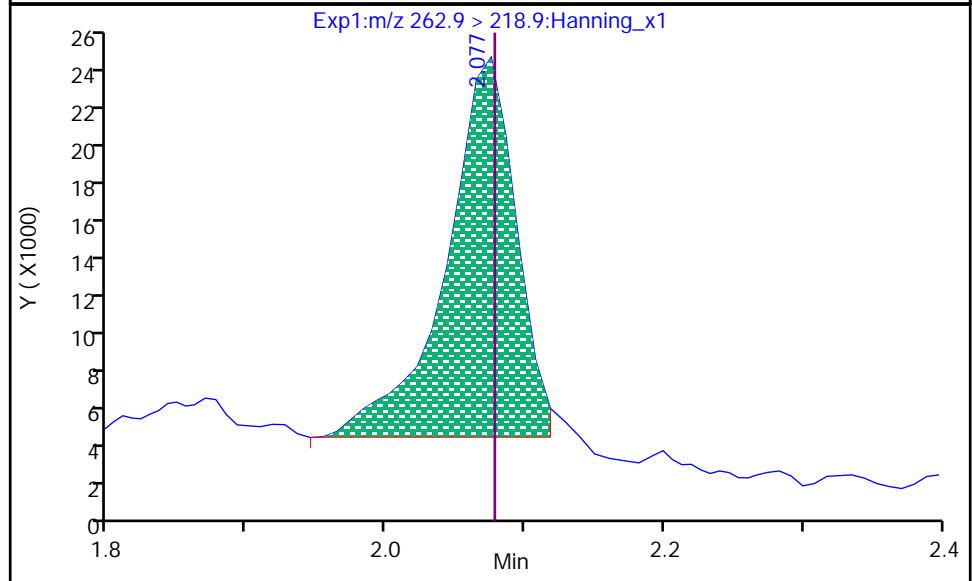
21 PFPeA, CAS: 2706-90-3

RT: 2.077  
Area: 65780  
Conc: 18.930  
Conc Units: ng/L

Processing Integration Results



RT: 2.077  
Area: 68027  
Conc: 19.576  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:39:22

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-009</b>
Description: <b>ET-3-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1106	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>6.3</b>	<b>JQ</b>	<b>6.9</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	UQ	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>12</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>380</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>65</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>80</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.8</b>		<b>3.4</b>	<b>1.7</b>	<b>0.86</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	382	50-150
13C2_8:2FTS	N	301	50-150
13C2_PFDaA		113	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		62	50-150
13C3_PFHxS		66	50-150
13C3-HFPO-DA	N	41	50-150
13C4_PFBa	N	9.6	50-150
13C4_PFHpA		52	50-150
13C5_PFHxA		53	50-150
13C5_PFPeA	N	22	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		74	50-150
13C8_PFOs		82	50-150
13C9_PFNa		89	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		127	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920010.d  
 Injection Date: 29-Dec-2020 11:06:35 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 3  
 Lab Sample ID: VL11001-009 Lab Prep. Batch: 77741  
 Client ID: ET-3-1220 Sample Group: VL11001  
 Sample Info: VL11001-009 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0377629$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	291	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBA CAS: SESI-0111**

217 > 172 1.698 1.702 0 64132 20 >100:1 1001.00 92.469 9.6\*

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.698 1.709 0/0 635614 20 13:1 9960.83 376.15

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.066 2.080 0 153451 13 92:1 1001.00 223.08 22.3\*

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.066 2.080 0/0 327636 14 0.453:1 2125.74 80.274

**D 44 13C3\_PFBS CAS: SESI-0116**

302 > 80 2.118 2.133 0 149628 17 41:1 1001.00 649.90 62

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.133 ND ND 298.9 > 80 44 2.133 ND ND 1001.00 649.90 62 U

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.406 2.429 -1 403944 17 >100:1 1001.00 548.04 53.4

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.406 2.420 0/1 684195 11 8.2:1 Target = 17.01 1717.33 64.851 M

313 > 119 49 2.406 2.420 37107 16 30:1 18.43 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.513 2.536 -1 584789 18 >100:1 5005.00 2195.53 41.3\*

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.536 ND ND 285 > 119 66 2.536 ND ND 5005.00 2195.53 41.3\* U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.763 2.777 0 320313 17 >100:1 1001.00 528.01 52.2

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 2.786 0/0 231614 14 5.5:1 Target = 3.79 697.81 26.351

363 > 169 47 2.763 2.786 68351 16 23:1 3.38 (1.89-5.69)

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.781 2.795 0 123056 15 76:1 1001.00 718.66 66.2

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.781 2.795 0/0 40082 21 5.3:1 Target = 3.80 0.19 307.51 11.612

399 > 99 45 2.781 2.795 11784 17 3.4:1 3.40 (1.90-5.71) 0.27



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.823		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.132	-1	402889	21	>100:1			5005.00	20920	382*	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													J
427 > 407	64	3.114	3.139	-1/0	31819	40	>100:1	Target = 1.77		167.51	6.3257		
427 > 81	64	3.114	3.139		14326	20	7.7:1	2.22 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.159	-1	449643	21	>100:1			1001.00	759.71	74	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.141	3.159	-1/0	1319164	35	>100:1	Target = 2.85	0.27	2880.70	108.78		
413 > 169	53	3.141	3.159		468573	34	>100:1	2.81 (1.42-4.28)	0.36				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.520	3.533	0	126500	21	8.7:1			1001.00	843.73	82.4	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.533	0/0	38943	57	24:1	Target = 6.80	1.74	260.05	9.8203		
499 > 99	54	3.513	3.533		11054	53	4.0:1	3.52 (3.40-10.20)	2.10				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.740		ND								
<b>31 11-chloroicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.334		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.520	3.533	0	704130	21	>100:1			1001.00	937.64	89.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.533		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.879	0	314329	20	>100:1			5005.00	16945	301*	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.911		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.881	3.887	0	648601	20	>100:1			1001.00	977.79	92.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.887		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.028	4.034	0	924252	18	>100:1			5005.00	6439.01	127	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.043		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.193	0	795506	19	>100:1			5005.00	5989.59	112	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.203		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.193	0	671433	17	>100:1			1001.00	1062.27	105	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.193		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.455	4.461	0	688075	19	>100:1			1001.00	1136.72	113	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.918	0	680437	19	>100:1			1001.00	807.70	86.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.887	0	585377	20	>100:1					85.1	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.406	2.429	-1	355313	17	>100:1					48.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.152	0	394989	23	>100:1					64.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.702	0	129161	18	8.6:1					20.2	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.520	3.533	0	117652	18	37:1					68.3	

### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920010.d

Injection Date: 29-Dec-2020 11:06:35

Inst. ID: LCMSMS02

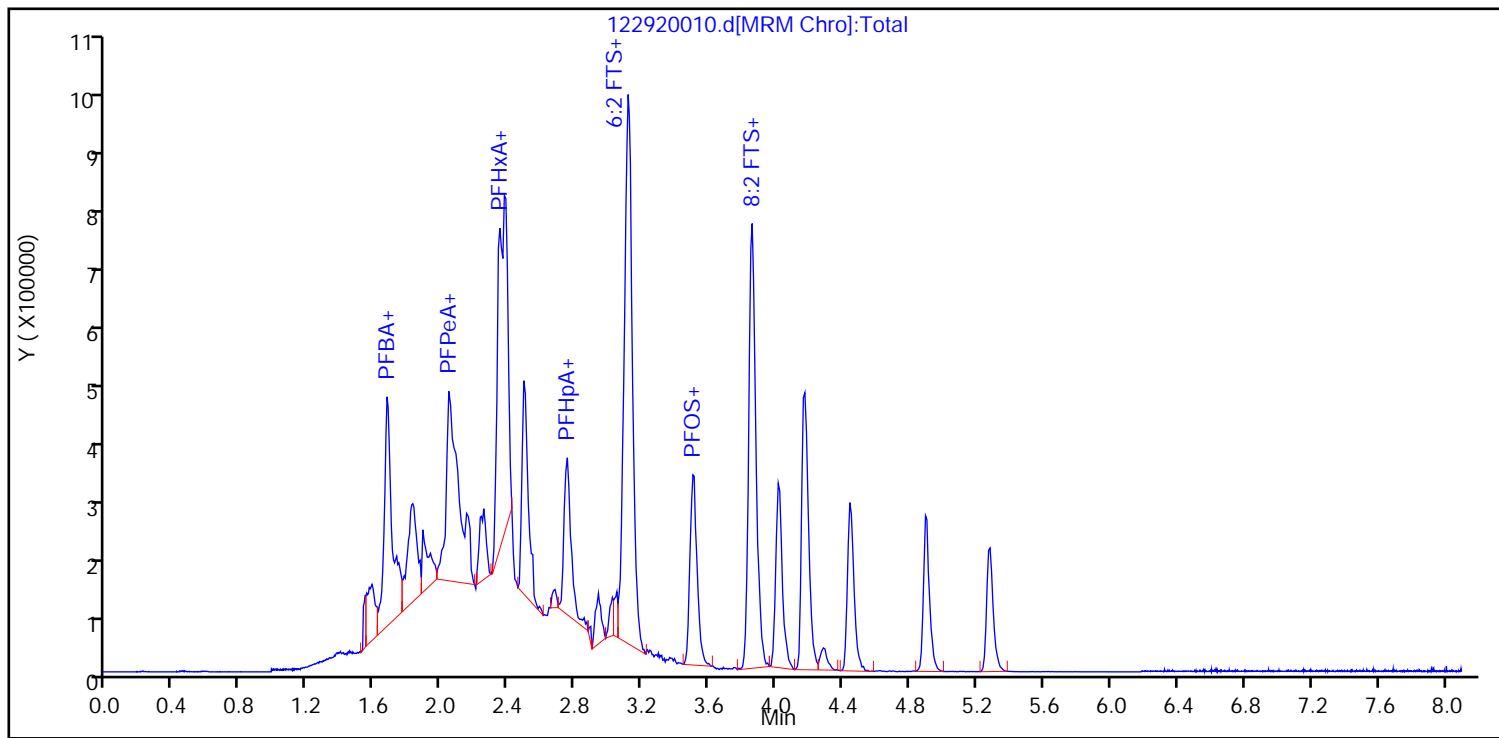
Client ID: ET-3-1220

Lab ID: VL11001-009

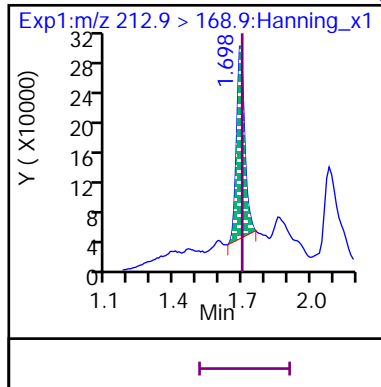
Sample Info: VL11001-009

Dil. Factor: 1

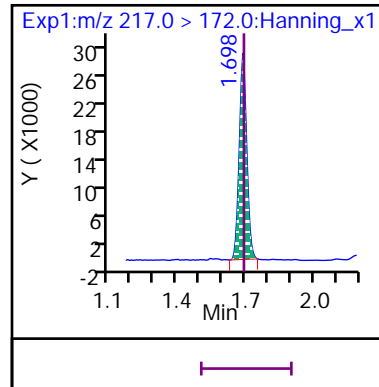
Operator: Matthew M. Miller



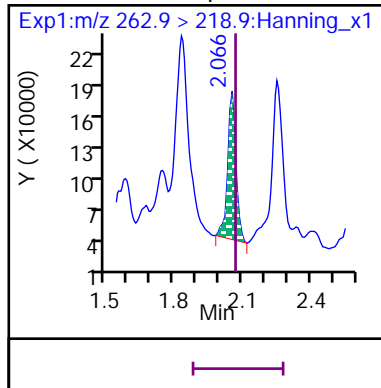
8 Perfluoro-n-butanoic acid (PFBA)



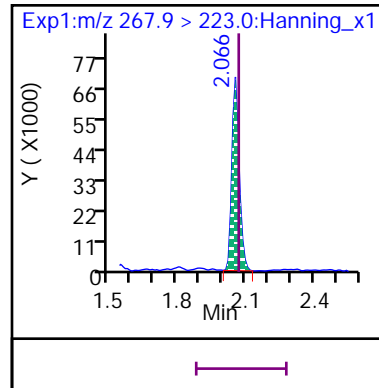
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

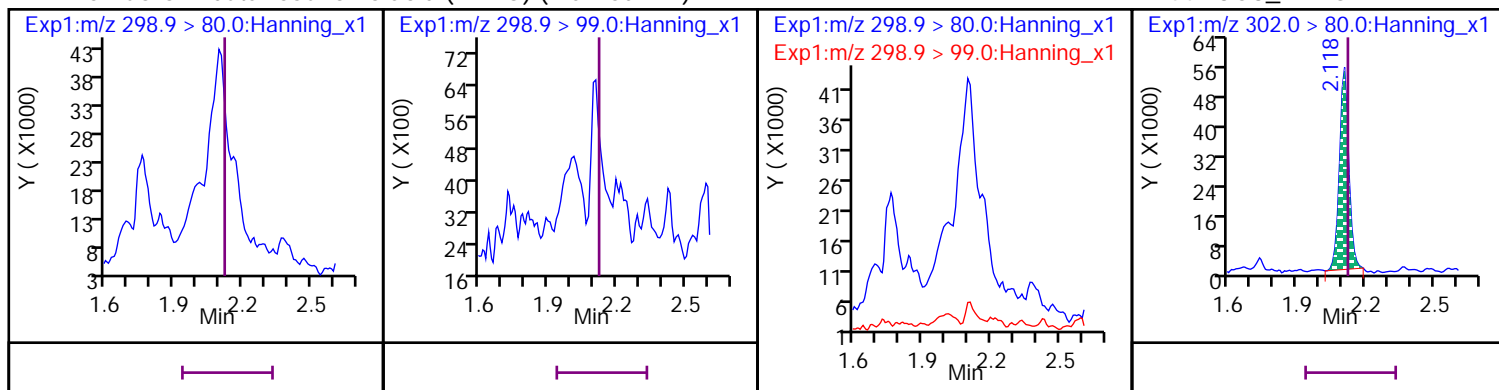


D 50 13C5\_PFPeA



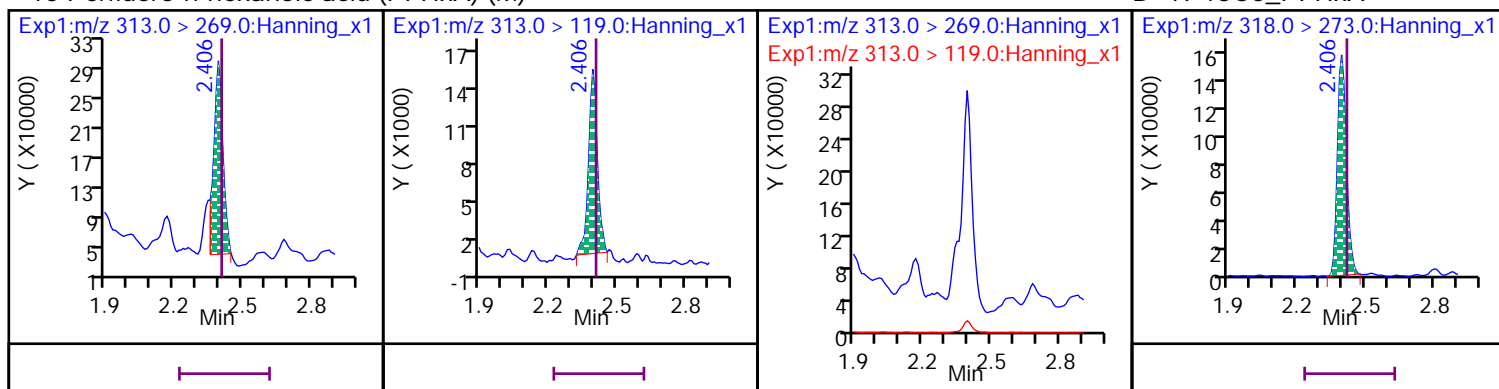
7 Perfluoro-1-butanesulfonic acid (PFBS) (Marked ND)

D 44 13C3\_PFBS



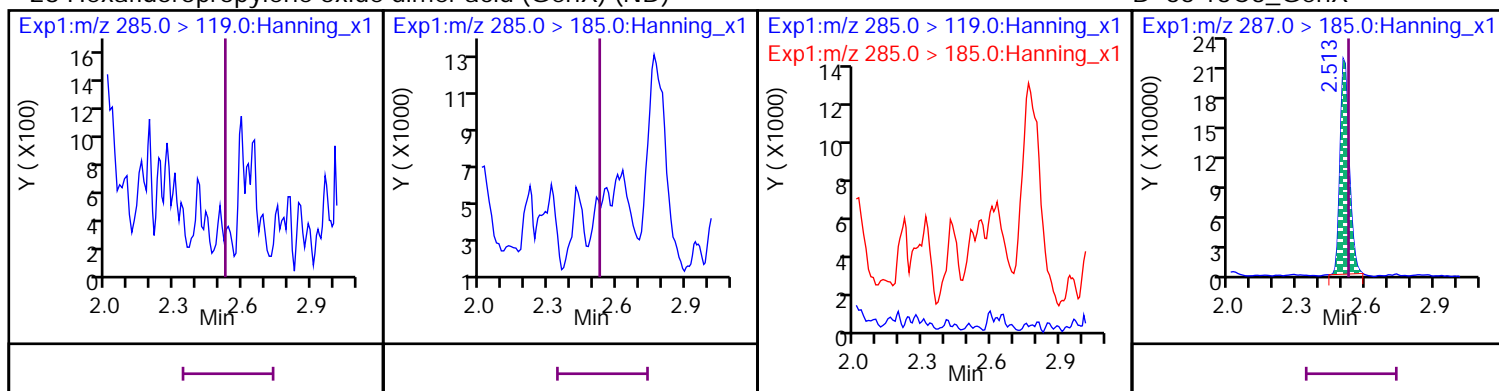
15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



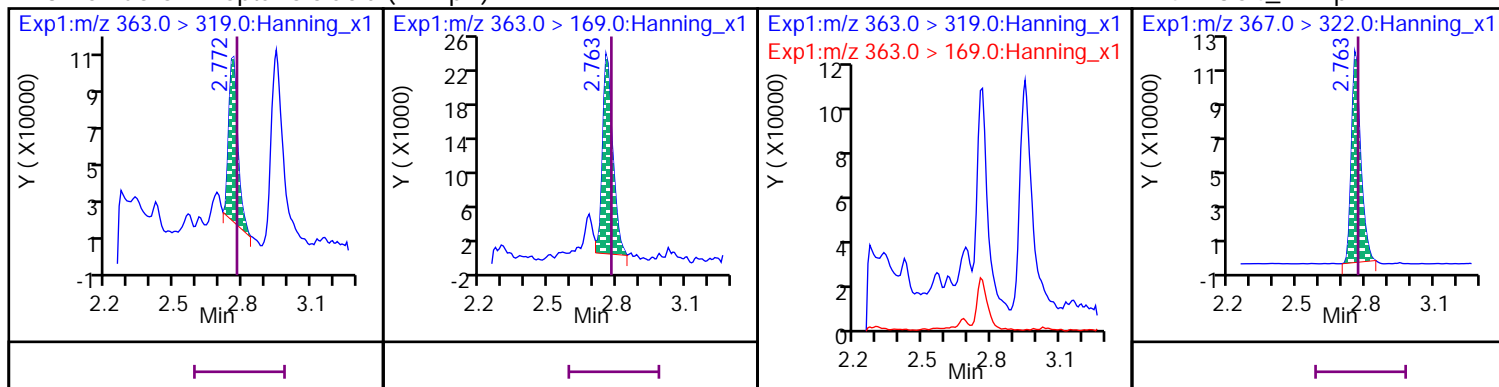
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



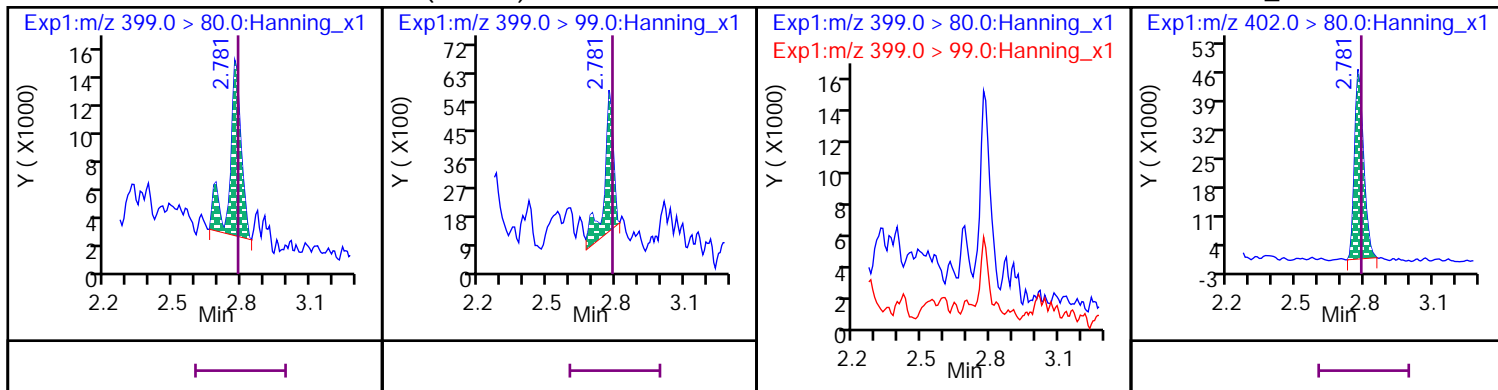
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



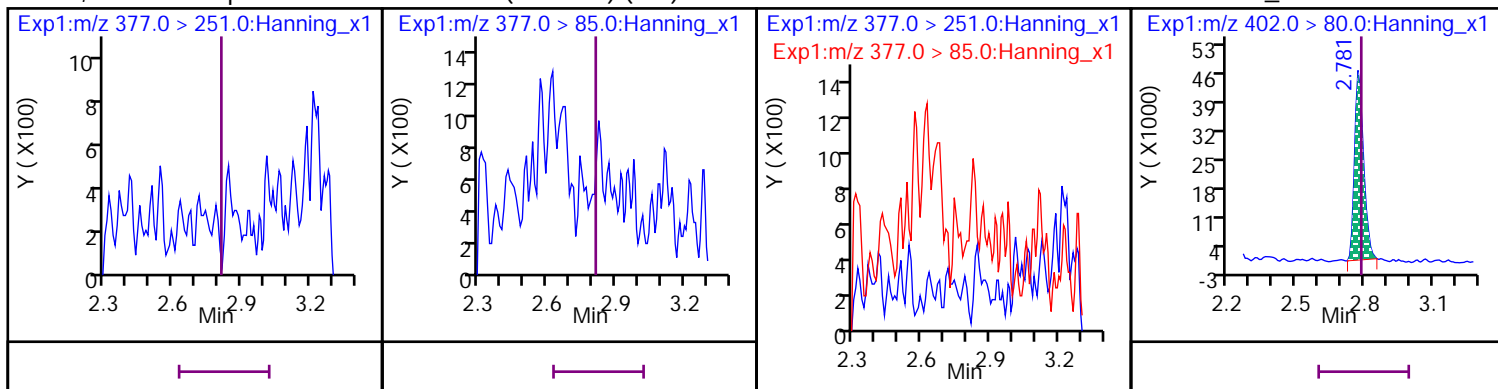
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



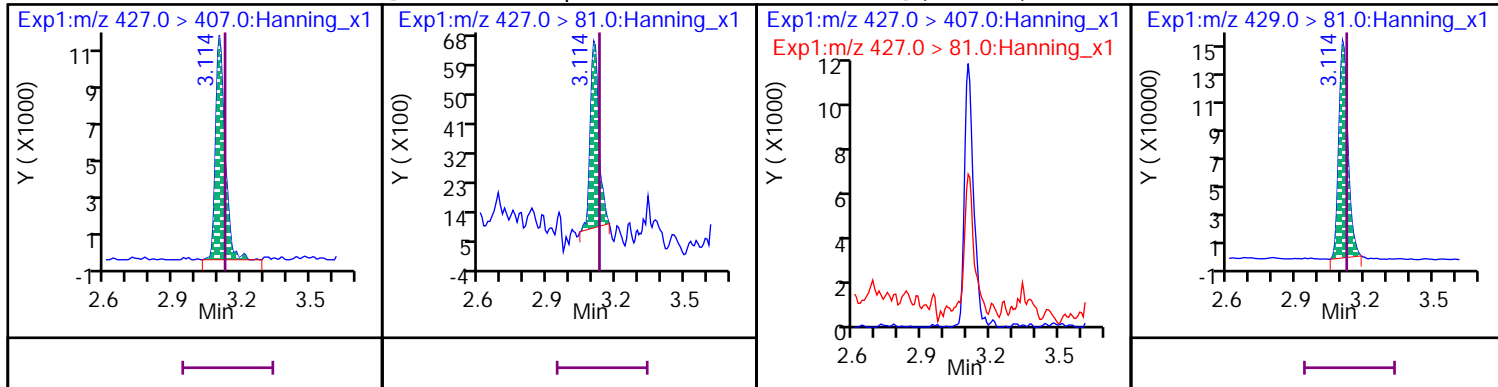
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



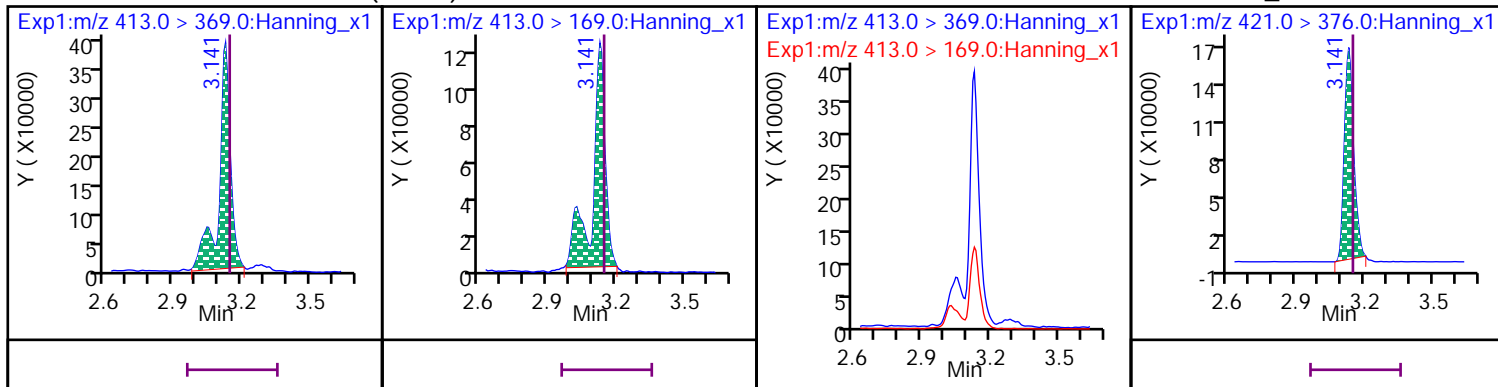
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



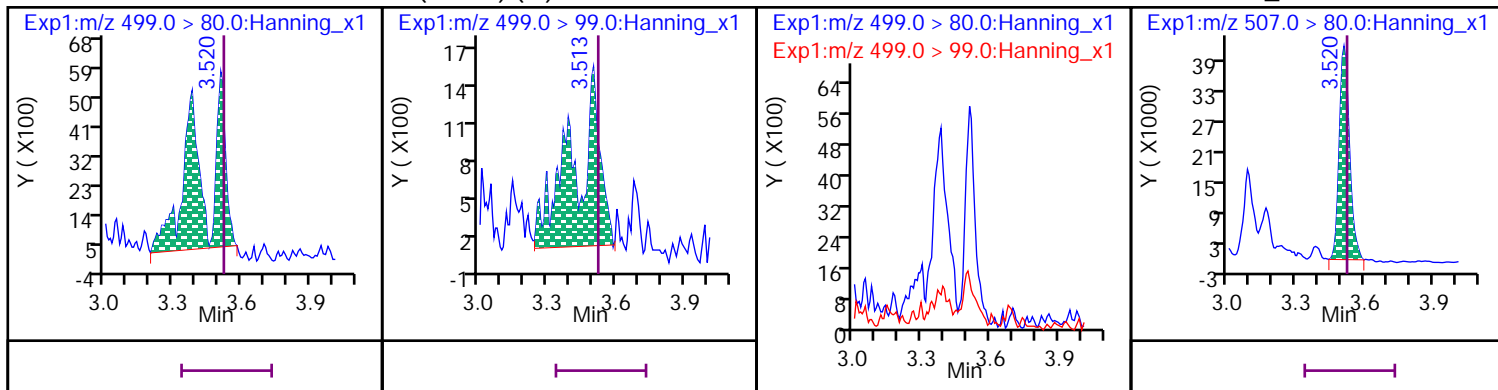
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



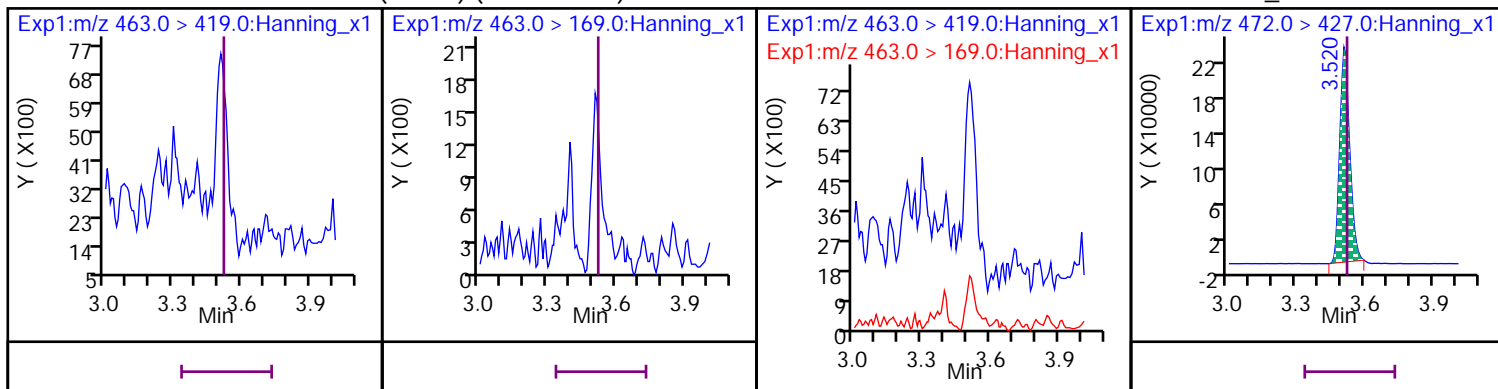
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



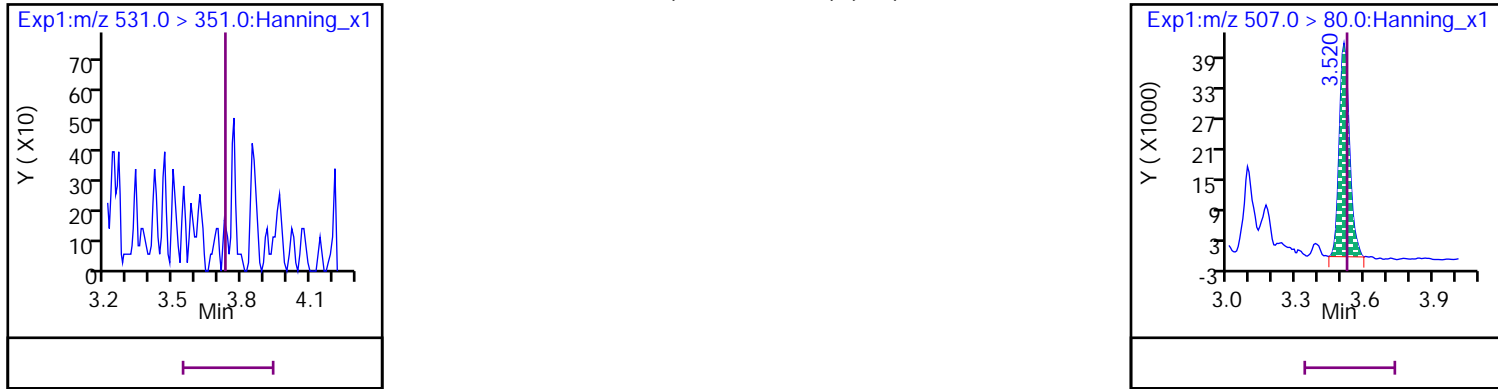
17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



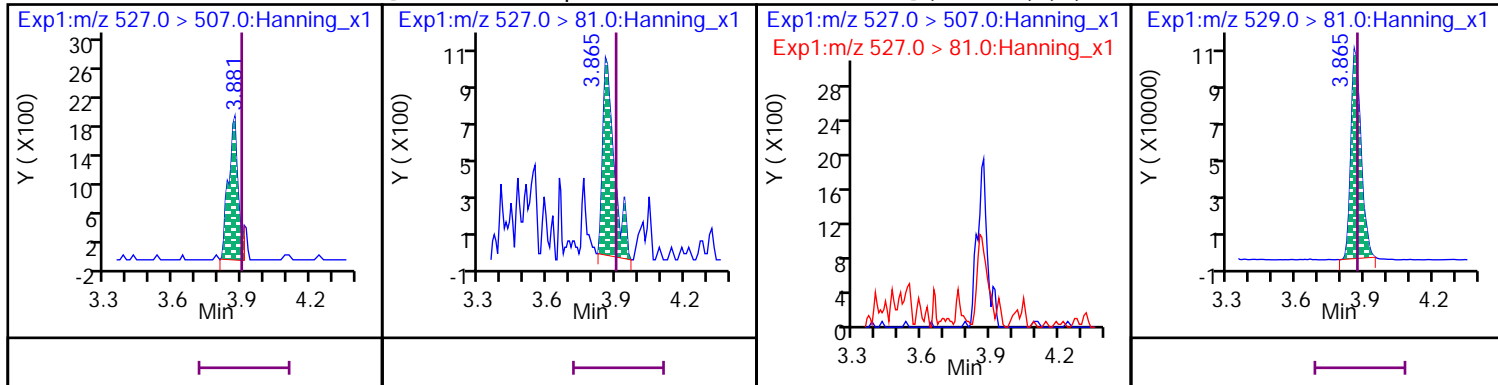
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

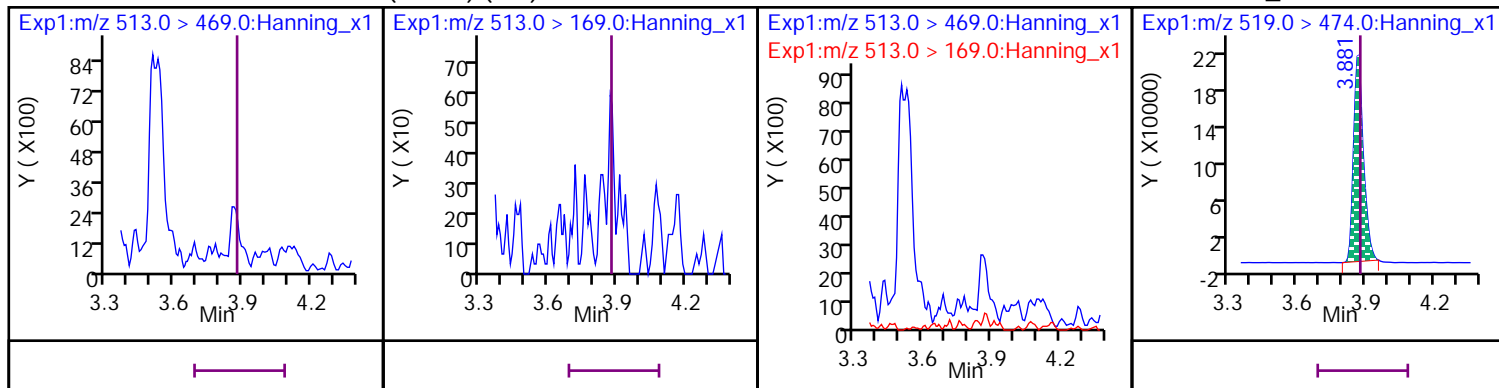
D 65 13C2\_8:2 FTS\_2





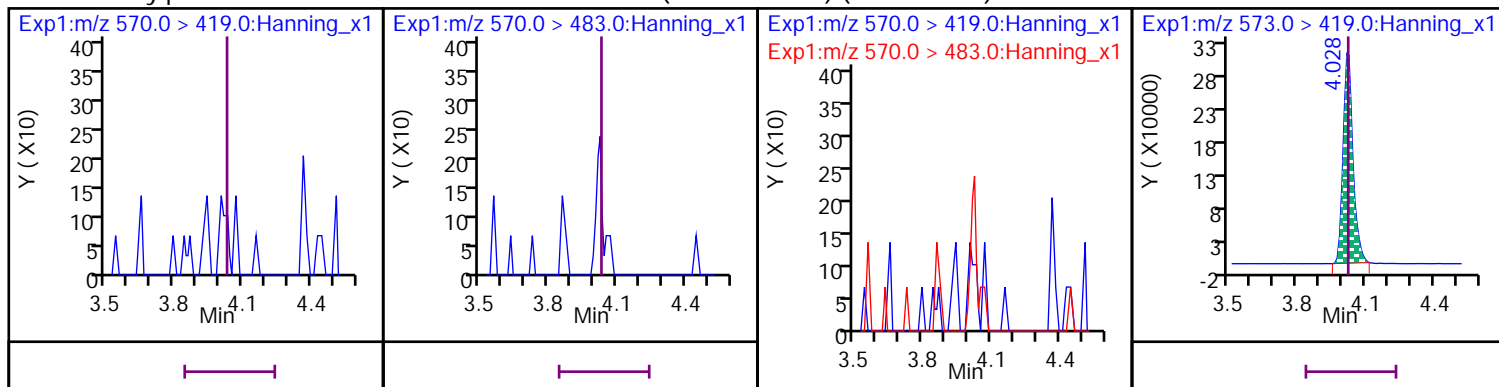
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



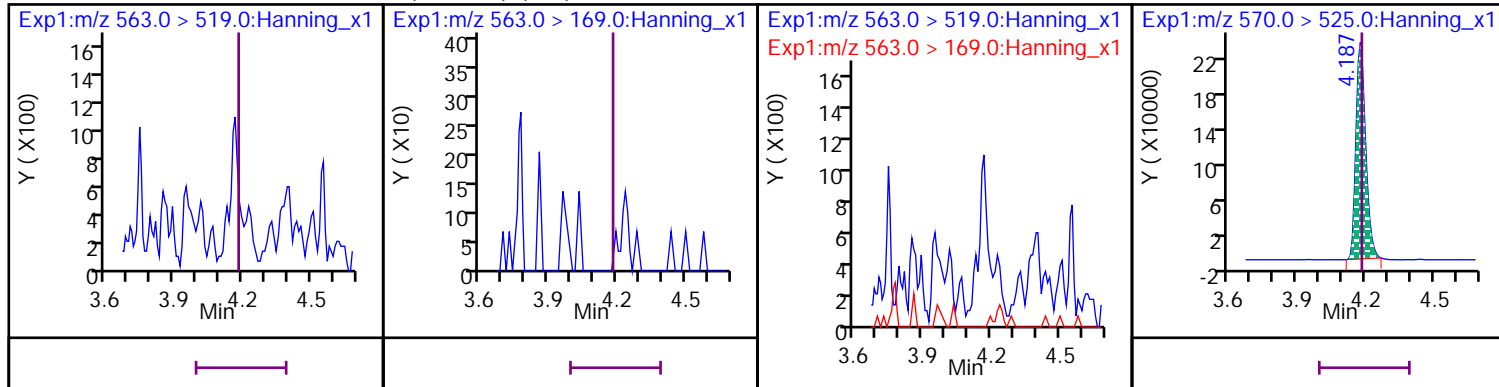
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



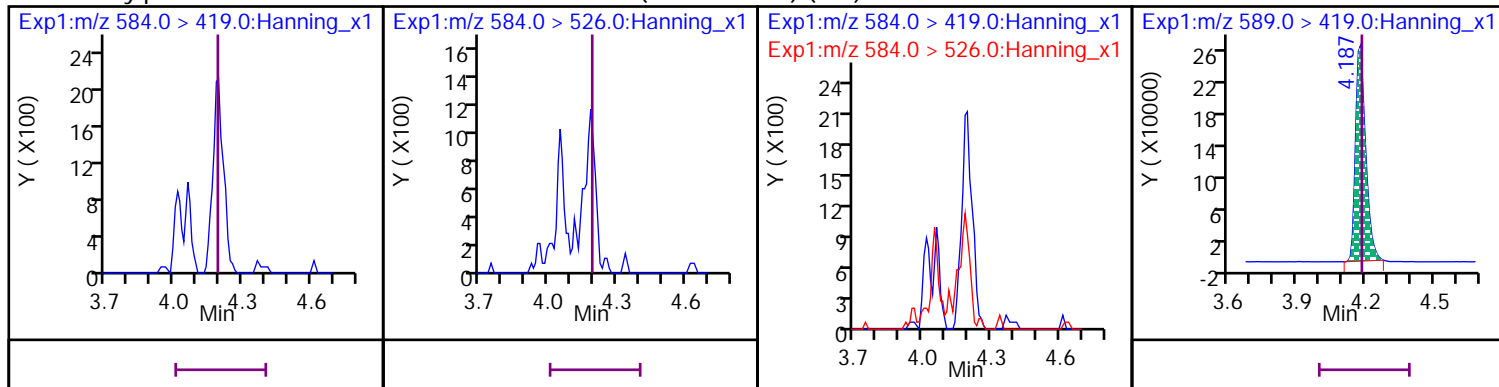
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

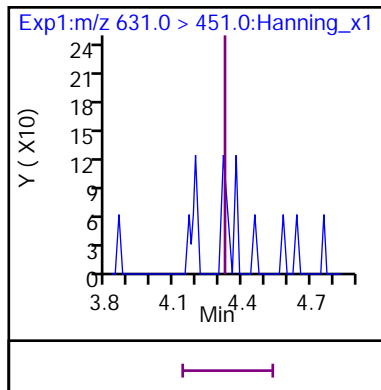


5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

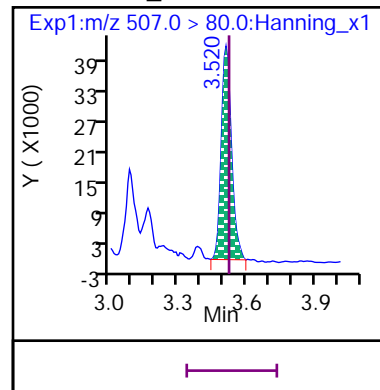
D 60 d5-EtFOSAA



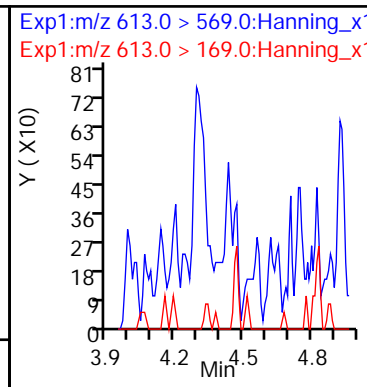
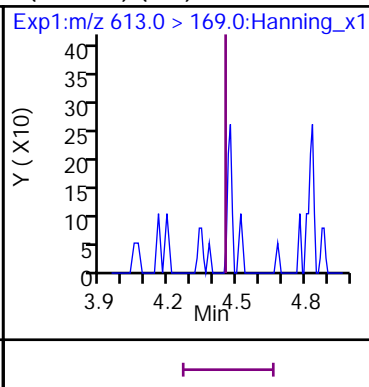
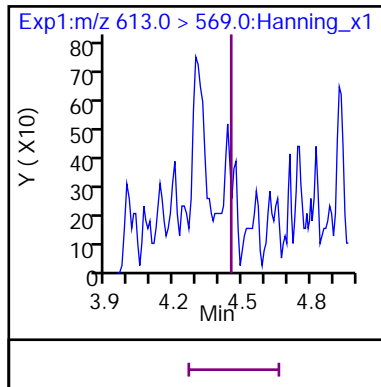
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



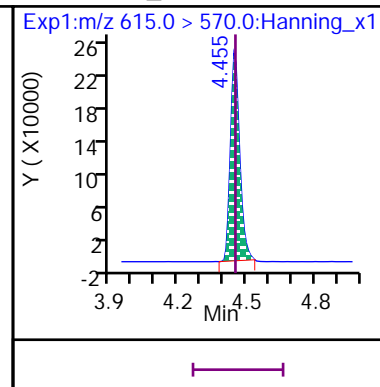
D 54 13C8\_PFOS



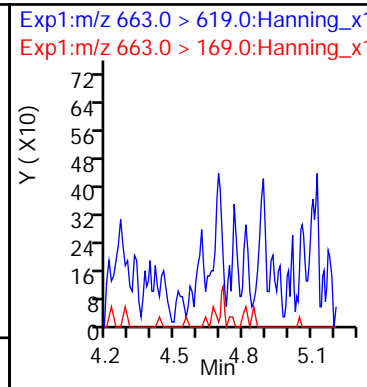
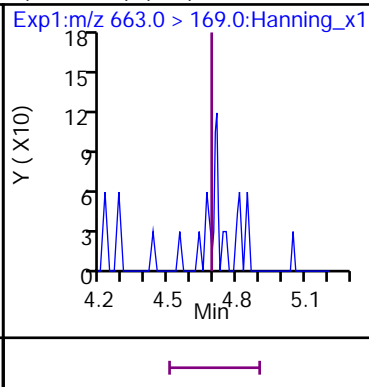
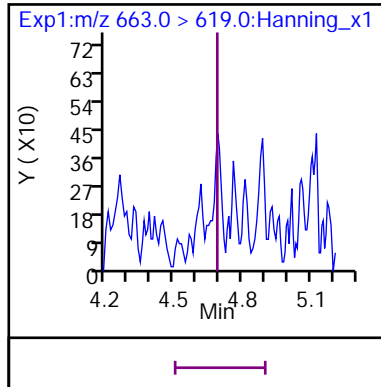
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



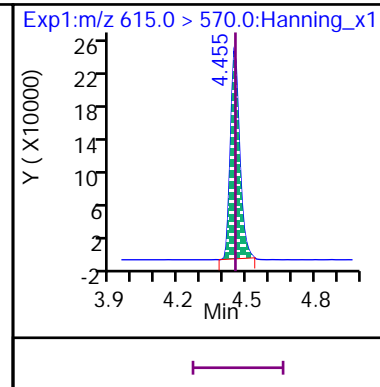
D 38 13C2\_PFDoA



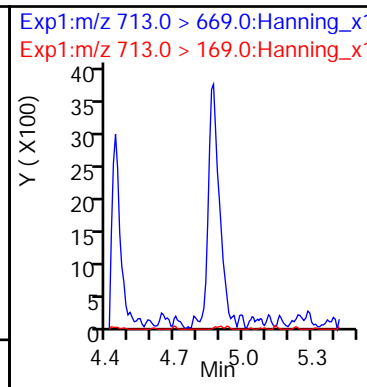
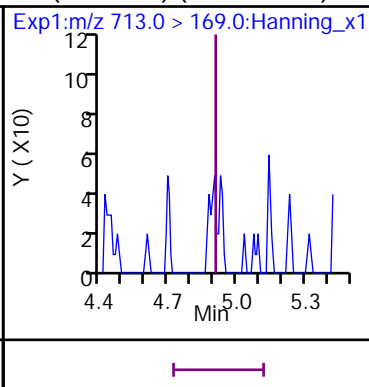
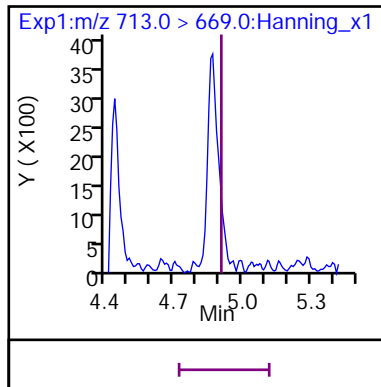
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



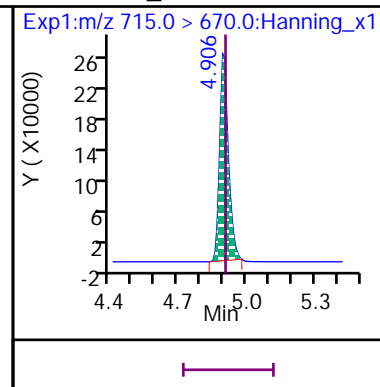
D 38 13C2\_PFTeDA



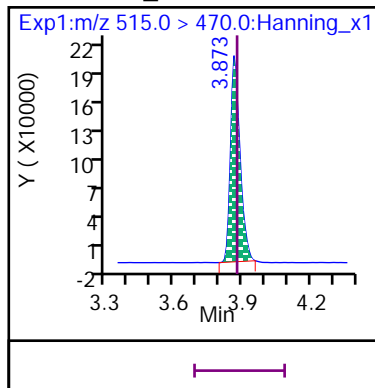
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



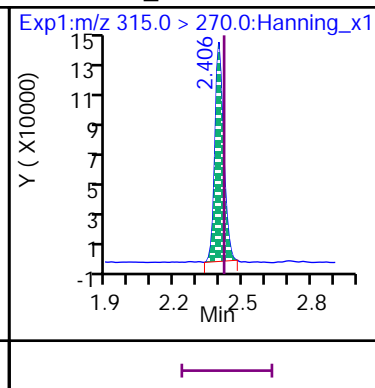
D 42 13C2\_PFTeDA



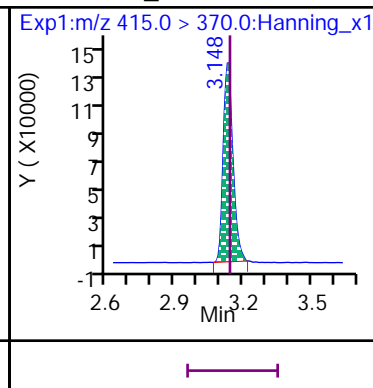
\* 37 13C2\_PFDA



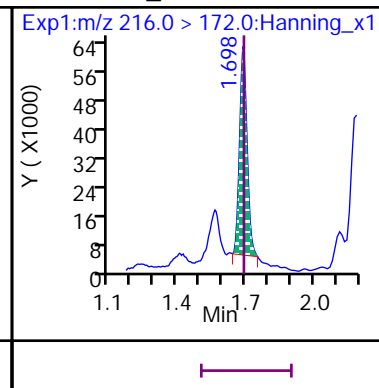
\* 39 13C2\_PFHxA



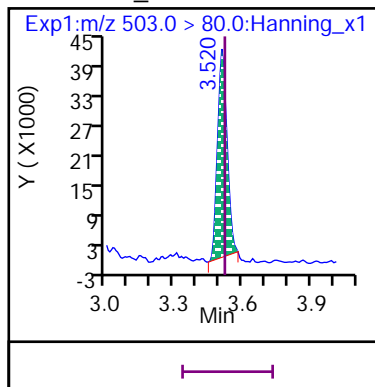
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

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Inst. ID: LCMSMS02

Client ID: ET-3-1220

Lab ID: VL11001-009

Sample Info: VL11001-009

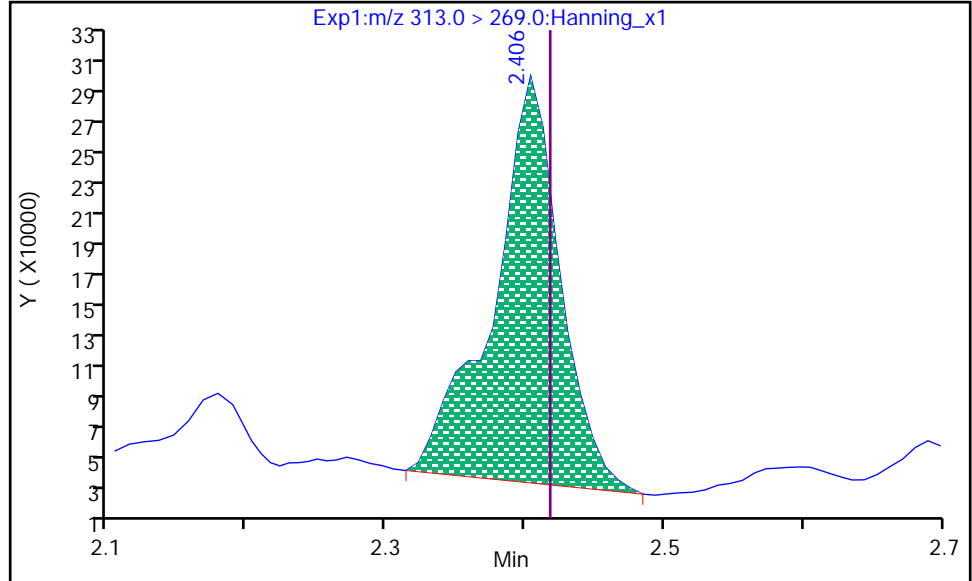
Dil. Factor: 1

Operator: Matthew M. Miller

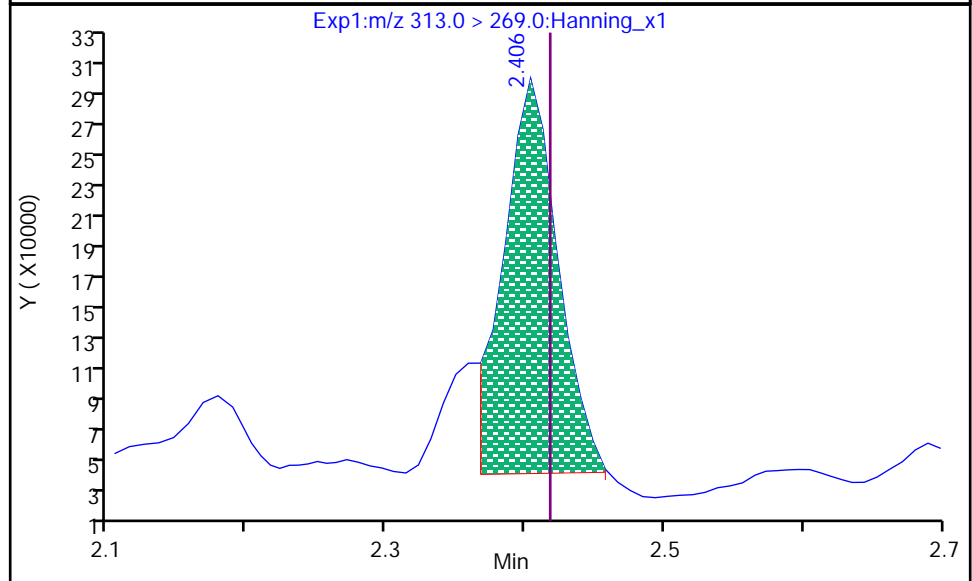
15 PFHxA, CAS: 307-24-4

RT: 2.406  
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Conc: 83.120  
Conc Units: ng/L

Processing Integration Results



RT: 2.406  
Area: 684195  
Conc: 64.851  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:40:31

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

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Injection Date: 29-Dec-2020 11:06:35

Inst. ID: LCMSMS02

Client ID: ET-3-1220

Lab ID: VL11001-009

Sample Info: VL11001-009

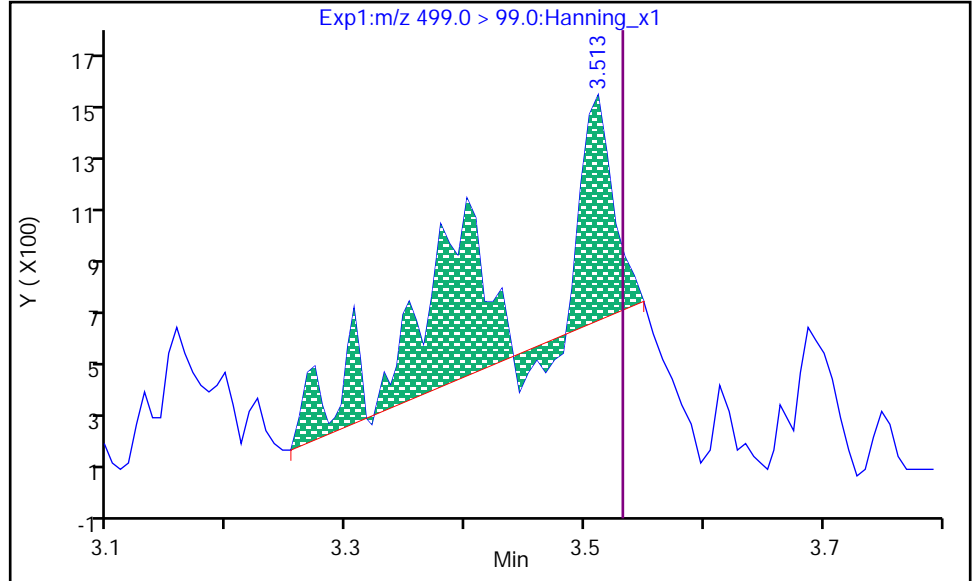
Dil. Factor: 1

Operator: Matthew M. Miller

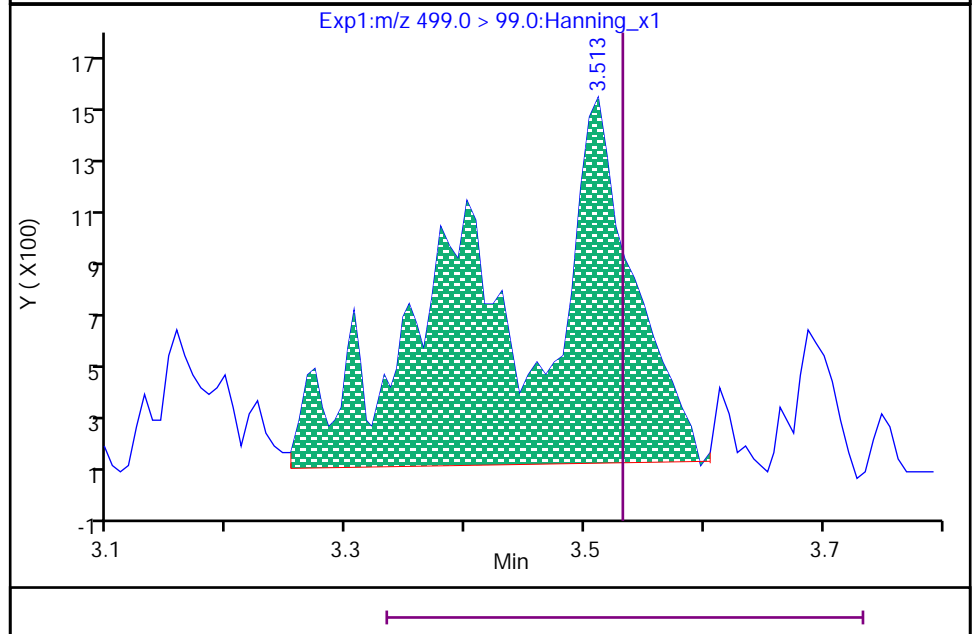
18 PFOS, CAS: 1763-23-1

RT: 3.513  
Area: 4344  
Conc: 9.8203  
Conc Units: ng/L

Processing Integration Results



RT: 3.513  
Area: 11054  
Conc: 9.8203  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:40:49

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-010</b>
Description: <b>FD02-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1245</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1141	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>5.5</b>	<b>JQ</b>	<b>6.8</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)</b>	<b>2991-50-6</b>	<b>PFAS by ID SOP</b>	<b>2.9</b>	<b>J</b>	<b>6.8</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>26</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>14</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>390</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>27</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>86</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-nonanoic acid (PFNA)</b>	<b>375-95-1</b>	<b>PFAS by ID SOP</b>	<b>1.0</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>84</b>	<b>Q</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-tetradecanoic acid (PFTeDA)</b>	<b>376-06-7</b>	<b>PFAS by ID SOP</b>	<b>0.91</b>	<b>J</b>	<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.4</b>	<b>1.7</b>	<b>0.85</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	327	50-150
13C2_8:2FTS	N	295	50-150
13C2_PFDaA		104	50-150
13C2_PFTeDA		77	50-150
13C3_PFBs		62	50-150
13C3_PFHxS		65	50-150
13C3-HFPO-DA	N	39	50-150
13C4_PFBa	N	9.6	50-150
13C4_PFHpA	N	46	50-150
13C5_PFHxA	N	47	50-150
13C5_PFPeA	N	21	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		64	50-150
13C8_PFOs		79	50-150
13C9_PFNa		83	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		112	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820015.d  
 Injection Date: 28-Dec-2020 11:41:48 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 7  
 Lab Sample ID: VL11001-010 Lab Prep. Batch: 77741  
 Client ID: FD02-1220 Sample Group: VL11001  
 Sample Info: VL11001-010 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0372509$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	295	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.692 1.696 0 62438 19 >100:1 1001.00 90.026 9.6\*

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/1 649274 22 13:1 10451 389.31

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 138956 14 78:1 1001.00 202.00 20.9\*

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.056 2.072 0/0 316317 13 0.260:1 2266.38 84.425

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.109 2.125 0 148154 17 32:1 1001.00 643.50 62.2

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.109 2.125 0/0 121391 9 6.6:1 Target = 3.34 695.63 25.913 M  
 298.9 > 99 44 2.109 2.125 6843 10 -0.219:1 17.73 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.407 2.423 -1 345496 17 >100:1 1001.00 468.74 46.5\*

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.407 2.423 -1/0 789576 15 9.8:1 Target = 17.01 2317.10 86.314 M  
 313 > 119 49 2.407 2.423 37960 20 26:1 20.80 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.514 2.530 -1 538959 18 >100:1 5005.00 2023.47 38.5\*

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND 8

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.764 2.772 0 294274 17 >100:1 1001.00 485.08 46.4\*

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.764 2.772 0/0 221170 13 6.6:1 Target = 3.79 725.30 27.018  
 363 > 169 47 2.773 2.772 70953 15 39:1 3.11 (1.89-5.69)

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.782 2.790 0 113260 17 85:1 1001.00 661.45 65

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.782 2.790 0/0 43576 24 7.9:1 Target = 3.80 0.34 363.23 13.531  
 399 > 99 45 2.791 2.790 18367 24 3.8:1 2.37 (1.90-5.71) 0.33

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.114	1	340714	20	>100:1			5005.00	17692	327*	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													J
427 > 407	64	3.108	3.128	-1/-2	24219	21	>100:1	Target = 1.77		147.87	5.5081		
427 > 81	64	3.115	3.128		14614	19	5.8:1	1.65 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.141	0	399546	20	>100:1			1001.00	675.06	63.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.148	0/0	1240655	36	43:1	Target = 2.85	0.26	3048.96	113.58		
413 > 169	53	3.135	3.148		465830	44	>100:1	2.66 (1.42-4.28)	0.37				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.513	3.520	0	119676	28	7.9:1			1001.00	798.22	78.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.513	3.520	0/0	34728	61	4.6:1	Target = 6.80	2.37	245.13	9.1313		
499 > 99	54	3.506	3.520		9777	35	7.8:1	3.55 (3.40-10.20)	0.74				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.521	3.520	1	634778	22	>100:1			1001.00	845.29	82.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													J
463 > 419	56	3.513	3.520	0/-1	17743	20	2.6:1	Target = 6.19		27.979	1.0422		
463 > 169	56	3.521	3.520		2923	20	2.3:1	6.07 (3.09-9.28)					
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	296498	20	>100:1			5005.00	15984	295*	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	611778	21	>100:1			1001.00	922.28	90.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.029	4.029	1	889336	17	>100:1			5005.00	6195.76	112	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	736187	19	>100:1			5005.00	5542.96	101	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													J
584 > 419	60	4.188	4.187	1/0	11389	40	17:1	Target = 1.71	0.66	77.772	2.8971		
584 > 526	60	4.179	4.187		7518	31	13:1	1.51 (0.85-2.57)	0.54				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.178	1	625852	18	>100:1			1001.00	990.16	97.3	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	1	634643	18	>100:1			1001.00	1048.45	104	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.906	1	621663	19	>100:1			1001.00	737.93	76.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													J
713 > 669	42	4.890	4.906	0/-1	13128	19	43:1	Target = 11.29		24.397	0.90881		
713 > 169	42	4.898	4.906		114	9	4.6:1	115.15 (5.64-16.94)					

Data File: \\ORGANICS\ILL\LCMSMS02.1\122820-DOD.b\122820015.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	802649	20	>100:1					110	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.407	2.423	-1	463985	19	>100:1					63.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.148	0	504013	23	>100:1					84.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	180506	21	14:1					29.6	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.513	3.520	0	163622	24	41:1					100	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

J - Compound Concentration Below Quantitation Limit

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820015.d

Injection Date: 28-Dec-2020 11:41:48

Inst. ID: LCMSMS02

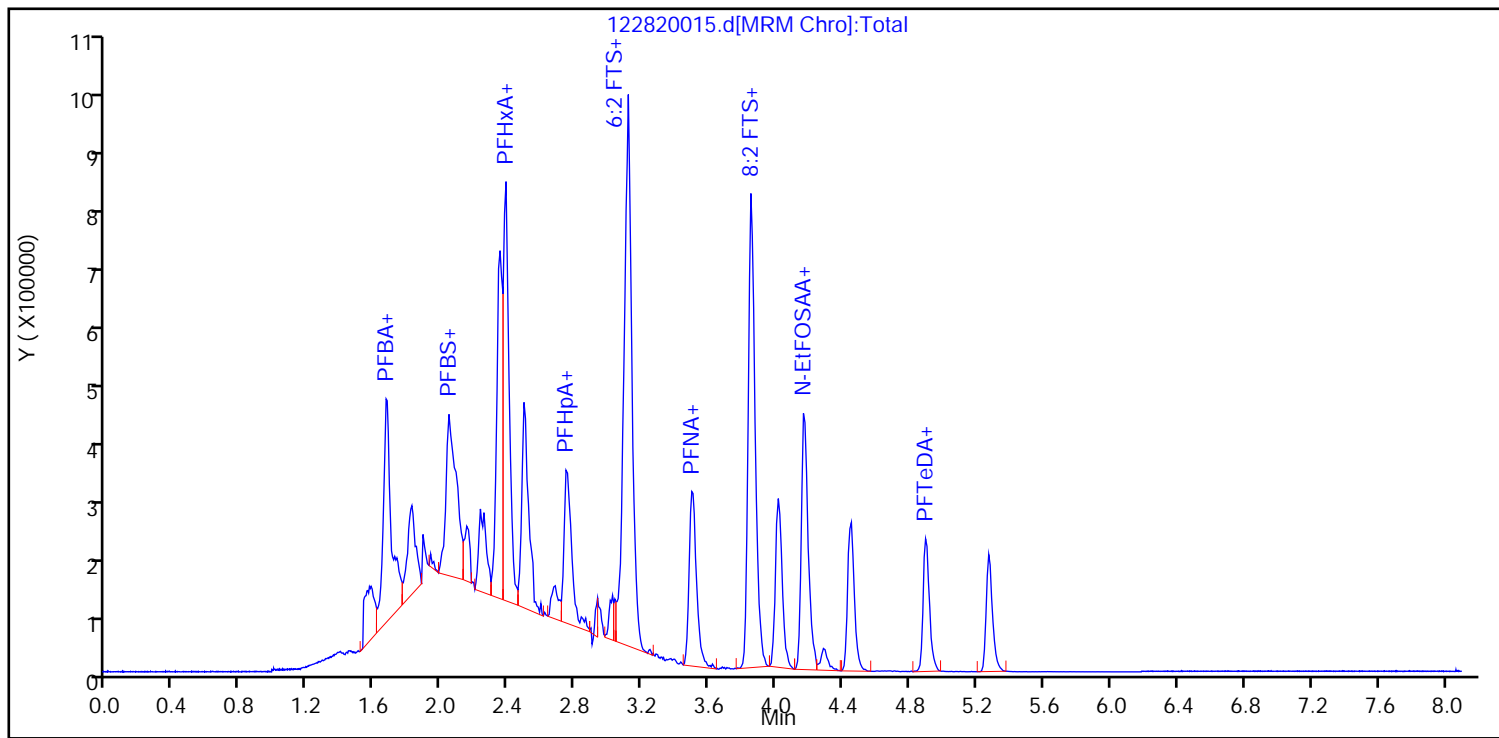
Client ID: FD02-1220

Lab ID: VL11001-010

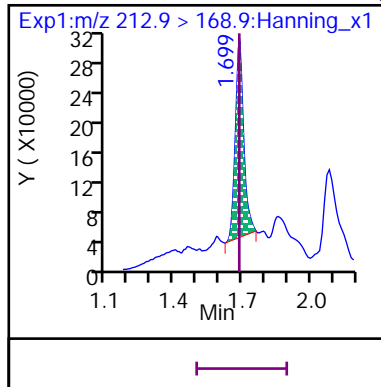
Sample Info: VL11001-010

Dil. Factor: 1

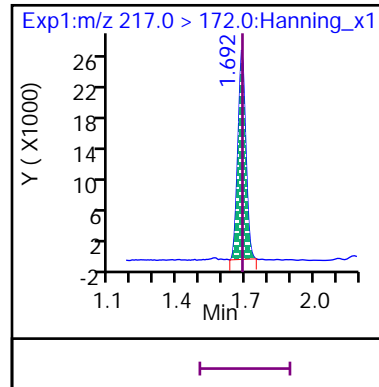
Operator: Matthew M. Miller



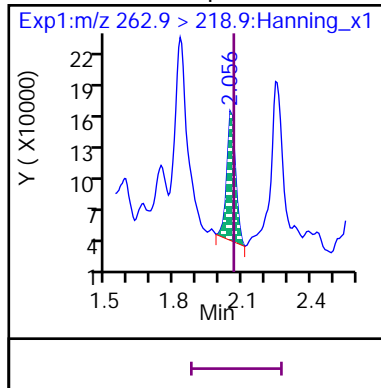
8 Perfluoro-n-butanoic acid (PFBA)



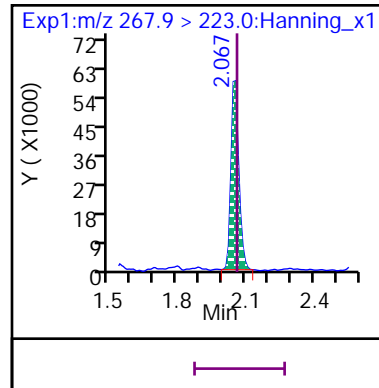
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

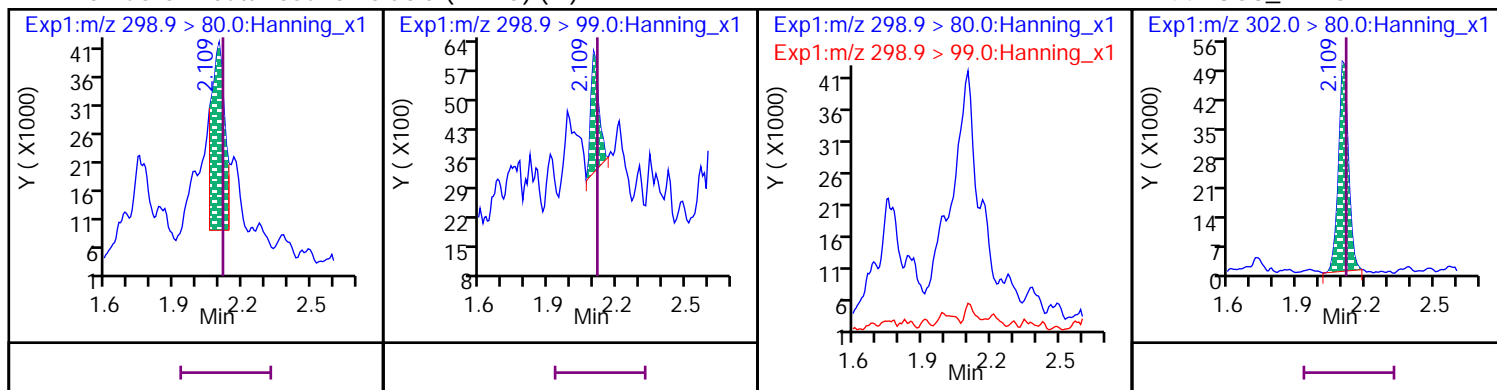


D 50 13C5\_PFPeA



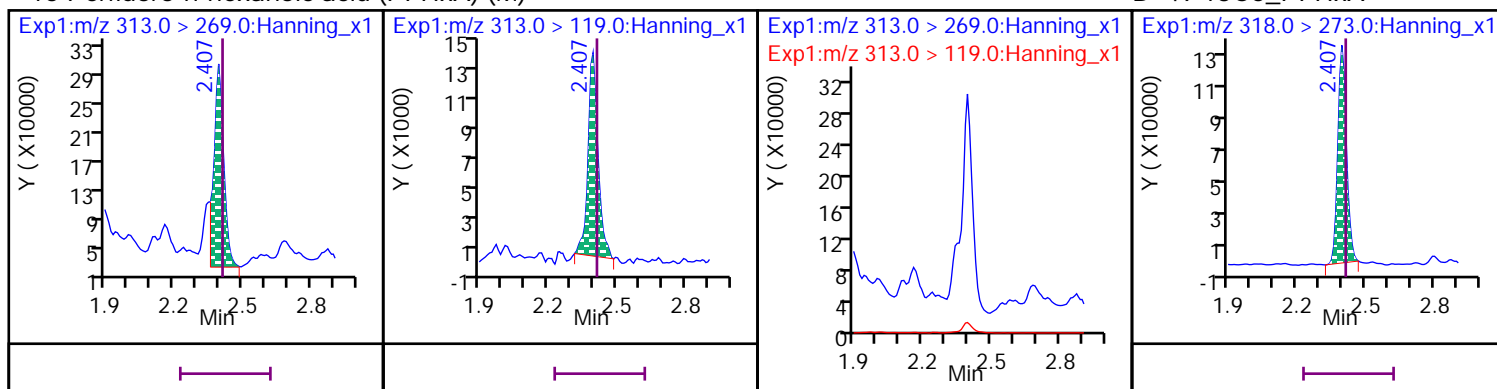
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (M)

D 44 13C3\_PFBS



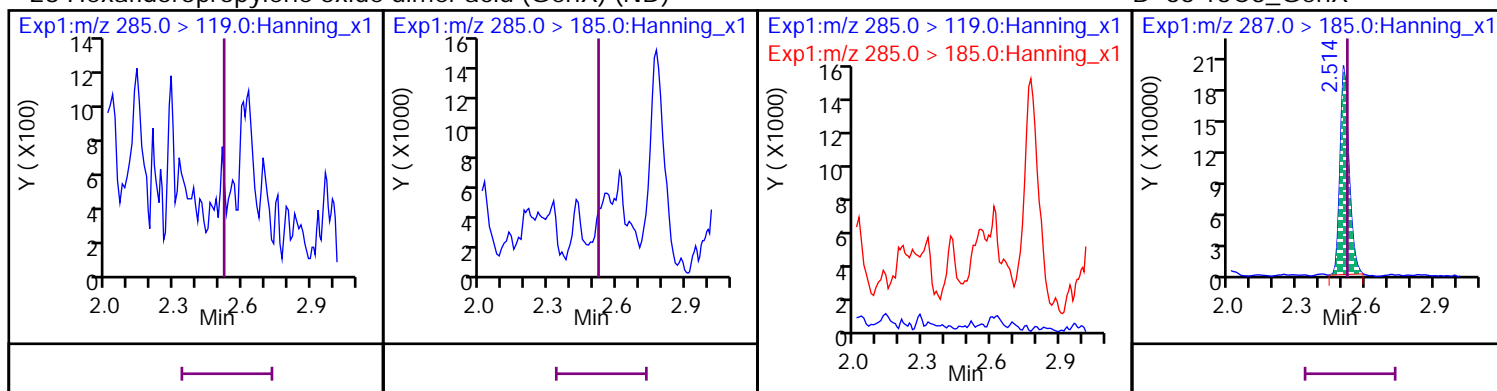
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



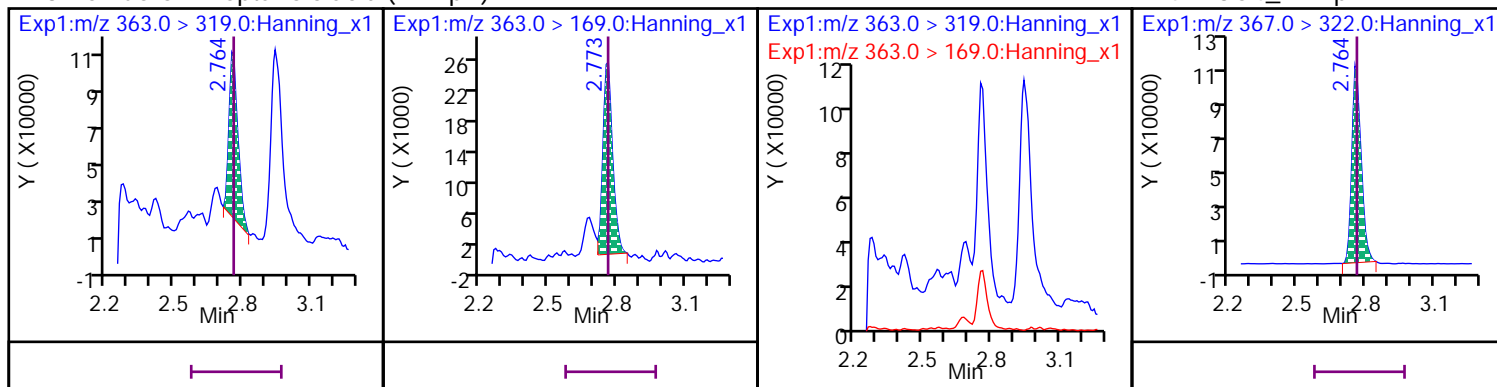
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



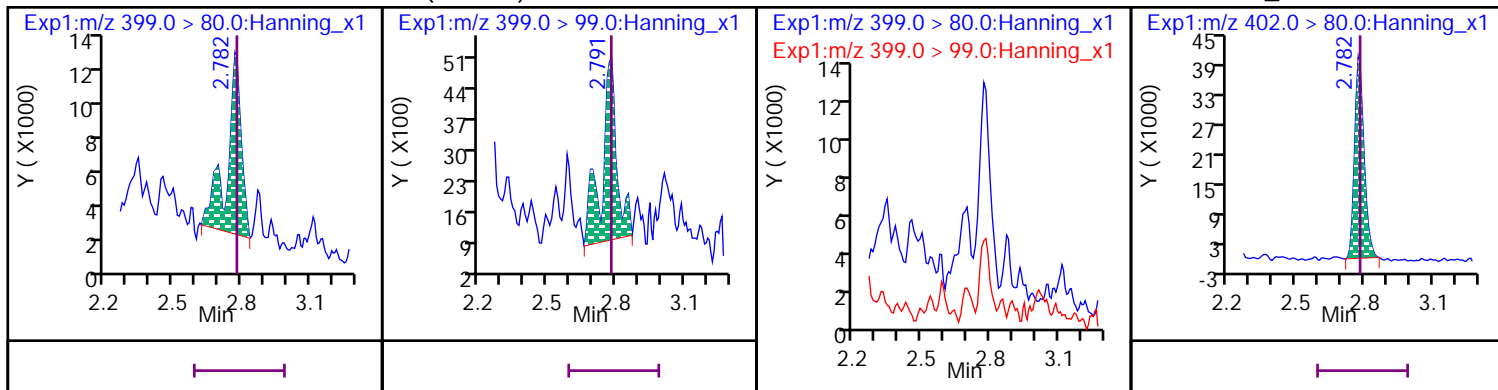
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



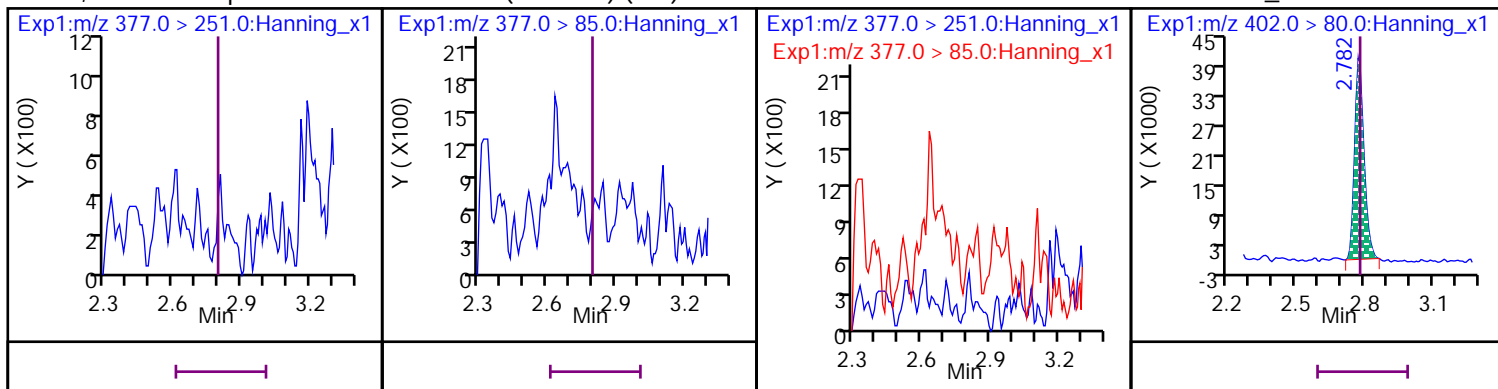
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



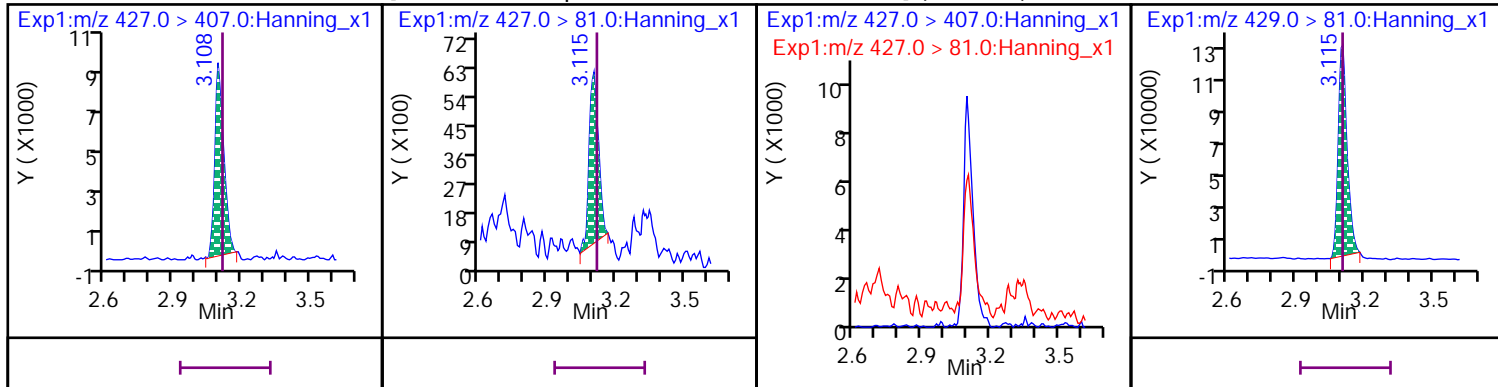
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



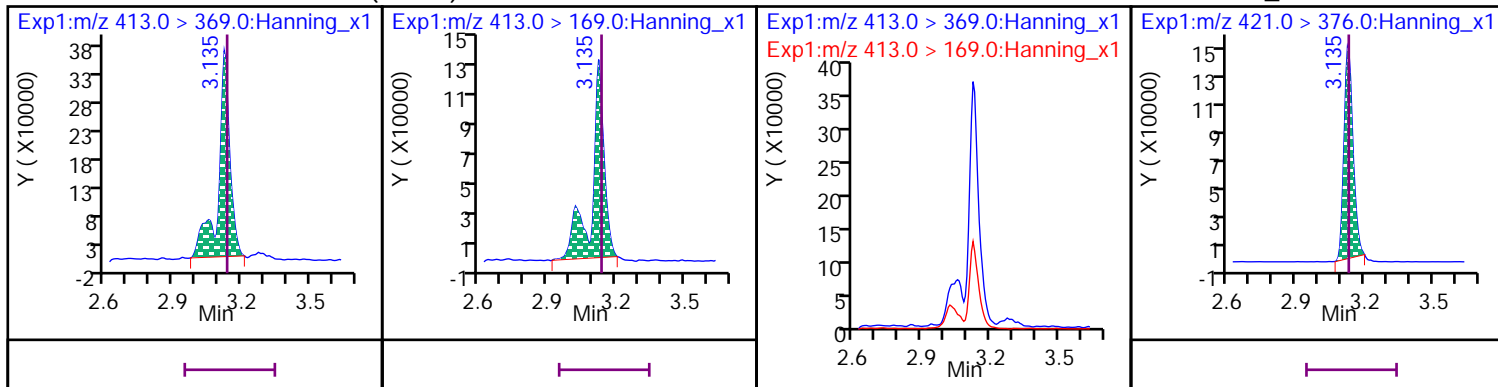
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



20 Perfluoro-n-octanoic acid (PFOA)

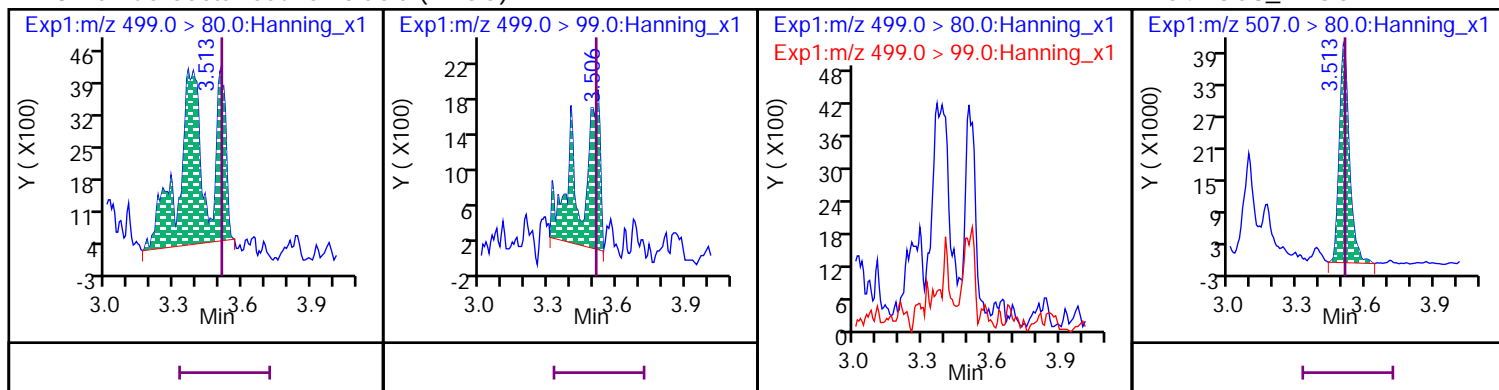
D 53 13C8\_PFOA





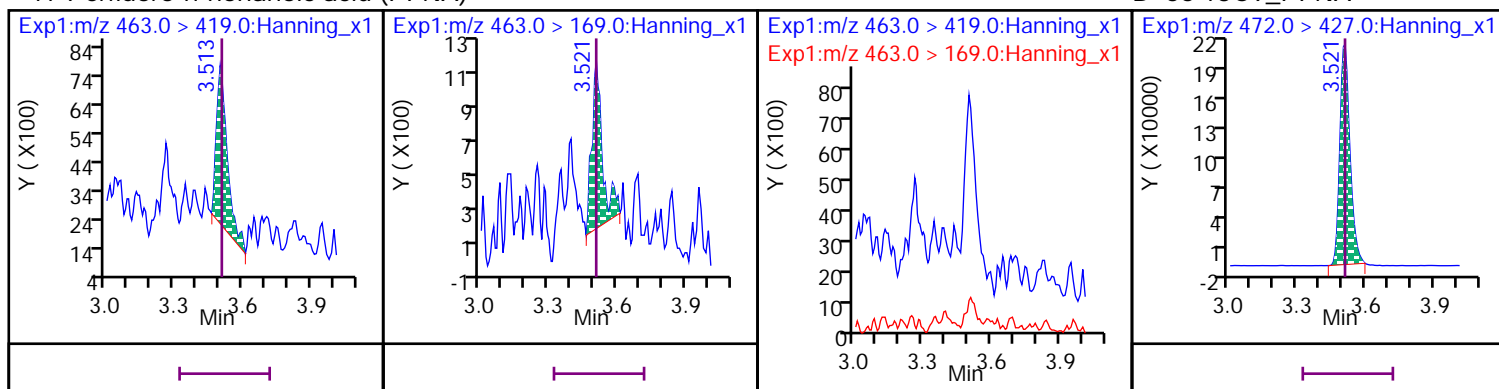
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



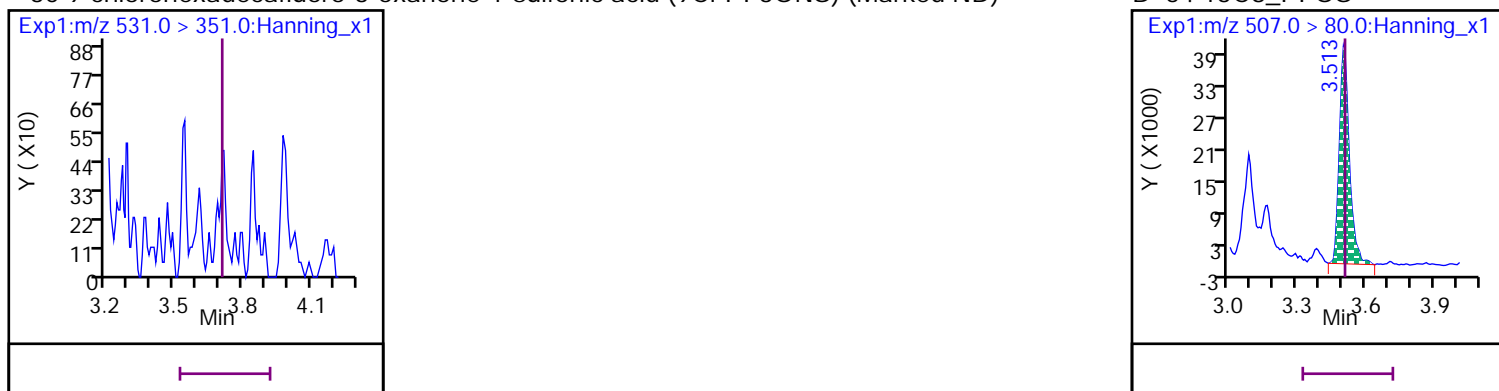
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



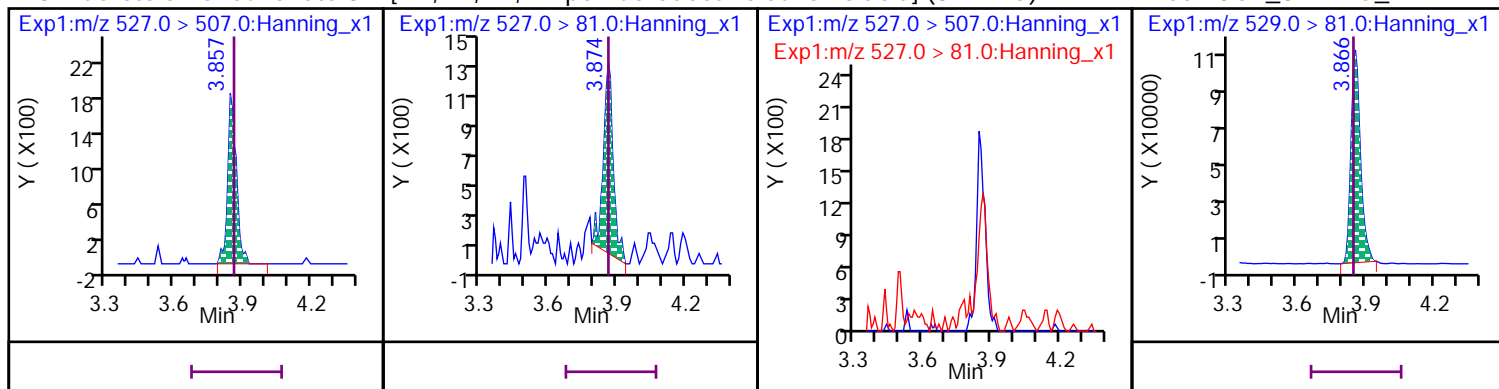
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



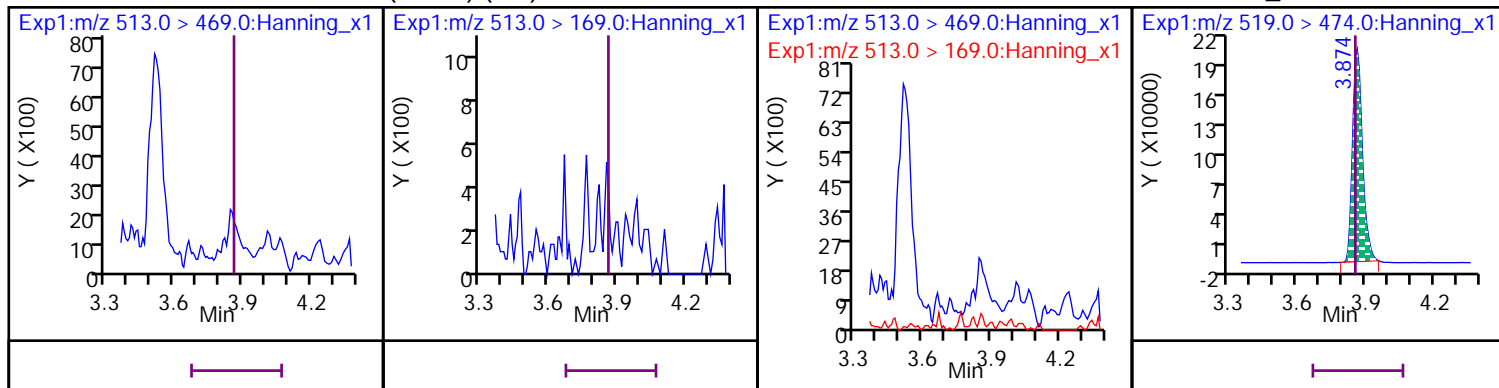
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



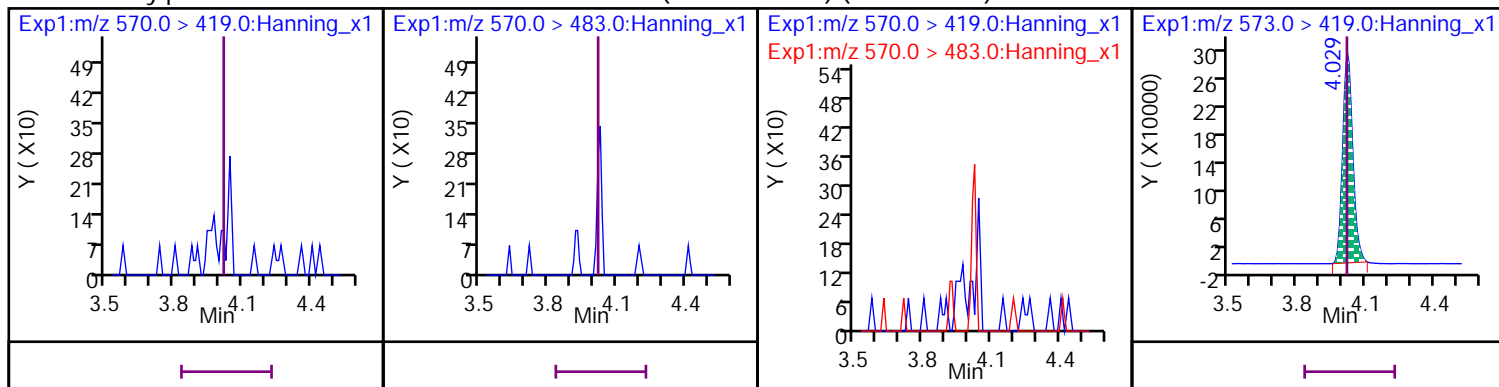
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



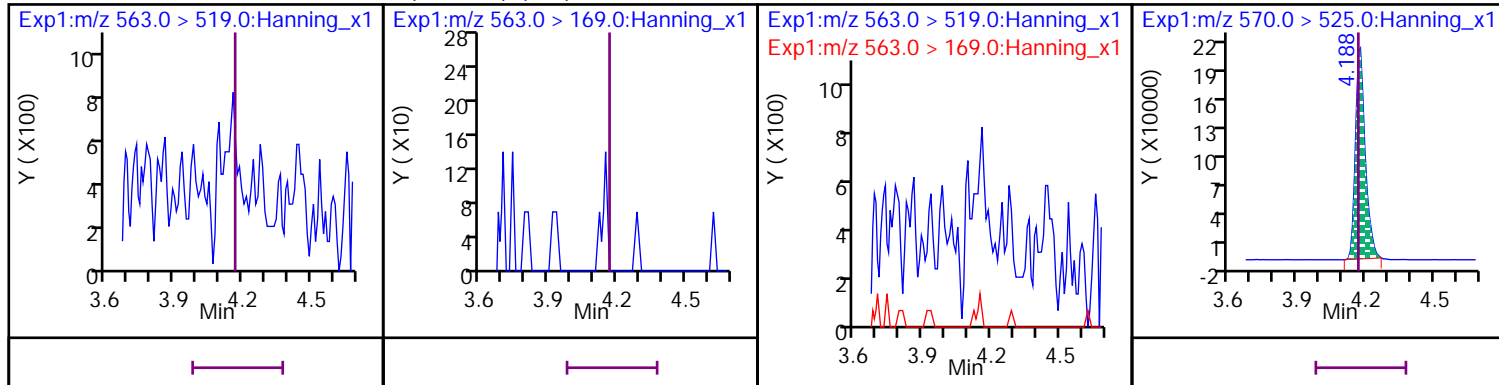
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



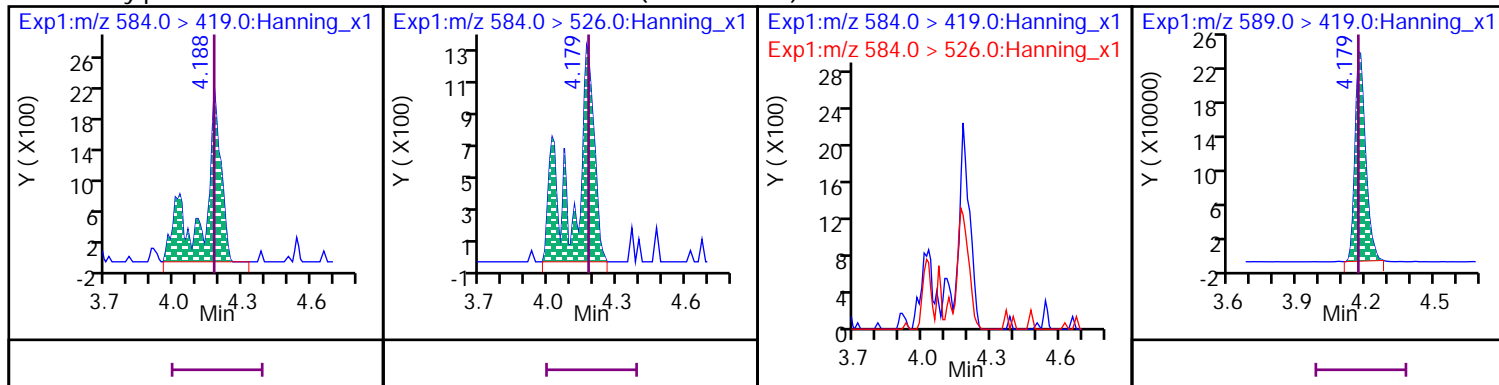
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

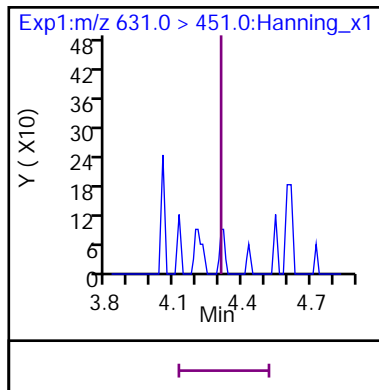


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

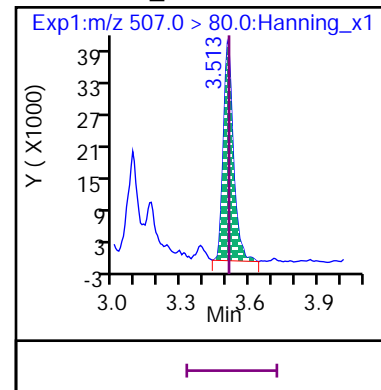
D 60 d5-EtFOSAA



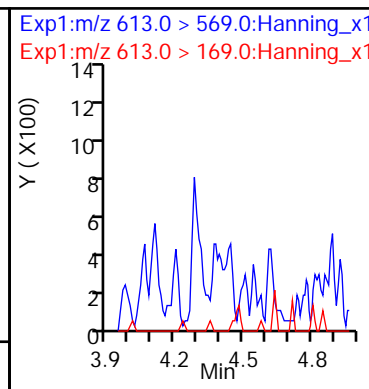
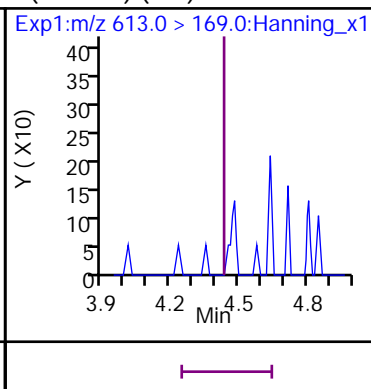
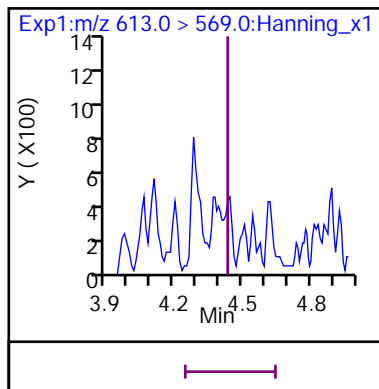
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



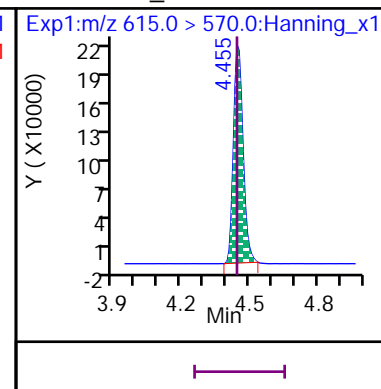
## D 54 13C8\_PFOS



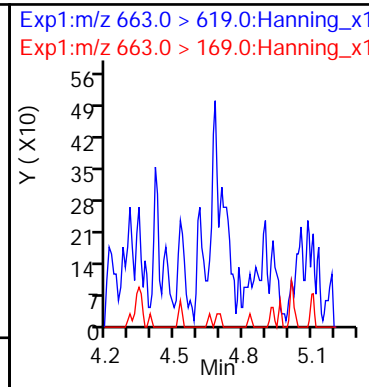
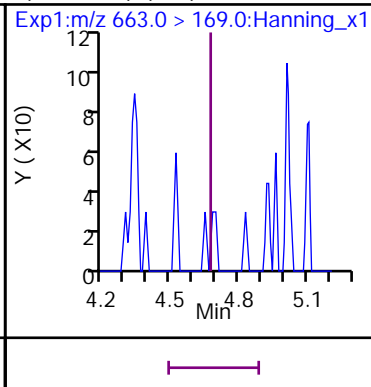
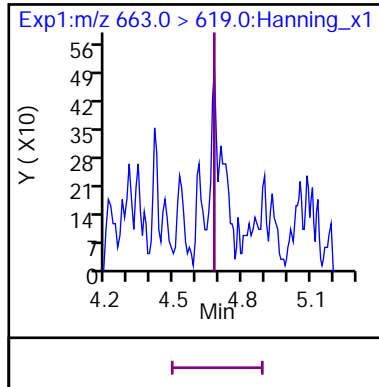
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



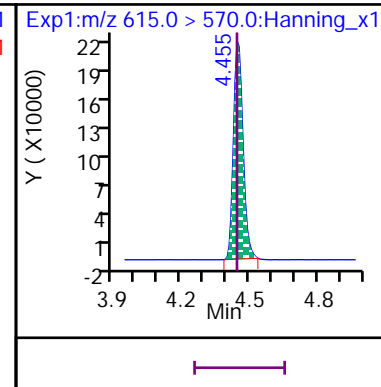
## D 38 13C2\_PFDoA



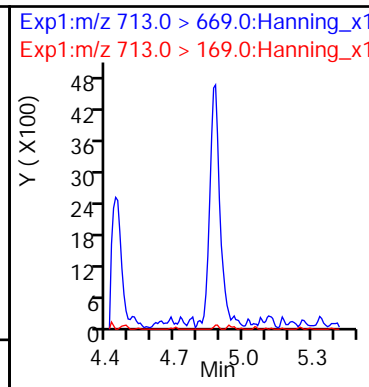
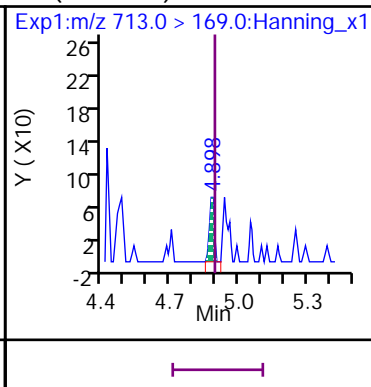
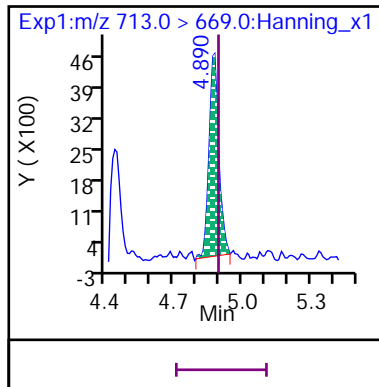
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



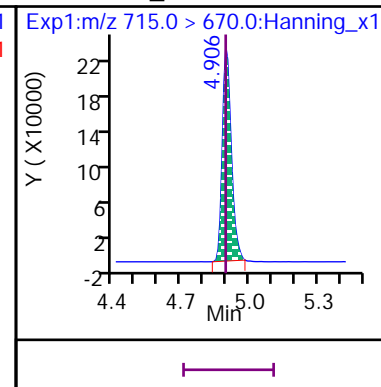
## D 38 13C2\_PFDoA



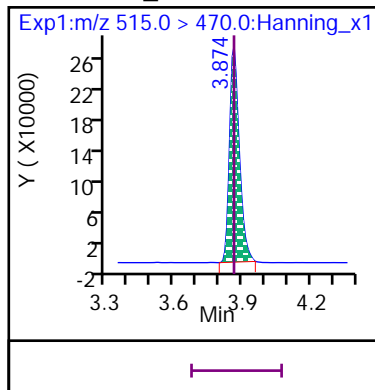
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)



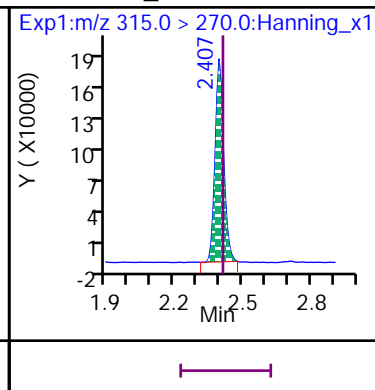
## D 42 13C2\_PFTeDA



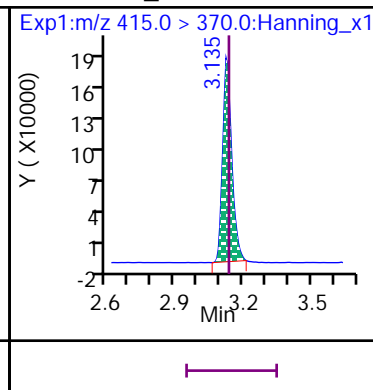
\* 37 13C2\_PFDA



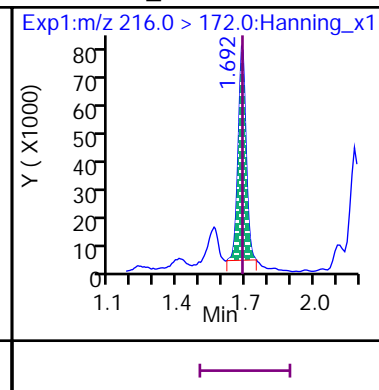
\* 39 13C2\_PFHxA



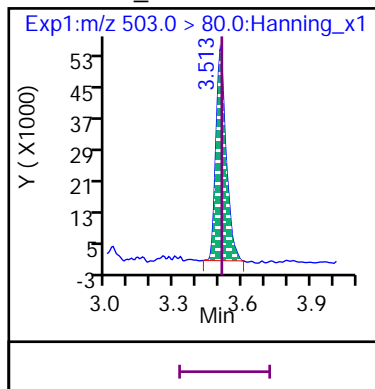
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820015.d

Injection Date: 28-Dec-2020 11:41:48

Inst. ID: LCMSMS02

Client ID: FD02-1220

Lab ID: VL11001-010

Sample Info: VL11001-010

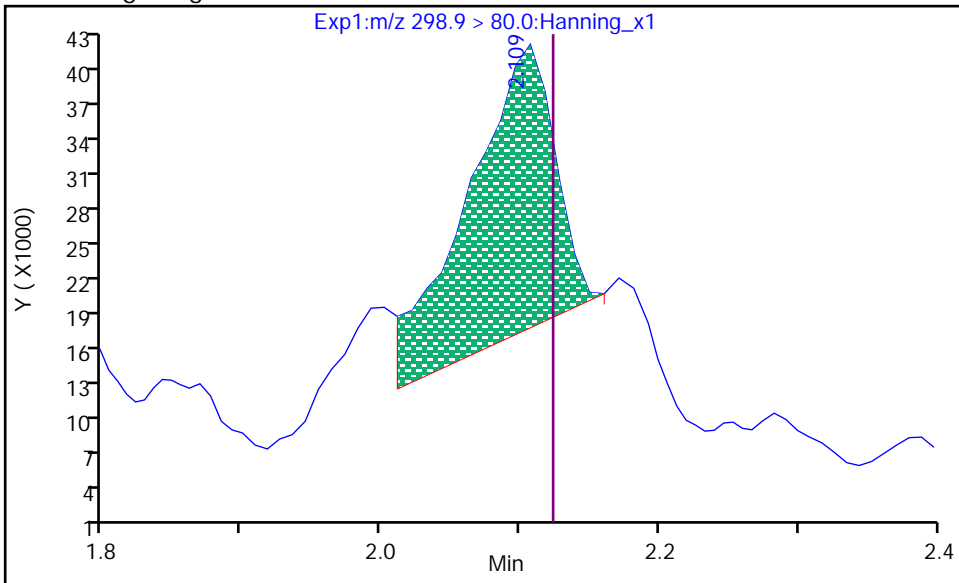
Dil. Factor: 1

Operator: Matthew M. Miller

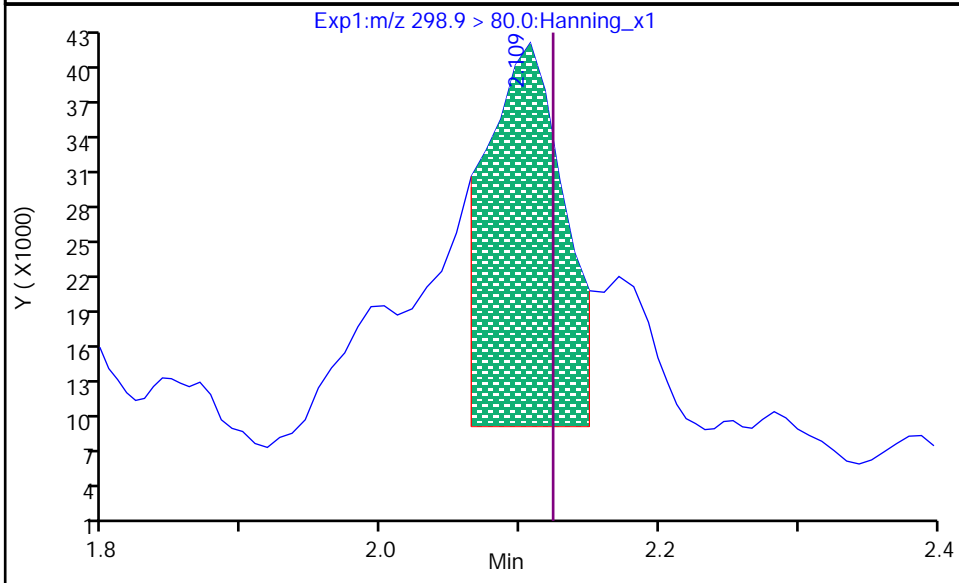
7 PFBS, CAS: 375-73-5

RT: 2.109  
Area: 105742  
Conc: 22.572  
Conc Units: ng/L

Processing Integration Results



RT: 2.109  
Area: 121391  
Conc: 25.913  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:31:44

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820015.d

Injection Date: 28-Dec-2020 11:41:48

Inst. ID: LCMSMS02

Client ID: FD02-1220

Lab ID: VL11001-010

Sample Info: VL11001-010

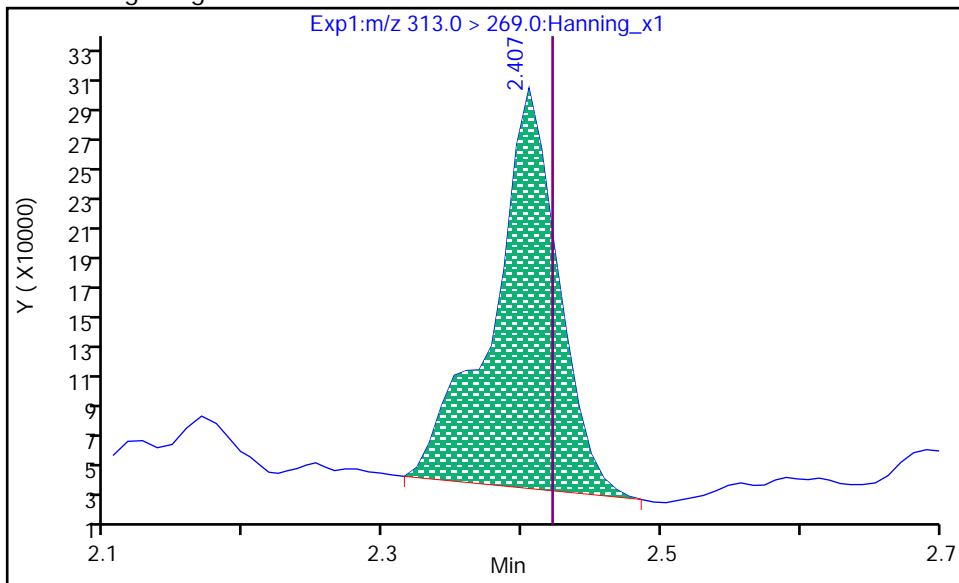
Dil. Factor: 1

Operator: Matthew M. Miller

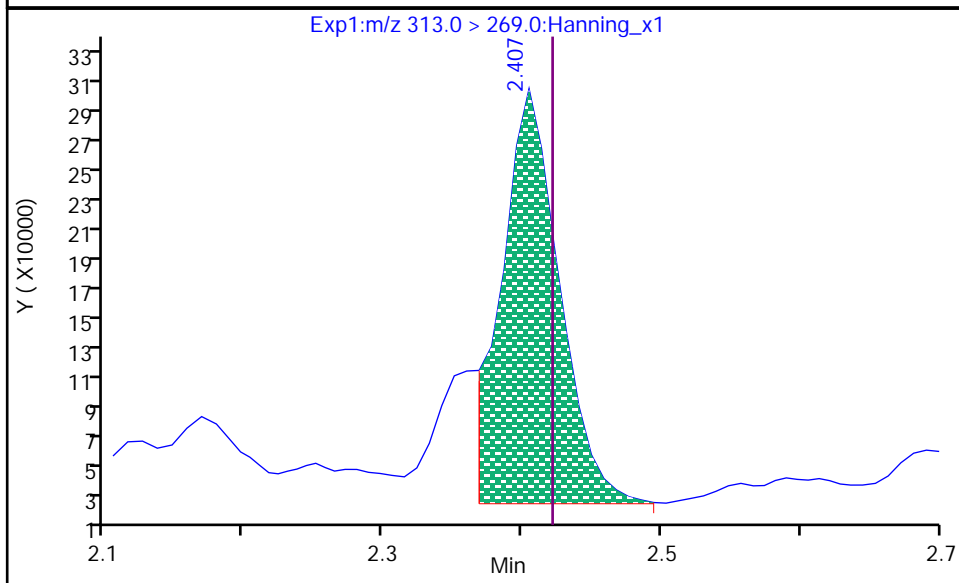
15 PFHxA, CAS: 307-24-4

RT: 2.407  
Area: 875346  
Conc: 95.690  
Conc Units: ng/L

Processing Integration Results



RT: 2.407  
Area: 789576  
Conc: 86.314  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:31:53

Audit Action: Mint

Audit Reason: Invalid Integration



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-011</b>
Description: <b>EB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1425</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1152	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanefluoro-1-octanesulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		86	50-150
13C2_PFDaA		85	50-150
13C2_PFTeDA		81	50-150
13C3_PFBs		89	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBa		98	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		96	50-150
13C6_PFDa		94	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		91	50-150
13C8_PFOs		87	50-150
13C9_PFNa		95	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820016.d  
Injection Date: 28-Dec-2020 11:52:30 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 8  
Lab Sample ID: VL11001-011 Lab Prep. Batch: 77741  
Client ID: EB01-120820 Sample Group: VL11001  
Sample Info: VL11001-011 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0424286$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	259	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 637068 23 >100:1 1001.00 918.56 98

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.696 ND ND 1001.00 918.56 98 U

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 639430 17 >100:1 1001.00 929.56 96

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.072 ND ND 1001.00 929.56 96 U

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 211681 16 >100:1 1001.00 919.43 88.9

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.125 ND ND 1001.00 919.43 88.9 U

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 697733 19 >100:1 1001.00 946.63 93.8

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.423 ND ND 1001.00 946.63 93.8 U

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.532 2.530 1 1338219 19 >100:1 5005.00 5024.21 95.5

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND 5005.00 5024.21 95.5 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 588124 20 >100:1 1001.00 969.47 92.8

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 ND ND 1001.00 969.47 92.8 U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 160724 21 1001.00 938.65 92.3

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.790 ND ND 1001.00 938.65 92.3 U

**29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4**

377 > 251 45 2.808 ND ND 1001.00 938.65 92.3 U

**D 64 13C2\_6:2 FTS\_2 CAS: SESI-0105**

429 > 81 3.129 3.114 1 102007 26 >100:1 5005.00 5296.75 97.8

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.128		ND								U
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	570880	23	>100:1			1001.00	964.55	90.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.148		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	133040	21				1001.00	887.35	87.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.520		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.722		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUDS) CAS: 763051-92-9</b>													
631 > 451	54		4.317		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	729683	22	>100:1			1001.00	971.66	95.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.520		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	86823	22	>100:1			5005.00	4680.45	86.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.873		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	630922	21	>100:1			1001.00	951.14	93.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.873		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	727859	18	>100:1			5005.00	5070.80	92	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.029		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	634542	18	>100:1			5005.00	4777.65	86.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.187		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	605145	18	>100:1			1001.00	957.39	94	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.178		ND								U
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	518392	19	>100:1			1001.00	856.40	84.8	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													
613 > 569	38		4.446		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.688		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	657598	18	>100:1			1001.00	780.58	80.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.906		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	723248	19	>100:1					98.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	792069	19	>100:1					108	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	638961	24	>100:1					107	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	656992	23	>100:1					108	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	175046	23	>100:1					107	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820016.d

Injection Date: 28-Dec-2020 11:52:30

Inst. ID: LCMSMS02

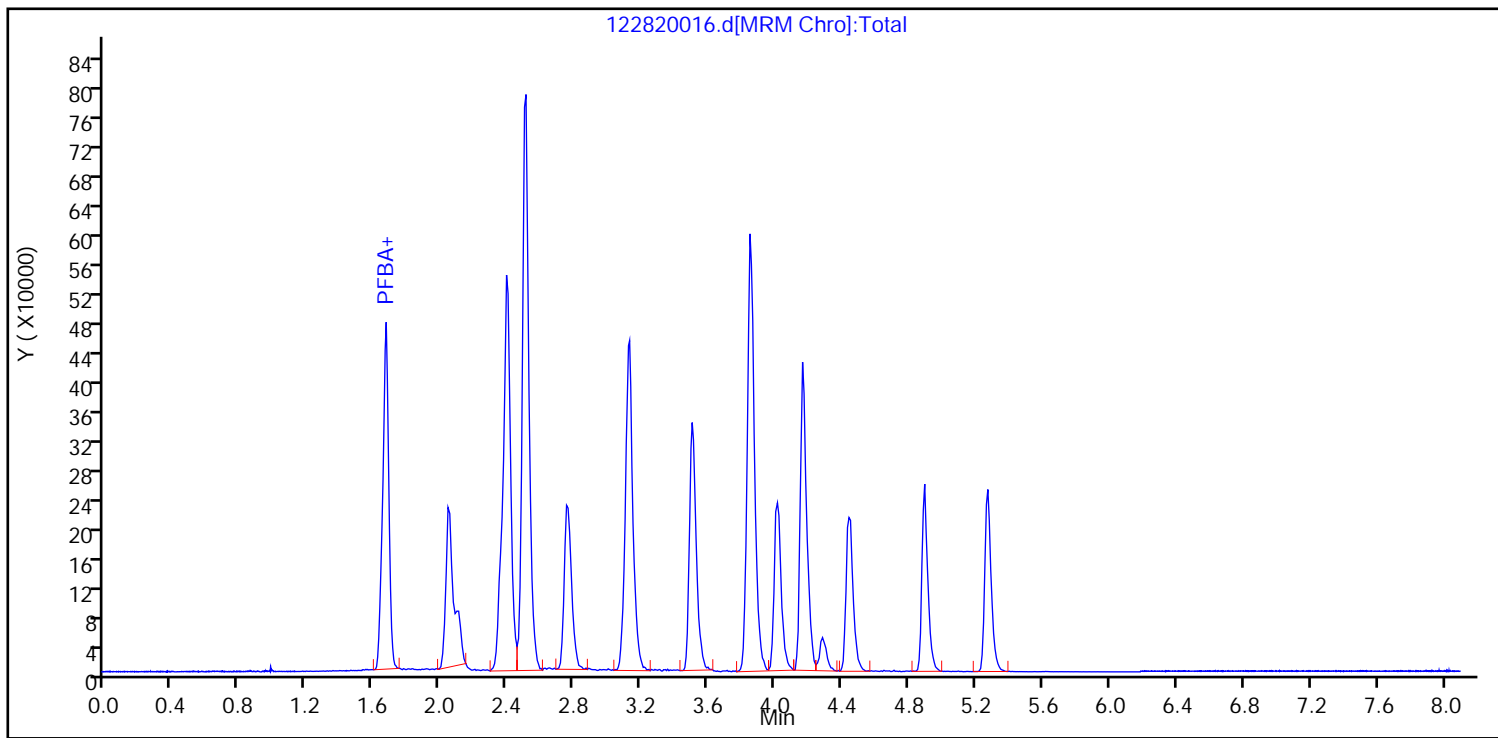
Client ID: EB01-120820

Lab ID: VL11001-011

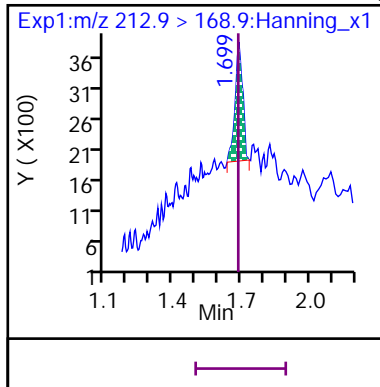
Sample Info: VL11001-011

Dil. Factor: 1

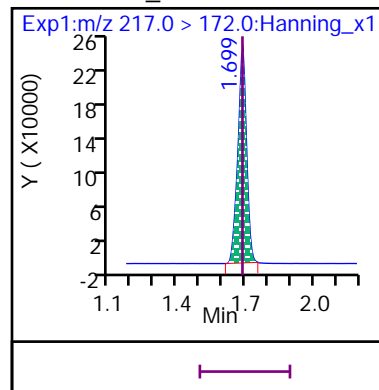
Operator: Matthew M. Miller



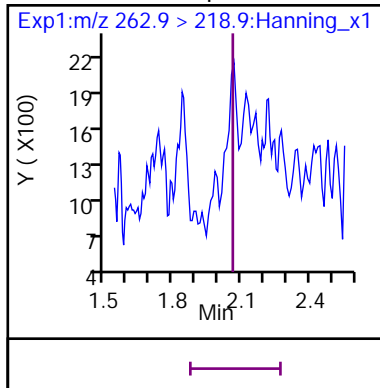
8 Perfluoro-n-butanoic acid (PFBA)



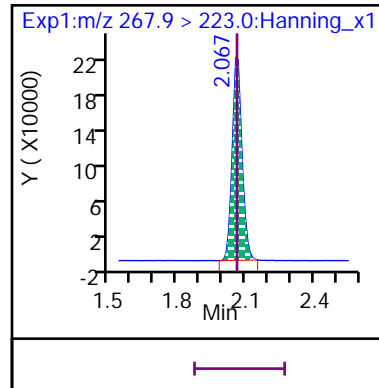
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

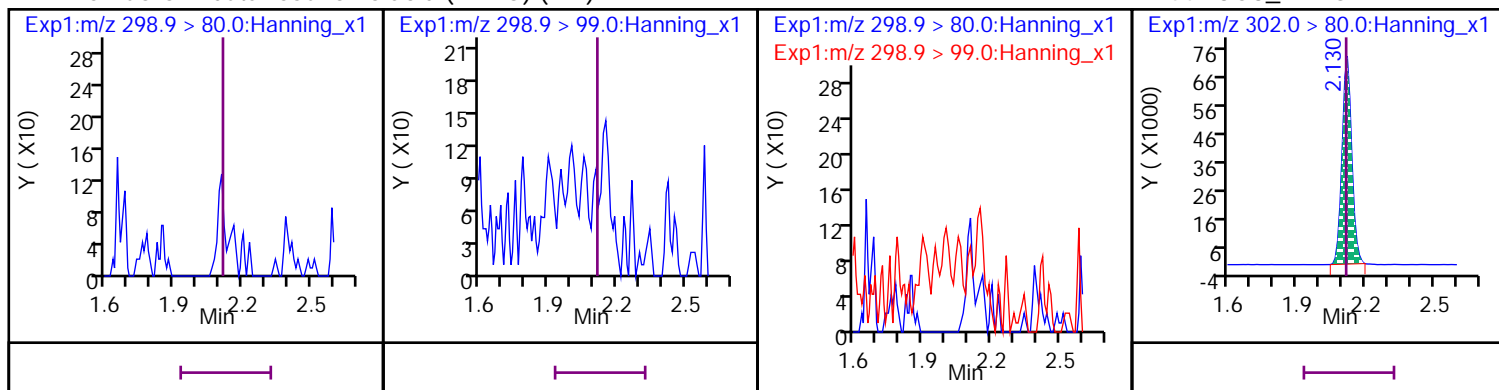


D 50 13C5\_PFPeA



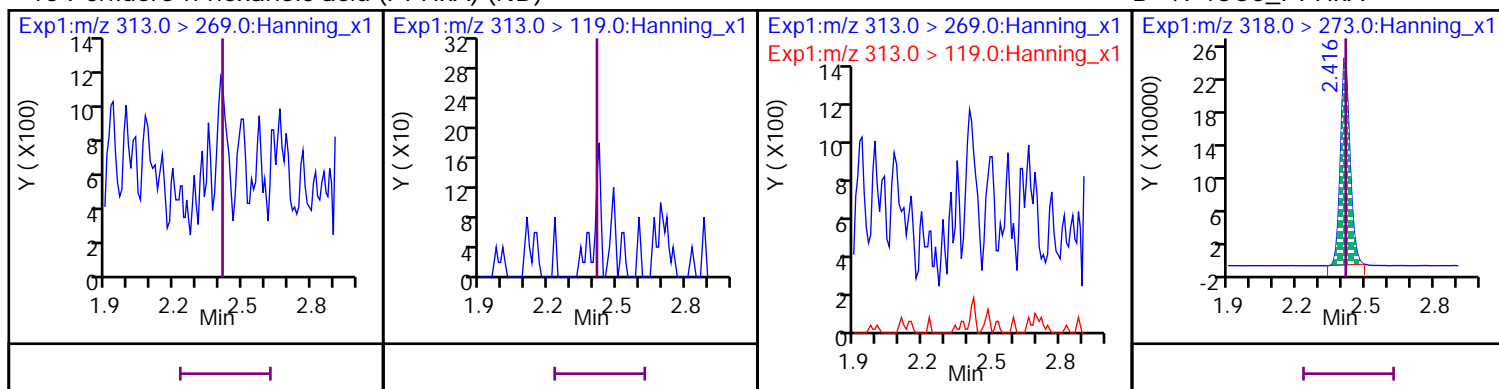
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



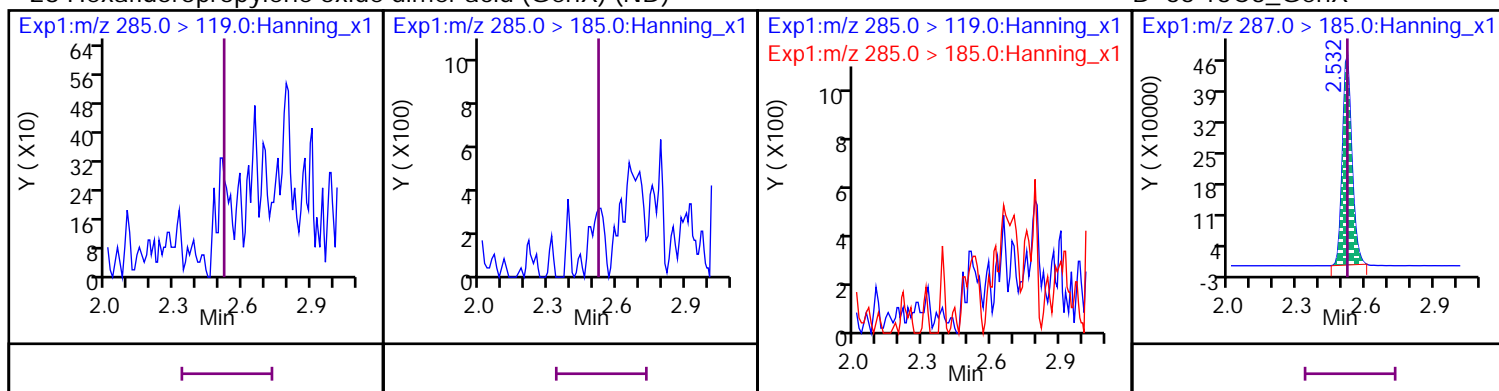
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



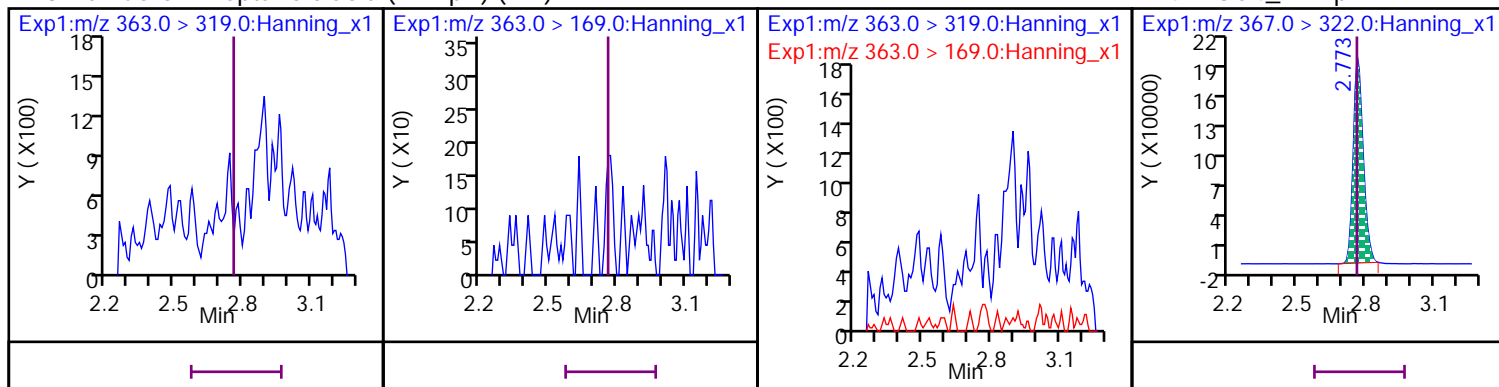
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



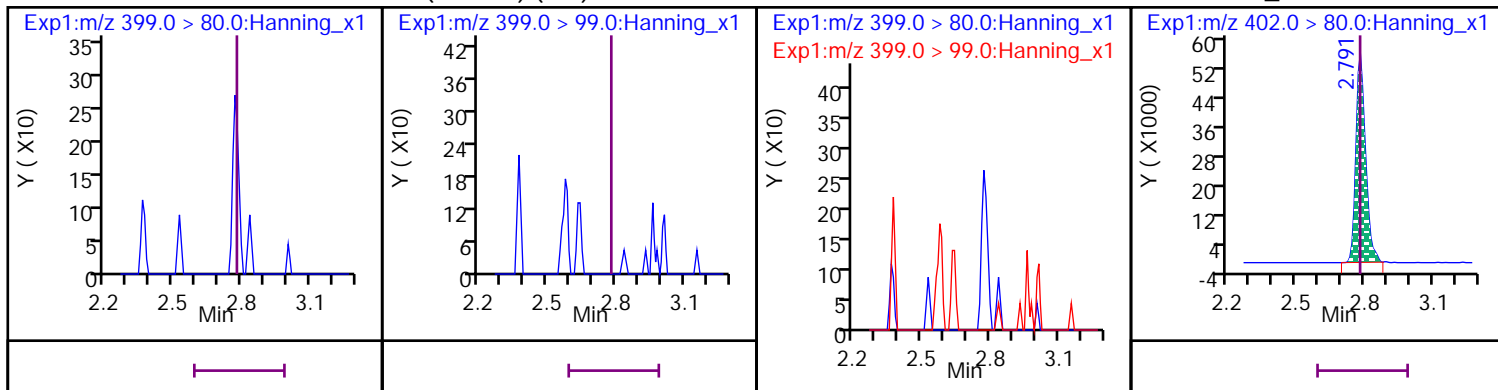
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



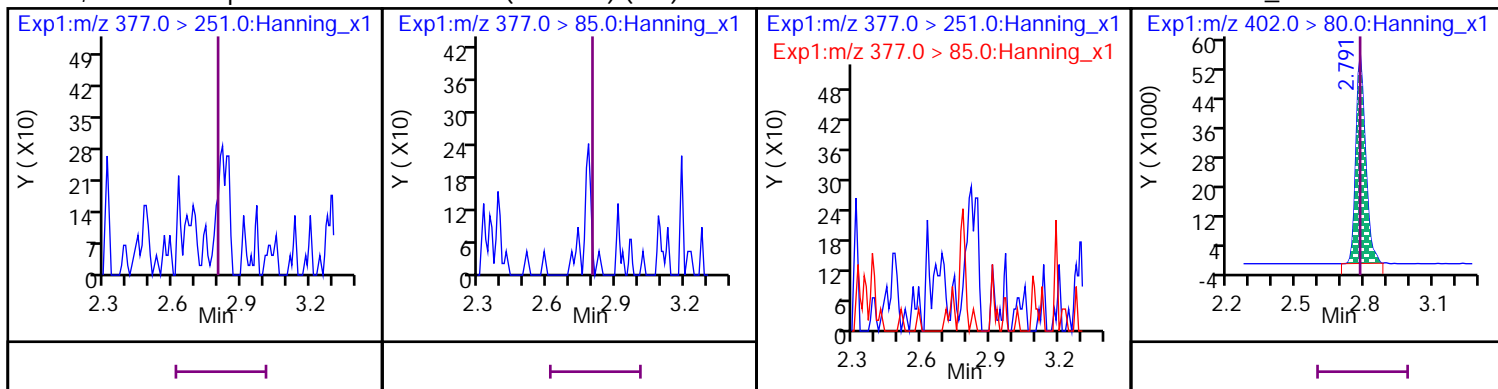
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



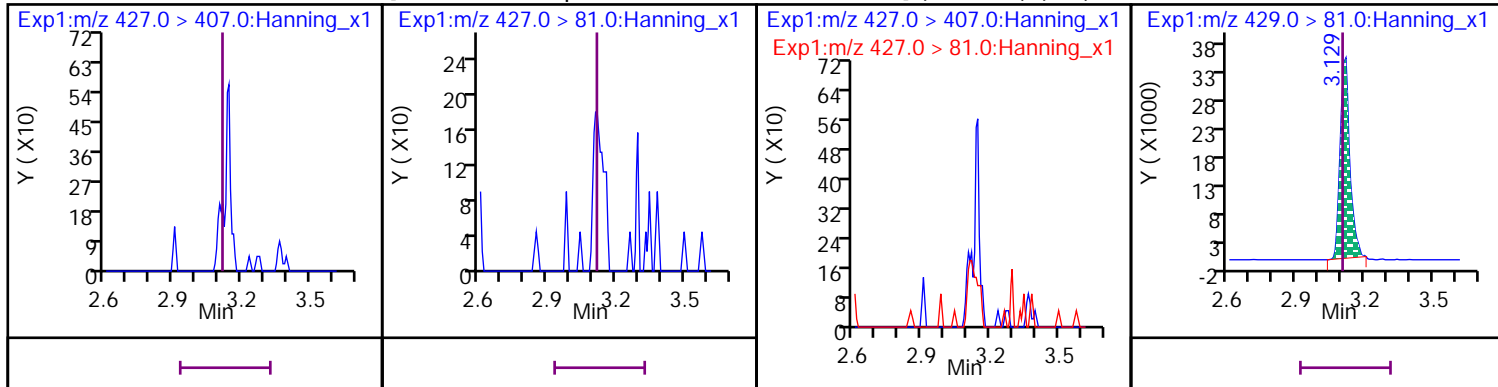
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



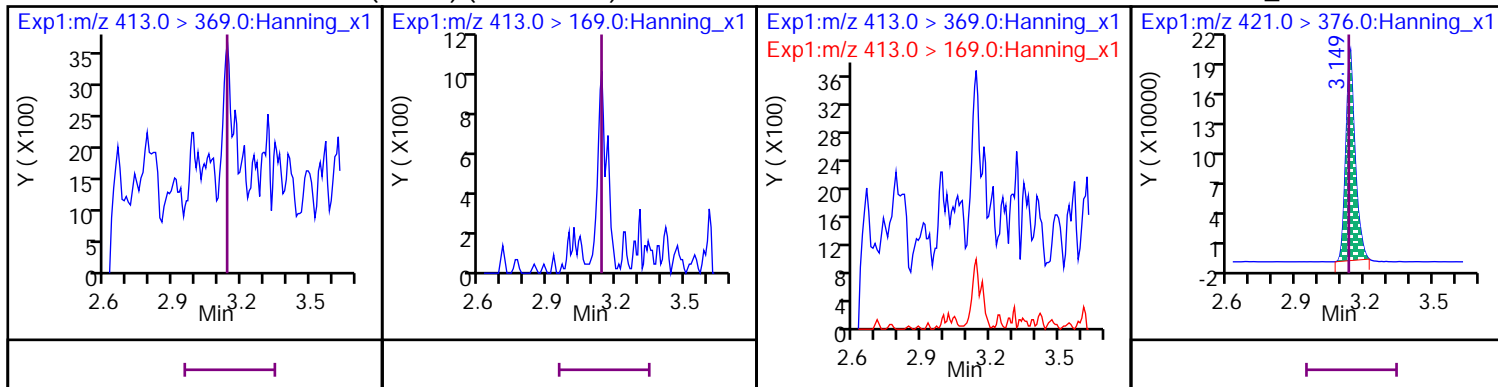
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

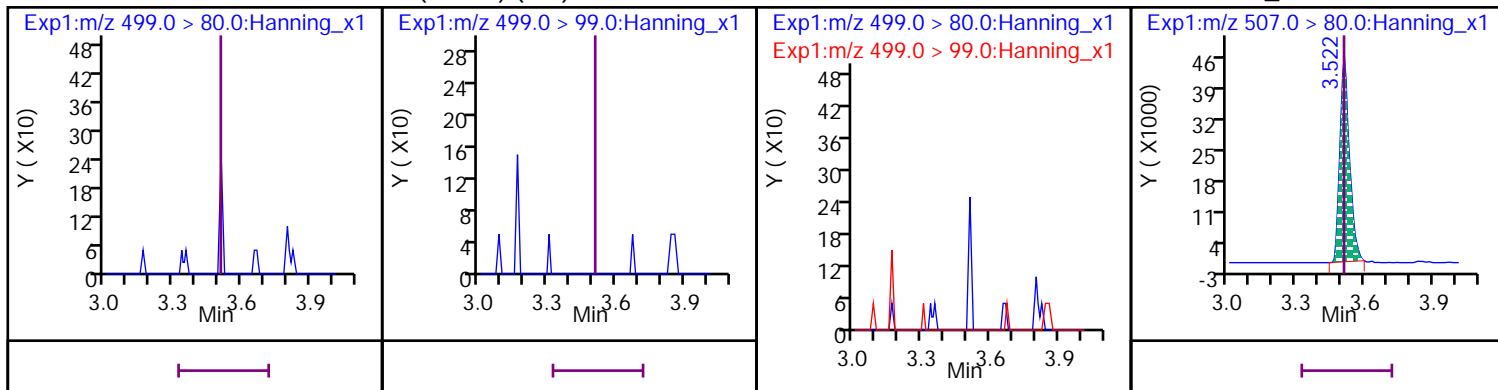
D 53 13C8\_PFOA





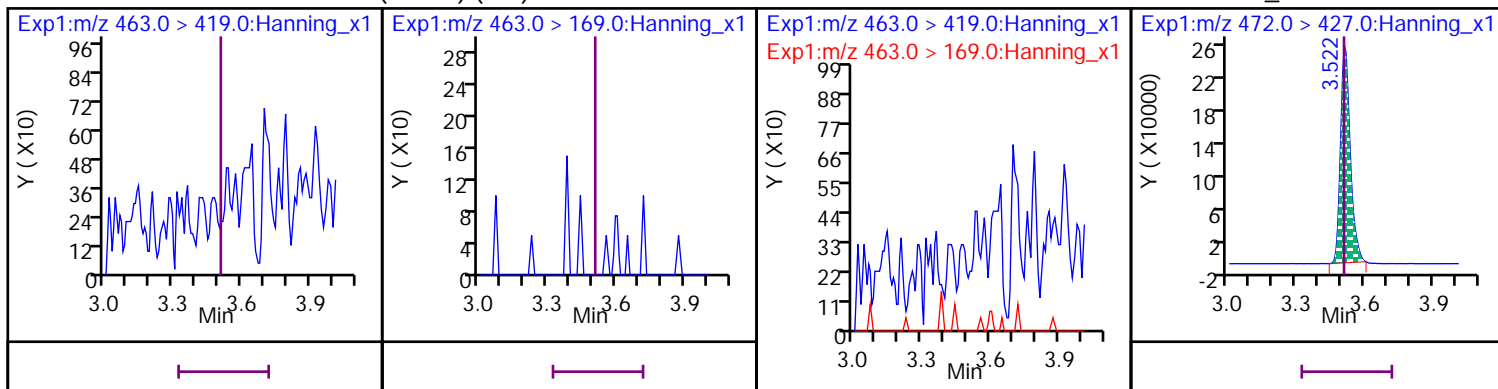
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



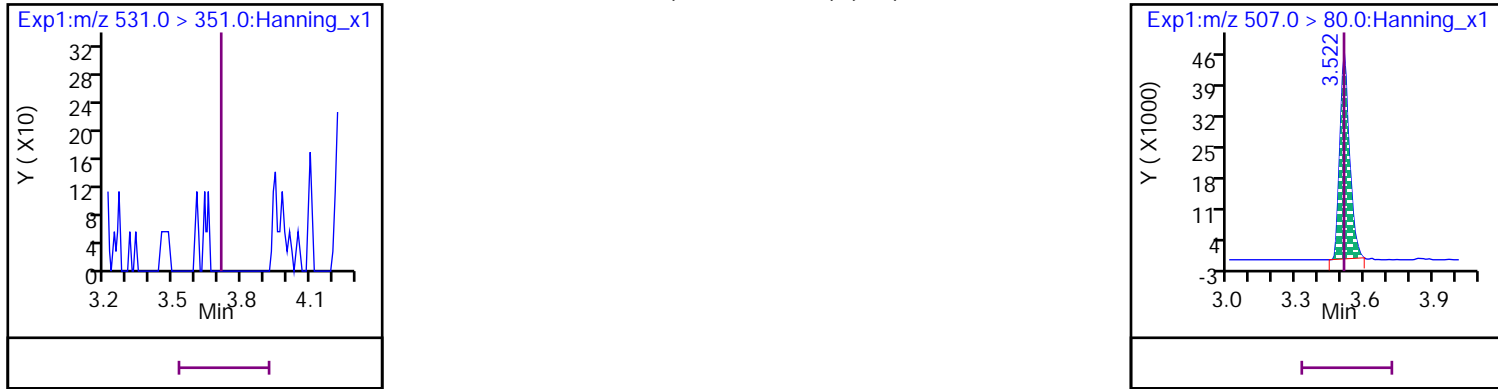
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



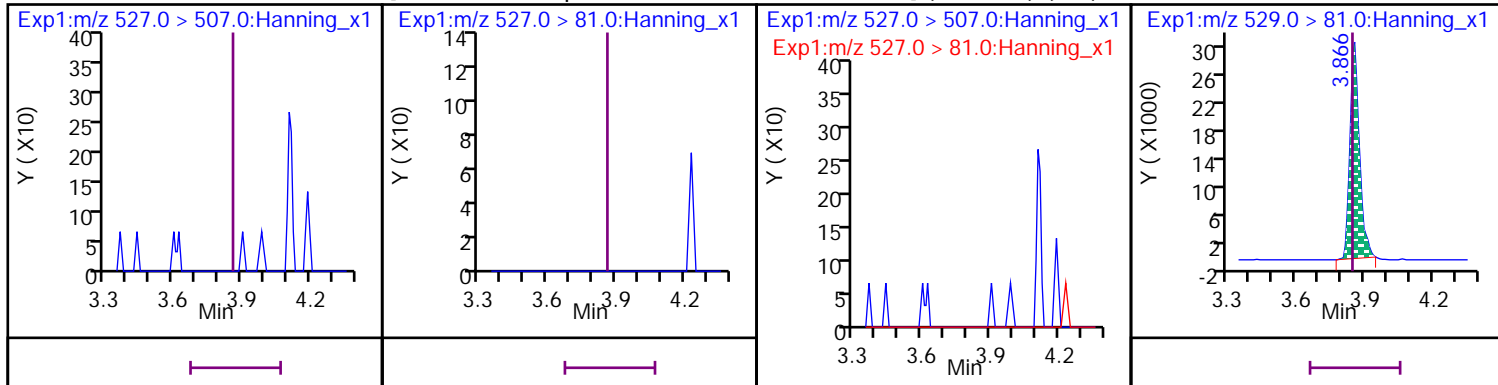
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



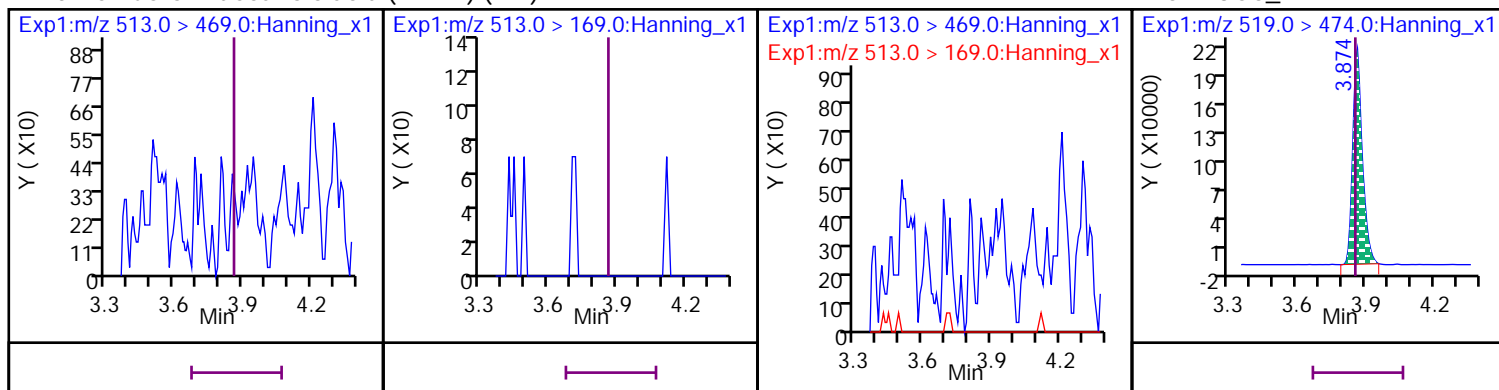
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



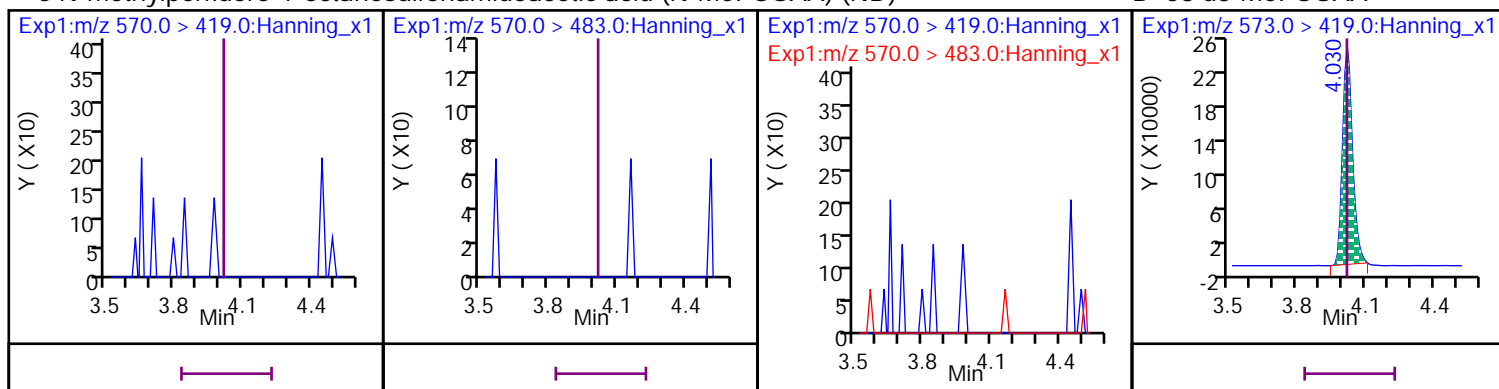
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



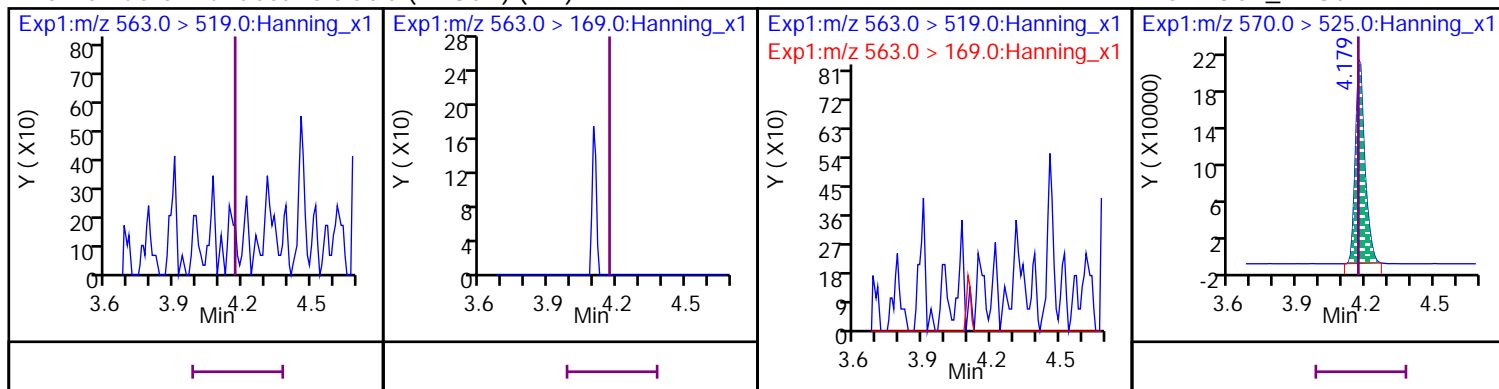
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



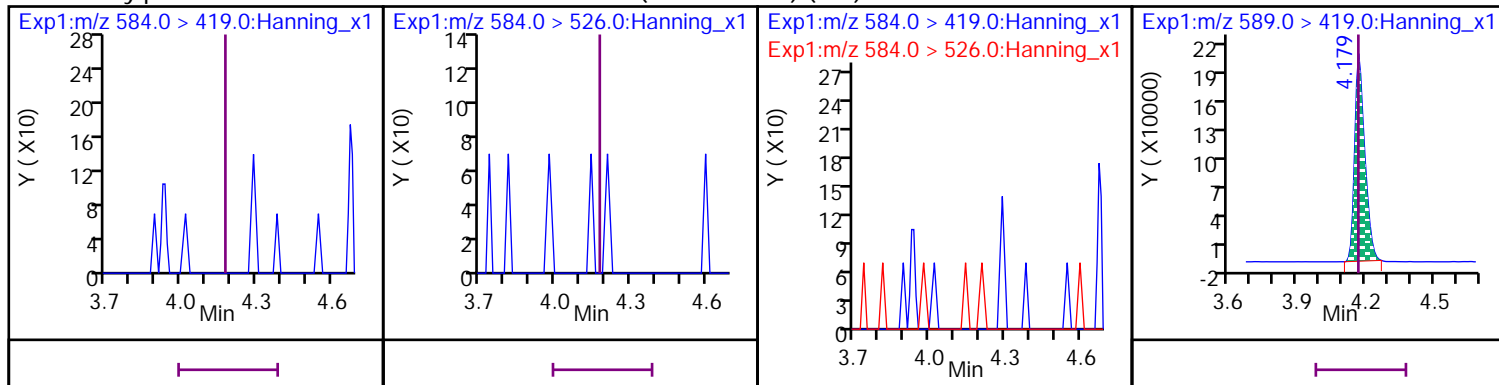
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

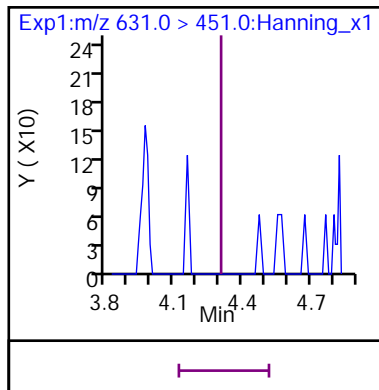


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

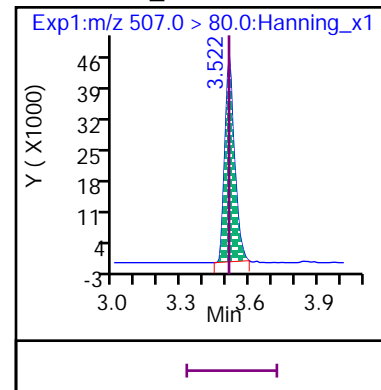
D 60 d5-EtFOSAA



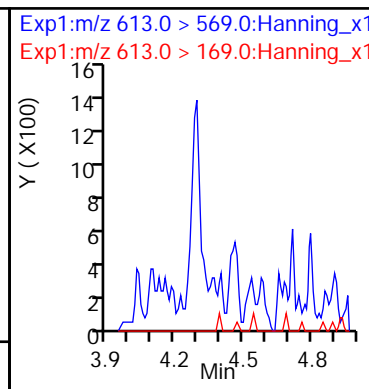
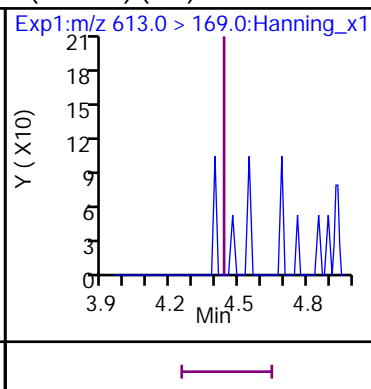
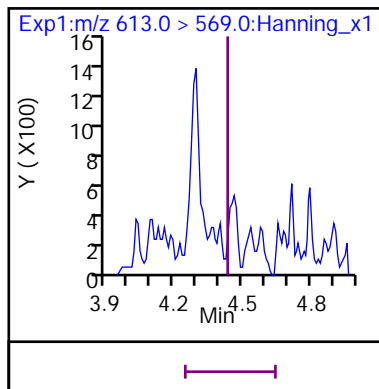
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) (Marked ND)



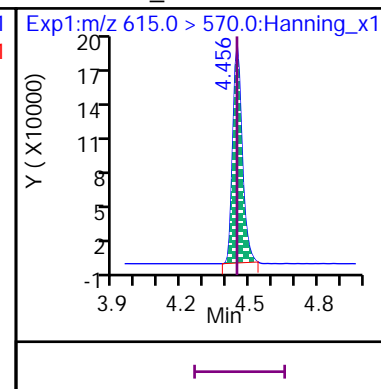
## D 54 13C8\_PFOS



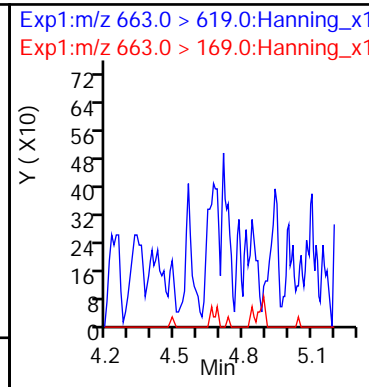
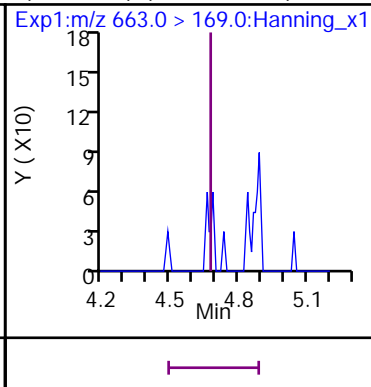
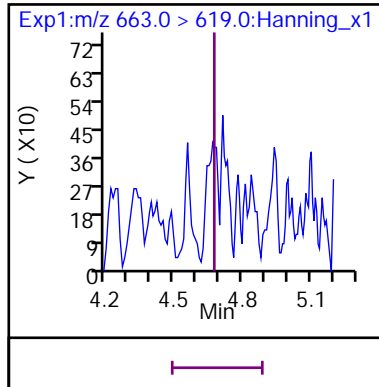
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



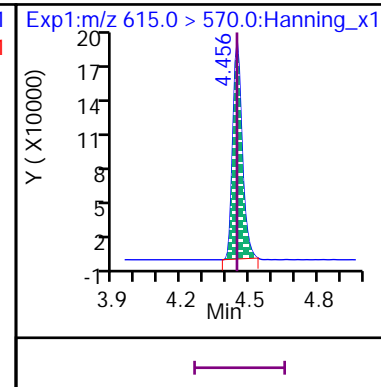
## D 38 13C2\_PFDoA



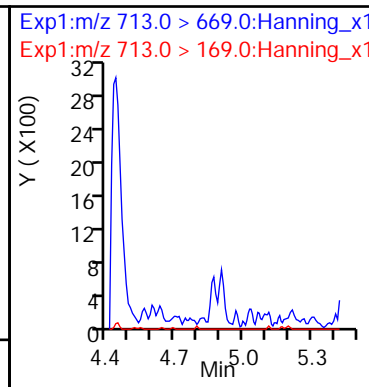
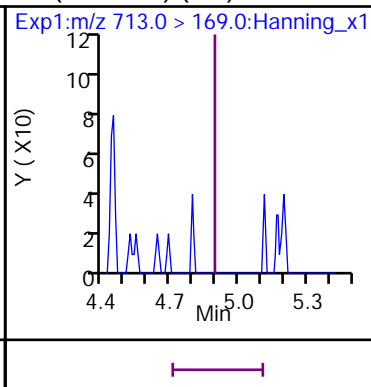
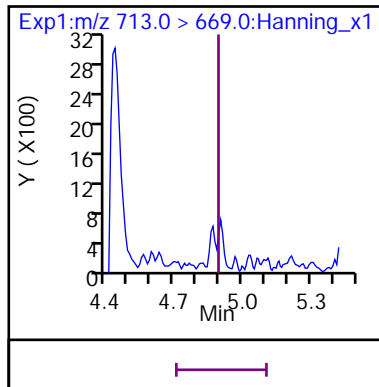
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (Marked ND)



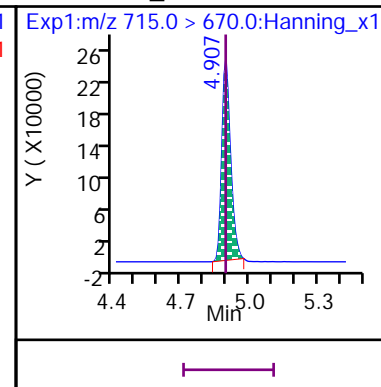
## D 38 13C2\_PFDoA



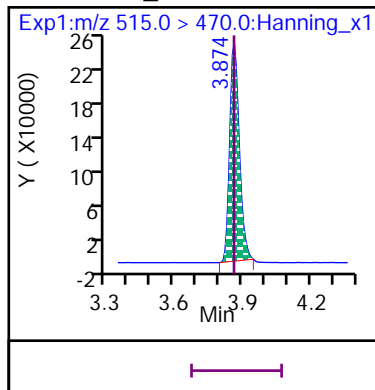
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



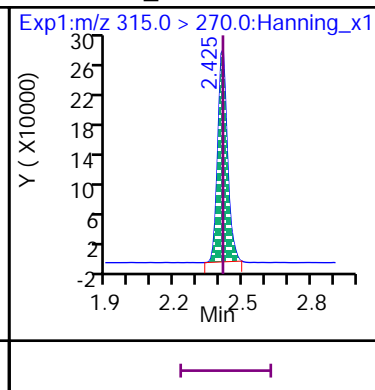
## D 42 13C2\_PFTeDA



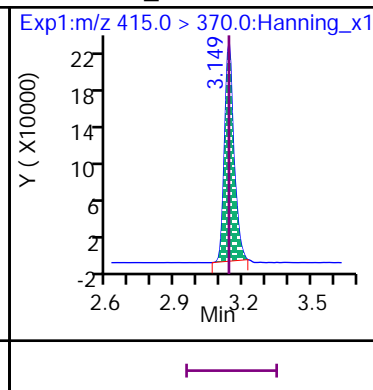
\* 37 13C2\_PFDA



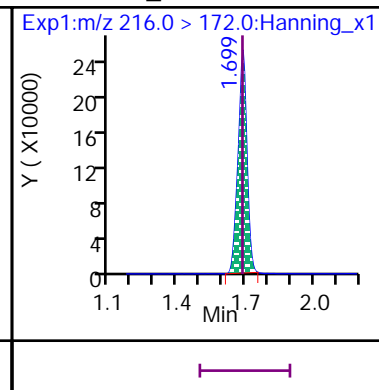
\* 39 13C2\_PFHxA



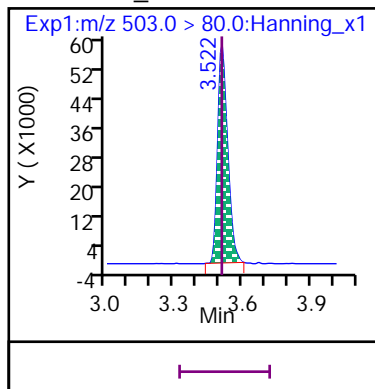
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-012</b>
Description: <b>EB02-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020 1510</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1203	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanefluoro-1-octanesulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		89	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820017.d  
Injection Date: 28-Dec-2020 12:03:09 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 9  
Lab Sample ID: VL11001-012 Lab Prep. Batch: 77741  
Client ID: EB02-120820 Sample Group: VL11001  
Sample Info: VL11001-012 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0416250$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	264	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA</b>	<b>CAS: SESI-0111</b>												
217 > 172		1.698	1.696	1	619732	23	>100:1			1001.00	893.56	95.4	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>	<b>CAS: 375-22-4</b>												U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>	<b>CAS: SESI-0112</b>												
267.9 > 223		2.076	2.072	1	610995	16	>100:1			1001.00	888.22	91.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>CAS: 2706-90-3</b>												U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBFS</b>	<b>CAS: SESI-0116</b>												
302 > 80		2.129	2.125	1	209450	16	>100:1			1001.00	909.74	87.9	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS)</b>	<b>CAS: 375-73-5</b>												U
298.9 > 80	44		2.125		ND								
<b>D 49 13C5_PFHxA</b>	<b>CAS: SESI-0113</b>												
318 > 273		2.415	2.423	0	682780	19	>100:1			1001.00	926.34	91.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>CAS: 307-24-4</b>												U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>	<b>CAS: SESI-0121</b>												
287 > 185		2.530	2.530	1	1310695	19	>100:1			5005.00	4920.88	93.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>	<b>CAS: 13252-13-6</b>												U
285 > 119	66		2.530		ND								
<b>D 47 13C4_PFHpA</b>	<b>CAS: SESI-0114</b>												
367 > 322		2.772	2.772	1	543495	19	>100:1			1001.00	895.90	85.8	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>CAS: 375-85-9</b>												U
363 > 319	47		2.772		ND								
<b>D 45 13C3_PFHxS</b>	<b>CAS: SESI-0096</b>												
402 > 80		2.790	2.790	1	158086	19				1001.00	923.24	90.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>	<b>CAS: 355-46-4</b>												U
399 > 80	45		2.790		ND								
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA)</b>	<b>CAS: 919005-14-4</b>												U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2</b>	<b>CAS: SESI-0105</b>												
429 > 81		3.121	3.114	1	101340	25	>100:1			5005.00	5262.12	97.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.128		ND								U
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.141	1	558638	25	>100:1			1001.00	943.86	89	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.148		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.520	3.520	1	125434	21	>100:1			1001.00	836.62	82.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.520		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.722		ND								U
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUDS) CAS: 763051-92-9</b>													
631 > 451	54		4.317		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.520	3.520	1	678849	22	>100:1			1001.00	903.97	88.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.520		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.857	1	79842	21	>100:1			5005.00	4304.12	79.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.873		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.873	3.865	1	598748	20	>100:1			1001.00	902.64	89	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.873		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.029	4.029	1	694600	18	>100:1			5005.00	4839.09	87.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.029		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.178	4.178	1	633454	19	>100:1			5005.00	4769.46	86.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.187		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.178	4.178	1	563495	18				1001.00	891.50	87.6	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.178		ND								U
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	1	551380	18	>100:1			1001.00	910.89	90.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													
613 > 569	38		4.446		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.688		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.906	1	634923	18	>100:1			1001.00	753.67	78.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.906		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.873	1	708091	19	>100:1					96.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.423	0	767907	19	>100:1					105	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.141	3.148	0	627642	23	>100:1					105	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.696	1	647011	22	>100:1					106	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.520	3.520	1	177165	22	>100:1					109	



## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820017.d

Injection Date: 28-Dec-2020 12:03:09

Inst. ID: LCMSMS02

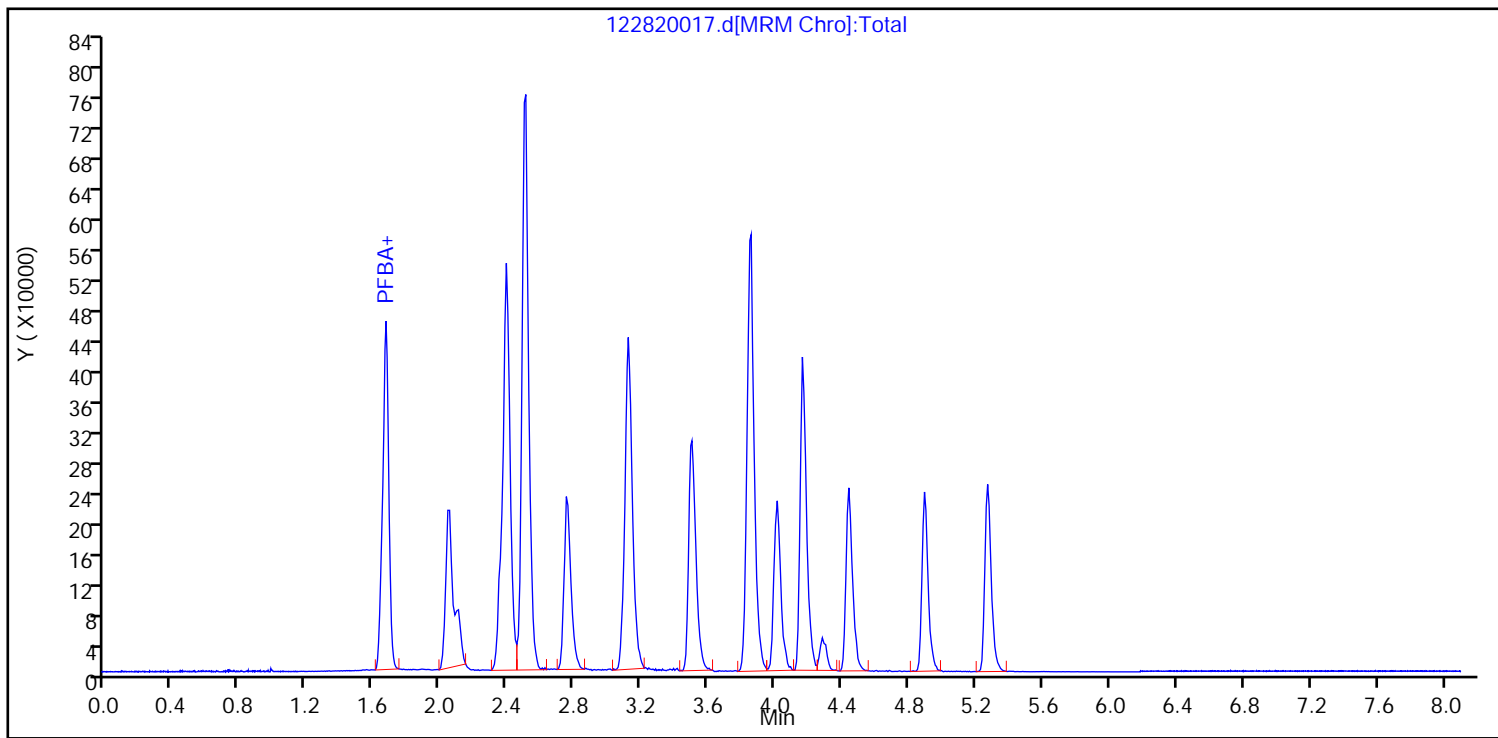
Client ID: EB02-120820

Lab ID: VL11001-012

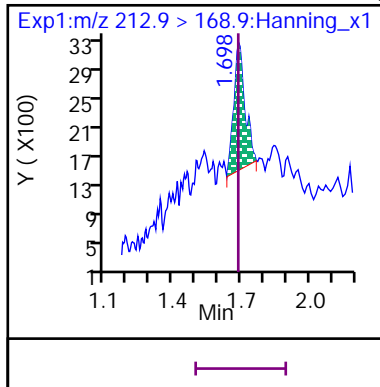
Sample Info: VL11001-012

Dil. Factor: 1

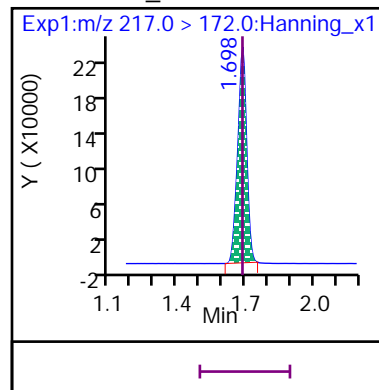
Operator: Matthew M. Miller



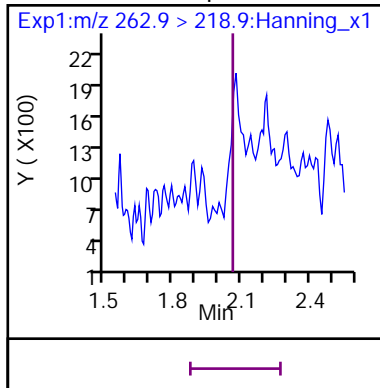
8 Perfluoro-n-butanoic acid (PFBA)



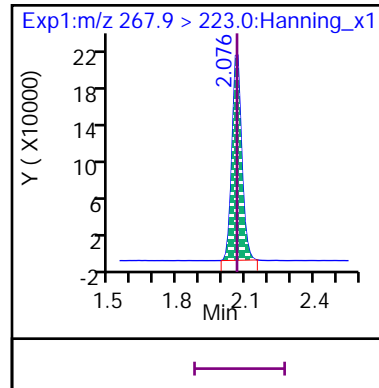
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

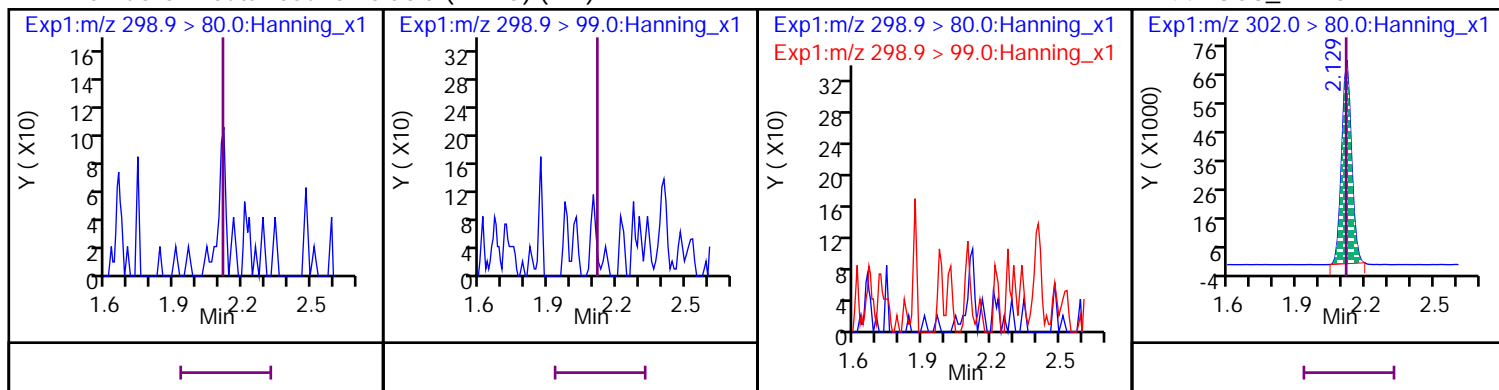


D 50 13C5\_PFPeA



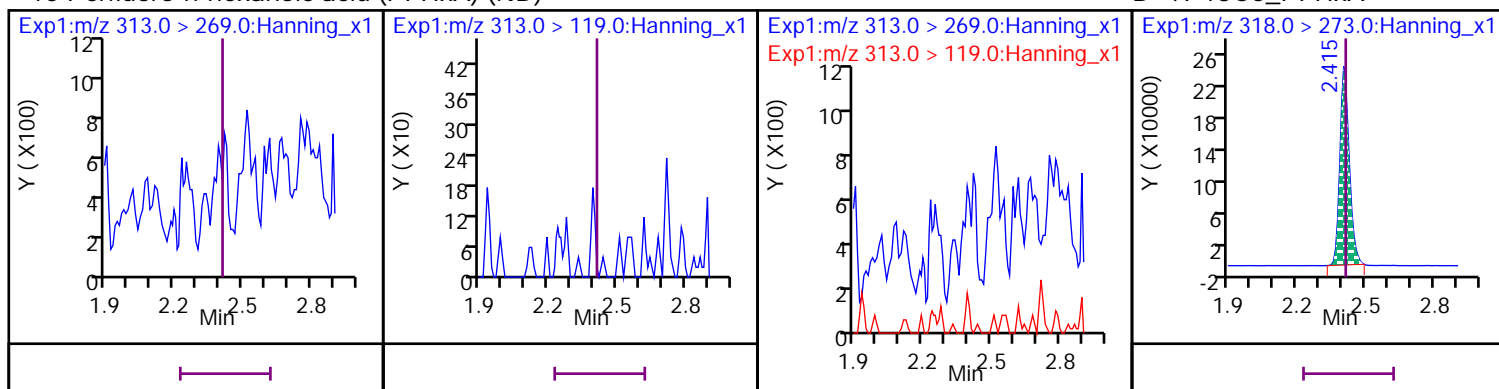
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



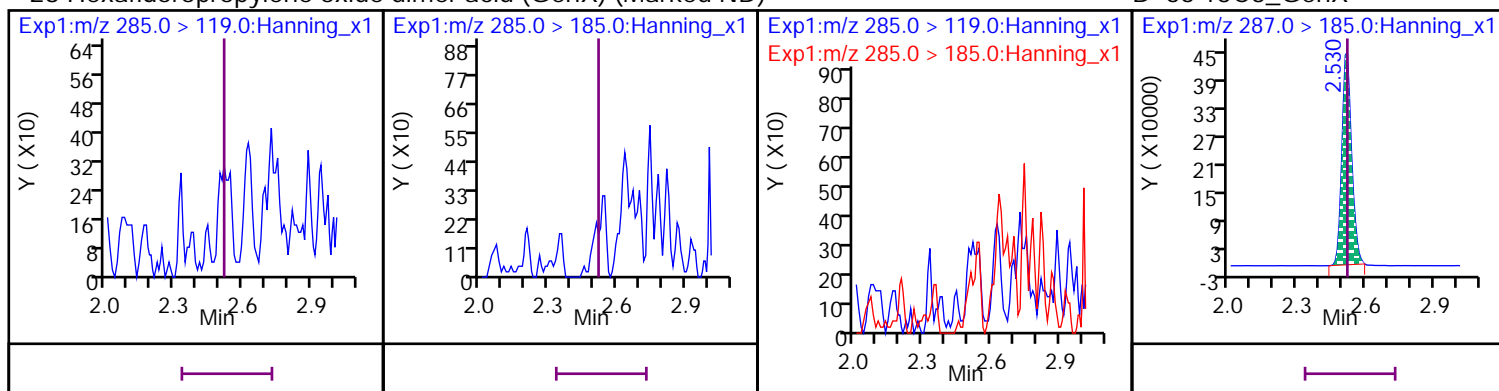
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



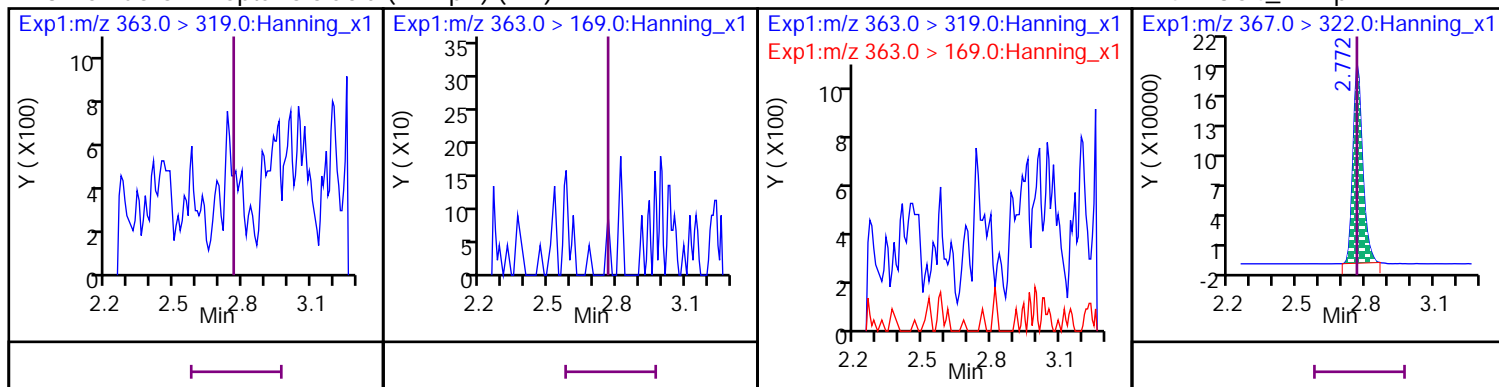
## 28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



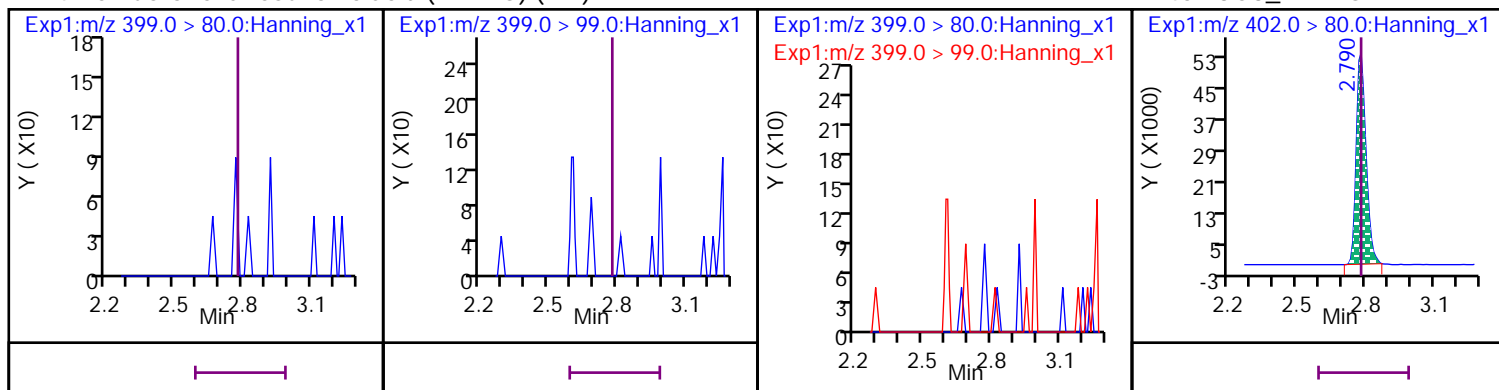
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



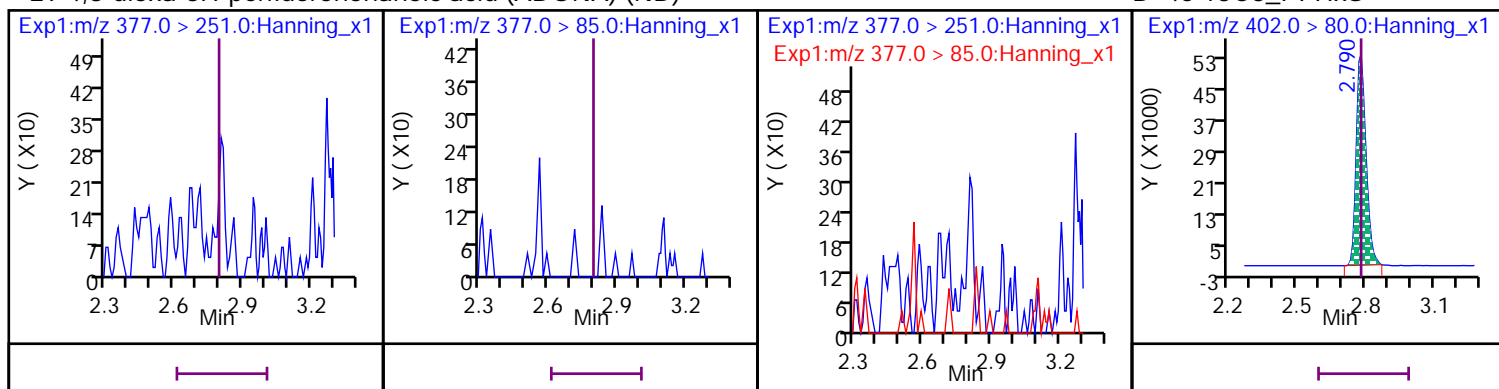
## 14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



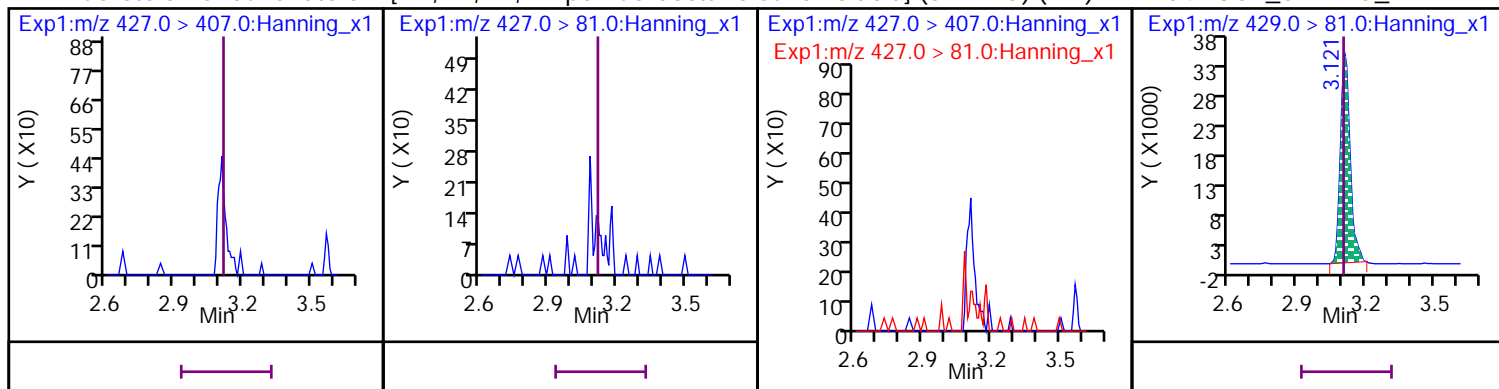
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



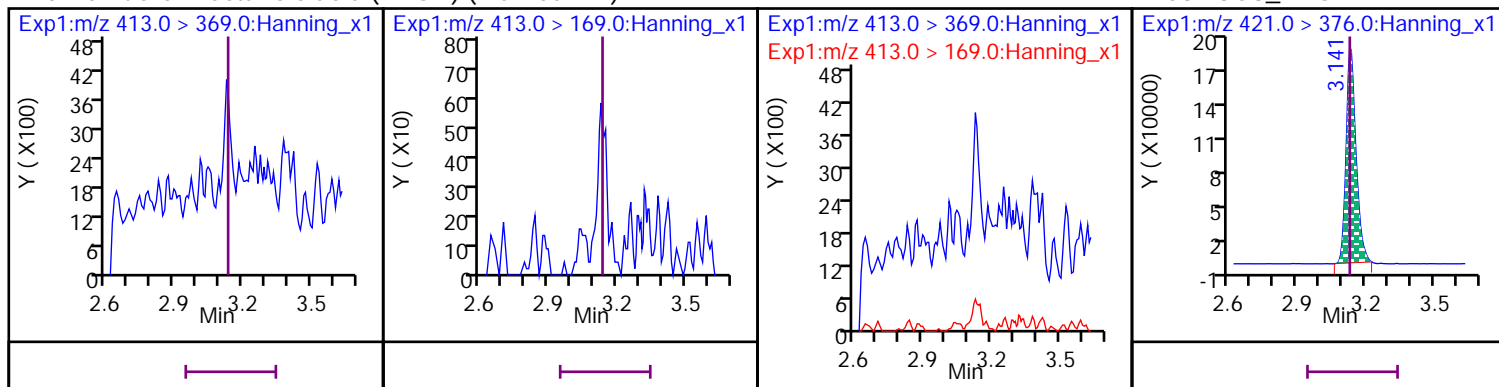
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



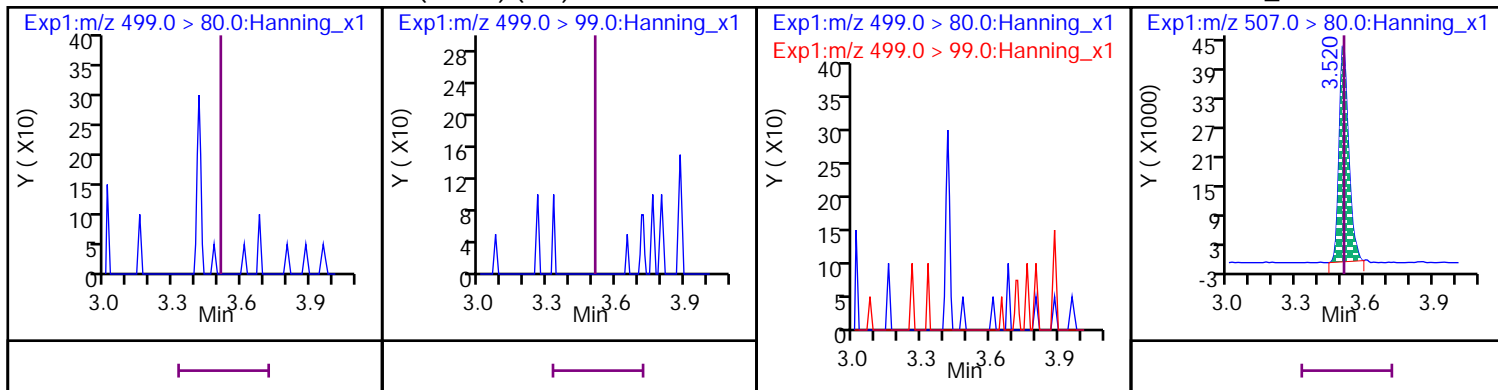
## 20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



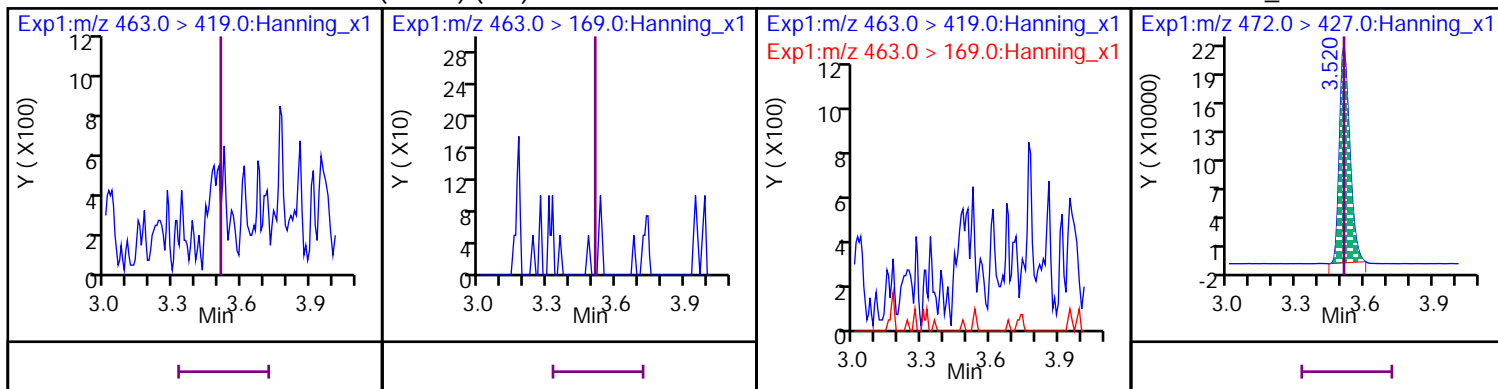
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



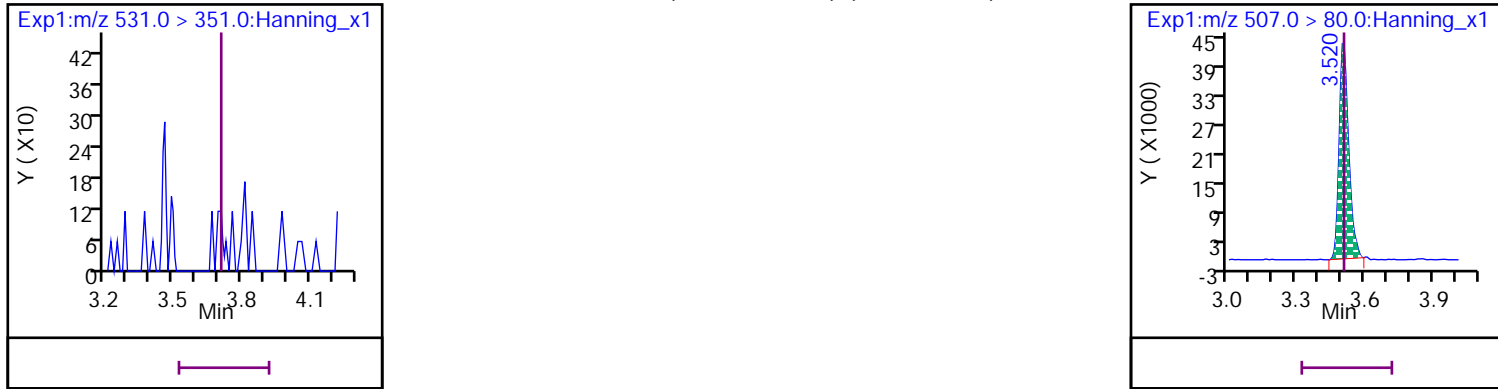
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



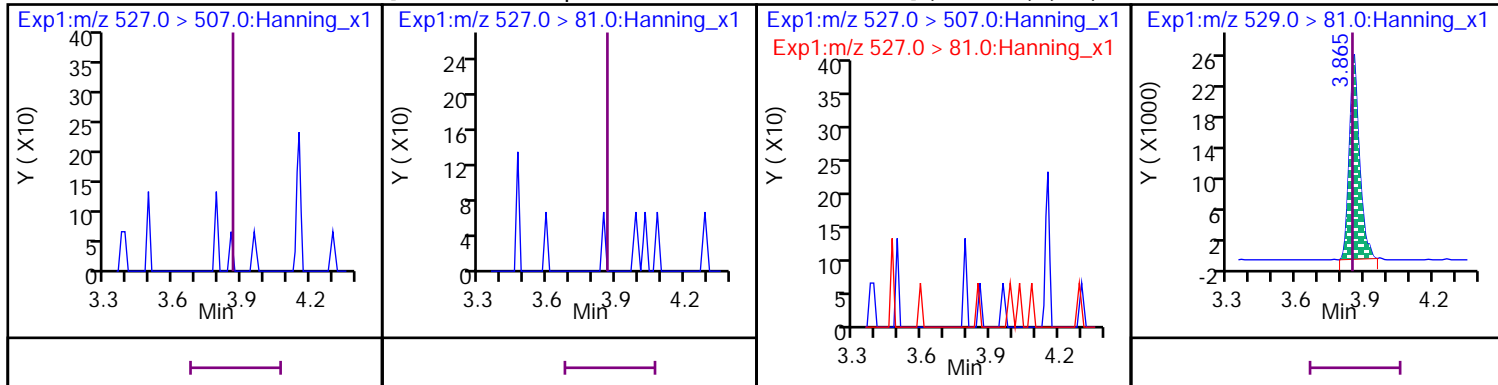
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



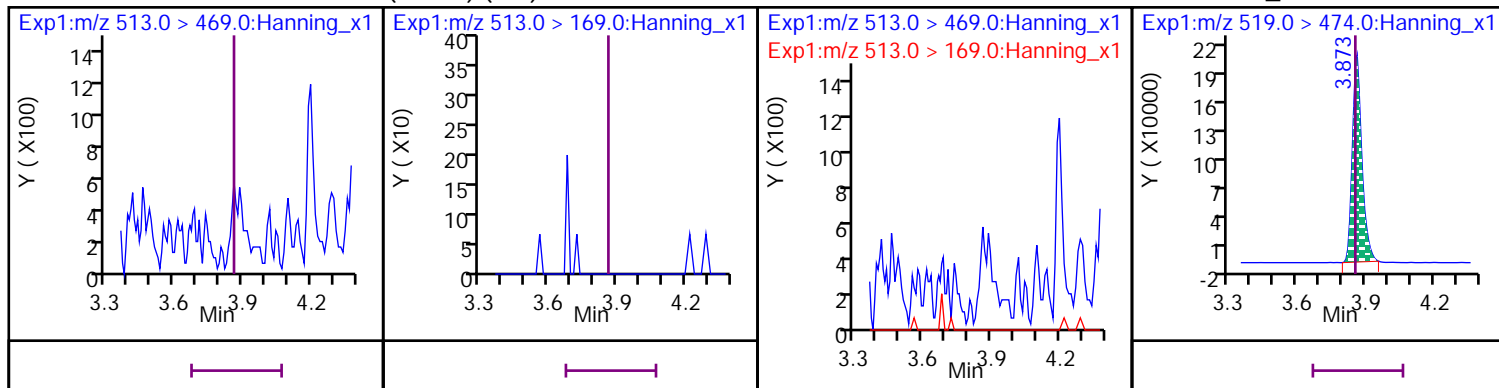
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



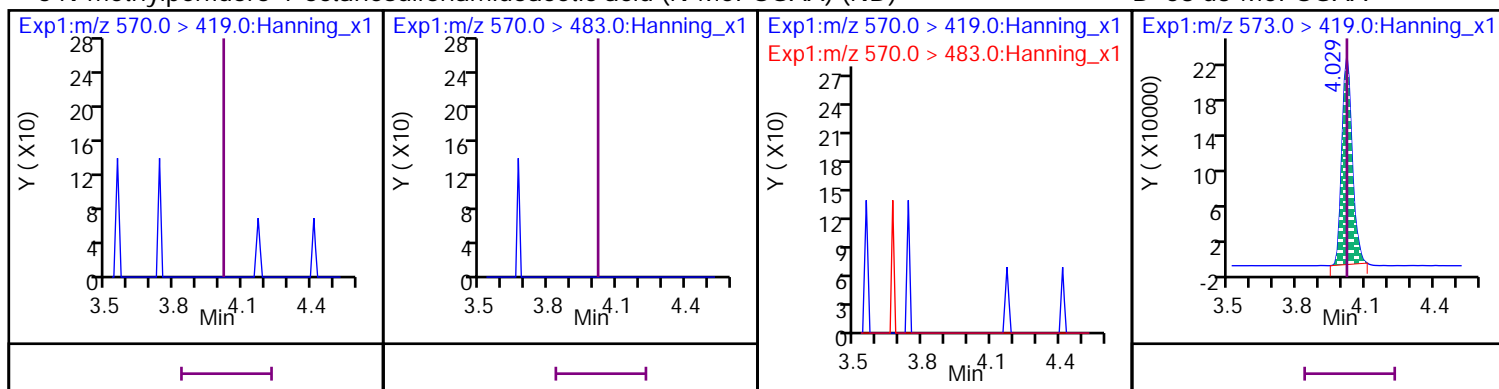
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



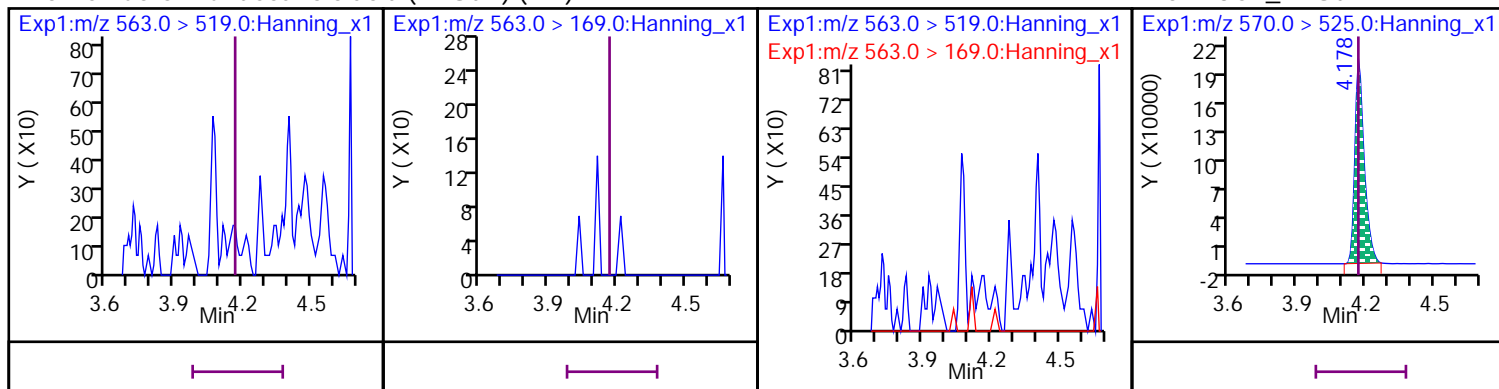
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



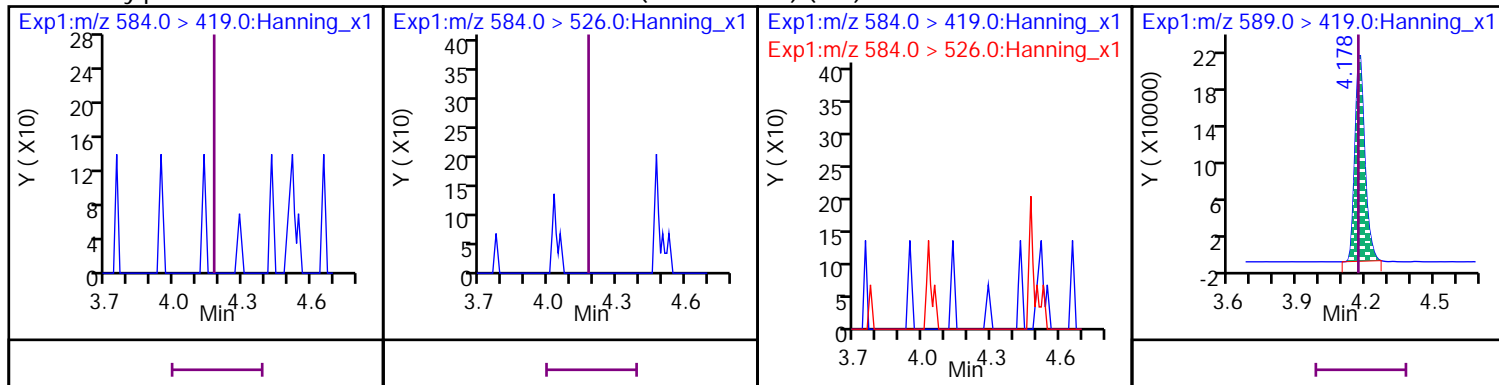
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

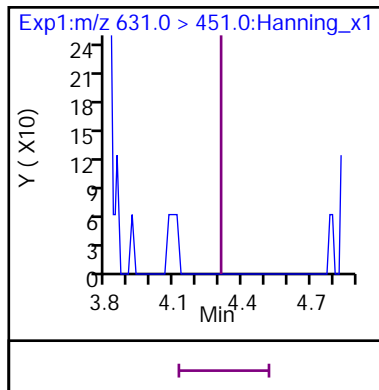


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

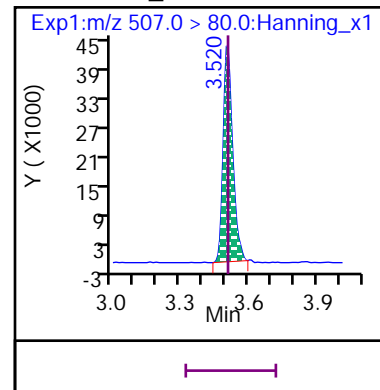
D 60 d5-EtFOSAA



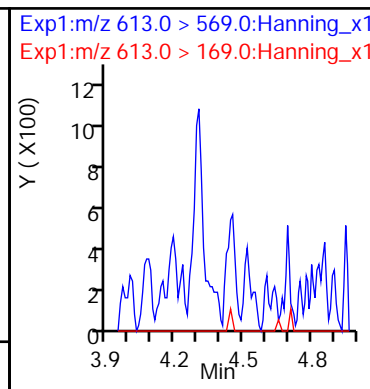
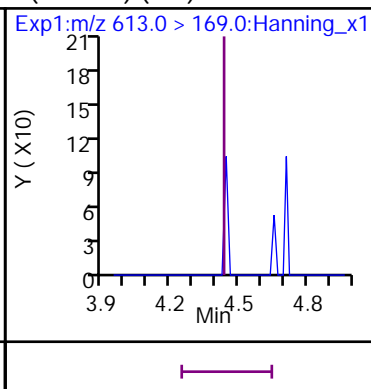
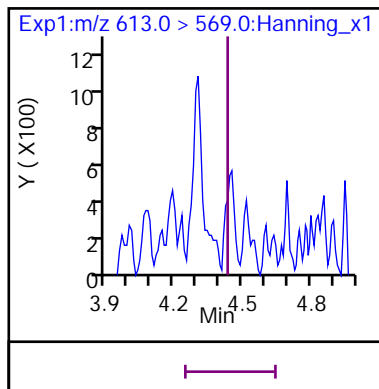
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



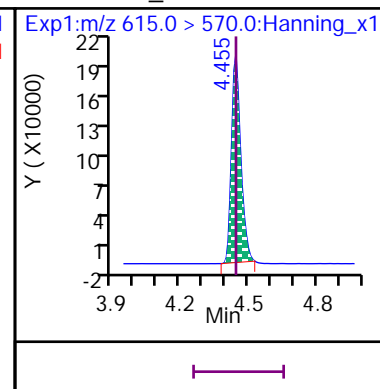
## D 54 13C8\_PFOS



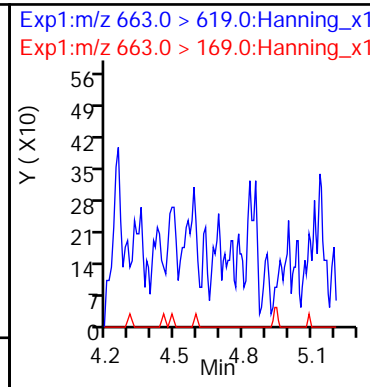
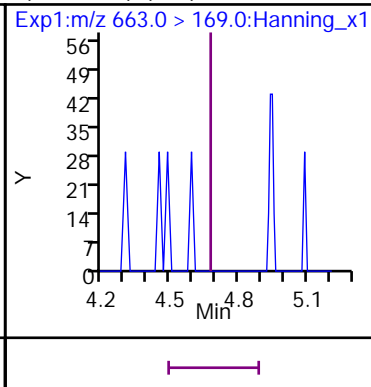
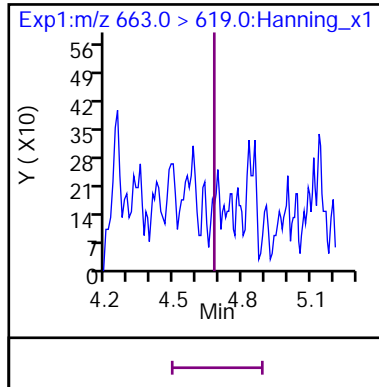
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



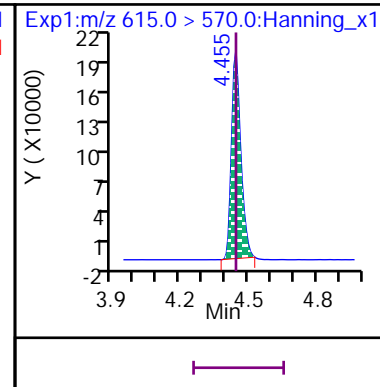
## D 38 13C2\_PFDoA



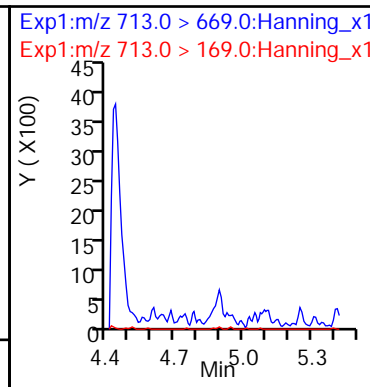
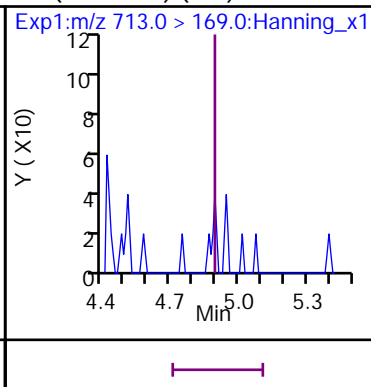
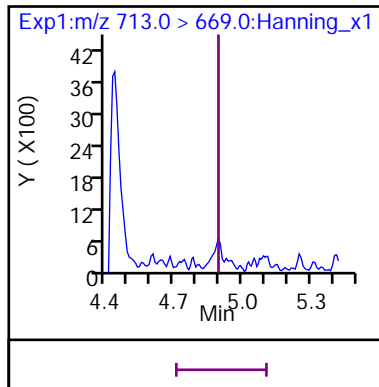
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



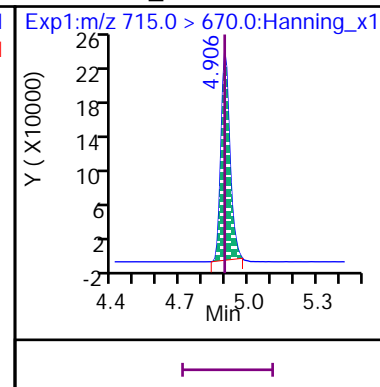
## D 38 13C2\_PFDoA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

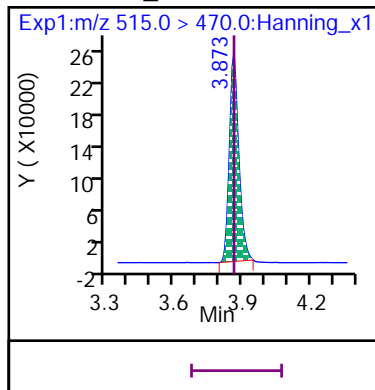


## D 42 13C2\_PFTeDA

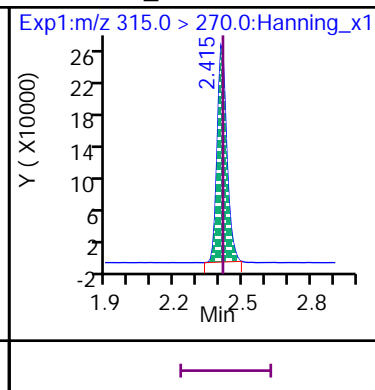




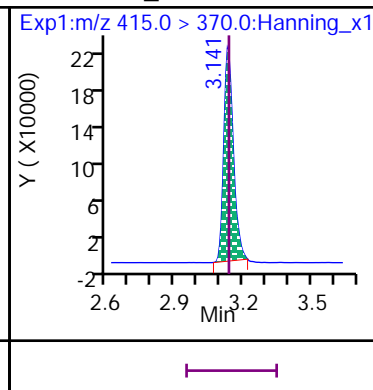
\* 37 13C2\_PFDA



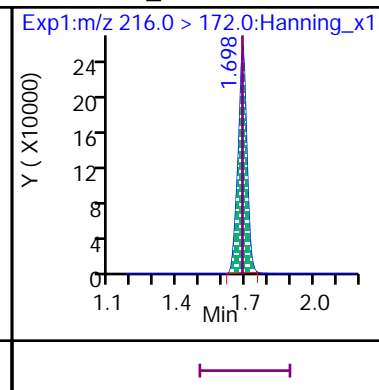
\* 39 13C2\_PFHxA



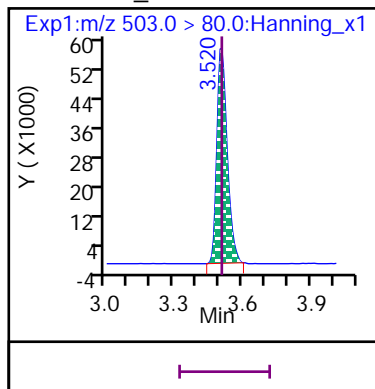
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11001-013</b>
Description: <b>TB01-120820</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/08/2020</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/09/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1213	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanefluoro-1-octanesulfonic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		103	50-150
13C2_8:2FTS		89	50-150
13C2_PFDaA		91	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		94	50-150
13C8_PFOS		96	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820018.d  
 Injection Date: 28-Dec-2020 12:13:48 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 10  
 Lab Sample ID: VL11001-013 Lab Prep. Batch: 77741  
 Client ID: TB01-120820 Sample Group: VL11001  
 Sample Info: VL11001-013 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0414680$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	265	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA</b>	<b>CAS: SESI-0111</b>												
217 > 172		1.699	1.696	1	636200	23	>100:1			1001.00	917.31	97.9	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>	<b>CAS: 375-22-4</b>												U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>	<b>CAS: SESI-0112</b>												
267.9 > 223		2.067	2.072	0	637936	17	>100:1			1001.00	927.39	95.8	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>CAS: 2706-90-3</b>												U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBFS</b>	<b>CAS: SESI-0116</b>												
302 > 80		2.130	2.125	1	221709	18	>100:1			1001.00	962.99	93.1	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS)</b>	<b>CAS: 375-73-5</b>												U
298.9 > 80	44		2.125		ND								
<b>D 49 13C5_PFHxA</b>	<b>CAS: SESI-0113</b>												
318 > 273		2.416	2.423	0	704950	19	>100:1			1001.00	956.42	94.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>CAS: 307-24-4</b>												U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>	<b>CAS: SESI-0121</b>												
287 > 185		2.523	2.530	0	1365951	20	>100:1			5005.00	5128.33	97.5	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>	<b>CAS: 13252-13-6</b>												U
285 > 119	66		2.530		ND								
<b>D 47 13C4_PFHpA</b>	<b>CAS: SESI-0114</b>												
367 > 322		2.773	2.772	1	600961	19	>100:1			1001.00	990.63	94.8	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>CAS: 375-85-9</b>												U
363 > 319	47		2.772		ND								
<b>D 45 13C3_PFHxS</b>	<b>CAS: SESI-0096</b>												
402 > 80		2.791	2.790	1	165357	19	>100:1			1001.00	965.71	95	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>	<b>CAS: 355-46-4</b>												U
399 > 80	45		2.790		ND								
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA)</b>	<b>CAS: 919005-14-4</b>												U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2</b>	<b>CAS: SESI-0105</b>												
429 > 81		3.122	3.114	1	107292	26	>100:1			5005.00	5571.18	103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.128		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	589837	24	>100:1			1001.00	996.57	93.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													U
413 > 369	53		3.148		ND								
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	146195	22	>100:1			1001.00	975.10	95.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													U
499 > 80	54		3.520		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDs) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	722132	22	>100:1			1001.00	961.61	94.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	89557	17	>100:1			5005.00	4827.83	89.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	615464	20	>100:1			1001.00	927.84	91.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	755474	18	>100:1			5005.00	5263.18	95.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	653283	20	>100:1			5005.00	4918.76	89.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	612107	18	>100:1			1001.00	968.41	95.1	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	555342	18				1001.00	917.44	90.8	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	665736	18	>100:1			1001.00	790.24	81.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	684996	19	>100:1					93.5	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	695606	19	>100:1					95.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	629554	24	>100:1					105	
<b>* 43 13C3_PFBFA</b>													
216 > 172		1.699	1.696	1	618238	23	>100:1					101	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	164245	23	>100:1					101	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820018.d

Injection Date: 28-Dec-2020 12:13:48

Inst. ID: LCMSMS02

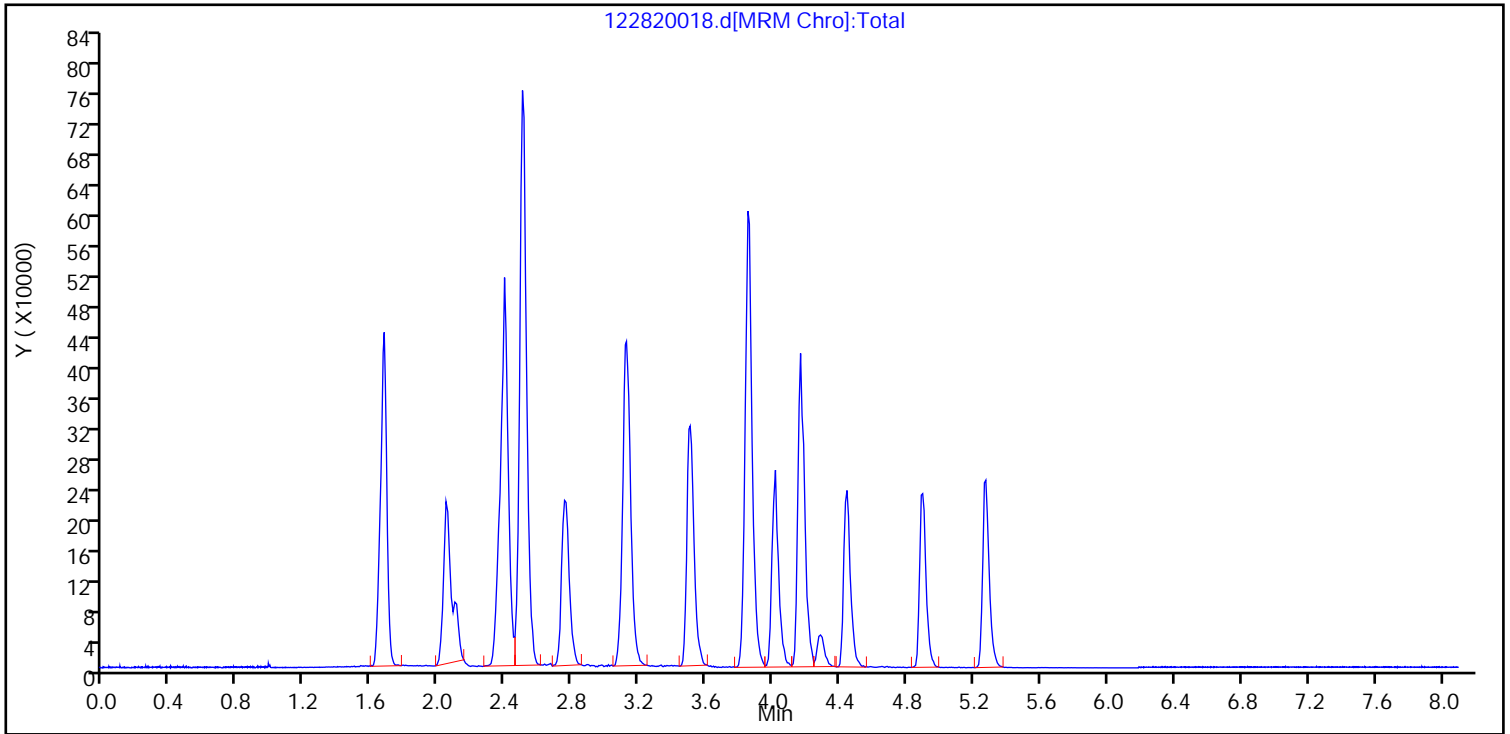
Client ID: TB01-120820

Lab ID: VL11001-013

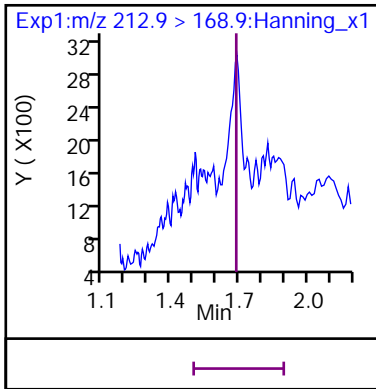
Sample Info: VL11001-013

Dil. Factor: 1

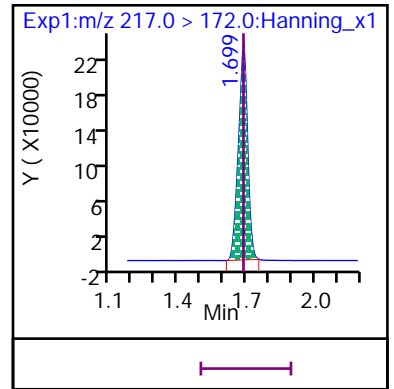
Operator: Matthew M. Miller



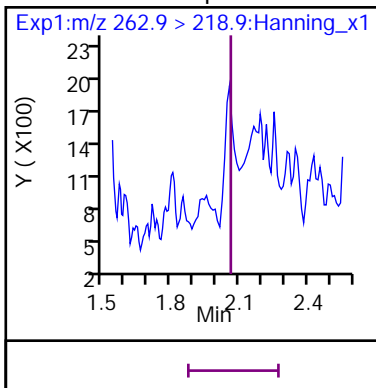
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



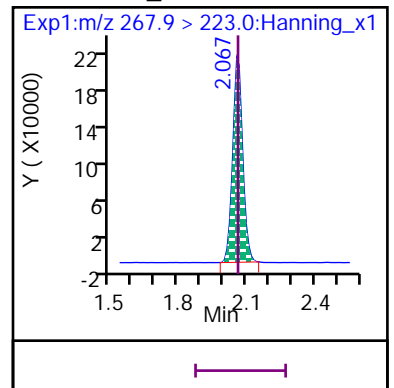
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

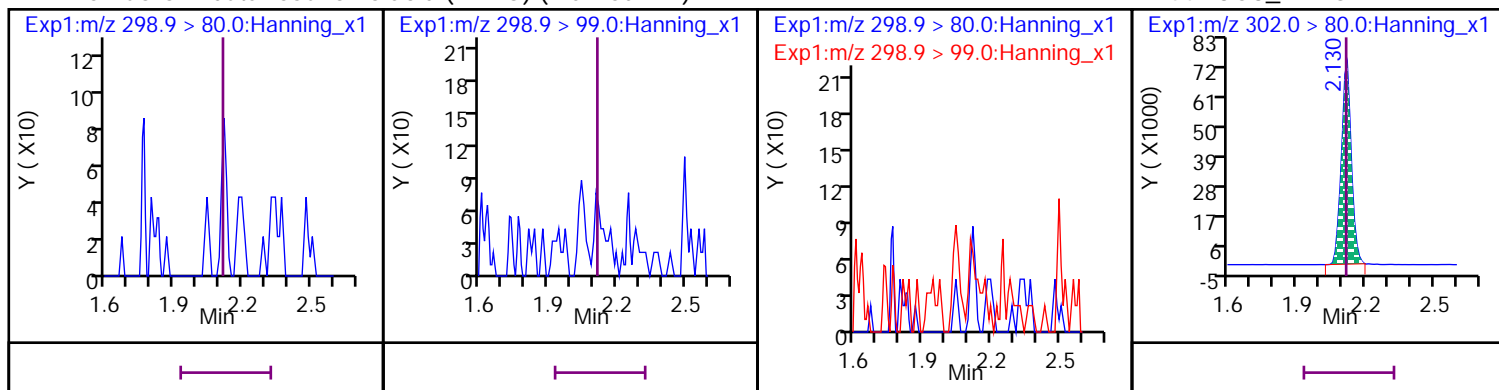


D 50 13C5\_PFPeA



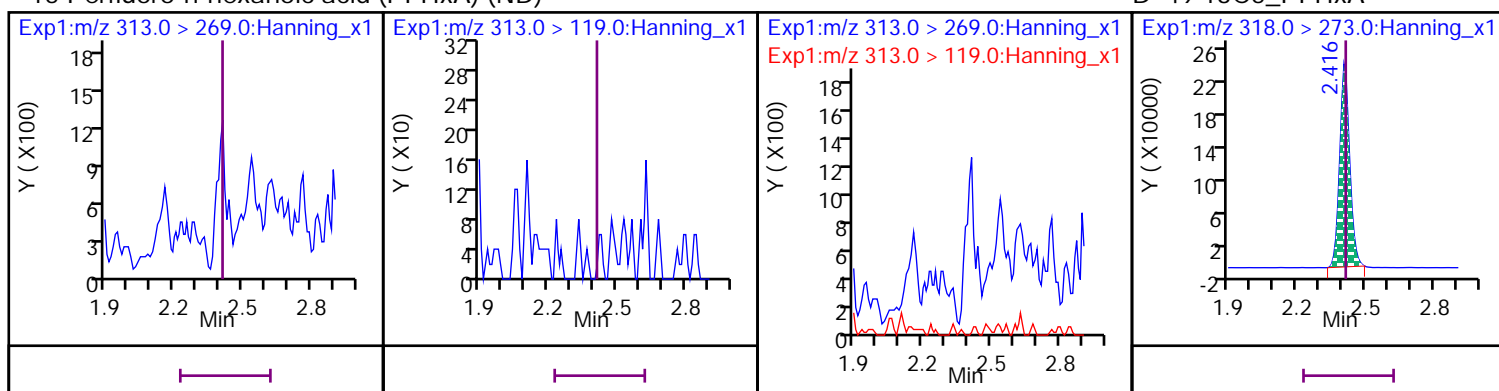
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (Marked ND)

D 44 13C3\_PFBS



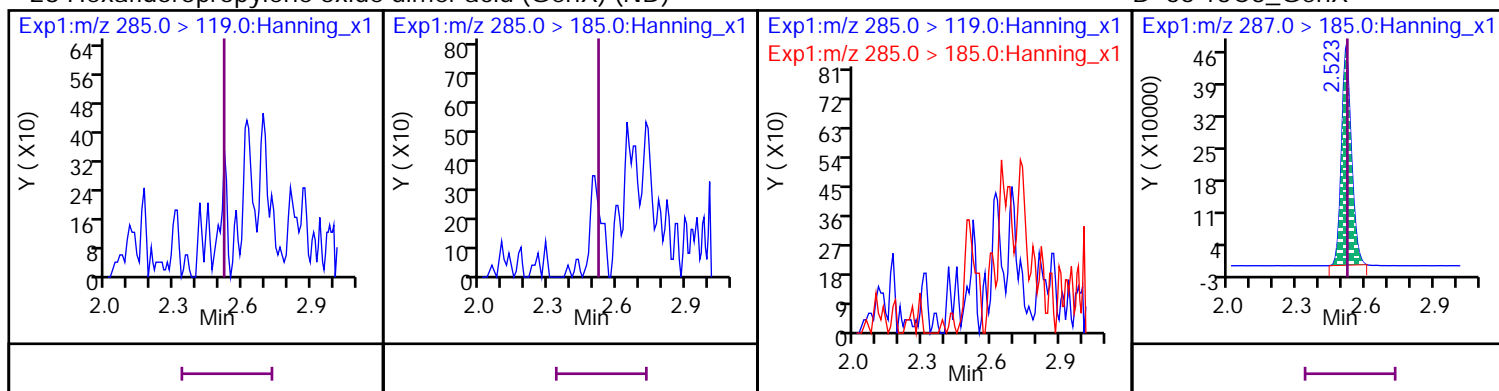
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



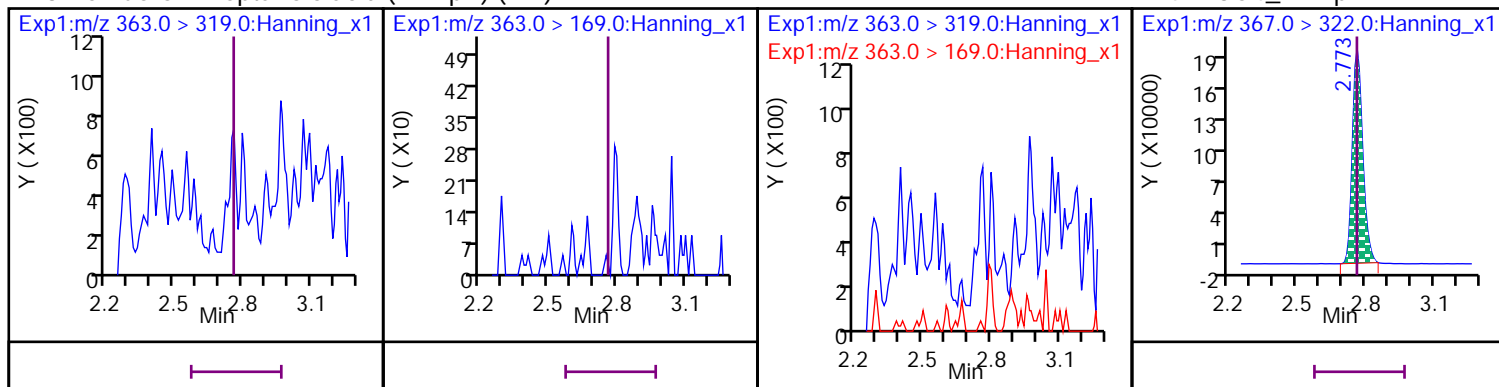
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

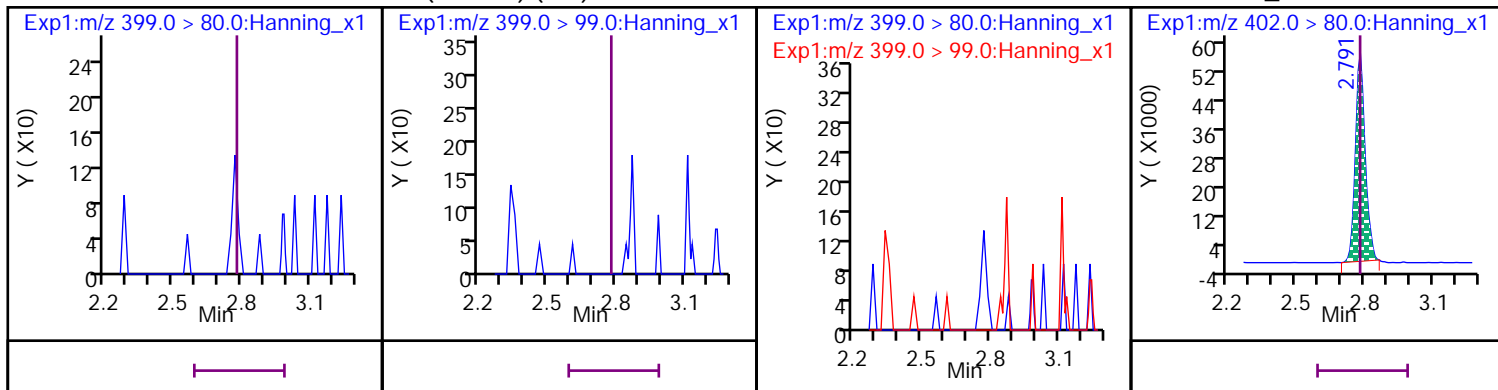
D 47 13C4\_PFHpA





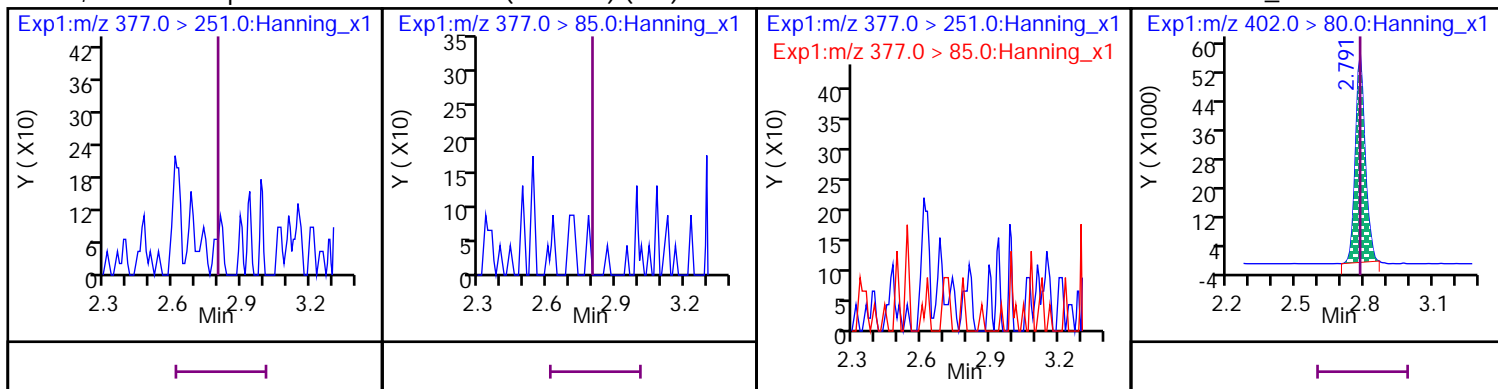
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



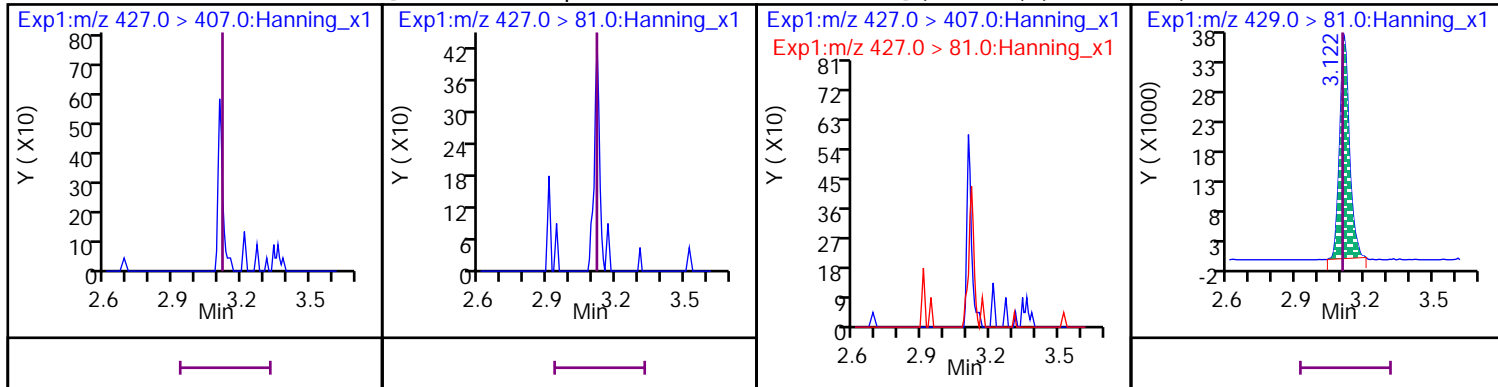
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



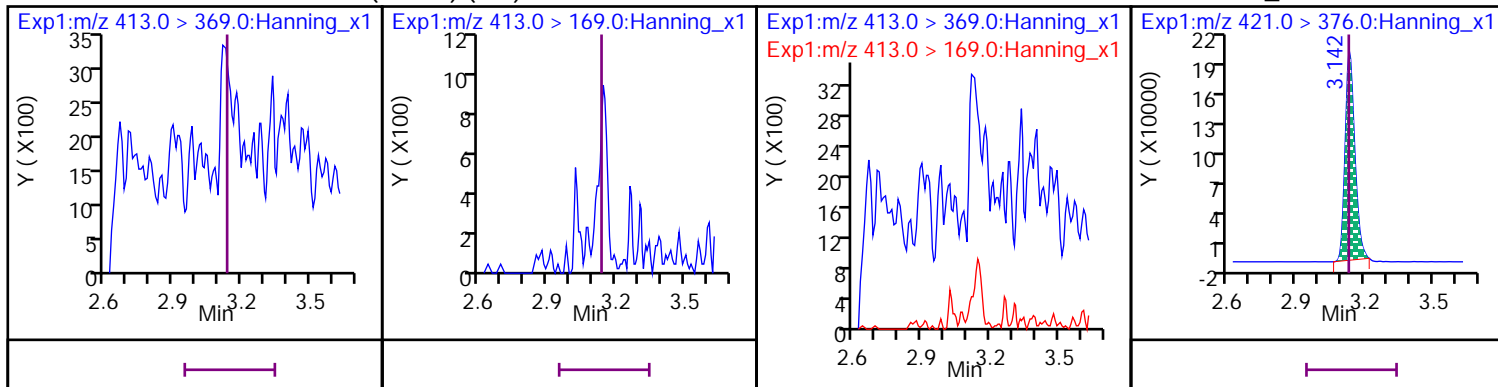
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (Marked ~~ND~~)

D 45 13C2\_6:2 FTS\_2



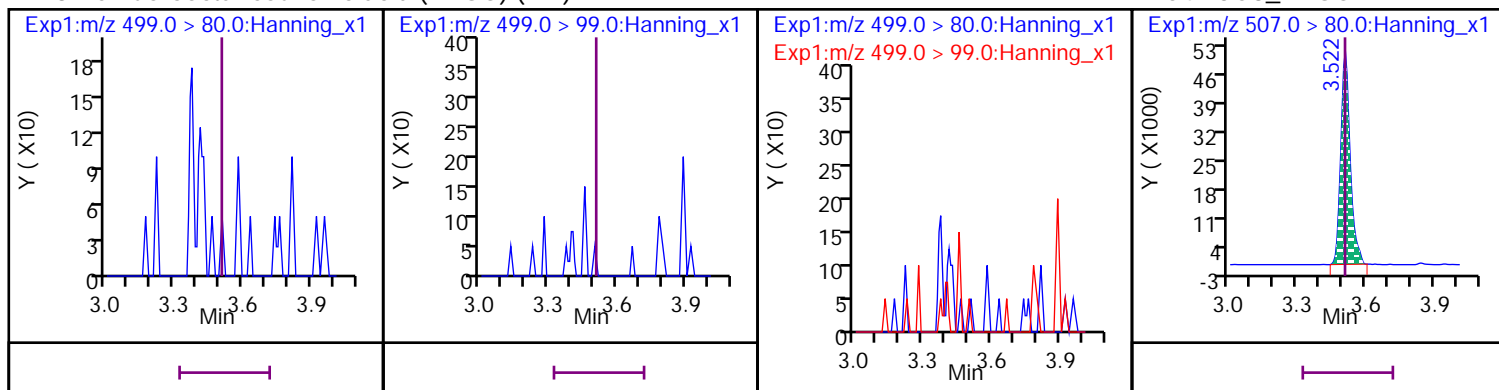
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



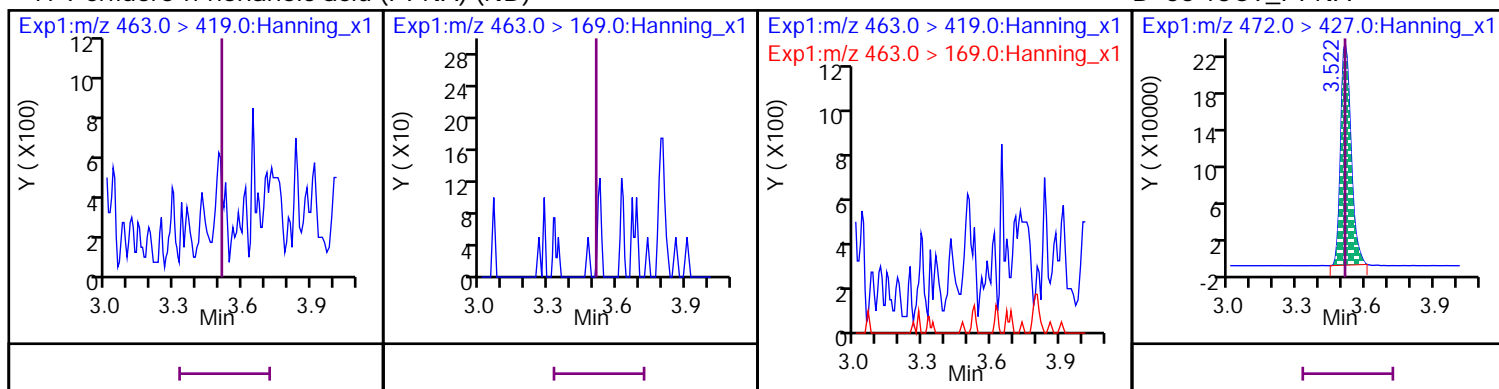
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



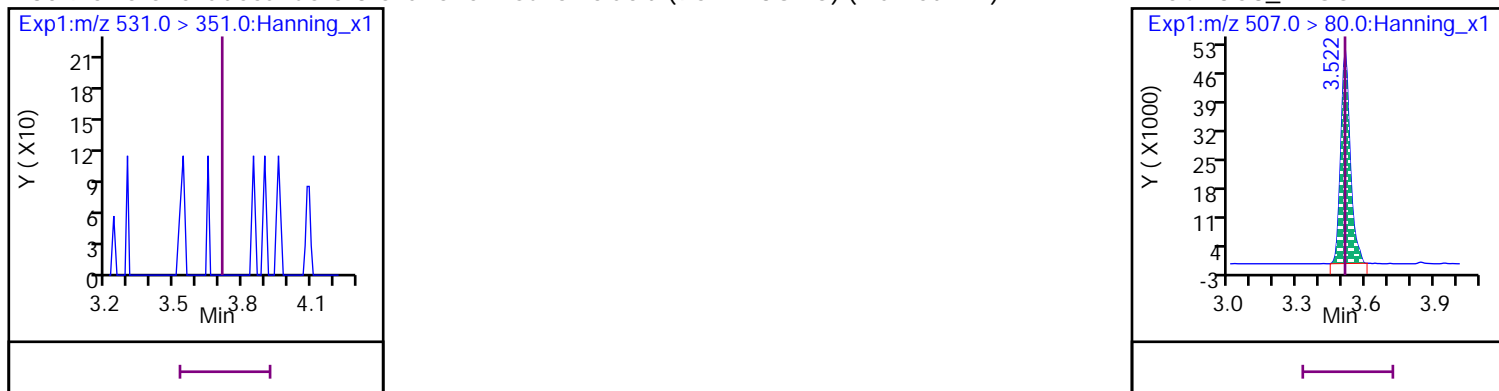
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



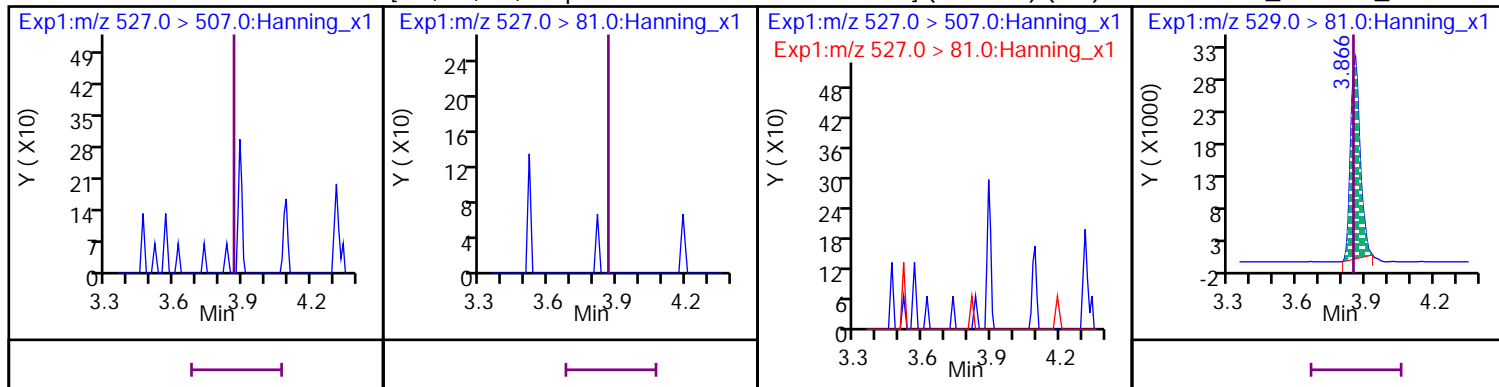
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



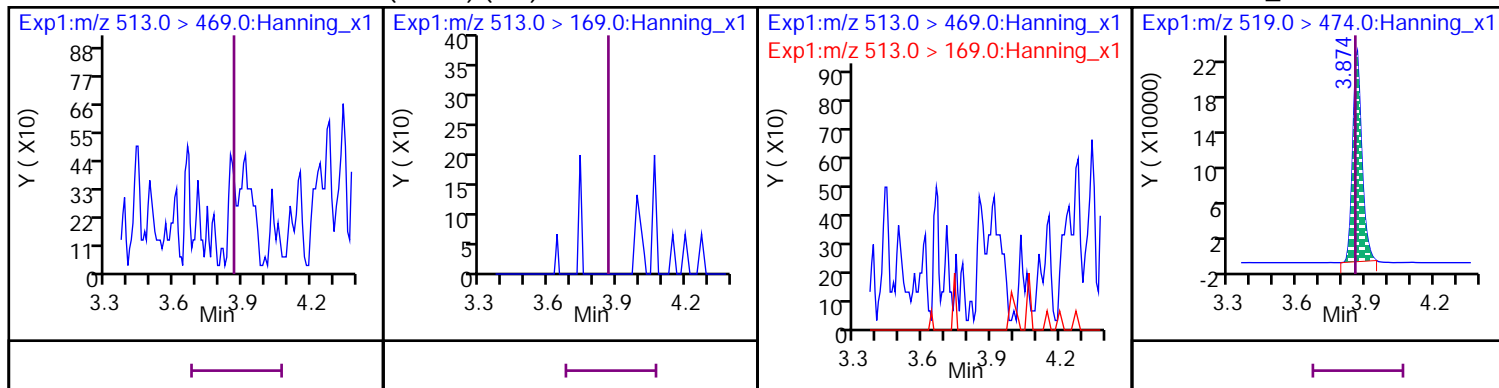
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



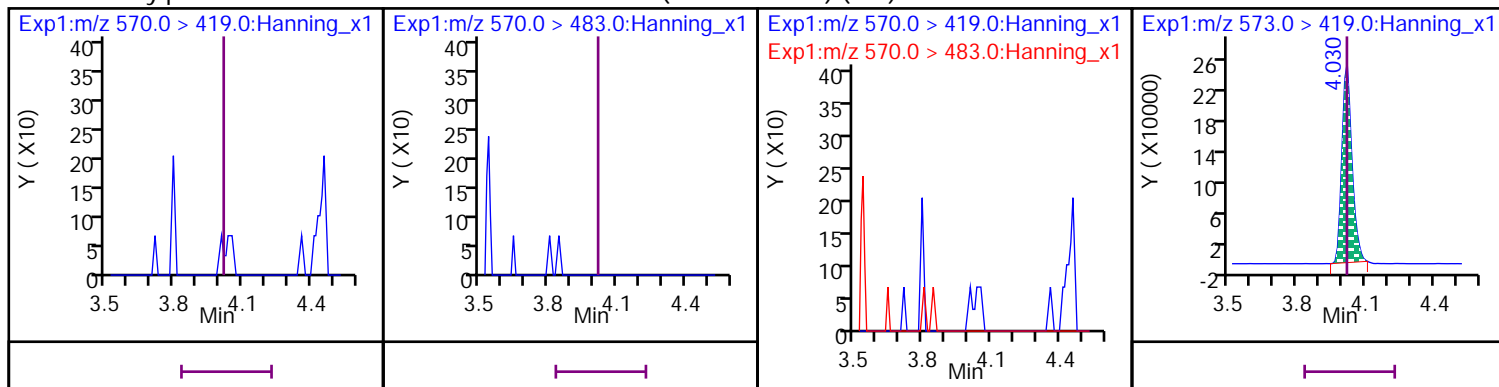
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



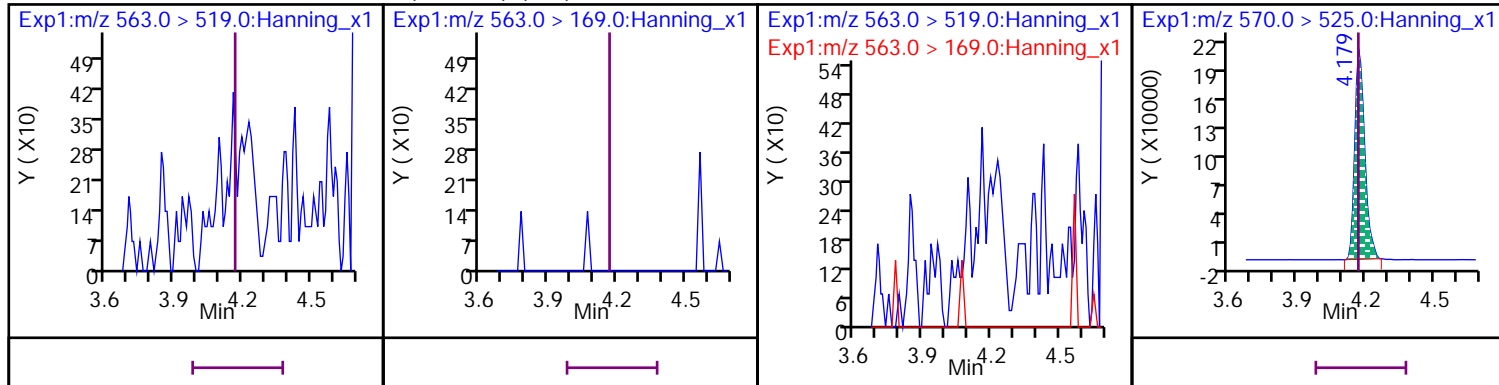
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



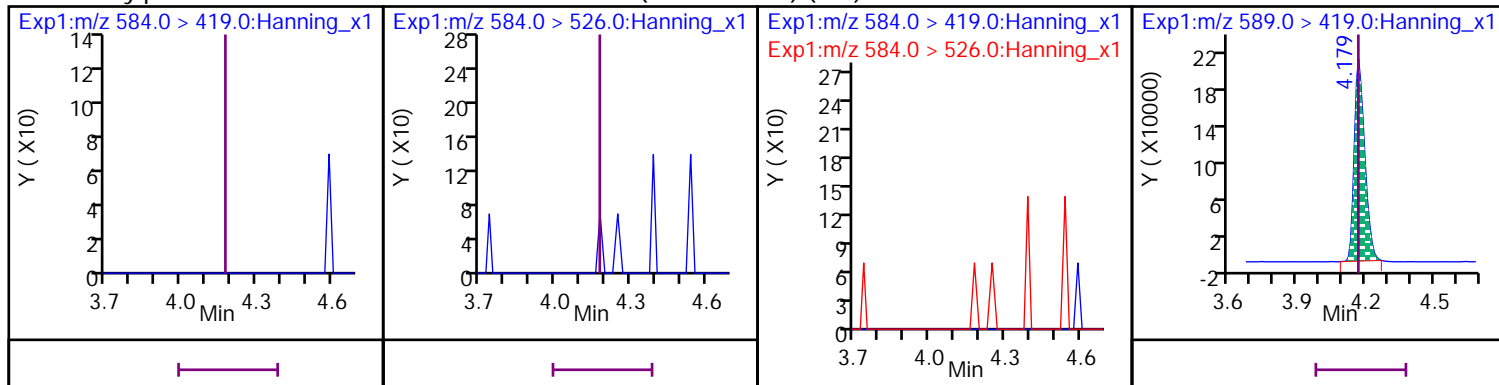
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

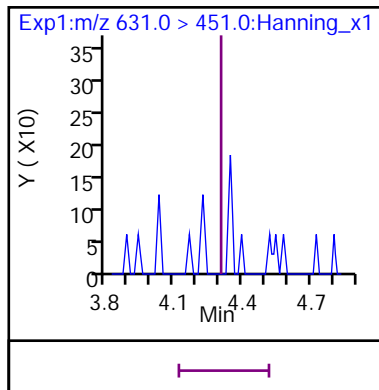


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

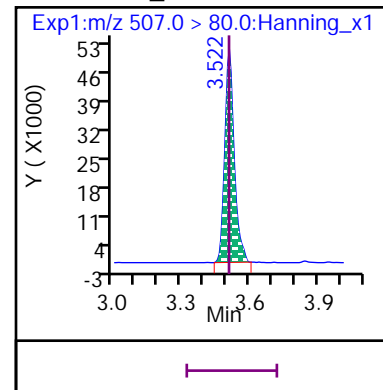
D 60 d5-EtFOSAA



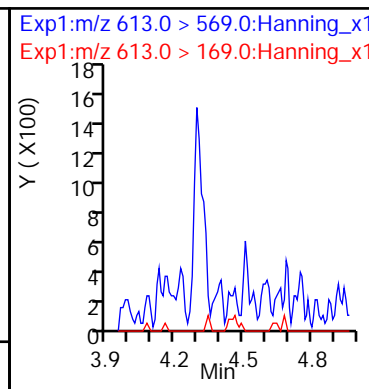
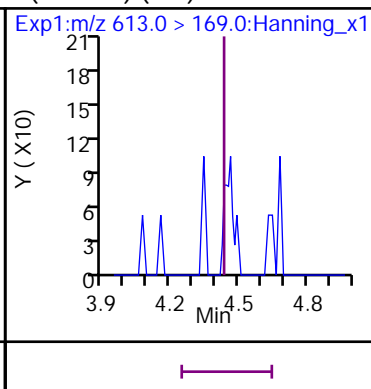
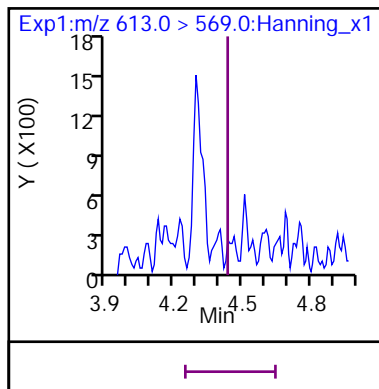
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) (Marked ND)



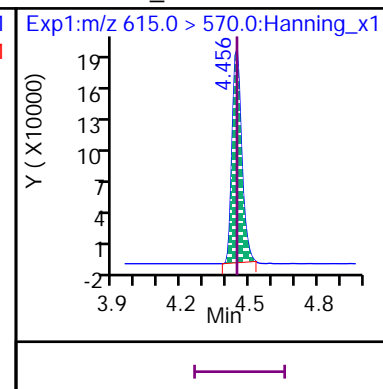
## D 54 13C8\_PFOS



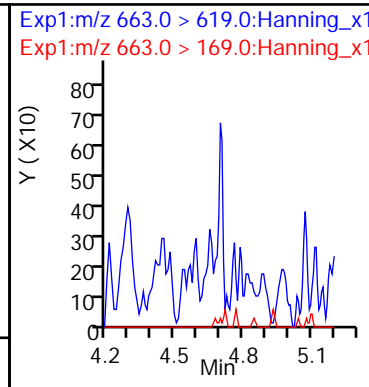
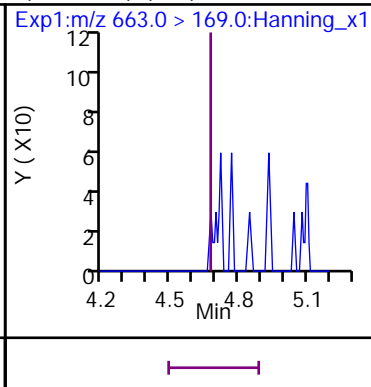
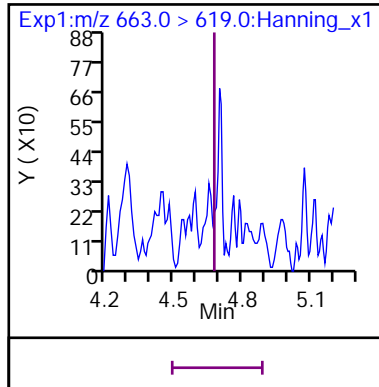
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



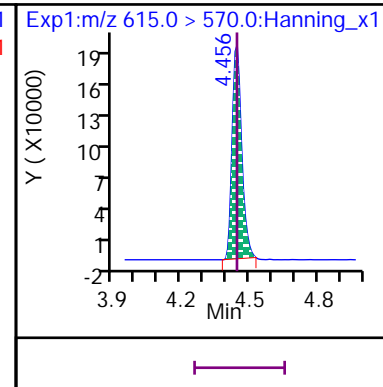
## D 38 13C2\_PFDoA



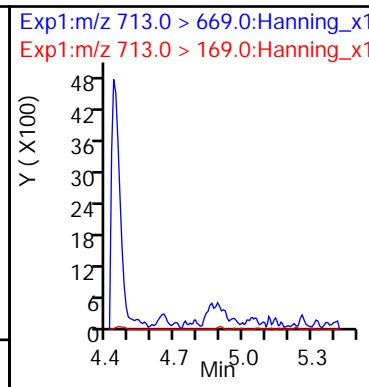
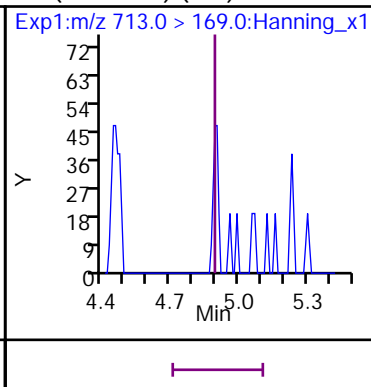
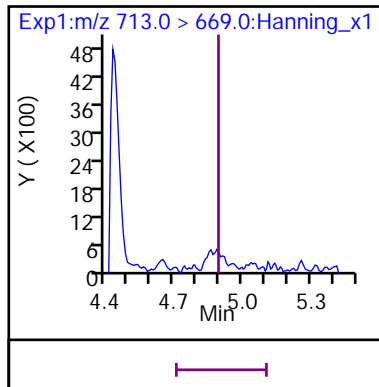
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



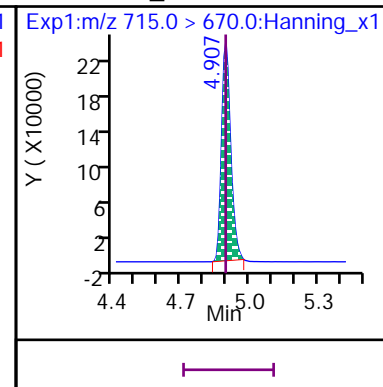
## D 38 13C2\_PFTeDA



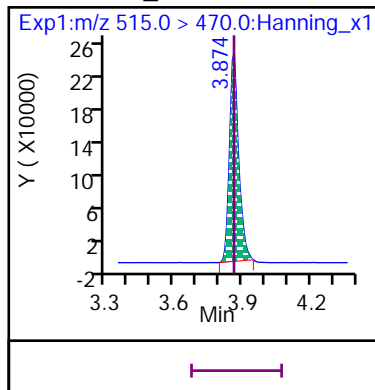
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



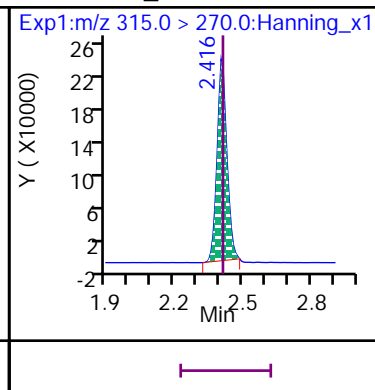
## D 42 13C2\_PFTeDA



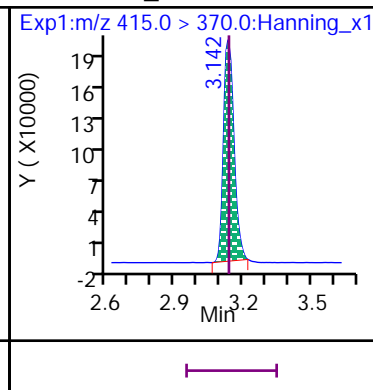
\* 37 13C2\_PFDA



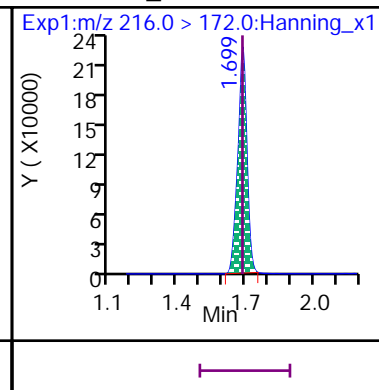
\* 39 13C2\_PFHxA



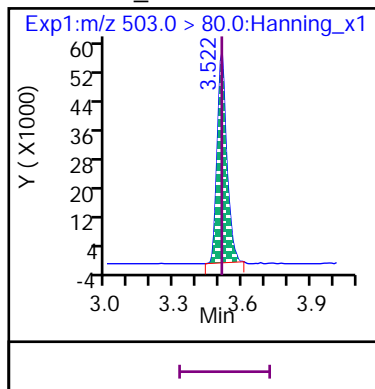
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# CALIBRATION DATA

Pace Environmental Services, LLC  
Initial Calibration Signal Ratios Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.375	3.365	3.417	3.583	3.350	3.422	3.669	3.539	3.651	3.689	3.506	2.888-3.811	0.15375	1.675
1 4:2 FTS	1.740	1.271	2.227	1.747	1.641	1.778	1.917	1.832	1.949	1.952	1.805	0.915-2.366	0.24199	0.820
15 PFHxA	18.442	20.030	15.499	18.416	17.013	17.619	19.976	18.600	19.133	18.707	18.343	12.643-21.382	1.45644	8.506
22 PFPeS	3.429	2.825	3.387	2.905	3.095	3.026	3.153	3.038	3.064	3.127	3.104	2.544-3.645	0.18357	1.547
28 GenX	0.802	0.874	0.881	0.845	0.791	0.810	0.794	0.784	0.799	0.800	0.818	0.679-0.902	0.03719	0.395
13 PFHpA	3.160	3.841	3.704	4.011	3.797	3.680	3.758	3.723	3.730	3.674	3.707	3.176-4.417	0.20677	1.898
14 PFHxS	2.856	3.471	2.752	3.296	3.809	3.210	3.239	3.197	3.210	3.083	3.212	2.972-4.645	0.27880	1.904
29 ADONA	2.792	3.100	2.997	3.093	2.977	2.950	3.069	2.986	2.933	2.883	2.978	2.711-3.242	0.08838	1.488
2 6:2 FTS	1.990	1.694	1.765	1.765	1.774	1.860	1.730	1.843	1.762	1.897	1.808	1.358-2.189	0.13840	0.887
20 PFOA	2.767	3.072	2.862	2.931	2.854	2.911	2.831	2.839	2.943	2.747	2.875	2.569-3.138	0.09491	1.427
12 PFHpS	2.779	3.432	2.972	2.960	3.099	3.098	3.291	3.060	3.192	3.018	3.090	2.532-3.665	0.18868	1.549
18 PFOS	2.665	2.939	4.256	4.054	6.805	3.293	3.509	3.623	3.647	3.636	3.842	3.623-9.986	1.06054	3.402
17 PFNA	6.042	6.114	6.308	5.979	6.190	6.089	6.324	6.330	6.001	6.242	6.161	5.774-6.605	0.13861	3.095
3 8:2 FTS	1.969	2.043	2.152	1.669	2.111	1.940	2.024	1.839	1.917	1.873	1.953	1.717-2.504	0.13117	1.055
16 PFNS	6.029	2.522	3.073	2.421	3.036	2.621	2.732	2.668	2.858	2.813	3.077	0.046-6.025	0.99644	1.518
10 PFDA	24.185	15.981	15.642	21.616	13.225	13.928	14.668	13.457	13.525	13.228	15.945	1.743-24.706	3.82708	6.612
6 N-MeFOSAA	1.071	1.340	1.449	1.414	1.348	1.284	1.404	1.361	1.295	1.345	1.331	0.871-1.824	0.15871	0.674
9 PFDS	4.189	3.172	3.768	2.572	2.741	2.987	2.736	2.778	2.827	2.617	3.038	1.210-4.271	0.51006	1.370
25 PFUdA	22.113	12.610	15.515	16.875	16.054	13.756	14.349	15.840	14.439	13.537	15.508	8.383-23.724	2.55696	8.027
5 N-EtFOSAA	1.454	1.506	1.535	1.583	1.715	1.712	1.572	1.582	1.584	1.584	1.582	1.488-1.941	0.07543	0.857
26 MeFOSA	1.144	1.399	1.179	1.011	1.183	1.031	1.104	1.058	1.076	1.044	1.122	0.824-1.541	0.11940	0.591
11 PFDaA	13.126	9.490	12.137	10.877	10.358	10.825	10.909	10.101	10.483	10.296	10.860	7.324-13.391	1.01122	5.179
4 10:2 FTS	2.424	3.224	3.510	3.104	3.053	3.054	3.423	3.130	3.276	3.276	3.147	2.247-3.858	0.26845	1.526
27 EtFOSA	1.213	0.968	1.149	1.090	1.080	1.003	0.916	0.993	0.975	1.004	1.039	0.782-1.377	0.09912	0.540
34 PFDOS	4.707	3.977	2.930	2.897	3.168	3.112	3.157	3.063	3.273	3.106	3.339	1.349-4.986	0.60609	1.584
24 PFTTrDA	8.783	8.481	8.000	8.710	8.564	8.109	8.466	8.154	8.257	8.250	8.377	7.797-9.330	0.25559	4.282
23 PFTeDA	14.094	12.348	12.933	12.364	11.293	11.231	12.205	11.590	11.672	11.431	12.116	8.819-13.766	0.82455	5.646
35 PFHxDA	12.861	12.762	11.367	10.860	11.440	11.225	11.378	11.252	11.036	10.721	11.490	9.164-13.715	0.75841	5.720
36 PFODA	13.320	14.856	14.467	13.704	13.845	13.962	14.032	13.700	13.500	13.437	13.882	12.374-15.315	0.49033	6.922



Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
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 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No.Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

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7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Curve Legend: Ex. Avg;H Wt:C2 Org:F Dep:A

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area  
 Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None  
 Org: Origin, F-Force, I-Include, N-Neither  
 Dep: Dependent Variable, A-Amount, R-Response

$$\%Rec = (\text{Measured Amount} / \text{True Amount}) * 100$$

Column: 1

Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBFA	706	694	712	706	735	691	690	665	667	670	Avg:A Wt:C2	694		RSD=3.2	
	102	100	103	102	106	99.6	99.5	95.9	96.1	96.6	Org:N Dep:A				
8 PFBA	1.091139	1.054497	1.012192	0.941608	0.918189	0.991494	0.991606	1.004334	0.982925	0.971965	Avg:A Wt:C2	0.995995		RSD=5.0	
	110	106	102	94.5	92.2	99.5	99.6	101	98.7	97.6	Org:N Dep:A				
D 50 13C5_PFPeA	707	694	717	687	728	708	674	652	663	650	Avg:A Wt:C2	688		RSD=4.0	
	103	101	104	99.8	106	103	97.9	94.8	96.4	94.5	Org:N Dep:A				
21 PFPeA	1.086981	1.044304	1.010325	0.982642	0.942195	0.958032	1.014471	1.041862	0.989098	0.984260	Avg:A Wt:C2	1.005417		RSD=4.3	
	108	104	100	97.7	93.7	95.3	101	104	98.4	97.9	Org:N Dep:A				
D 44 13C3_PFBS	235	232	231	238	248	234	228	218	218	220	Avg:A Wt:C2	230		RSD=4.1	
	102	101	100	103	108	102	99.1	94.7	94.8	95.6	Org:N Dep:A				
7 PFBS	1.319500	1.193640	1.210181	1.070606	1.063597	1.144377	1.182630	1.201174	1.199969	1.204724	Avg:A Wt:C2	1.179040		RSD=6.2	
	112	101	103	90.8	90.2	97.1	100	102	102	102	Org:N Dep:A				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
1 4:2 FTS	2.185420	1.863370	1.975258	2.030625	1.773490	2.052481	1.998581	2.012288	2.129223	1.936507	Avg:A Wt:C2	1.995724		RSD=6.0	
	110	93.4	99	102	88.9	103	100	101	107	97	Org:N Dep:A				
D 63 13C2_4:2 FTS_2	24.5250	24.2762	24.8226	23.3586	25.2928	23.5290	23.8080	23.8800	23.4802	25.1108	Avg:A Wt:C2	24.2083		RSD=2.9	
	101	100	103	96.5	104	97.2	98.3	98.6	97	104	Org:N Dep:A				
D 49 13C5_PFHxA	762	745	793	747	774	731	728	706	680	704	Avg:A Wt:C2	737		RSD=4.7	
	103	101	108	101	105	99.2	98.8	95.8	92.3	95.5	Org:N Dep:A				
15 PFHxA	1.067720	1.082954	0.932674	0.955775	0.927055	0.976939	0.988566	0.959037	1.010955	0.971111	Avg:A Wt:C2	0.987279		RSD=5.3	
	108	110	94.5	96.8	93.9	99	100	97.1	102	98.4	Org:N Dep:A				
22 PFPeS	0.923263	0.862346	0.897577	0.795888	0.788463	0.823648	0.863930	0.911847	0.890047	0.917479	Avg:A Wt:C2	0.867449		RSD=5.7	
	106	99.4	103	91.8	90.9	95	99.6	105	103	106	Org:N Dep:A				
28 GenX	0.697112	0.796040	0.772472	0.704563	0.655423	0.697711	0.696856	0.712622	0.740380	0.711419	Avg:A Wt:C2	0.718460		RSD=5.7	
	97	111	108	98.1	91.2	97.1	97	99.2	103	99	Org:N Dep:A				
D 66 13C3_GenX	276	271	270	272	282	267	264	257	246	257	Avg:A Wt:C2	266		RSD=4.0	
	104	102	101	102	106	100	99.3	96.5	92.5	96.4	Org:N Dep:A				
D 47 13C4_PFHpA	639	593	601	616	616	620	623	580	569	609	Avg:A Wt:C2	607		RSD=3.5	
	105	97.7	99.1	102	102	102	103	95.6	93.8	100	Org:N Dep:A				
13 PFHpA	1.011664	1.101543	1.118109	1.061199	1.020700	0.993781	0.982342	1.057344	1.042522	0.983416	Avg:A Wt:C2	1.037262		RSD=4.6	
	97.5	106	108	102	98.4	95.8	94.7	102	101	94.8	Org:N Dep:A				
14 PFHxS	1.039563	1.166554	1.088356	0.915465	1.045658	1.077000	1.045534	1.021450	1.095271	1.108019	Avg:A Wt:C2	1.060287		RSD=6.2	
	98	110	103	86.3	98.6	102	98.6	96.3	103	105	Org:N Dep:A				
D 45 13C3_PFHxS	177	180	174	177	179	169	169	174	158	153	Avg:A Wt:C2	171		RSD=5.3	
	104	105	102	104	105	98.8	99	102	92.1	89.5	Org:N Dep:A				
29 ADONA	5.782667	6.559767	6.584441	6.142465	6.039204	6.398585	6.374612	6.196943	6.568953	6.840559	Avg:A Wt:C2	6.348820		RSD=4.9	
	91.1	103	104	96.7	95.1	101	100	97.6	103	108	Org:N Dep:A				
2 6:2 FTS	3.313509	2.552165	2.298217	1.826136	2.092252	2.089672	2.021017	2.212993	1.983334	2.118831	Ln:A Wt:C2	2.011042	58.4075	R <sup>2</sup> =0.994	
	103	96.3	99	84.7	101	102	99.9	110	98.4	105	Org:N Dep:A			RSE=7	
D 64 13C2_6:2 FTS_2	19.6676	18.2686	19.2178	21.0354	20.9246	19.9252	19.0898	17.7098	18.7552	17.9900	Avg:A Wt:C2	19.2584		RSD=5.9	
	102	94.9	99.8	109	109	103	99.1	92	97.4	93.4	Org:N Dep:A				
D 53 13C8_PFOA	601	628	615	613	655	600	596	535	540	536	Avg:A Wt:C2	592		RSD=7.0	
	102	106	104	104	111	101	101	90.3	91.3	90.5	Org:N Dep:A				
20 PFOA	1.067889	1.119744	1.057825	0.985823	0.935567	1.015830	0.970504	1.039156	1.023232	0.978943	Avg:A Wt:C2	1.019451		RSD=5.3	
	105	110	104	96.7	91.8	99.6	95.2	102	100	96	Org:N Dep:A				
12 PFHpS	0.821583	1.000625	1.032417	0.876048	0.891586	0.891871	0.929346	0.847056	0.906036	0.887734	Avg:A Wt:C2	0.908430		RSD=7.1	
	90.4	110	114	96.4	98.1	98.2	102	93.2	99.7	97.7	Org:N Dep:A				
D 54 13C8_PFOS	155	151	157	149	154	150	155	141	140	146	Avg:A Wt:C2	150		RSD=4.0	
	104	101	105	99.4	103	100	104	94.3	93.5	97.1	Org:N Dep:A				
18 PFOS	1.288019	1.106634	1.264640	1.185556	1.105127	1.096804	1.124743	1.211778	1.230661	1.235891	Avg:A Wt:C2	1.184985		RSD=6.1	
	109	93.4	107	100	93.3	92.6	94.9	102	104	104	Org:N Dep:A				
17 PFNA	1.073000	1.114280	1.028578	0.954886	0.923649	0.987359	0.993144	0.996369	0.955990	0.973031	Avg:A Wt:C2	1.000029		RSD=5.8	
	107	111	103	95.5	92.4	98.7	99.3	99.6	95.6	97.3	Org:N Dep:A				
D 56 13C9_PFNA	801	741	765	769	792	747	735	719	713	727	Avg:A Wt:C2	751		RSD=4.0	
	107	98.7	102	102	106	99.5	97.8	95.7	94.9	96.8	Org:N Dep:A				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.203947	3.357981	3.519008	3.335492	3.147725	3.318553	3.239700	3.499262	3.639860	3.403234	Avg:A Wt:C2	3.366476		RSD=4.5	
	95.2	99.7	105	99.1	93.5	98.6	96.2	104	108	101	Org:N Dep:A				
D 55 13C8_PFOA	303	313	315	328	331	312	302	304	302	286	Avg:A Wt:C2	310		RSD=4.3	
	97.9	101	102	106	107	101	97.5	98.1	97.6	92.5	Org:N Dep:A				
19 PFOSA	0.951815	1.021259	1.014955	0.977637	0.970307	0.984338	0.975203	0.974789	0.959640	1.024556	Avg:A Wt:C2	0.985450		RSD=2.6	
	96.6	104	103	99.2	98.5	99.9	99	98.9	97.4	104	Org:N Dep:A				
3 8:2 FTS	3.137111	2.022161	2.059449	1.823517	2.040387	2.064826	2.030473	1.976196	2.049735	1.913367	Ln:A Wt:C	1.976470	33.2946	R <sup>2</sup> =0.998	
	124	84.7	95.4	88.7	101	104	102	99.8	104	96.7	Org:N Dep:A			RSE=11.1	
16 PFNS	0.825404	0.780532	0.854565	0.704842	0.762032	0.759628	0.693956	0.784910	0.756785	0.730025	Avg:A Wt:C2	0.765268		RSD=6.5	
	108	102	112	92.1	99.6	99.3	90.7	103	98.9	95.4	Org:N Dep:A				
D 65 13C2_8:2 FTS_2	18.5336	19.6208	19.5874	19.3574	18.6628	17.4824	18.3224	17.9880	17.4196	18.5270	Avg:A Wt:C2	18.5501		RSD=4.3	
	99.9	106	106	104	101	94.2	98.8	97	93.9	99.9	Org:N Dep:A				
D 51 13C6_PFDA	666	671	672	686	698	682	667	634	618	639	Avg:A Wt:C2	663		RSD=3.8	
	100	101	101	103	105	103	100	95.6	93.2	96.3	Org:N Dep:A				
10 PFDA	1.082776	0.954504	1.050577	0.979894	0.905707	0.961047	0.950554	1.000079	1.010610	0.930209	Avg:A Wt:C2	0.982595		RSD=5.5	
	110	97.1	107	99.7	92.2	97.8	96.7	102	103	94.7	Org:N Dep:A				
D 58 d3-MeFOSAA	145	136	143	143	152	147	146	137	139	147	Avg:A Wt:C2	144		RSD=3.4	
	101	94.8	99.8	99.4	106	102	101	95.8	97	102	Org:N Dep:A				
6 N-MeFOSAA	0.635947	0.855857	0.854728	0.788585	0.717535	0.737984	0.756366	0.808021	0.765873	0.760614	Avg:A Wt:C2	0.768151		RSD=8.5	
	82.8	111	111	103	93.4	96.1	98.5	105	99.7	99	Org:N Dep:A				
9 PFDS	0.695408	0.731307	0.789111	0.698172	0.686800	0.739729	0.687780	0.763202	0.770649	0.695154	Avg:A Wt:C2	0.725731		RSD=5.3	
	95.8	101	109	96.2	94.6	102	94.8	105	106	95.8	Org:N Dep:A				
25 PFUdA	1.115782	0.933393	0.965682	0.875313	0.897037	0.906414	0.909248	0.985626	0.926951	0.883298	Avg:A Wt:C2	0.939874		RSD=7.5	
	119	99.3	103	93.1	95.4	96.4	96.7	105	98.6	94	Org:N Dep:A				
D 60 d5-EtFOSAA	144	136	141	142	148	132	131	124	120	111	Avg:A Wt:C2	133		RSD=8.8	
	108	102	106	107	111	99.3	98.4	93.2	90.5	83.7	Org:N Dep:A				
5 N-EtFOSAA	1.044603	1.126368	1.002271	0.932952	0.927289	1.003713	0.986979	0.952588	0.965127	1.013948	Avg:A Wt:C2	0.995584		RSD=5.9	
	105	113	101	93.7	93.1	101	99.1	95.7	96.9	102	Org:N Dep:A				
D 52 13C7_PFUdA	651	670	639	625	679	644	627	593	601	592	Avg:A Wt:C2	632		RSD=4.8	
	103	106	101	98.9	107	102	99.2	93.8	95	93.6	Org:N Dep:A				
D 61 d7-MeFOSE	104	100	113	111	117	107	113	98.7630	107	110	Avg:A Wt:C2	108		RSD=5.4	
	96.3	92.7	104	103	108	99.1	105	91.3	98.8	102	Org:N Dep:A				
32 MeFOSE	0.997727	1.192239	0.949548	0.895760	0.834200	0.901858	0.861530	0.972567	0.895099	0.895480	Avg:A Wt:C2	0.939601		RSD=10.8	
	106	127	101	95.3	88.8	96	91.7	104	95.3	95.3	Org:N Dep:A				
26 MeFOA	1.020662	1.423995	1.218730	1.188712	1.125489	1.042353	1.087780	1.086879	0.991204	1.096250	Avg:A Wt:C2	1.128205		RSD=11.1	
	90.5	126	108	105	99.8	92.4	96.4	96.3	87.9	97.2	Org:N Dep:A				
D 57 d3-MeFOA	50.6730	50.8850	52.4070	46.1020	54.9690	56.5600	54.5890	52.2610	58.1020	52.6210	Avg:A Wt:C2	52.9169		RSD=6.4	
	95.8	96.2	99	87.1	104	107	103	98.8	110	99.4	Org:N Dep:A				
31 11Cl-PF3OUDS	2.931943	3.091536	2.822319	2.750533	2.704033	2.749012	2.667085	3.027545	2.805208	2.850209	Avg:A Wt:C2	2.839942		RSD=4.9	
	103	109	99.4	96.9	95.2	96.8	93.9	107	98.8	100	Org:N Dep:A				
D 62 d9-EtFOSE	125	124	132	131	122	122	130	118	120	130	Avg:A Wt:C2	125		RSD=4.0	
	99.8	98.8	105	105	97.2	97	104	94.3	95.8	104	Org:N Dep:A				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
33 EtFOSE	1.019154	0.880146	0.947863	0.797594	0.885335	0.885237	0.830966	0.912332	0.915327	0.822825	Avg:A Wt:C2	0.889678		RSD=7.3	
	115	98.9	107	89.6	99.5	99.5	93.4	103	103	92.5	Org:N Dep:A				
D 38 13C2_PFDoA	642	608	629	618	649	611	615	581	527	574	Avg:A Wt:C2	605		RSD=6.0	
	106	100	104	102	107	101	102	96	87	94.8	Org:N Dep:A				
D 59 d5-EtFOSA	56.9440	45.8870	49.7250	45.9440	51.5170	49.5820	48.3220	45.1220	48.6870	49.2150	Avg:A Wt:C2	49.0945		RSD=7.0	
	116	93.5	101	93.6	105	101	98.4	91.9	99.2	100	Org:N Dep:A				
11 PFDoA	1.122255	1.090672	1.055226	1.013845	0.920179	1.006988	0.970170	0.971516	1.049850	0.925985	Avg:A Wt:C2	1.012668		RSD=6.7	
	111	108	104	100	90.9	99.4	95.8	95.9	104	91.4	Org:N Dep:A				
4 10:2 FTS	2.657504	2.129589	2.424499	2.133487	2.295656	2.563159	2.273434	2.262591	2.254972	2.114073	Avg:A Wt:C2	2.310896		RSD=8.0	
	115	92.2	105	92.3	99.3	111	98.4	97.9	97.6	91.5	Org:N Dep:A				
27 EtFOSA	0.978856	1.295574	1.193062	1.167421	1.061009	1.057450	1.013774	1.110846	0.989496	1.057651	Avg:A Wt:C2	1.092514		RSD=9.2	
	89.6	119	109	107	97.1	96.8	92.8	102	90.6	96.8	Org:N Dep:A				
34 PFDOS	0.882871	0.792564	0.811512	0.741446	0.799524	0.771282	0.750037	0.832942	0.840539	0.805590	Avg:A Wt:C2	0.802831		RSD=5.3	
	110	98.7	101	92.4	99.6	96.1	93.4	104	105	100	Org:N Dep:A				
24 PFTrDA	1.006007	1.028828	1.025216	0.969996	0.922421	0.959307	0.948191	0.981902	1.057372	0.950146	Avg:A Wt:C2	0.984939		RSD=4.4	
	102	104	104	98.5	93.7	97.4	96.3	99.7	107	96.5	Org:N Dep:A				
D 42 13C2_PFTeDA	846	851	838	857	887	833	829	824	823	837	Avg:A Wt:C2	842		RSD=2.3	
	100	101	99.4	102	105	98.9	98.5	97.8	97.7	99.4	Org:N Dep:A				
23 PFTeDA	0.948194	0.918834	0.915903	0.848893	0.816283	0.837434	0.877354	0.845799	0.845161	0.810642	Avg:A Wt:C2	0.866450		RSD=5.4	
	109	106	106	98	94.2	96.7	101	97.6	97.5	93.6	Org:N Dep:A				
35 PFHxDA	0.804237	0.723303	0.688060	0.633582	0.618643	0.620417	0.626323	0.627488	0.601309	0.590532	Avg:A Wt:C2	0.653389		RSD=10.2	
	123	111	105	97	94.7	95	95.9	96	92	90.4	Org:N Dep:A				
D 40 13C2_PFHxDA	925	909	917	911	914	939	907	870	884	887	Avg:A Wt:C2	906		RSD=2.3	
	102	100	101	101	101	104	100	96.1	97.6	97.9	Org:N Dep:A				
36 PFODA	0.919372	0.930591	0.921761	0.856482	0.857857	0.845176	0.878381	0.894528	0.869450	0.878589	Avg:A Wt:C2	0.885219		RSD=3.4	
	104	105	104	96.8	96.9	95.5	99.2	101	98.2	99.3	Org:N Dep:A				

Pace Environmental Services, LLC  
Initial Calibration Ion Suppression Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No.Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector:

LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	663024	682347	669430	674242	726117	687130	648368	678382	640826	655979	0.26
* 39 13C2_PFHxA	695280	736017	745707	712364	752645	712399	707776	719360	727334	724179	1.01
* 41 13C2_PFOA	576963	627818	627559	603232	644116	588156	567038	571070	533004	567967	0.39
* 43 13C3_PFBA	610167	654143	654457	635147	665854	635025	621648	642378	606649	622072	0.48
* 48 13C4_PFOS	146687	165000	163672	161217	162438	153888	143306	163967	156417	162431	2.54

13C2\_PFDA ( (|655979 - 663024| / (655979 + 663024)) / 2) \* 100 = 0.27  
 13C2\_PFHxA ( (|724179 - 695280| / (724179 + 695280)) / 2) \* 100 = 1.02  
 13C2\_PFOA ( (|567967 - 576963| / (567967 + 576963)) / 2) \* 100 = 0.39  
 13C3\_PFBA ( (|622072 - 610167| / (622072 + 610167)) / 2) \* 100 = 0.48  
 13C4\_PFOS ( (|162431 - 146687| / (162431 + 146687)) / 2) \* 100 = 2.55

Pace Environmental Services, LLC  
Initial Calibration Response Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Quantitation Standards (\* - Istd) (D - Iso Dil Std)

- \* 37 13C2\_PFDA
- \* 39 13C2\_PFHxA
- \* 41 13C2\_PFOA
- \* 43 13C3\_PFBA
- \* 48 13C4\_PFOS
- D 38 13C2\_PFDoA
- D 40 13C2\_PFHxDA
- D 42 13C2\_PFTeDA
- D 44 13C3\_PFBS
- D 45 13C3\_PFHxS
- D 46 13C4\_PFBA
- D 47 13C4\_PFHpA
- D 49 13C5\_PFHxA
- D 50 13C5\_PFPeA
- D 51 13C6\_PFDA
- D 52 13C7\_PFUdA
- D 53 13C8\_PFOA
- D 54 13C8\_PFOS
- D 55 13C8\_PFOA
- D 56 13C9\_PFNA
- D 57 d3-MeFOA
- D 58 d3-MeFOA
- D 59 d5-EtFOA
- D 60 d5-EtFOA
- D 61 d7-MeFOE
- D 62 d9-EtFOE
- D 63 13C2\_4:2 FTS\_2
- D 64 13C2\_6:2 FTS\_2
- D 65 13C2\_8:2 FTS\_2
- D 66 13C3\_GenX

Column: 1

Detector:

LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	705996	694056	711668	706020	735341	690771	689746	665321	666524	670075	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	38517	73188	144069	332397	675182	1369790	3419782	6682046	9827144	13025794	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	706599	693821	717259	686828	728206	707649	673601	651811	663206	649876	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	38403	72456	144933	337453	686112	1355901	3416745	6790971	9839633	12792943	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	235006	232321	231160	237792	247575	234029	228127	218052	218164	220082	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	13706	24514	49459	112525	232775	473501	1192471	2315358	3471337	4687642	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	2503	4225	9159	22151	41896	90211	222209	448819	700424	908357	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	122625	121381	124113	116793	126464	117645	119040	119400	117401	125554	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	761735	745193	793257	746858	774364	730846	727937	706446	680161	703908	
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	40666	80701	147970	356914	717878	1427984	3598068	6775081	10314185	13671450	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	10176	18792	38924	88761	183101	361613	924332	1865025	2732060	3788032	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	19247	43113	83476	191755	370236	745633	1842769	3663382	5473439	7308102	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1380482	1353983	1350793	1360808	1412202	1335856	1322202	1285178	1232123	1284072	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	639145	592578	601216	615843	616003	620403	623058	580132	569084	609009	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	32330	65275	134445	326766	628754	1233089	3060279	6133989	8899240	11978188	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	8383	19133	34534	73859	170607	331697	806242	1618935	2357954	3091076	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	177230	180234	174343	177317	179294	169221	169479	174169	157718	153282	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	48271	111372	216274	512996	1019991	2039948	5088509	10167151	14639276	19754392	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	3089	4420	8374	18208	41503	78944	182873	371537	528953	722713	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	98338	91343	96089	105177	104623	99626	95449	88549	93776	89950	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	601280	628251	615324	612816	654941	599661	595770	534634	540395	535572	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	32105	70348	130181	302064	612741	1218307	2890986	5555679	8294244	10485888	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	6931	17169	34271	73941	152183	287358	749722	1404494	2040587	2590841	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155227	150912	157006	149008	154357	150186	155392	141411	140164	145625	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	9277	15498	36852	81969	158302	305729	810961	1590209	2401122	3340366	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42994	82559	157415	367390	731878	1474929	3648336	7162720	10223367	14144518	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	801379	740918	765207	769495	792377	746906	734704	718882	712934	726828	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23176	47230	102987	231609	452834	929018	2345953	4611854	7132279	9237909	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	303168	312712	315019	328216	330552	312166	301964	303539	302106	286198	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	14428	31936	63946	160438	320737	614554	1472381	2958864	4348697	5864519	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	2785	3801	7729	16908	36480	69164	178203	340548	513089	679202	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	6150	11308	25761	50413	112920	219044	517609	1065551	1527466	2041151	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	92668	98104	97937	96787	93314	87412	91612	89940	87098	92635	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	666066	671396	672326	685807	698114	682060	666513	634238	618084	638714	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	36060	64085	141266	336009	632287	1310983	3167782	6342880	9369624	11882751	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	723802	680663	716544	713379	762102	735121	728018	687461	696167	733711	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	4603	11651	24498	56256	109367	217003	550648	1110966	1599526	2232283	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	5203	10639	23887	50144	102196	214195	515140	1040398	1561930	1951749	



Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	36310	62546	123504	273549	608820	1167255	2851720	5844692	8350413	10456451	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	717593	678730	706396	710894	738335	659409	653728	618761	600812	556076	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7496	15290	28320	66323	136930	264743	645216	1178848	1739580	2255329	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	650844	670093	639465	625031	678701	643886	627270	592993	600565	591898	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	104257	100349	112543	110965	117292	107248	113389	98763	106887	110386	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5201	11964	21373	49699	97845	193445	488440	960536	1435117	1976969	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2586	7246	12774	27401	61867	117911	296904	568014	863864	1153715	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	50673	50885	52407	46102	54969	56560	54589	52261	58102	52621	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21436	43949	83484	193040	393178	777834	1952030	4032967	5555764	7819762	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	125143	123934	131865	131192	121851	121638	130009	118273	120117	129932	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6377	10908	24998	52319	107879	215357	540165	1079042	1649195	2138227	
D 38 13C2_PFD0A	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	641904	608304	628619	617850	649290	610527	614915	581218	526602	573941	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	56944	45887	49725	45944	51517	49582	48322	45122	48687	49215	
11 PFD0A	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	36019	66346	132667	313202	597463	1229587	2982859	5646628	8292794	10629213	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2374	4028	9156	19906	41301	86394	200776	392343	567999	755148	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2787	5945	11865	26818	54660	104861	244938	501236	722634	1041046	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6633	11578	24667	53473	119463	224258	564101	1140180	1710650	2271201	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32288	62584	128894	299656	598919	1171366	2915284	5706994	8352213	10906551	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	845523	850556	837660	856925	887372	833060	829396	823800	822708	837427	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	40086	78152	153443	363719	724347	1395266	3638371	6967694	10429810	13577068	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37182	65729	126217	288509	565232	1164830	2839296	5461937	7973247	10474146	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	924653	908734	917195	910723	913664	938748	906655	870445	883988	886840	
36 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	42505	84566	169087	390009	783793	1586814	3981944	7786374	11528747	15583360	

## Pace Environmental Services, LLC

## Initial Calibration RT Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg-RT	%Rsd RT
D 46 13C4_PFBFA	1.691	1.692	1.692	1.690	1.696	1.696	1.692	1.696	1.692	1.693	1.693	0.141
8 PFBA	1.698	1.699	1.699	1.696	1.696	1.696	1.692	1.696	1.699	1.699	1.697	0.109
D 50 13C5_PFPeA	2.066	2.067	2.067	2.062	2.072	2.072	2.067	2.062	2.067	2.067	2.066	0.179
21 PFPeA	2.066	2.067	2.067	2.072	2.072	2.072	2.067	2.072	2.067	2.067	2.068	0.152
D 44 13C3_PFBFS	2.119	2.120	2.120	2.125	2.125	2.125	2.120	2.125	2.120	2.120	2.121	0.151
7 PFBFS	2.119	2.120	2.120	2.125	2.125	2.125	2.120	2.125	2.120	2.120	2.121	0.151
1 4:2 FTS	2.370	2.398	2.389	2.388	2.388	2.388	2.389	2.388	2.380	2.389	2.386	0.295
D 63 13C2_4:2 FTS_2	2.388	2.389	2.389	2.379	2.388	2.388	2.380	2.379	2.389	2.380	2.384	0.187
D 49 13C5_PFHxA	2.424	2.425	2.425	2.423	2.423	2.423	2.425	2.423	2.424	2.425	2.424	0.022
15 PFHxA	2.424	2.425	2.425	2.423	2.423	2.423	2.425	2.423	2.424	2.425	2.424	0.022
22 PFPeS	2.450	2.451	2.451	2.459	2.459	2.459	2.451	2.450	2.451	2.451	2.453	0.158
28 GenX	2.539	2.532	2.532	2.530	2.539	2.539	2.532	2.530	2.531	2.532	2.533	0.159
D 66 13C3_GenX	2.531	2.532	2.532	2.530	2.539	2.530	2.532	2.530	2.531	2.532	2.531	0.107
D 47 13C4_PFHpA	2.790	2.791	2.782	2.790	2.790	2.781	2.782	2.781	2.791	2.782	2.786	0.168
13 PFHpA	2.790	2.782	2.782	2.790	2.790	2.790	2.782	2.781	2.782	2.782	2.785	0.152
14 PFHxS	2.809	2.800	2.800	2.799	2.799	2.799	2.800	2.799	2.800	2.801	2.800	0.097
D 45 13C3_PFHxS	2.799	2.800	2.800	2.799	2.799	2.799	2.800	2.799	2.800	2.801	2.800	0.019
29 ADONA	2.827	2.828	2.828	2.827	2.827	2.827	2.828	2.827	2.828	2.828	2.827	0.019
2 6:2 FTS	3.141	3.135	3.142	3.142	3.135	3.142	3.142	3.134	3.142	3.136	3.139	0.115
D 64 13C2_6:2 FTS_2	3.141	3.142	3.142	3.135	3.135	3.135	3.135	3.141	3.142	3.136	3.138	0.108
D 53 13C8_PFOA	3.168	3.169	3.162	3.162	3.169	3.162	3.162	3.161	3.169	3.162	3.164	0.102
20 PFOA	3.175	3.169	3.169	3.169	3.169	3.162	3.162	3.161	3.169	3.162	3.166	0.137
12 PFHpS	3.161	3.183	3.169	3.176	3.169	3.169	3.169	3.168	3.176	3.169	3.170	0.179
D 54 13C8_PFOS	3.551	3.545	3.545	3.545	3.545	3.537	3.545	3.543	3.545	3.537	3.543	0.122
18 PFOS	3.551	3.553	3.545	3.545	3.545	3.545	3.545	3.543	3.545	3.545	3.545	0.091
17 PFNA	3.559	3.553	3.553	3.553	3.545	3.545	3.545	3.551	3.553	3.545	3.549	0.139
D 56 13C9_PFNA	3.551	3.553	3.553	3.553	3.545	3.545	3.545	3.551	3.553	3.545	3.549	0.111
30 9Cl-PF3ONS	3.756	3.758	3.751	3.757	3.750	3.751	3.751	3.756	3.757	3.751	3.753	0.093
D 55 13C8_PFOSA	3.873	3.874	3.866	3.866	3.866	3.866	3.866	3.865	3.874	3.866	3.868	0.098
19 PFOSA	3.873	3.866	3.866	3.866	3.866	3.866	3.866	3.865	3.874	3.866	3.867	0.084
3 8:2 FTS	3.898	3.891	3.899	3.899	3.891	3.891	3.891	3.890	3.899	3.891	3.893	0.106
16 PFNS	3.898	3.899	3.899	3.891	3.891	3.891	3.891	3.890	3.891	3.883	3.891	0.128
D 65 13C2_8:2 FTS_2	3.898	3.899	3.891	3.891	3.891	3.891	3.891	3.890	3.899	3.891	3.892	0.097

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 51 13C6_PFDA	3.906	3.907	3.899	3.899	3.899	3.899	3.899	3.898	3.907	3.899	3.900	0.106
10 PFDA	3.914	3.899	3.899	3.899	3.899	3.899	3.899	3.898	3.907	3.899	3.900	0.140
D 58 d3-MeFOSAA	4.064	4.056	4.056	4.056	4.056	4.056	4.056	4.055	4.056	4.056	4.056	0.059
6 N-MeFOSAA	4.073	4.074	4.065	4.065	4.065	4.056	4.065	4.064	4.065	4.056	4.064	0.136
9 PFDS	4.206	4.198	4.198	4.207	4.198	4.198	4.198	4.197	4.198	4.188	4.198	0.127
25 PFUdA	4.227	4.218	4.218	4.218	4.217	4.217	4.218	4.216	4.217	4.207	4.217	0.107
D 60 d5-EtFOSAA	4.217	4.218	4.218	4.218	4.217	4.207	4.218	4.216	4.217	4.207	4.215	0.098
5 N-EtFOSAA	4.227	4.228	4.228	4.218	4.217	4.217	4.218	4.227	4.228	4.218	4.222	0.120
D 52 13C7_PFUdA	4.217	4.218	4.218	4.218	4.217	4.207	4.218	4.216	4.217	4.207	4.215	0.098
D 61 d7-MeFOSE	4.307	4.308	4.298	4.298	4.298	4.298	4.298	4.297	4.298	4.298	4.300	0.095
32 MeFOSE	4.317	4.308	4.308	4.308	4.308	4.308	4.308	4.307	4.308	4.308	4.309	0.067
26 MeFOSA	4.327	4.328	4.328	4.318	4.318	4.318	4.318	4.327	4.328	4.319	4.323	0.117
D 57 d3-MeFOSA	4.327	4.318	4.318	4.318	4.318	4.318	4.318	4.317	4.318	4.319	4.319	0.067
31 11Cl-PF3OUDS	4.366	4.358	4.358	4.358	4.357	4.358	4.358	4.356	4.358	4.358	4.358	0.067
D 62 d9-EtFOSE	4.473	4.465	4.465	4.465	4.465	4.465	4.465	4.464	4.465	4.456	4.464	0.091
33 EtFOSE	4.482	4.483	4.474	4.474	4.474	4.474	4.474	4.482	4.474	4.474	4.476	0.092
D 38 13C2_PFDoA	4.500	4.492	4.492	4.492	4.483	4.492	4.492	4.491	4.492	4.483	4.491	0.109
D 59 d5-EtFOSA	4.491	4.492	4.483	4.483	4.483	4.483	4.483	4.482	4.492	4.483	4.486	0.095
11 PFDoA	4.491	4.492	4.492	4.492	4.492	4.492	4.492	4.491	4.492	4.483	4.491	0.062
4 10:2 FTS	4.500	4.492	4.492	4.492	4.492	4.492	4.492	4.500	4.501	4.492	4.495	0.090
27 EtFOSA	4.491	4.492	4.492	4.492	4.492	4.492	4.492	4.491	4.492	4.492	4.492	0.009
34 PFDOS	4.710	4.711	4.704	4.704	4.704	4.704	4.704	4.703	4.704	4.697	4.704	0.082
24 PFTrDA	4.737	4.731	4.731	4.724	4.731	4.731	4.724	4.730	4.731	4.725	4.729	0.085
D 42 13C2_PFTeDA	4.956	4.948	4.948	4.948	4.948	4.948	4.948	4.947	4.948	4.940	4.948	0.072
23 PFTeDA	4.956	4.948	4.948	4.948	4.948	4.948	4.948	4.947	4.948	4.948	4.949	0.046
35 PFHxDA	5.342	5.335	5.334	5.334	5.334	5.334	5.334	5.333	5.334	5.334	5.335	0.048
D 40 13C2_PFHxDA	5.342	5.335	5.334	5.334	5.334	5.334	5.334	5.333	5.334	5.334	5.335	0.048
36 PFODA	5.702	5.696	5.696	5.696	5.689	5.689	5.689	5.694	5.689	5.688	5.692	0.081

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d  
 Injection Date: 17-Dec-2020 12:22:20 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 1 Auto Sampler: 1  
 Sample Info: ICAL 50\_SVLC-1219 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.691	1.696	0	705996	22	>100:1			1000.00	1017.94	96	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.696	1/1	38517	21	20:1			50.000	54.776		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.066	2.072	0	706599	17	>100:1			1000.00	1027.20	97	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.066	2.072	0/0	38403	16	59:1			50.000	54.056		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.119	2.125	0	235006	16	>100:1			1000.00	1020.74	94.9	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.119	2.125	0/0	13706	17	>100:1	Target = 3.50		44.200	49.466		
298.9 > 99	44	2.119	2.125		4060	14	48:1	3.37 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.459	0/0	10176	19	>100:1	Target = 3.10		46.900	49.918		
349 > 99	44	2.450	2.459		2967	19	24:1	3.42 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	1	122625	19	>100:1			5000.00	5065.41	97	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.370	2.388	-1/-2	2503	22	27:1	Target = 1.80		46.700	51.139		
327 > 81	63	2.370	2.388		1438	10	12:1	1.74 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	761735	19	>100:1			1000.00	1033.46	98.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	40666	24	62:1	Target = 18.34		50.000	54.074		
313 > 119	49	2.415	2.423		2205	22	16:1	18.44 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1380482	20	>100:1			5000.00	5182.88	97.8	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	1/1	19247	19	52:1	Target = 0.81		100.00	97.029		
285 > 185	66	2.539	2.539		23991	19	94:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	639145	20	>100:1			1000.00	1053.57	104	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	32330	17	49:1	Target = 3.70		50.000	48.766		
363 > 169	47	2.781	2.790		10229	15	75:1	3.16 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	177230	20	>100:1			1000.00	1035.05	98.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.809	2.799	1/0	8383	33	79:1	Target = 3.21	0.13	45.500	44.611		
399 > 99	45	2.790	2.799		2935	16	19:1	2.85 (1.60-4.81)	0.15				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	48271	18	>100:1	Target = 2.97		47.100	42.900		
377 > 85	45	2.827	2.827		17289	24	100:1	2.79 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.161	3.169	0/-1	6931	16	26:1	Target = 3.08		47.600	43.049		
449 > 99	45	3.175	3.169		2494	21	21:1	2.77 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	98338	23	>100:1			5000.00	5106.24	94	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.135	1/0	3089	28	44:1	Target = 1.80		47.400	49.056		
427 > 81	64	3.134	3.135		1552	17	31:1	1.99 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.168	3.169	0	601280	24	>100:1			1000.00	1015.91	91.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.175	3.169	1/1	32105	20	20:1	Target = 2.87		50.000	52.376		
413 > 169	53	3.175	3.169		11599	22	58:1	2.76 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.551	3.545	1	155227	21	>100:1			1000.00	1035.34	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.551	3.545	1/0	9277	48	30:1	Target = 3.84	0.23	46.400	50.434		
499 > 99	54	3.559	3.545		3481	27	28:1	2.66 (1.92-5.76)	0.07				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.756	3.750	1/0	23176	25	70:1			46.600	44.350		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.898	3.891	1/0	6150	24	52:1	Target = 3.07		48.000	51.772		
549 > 99	54	3.898	3.891		1020	15	3.3:1	6.02 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.206	4.198	1/0	5203	19		Target = 3.03		48.200	46.186		
599 > 99	54	4.187	4.198		1242	18	8.2:1	4.18 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.366	4.357	1/0	21436	22	>100:1			47.100	48.626		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.710	4.704	1/0	6633	16	98:1	Target = 3.33		48.400	53.225		
699 > 99	54	4.710	4.704		1409	22	15:1	4.70 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	801379	21	>100:1			1000.00	1067.14	101	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.559	3.545	1/0	42994	24	75:1	Target = 6.16		50.000	53.648		
463 > 169	56	3.551	3.545		7115	26	33:1	6.04 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.873	3.866	1	303168	20	>100:1			1000.00	979.34	91.7	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.873	3.866	1/0	14428	19	58:1			50.000	48.293		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.898	3.891	1	92668	18	>100:1			5000.00	4995.54	99.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.898	3.891	1/0	2785	29	16:1	Target = 1.95		47.900	59.183		
527 > 81	65	3.898	3.891		1414	20	11:1	1.96 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.500	4.492	1/0	2374	16	16:1	Target = 3.14		48.200	55.429		
627 > 80	65	4.500	4.492		979	16	16:1	2.42 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.906	3.899	1	666066	19	>100:1			1000.00	1004.12	95.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.914	3.899	1/0	36060	18	72:1	Target = 15.94		50.000	55.098		
513 > 169	51	3.922	3.899		1491	18	8.0:1	24.18 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.064	4.056	1	723802	17	>100:1			5000.00	5042.53	95	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.073	4.065	1/0	4603	27		Target = 1.33		50.000	41.395		M
570 > 483	58	4.073	4.065		4295	29	14:1	1.07 (0.66-1.99)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	0	717593	17	>100:1			5000.00	5402.96	97.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.227	4.217	1/1	7496	33		Target = 1.58	0.14	50.000	52.462		M
584 > 526	60	4.227	4.217		5152	35	13:1	1.45 (0.79-2.37)	0.38				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	0	650844	18	>100:1			1000.00	1029.69	95.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.227	4.217	1/1	36310	19	72:1	Target = 15.50		50.000	59.358		
563 > 169	52	4.227	4.217		1642	20	13:1	22.11 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.307	4.298	1	104257	15	>100:1			1000.00	963.49	88.9	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.317	4.308	1/0	5201	10	25:1			50.000	53.093		M
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.327	4.318	1	50673	15	>100:1			1000.00	957.60	92.2	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.318	1/0	2586	20	7.0:1	Target = 1.12		50.000	45.234		
512 > 219	57	4.317	4.318		2260	18	21:1	1.14 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.473	4.465	1	125143	16	>100:1			1000.00	997.99	103	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.474	1/0	6377	19	26:1			50.000	57.277		
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.500	4.483	2	641904	18	>100:1			1000.00	1060.44	98.9	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													
613 > 569	38	4.491	4.492	0/-2	36019	16	9.9:1	Target = 10.85		50.000	55.411		
613 > 169	38	4.491	4.492		2744	24		13.12 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.737	4.731	1/-1	32288	20	>100:1	Target = 8.37		50.000	51.070		
663 > 169	38	4.730	4.731		3676	19	66:1	8.78 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.491	4.483	1	56944	16	>100:1			1000.00	1159.89	111	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.492	0/-1	2787	21	18:1	Target = 1.03		50.000	44.798		
526 > 219	59	4.491	4.492		2297	18	28:1	1.21 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.956	4.948	1	845523	19	>100:1			1000.00	1003.66	95.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.956	4.948	1/0	40086	19	>100:1	Target = 12.11		50.000	54.717		
713 > 169	42	4.956	4.948		2844	15	47:1	14.09 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.342	5.334	1	924653	18	>100:1			1000.00	1020.40	101	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.342	5.334	1/0	37182	17	12:1	Target = 11.48		50.000	61.543		
813 > 269	40	5.334	5.334		2891	14	>100:1	12.86 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.702	5.689	1/0	42505	24	>100:1	Target = 13.88		50.000	51.929		
913 > 319	40	5.702	5.689		3191	25	85:1	13.32 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.906	3.899	1	663024	19	>100:1					91.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	695280	19	>100:1					92.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.168	3.169	0	576963	25	>100:1					89.6	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.691	1.696	0	610167	22	>100:1					91.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.551	3.545	1	146687	21						90.3	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

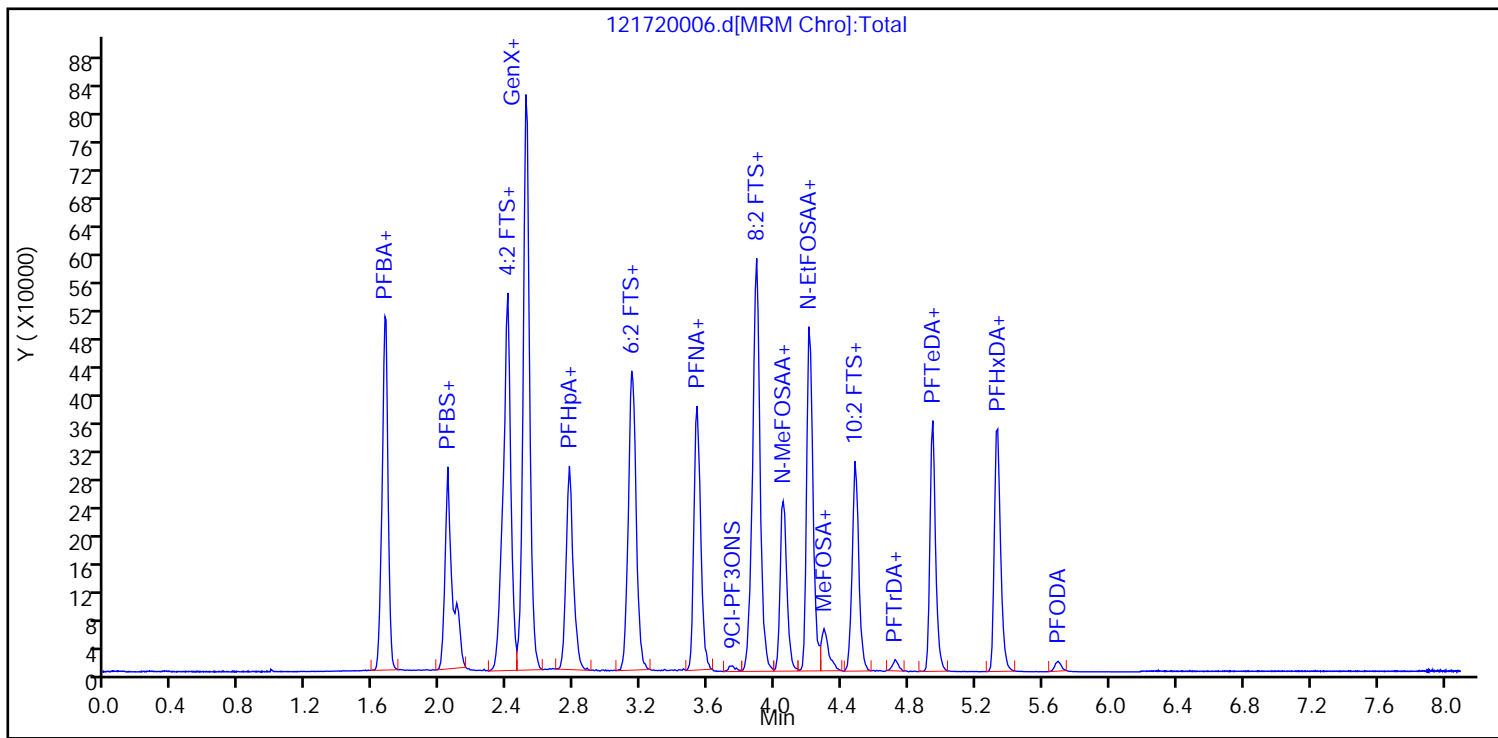
Client ID:

Lab ID: ICAL 50\_SVLC-1219

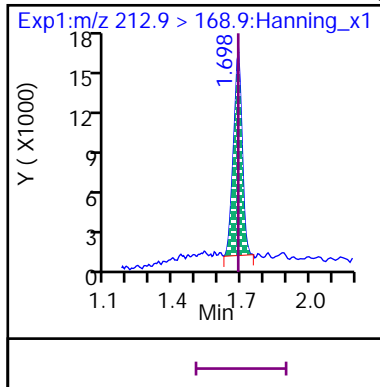
Sample Info: ICAL 50\_SVLC-1219

Dil. Factor: 1

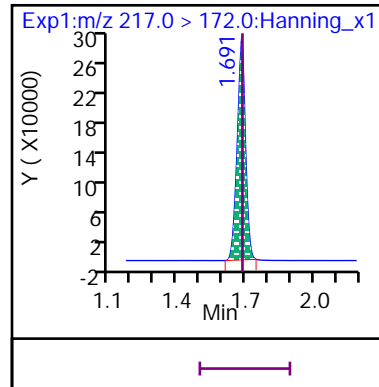
Operator: Stephen E. Somerville



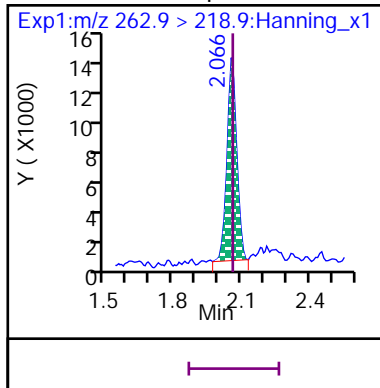
8 Perfluoro-n-butanoic acid (PFBA)



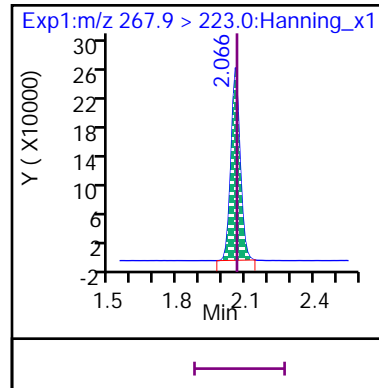
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

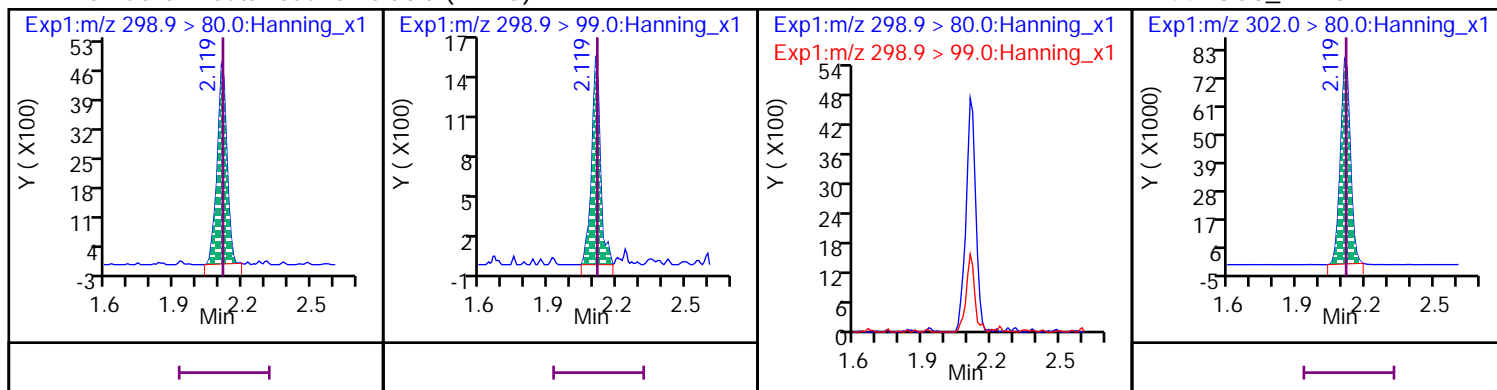


D 50 13C5\_PFPeA



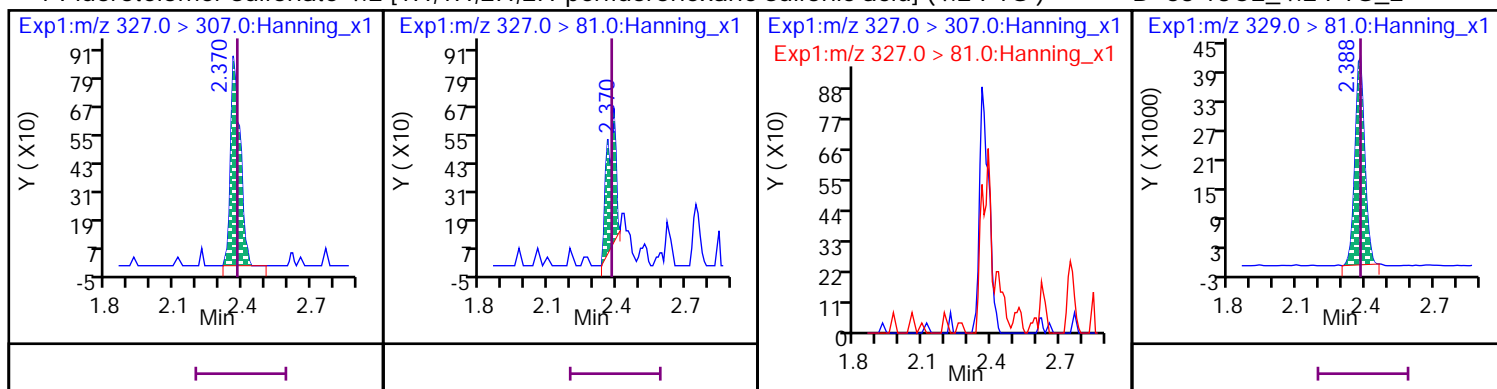
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



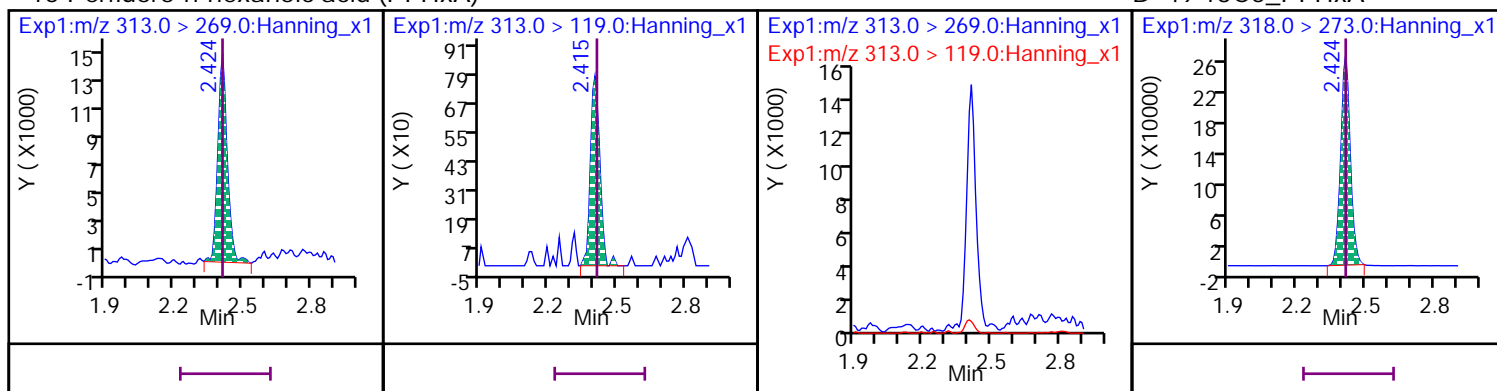
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



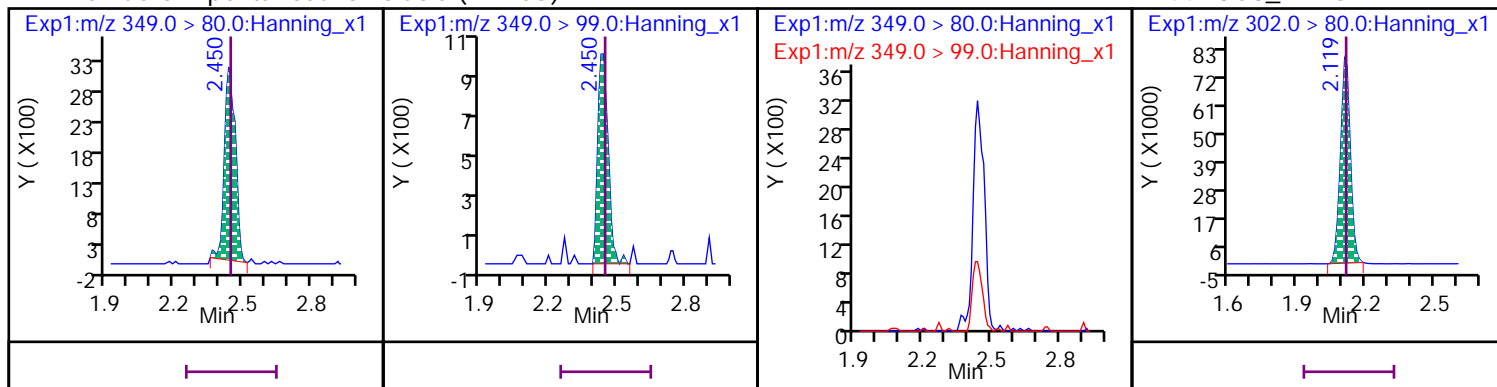
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



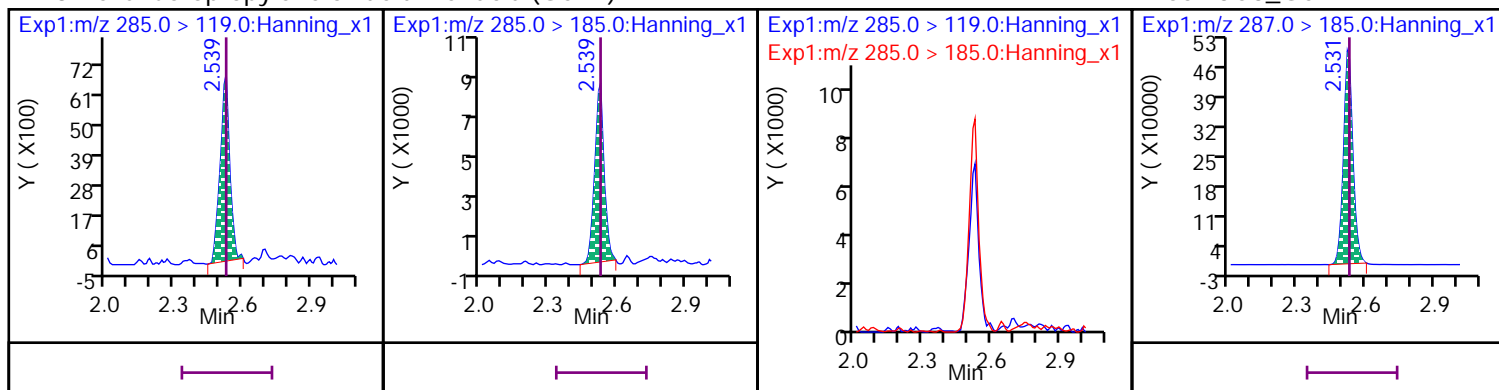
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



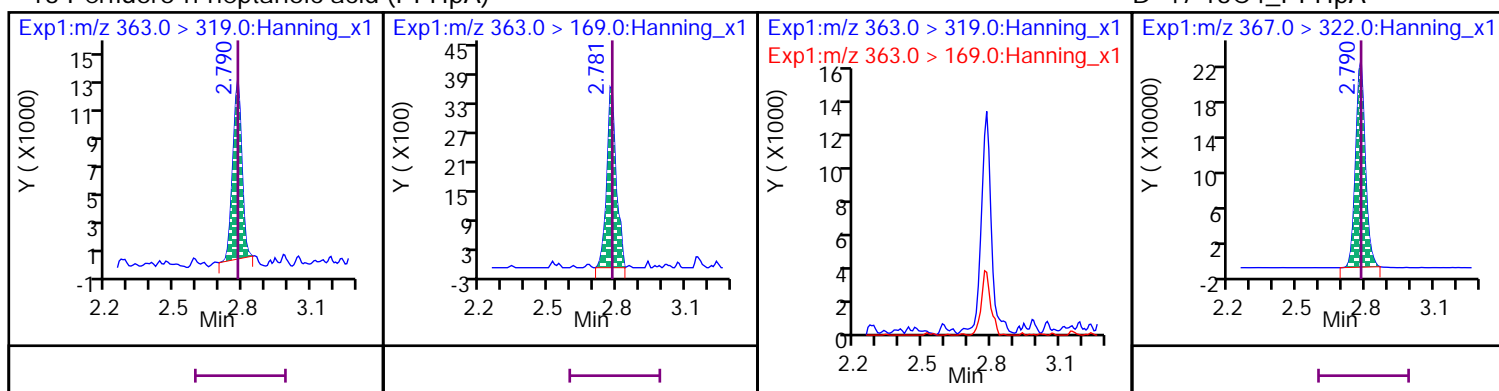
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



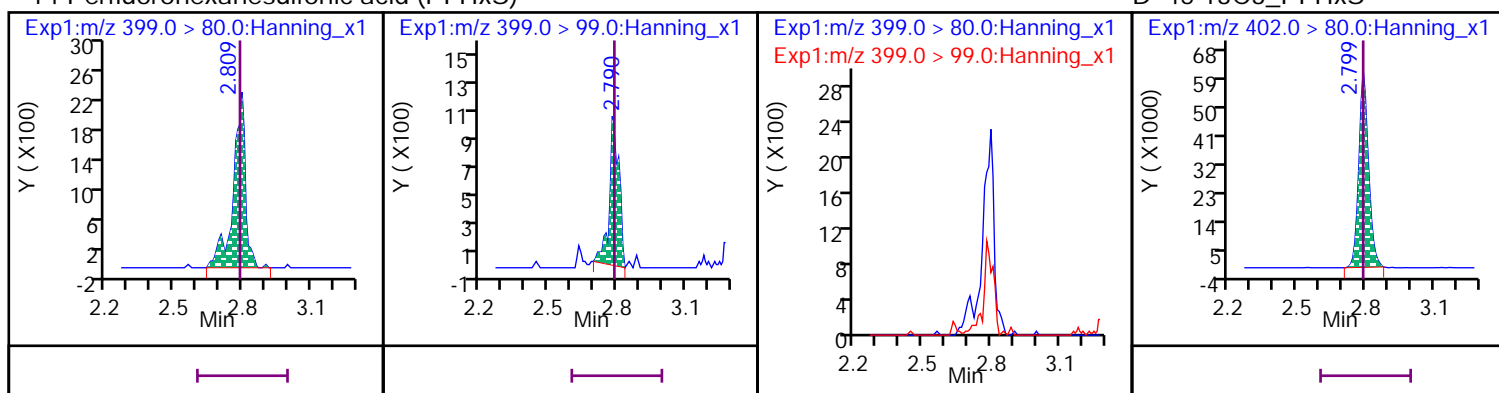
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



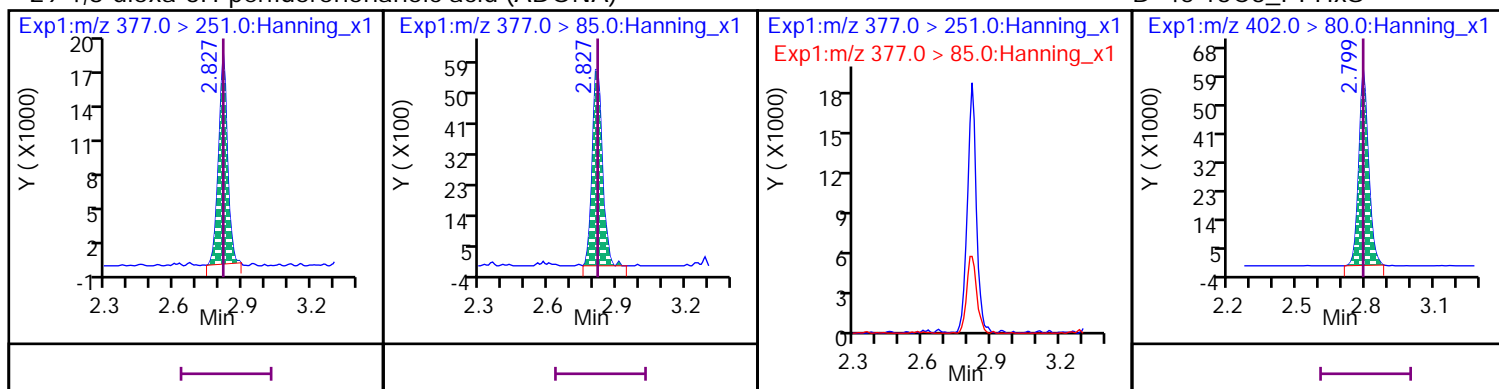
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



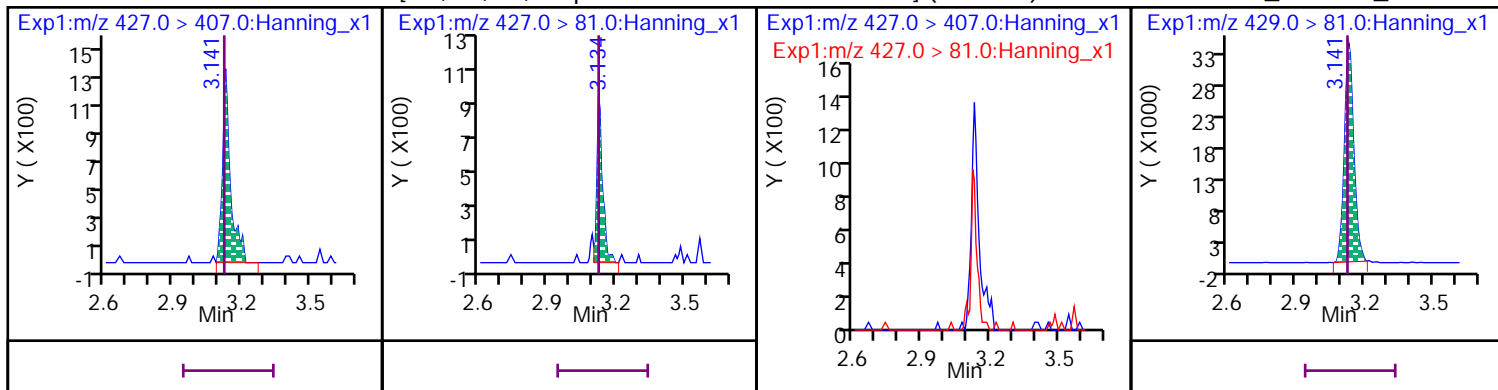
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



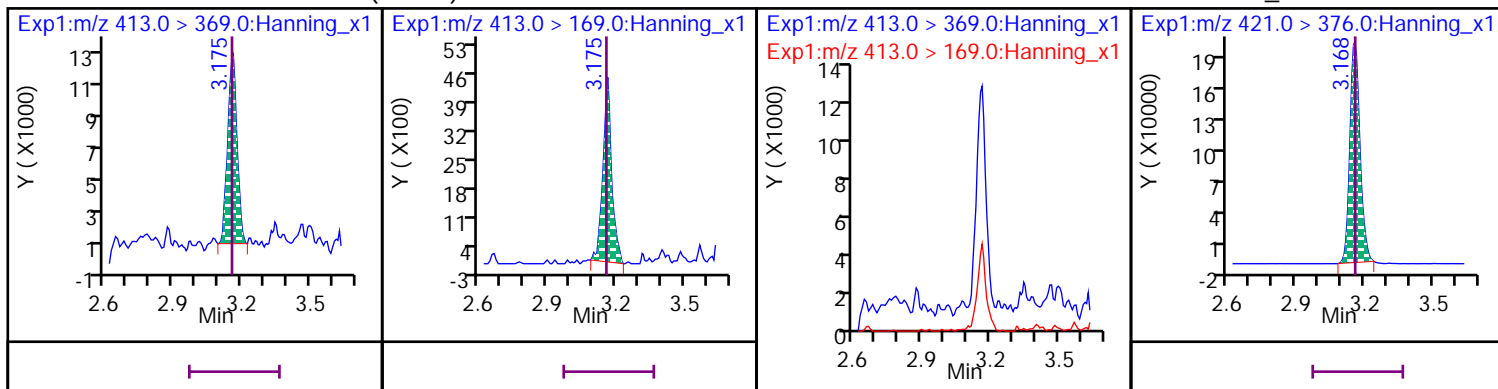
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



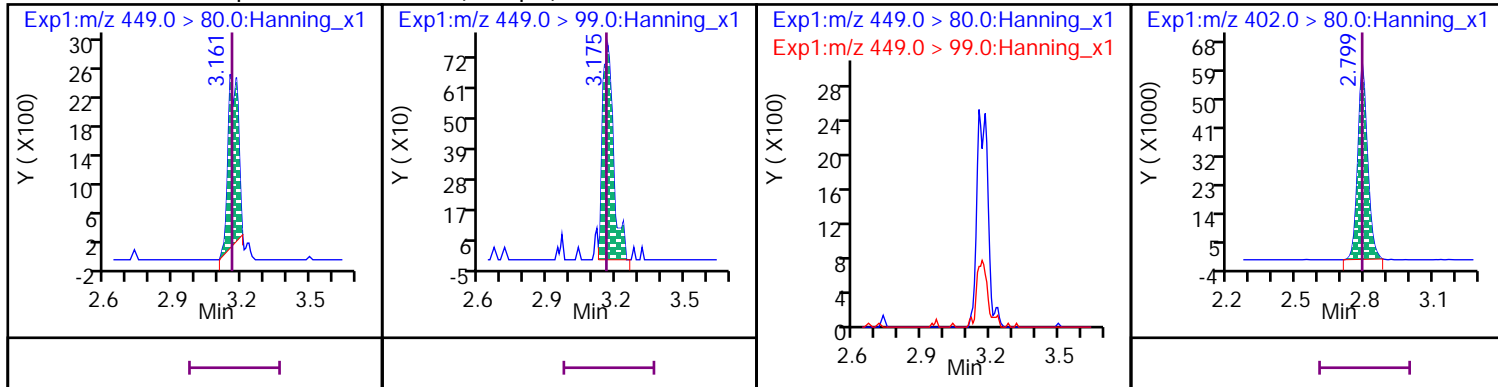
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



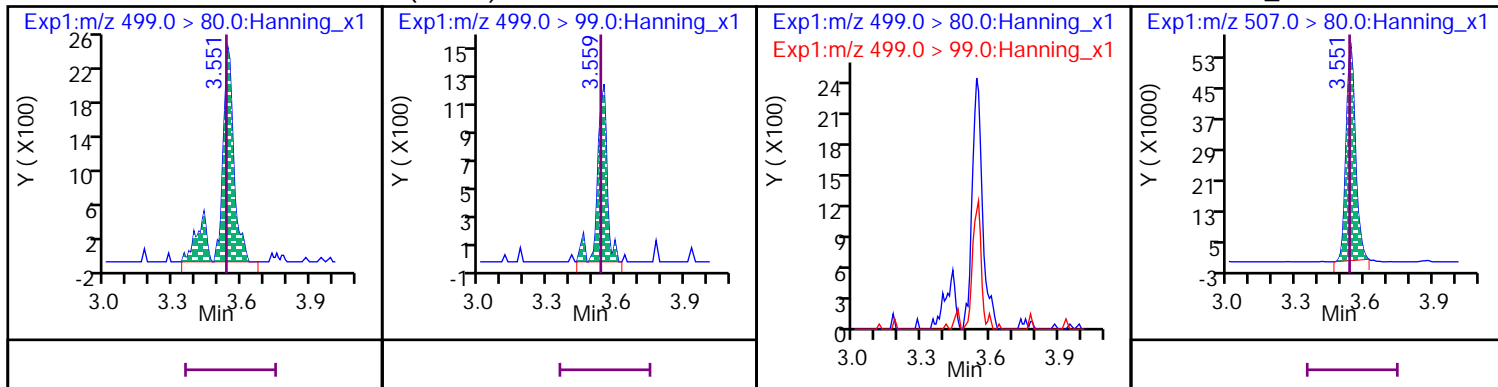
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



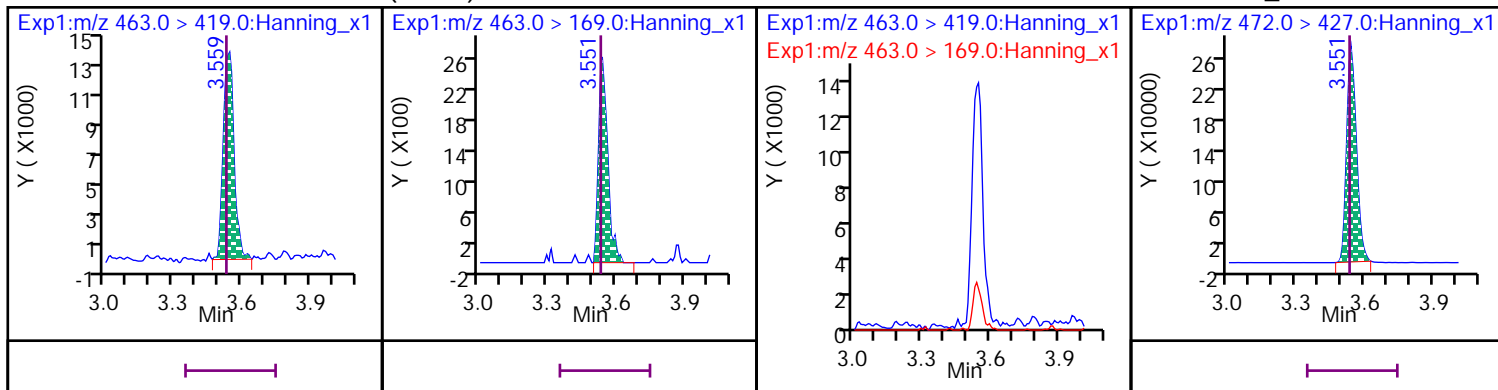
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



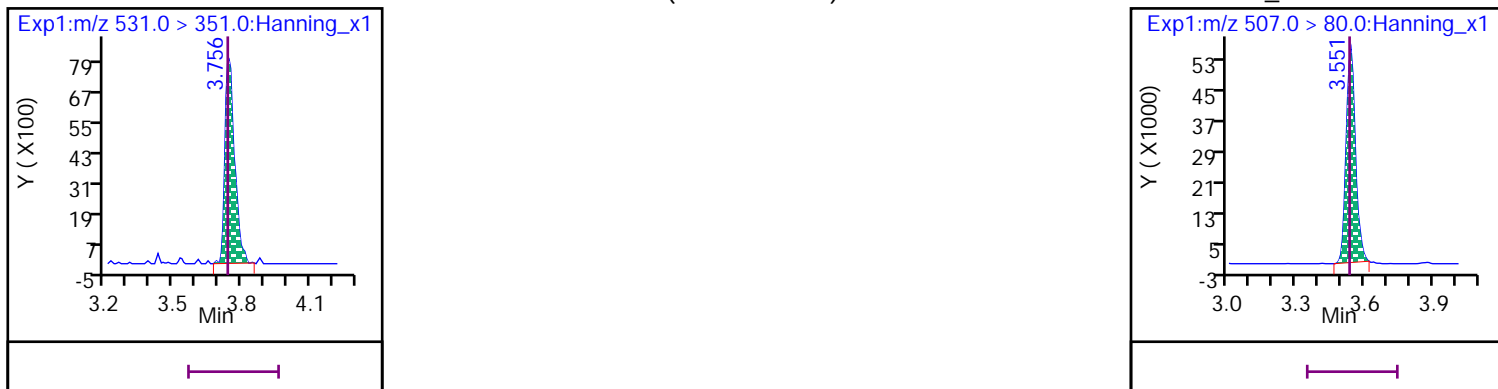
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



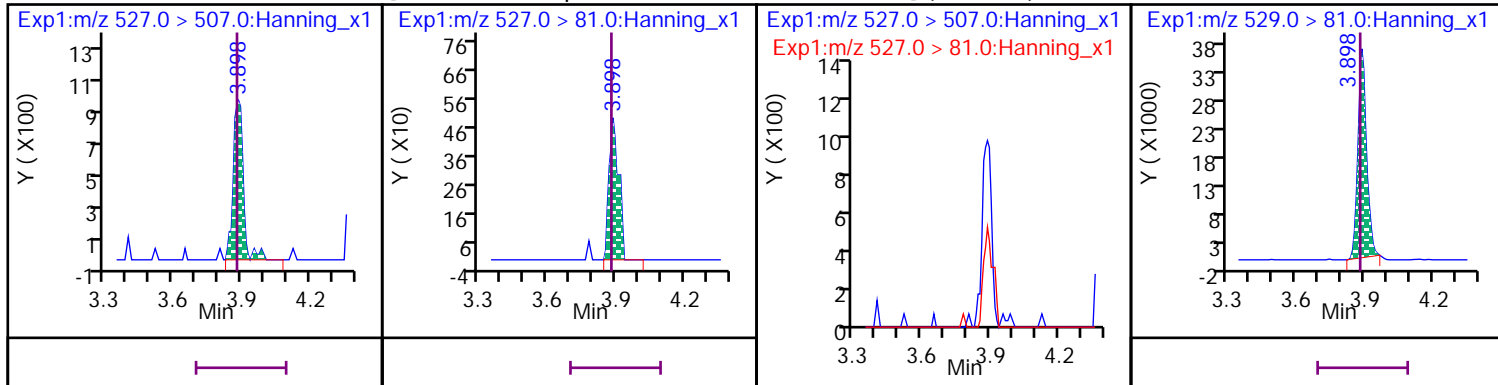
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



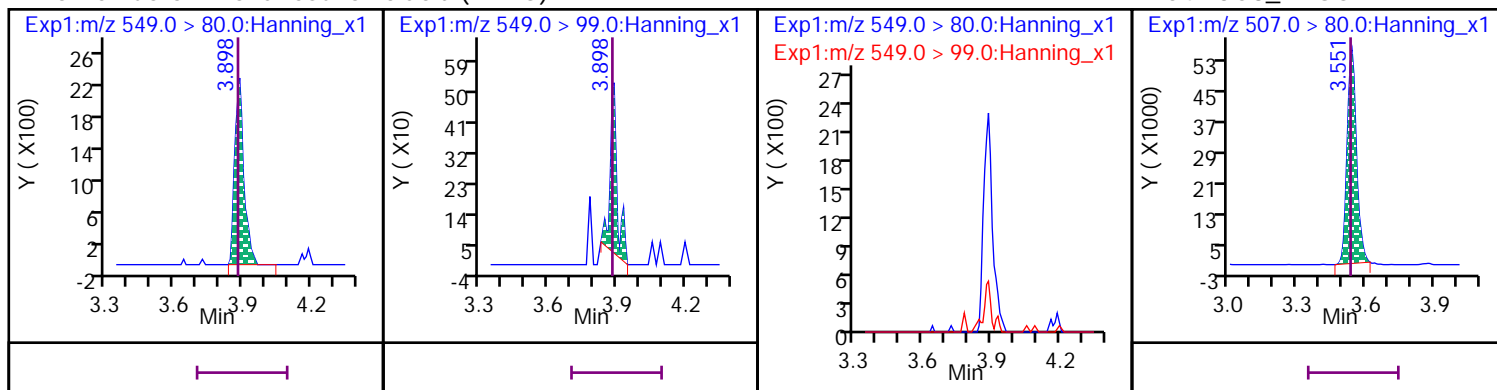
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



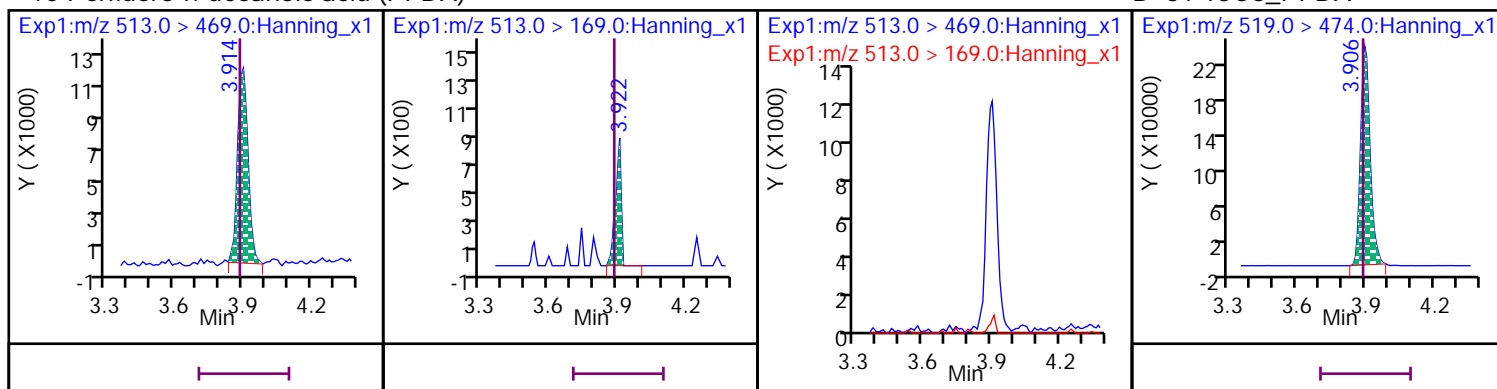
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



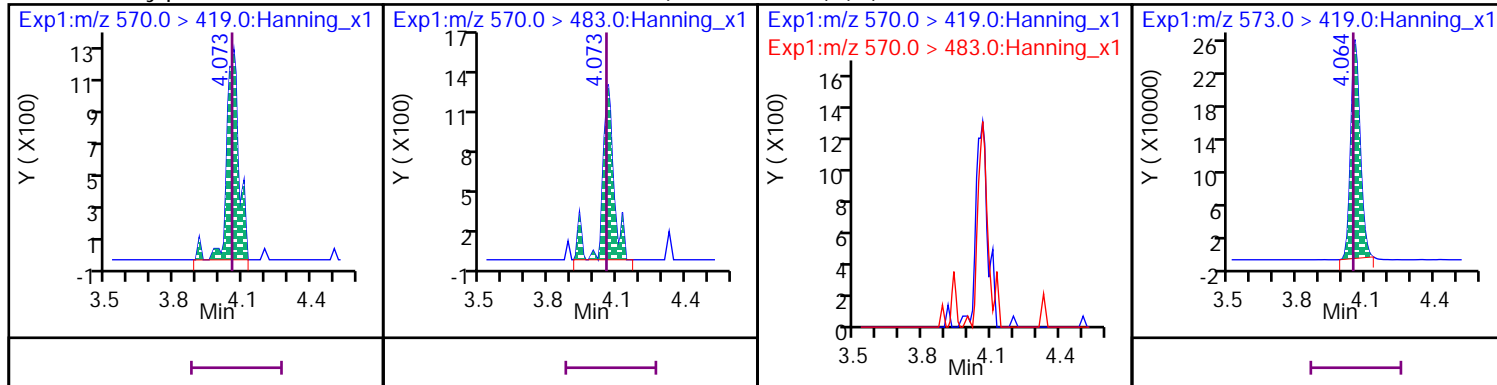
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



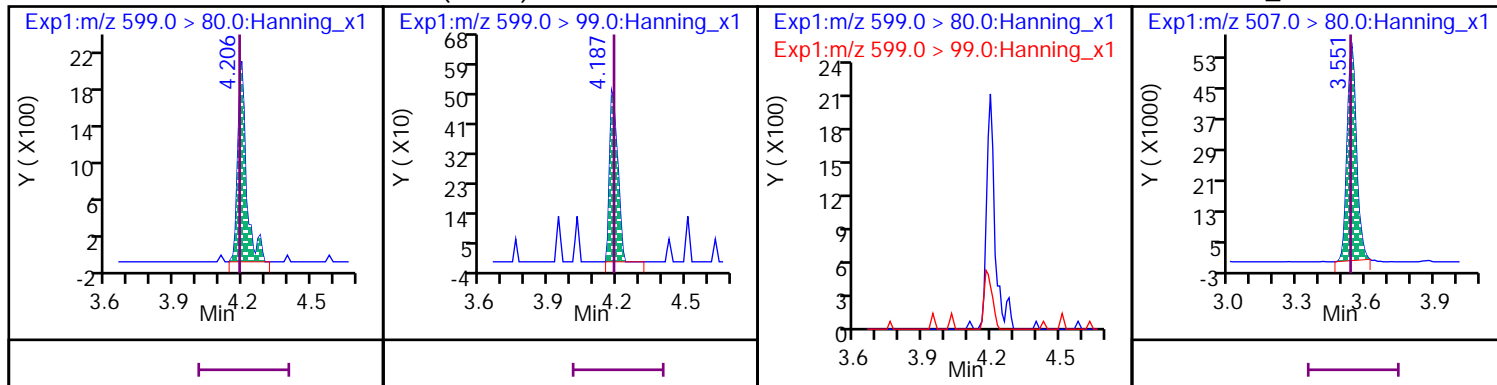
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



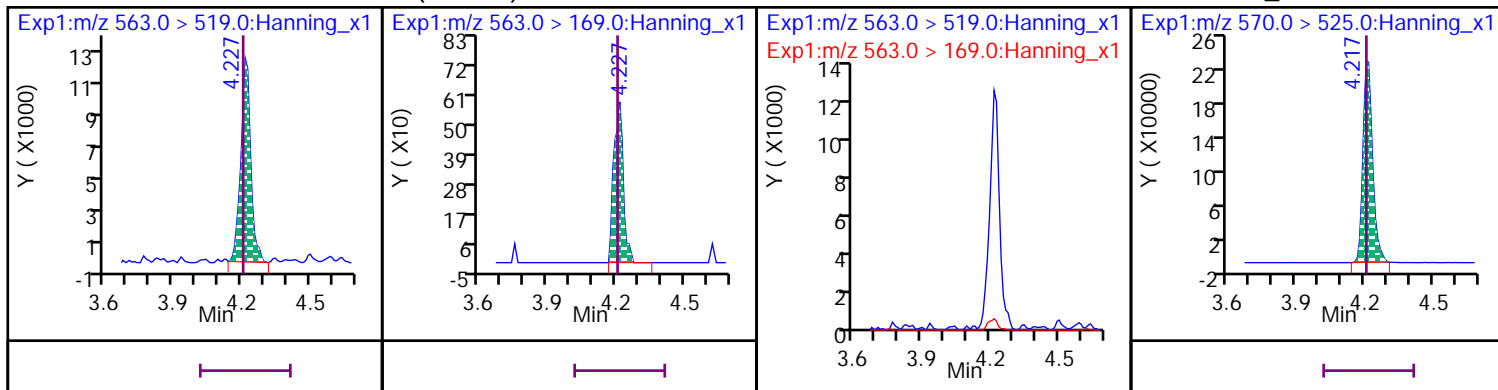
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



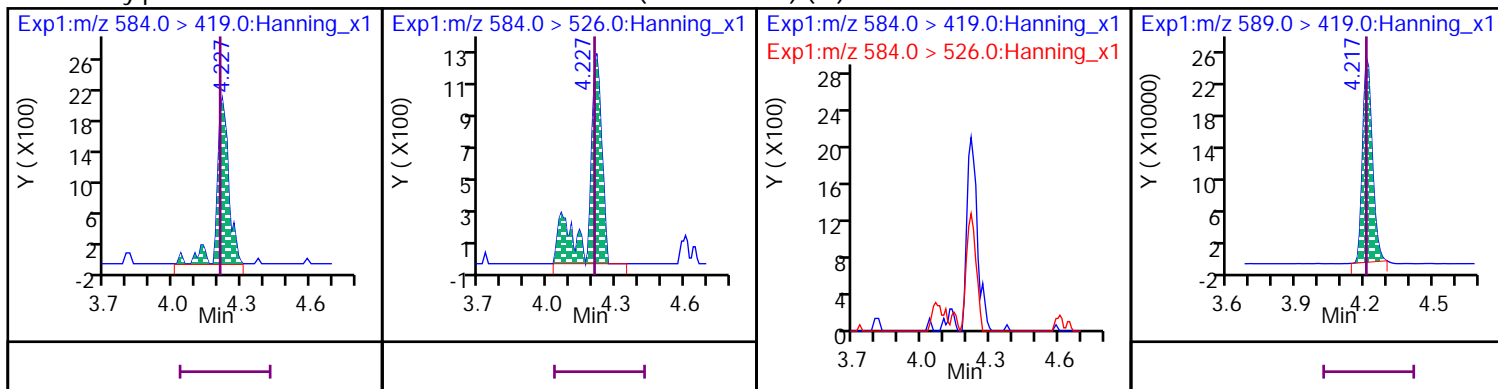
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



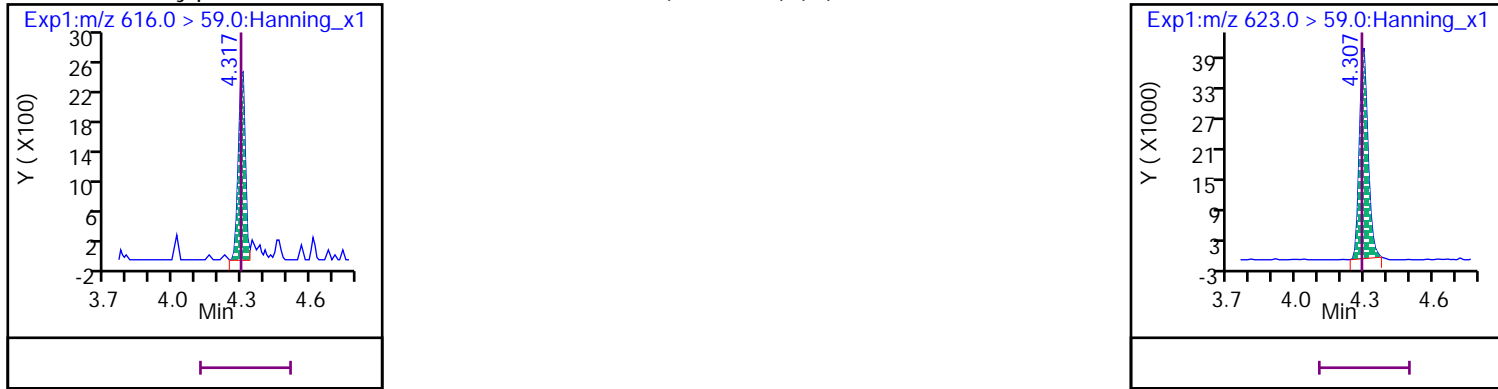
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



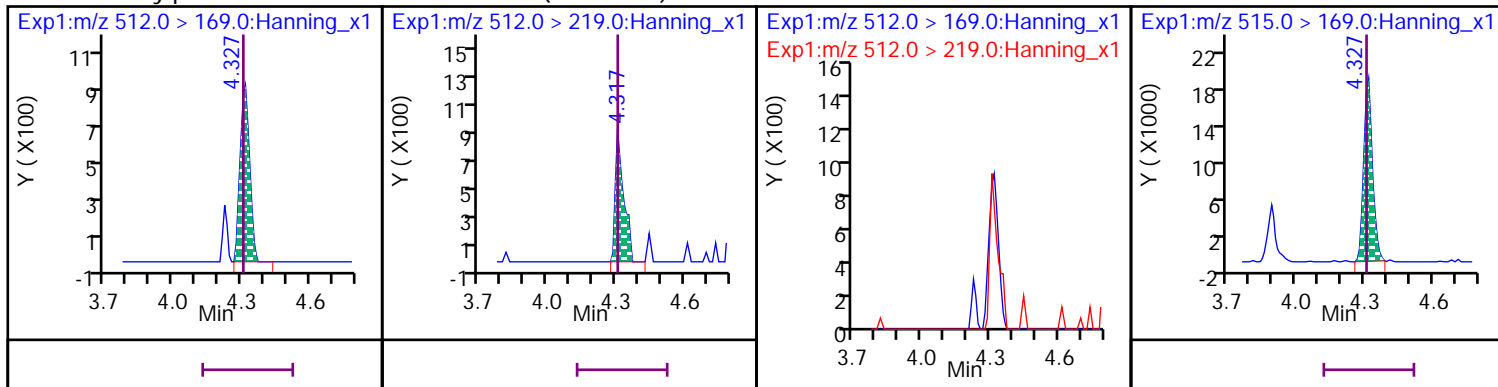
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (M)

D 61 d7-MeFOSE



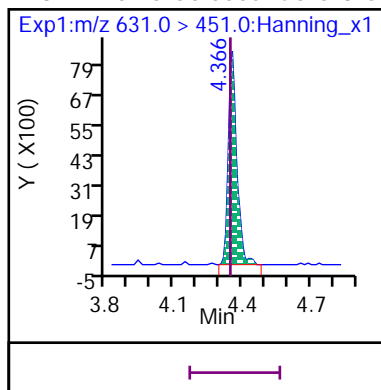
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

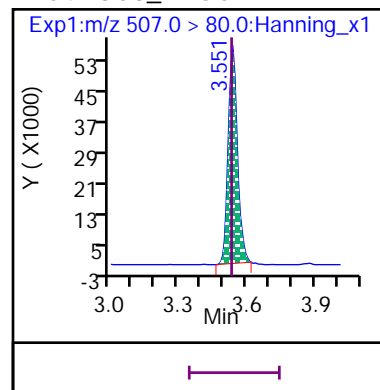




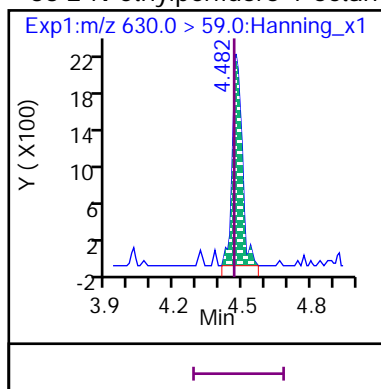
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



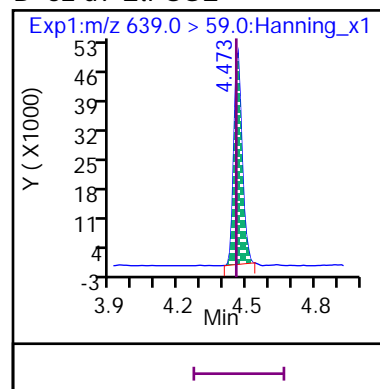
D 54 13C8\_PFOS



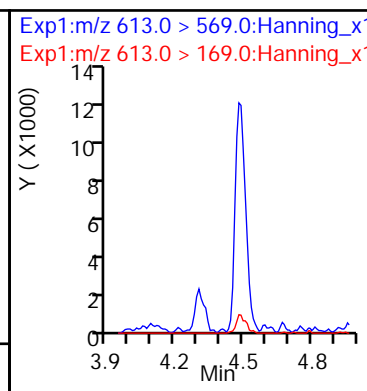
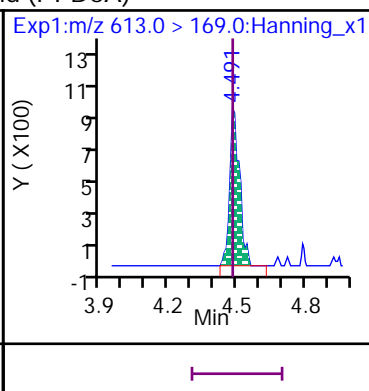
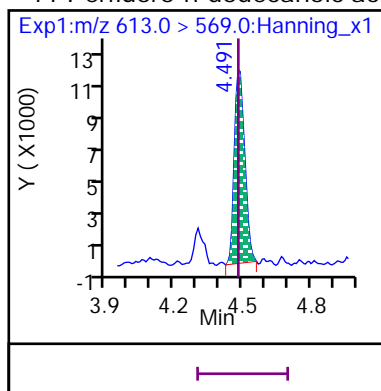
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



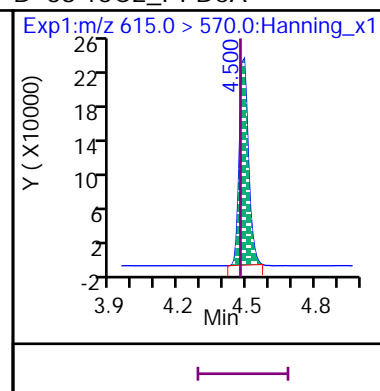
D 62 d9-EtFOSE



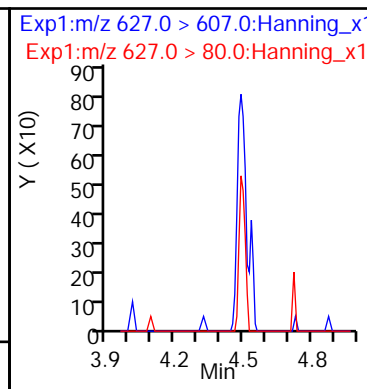
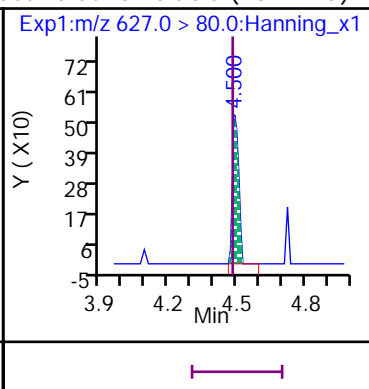
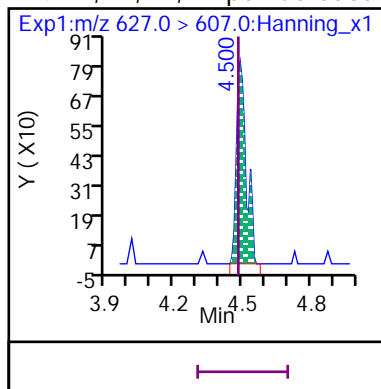
11 Perfluoro-n-dodecanoic acid (PFDoA)



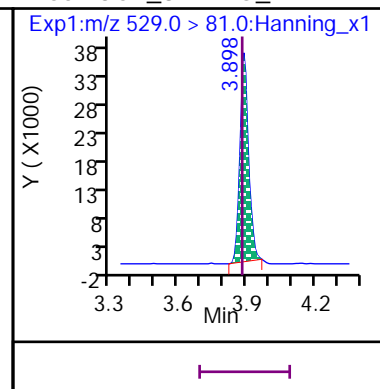
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

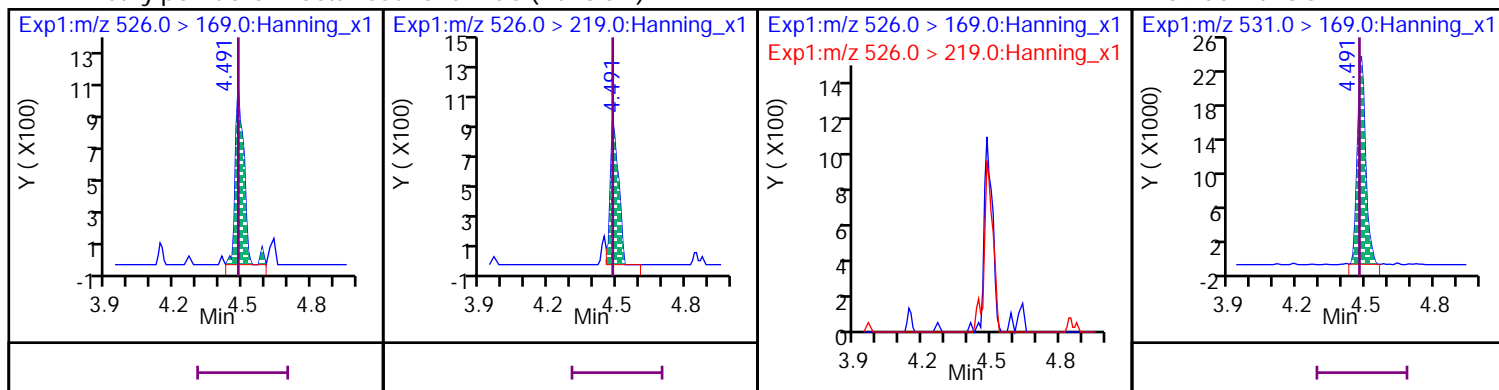


D 65 13C2\_8:2 FTS\_2



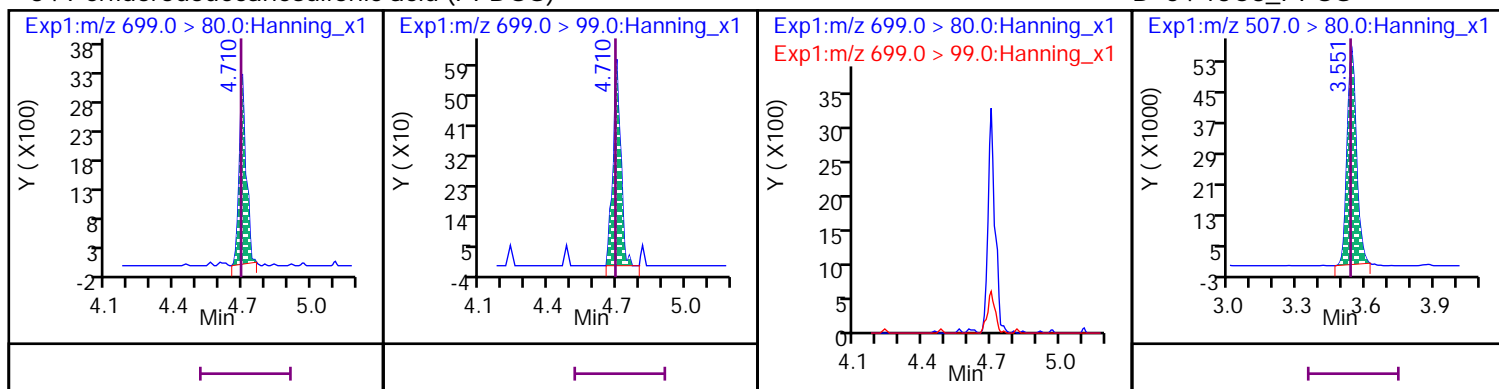
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



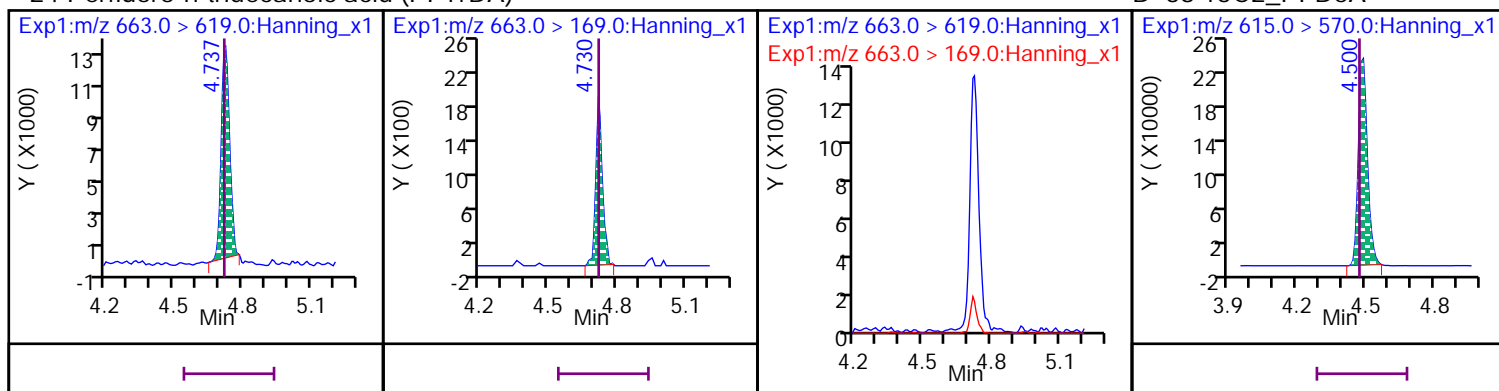
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



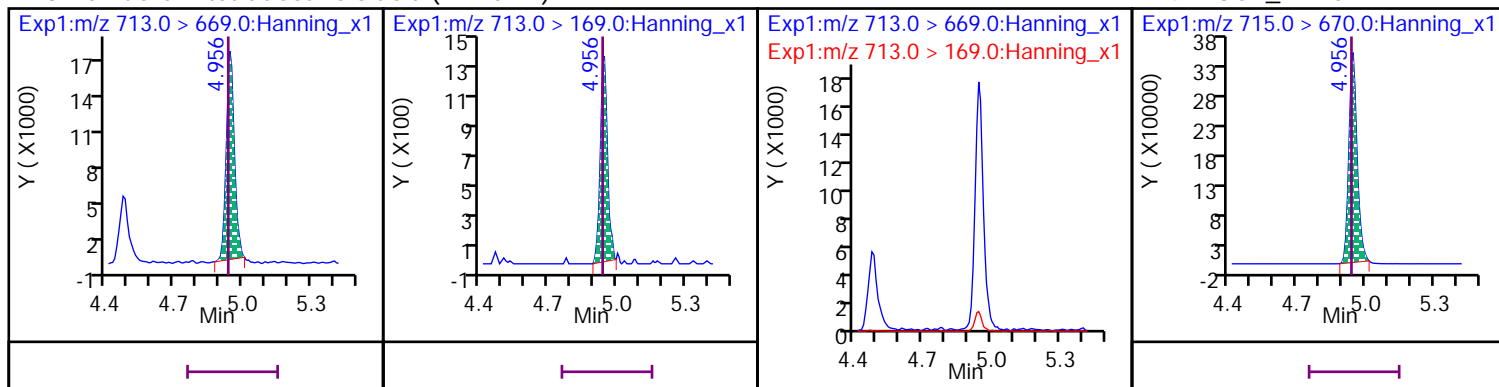
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



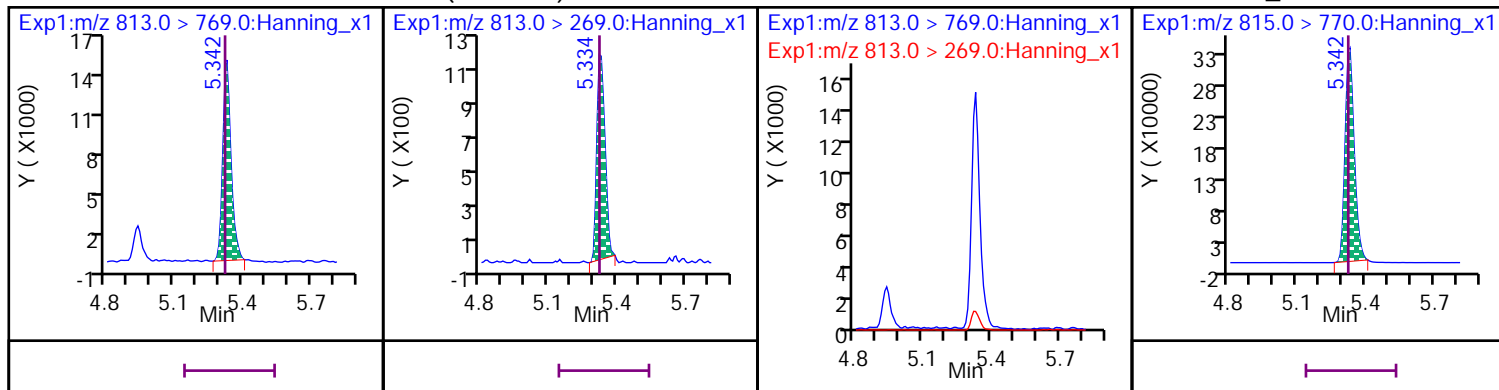
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



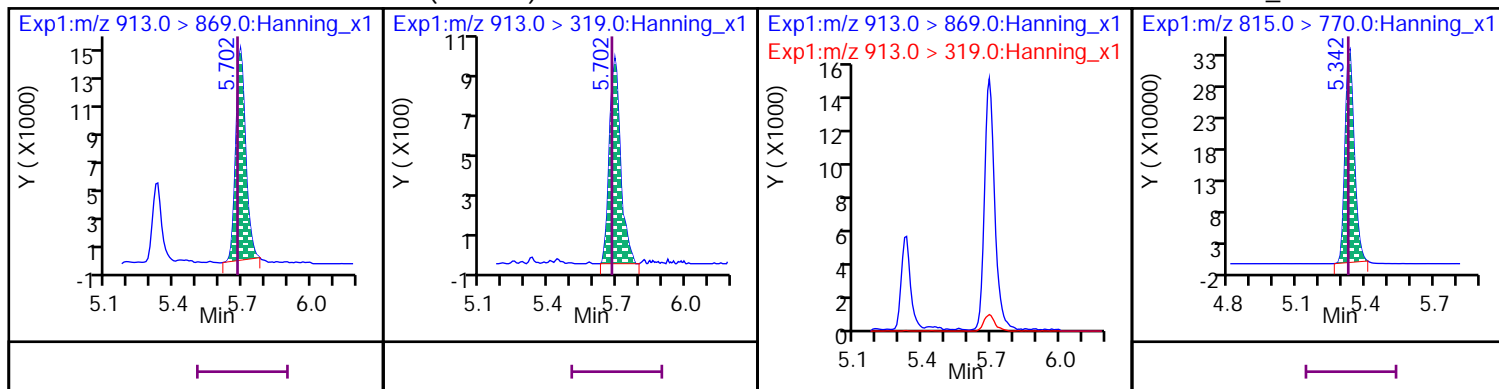
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

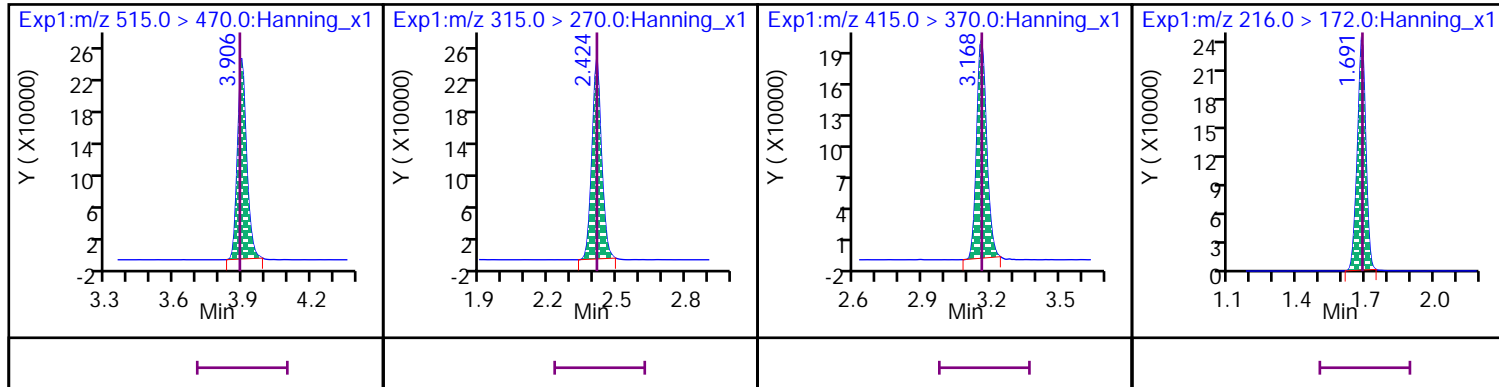


\* 37 13C2\_PFDA

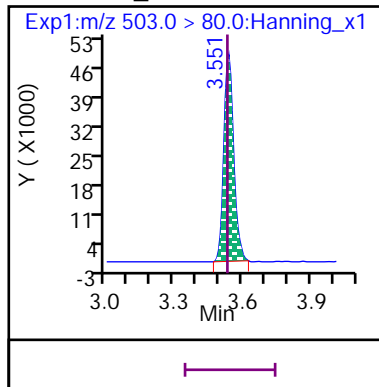
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

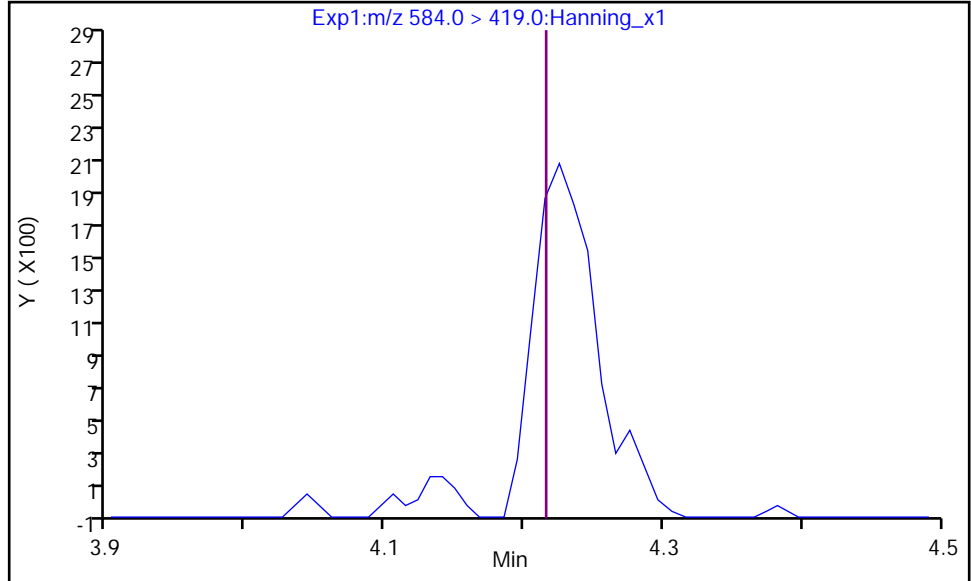
Dil. Factor: 1

Operator: Stephen E. Somerville

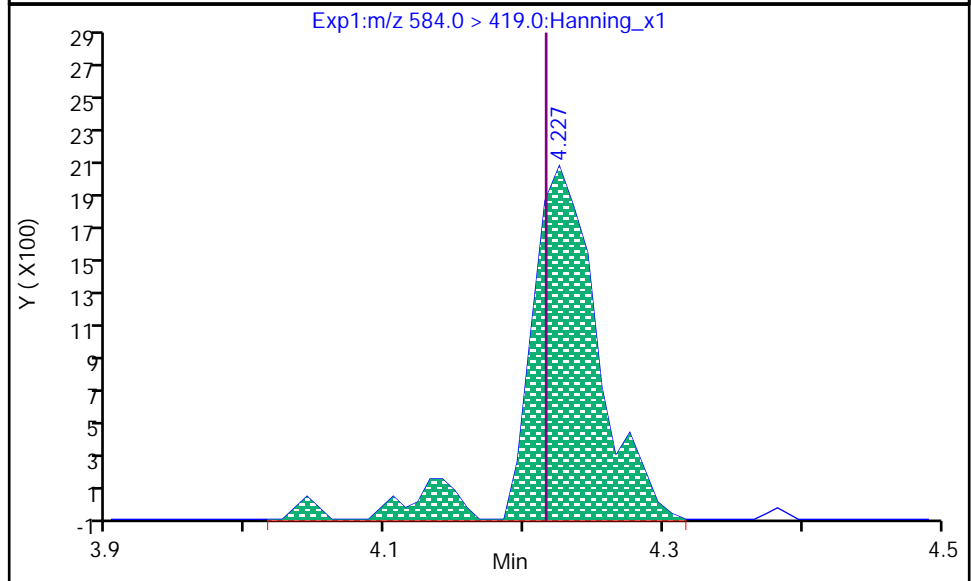
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.227  
Area: 7594  
Amount: 54.109  
Amount Units: ng/L



RT: 4.227  
Area: 7496  
Amount: 52.462  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:33

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

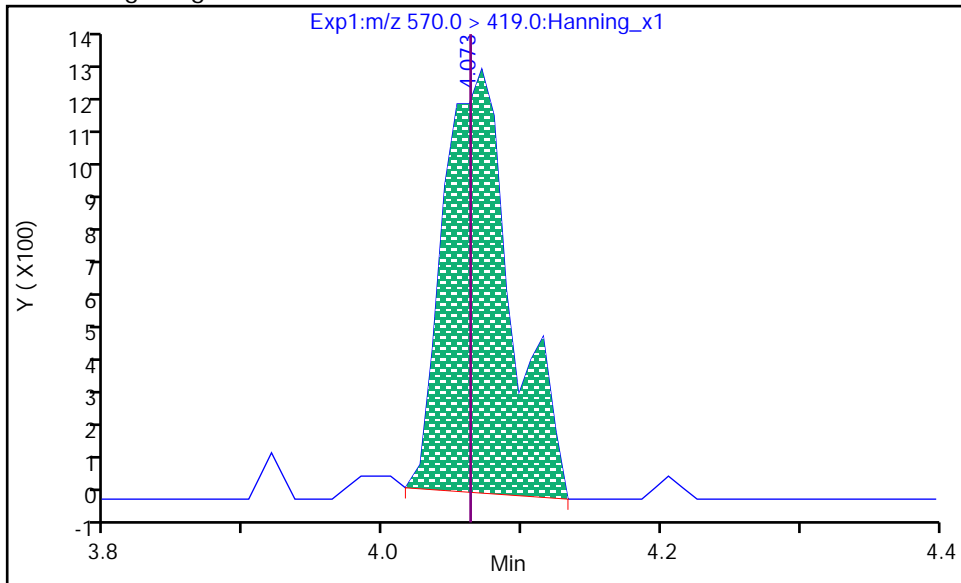
Dil. Factor: 1

Operator: Stephen E. Somerville

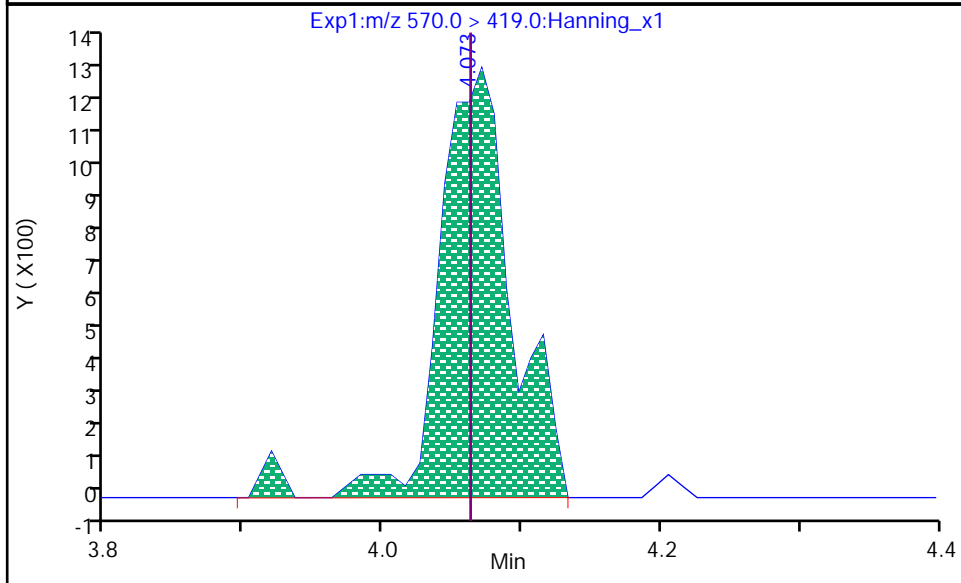
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.073  
Area: 4189  
Amount: 38.580  
Amount Units: ng/L

Processing Integration Results



RT: 4.073  
Area: 4603  
Amount: 41.395  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:01

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

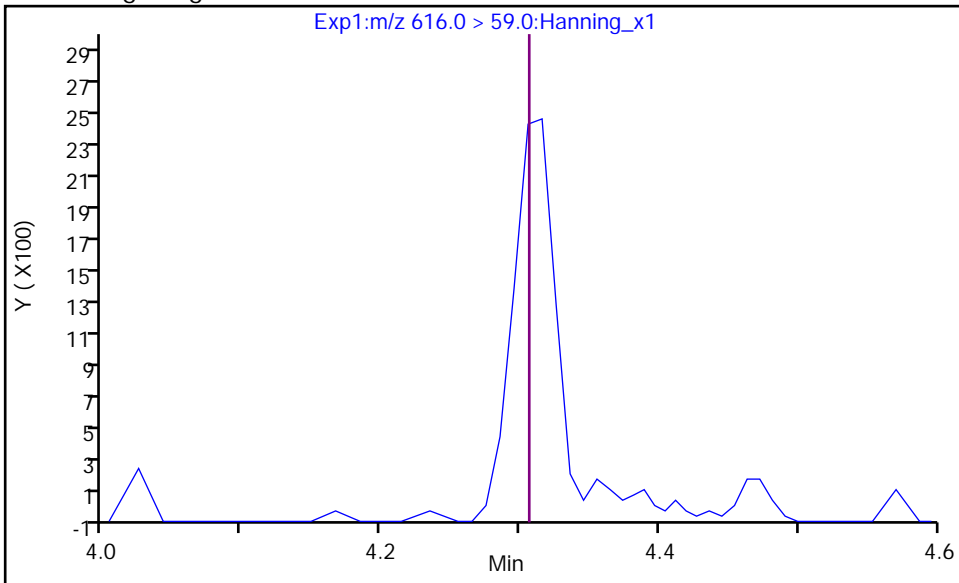
Dil. Factor: 1

Operator: Stephen E. Somerville

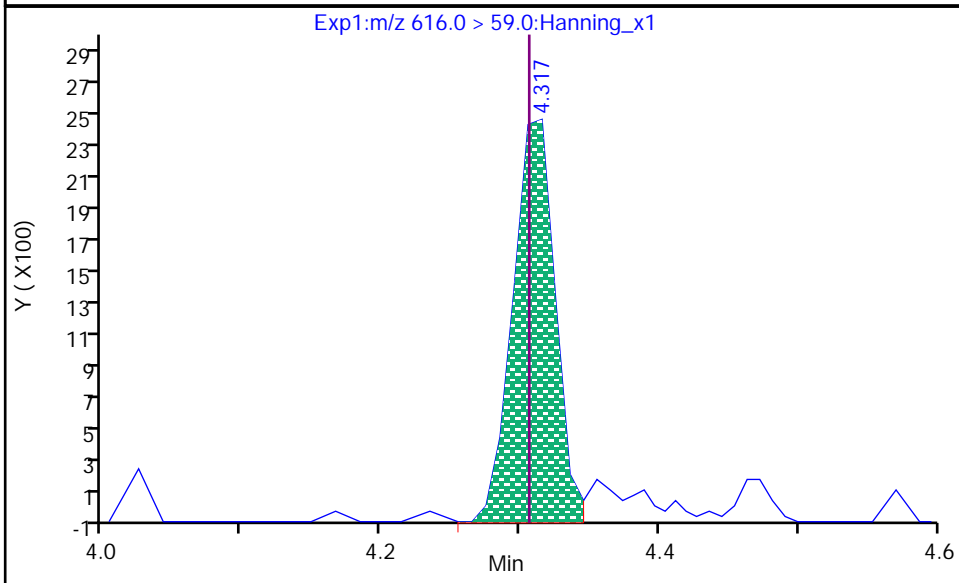
32 MeFOSE, CAS: 24448-09-7

Processing Integration Results

Not Detected  
Expected RT: 4.308  
RT Window: 4.117-4.517



RT: 4.317  
Area: 5201  
Amount: 53.093  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:15:27

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d  
Injection Date: 17-Dec-2020 12:32:59 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 2 Auto Sampler: 2  
Sample Info: ICAL 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	694056	22	>100:1			1000.00	1000.73	94.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	73188	20	42:1			100.00	105.87		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	693821	17	>100:1			1000.00	1008.63	95.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	72456	15	>100:1			100.00	103.87		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	232321	16	>100:1			1000.00	1009.08	93.8	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	24514	14	>100:1	Target = 3.50		88.400	89.495		
298.9 > 99	44	2.130	2.125		7283	15	47:1	3.36 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	18792	25	>100:1	Target = 3.10		93.800	93.248		
349 > 99	44	2.451	2.459		6650	26	30:1	2.82 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	121381	19	>100:1			5000.00	5014.02	96	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.398	2.388	1/0	4225	28	29:1	Target = 1.80		93.400	87.206		
327 > 81	63	2.380	2.388		3324	26	20:1	1.27 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	745193	19	>100:1			1000.00	1011.02	96.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	80701	20	>100:1	Target = 18.34		100.00	109.69		
313 > 119	49	2.425	2.423		4029	13	28:1	20.03 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1353983	20	>100:1			5000.00	5083.40	95.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	43113	25	>100:1	Target = 0.81		200.00	221.60		
285 > 185	66	2.532	2.539		49305	18	>100:1	0.87 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.791	2.790	1	592578	20	>100:1			1000.00	976.81	96.2	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/-1	65275	19	98:1	Target = 3.70		100.00	106.20		
363 > 169	47	2.791	2.790		16992	19	>100:1	3.84 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	180234	20				1000.00	1052.59	101	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	19133	25	89:1	Target = 3.21	0.07	91.000	100.12		
399 > 99	45	2.800	2.799		5512	22	55:1	3.47 (1.60-4.81)	0.07				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	111372	21	>100:1	Target = 2.97		94.200	97.330		
377 > 85	45	2.828	2.827		35923	20	>100:1	3.10 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.183	3.169	1/0	17169	24		Target = 3.08		95.200	104.86		
449 > 99	45	3.169	3.169		5002	42	25:1	3.43 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	91343	20	>100:1			5000.00	4743.02	87.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.135	1/0	4420	19	58:1	Target = 1.80		94.800	91.265		
427 > 81	64	3.142	3.135		2609	24	16:1	1.69 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	1	628251	23	>100:1			1000.00	1061.48	95.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/0	70348	23	39:1	Target = 2.87		100.00	109.84		
413 > 169	53	3.169	3.169		22895	23	>100:1	3.07 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	150912	20	>100:1			1000.00	1006.56	97.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.553	3.545	1/0	15498	36	42:1	Target = 3.84	0.27	92.800	86.664		
499 > 99	54	3.553	3.545		5273	42	69:1	2.93 (1.92-5.76)	0.09				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.758	3.750	1/0	47230	22	>100:1			93.200	92.965		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.899	3.891	1/0	11308	23		Target = 3.07		96.000	97.915		
549 > 99	54	3.891	3.891		4483	13	28:1	2.52 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	10639	14		Target = 3.03		96.400	97.141		
599 > 99	54	4.207	4.198		3353	17	19:1	3.17 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	43949	18	>100:1			94.200	102.55		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.711	4.704	1/0	11578	14	>100:1	Target = 3.33		96.800	95.562		
699 > 99	54	4.704	4.704		2911	26	59:1	3.97 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	740918	20	>100:1			1000.00	986.62	93.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	82559	26	>100:1	Target = 6.16		100.00	111.42		
463 > 169	56	3.545	3.545		13502	25	63:1	6.11 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.874	3.866	1	312712	19	>100:1			1000.00	1010.17	94.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	31936	22	>100:1			100.00	103.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.899	3.891	1	98104	20				5000.00	5288.59	105	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	3801	12	24:1	Target = 1.95		95.800	81.169		
527 > 81	65	3.883	3.891		1860	12	7.5:1	2.04 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	4028	14		Target = 3.14		96.400	88.837		
627 > 80	65	4.492	4.492		1249	15		3.22 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.907	3.899	1	671396	18	>100:1			1000.00	1012.16	96.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	64085	20	60:1	Target = 15.94		100.00	97.141		
513 > 169	51	3.899	3.899		4010	18	25:1	15.98 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	680663	18	>100:1			5000.00	4742.00	89.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.074	4.065	1/0	11651	30	73:1	Target = 1.33	0.17	100.00	111.42		M
570 > 483	58	4.065	4.065		8693	35		1.34 (0.66-1.99)	0.34				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	678730	18	>100:1			5000.00	5110.35	91.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	15290	30	96:1	Target = 1.58	0.08	100.00	113.14		M
584 > 526	60	4.238	4.217		10149	39		1.50 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	670093	17	>100:1			1000.00	1060.15	98.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	62546	18	>100:1	Target = 15.50		100.00	99.310		
563 > 169	52	4.218	4.217		4960	19	26:1	12.61 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.308	4.298	1	100349	15	>100:1			1000.00	927.37	85.6	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	11964	22	70:1			100.00	126.89		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	50885	15	>100:1			1000.00	961.60	92.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	7246	19		Target = 1.12		100.00	126.22		
512 > 219	57	4.338	4.318		5178	13	19:1	1.39 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	123934	22	>100:1			1000.00	988.35	102	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.483	4.474	1/0	10908	21	88:1			100.00	98.929		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	608304	18	>100:1			1000.00	1004.93	93.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	66346	19	38:1	Target = 10.85		100.00	107.70		
613 > 169	38	4.492	4.492		6991	27	43:1	9.49 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	62584	20	>100:1	Target = 8.37		100.00	104.46		
663 > 169	38	4.731	4.731		7379	18	97:1	8.48 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.492	4.483	1	45887	16	>100:1			1000.00	934.67	89.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	5945	17	59:1	Target = 1.03		100.00	118.59		
526 > 219	59	4.483	4.492		6140	19	42:1	0.96 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	850556	19	>100:1			1000.00	1009.63	95.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	78152	21	12:1	Target = 12.11		100.00	106.05		
713 > 169	42	4.948	4.948		6329	19	49:1	12.34 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.335	5.334	1	908734	19	>100:1			1000.00	1002.84	99.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.335	5.334	1/0	65729	20	17:1	Target = 11.48		100.00	110.70		
813 > 269	40	5.335	5.334		5150	13	>100:1	12.76 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	84566	24	9.1:1	Target = 13.88		100.00	105.13		
913 > 319	40	5.696	5.689		5692	22	>100:1	14.85 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.907	3.899	1	682347	19	>100:1					94	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	736017	19	>100:1					97.8	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	1	627818	23	>100:1					97.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	654143	22	>100:1					98.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.553	3.545	1	165000	20	>100:1					102	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

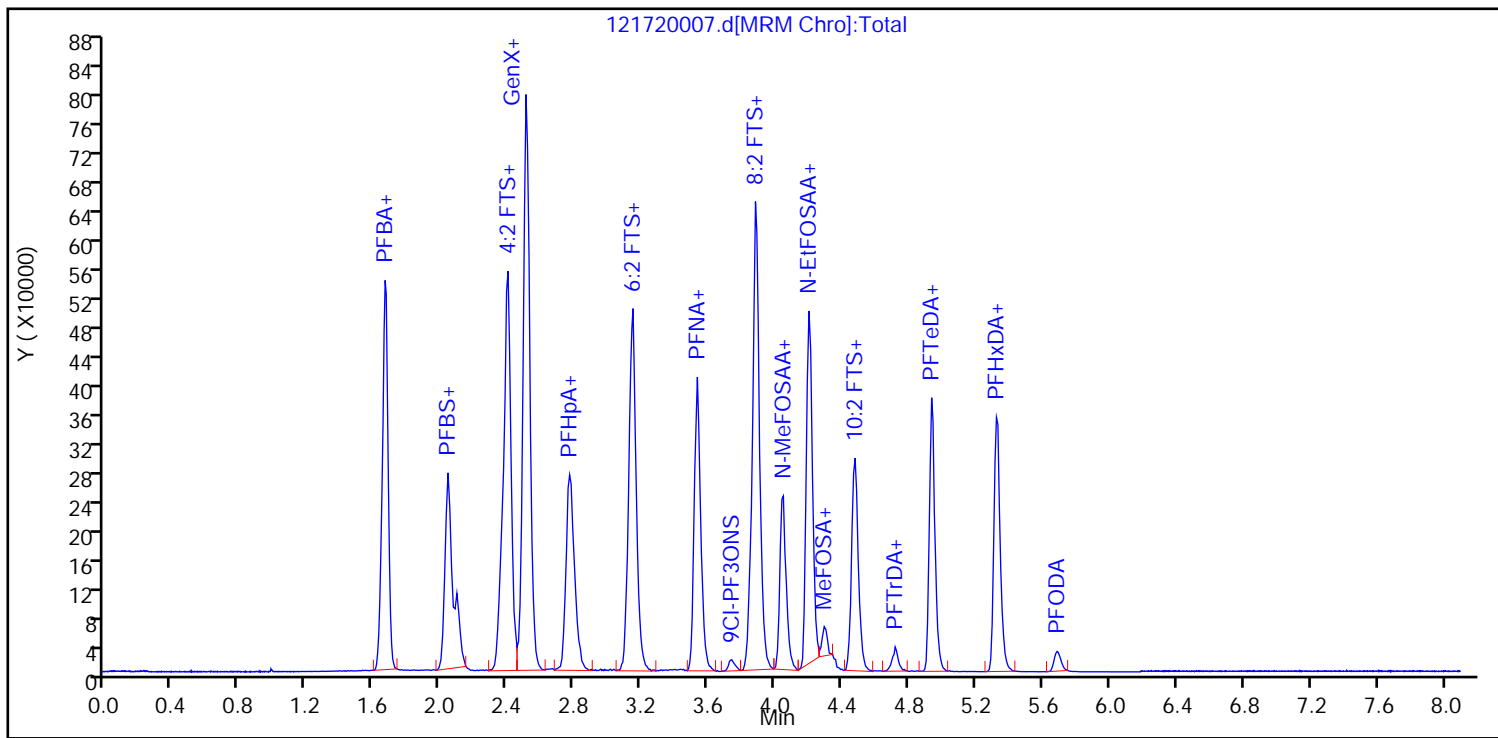
Client ID:

Lab ID: ICAL 100\_SVLC-1220

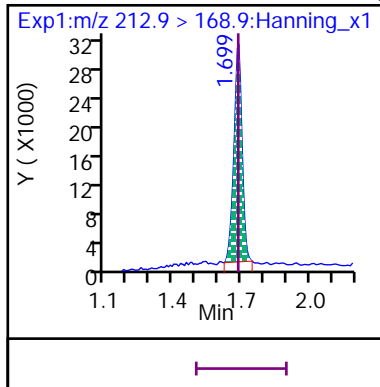
Sample Info: ICAL 100\_SVLC-1220

Dil. Factor: 1

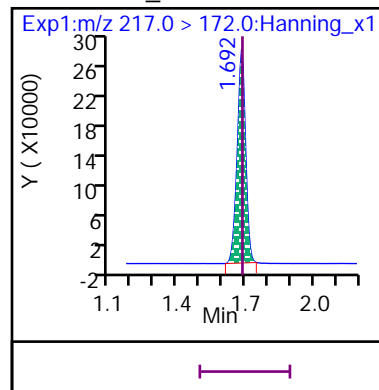
Operator: Stephen E. Somerville



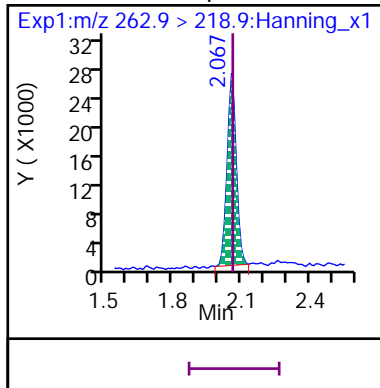
8 Perfluoro-n-butanoic acid (PFBA)



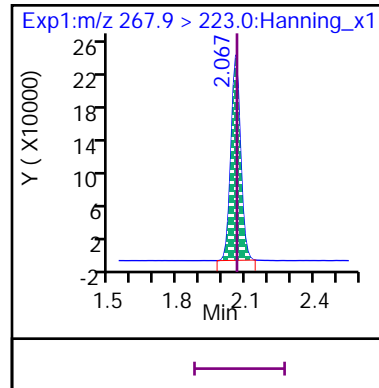
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

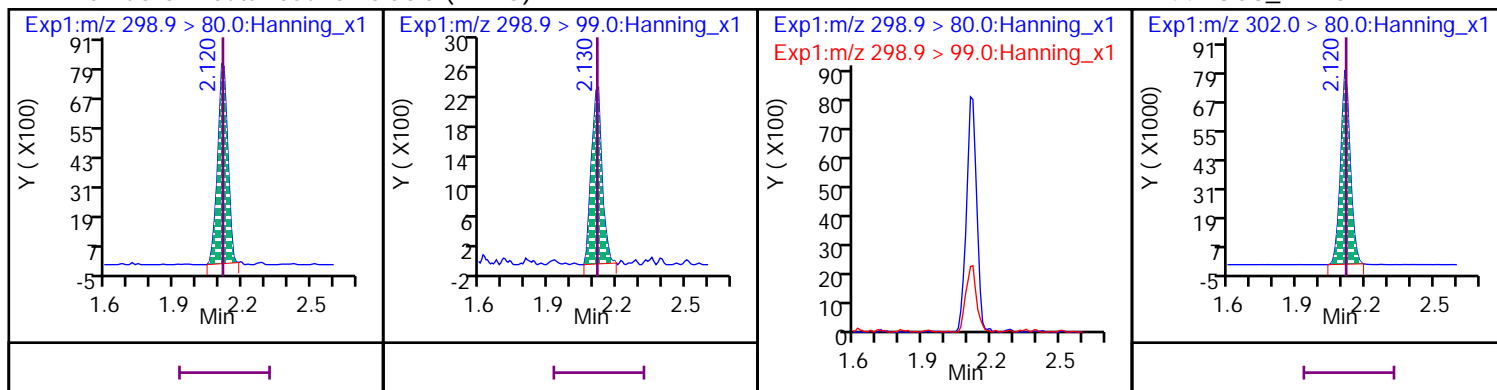


D 50 13C5\_PFPeA



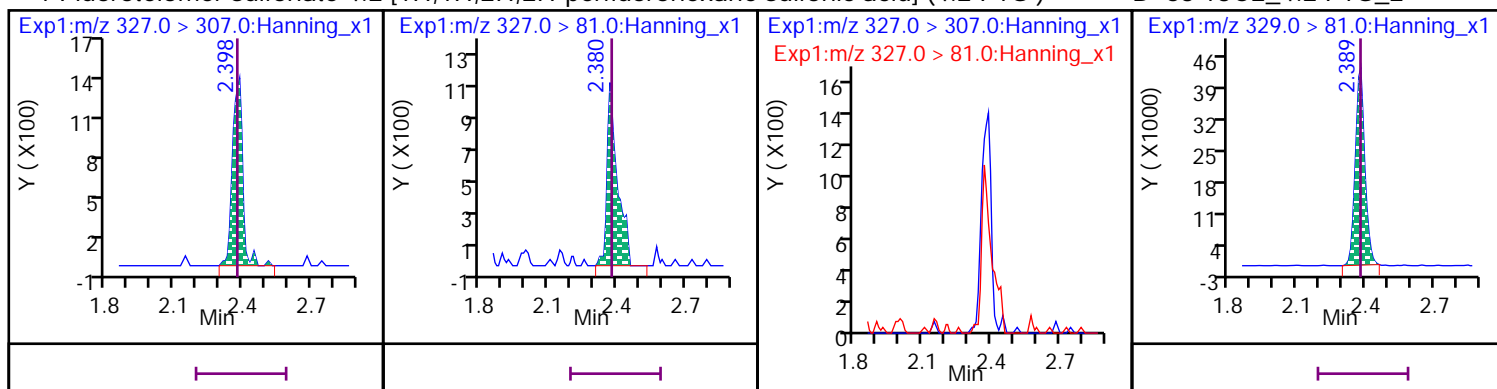
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



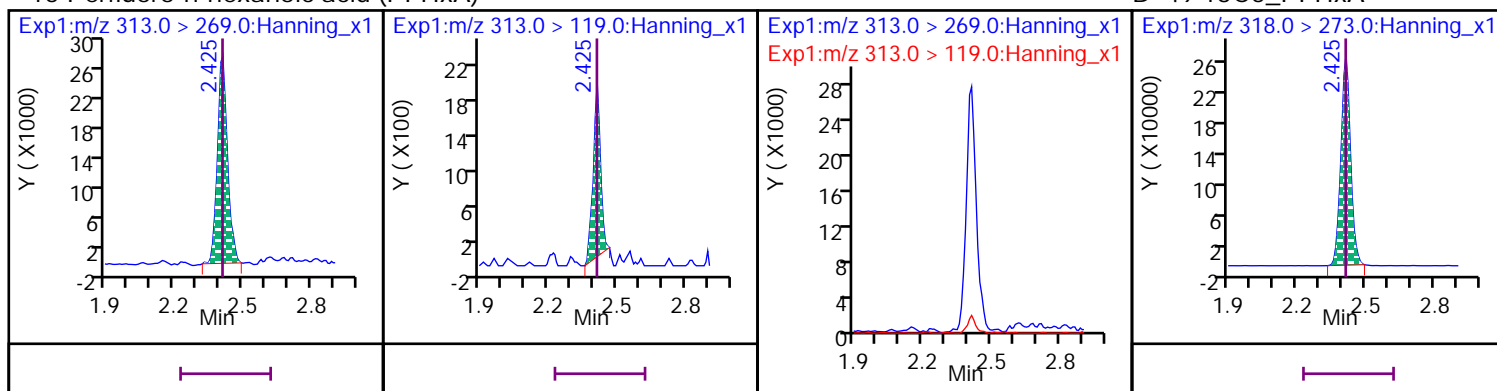
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



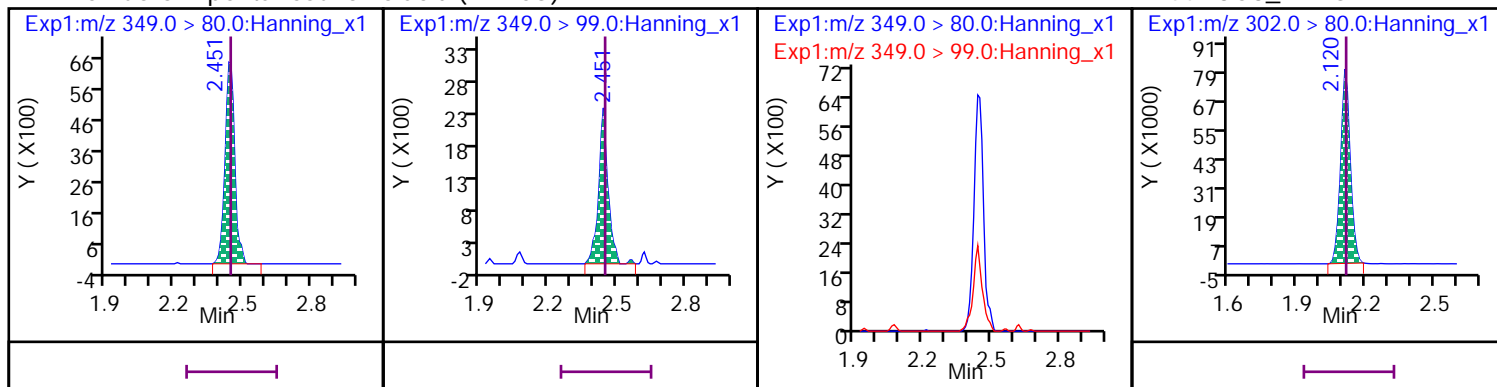
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



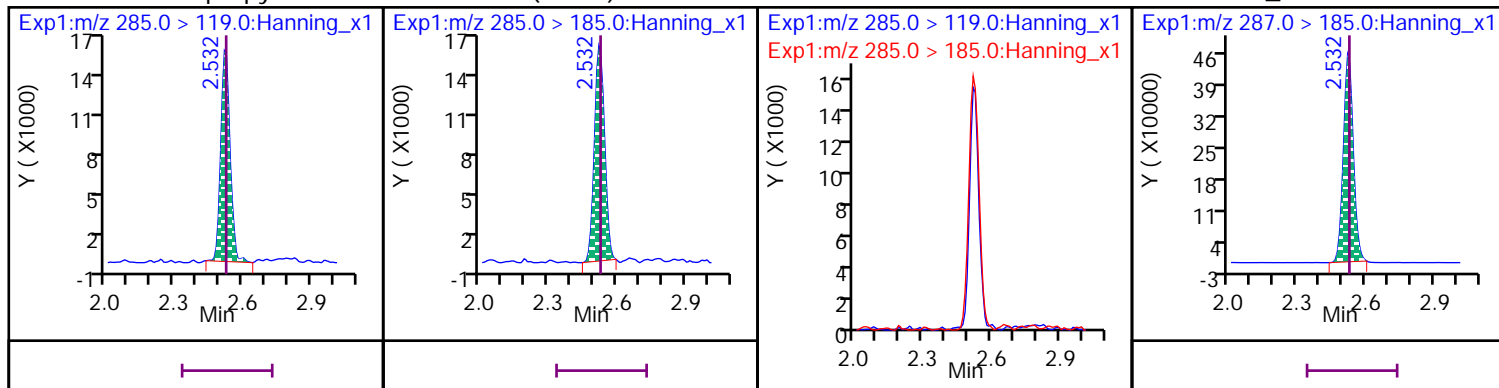
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



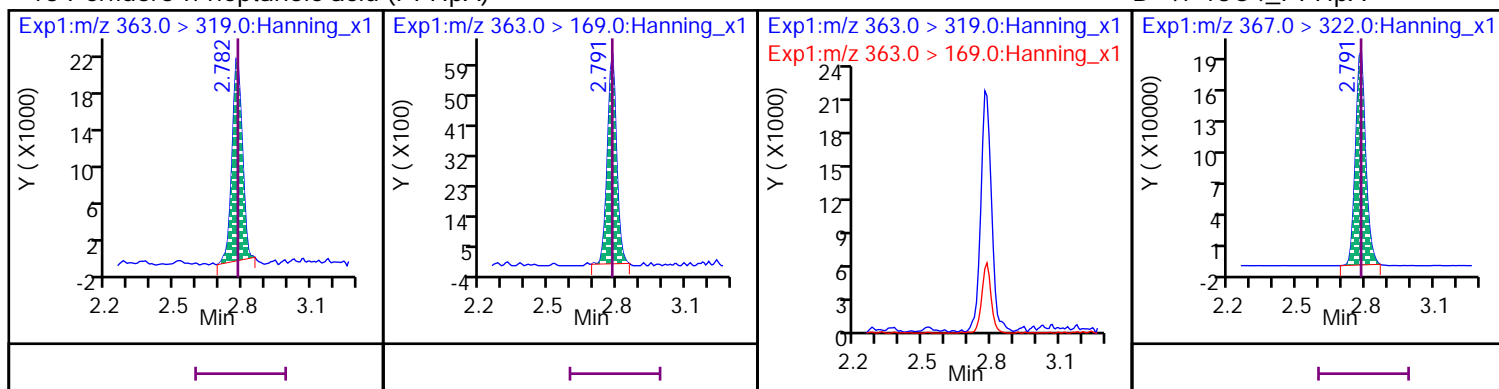
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



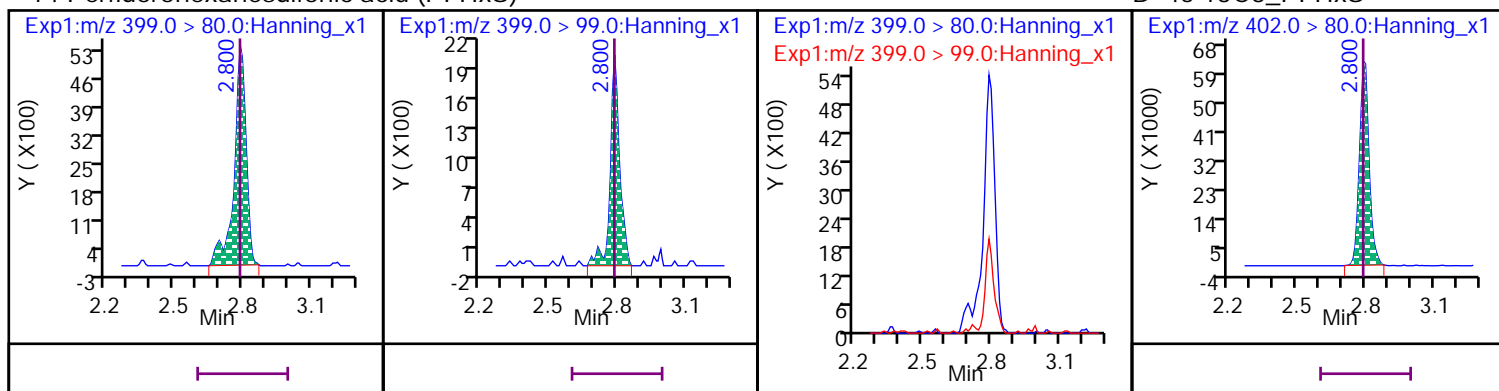
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



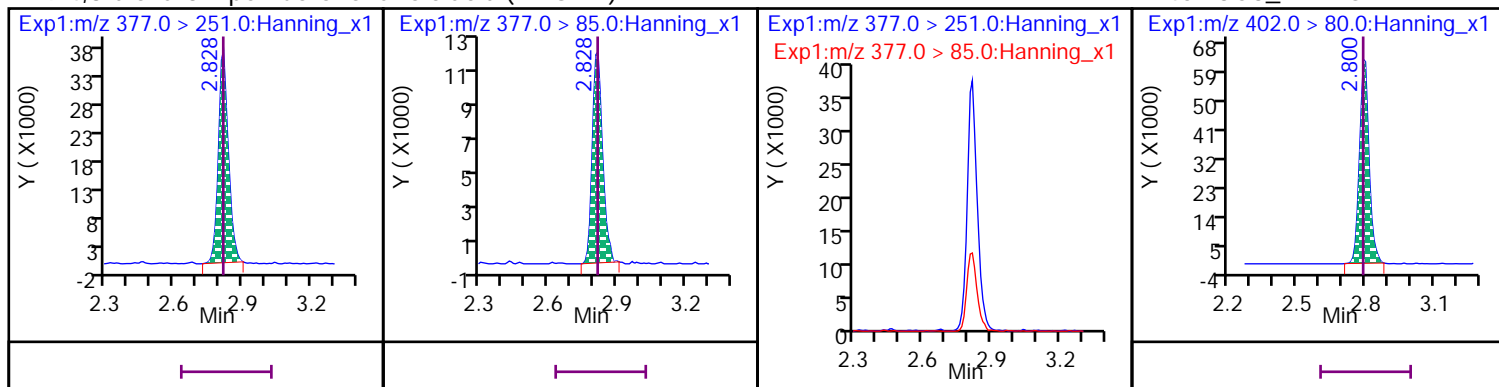
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



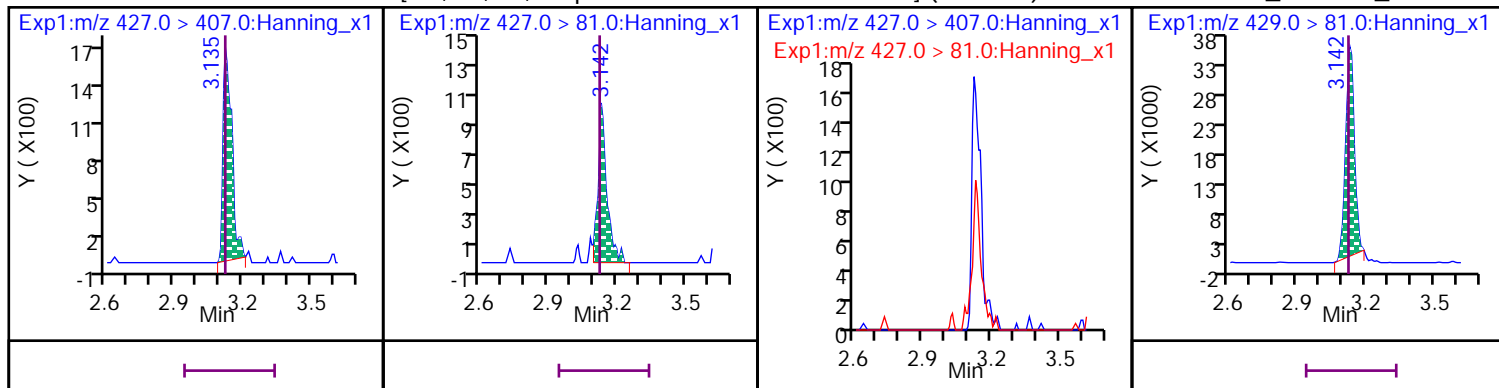
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



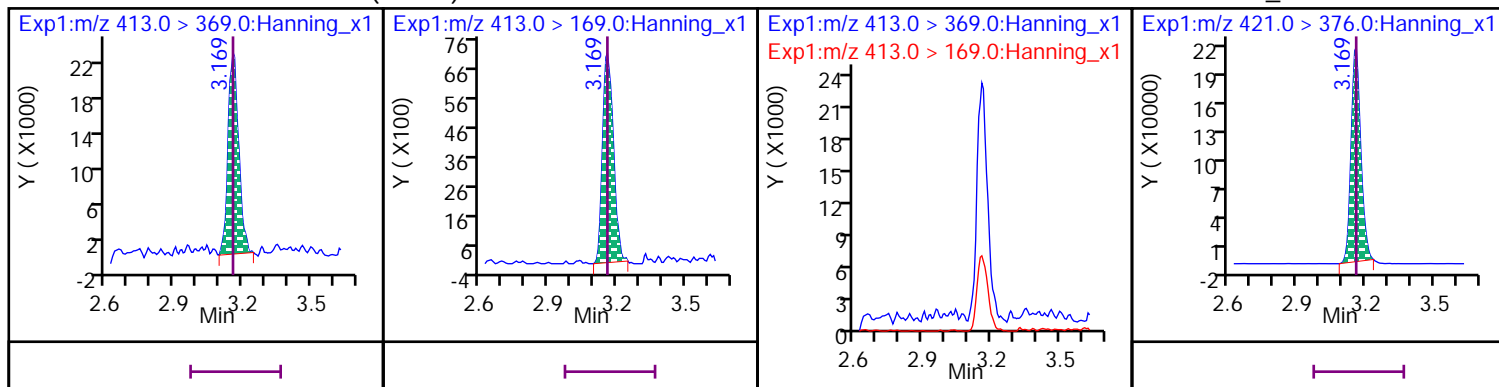
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



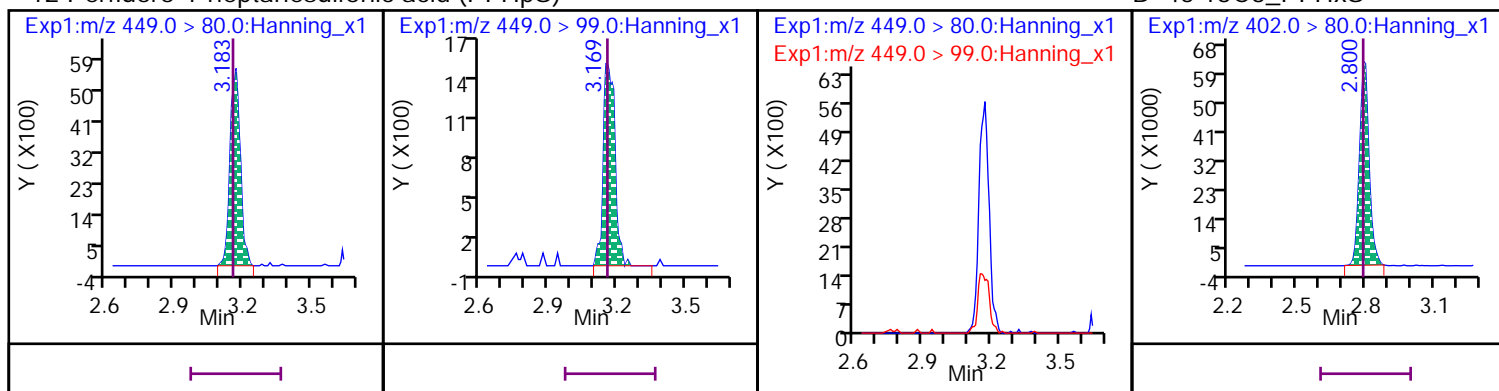
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



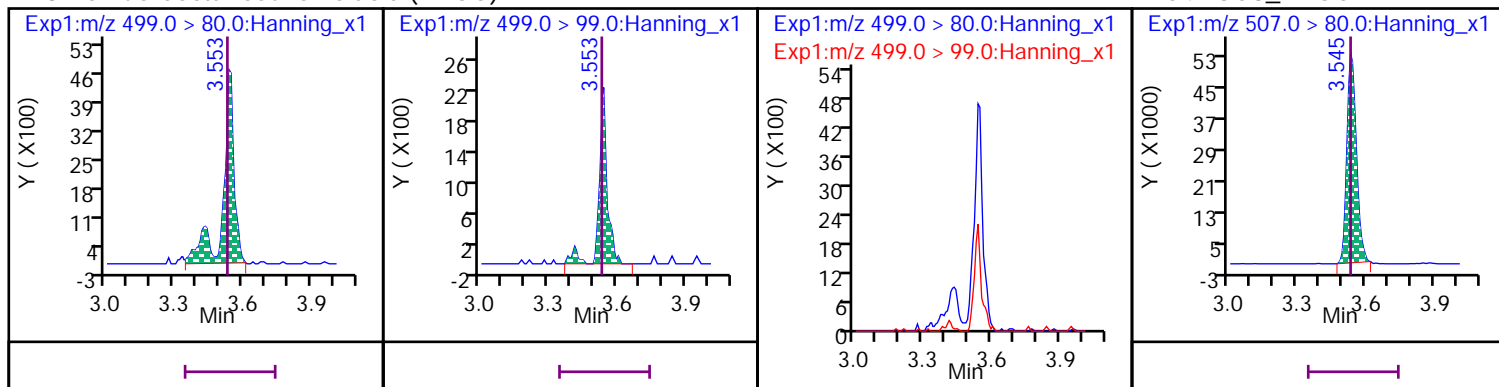
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

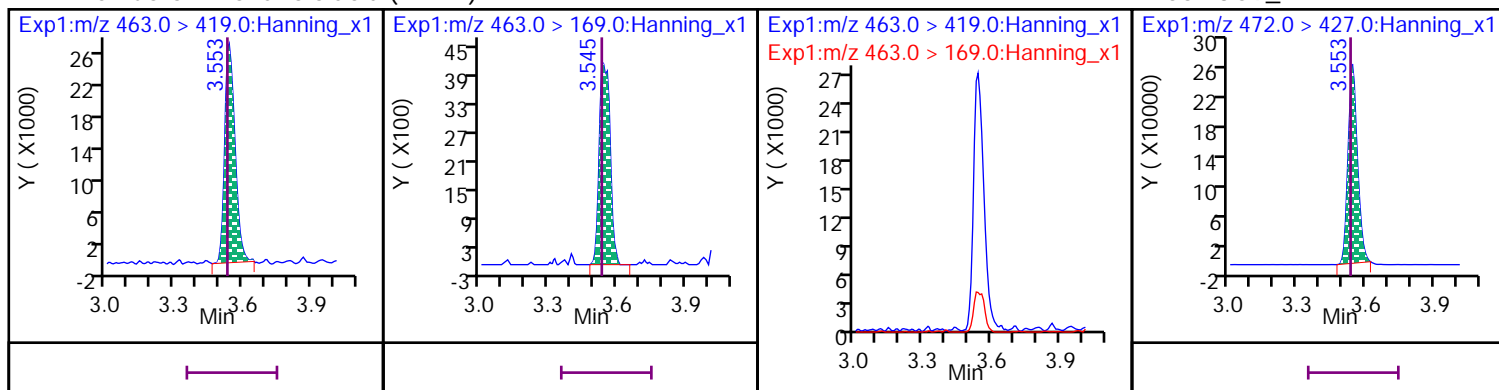
D 54 13C8\_PFOS





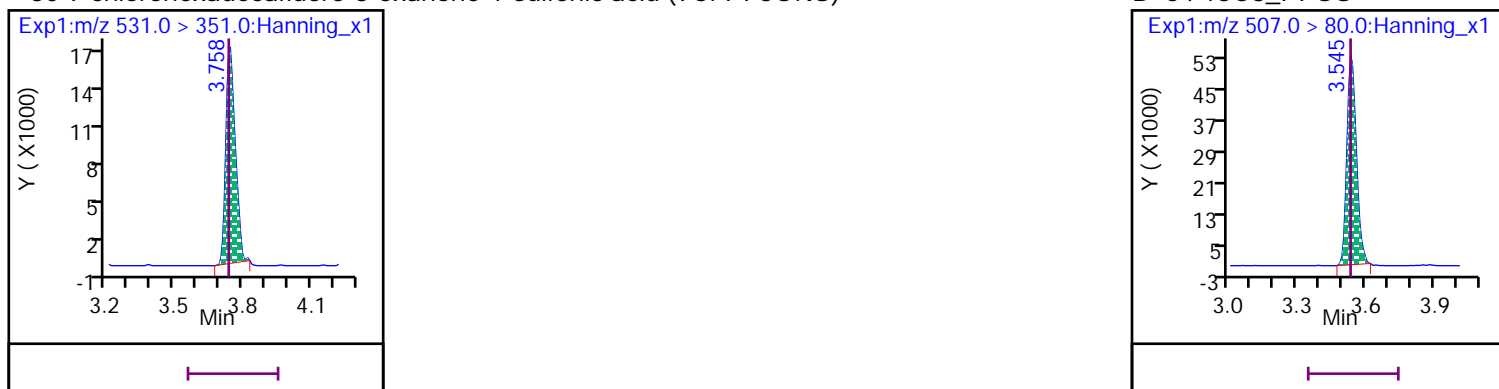
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



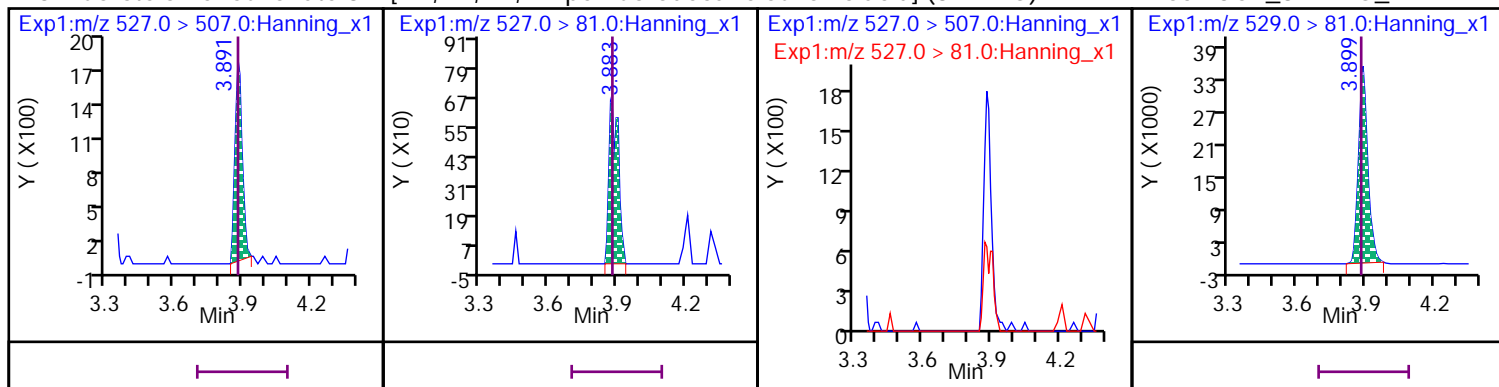
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



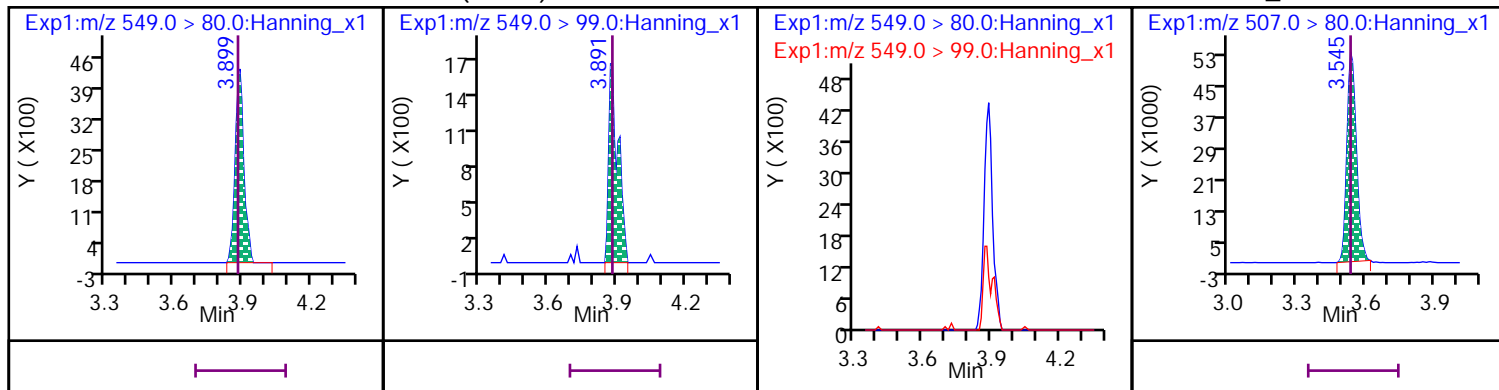
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



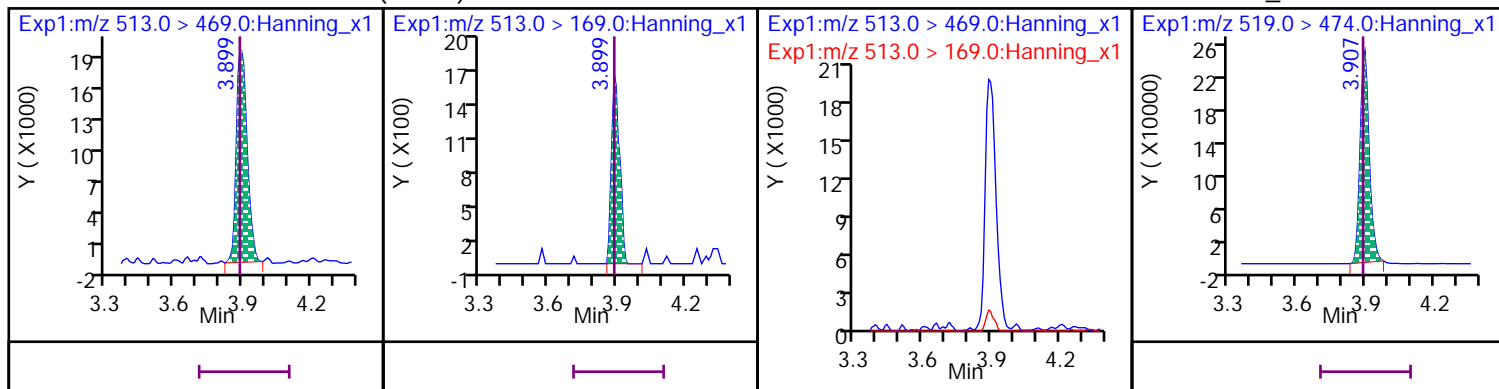
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



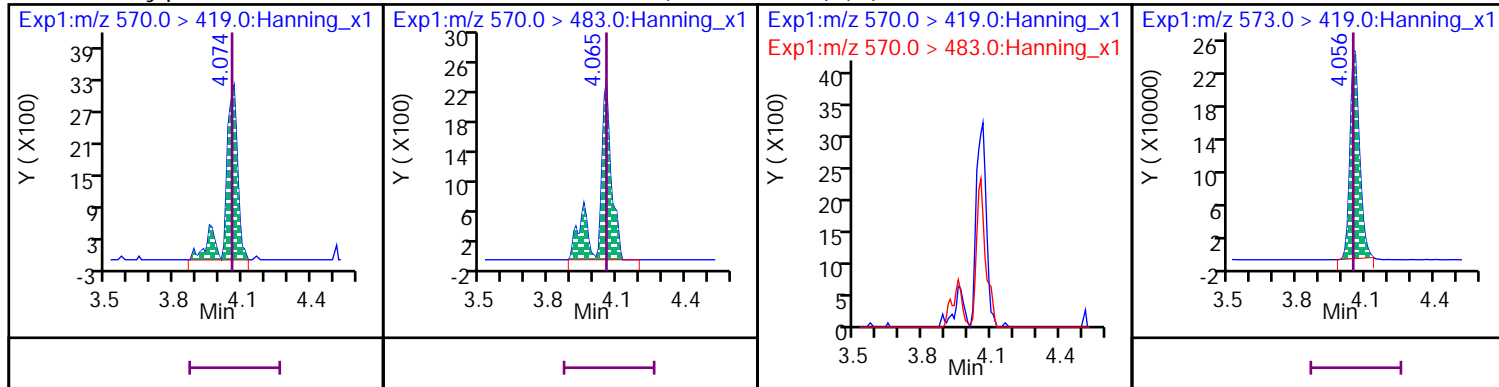
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



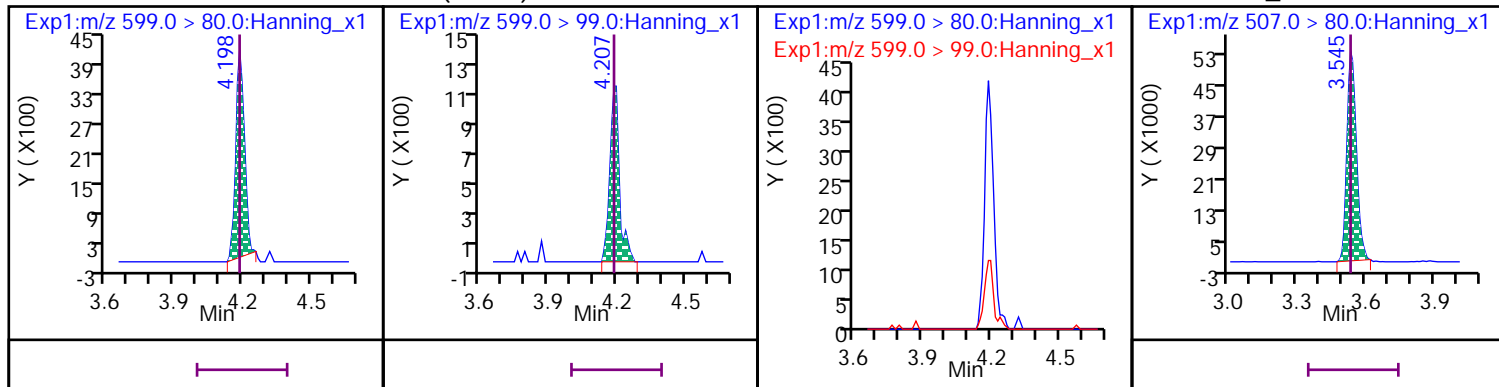
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



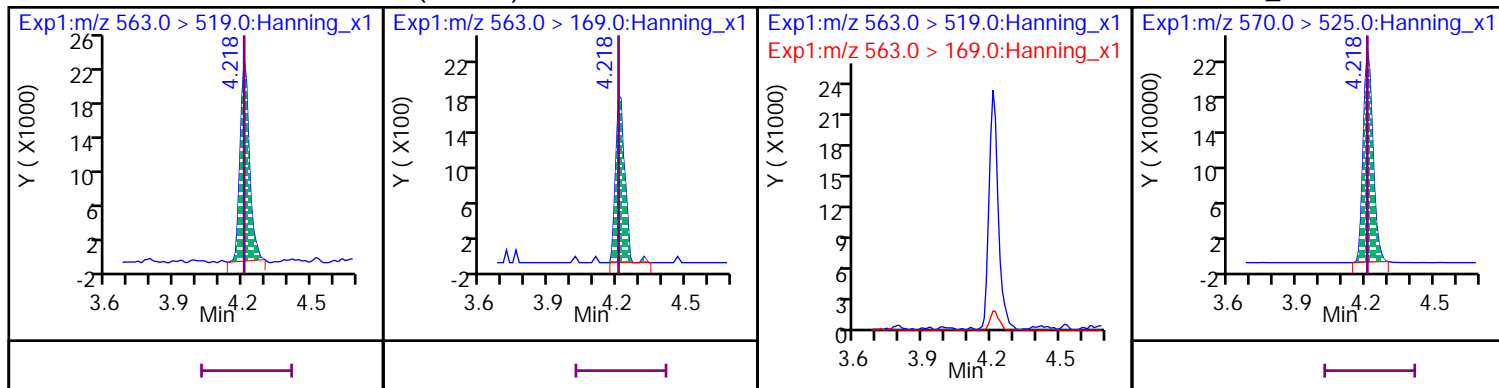
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



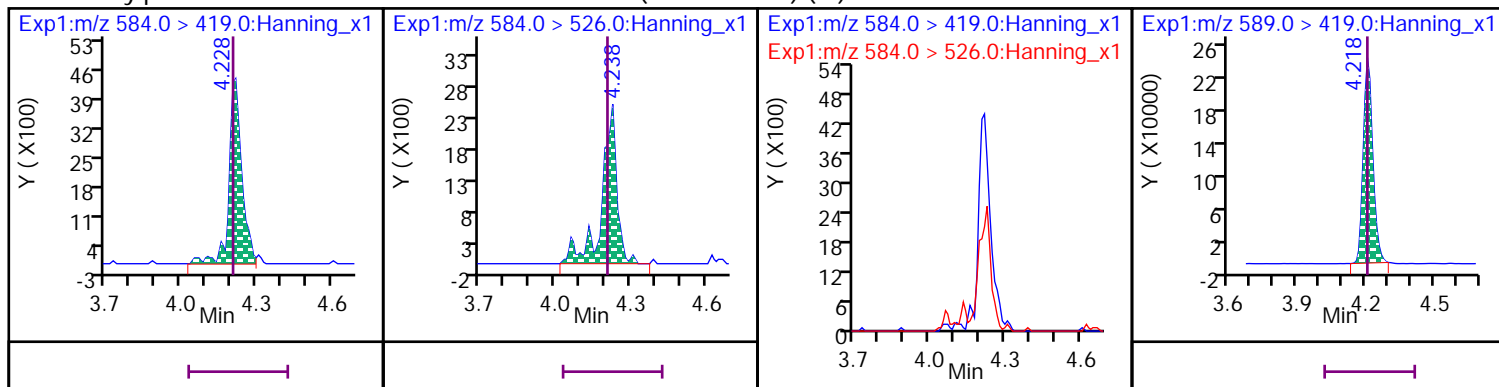
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



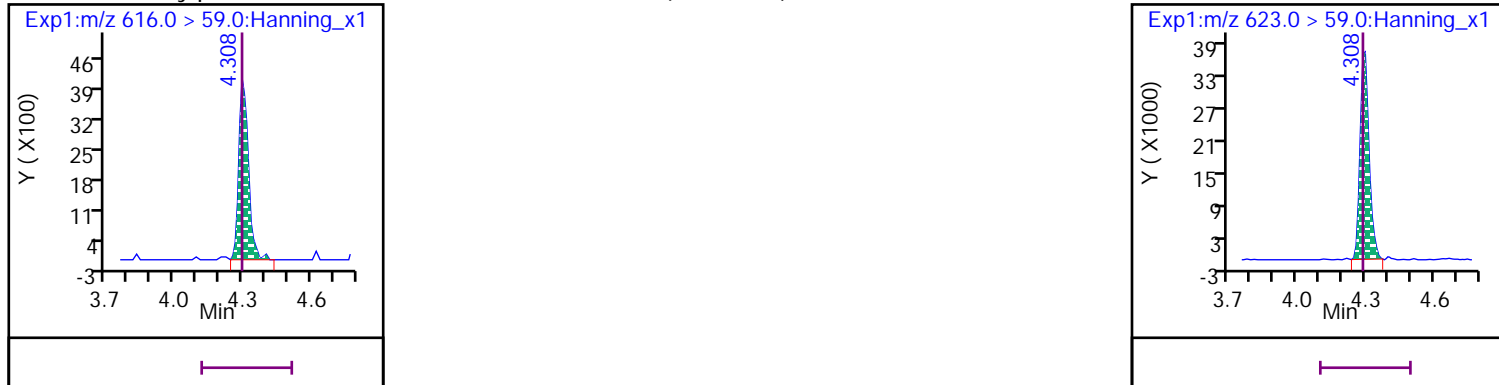
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



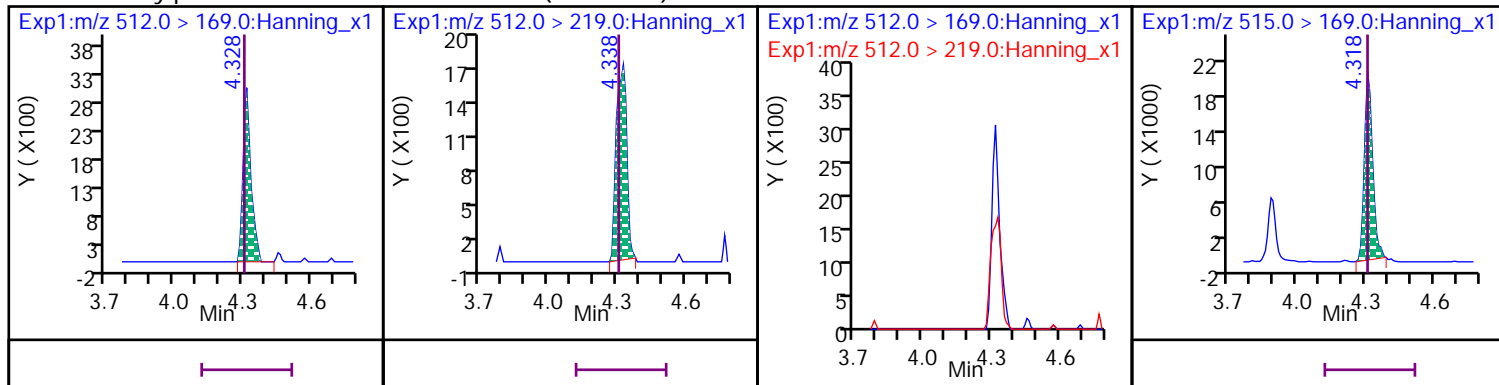
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

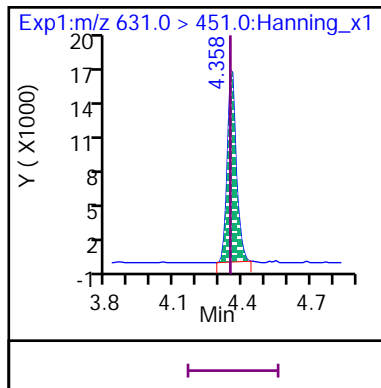


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

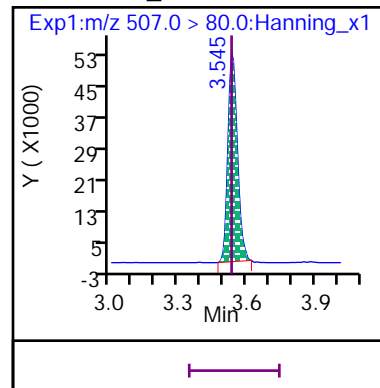
D 57 d3-MeFOSA



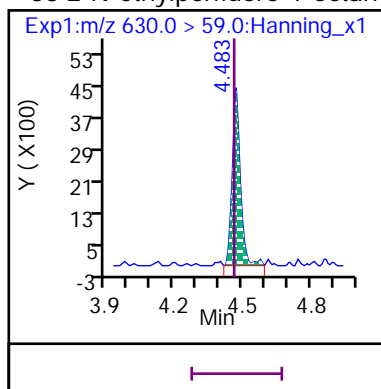
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



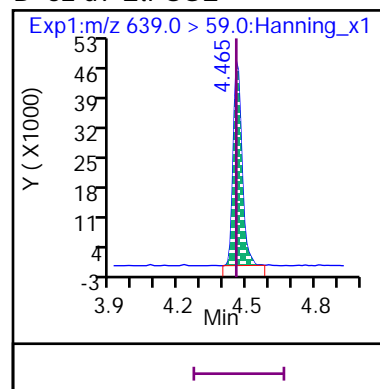
D 54 13C8\_PFOS



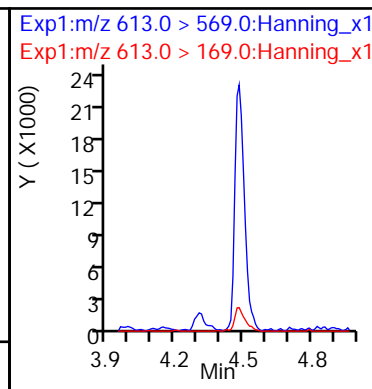
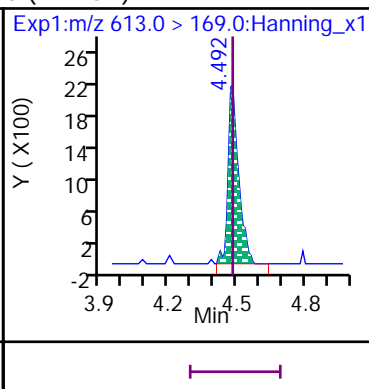
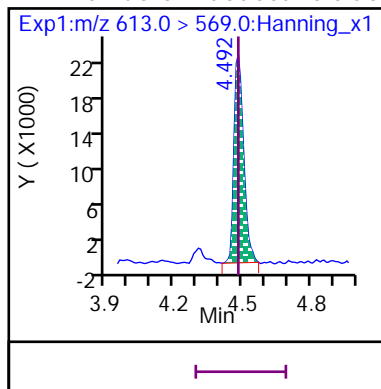
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



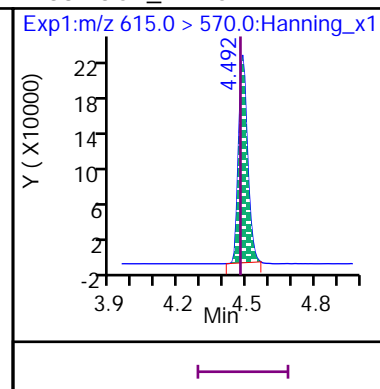
D 62 d9-EtFOSE



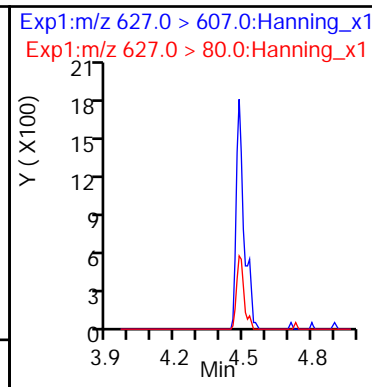
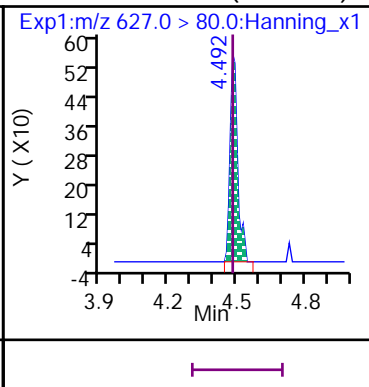
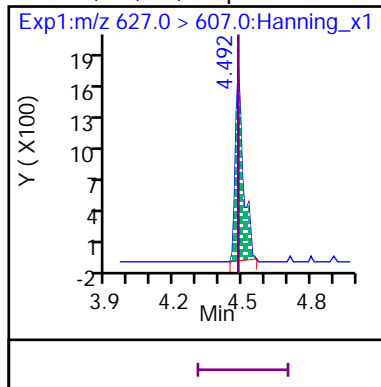
11 Perfluoro-n-dodecanoic acid (PFDaA)



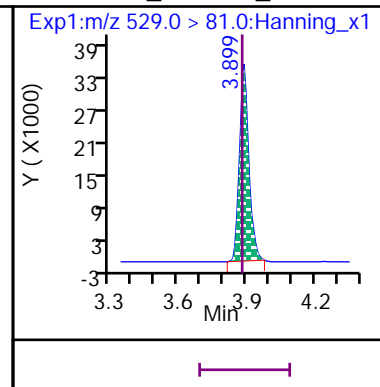
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

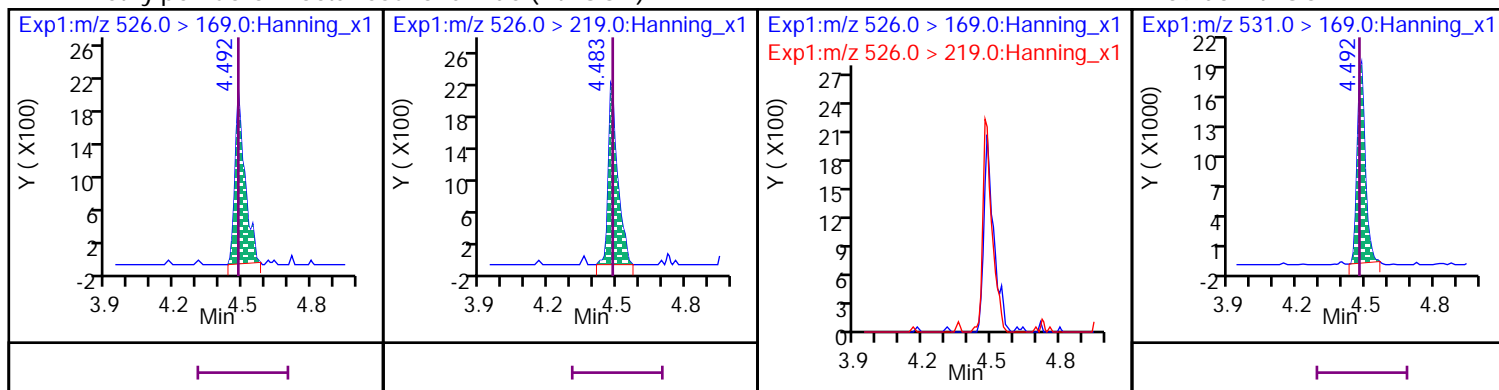


D 65 13C2\_8:2 FTS\_2



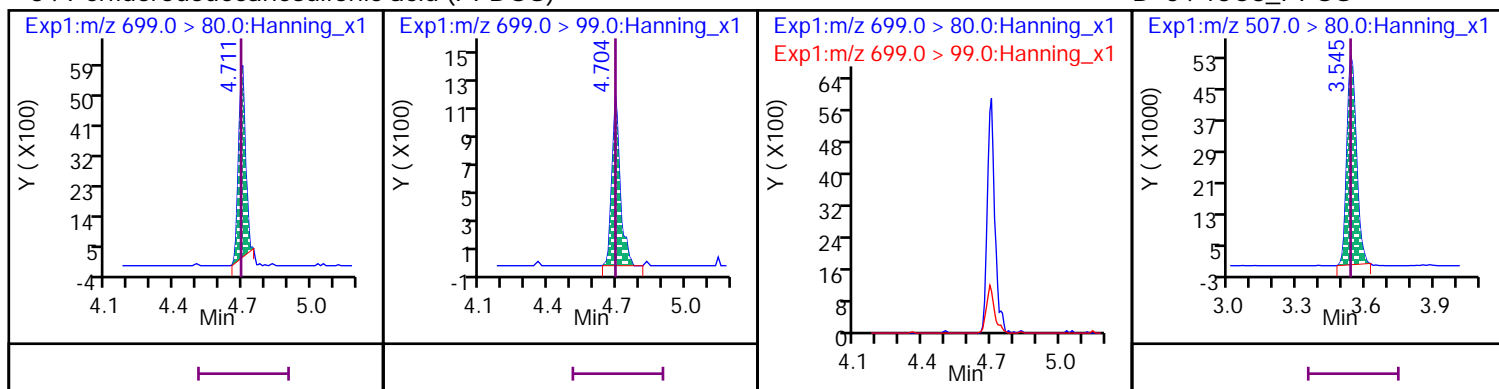
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



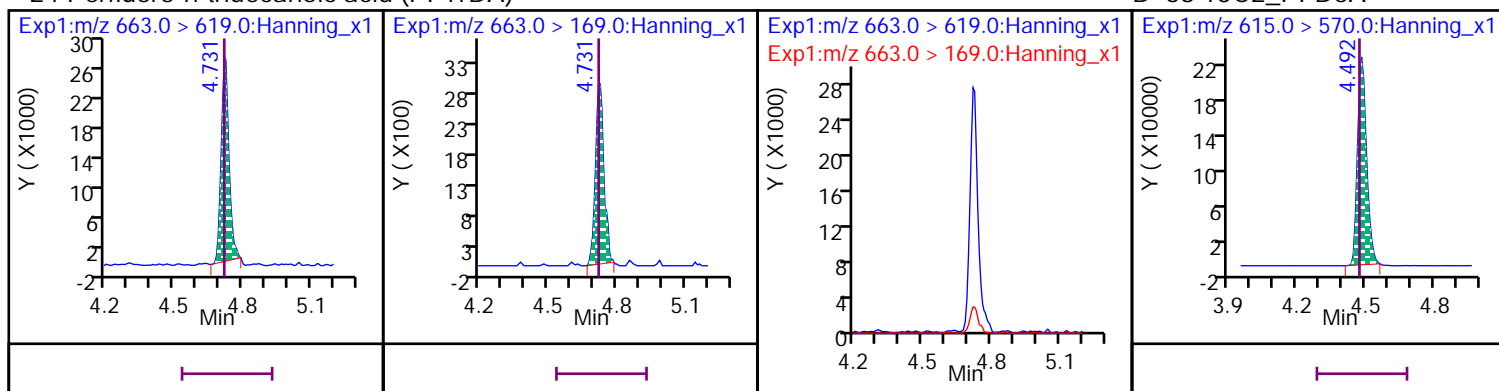
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



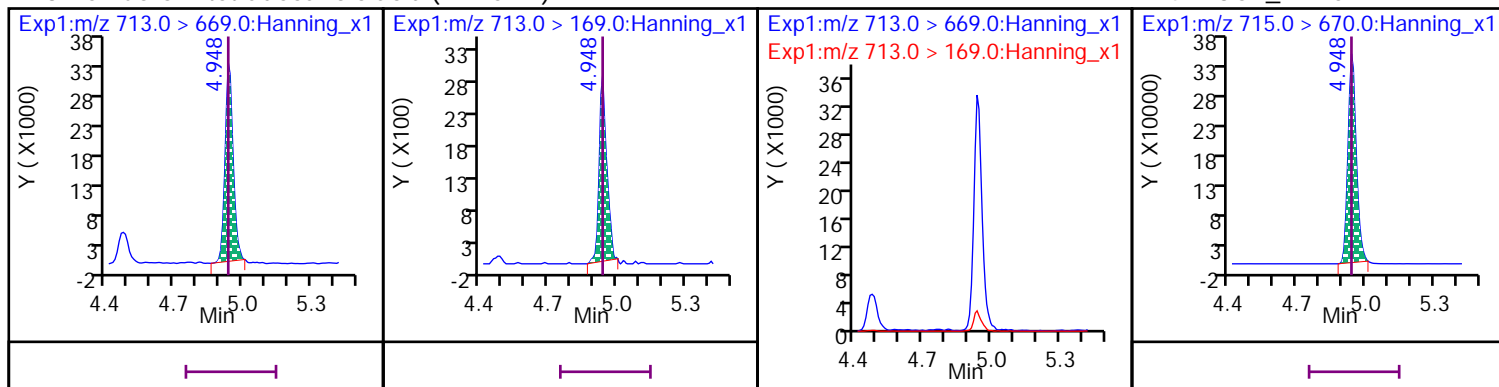
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



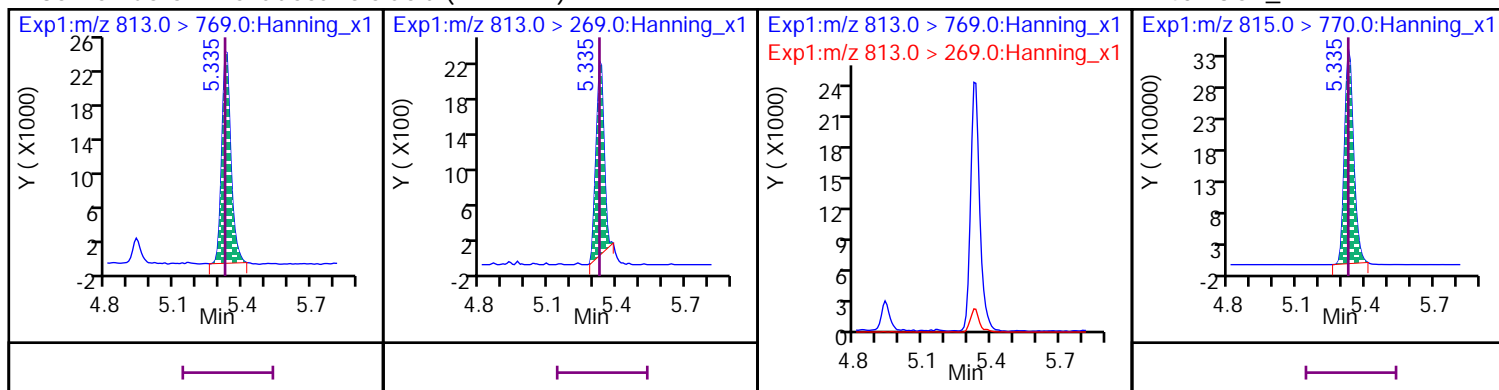
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



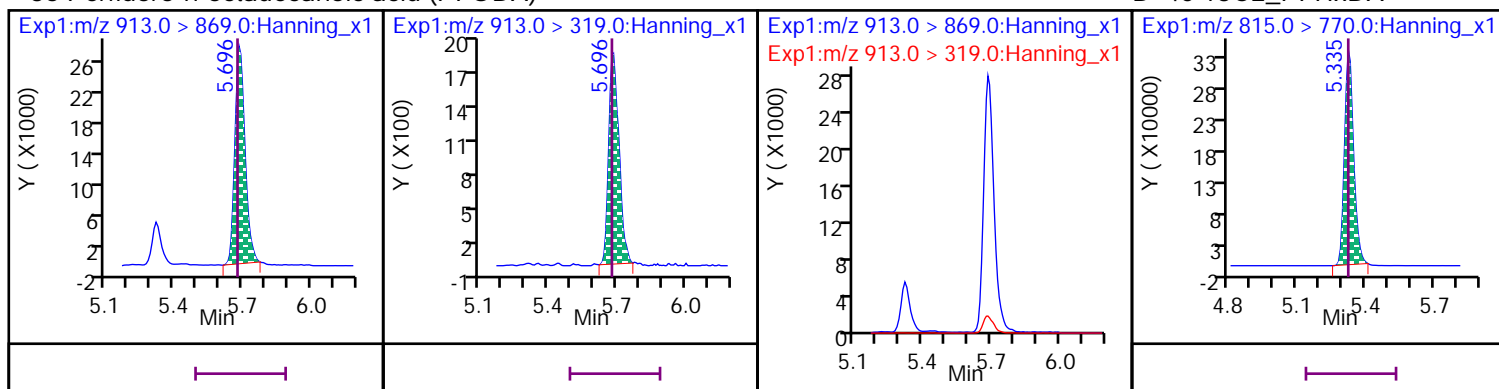
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

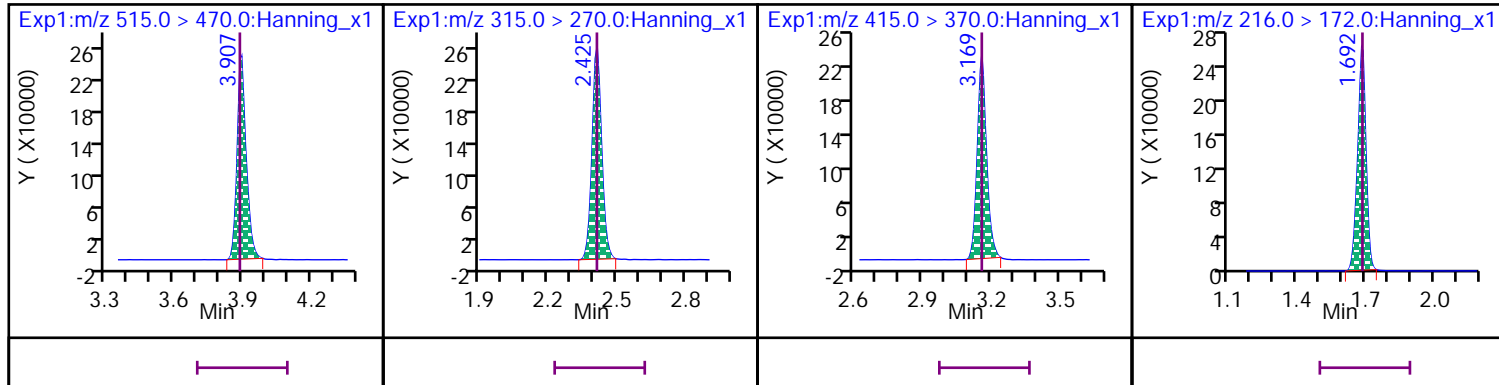


\* 37 13C2\_PFDA

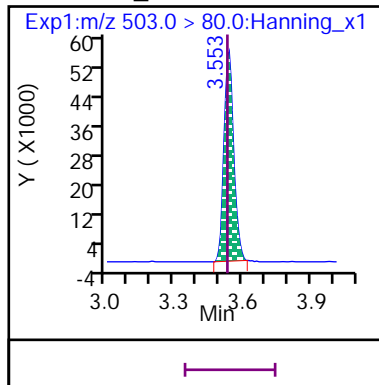
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 100\_SVLC-1220

Sample Info: ICAL 100\_SVLC-1220

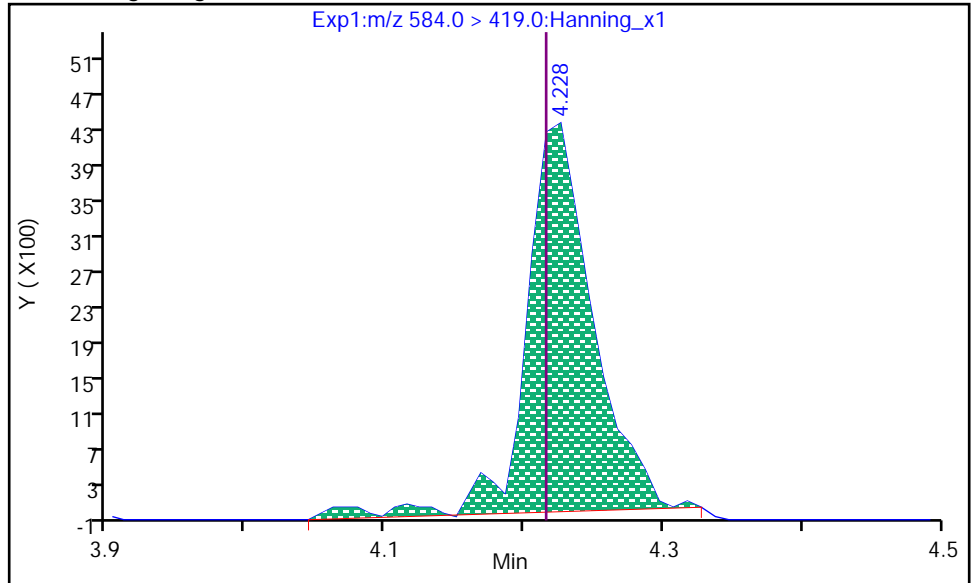
Dil. Factor: 1

Operator: Stephen E. Somerville

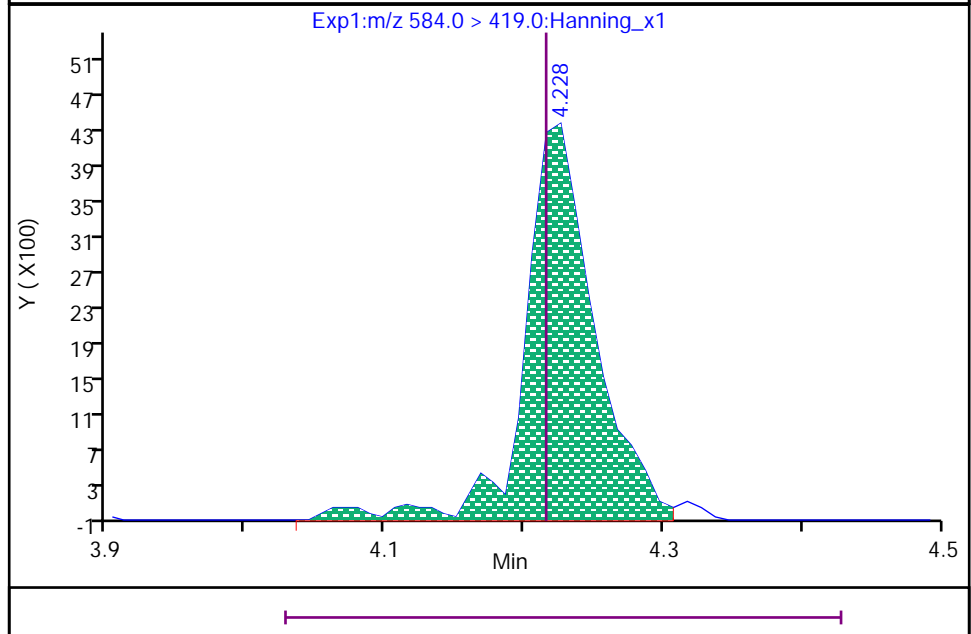
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.228  
Area: 14202  
Amount: 107.14  
Amount Units: ng/L



RT: 4.228  
Area: 15290  
Amount: 113.14  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:39

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 100\_SVLC-1220

Sample Info: ICAL 100\_SVLC-1220

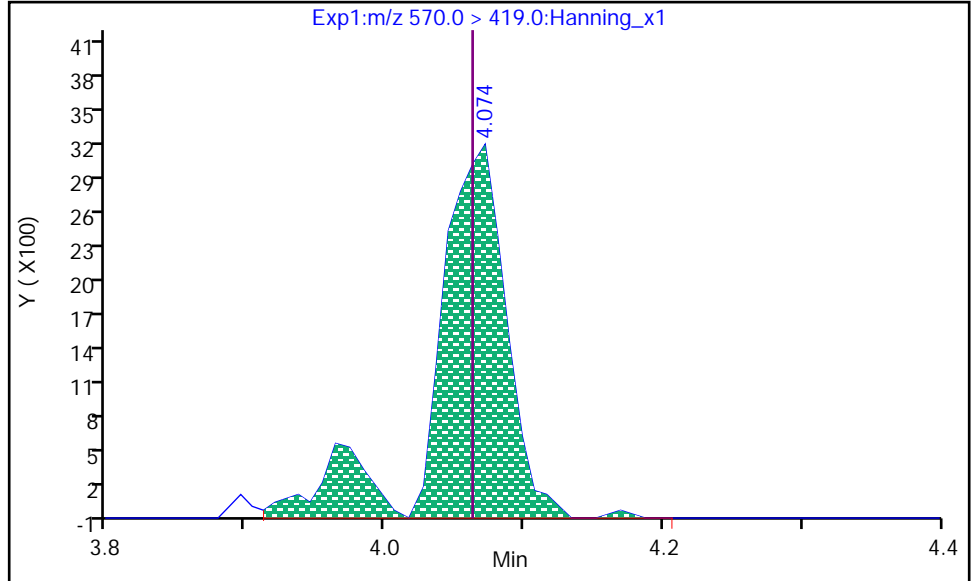
Dil. Factor: 1

Operator: Stephen E. Somerville

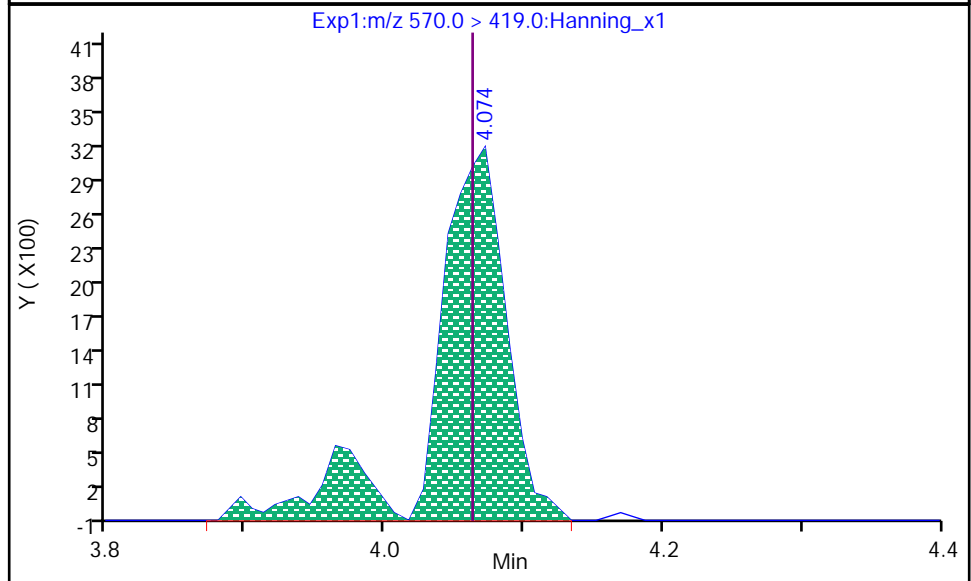
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.074  
Area: 11444  
Amount: 111.23  
Amount Units: ng/L

Processing Integration Results



RT: 4.074  
Area: 11651  
Amount: 111.42  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:06

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d  
Injection Date: 17-Dec-2020 12:43:32 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 3 Auto Sampler: 3  
Sample Info: ICAL 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	711668	23	>100:1			1000.00	1026.12	96.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	144069	23	86:1			200.00	203.25		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	717259	17	>100:1			1000.00	1042.70	98.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	144933	16	>100:1			200.00	200.98		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	231160	16	>100:1			1000.00	1004.04	93.4	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	49459	18	>100:1	Target = 3.50		176.80	181.47		
298.9 > 99	44	2.120	2.125		14474	18	>100:1	3.41 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	38924	16	>100:1	Target = 3.10		187.60	194.12		
349 > 99	44	2.451	2.459		11492	24	78:1	3.38 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	124113	20	>100:1			5000.00	5126.87	98.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/0	9159	22	74:1	Target = 1.80		186.80	184.88		
327 > 81	63	2.389	2.388		4111	18	46:1	2.22 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	793257	19	>100:1			1000.00	1076.23	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	147970	19	>100:1	Target = 18.34		200.00	188.94		
313 > 119	49	2.416	2.423		9547	17	94:1	15.49 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1350793	20	>100:1			5000.00	5071.42	95.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	83476	20	>100:1	Target = 0.81		400.00	430.07		
285 > 185	66	2.532	2.539		94732	19	>100:1	0.88 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	601216	19	>100:1			1000.00	991.05	97.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	134445	19	>100:1	Target = 3.70		200.00	215.59		
363 > 169	47	2.782	2.790		36289	21	>100:1	3.70 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	174343	19	>100:1			1000.00	1018.19	97.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	34534	26		Target = 3.21	0.15	182.00	186.82		
399 > 99	45	2.800	2.799		12548	25	99:1	2.75 (1.60-4.81)	0.06				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	216274	19	>100:1	Target = 2.97		188.40	195.39		
377 > 85	45	2.828	2.827		72152	22	>100:1	2.99 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	34271	22		Target = 3.08		190.40	216.39		
449 > 99	45	3.169	3.169		11529	21	69:1	2.97 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	96089	24	>100:1			5000.00	4989.46	91.8	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	8374	28	46:1	Target = 1.80		189.60	187.63		
427 > 81	64	3.135	3.135		4744	25	54:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	615324	24	>100:1			1000.00	1039.64	94	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/1	130181	24	78:1	Target = 2.87		200.00	207.53		
413 > 169	53	3.162	3.169		45478	32	>100:1	2.86 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	157006	21	>100:1			1000.00	1047.20	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	36852	38	>100:1	Target = 3.84	0.28	185.60	198.08		
499 > 99	54	3.545	3.545		8658	39	25:1	4.25 (1.92-5.76)	0.27				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/0	102987	21	>100:1			186.40	194.85		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.899	3.891	1/0	25761	23		Target = 3.07		192.00	214.40		
549 > 99	54	3.899	3.891		8382	24	25:1	3.07 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	23887	15		Target = 3.03		192.80	209.64		
599 > 99	54	4.198	4.198		6339	22		3.76 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	83484	19	>100:1			188.40	187.23		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	24667	21		Target = 3.33		193.60	195.69		
699 > 99	54	4.704	4.704		8416	20	>100:1	2.93 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	765207	21	>100:1			1000.00	1018.97	96.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	157415	21	>100:1	Target = 6.16		200.00	205.71		
463 > 169	56	3.553	3.545		24954	27	>100:1	6.30 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	315019	20	>100:1			1000.00	1017.62	95.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	63946	25	>100:1			200.00	205.99		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	97937	20				5000.00	5279.58	105	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	7729	23	45:1	Target = 1.95		191.60	182.80		
527 > 81	65	3.899	3.891		3591	20	16:1	2.15 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	9156	13		Target = 3.14		192.80	202.28		
627 > 80	65	4.492	4.492		2608	23		3.51 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	672326	21	>100:1			1000.00	1013.56	96.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	141266	21	>100:1	Target = 15.94		200.00	213.84		
513 > 169	51	3.891	3.899		9031	24	75:1	15.64 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	716544	18	>100:1			5000.00	4991.97	94	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	24498	36	>100:1	Target = 1.33	0.11	200.00	222.54		M
570 > 483	58	4.065	4.065		16896	38		1.44 (0.66-1.99)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	706396	18	>100:1			5000.00	5318.66	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	28320	29	>100:1	Target = 1.58	0.14	200.00	201.34		
584 > 526	60	4.218	4.217		18444	31	59:1	1.53 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	639465	18	>100:1			1000.00	1011.69	94.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	123504	16	>100:1	Target = 15.50		200.00	205.49		
563 > 169	52	4.207	4.217		7960	23	49:1	15.51 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	112543	17	>100:1			1000.00	1040.06	96	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	21373	21	>100:1			200.00	202.12		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	52407	16	>100:1			1000.00	990.36	95.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	12774	14		Target = 1.12		200.00	216.05		
512 > 219	57	4.318	4.318		10827	20	>100:1	1.17 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	131865	18	>100:1			1000.00	1051.59	108	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	24998	17	>100:1			200.00	213.08		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	628619	17	>100:1			1000.00	1038.50	96.8	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	132667	21	55:1	Target = 10.85		200.00	208.40		
613 > 169	38	4.492	4.492		10930	18	74:1	12.13 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	128894	20	>100:1	Target = 8.37		200.00	208.18		
663 > 169	38	4.731	4.731		16111	20	>100:1	8.00 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49725	15	>100:1			1000.00	1012.84	96.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	11865	21	>100:1	Target = 1.03		200.00	218.41		
526 > 219	59	4.492	4.492		10318	17	65:1	1.14 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	837660	19	>100:1			1000.00	994.32	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	153443	17	20:1	Target = 12.11		200.00	211.42		
713 > 169	42	4.948	4.948		11864	18	>100:1	12.93 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	917195	18	>100:1			1000.00	1012.17	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	126217	20	33:1	Target = 11.48		200.00	210.61		
813 > 269	40	5.334	5.334		11103	18	>100:1	11.36 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	169087	24	18:1	Target = 13.88		200.00	208.26		
913 > 319	40	5.696	5.689		11687	21	>100:1	14.46 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	669430	18	>100:1					92.2	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	745707	19	>100:1					99.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	627559	23	>100:1					97.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	654457	22	>100:1					98.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	163672	20	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d

Injection Date: 17-Dec-2020 12:43:32

Inst. ID: LCMSMS02

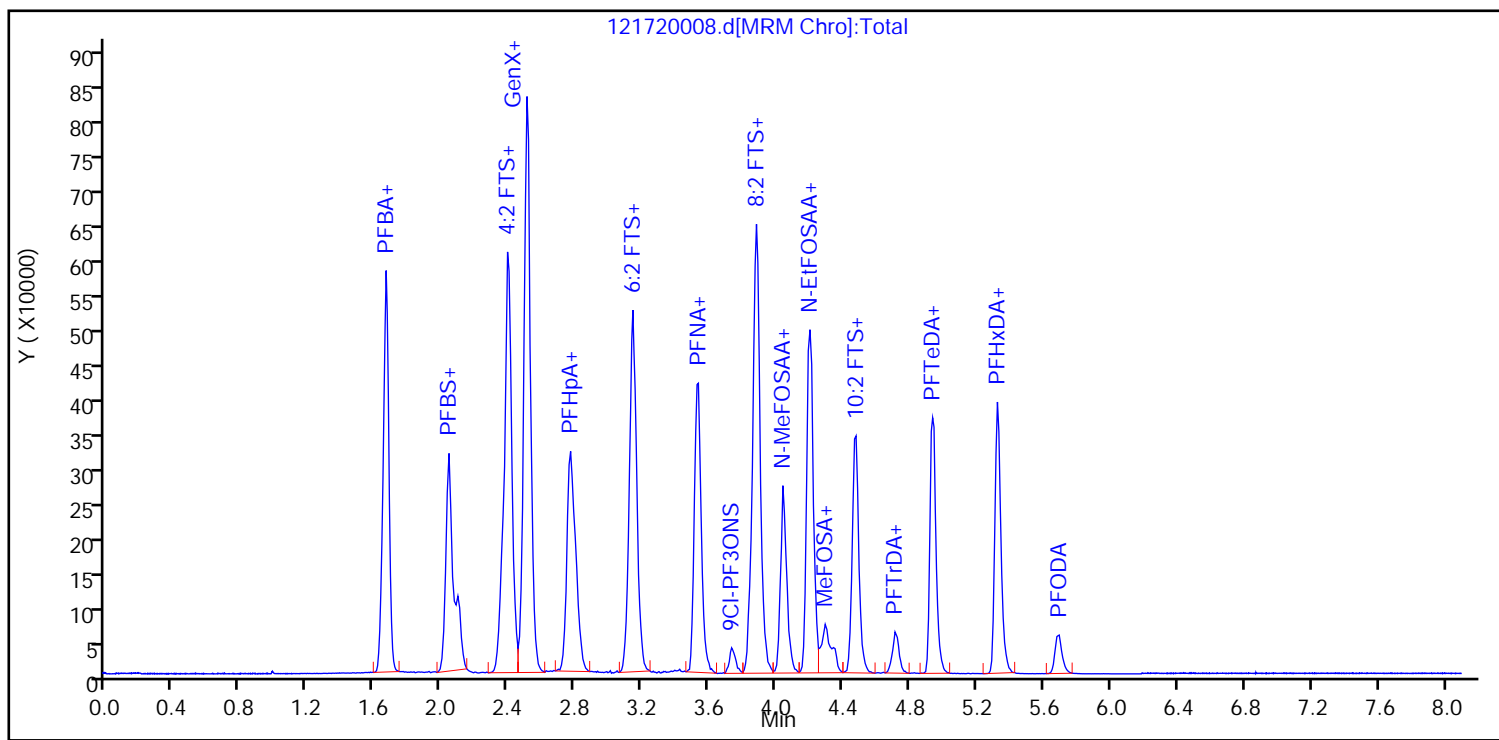
Client ID:

Lab ID: ICAL 200\_SVLC-1221

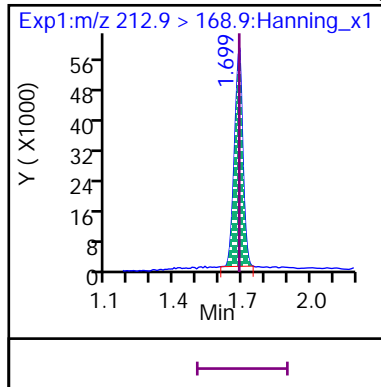
Sample Info: ICAL 200\_SVLC-1221

Dil. Factor: 1

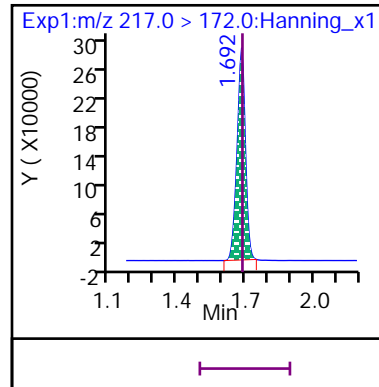
Operator: Stephen E. Somerville



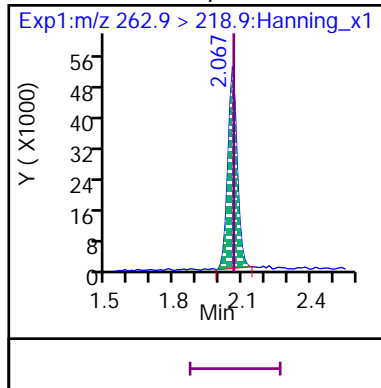
8 Perfluoro-n-butanoic acid (PFBA)



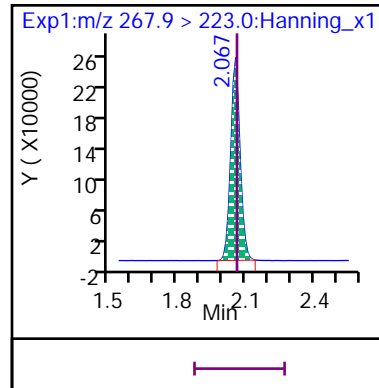
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

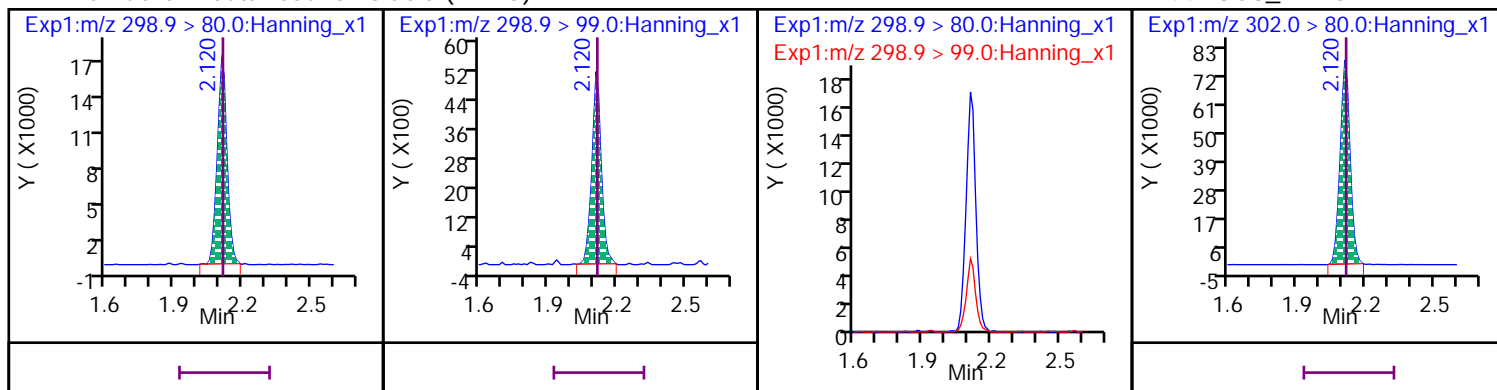


D 50 13C5\_PFPeA



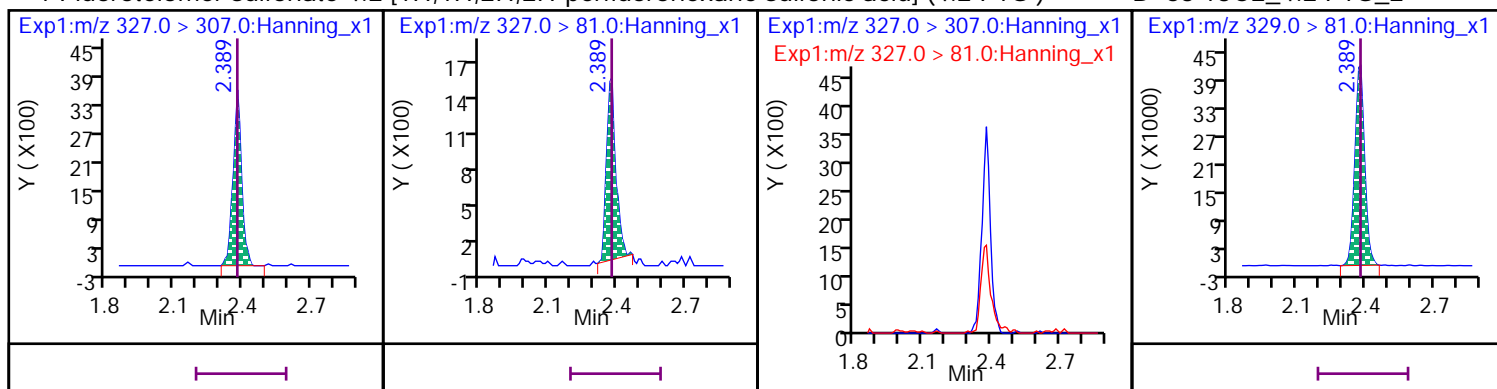
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



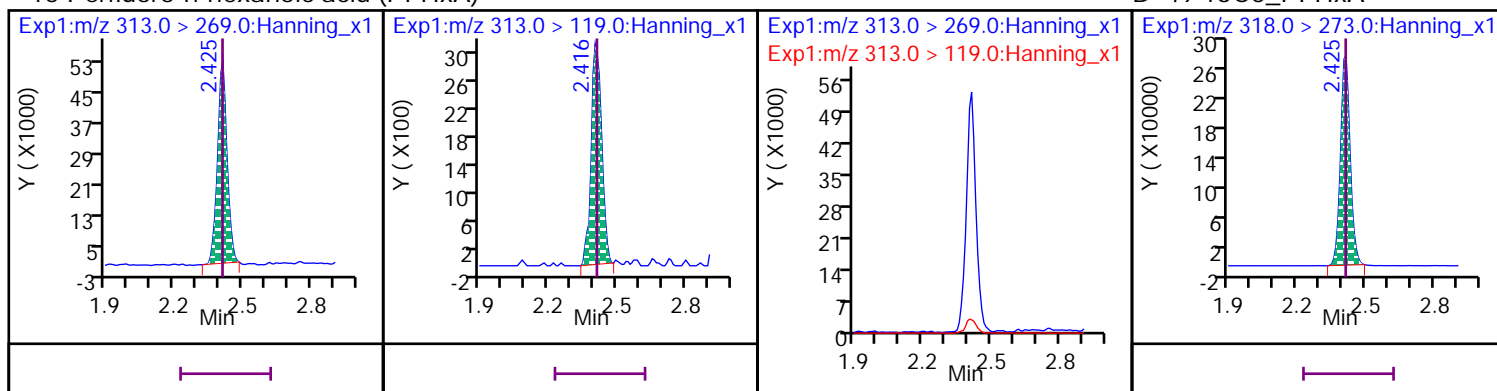
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



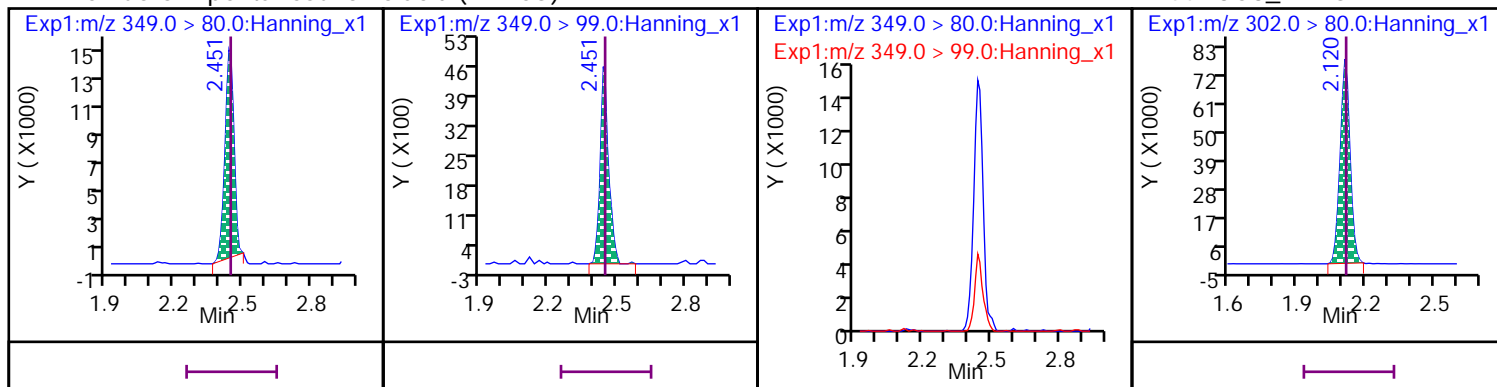
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

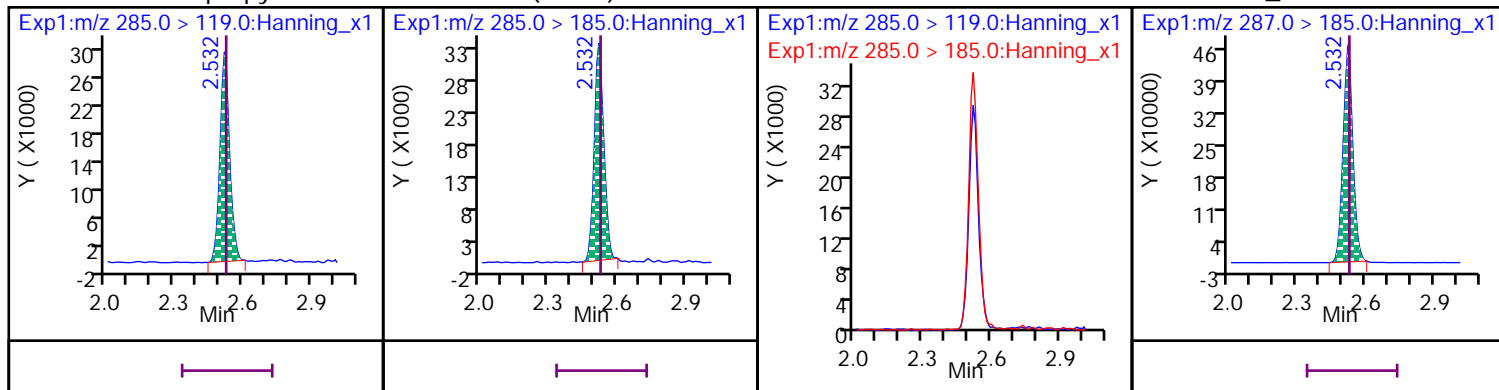
D 44 13C3\_PFBS





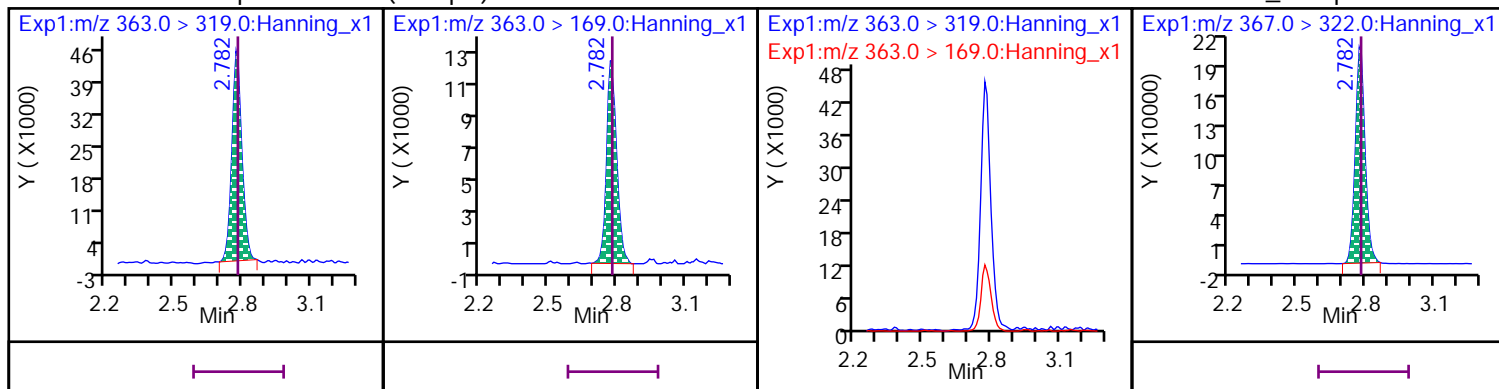
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



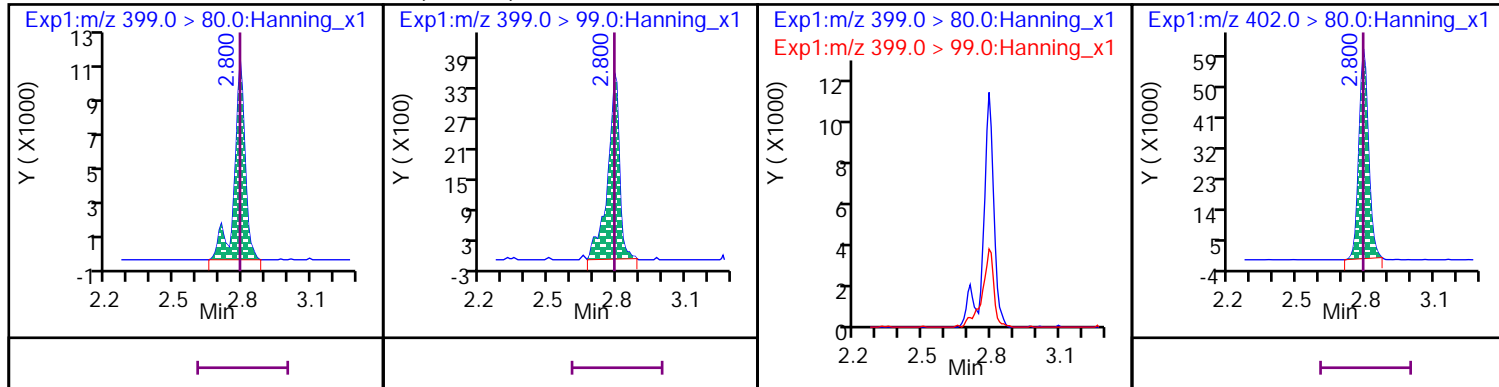
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



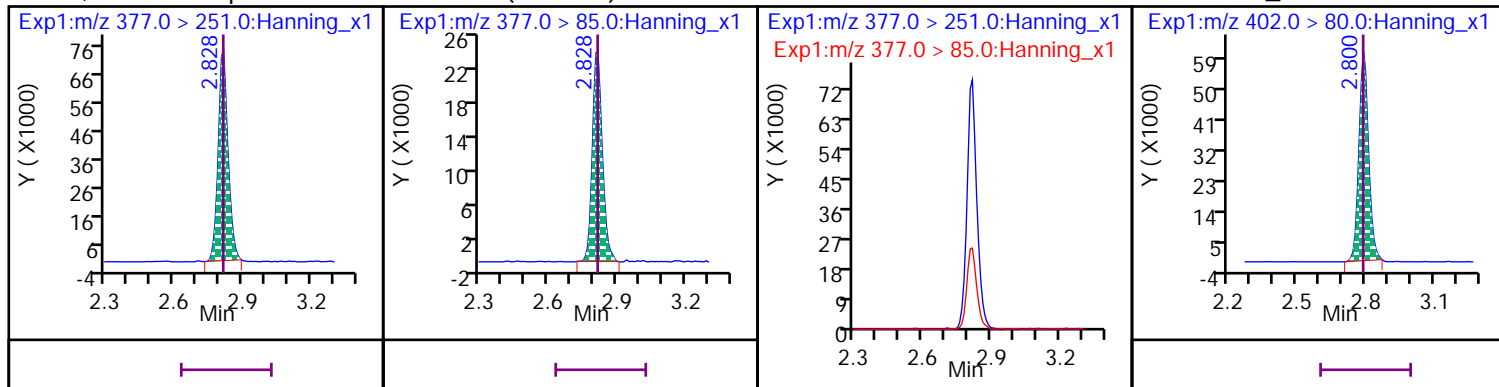
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



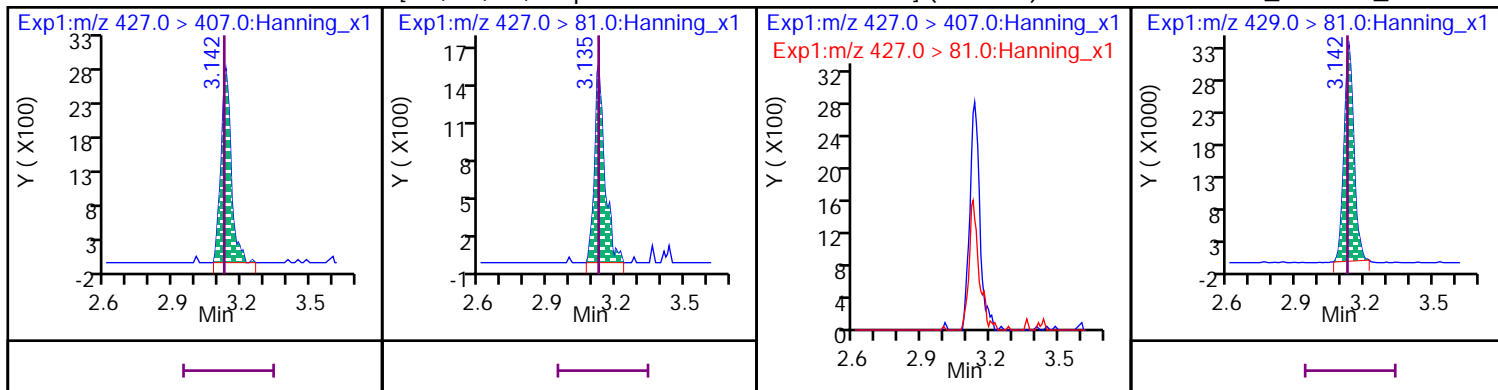
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



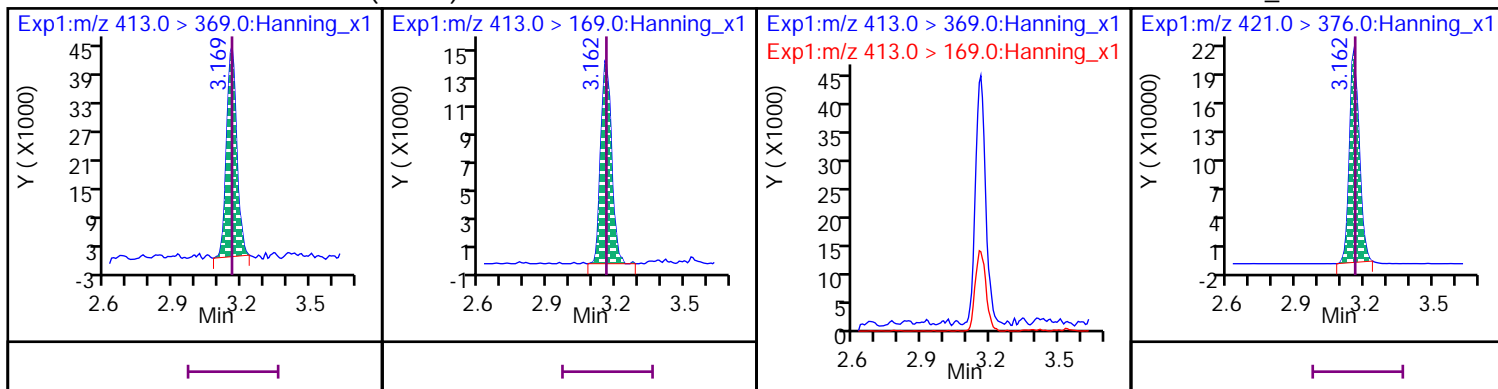
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



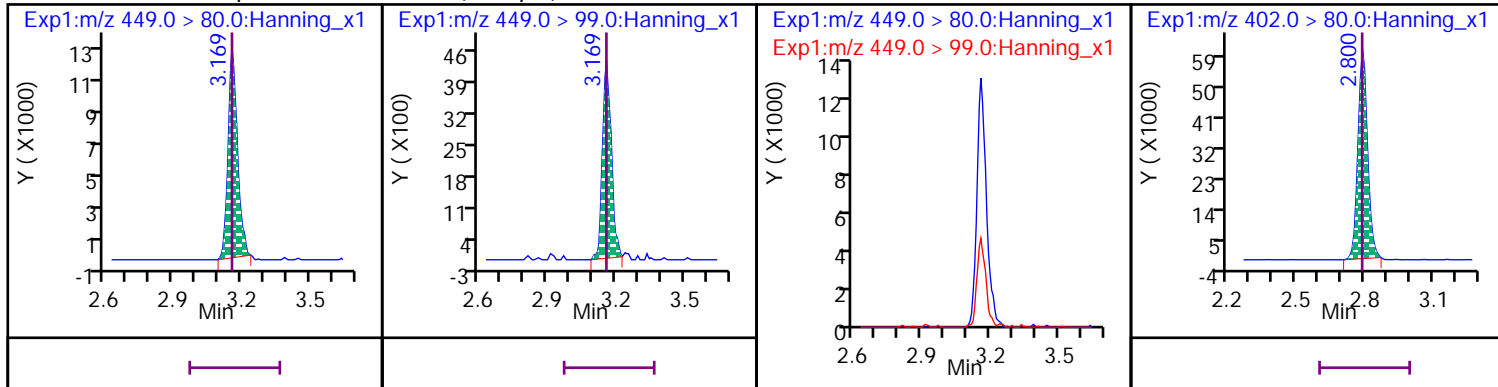
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



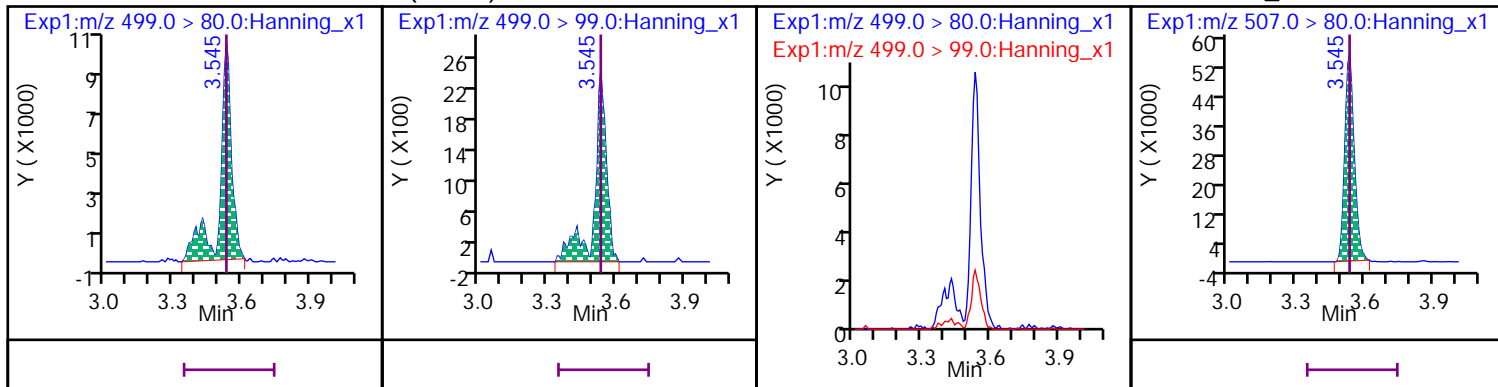
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



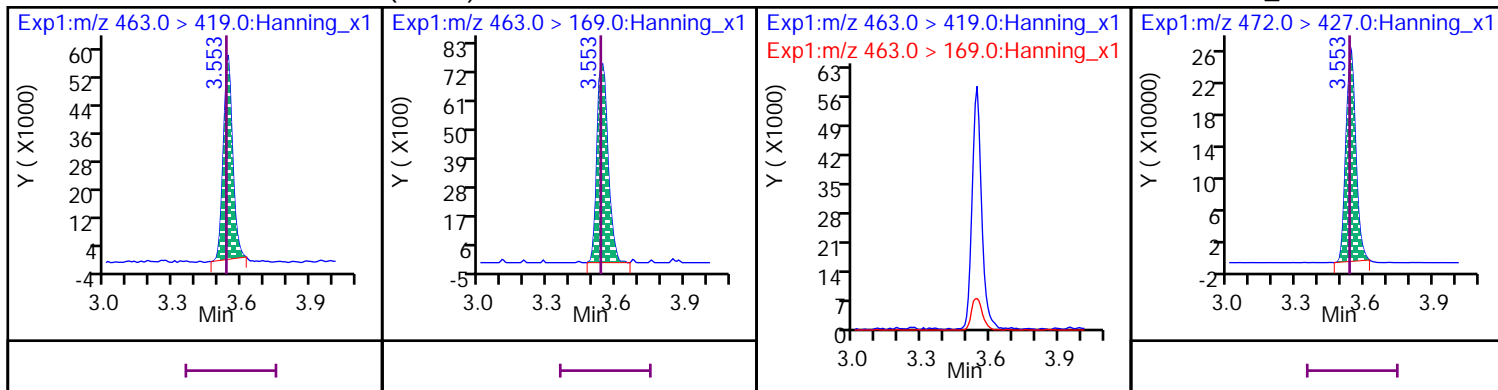
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



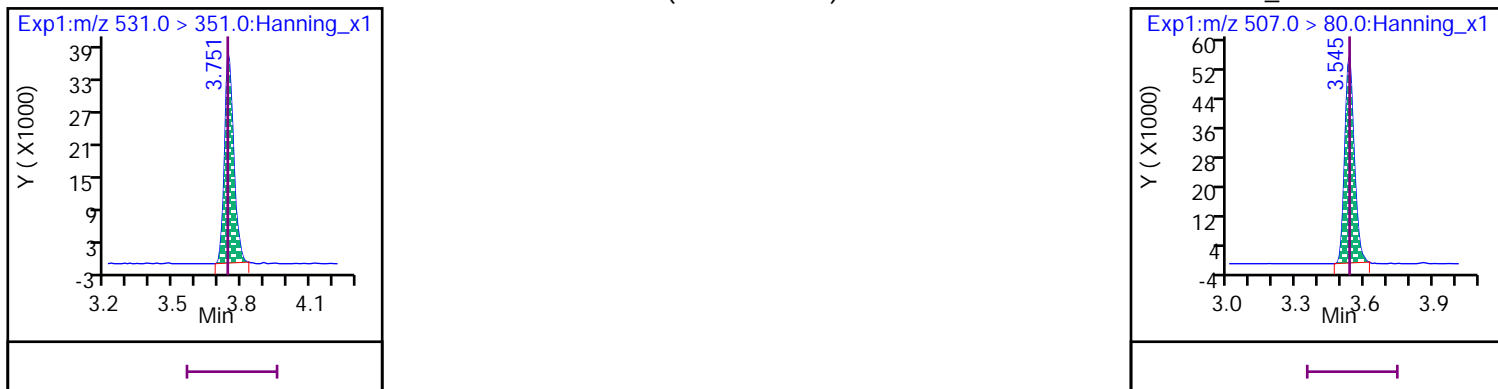
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



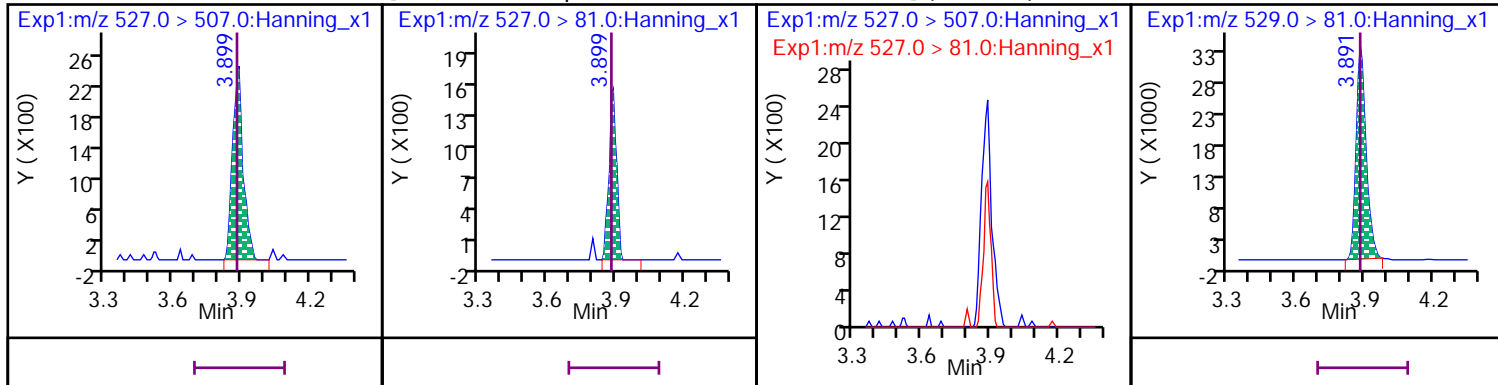
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



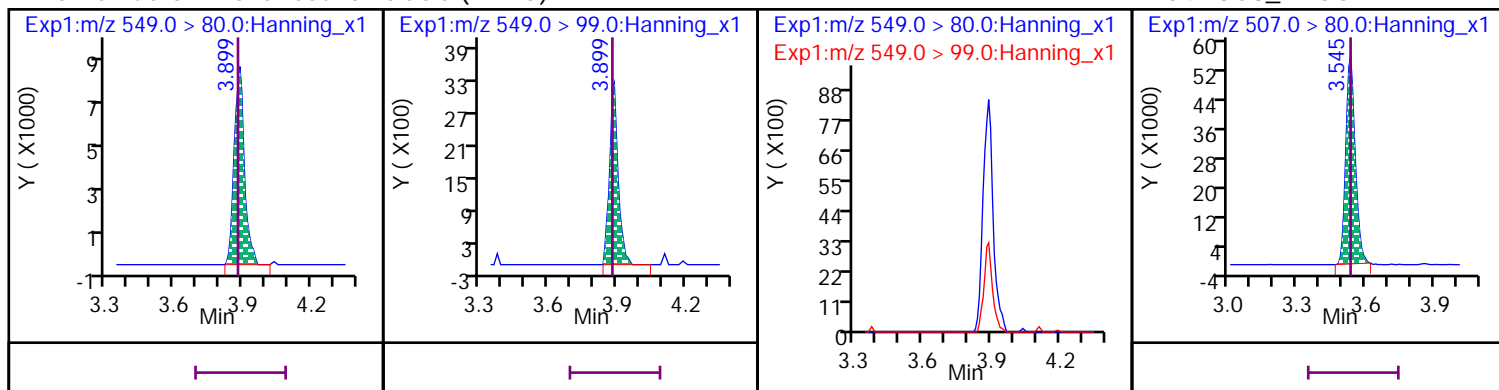
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



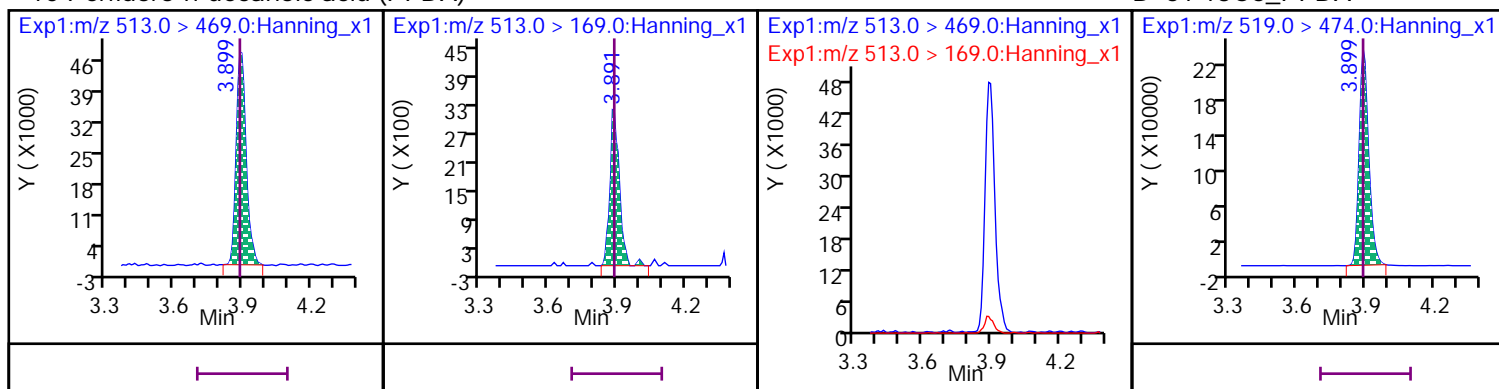
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



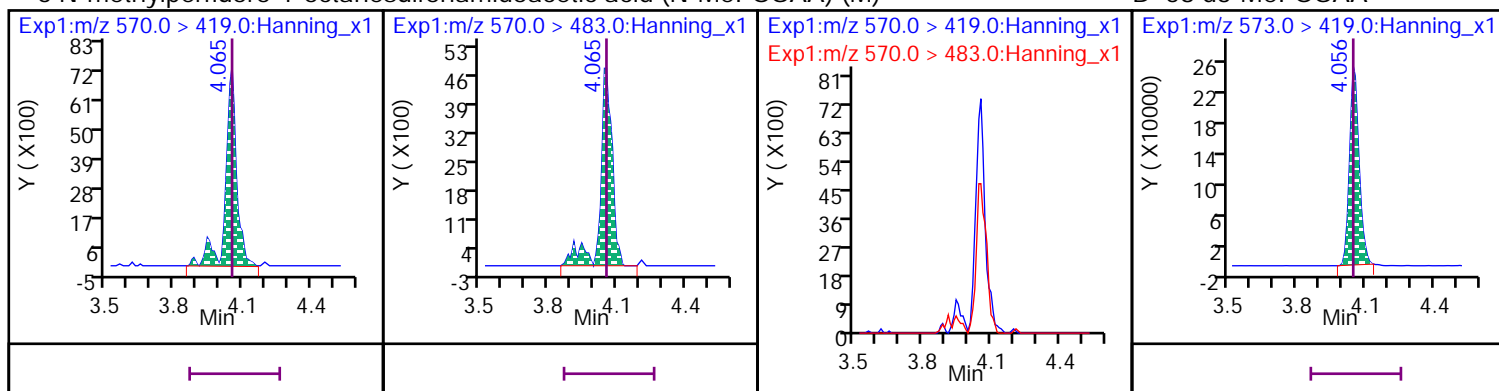
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



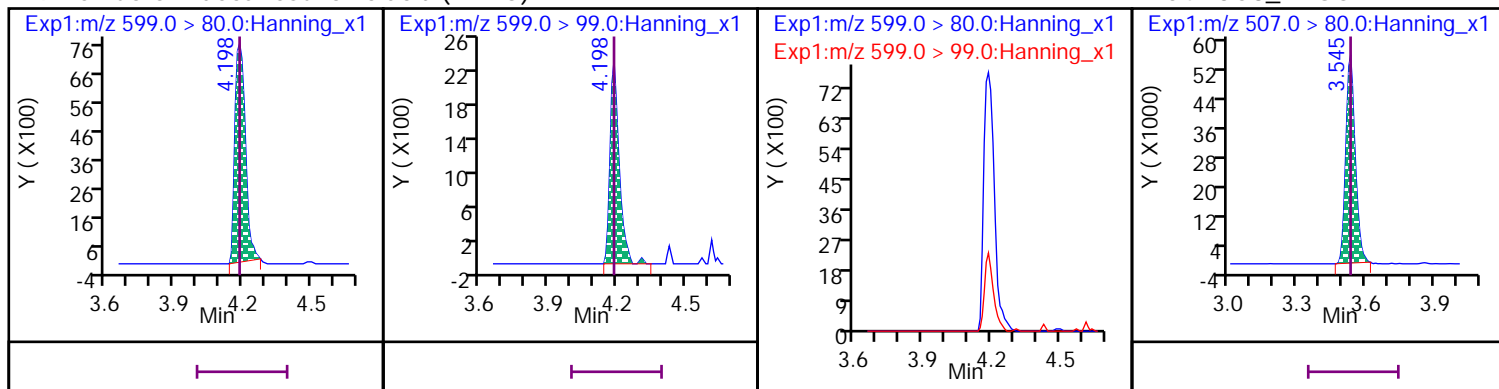
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



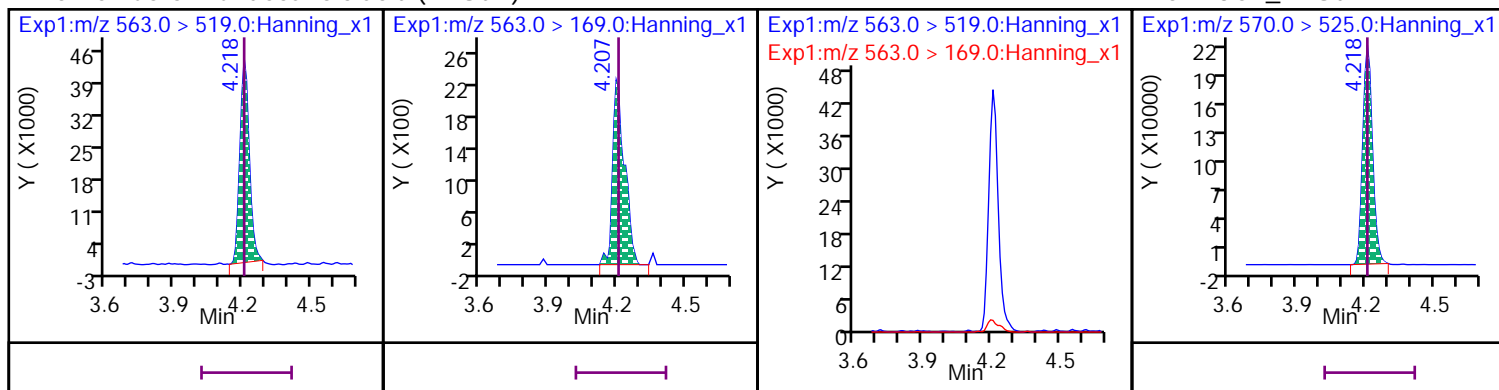
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



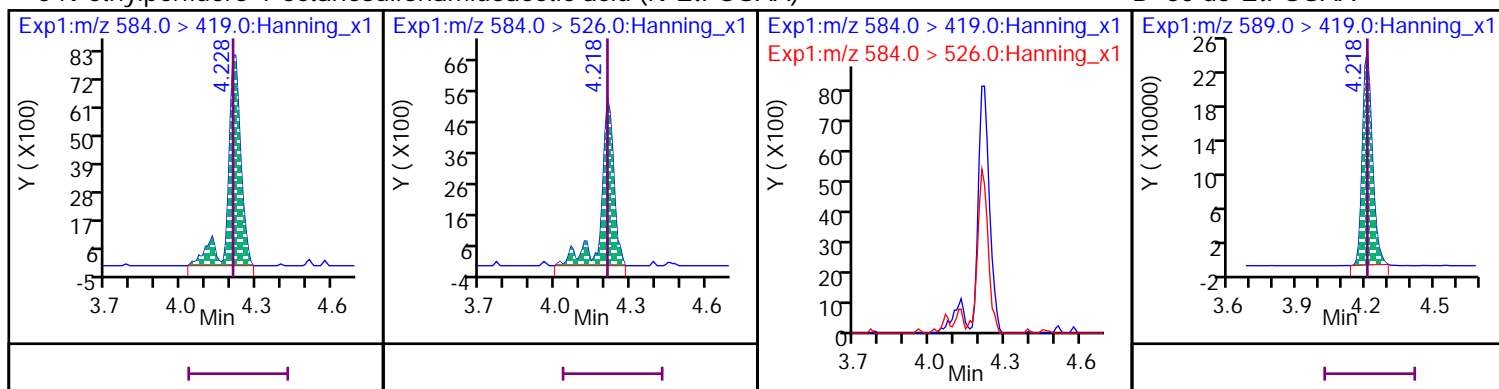
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



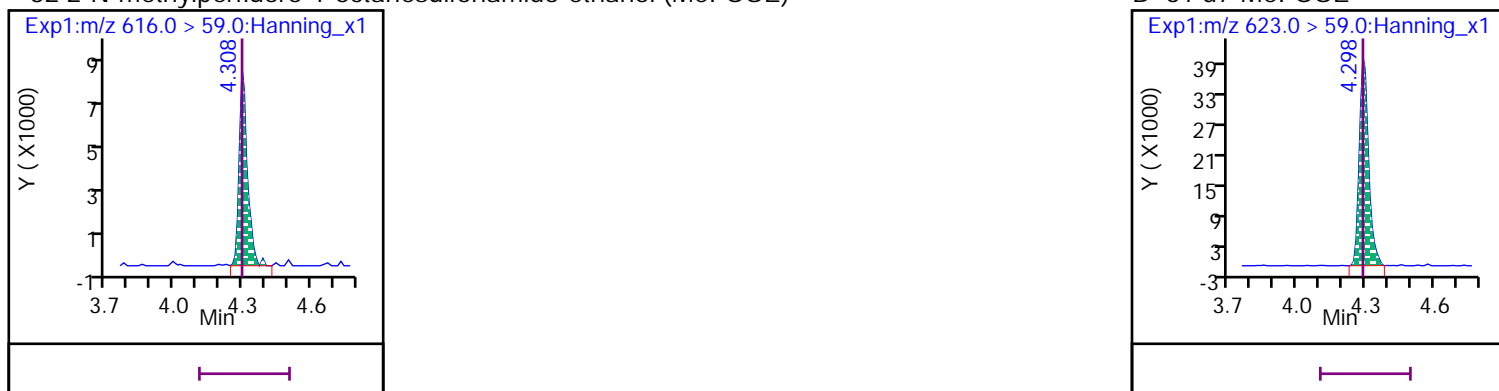
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



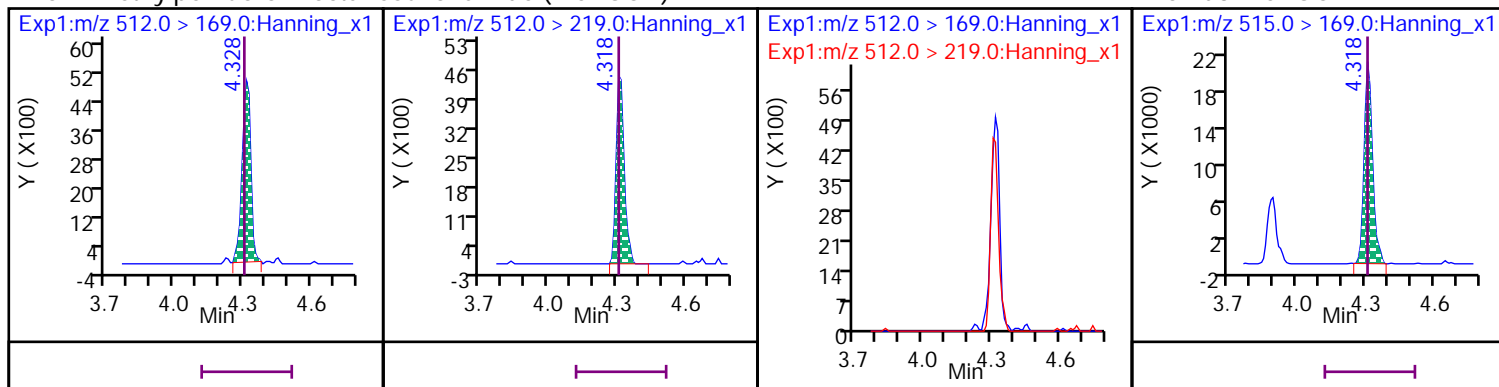
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

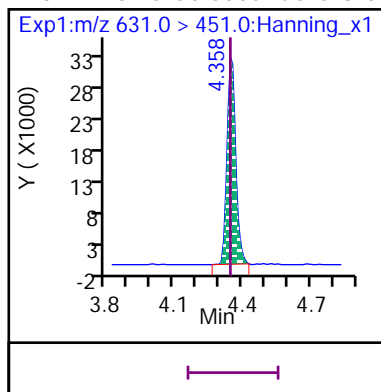


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

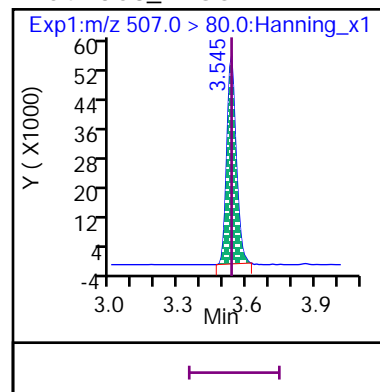
D 57 d3-MeFOSA



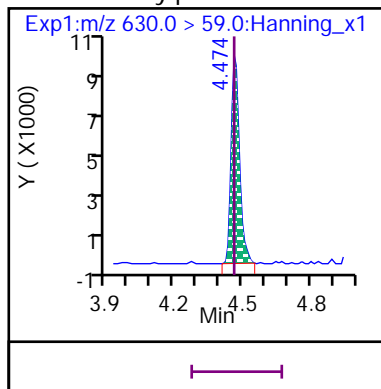
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



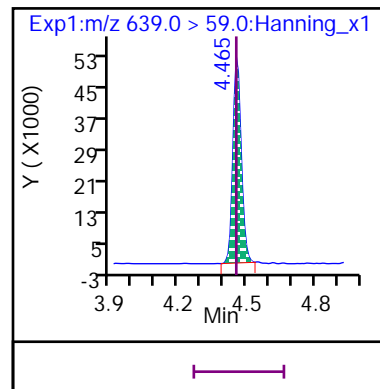
D 54 13C8\_PFOS



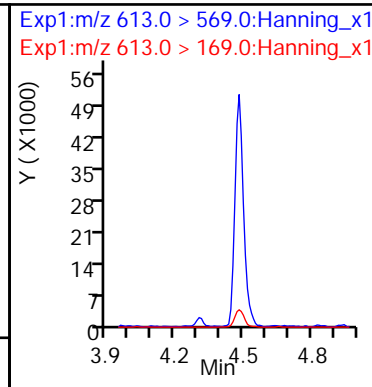
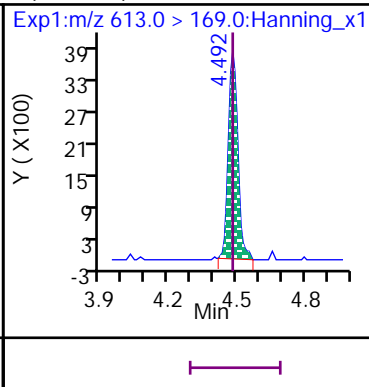
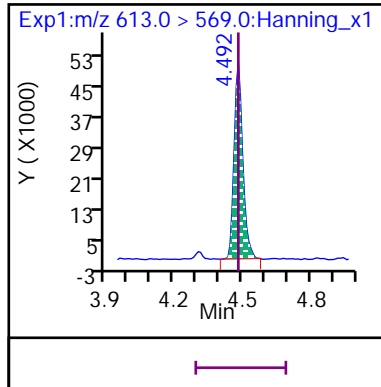
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



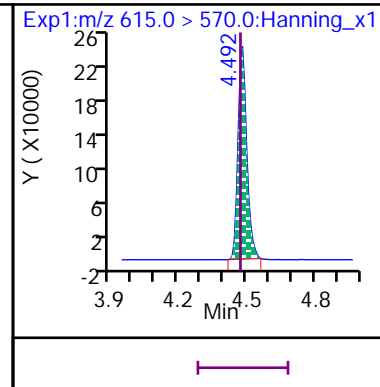
D 62 d9-EtFOSE



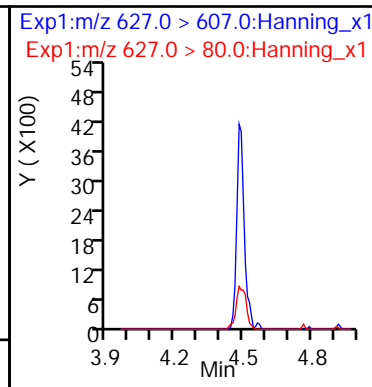
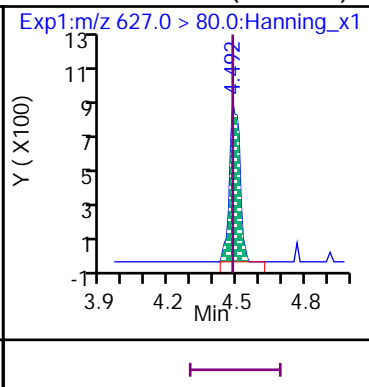
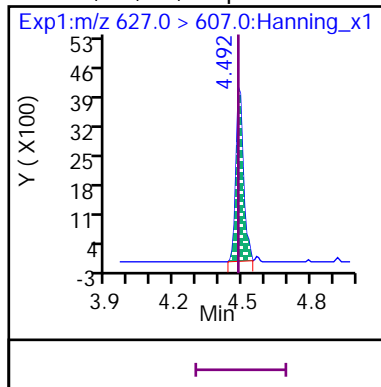
11 Perfluoro-n-dodecanoic acid (PFDoA)



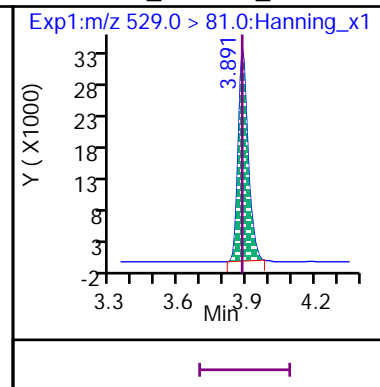
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

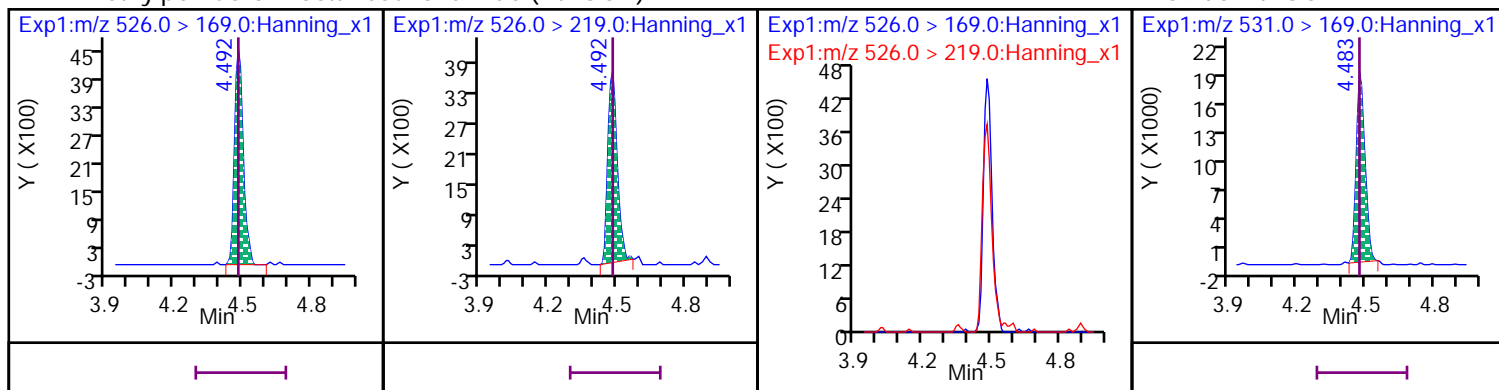


D 65 13C2\_8:2 FTS\_2



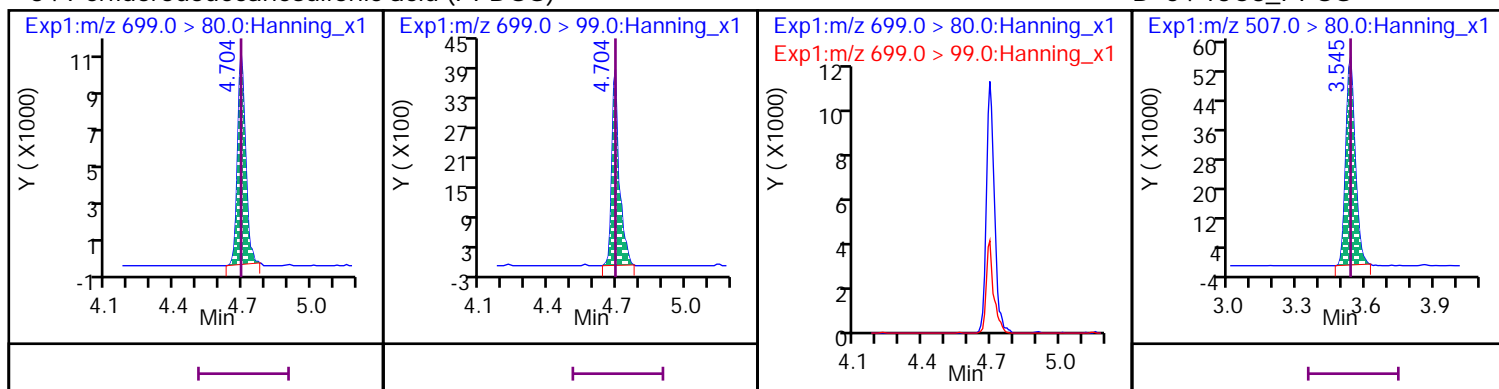
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



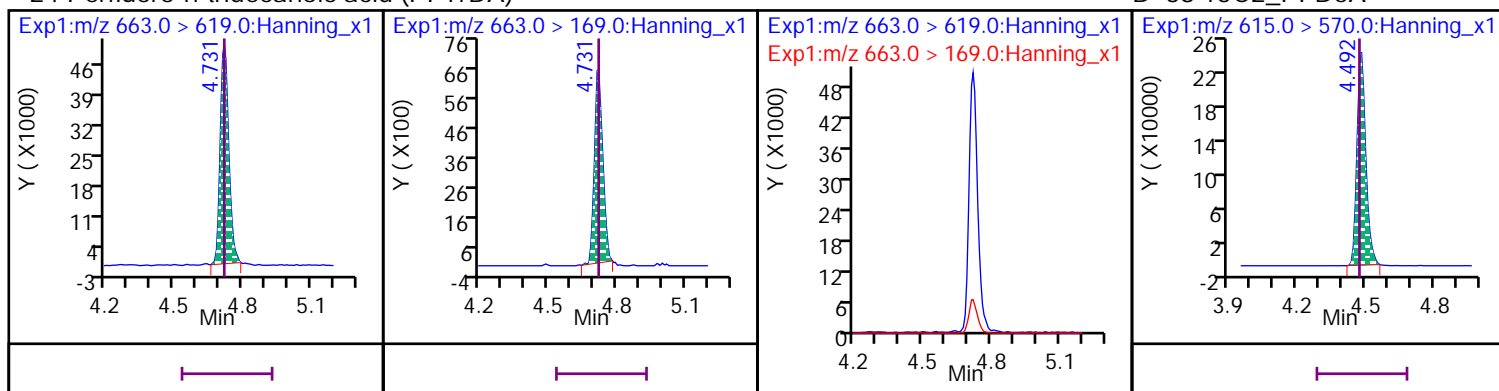
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



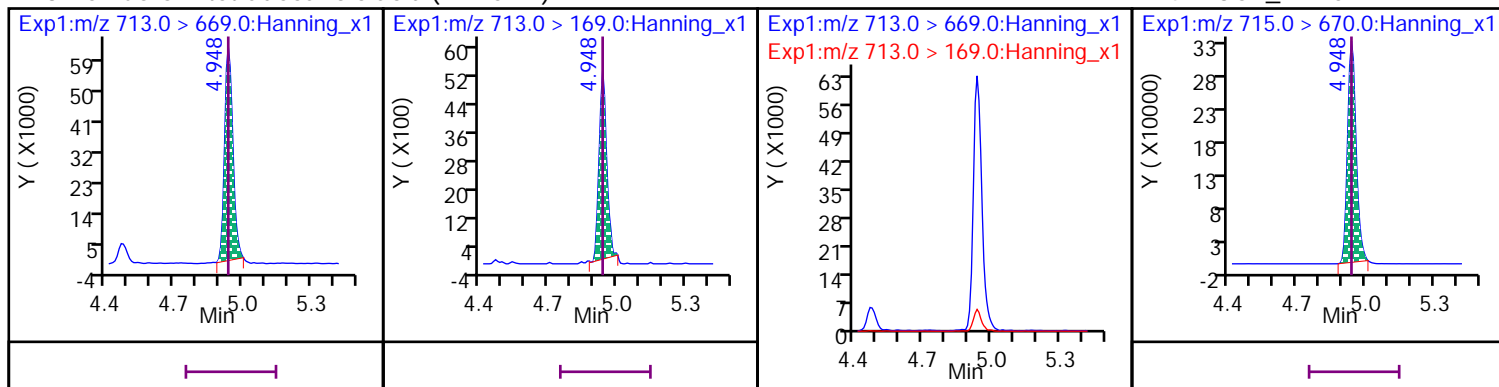
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

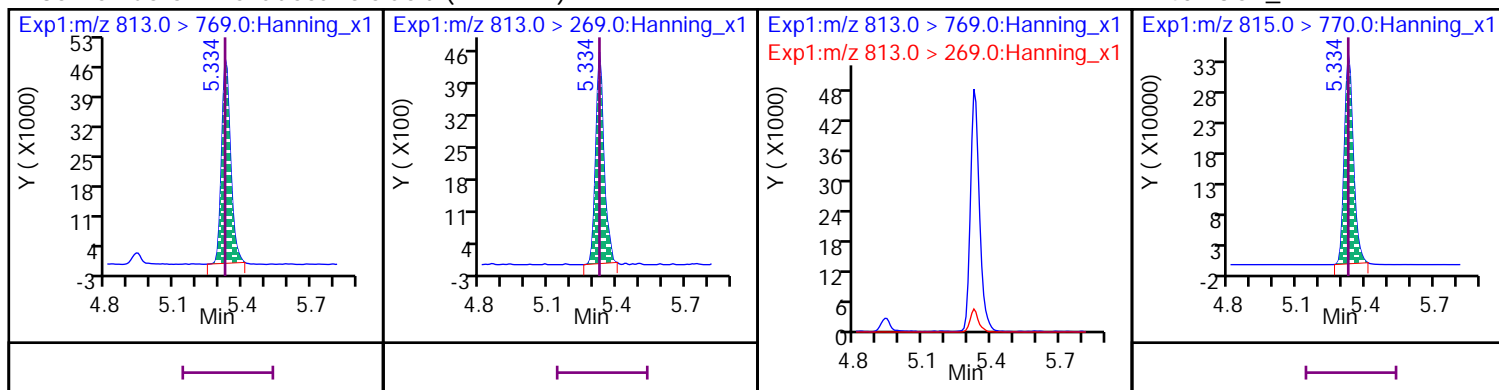
## D 42 13C2\_PFTeDA





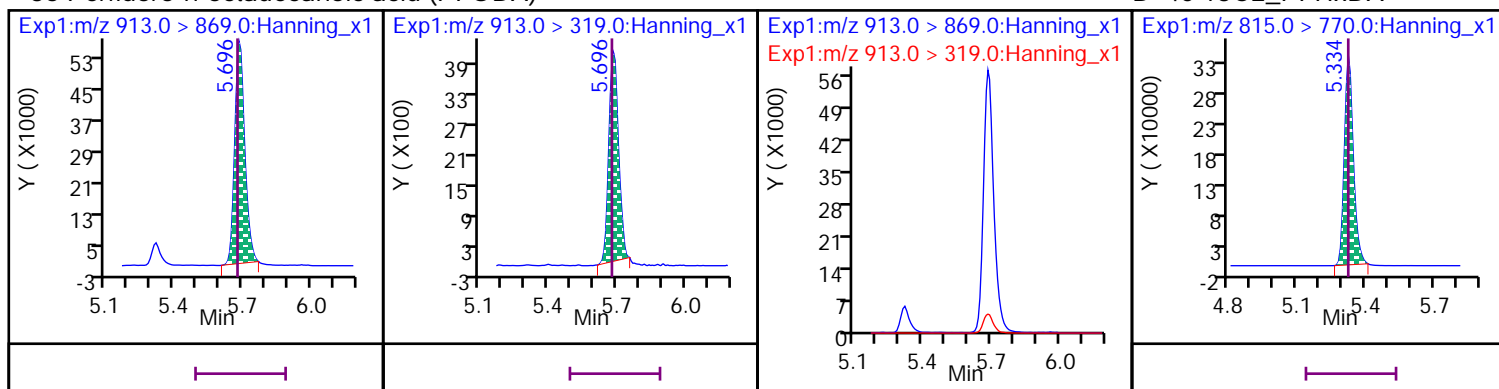
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

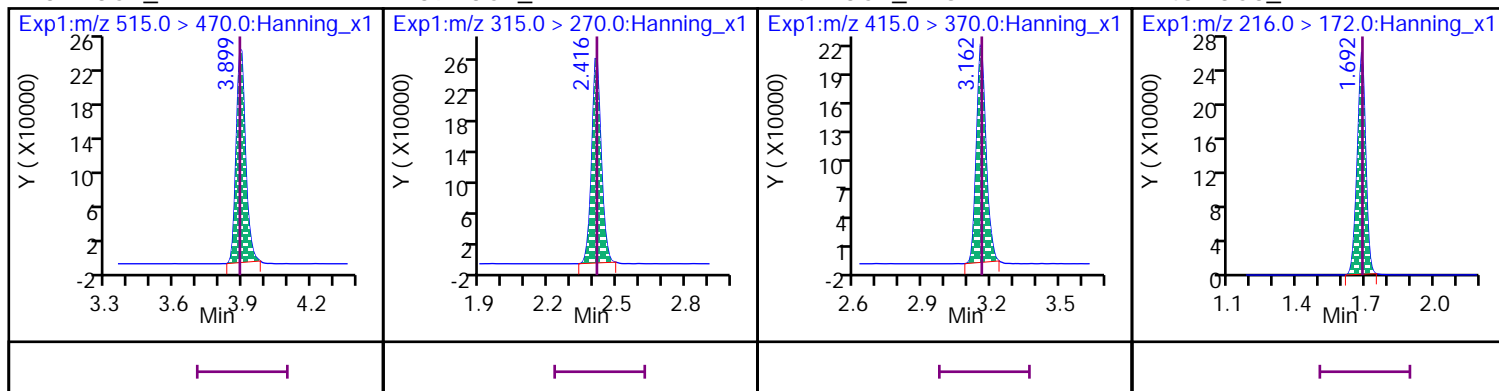


\* 37 13C2\_PFDA

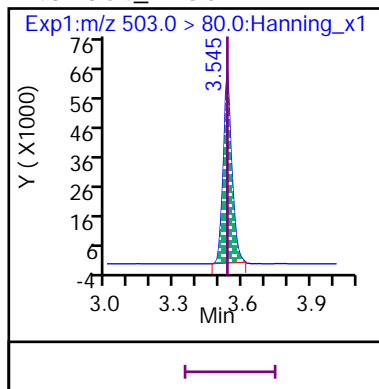
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d

Injection Date: 17-Dec-2020 12:43:32

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 200\_SVLC-1221

Sample Info: ICAL 200\_SVLC-1221

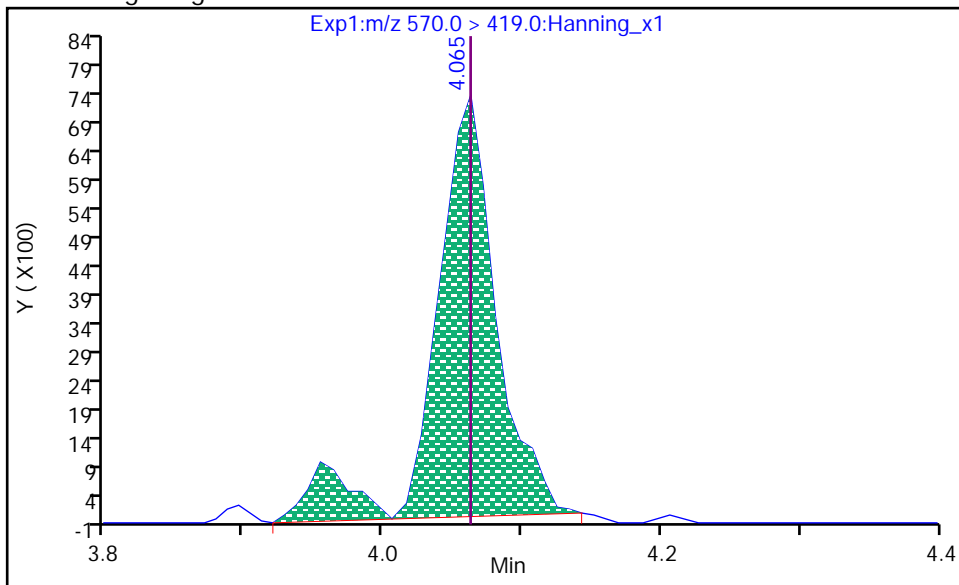
Dil. Factor: 1

Operator: Stephen E. Somerville

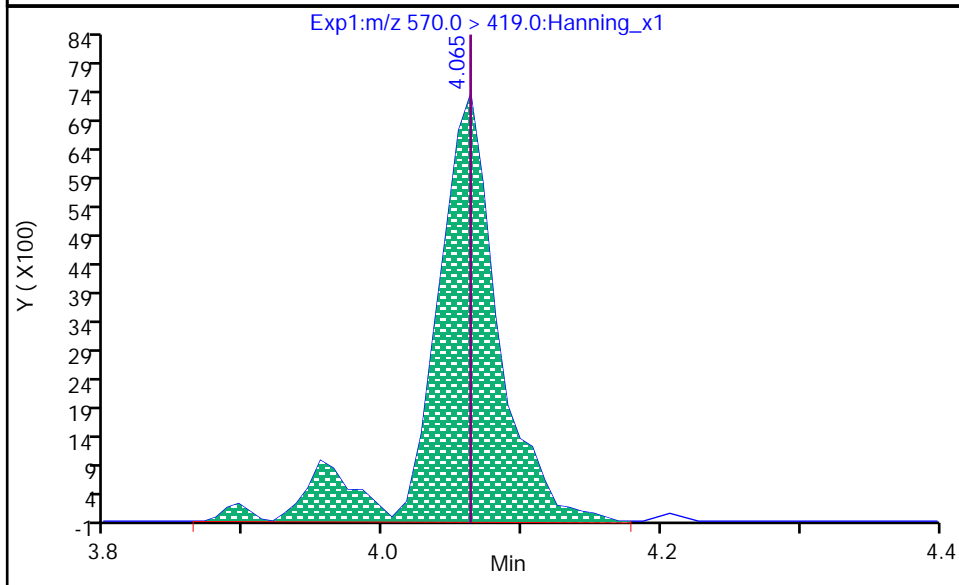
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.065  
Area: 22493  
Amount: 207.26  
Amount Units: ng/L

Processing Integration Results



RT: 4.065  
Area: 24498  
Amount: 222.54  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:10

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d  
 Injection Date: 17-Dec-2020 12:54:06 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 4 Auto Sampler: 4  
 Sample Info: ICAL 500\_SVLC-1222 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.690	1.696	0	706020	22	>100:1			1000.00	1017.98	96	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/1	332397	23	>100:1			500.00	472.70		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.062	2.072	0	686828	19	>100:1			1000.00	998.46	94.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/1	337453	25	>100:1			500.00	488.67		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	237792	17	>100:1			1000.00	1032.84	96	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	112525	16	>100:1	Target = 3.50		442.00	401.35		
298.9 > 99	44	2.125	2.125		31405	16	>100:1	3.58 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/0	88761	19	>100:1	Target = 3.10		469.00	430.31		
349 > 99	44	2.459	2.459		30551	21	>100:1	2.90 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	116793	20	>100:1			5000.00	4824.50	92.4	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	22151	18		Target = 1.80		467.00	475.17		
327 > 81	63	2.388	2.388		12675	21	93:1	1.74 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	746858	19	>100:1			1000.00	1013.28	96.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	356914	20	>100:1	Target = 18.34		500.00	484.05		
313 > 119	49	2.423	2.423		19380	16	>100:1	18.41 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1360808	19	>100:1			5000.00	5109.02	96.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.539	0/0	191755	25	>100:1	Target = 0.81		1000.00	980.66		
285 > 185	66	2.530	2.539		226814	18	>100:1	0.84 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	615843	20	>100:1			1000.00	1015.16	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	326766	20	>100:1	Target = 3.70		500.00	511.54		
363 > 169	47	2.781	2.790		81459	21	>100:1	4.01 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	177317	19	>100:1			1000.00	1035.56	98.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	73859	25	>100:1	Target = 3.21	0.17	455.00	392.85		
399 > 99	45	2.808	2.799		22408	16	87:1	3.29 (1.60-4.81)					
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	512996	19	>100:1	Target = 2.97		471.00	455.69		
377 > 85	45	2.827	2.827		165834	18	>100:1	3.09 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.176	3.169	1/0	73941	23	>100:1	Target = 3.08		476.00	459.03		
449 > 99	45	3.169	3.169		24975	25	>100:1	2.96 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	105177	25	>100:1			5000.00	5461.36	101	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	18208	22	>100:1	Target = 1.80		474.00	401.37		
427 > 81	64	3.135	3.135		10315	32	56:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	612816	25	>100:1			1000.00	1035.40	93.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/1	302064	22	>100:1	Target = 2.87		500.00	483.51		
413 > 169	53	3.169	3.169		103034	21	>100:1	2.93 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	149008	20	>100:1			1000.00	993.86	96.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	81969	38	>100:1	Target = 3.84	0.26	464.00	464.22		
499 > 99	54	3.545	3.545		20217	37	98:1	4.05 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/0	231609	22	>100:1			466.00	461.71		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	50413	18	>100:1	Target = 3.07		480.00	442.10		
549 > 99	54	3.891	3.891		20817	23	>100:1	2.42 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.207	4.198	1/0	50144	17	>100:1	Target = 3.03		482.00	463.70		
599 > 99	54	4.198	4.198		19495	20	>100:1	2.57 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	193040	17	>100:1			471.00	456.17		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	53473	18	>100:1	Target = 3.33		484.00	446.99		
699 > 99	54	4.704	4.704		18453	20	>100:1	2.89 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	769495	21	>100:1			1000.00	1024.68	97.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	367390	21	>100:1	Target = 6.16		500.00	477.43		
463 > 169	56	3.545	3.545		61446	22	>100:1	5.97 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	328216	20	>100:1			1000.00	1060.25	99.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	160438	21	>100:1			500.00	496.04		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	96787	19	>100:1			5000.00	5217.59	104	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	16908	18	>100:1	Target = 1.95		479.00	425.09		
527 > 81	65	3.891	3.891		10128	25	36:1	1.66 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	19906	17	>100:1	Target = 3.14		482.00	445.00		
627 > 80	65	4.492	4.492		6411	19	67:1	3.10 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	685807	21	>100:1			1000.00	1033.88	98.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	336009	20	>100:1	Target = 15.94		500.00	498.63		
513 > 169	51	3.899	3.899		15544	13	>100:1	21.61 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	713379	19	>100:1			5000.00	4969.92	93.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	56256	32	>100:1	Target = 1.33	0.09	500.00	513.30		M
570 > 483	58	4.065	4.065		39759	31	>100:1	1.41 (0.66-1.99)	0.19				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	710894	19	>100:1			5000.00	5352.53	96.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/0	66323	32	>100:1	Target = 1.58	0.13	500.00	468.55		
584 > 526	60	4.218	4.217		41879	31	>100:1	1.58 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	625031	17	>100:1			1000.00	988.86	92.1	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	273549	17	>100:1	Target = 15.50		500.00	465.65		
563 > 169	52	4.218	4.217		16210	15	69:1	16.87 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	110965	15	>100:1			1000.00	1025.48	94.6	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	49699	15	>100:1			500.00	476.67		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	46102	14	>100:1			1000.00	871.22	83.9	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	27401	20	>100:1	Target = 1.12		500.00	526.82		
512 > 219	57	4.328	4.318		27087	15	>100:1	1.01 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	131192	18	>100:1			1000.00	1046.23	108	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	52319	17	>100:1			500.00	448.25		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	617850	16	>100:1			1000.00	1020.70	95.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	313202	16	>100:1	Target = 10.85		500.00	500.58		
613 > 169	38	4.492	4.492		28793	24	>100:1	10.87 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.724	4.731	0/-1	299656	22	>100:1	Target = 8.37		500.00	492.41		
663 > 169	38	4.731	4.731		34403	22	>100:1	8.71 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	45944	16	>100:1			1000.00	935.83	89.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	26818	15	>100:1	Target = 1.03		500.00	534.28		
526 > 219	59	4.501	4.492		24603	14	>100:1	1.09 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	856925	20	>100:1			1000.00	1017.19	96.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	363719	21	42:1	Target = 12.11		500.00	489.87		
713 > 169	42	4.948	4.948		29417	18	>100:1	12.36 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	910723	19	>100:1			1000.00	1005.03	99.7	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	288509	18	88:1	Target = 11.48		500.00	484.84		
813 > 269	40	5.334	5.334		26566	17	>100:1	10.86 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	390009	24	41:1	Target = 13.88		500.00	483.77		
913 > 319	40	5.696	5.689		28458	33	>100:1	13.70 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	674242	18	>100:1					92.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	712364	19	>100:1					94.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	1	603232	24	>100:1					93.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	635147	23	>100:1					95.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	161217	22	>100:1					99.2	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d

Injection Date: 17-Dec-2020 12:54:06

Inst. ID: LCMSMS02

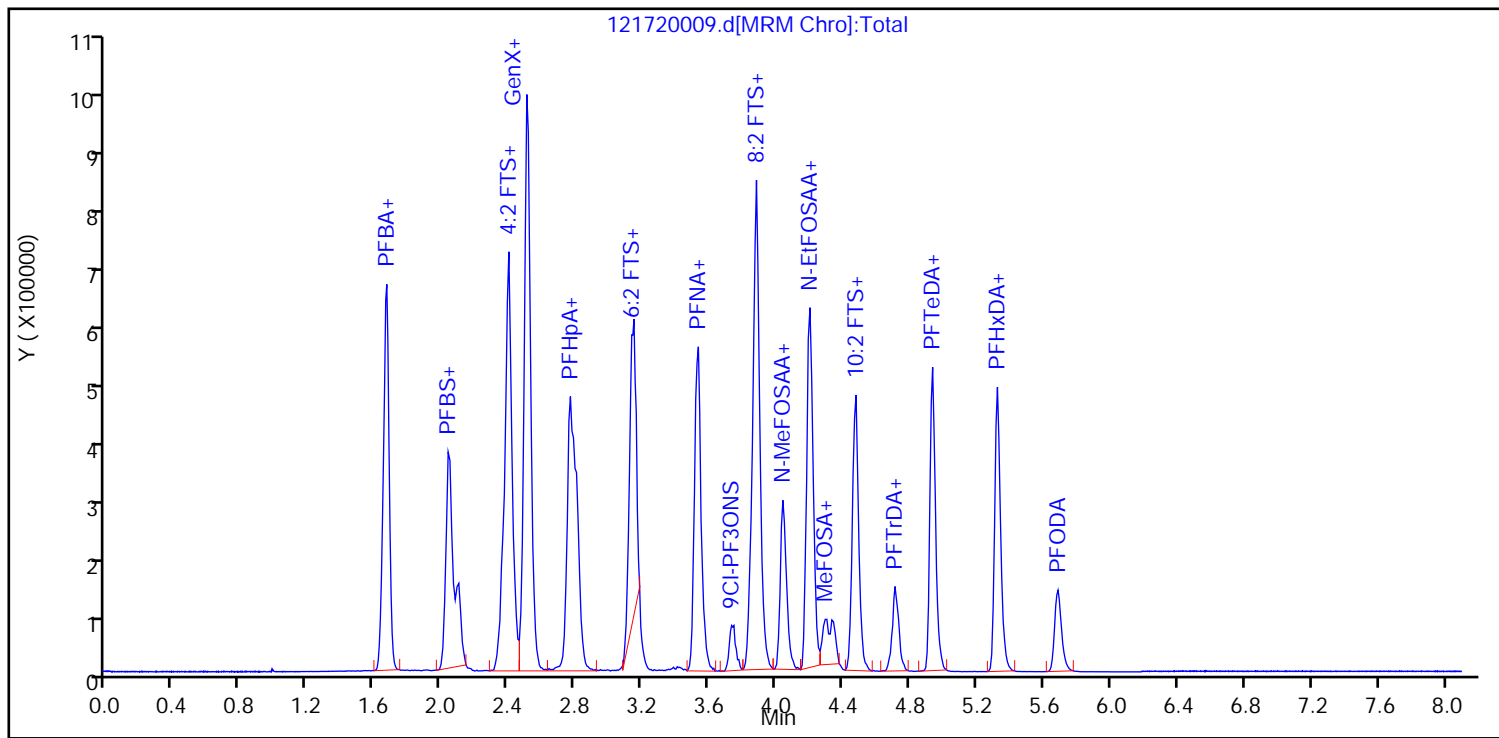
Client ID:

Lab ID: ICAL 500\_SVLC-1222

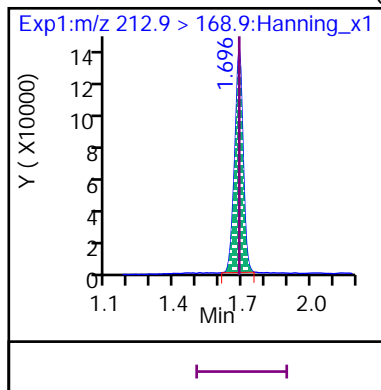
Sample Info: ICAL 500\_SVLC-1222

Dil. Factor: 1

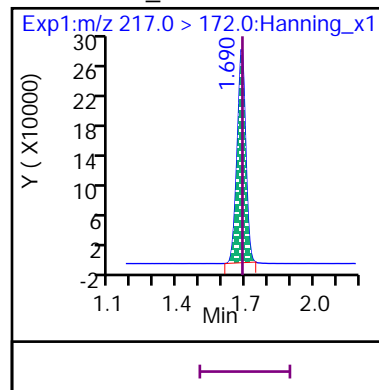
Operator: Stephen E. Somerville



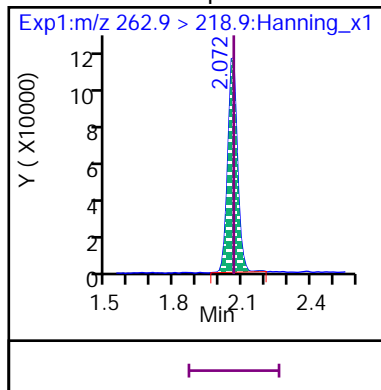
8 Perfluoro-n-butanoic acid (PFBA)



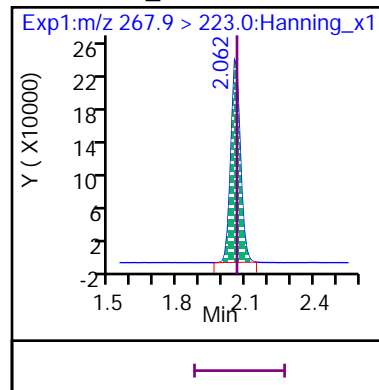
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



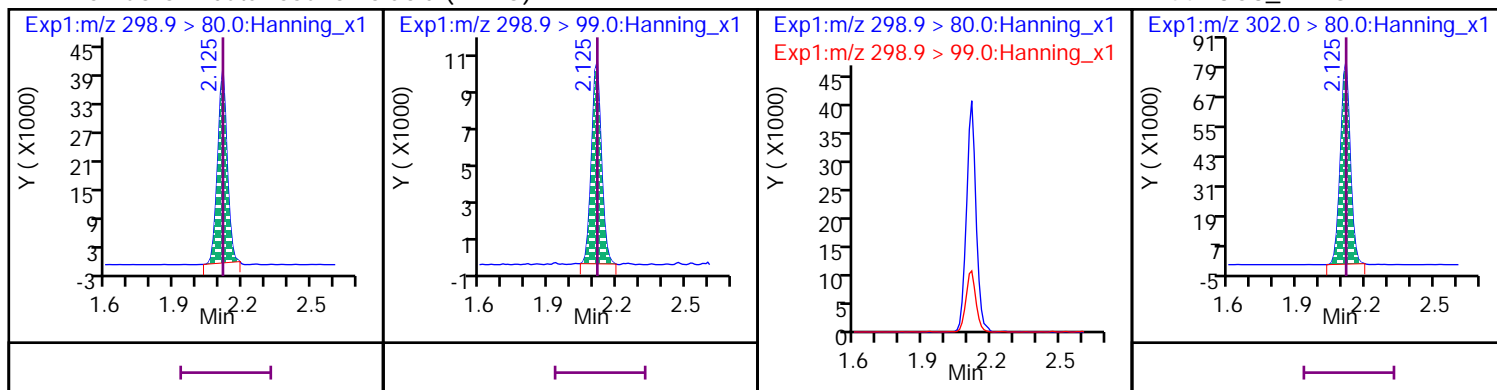
D 50 13C5\_PFPeA





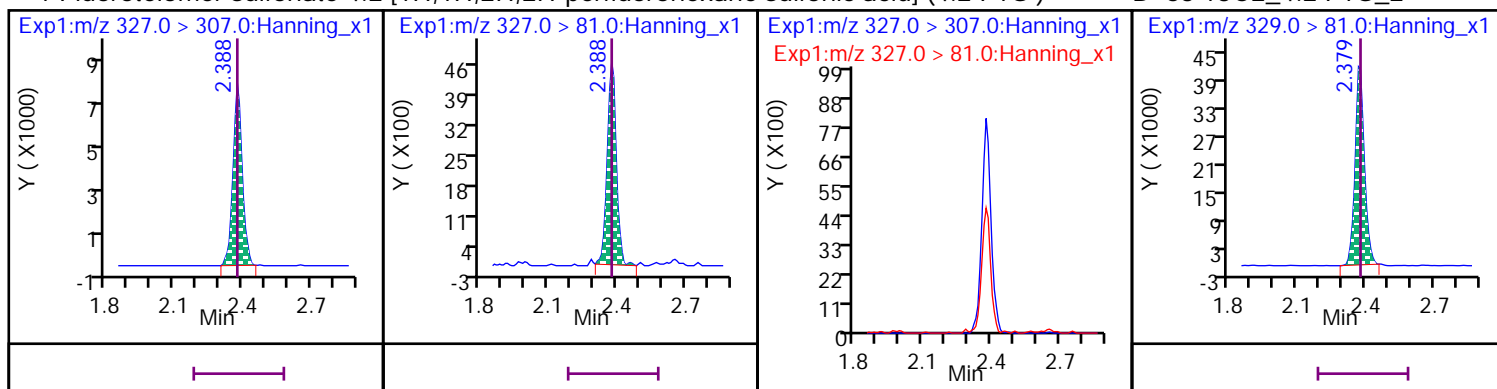
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



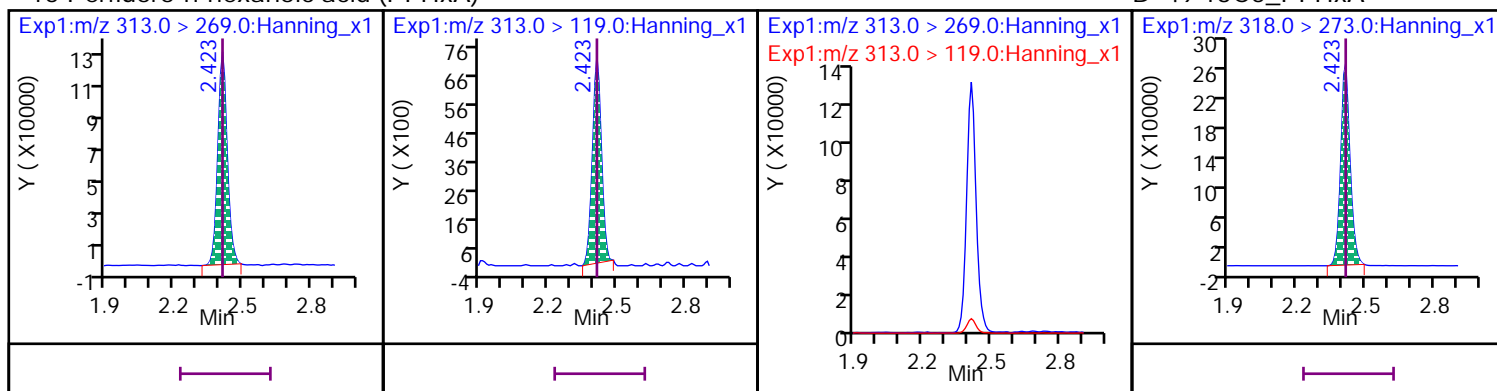
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



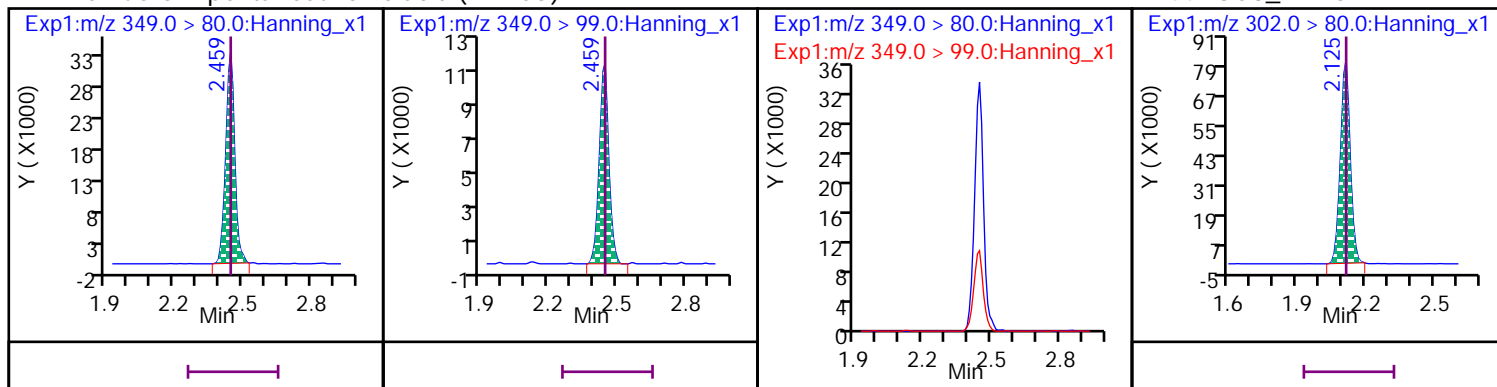
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



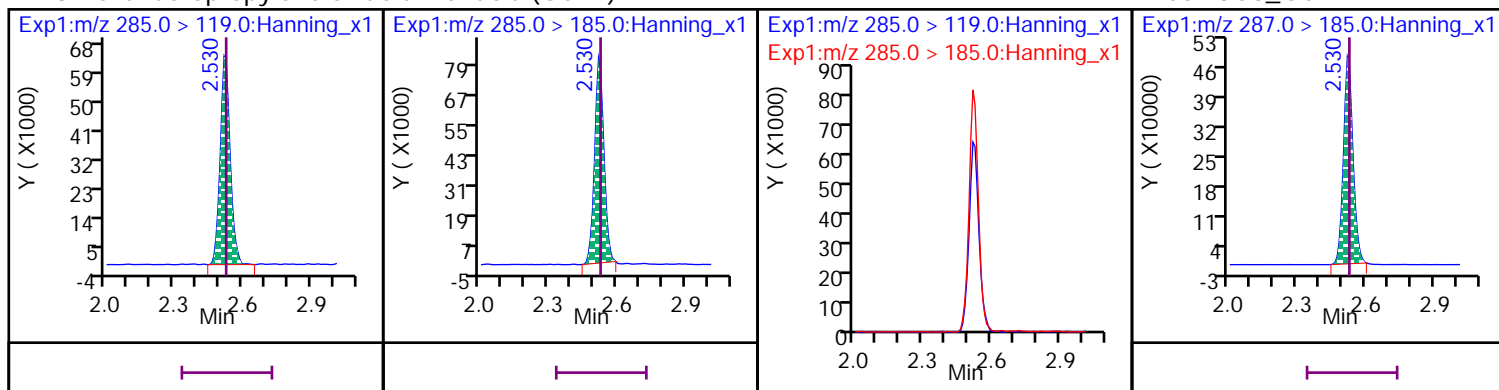
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



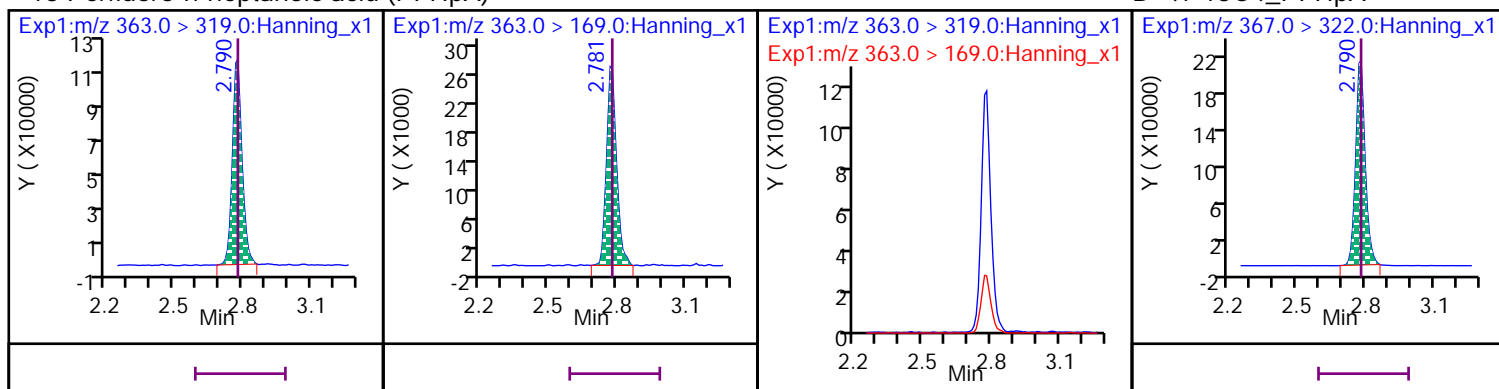
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



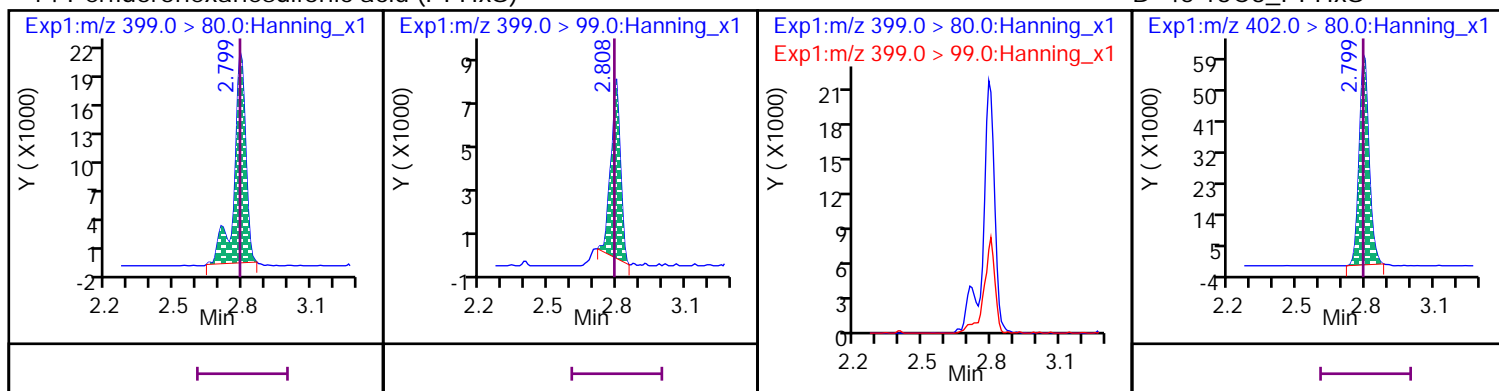
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



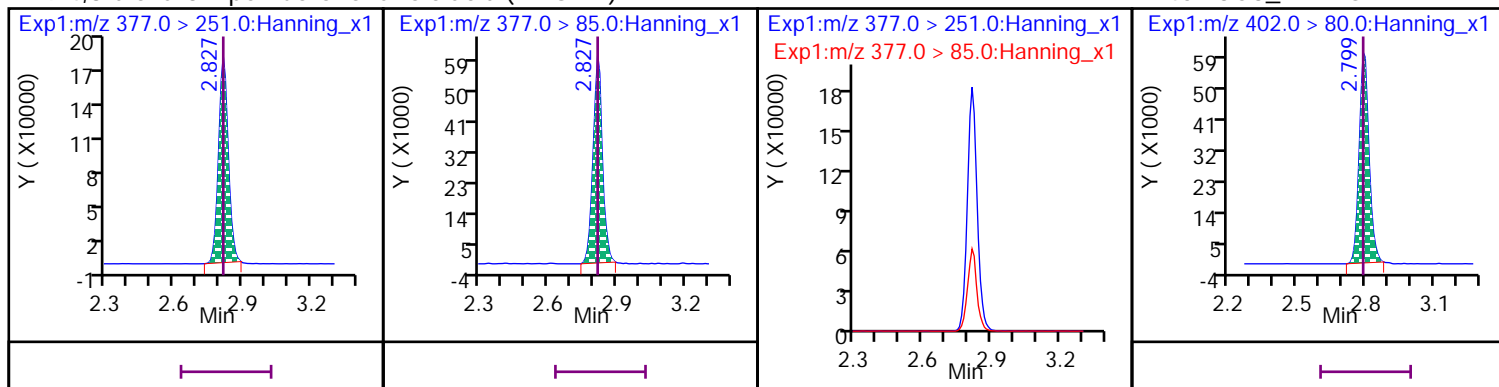
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



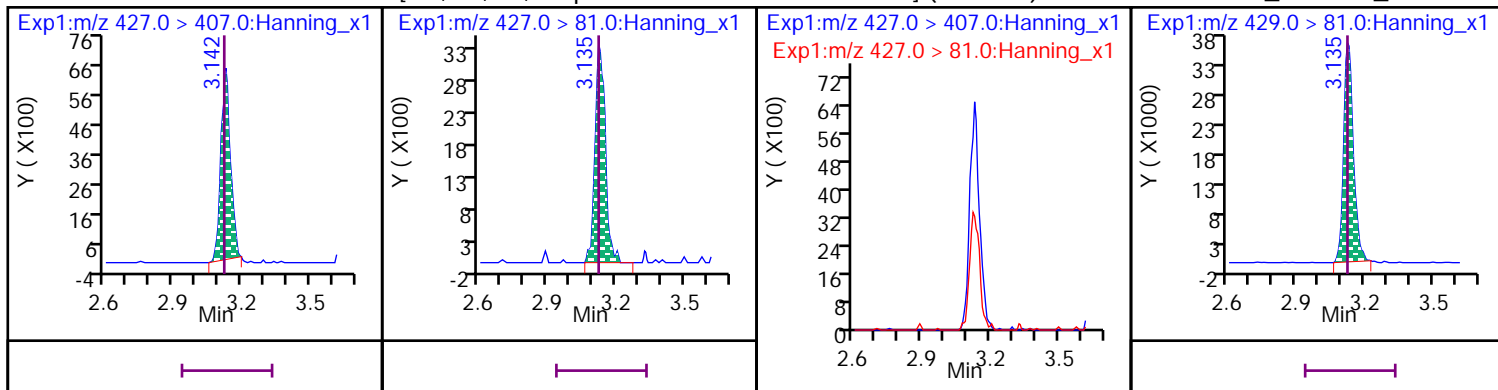
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



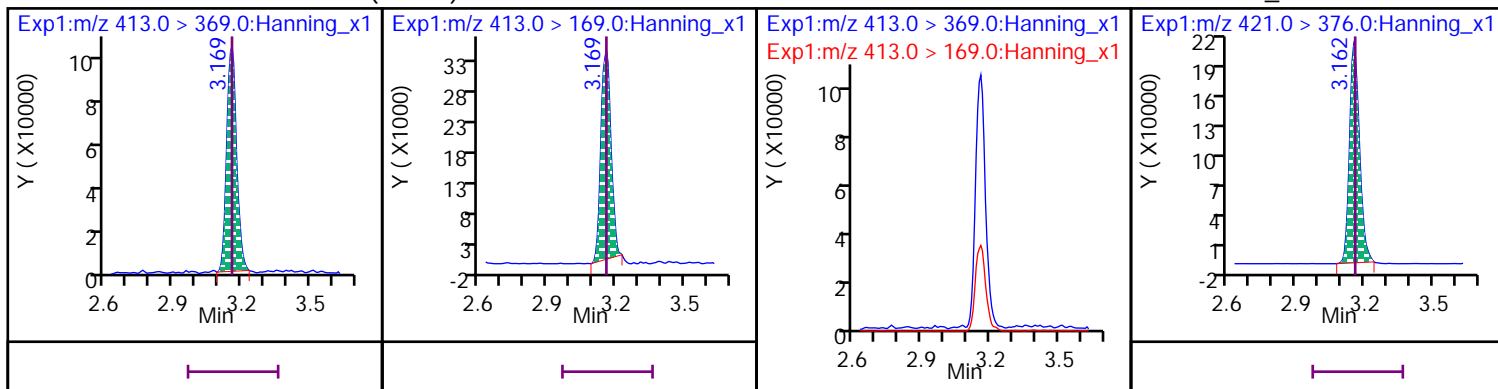
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



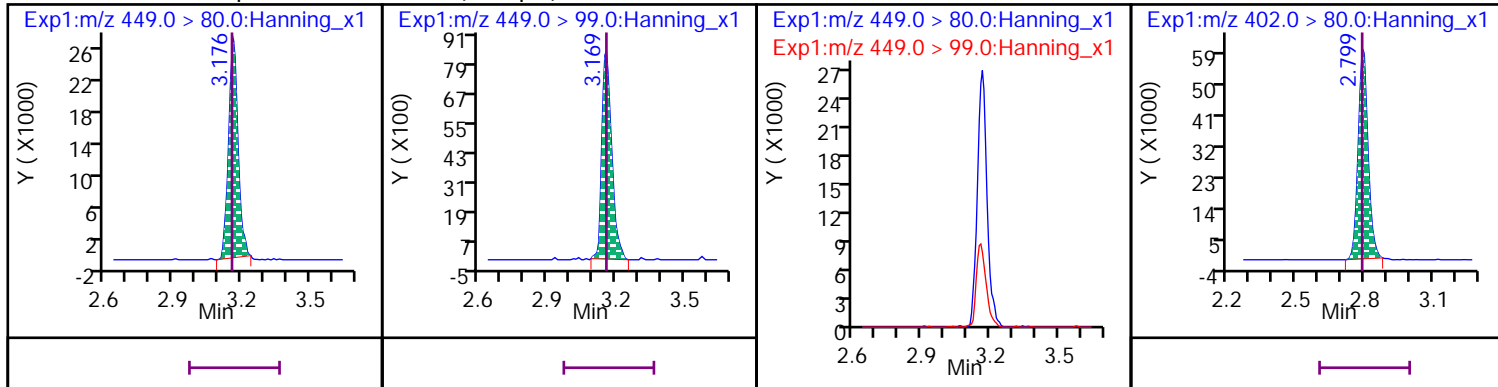
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



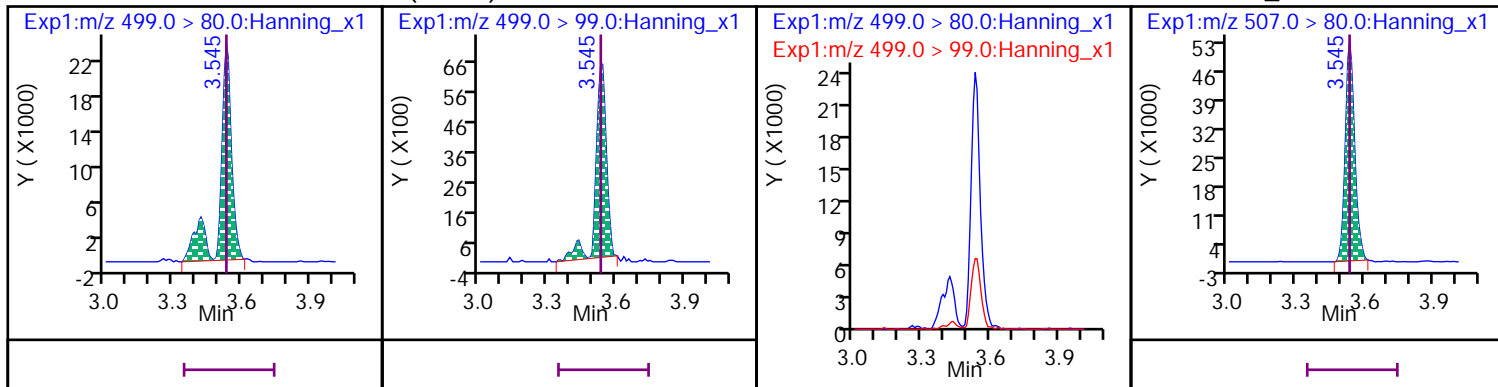
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



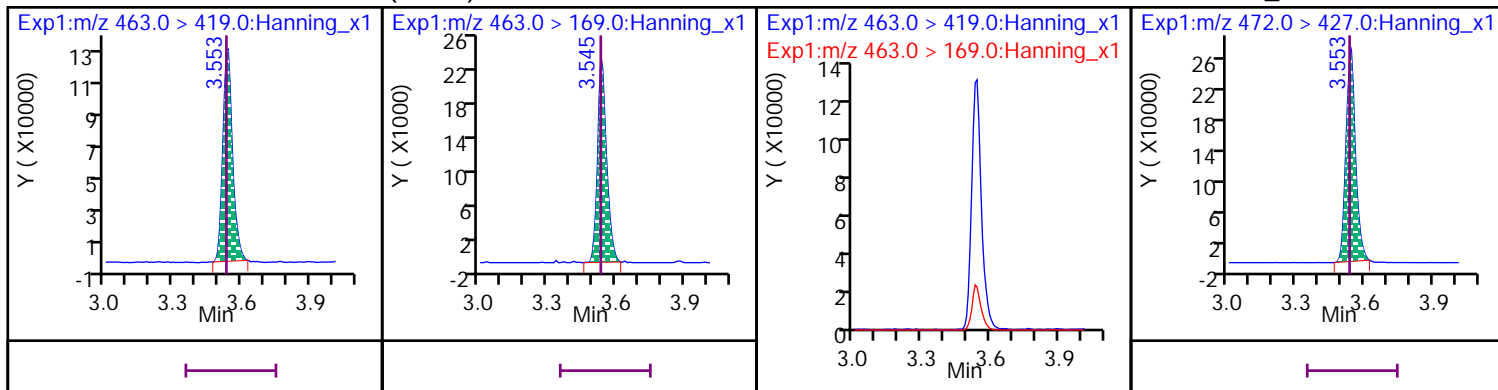
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



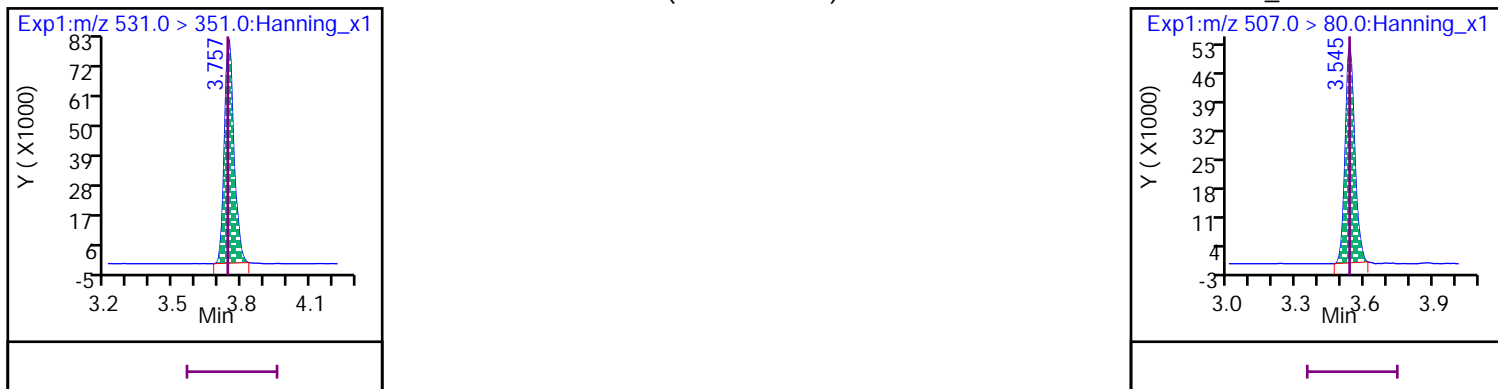
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



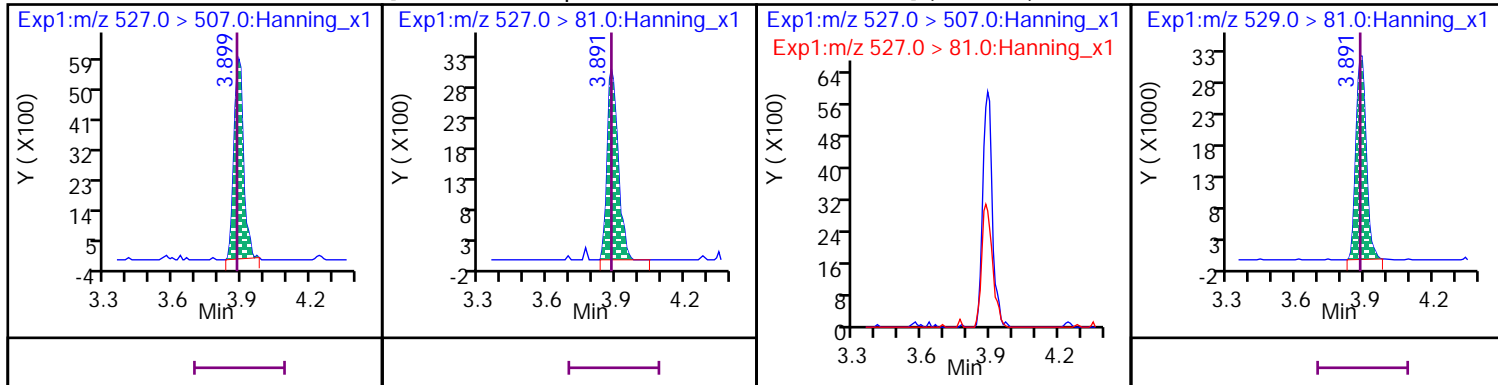
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



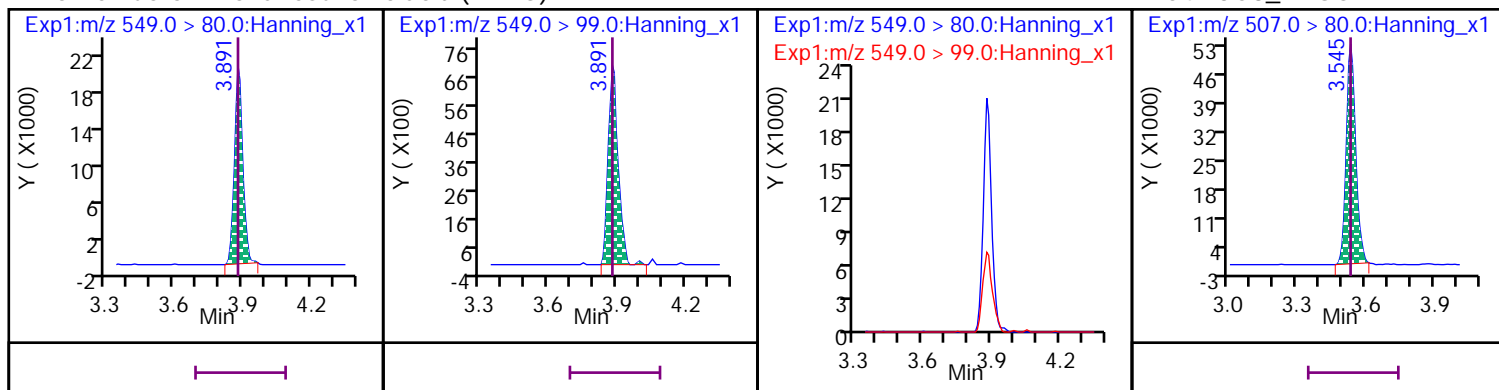
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



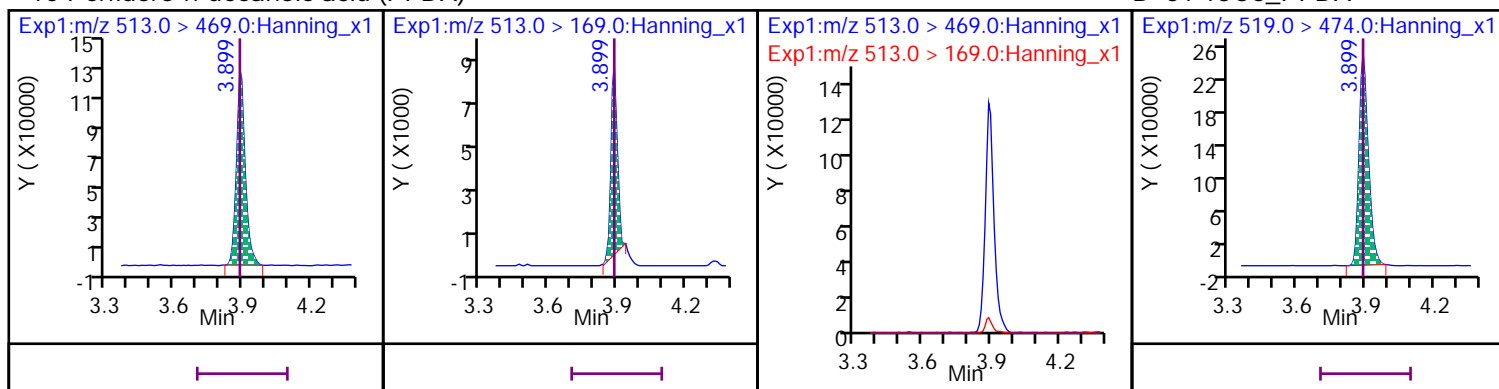
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



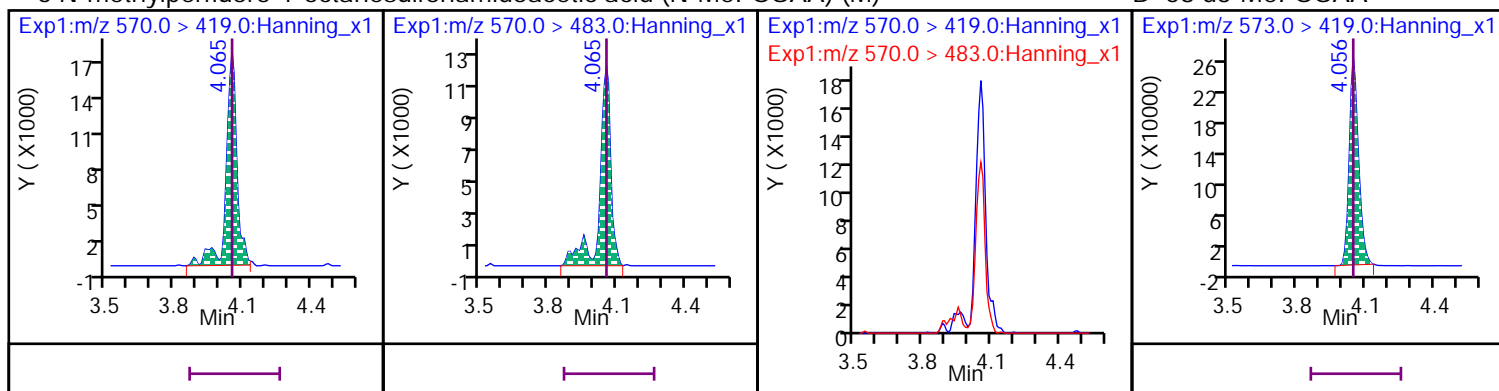
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



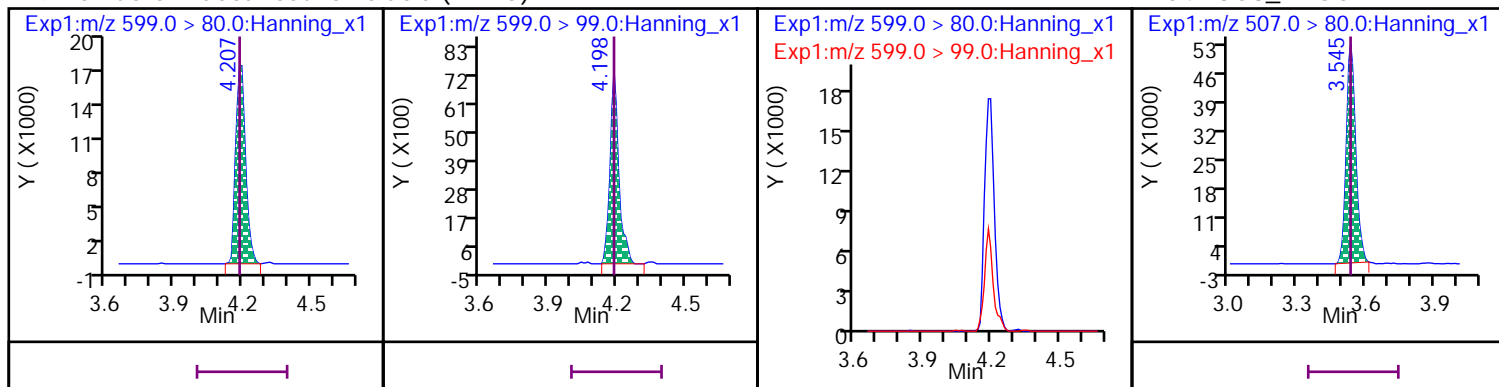
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



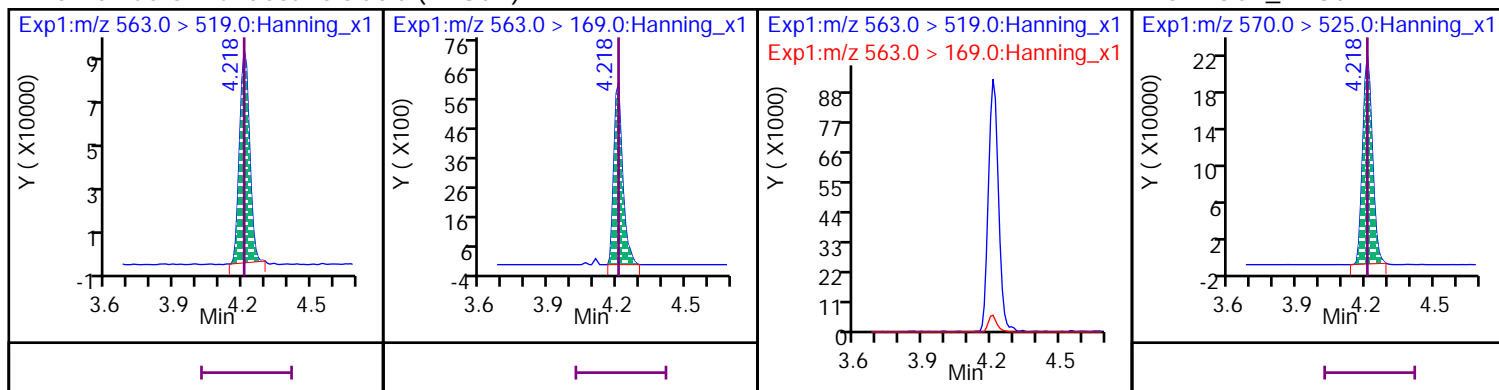
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



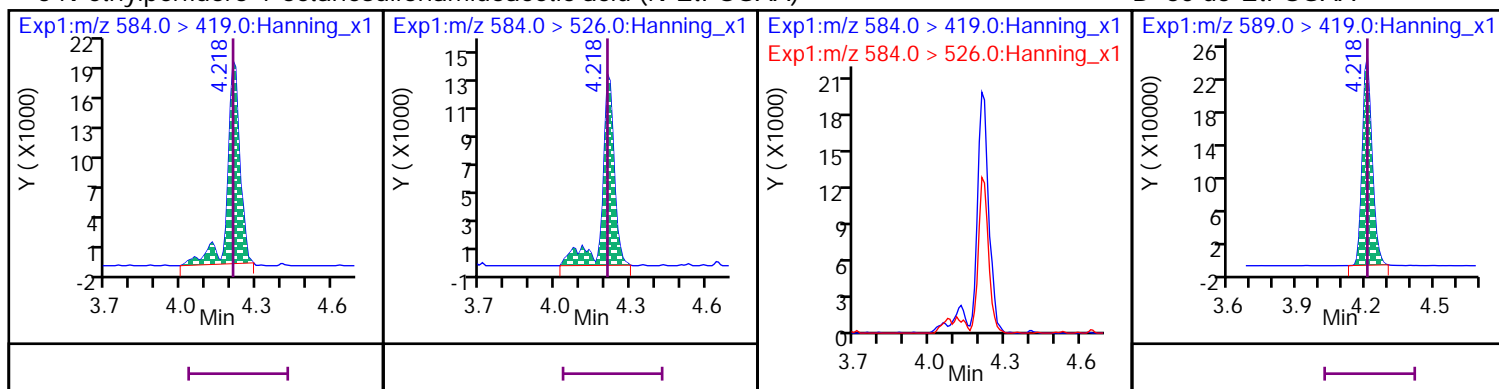
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



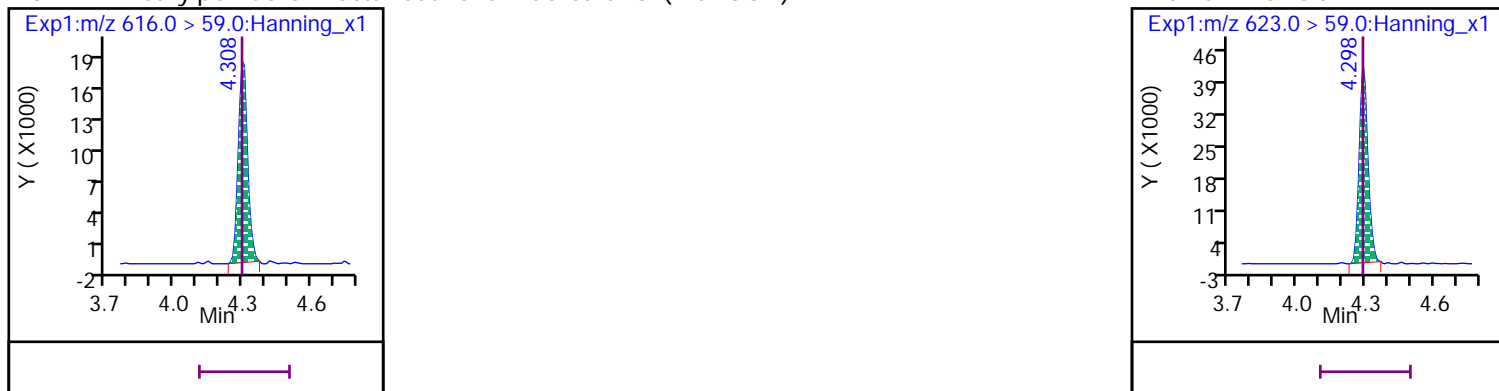
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



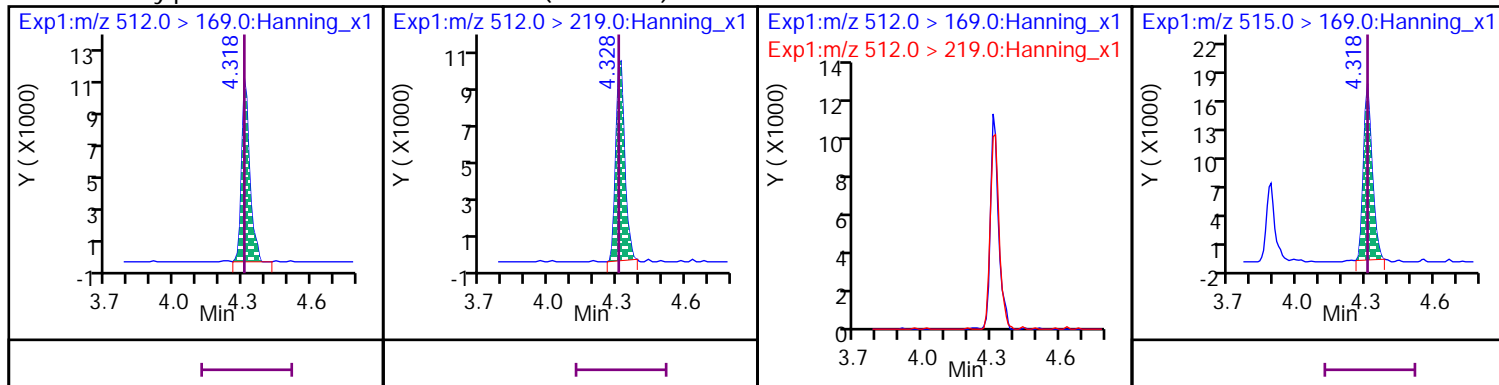
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

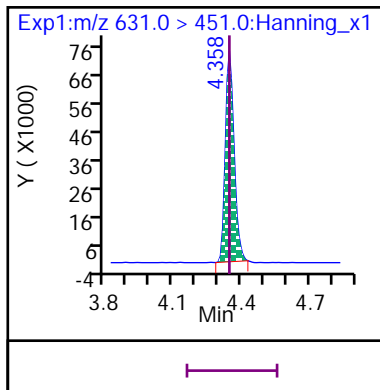


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

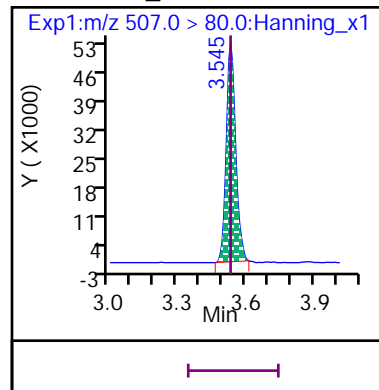
D 57 d3-MeFOSA



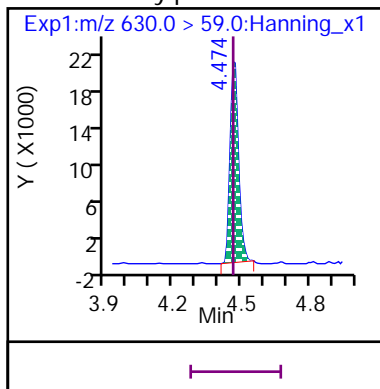
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



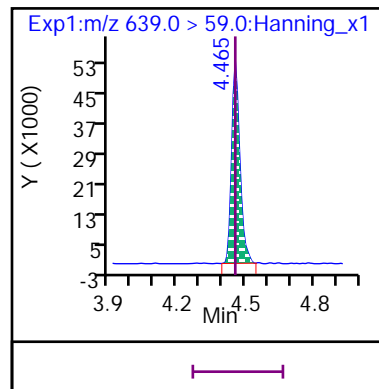
D 54 13C8\_PFOS



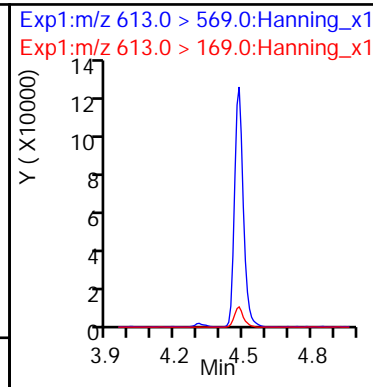
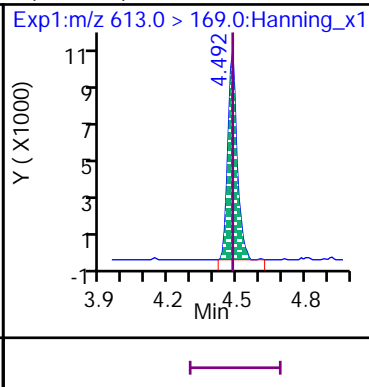
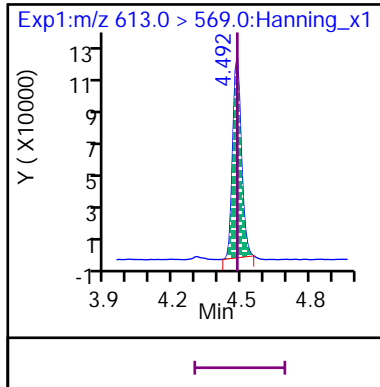
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



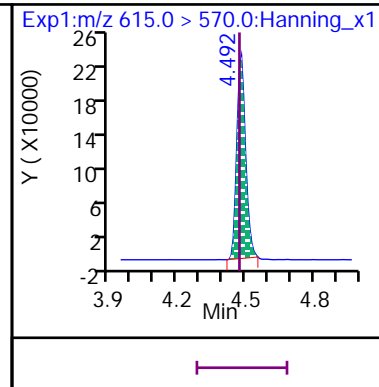
D 62 d9-EtFOSE



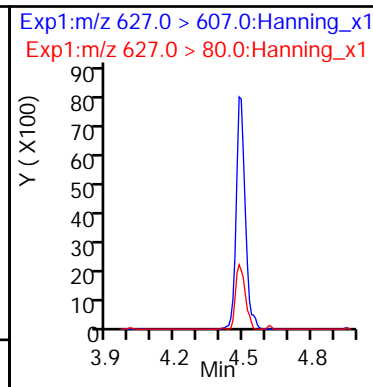
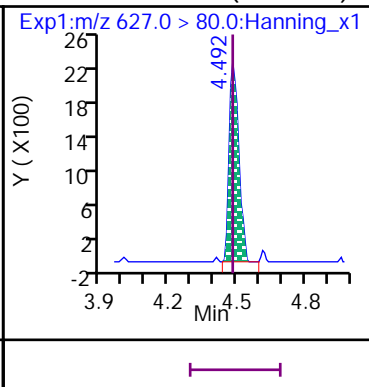
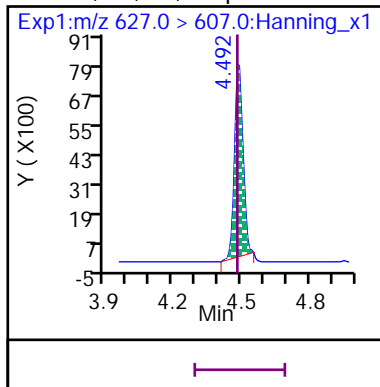
11 Perfluoro-n-dodecanoic acid (PFDoA)



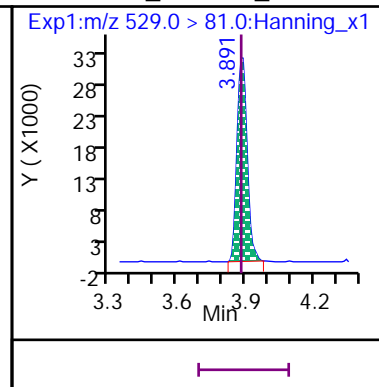
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



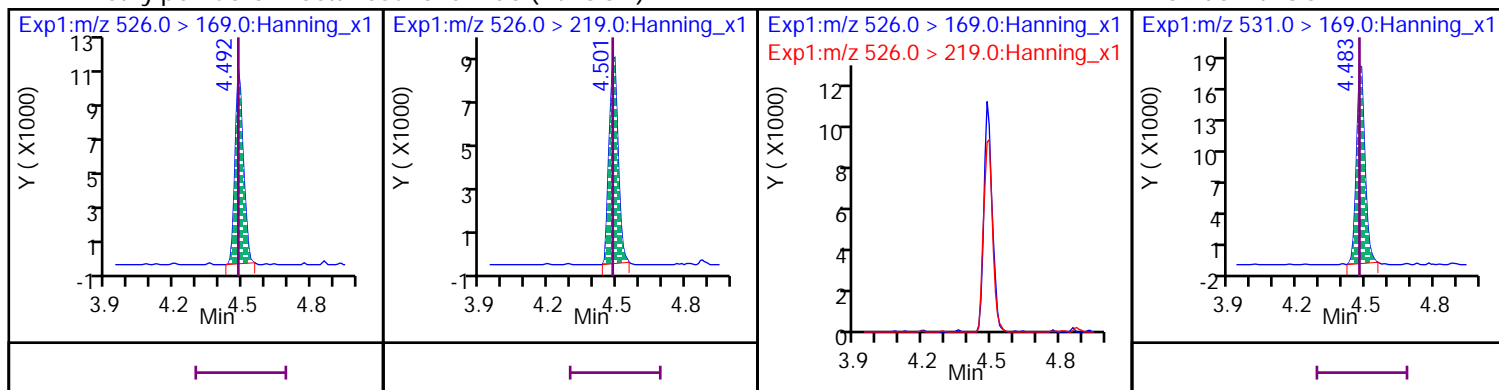
D 65 13C2\_8:2 FTS\_2





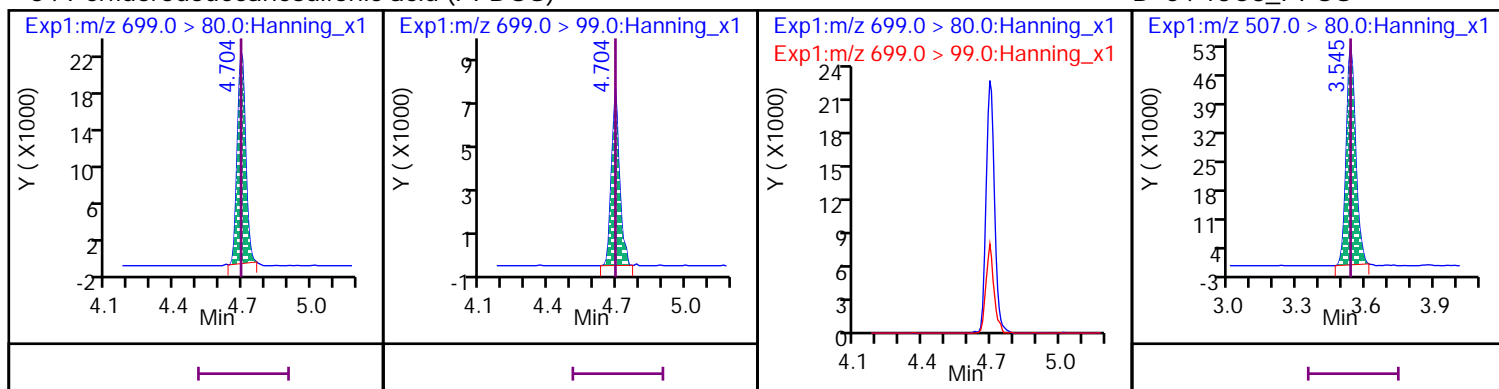
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



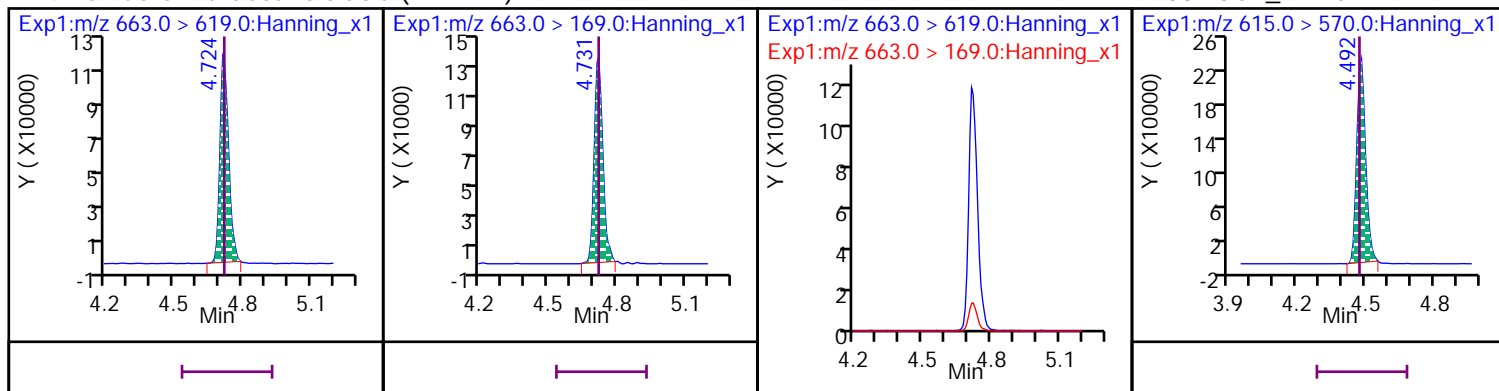
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



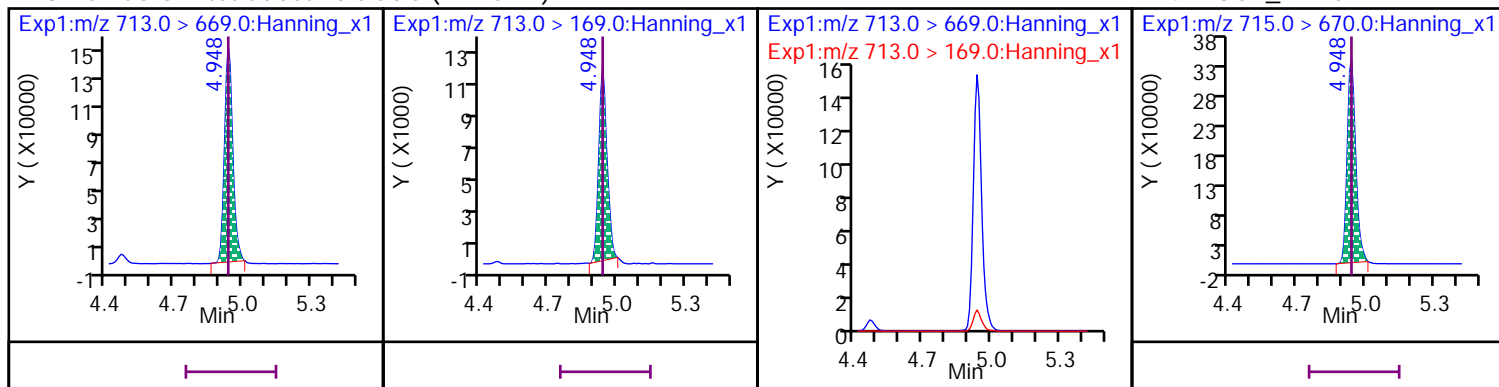
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



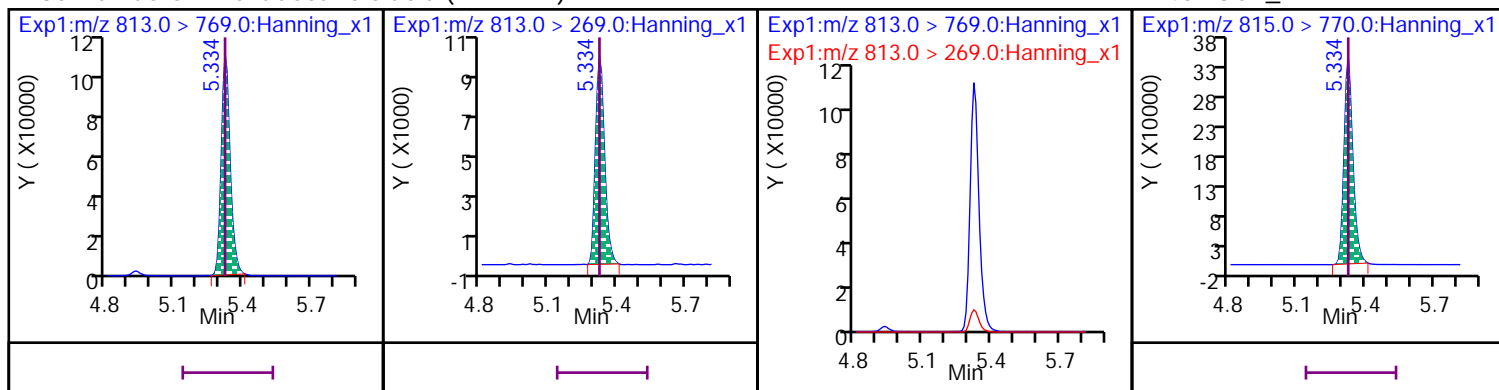
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



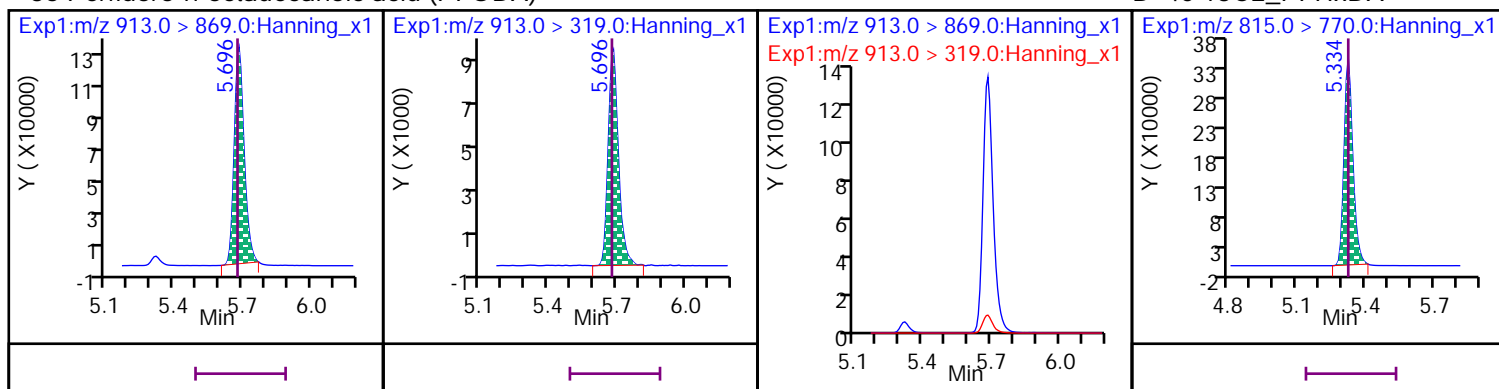
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

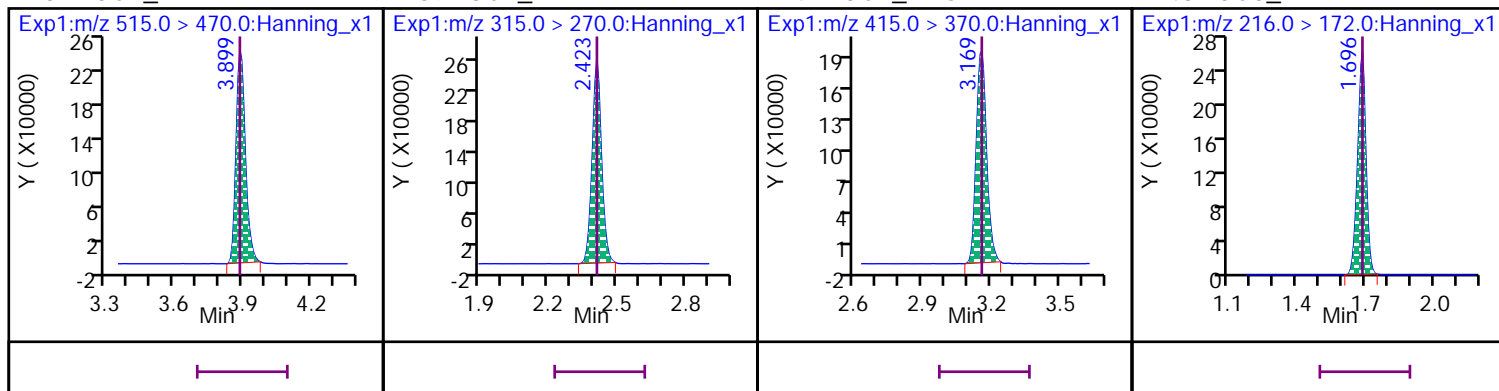


\* 37 13C2\_PFDA

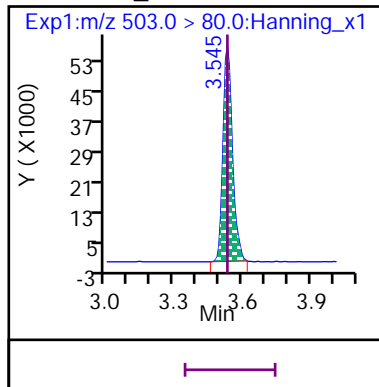
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d

Injection Date: 17-Dec-2020 12:54:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 500\_SVLC-1222

Sample Info: ICAL 500\_SVLC-1222

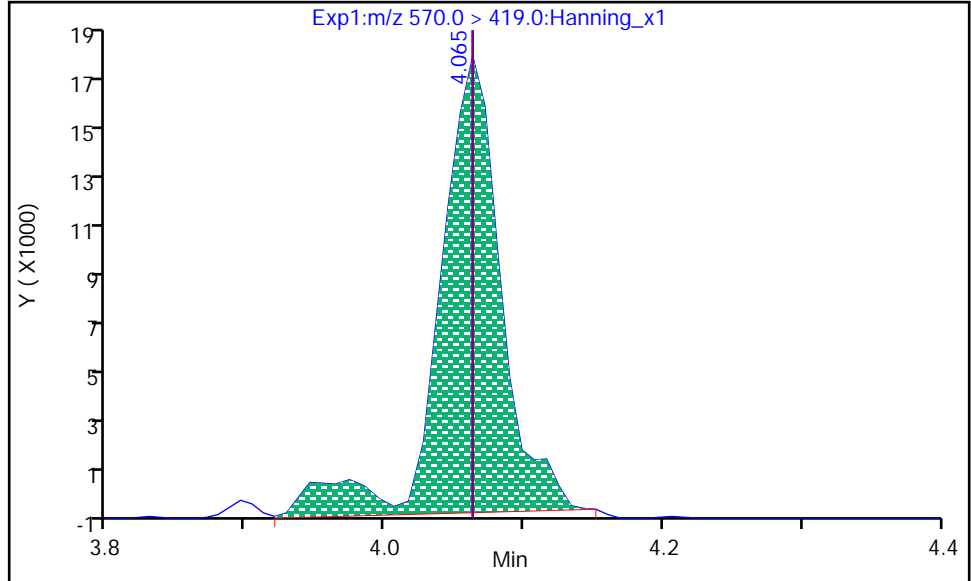
Dil. Factor: 1

Operator: Stephen E. Somerville

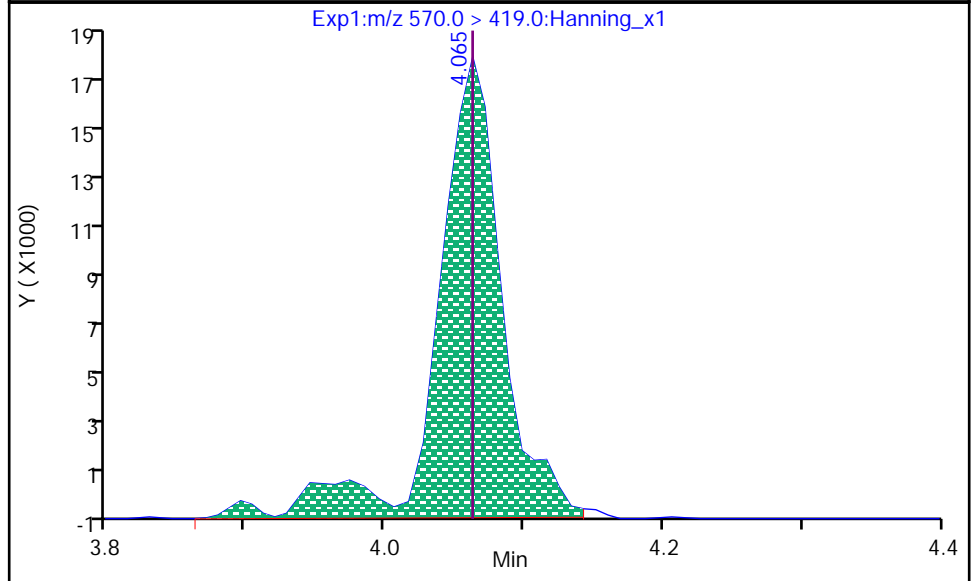
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.065  
Area: 53507  
Amount: 490.68  
Amount Units: ng/L

Processing Integration Results



RT: 4.065  
Area: 56256  
Amount: 513.30  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:15

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d  
Injection Date: 17-Dec-2020 13:04:45 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 5 Auto Sampler: 5  
Sample Info: ICAL 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	0	735341	23	>100:1			1000.00	1060.25	100	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	0/0	675182	23	>100:1			1000.00	921.88		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	728206	18	>100:1			1000.00	1058.61	100	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	686112	17	>100:1			1000.00	937.12		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	0	247575	17	>100:1			1000.00	1075.33	100	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	0/0	232775	17	>100:1	Target = 3.50		884.00	797.45		
298.9 > 99	44	2.125	2.125		69482	18	>100:1	3.35 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	0/0	183101	19	>100:1	Target = 3.10		938.00	852.59		
349 > 99	44	2.459	2.459		59145	19	>100:1	3.09 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	0	126464	19	>100:1			5000.00	5223.99	100	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/0	41896	20	>100:1	Target = 1.80		934.00	829.99		
327 > 81	63	2.388	2.388		25526	19	>100:1	1.64 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	0	774364	19	>100:1			1000.00	1050.60	100	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	717878	19	>100:1	Target = 18.34		1000.00	939.00		
313 > 119	49	2.423	2.423		42194	19	>100:1	17.01 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.539	2.539	0	1412202	19	>100:1			5000.00	5301.97	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	0/0	370236	19	>100:1	Target = 0.81		2000.00	1824.52		
285 > 185	66	2.530	2.539		467709	19	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	0	616003	19	>100:1			1000.00	1015.42	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	0/0	628754	20	>100:1	Target = 3.70		1000.00	984.03		
363 > 169	47	2.781	2.790		165588	19	>100:1	3.79 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	0	179294	19	>100:1			1000.00	1047.10	100	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	0/0	170607	27		Target = 3.21	0.16	910.00	897.44		
399 > 99	45	2.808	2.799		44788	17	>100:1	3.80 (1.60-4.81)					
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	0/0	1019991	20	>100:1	Target = 2.97		942.00	896.06		
377 > 85	45	2.827	2.827		342557	19	>100:1	2.97 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	0/0	152183	23	>100:1	Target = 3.08		952.00	934.35		
449 > 99	45	3.176	3.169		49093	22	>100:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	0	104623	26	>100:1			5000.00	5432.59	100	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.135	0/0	41503	26	>100:1	Target = 1.80		948.00	957.24		
427 > 81	64	3.142	3.135		23393	21	>100:1	1.77 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	0	654941	23	>100:1			1000.00	1106.57	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	0/0	612741	24	>100:1	Target = 2.87		1000.00	917.72		
413 > 169	53	3.162	3.169		214663	24	>100:1	2.85 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	0	154357	20	>100:1			1000.00	1029.54	100	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	0/0	158302	42	>100:1	Target = 3.84	0.25	928.00	865.46		
499 > 99	54	3.545	3.545		23262	22	37:1	6.80 (1.92-5.76)	0.28				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.750	3.750	0/0	452834	22	>100:1			932.00	871.44		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	0/0	112920	18	>100:1	Target = 3.07		960.00	955.94		
549 > 99	54	3.891	3.891		37193	19	>100:1	3.03 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	0/0	102196	16	>100:1	Target = 3.03		964.00	912.29		
599 > 99	54	4.198	4.198		37280	19		2.74 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.357	4.357	0/0	393178	17	>100:1			942.00	896.92		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	0/0	119463	17	>100:1	Target = 3.33		968.00	964.01		
699 > 99	54	4.697	4.704		37699	20	>100:1	3.16 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	0	792377	21	>100:1			1000.00	1055.15	100	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	0/0	731878	21	>100:1	Target = 6.16		1000.00	923.62		
463 > 169	56	3.545	3.545		118228	23	>100:1	6.19 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	0	330552	21	>100:1			1000.00	1067.80	100	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	0/0	320737	22	>100:1			1000.00	984.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	0	93314	21				5000.00	5030.37	100	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	0/0	36480	25	>100:1	Target = 1.95		958.00	972.14		
527 > 81	65	3.899	3.891		17278	18	52:1	2.11 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	0/0	41301	18	>100:1	Target = 3.14		964.00	957.64		
627 > 80	65	4.501	4.492		13527	24		3.05 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	0	698114	20	>100:1			1000.00	1052.44	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	0/0	632287	18	>100:1	Target = 15.94		1000.00	921.75		
513 > 169	51	3.899	3.899		47809	17	>100:1	13.22 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	0	762102	19	>100:1			5000.00	5309.36	100	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	0/0	109367	34		Target = 1.33	0.12	1000.00	934.11		
570 > 483	58	4.065	4.065		81085	32	>100:1	1.34 (0.66-1.99)	0.22				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	1	738335	18	>100:1			5000.00	5559.14	100	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	1/0	136930	32	>100:1	Target = 1.58	0.13	1000.00	931.40		
584 > 526	60	4.228	4.217		79831	31	>100:1	1.71 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	1	678701	17	>100:1			1000.00	1073.77	100	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/0	608820	19	>100:1	Target = 15.50		1000.00	954.42		
563 > 169	52	4.217	4.217		37923	17		16.05 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	0	117292	16	>100:1			1000.00	1083.95	100	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	0/0	97845	15	>100:1			1000.00	887.82		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	0	54969	17	>100:1			1000.00	1038.78	100	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	0/0	61867	19	>100:1	Target = 1.12		1000.00	997.59		
512 > 219	57	4.318	4.318		52269	15	>100:1	1.18 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	0	121851	19	>100:1			1000.00	971.73	100	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	0/0	107879	16	>100:1			1000.00	995.12		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	0	649290	18				1000.00	1072.64	100	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	0/0	597463	18	>100:1	Target = 10.85		1000.00	908.67		
613 > 169	38	4.492	4.492		57676	16		10.35 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	0/0	598919	19	>100:1	Target = 8.37		1000.00	936.53		
663 > 169	38	4.724	4.731		69927	19	>100:1	8.56 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	0	51517	20	>100:1			1000.00	1049.34	100	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	0/0	54660	17	>100:1	Target = 1.03		1000.00	971.16		
526 > 219	59	4.492	4.492		50571	17	>100:1	1.08 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	0	887372	18	>100:1			1000.00	1053.33	100	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	0/0	724347	20	91:1	Target = 12.11		1000.00	942.10		
713 > 169	42	4.948	4.948		64136	18	>100:1	11.29 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	0	913664	18	>100:1			1000.00	1008.28	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	0/0	565232	19	>100:1	Target = 11.48		1000.00	946.82		
813 > 269	40	5.334	5.334		49405	18	>100:1	11.44 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	0/0	783793	24	81:1	Target = 13.88		1000.00	969.09		
913 > 319	40	5.689	5.689		56611	24	>100:1	13.84 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	0	726117	19	>100:1					100	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	752645	18	>100:1					100	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	0	644116	25	>100:1					100	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	0	665854	23	>100:1					100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80      3.545    3.545      0      162438    22    >100:1      100

### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend



Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d

Injection Date: 17-Dec-2020 13:04:45

Inst. ID: LCMSMS02

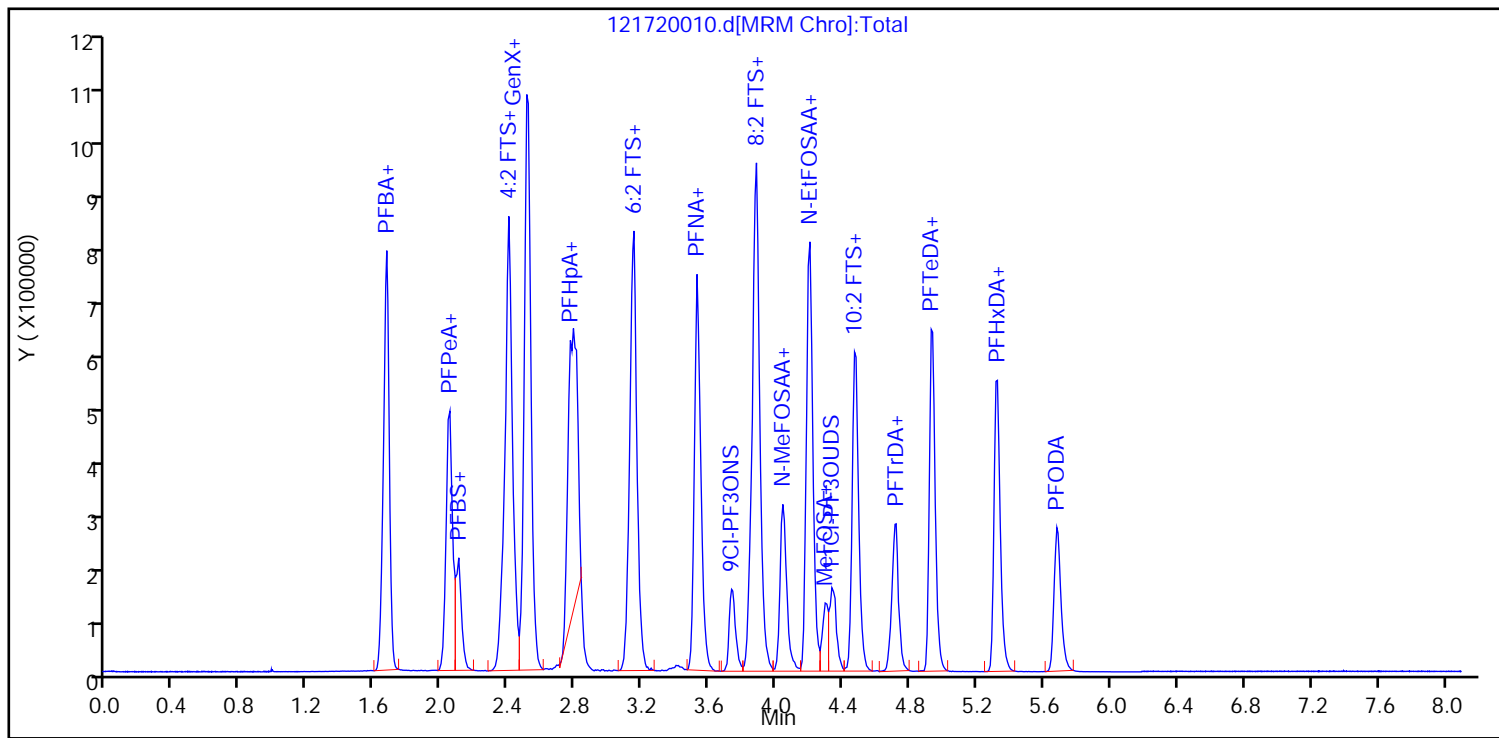
Client ID:

Lab ID: ICAL 1000\_SVLC-1248

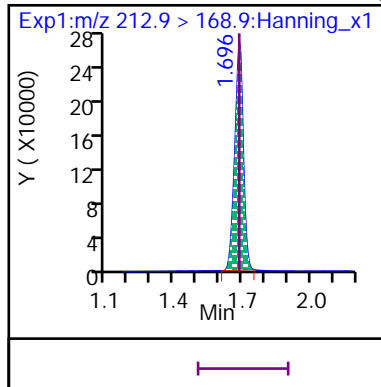
Sample Info: ICAL 1000\_SVLC-1248

Dil. Factor: 1

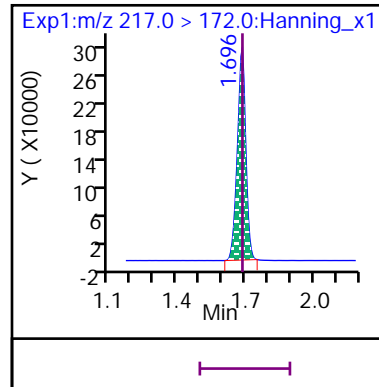
Operator: Stephen E. Somerville



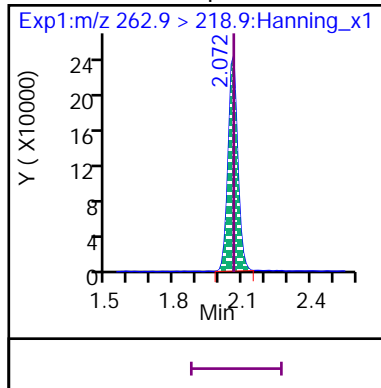
8 Perfluoro-n-butanoic acid (PFBA)



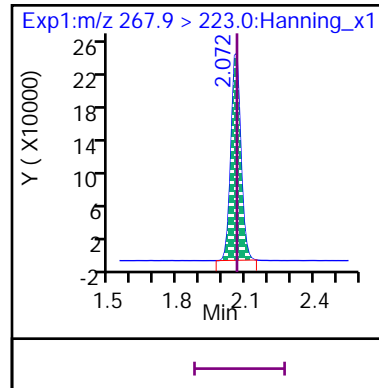
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

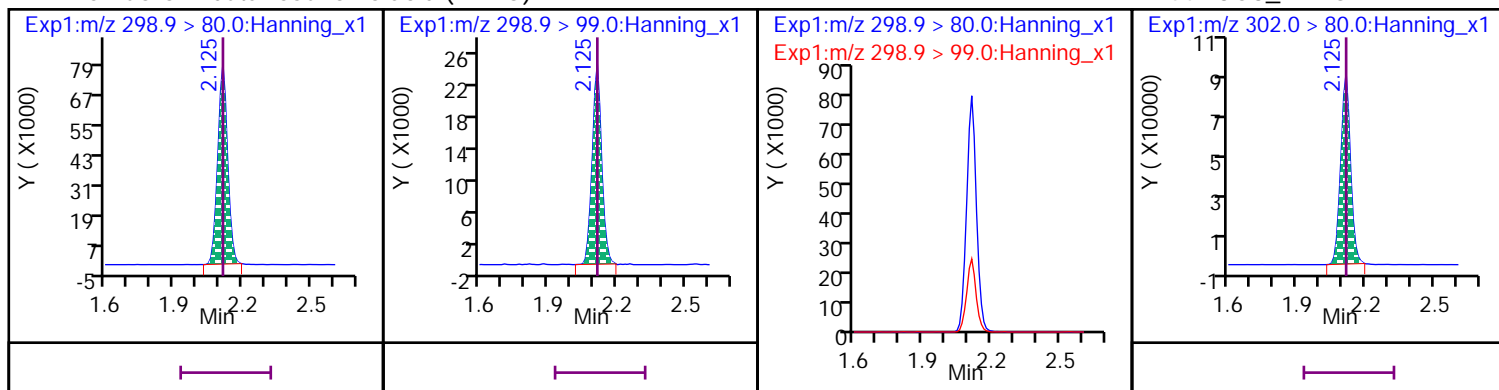


D 50 13C5\_PFPeA



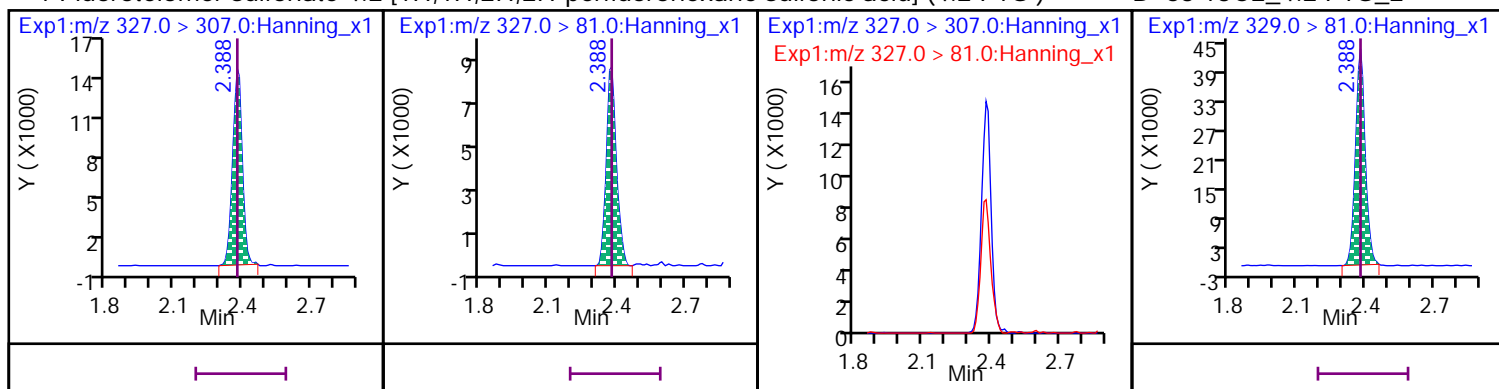
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



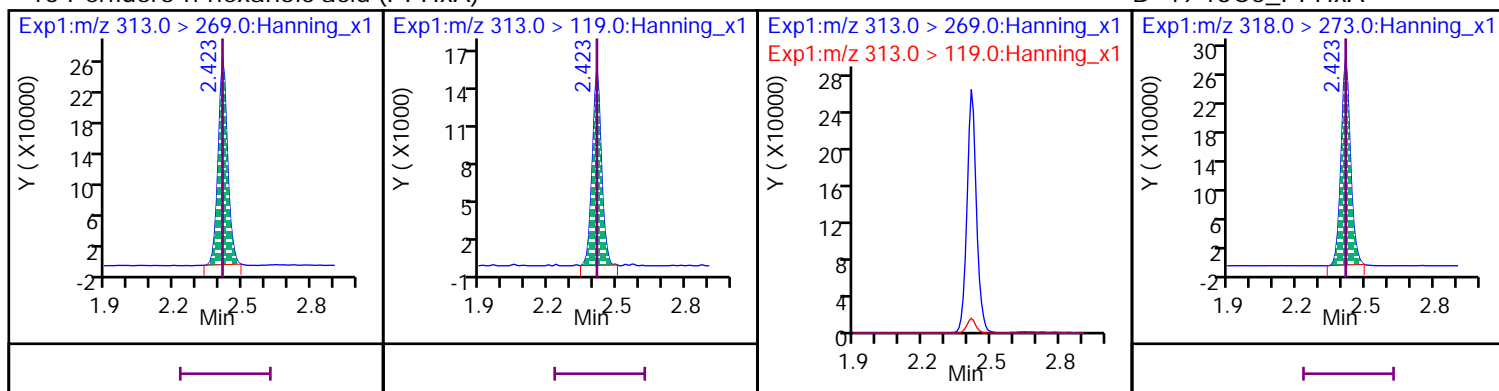
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



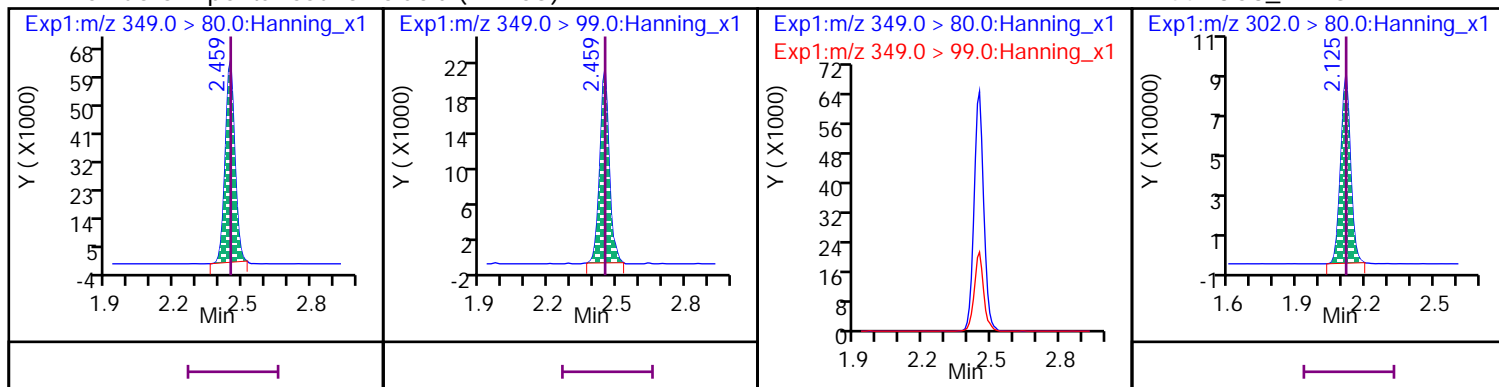
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



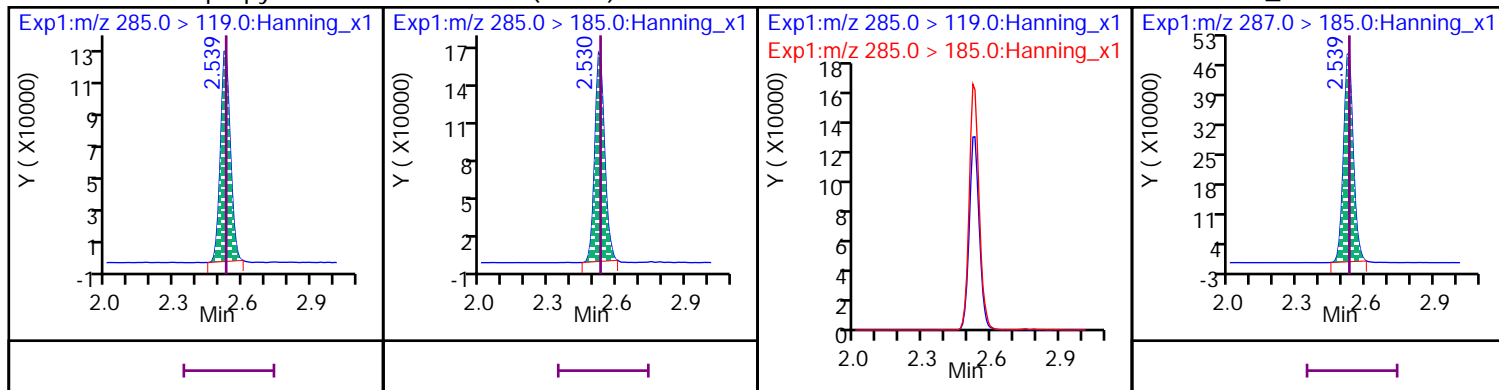
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



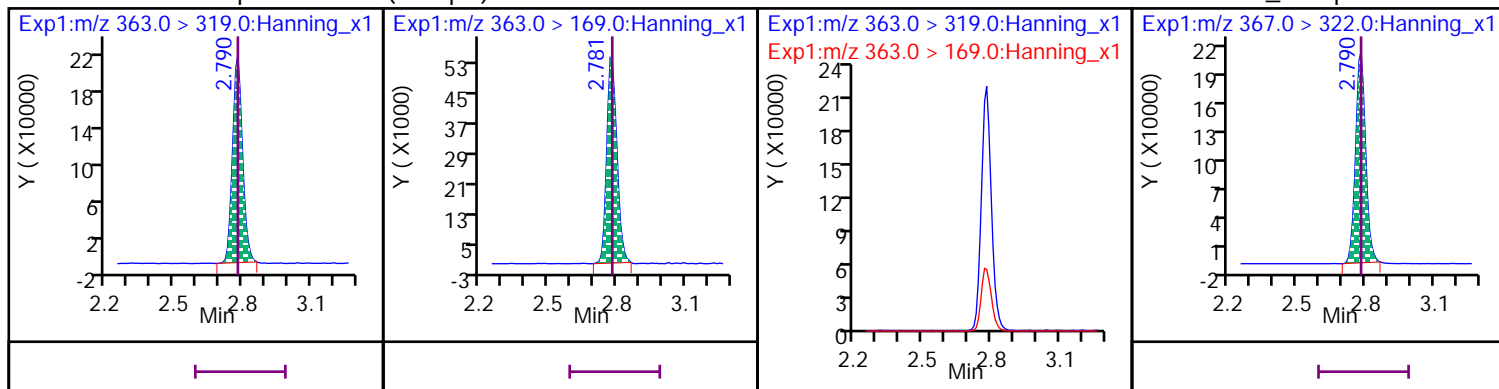
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



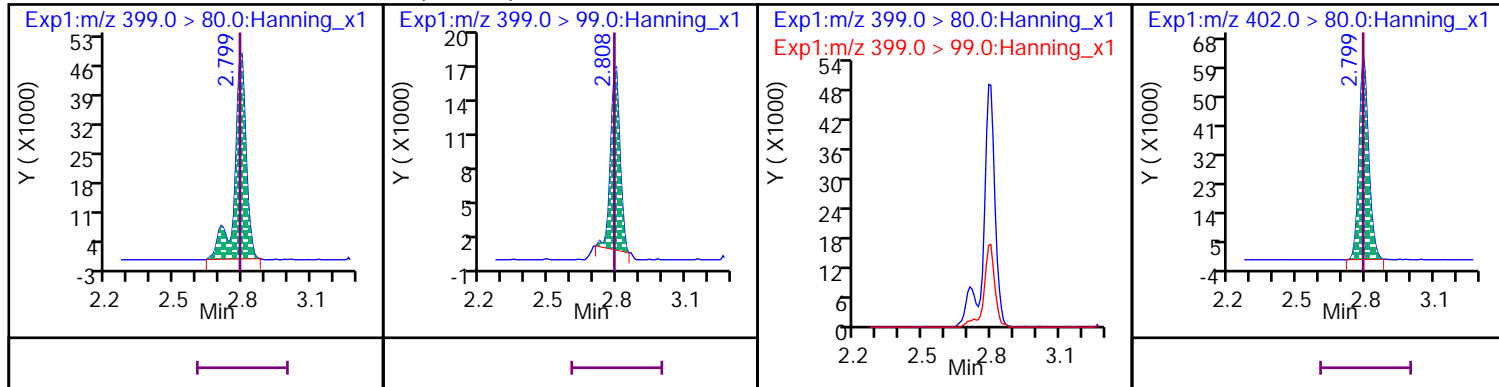
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



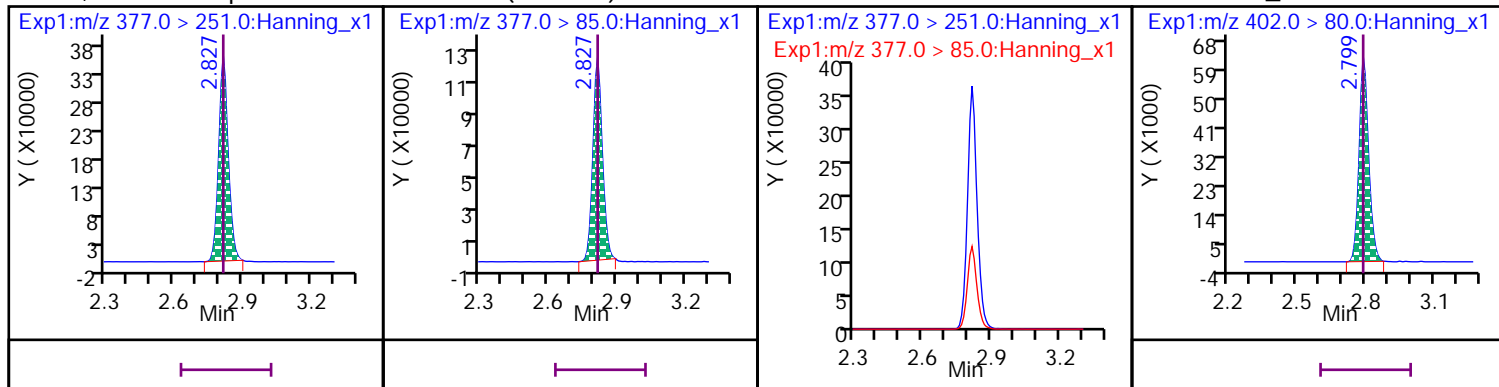
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



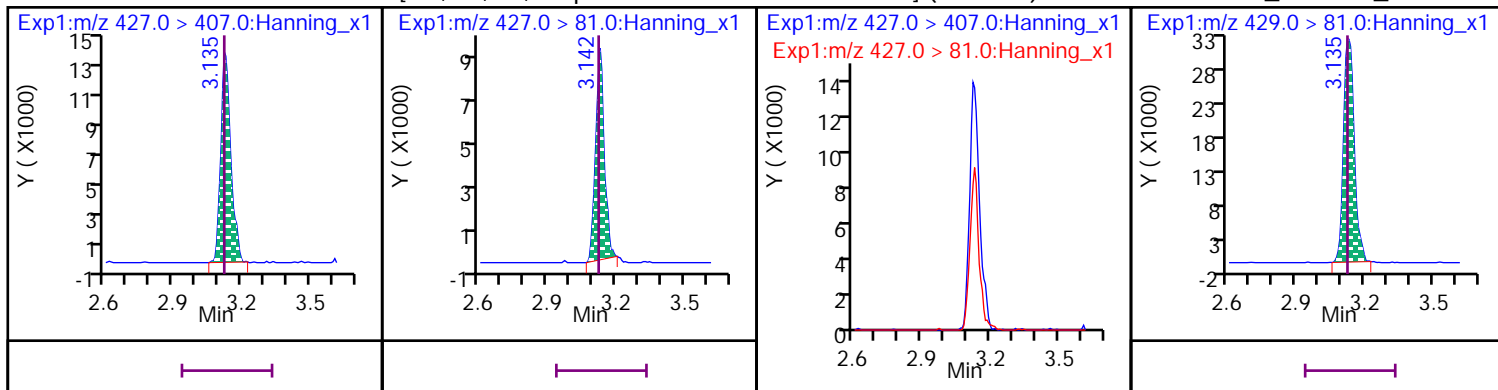
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



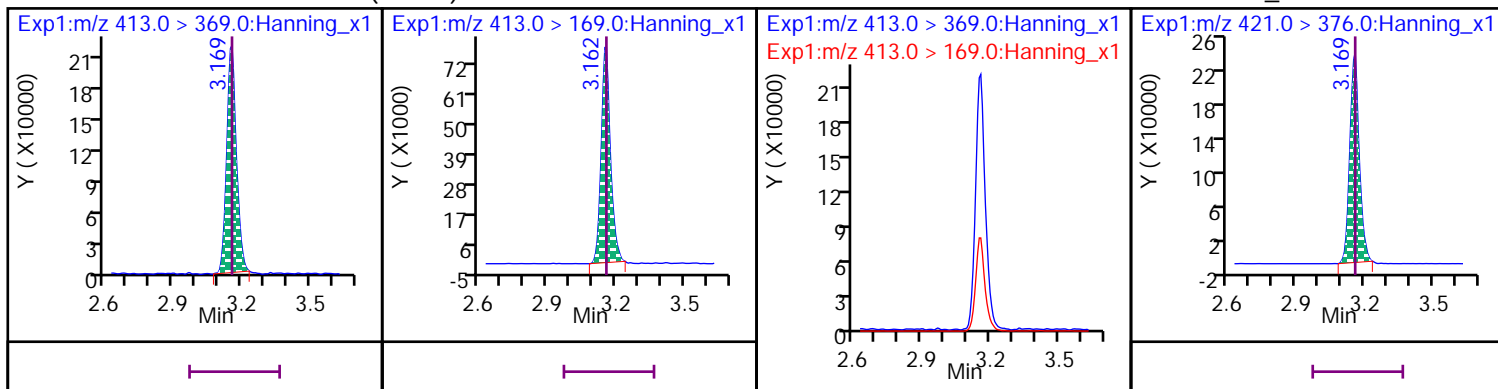
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



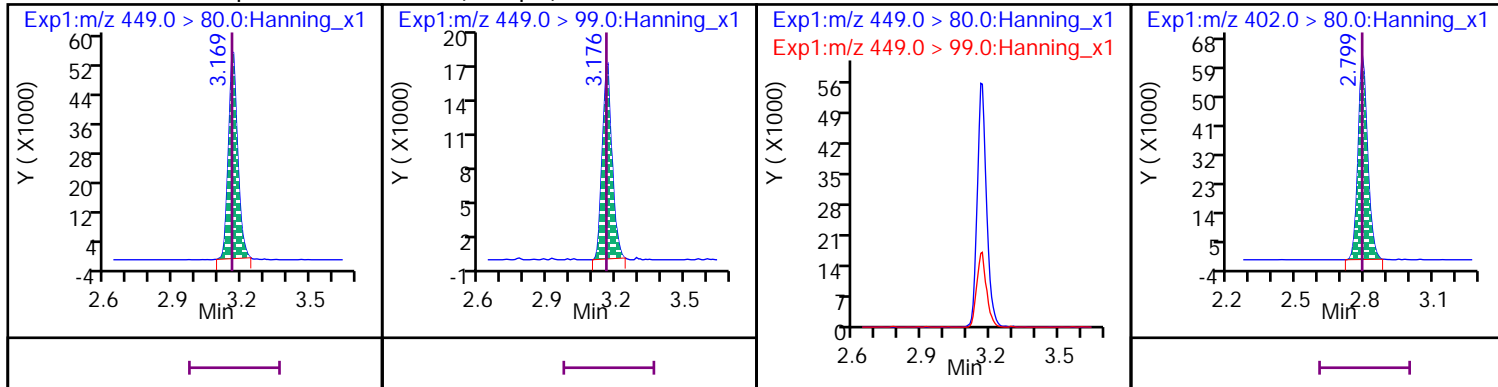
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



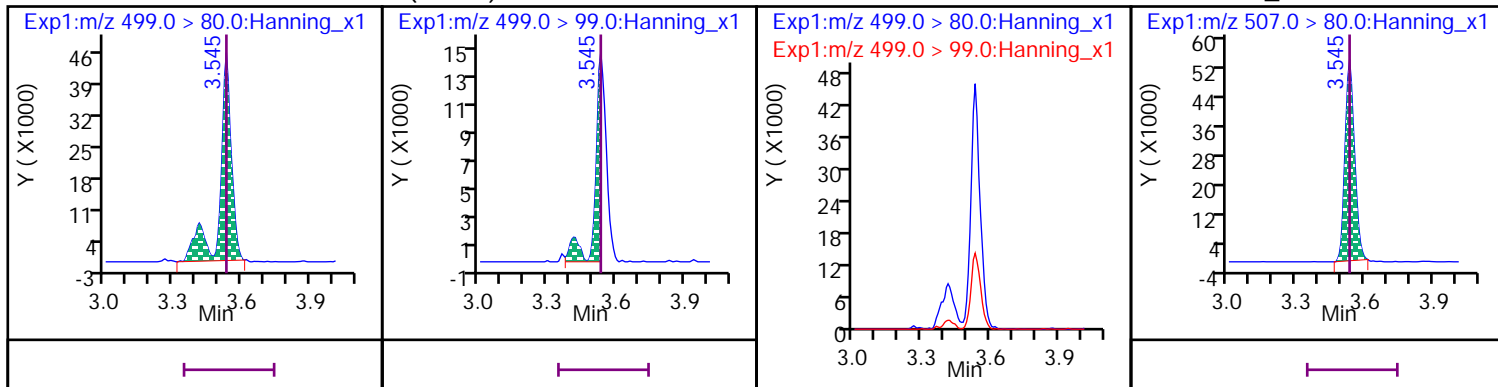
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



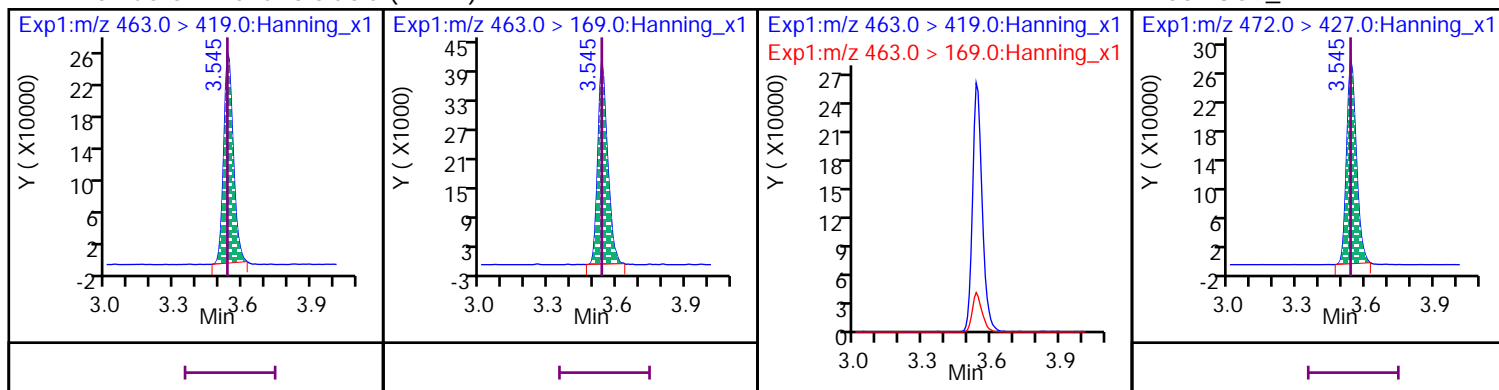
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



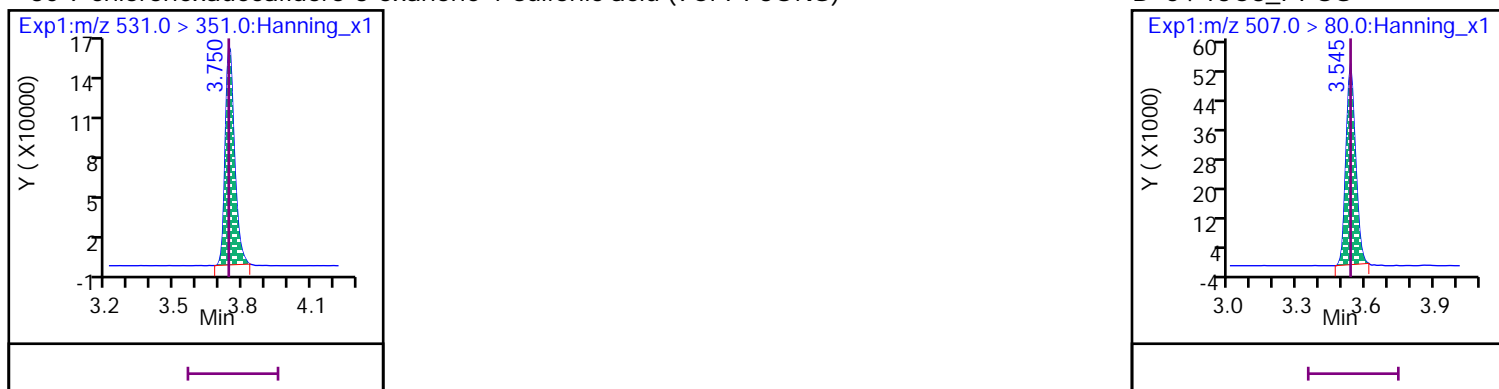
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



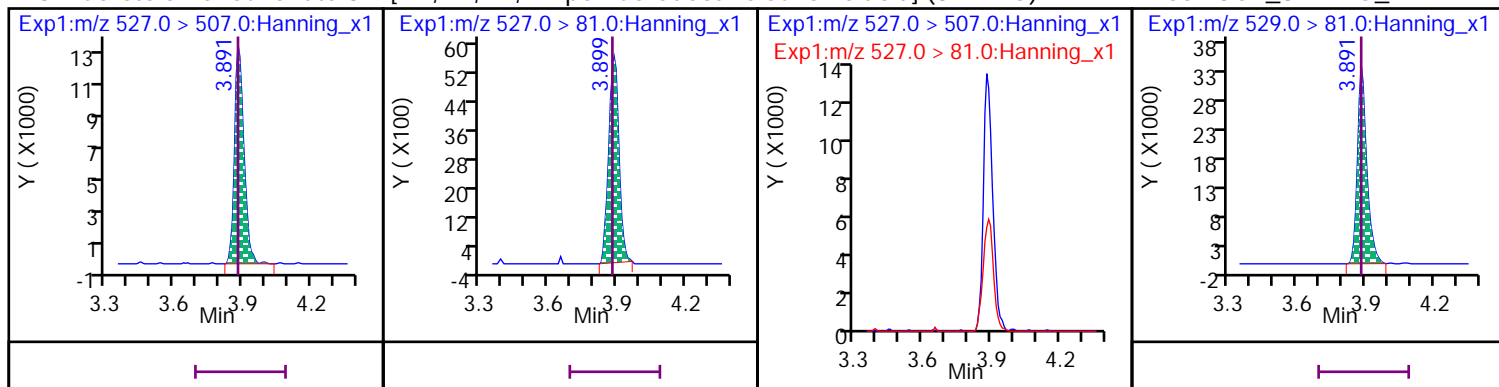
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



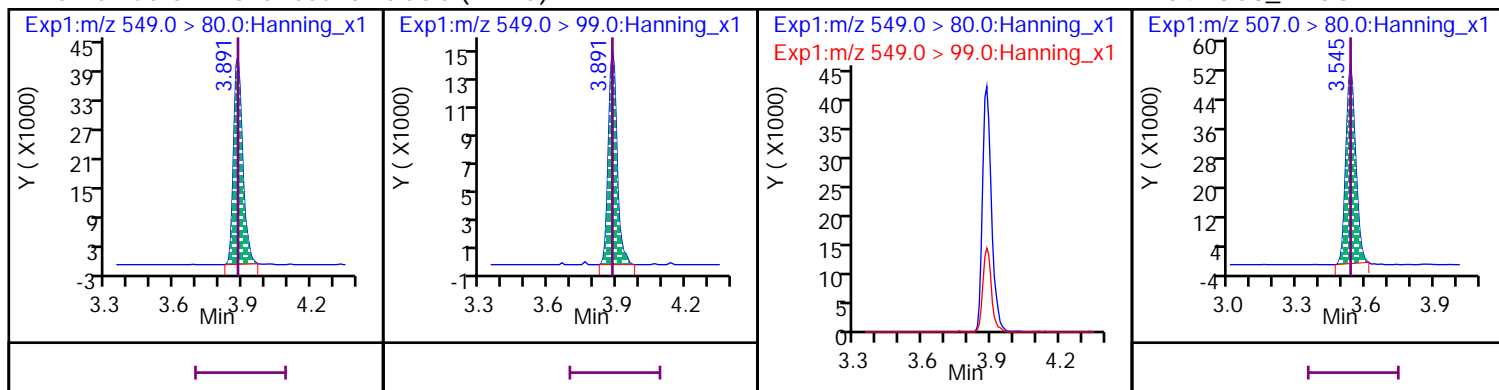
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



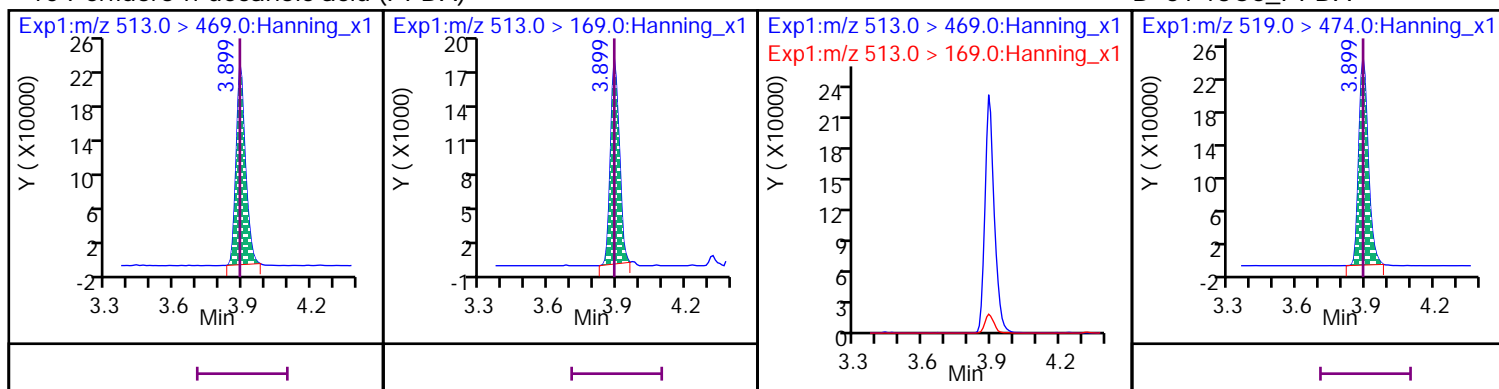
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



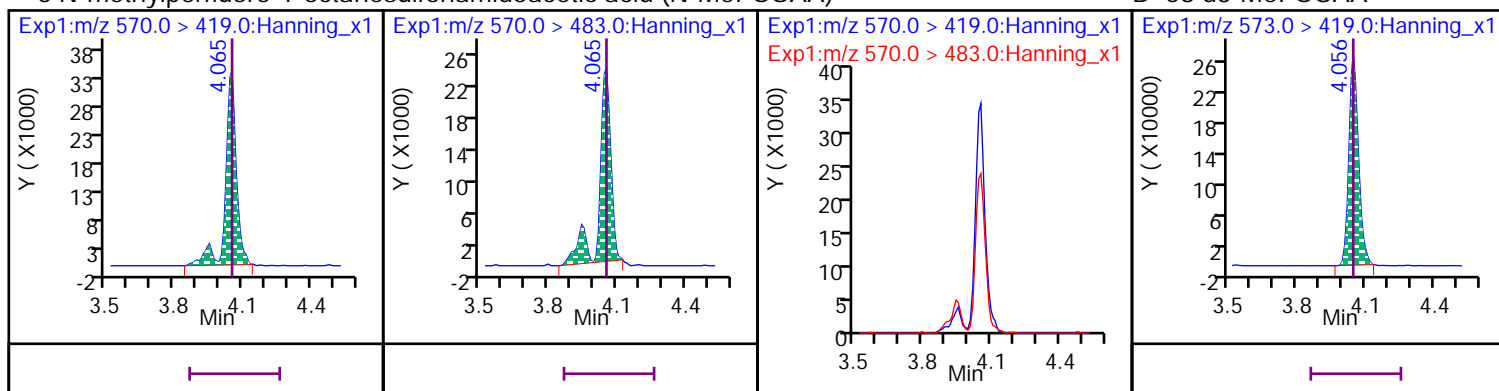
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



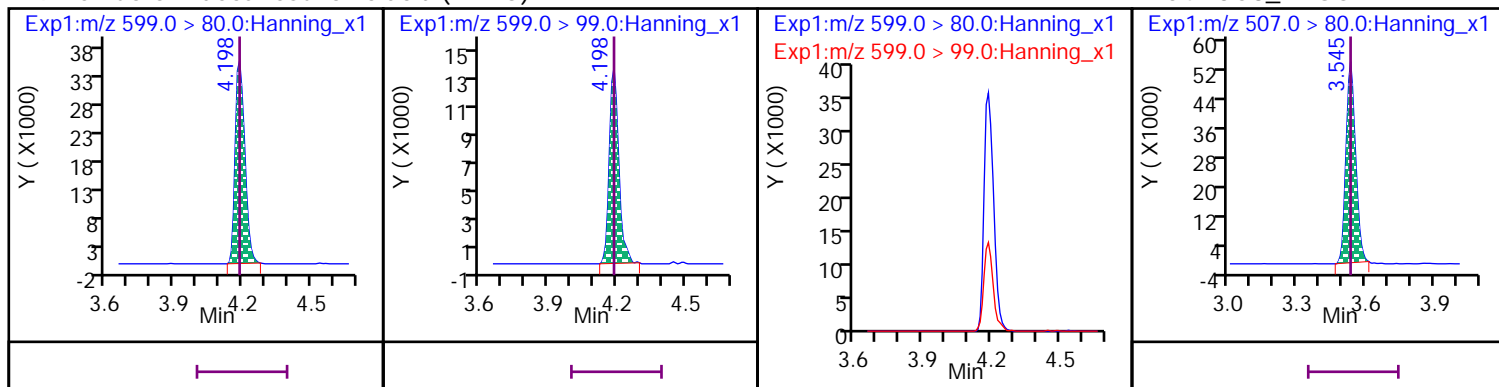
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



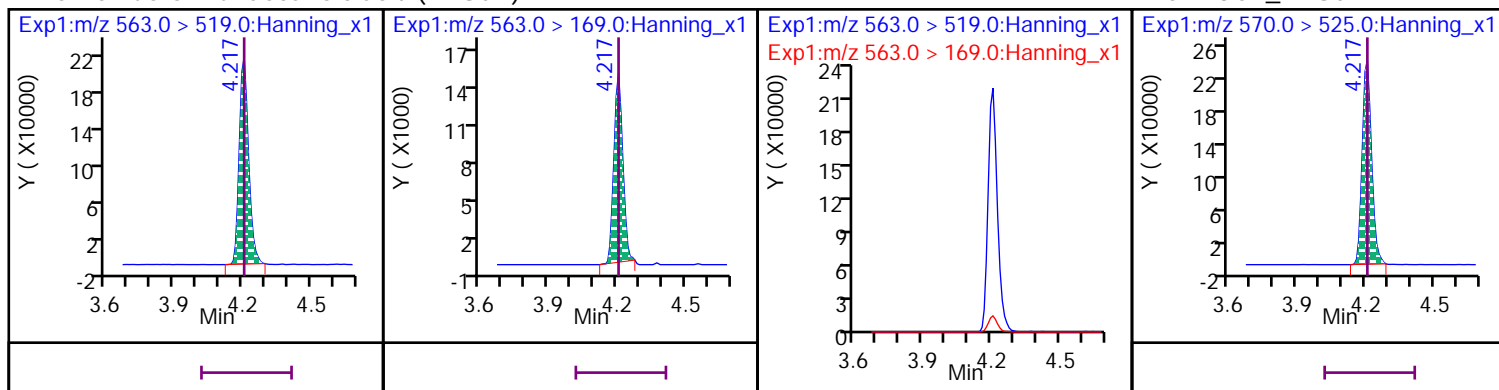
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



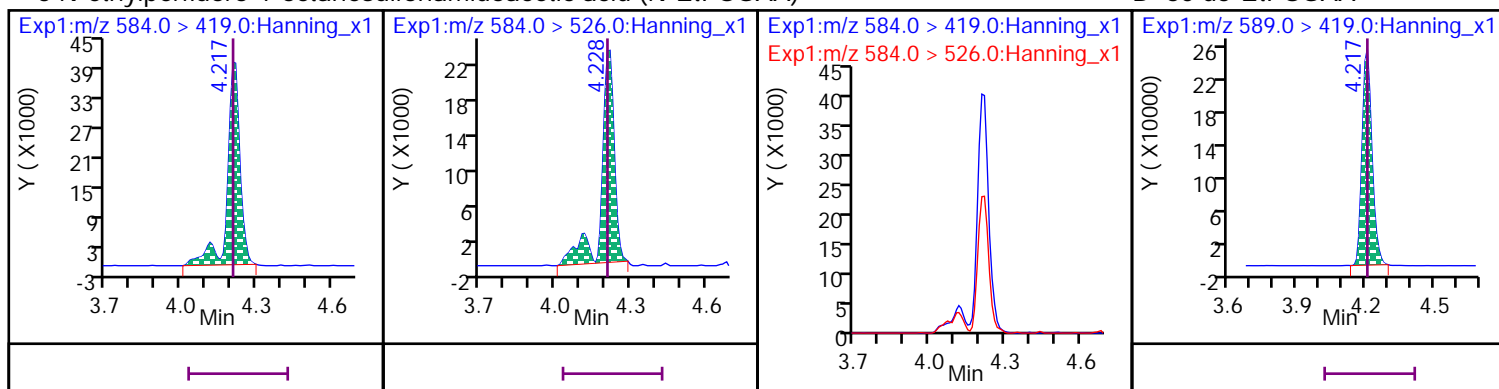
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



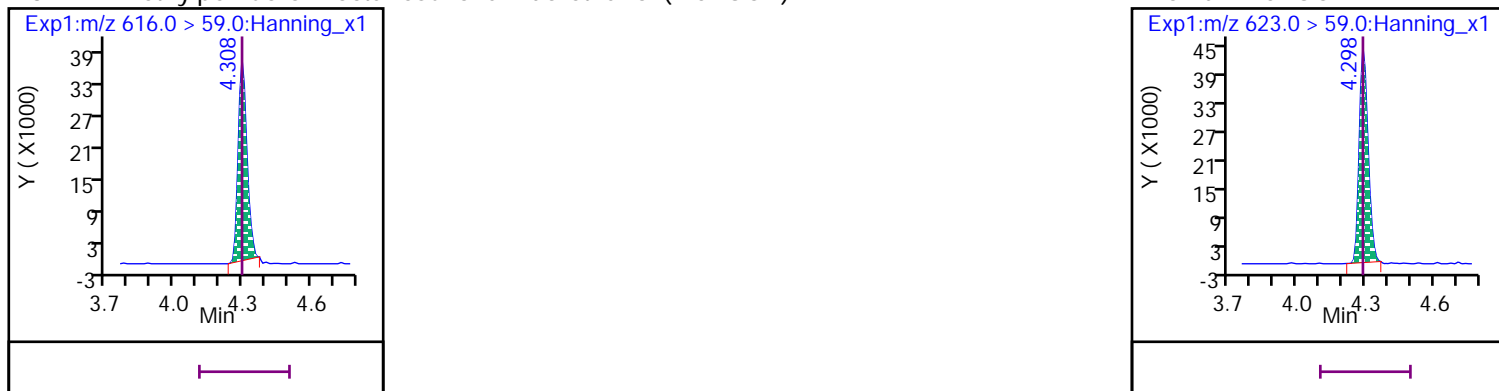
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



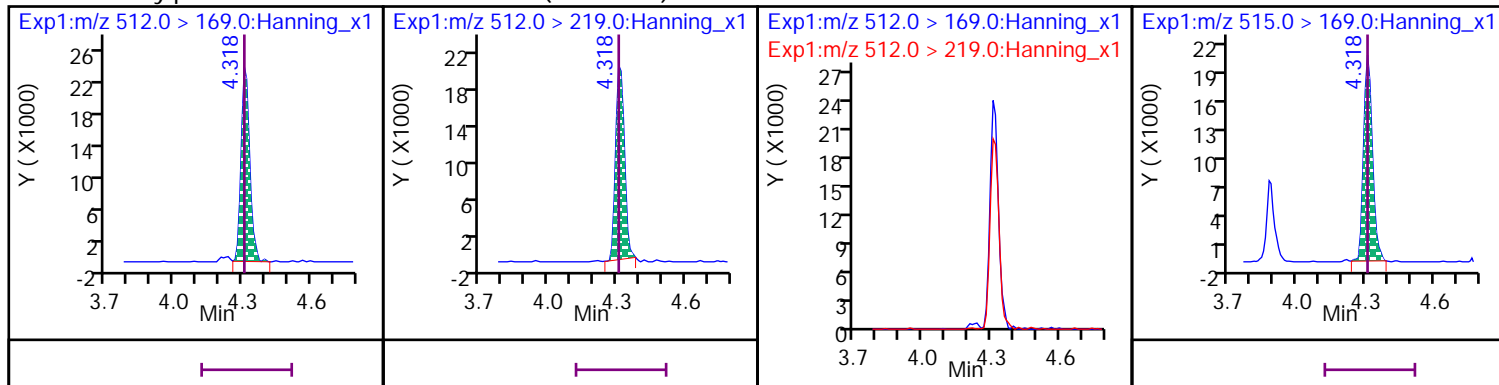
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



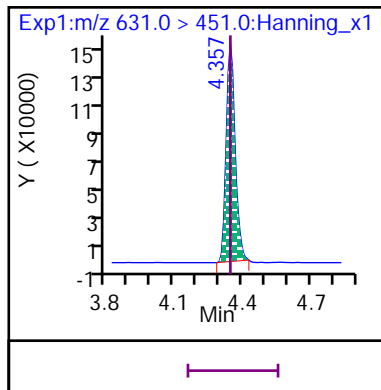
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

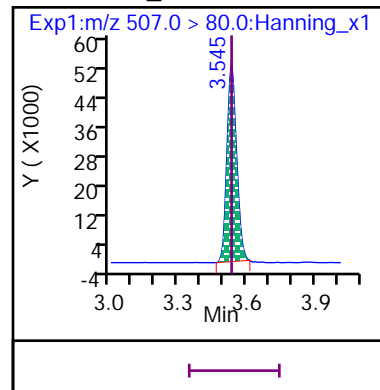




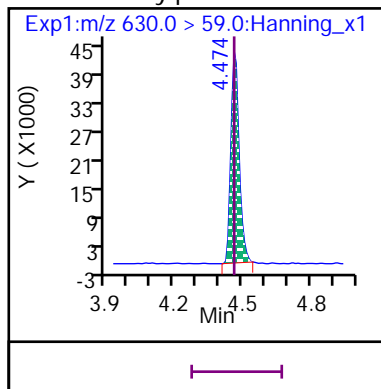
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



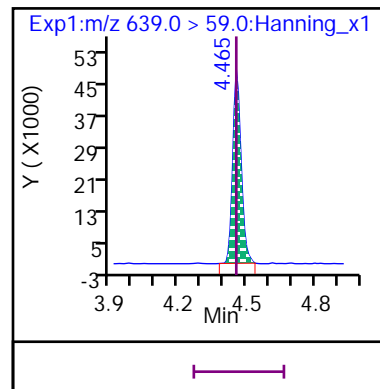
D 54 13C8\_PFOS



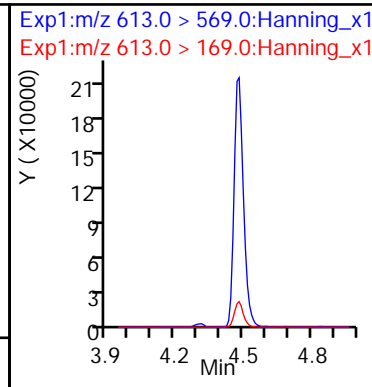
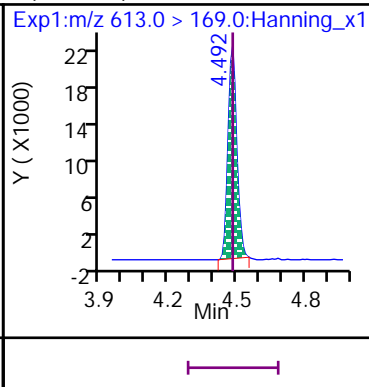
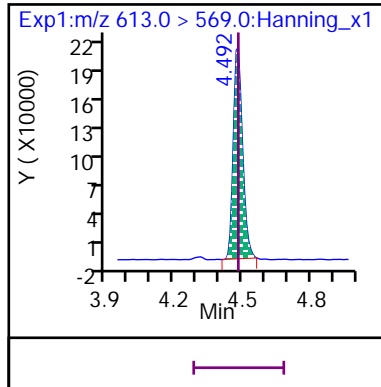
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



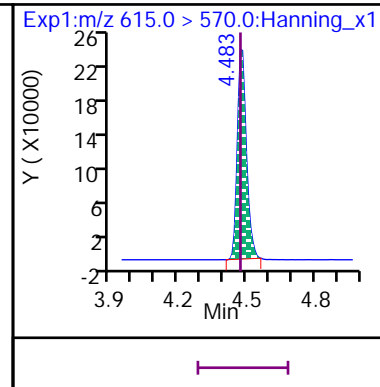
D 62 d9-EtFOSE



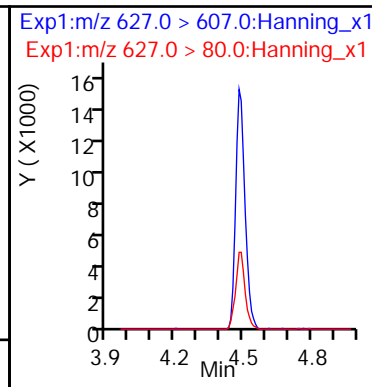
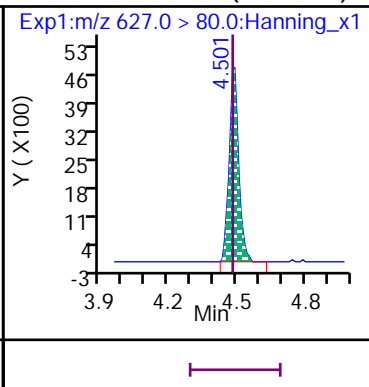
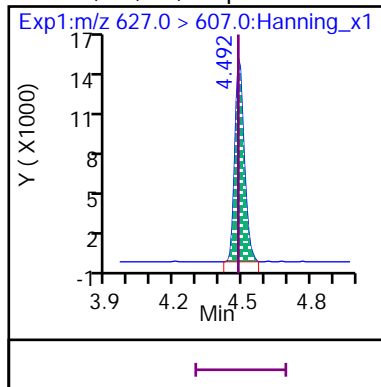
11 Perfluoro-n-dodecanoic acid (PFDaA)



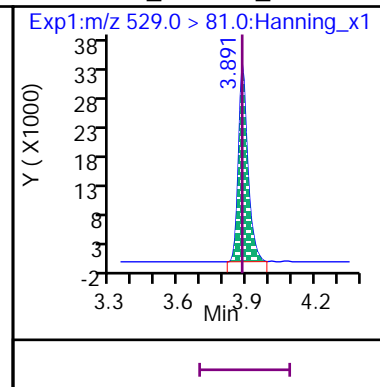
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

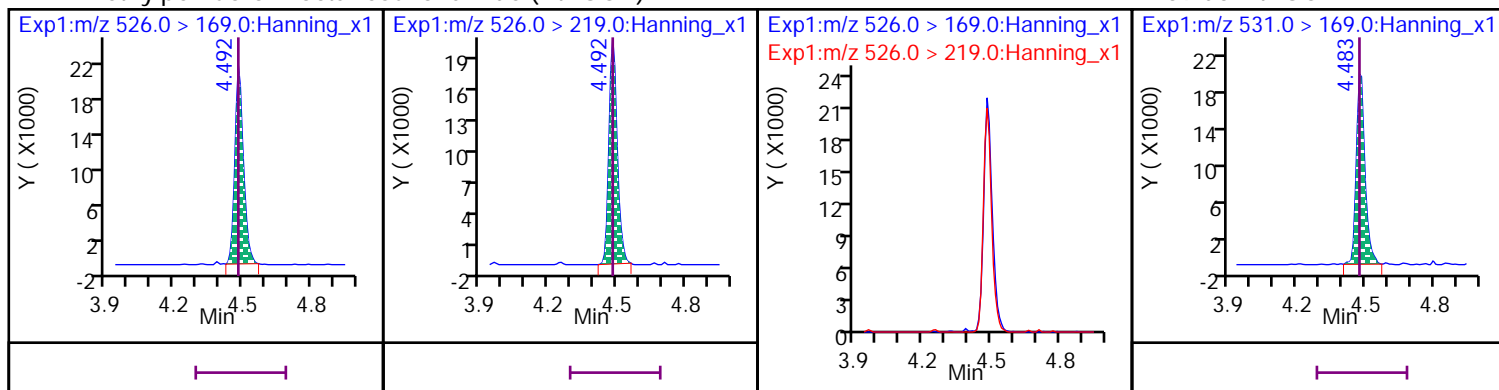


D 65 13C2\_8:2 FTS\_2



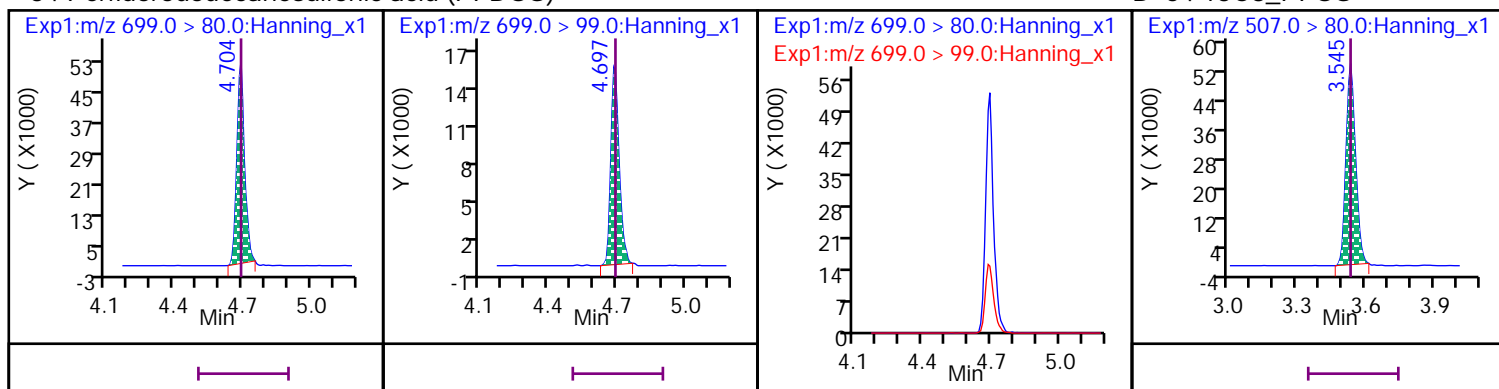
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



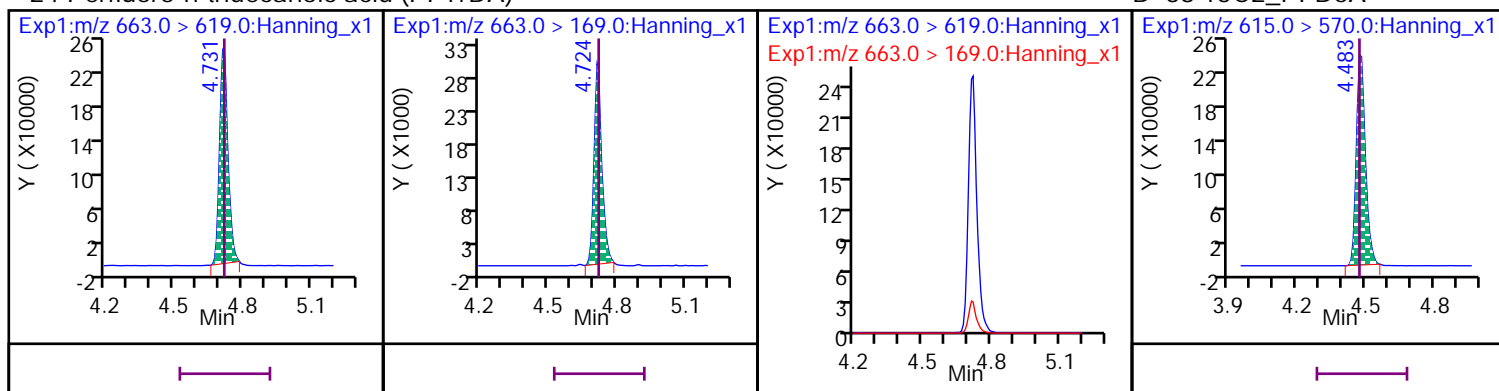
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



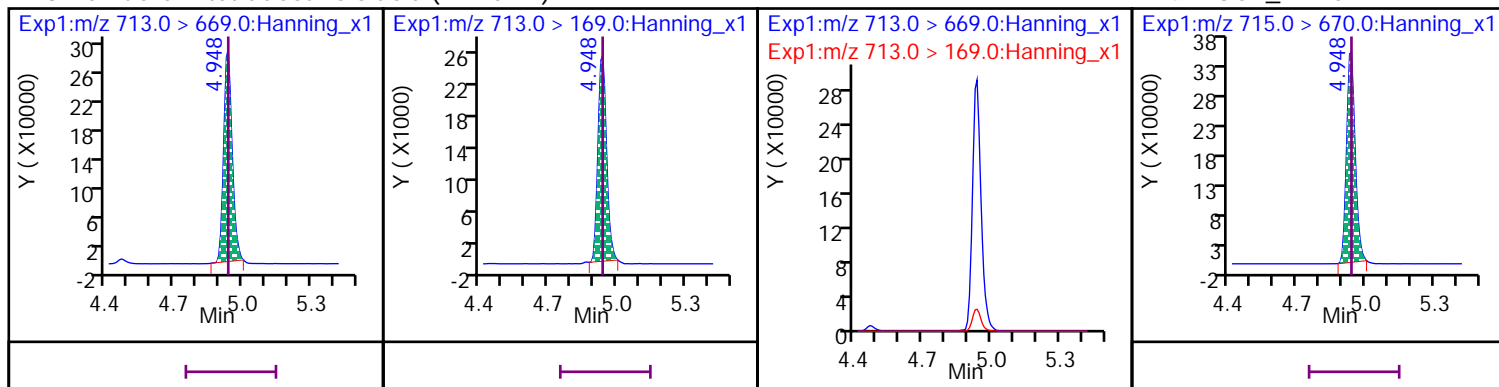
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



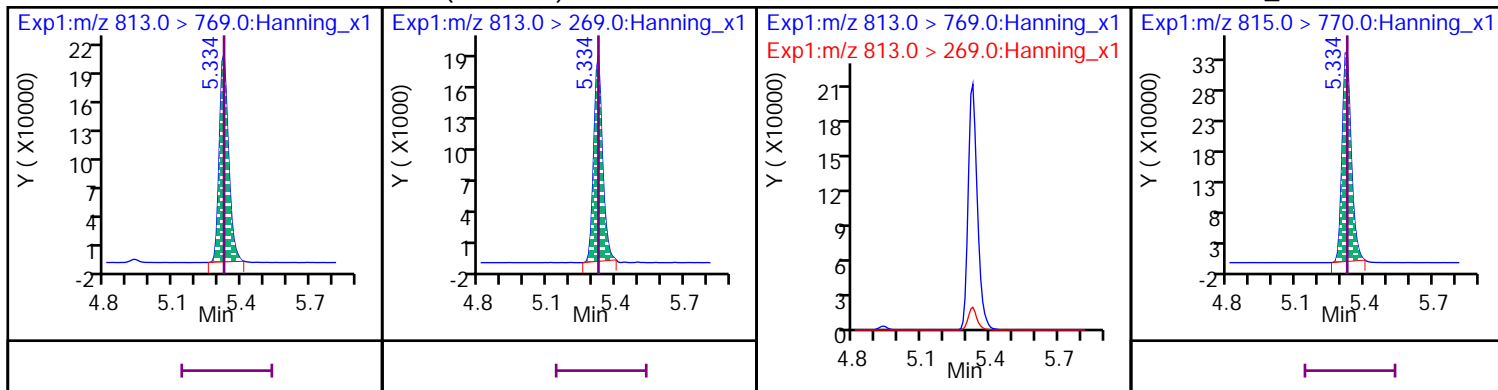
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



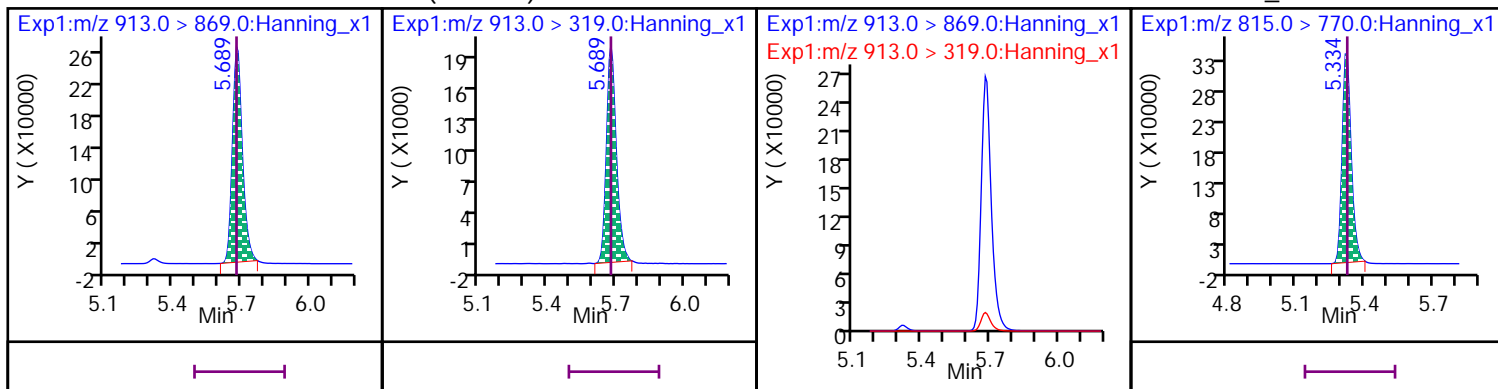
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

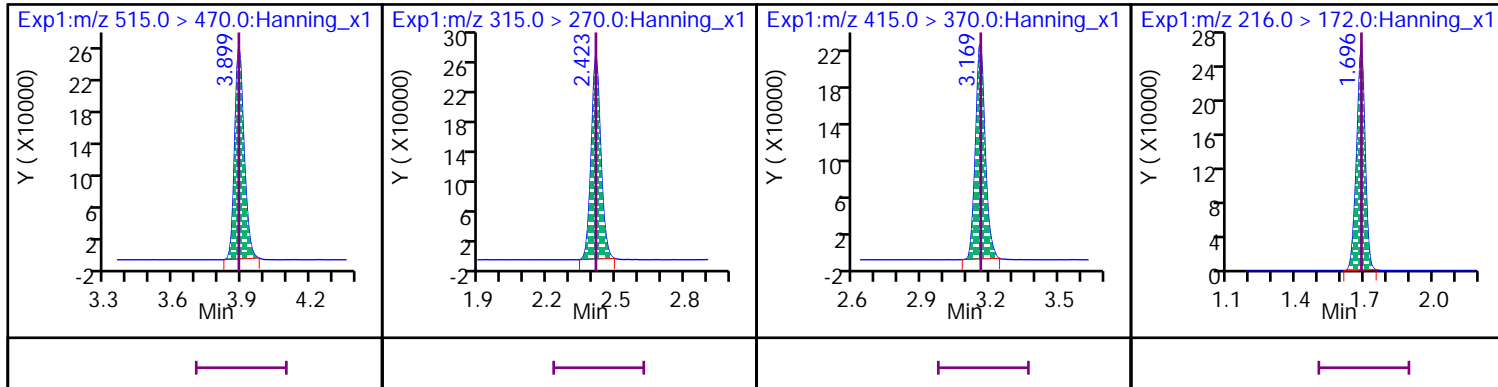


\* 37 13C2\_PFDA

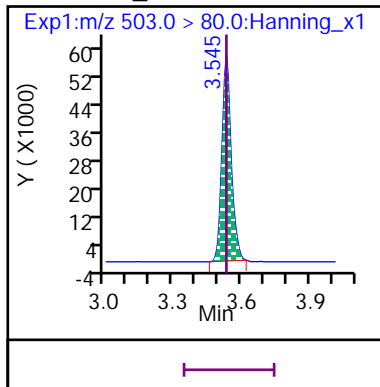
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720011.d  
 Injection Date: 17-Dec-2020 13:15:20 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 6 Auto Sampler: 6  
 Sample Info: ICAL 2000\_SVLC-1224 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	690771	23	>100:1			1000.00	995.99	93.9	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	1369790	23	>100:1			2000.00	1990.96		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	707649	18	>100:1			1000.00	1028.73	97.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	1355901	17	>100:1			2000.00	1905.74		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	234029	17	>100:1			1000.00	1016.50	94.5	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	473501	17	>100:1	Target = 3.50		1768.00	1716.02		
298.9 > 99	44	2.125	2.125		138363	17	>100:1	3.42 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/0	361613	20	>100:1	Target = 3.10		1876.00	1781.27		
349 > 99	44	2.459	2.459		119484	19	>100:1	3.02 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	1	117645	20	>100:1			5000.00	4859.69	93	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/0	90211	20		Target = 1.80		1868.00	1921.12		
327 > 81	63	2.388	2.388		50713	20	>100:1	1.77 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	730846	20	>100:1			1000.00	991.56	94.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	1427984	20	>100:1	Target = 18.34		2000.00	1979.05		
313 > 119	49	2.423	2.423		81047	21	>100:1	17.61 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1335856	20	>100:1			5000.00	5015.34	94.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	1/1	745633	21	>100:1	Target = 0.81		4000.00	3884.48		
285 > 185	66	2.539	2.539		919494	19	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.790	0	620403	19	>100:1			1000.00	1022.68	101	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/1	1233089	20	>100:1	Target = 3.70		2000.00	1916.16		
363 > 169	47	2.790	2.790		335065	19	>100:1	3.68 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	169221	20	>100:1			1000.00	988.27	94.4	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	331697	25	>100:1	Target = 3.21	0.16	1820.00	1848.69		
399 > 99	45	2.799	2.799		103327	28	>100:1	3.21 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	2039948	19	>100:1	Target = 2.97		1884.00	1898.77		
377 > 85	45	2.827	2.827		691343	19	>100:1	2.95 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	287358	22	>100:1	Target = 3.08		1904.00	1869.29		
449 > 99	45	3.169	3.169		92732	23	>100:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	99626	28	>100:1			5000.00	5173.12	95.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	78944	27	>100:1	Target = 1.80		1896.00	1941.09		
427 > 81	64	3.135	3.135		42430	20	>100:1	1.86 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	599661	23	>100:1			1000.00	1013.17	91.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	1218307	24	>100:1	Target = 2.87		2000.00	1992.90		
413 > 169	53	3.162	3.169		418424	23	>100:1	2.91 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	150186	21	>100:1			1000.00	1001.72	97.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/1	305729	40	>100:1	Target = 3.84	0.26	1856.00	1717.89		
499 > 99	54	3.537	3.545		92841	37	>100:1	3.29 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/1	929018	21	>100:1			1864.00	1837.47		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/1	219044	19	>100:1	Target = 3.07		1920.00	1905.85		
549 > 99	54	3.882	3.891		83562	20	>100:1	2.62 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/1	214195	19	>100:1	Target = 3.03		1928.00	1965.19		
599 > 99	54	4.198	4.198		71705	17	>100:1	2.98 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/1	777834	17	>100:1			1884.00	1823.68		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/1	224258	19	>100:1	Target = 3.33		1936.00	1859.92		
699 > 99	54	4.704	4.704		72042	18	>100:1	3.11 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	746906	20	>100:1			1000.00	994.60	94.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	1474929	22	>100:1	Target = 6.16		2000.00	1974.66		
463 > 169	56	3.545	3.545		242200	21	>100:1	6.08 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	312166	18	>100:1			1000.00	1008.41	94.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	614554	19	>100:1			2000.00	1997.74		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	87412	19				5000.00	4712.20	93.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	69164	19	>100:1	Target = 1.95		1916.00	1984.81		
527 > 81	65	3.882	3.891		35651	24	>100:1	1.94 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	86394	17	>100:1	Target = 3.14		1928.00	2138.46		
627 > 80	65	4.492	4.492		28288	23		3.05 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	682060	18	>100:1			1000.00	1028.23	97.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	1310983	19	>100:1	Target = 15.94		2000.00	1956.14		
513 > 169	51	3.899	3.899		94119	17	>100:1	13.92 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	735121	19	>100:1			5000.00	5121.39	96.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.056	4.065	0/-1	217003	35		Target = 1.33	0.12	2000.00	1921.46		
570 > 483	58	4.065	4.065		168949	33	>100:1	1.28 (0.66-1.99)	0.20				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.217	0	659409	18	>100:1			5000.00	4964.88	89.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	1/1	264743	33	>100:1	Target = 1.58	0.12	2000.00	2016.33		
584 > 526	60	4.217	4.217		154555	31	>100:1	1.71 (0.79-2.37)	0.19				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.207	4.217	0	643886	17	>100:1			1000.00	1018.69	94.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/1	1167255	18	>100:1	Target = 15.50		2000.00	1928.80		
563 > 169	52	4.217	4.217		84851	19	>100:1	13.75 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	107248	14	>100:1			1000.00	991.13	91.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	193445	16	>100:1			2000.00	1919.66		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	56560	15	>100:1			1000.00	1068.85	103	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	117911	15	>100:1	Target = 1.12		2000.00	1847.81		
512 > 219	57	4.318	4.318		114362	16	>100:1	1.03 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	121638	16	>100:1			1000.00	970.04	99.8	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	215357	17	>100:1			2000.00	1990.02		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	610527	16	>100:1			1000.00	1008.61	94	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	1229587	16	>100:1	Target = 10.85		2000.00	1988.78		
613 > 169	38	4.492	4.492		113584	19	>100:1	10.82 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	1171366	19	>100:1	Target = 8.37		2000.00	1947.95		
663 > 169	38	4.724	4.731		144444	20	>100:1	8.10 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49582	16	>100:1			1000.00	1009.93	96.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	104861	15	>100:1	Target = 1.03		2000.00	1935.81		
526 > 219	59	4.492	4.492		104490	15	>100:1	1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	833060	18	>100:1			1000.00	988.86	93.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	1395266	18	>100:1	Target = 12.11		2000.00	1933.02		
713 > 169	42	4.948	4.948		124227	17	>100:1	11.23 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	938748	19	>100:1			1000.00	1035.96	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	1164830	20	>100:1	Target = 11.48		2000.00	1899.07		
813 > 269	40	5.334	5.334		103765	20	>100:1	11.22 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	1/0	1586814	24	>100:1	Target = 13.88		2000.00	1909.53		
913 > 319	40	5.689	5.689		113646	23	>100:1	13.96 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	687130	19	>100:1					94.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	712399	20	>100:1					94.7	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	588156	23	>100:1					91.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	635025	23	>100:1					95.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80	3.537	3.545	0	153888	20	>100:1						94.7	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**



Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720011.d

Injection Date: 17-Dec-2020 13:15:20

Inst. ID: LCMSMS02

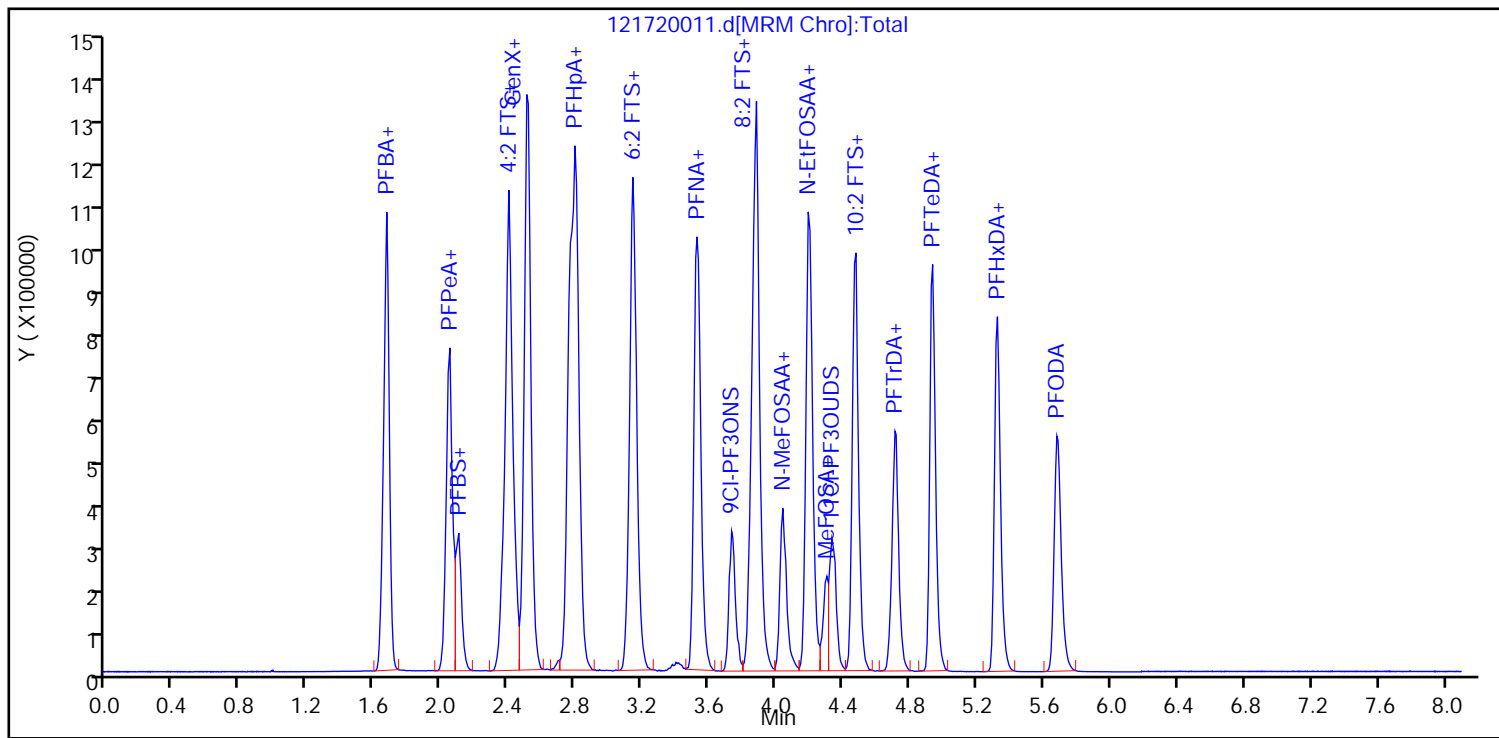
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Lab ID: ICAL 2000\_SVLC-1224

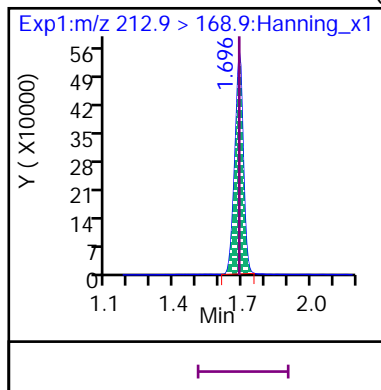
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Dil. Factor: 1

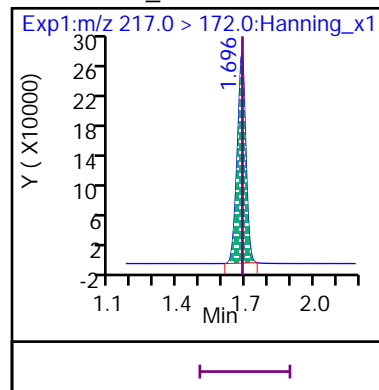
Operator: Stephen E. Somerville



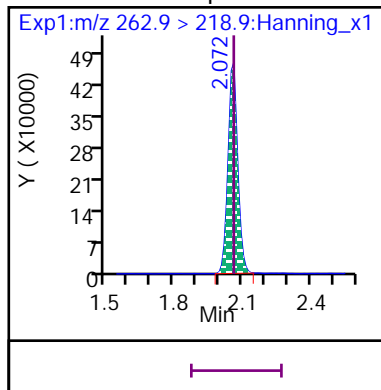
8 Perfluoro-n-butanoic acid (PFBA)



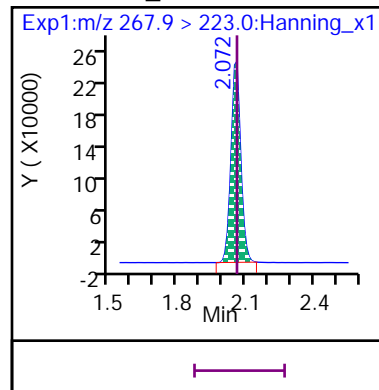
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

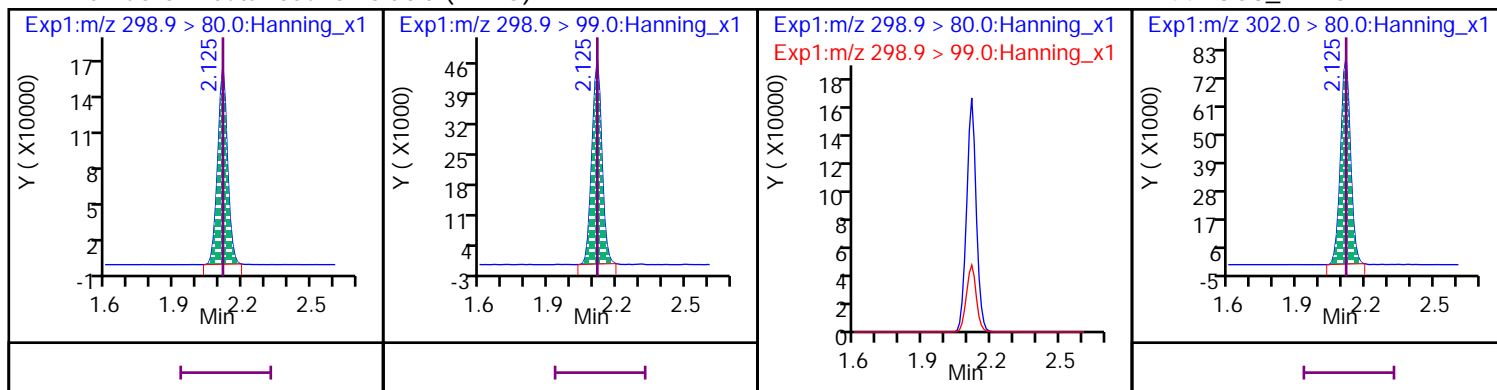


D 50 13C5\_PFPeA



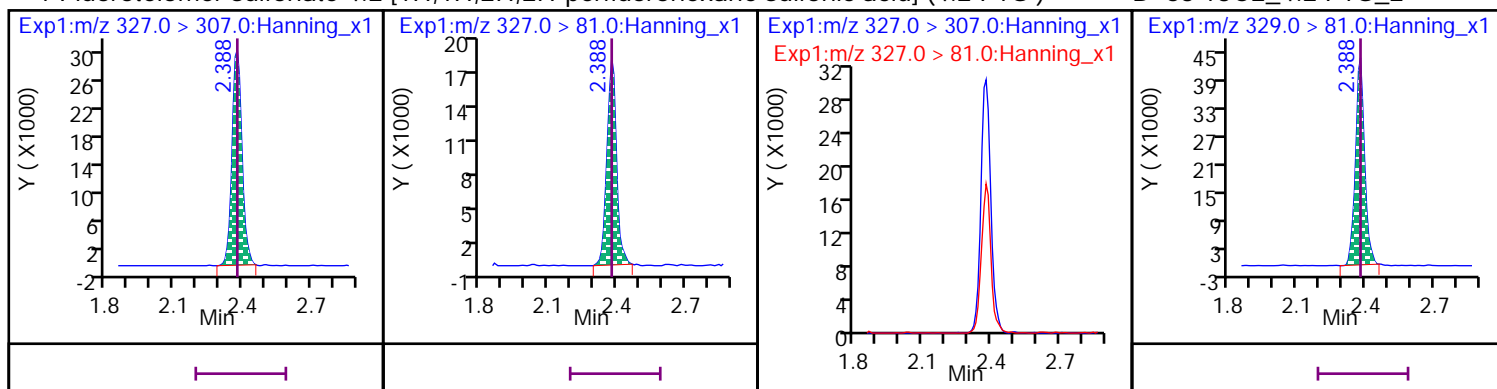
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



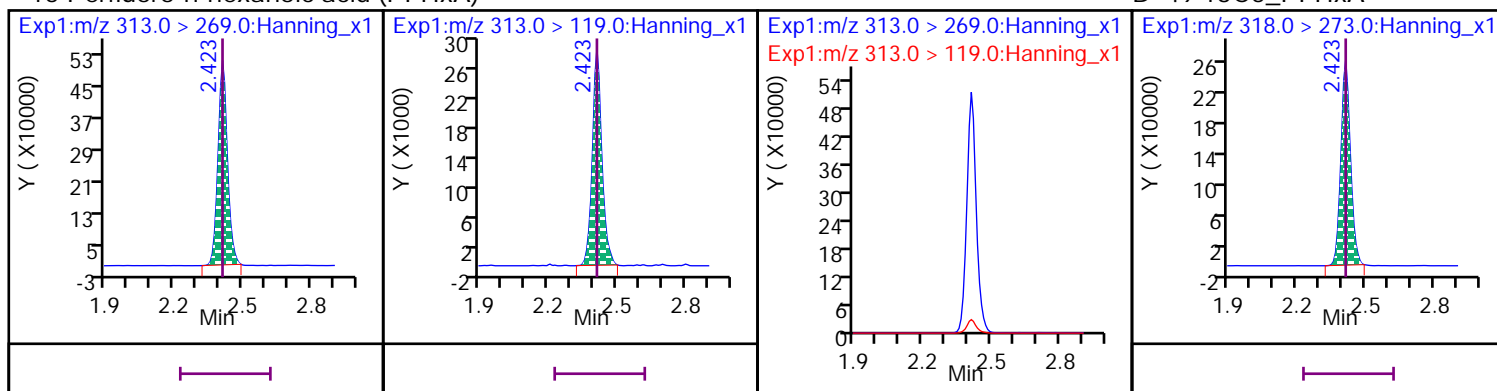
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



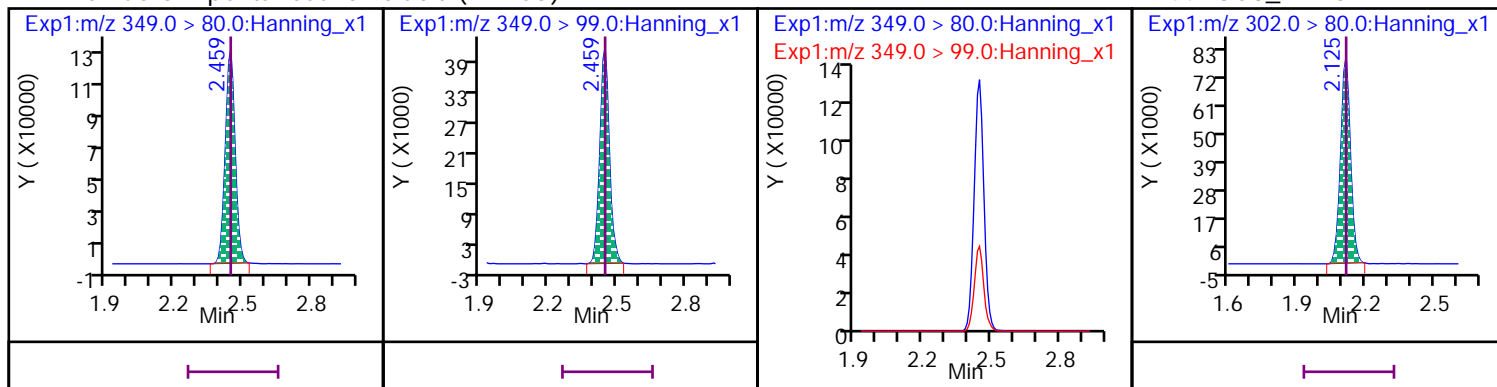
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



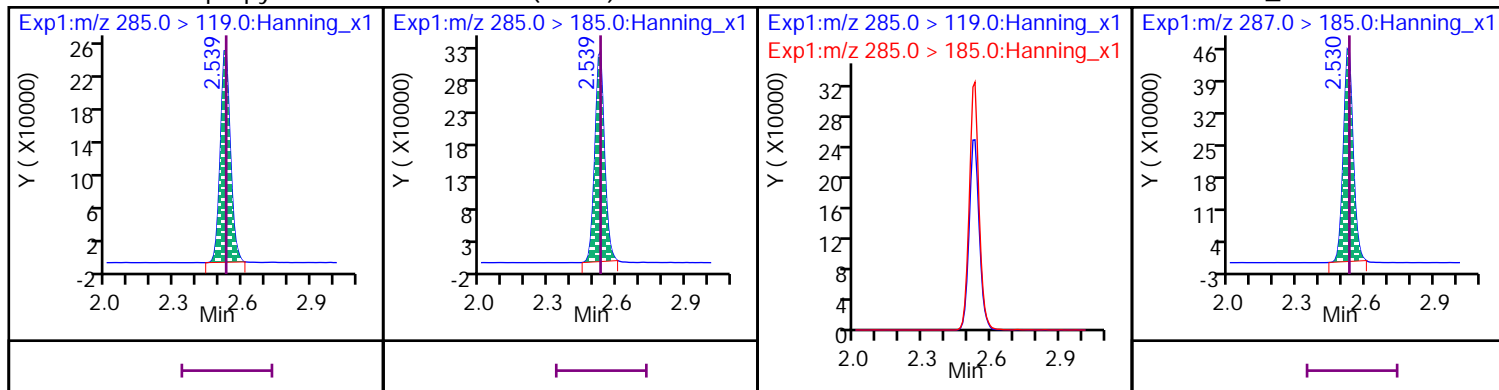
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



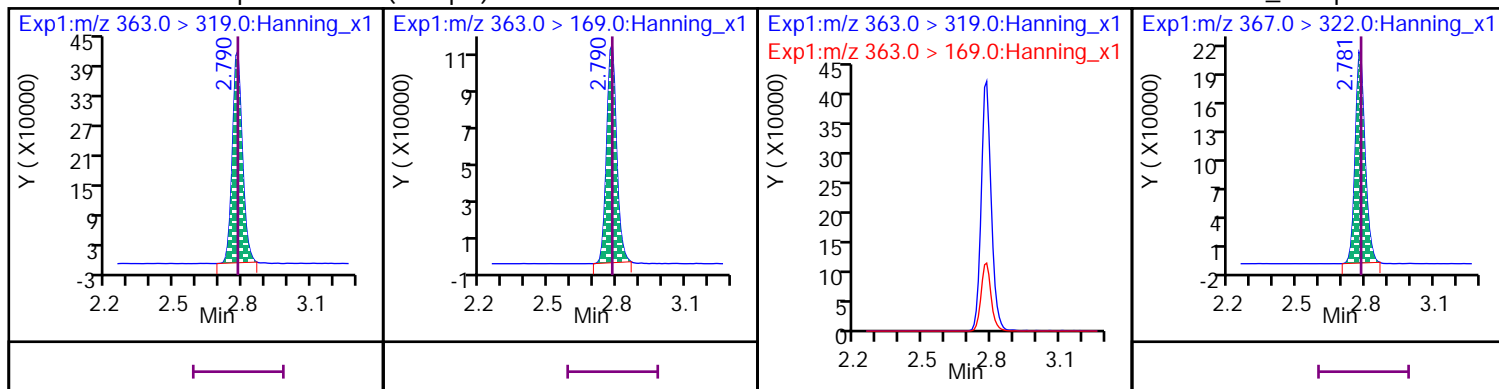
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



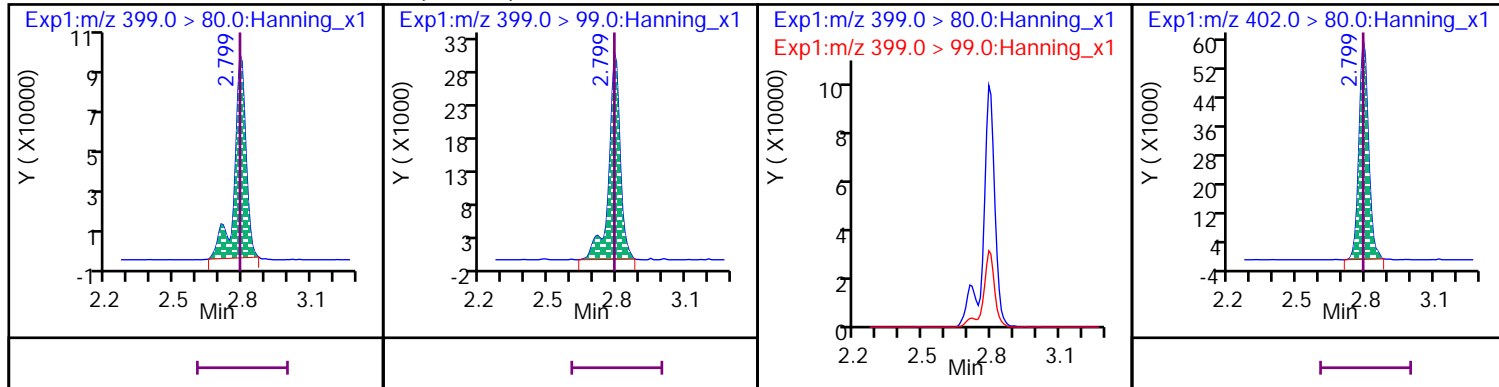
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



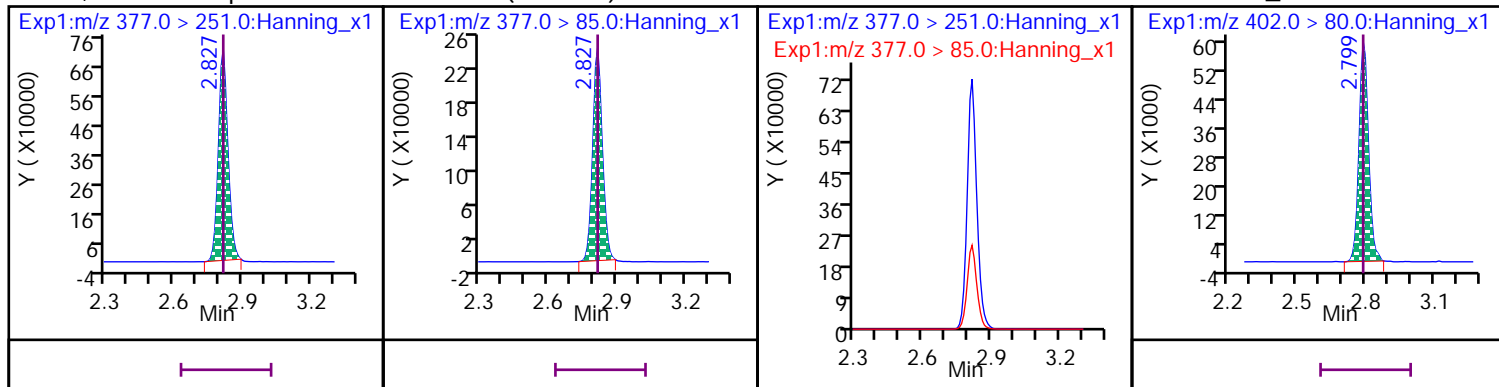
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



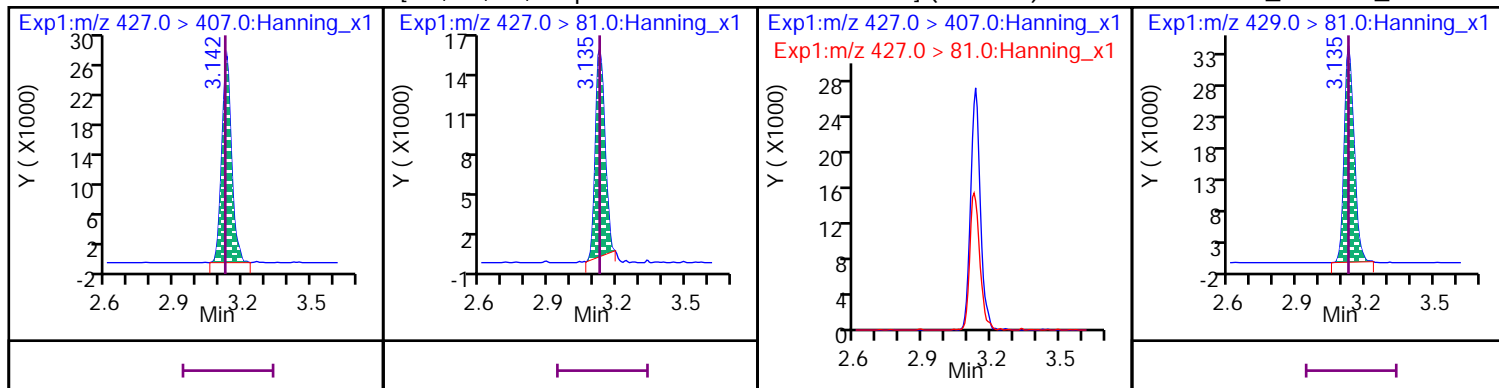
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



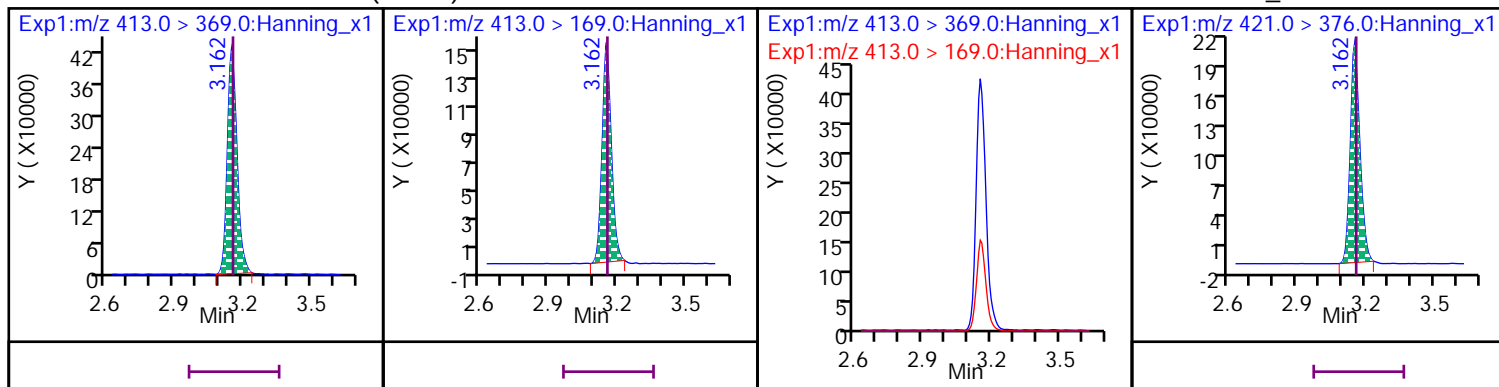
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



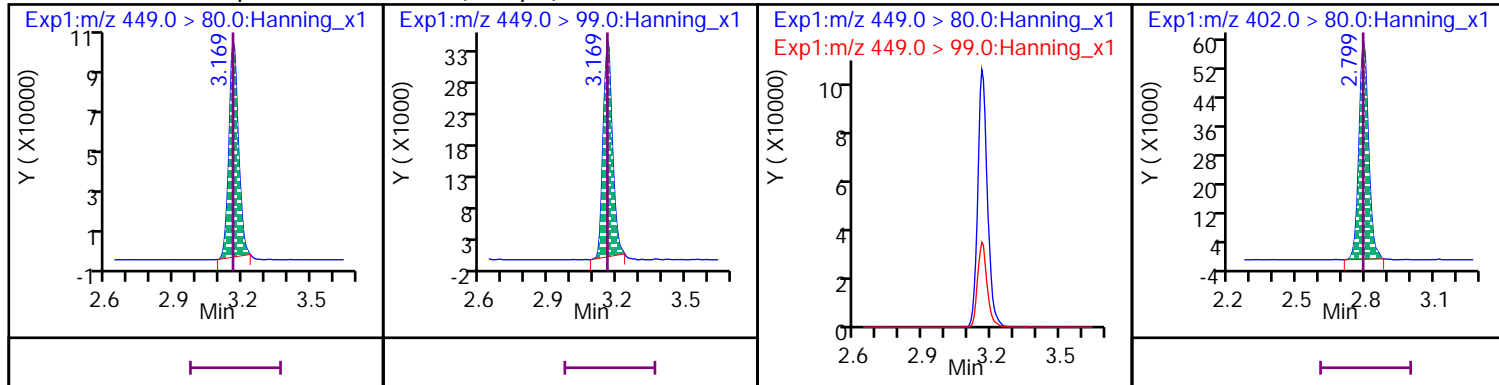
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



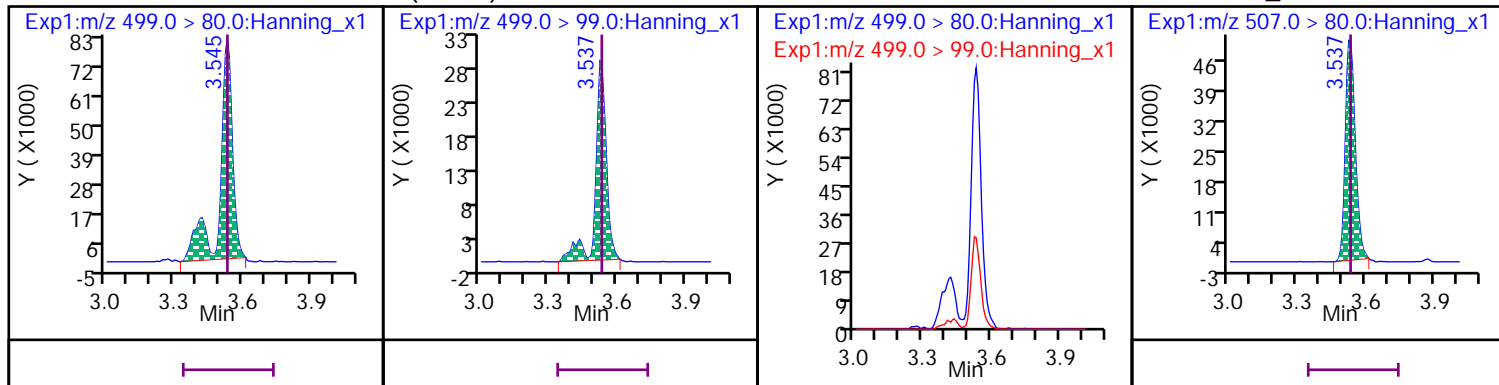
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



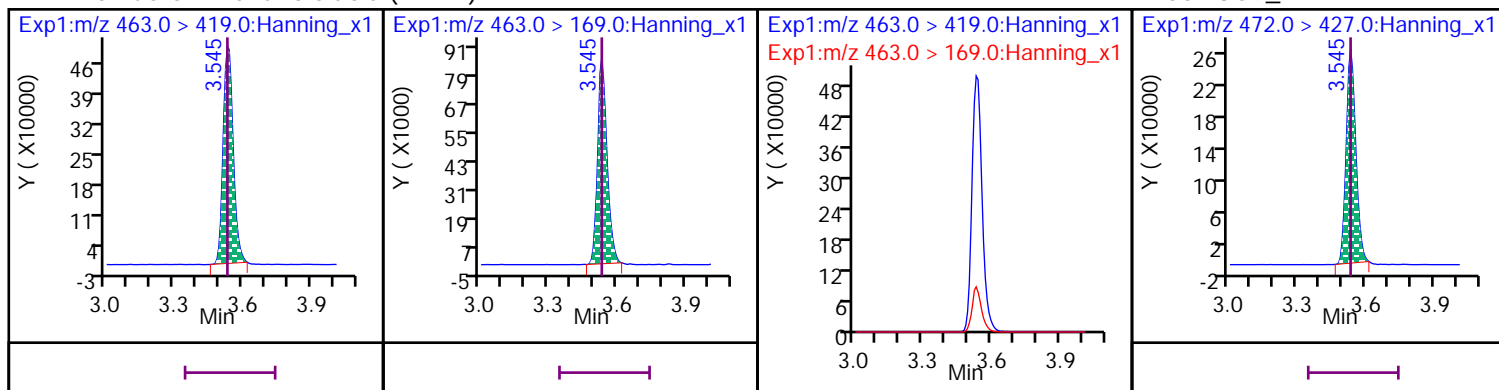
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



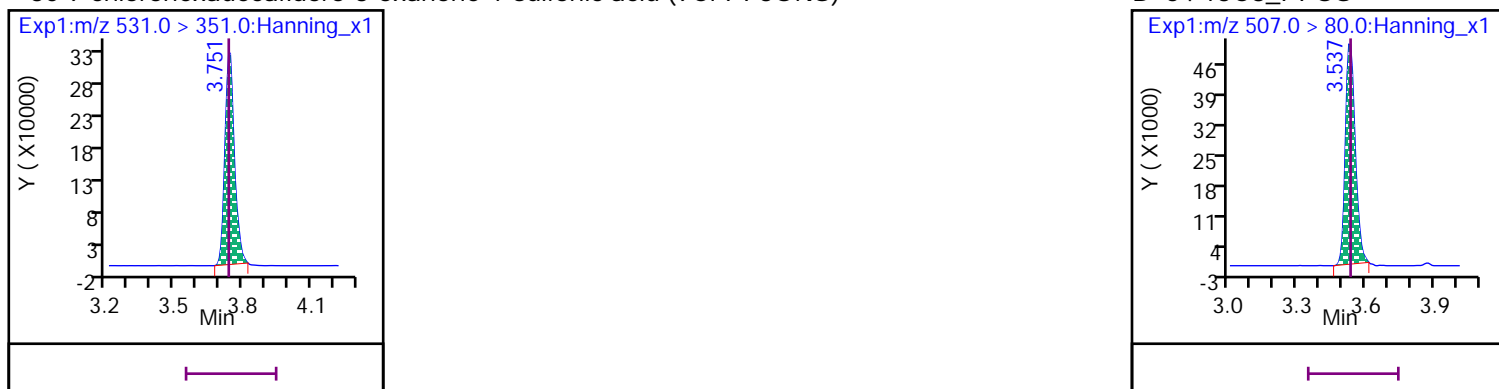
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



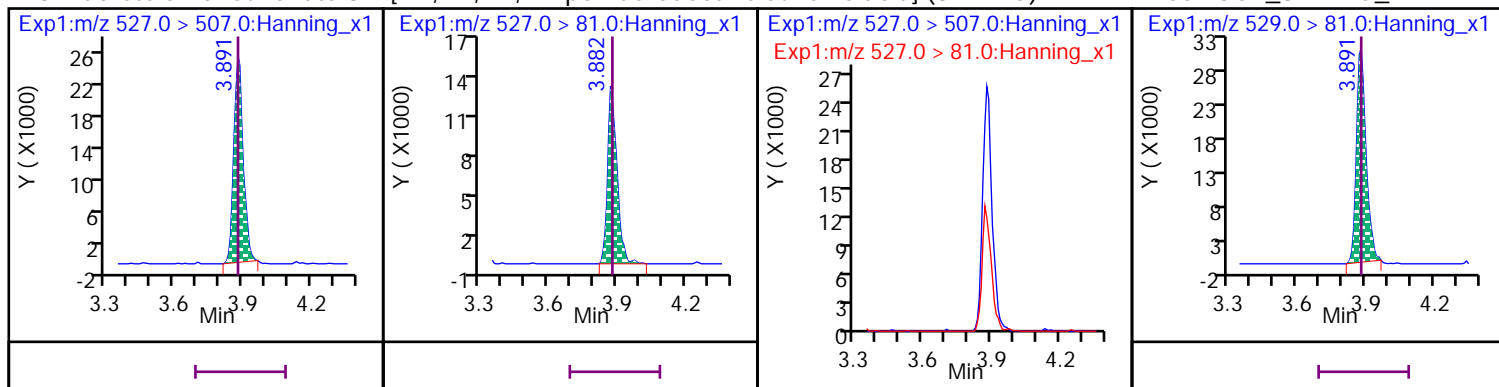
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



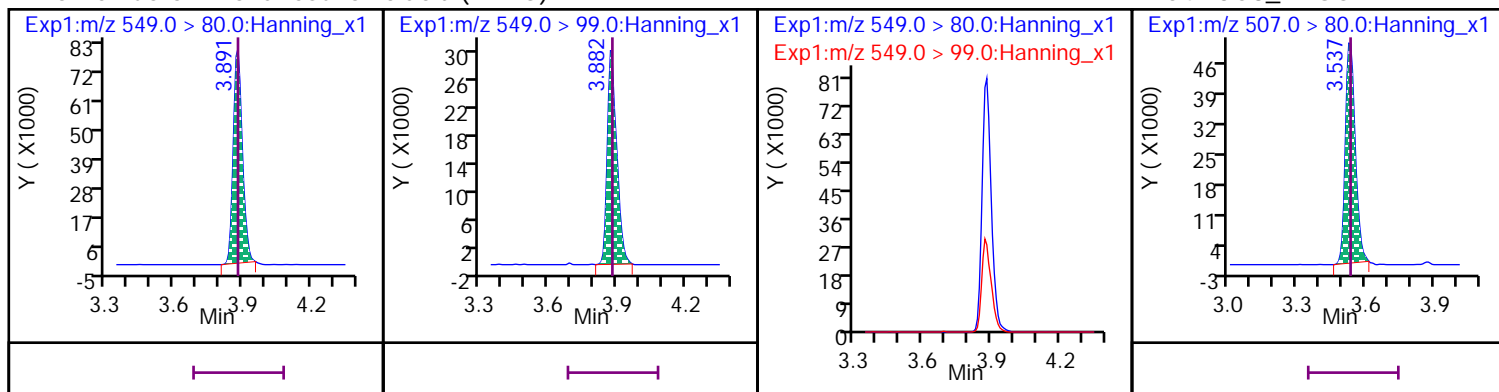
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



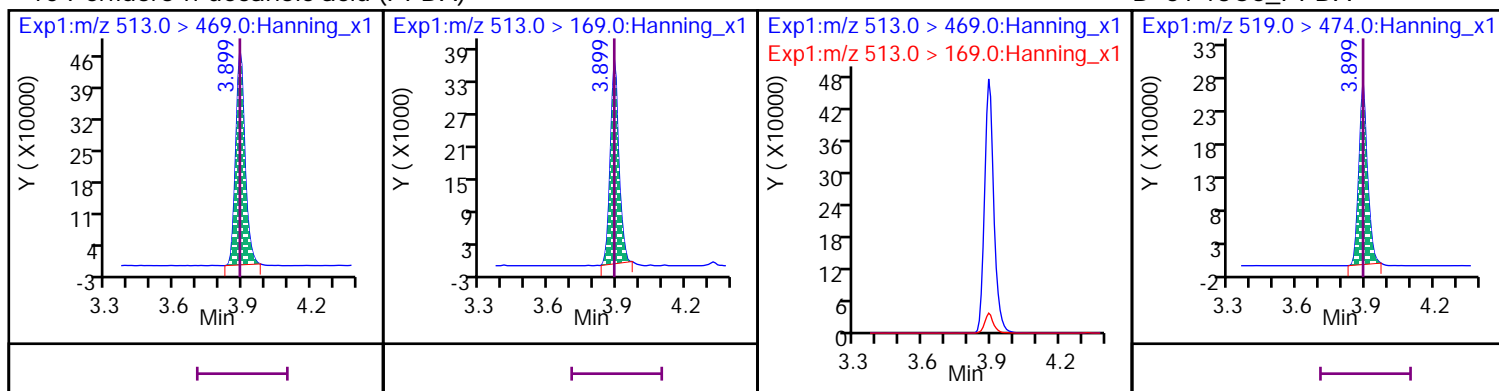
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



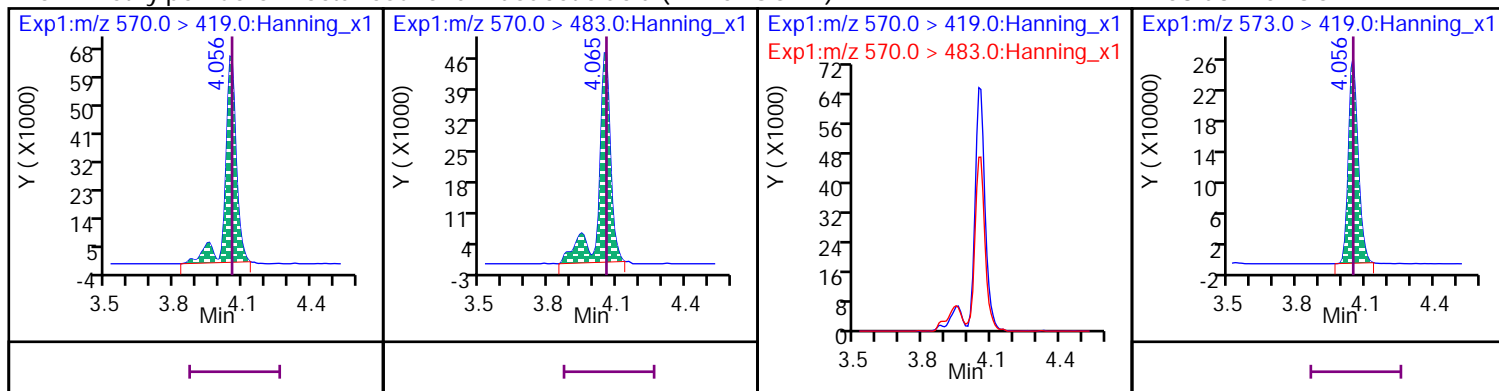
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



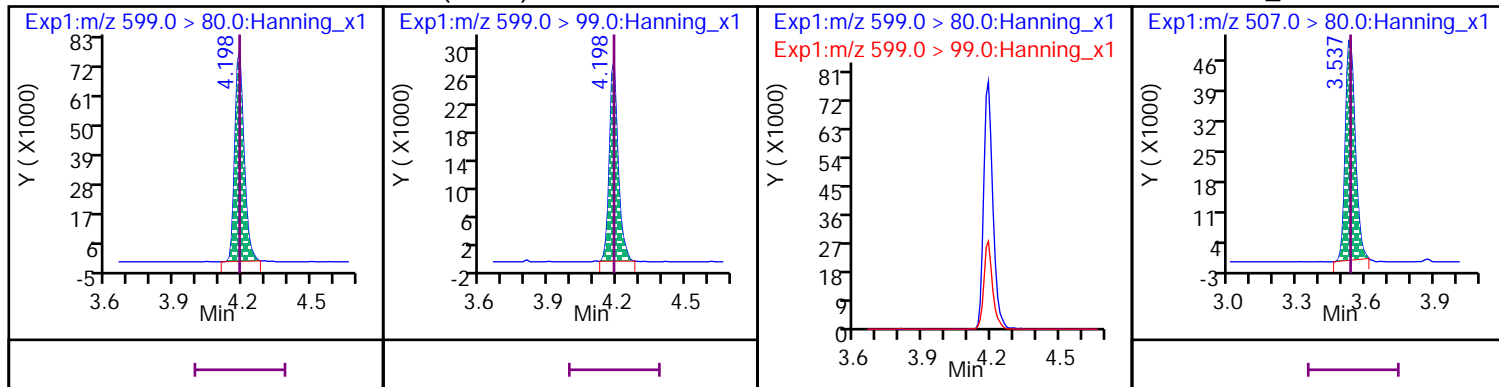
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



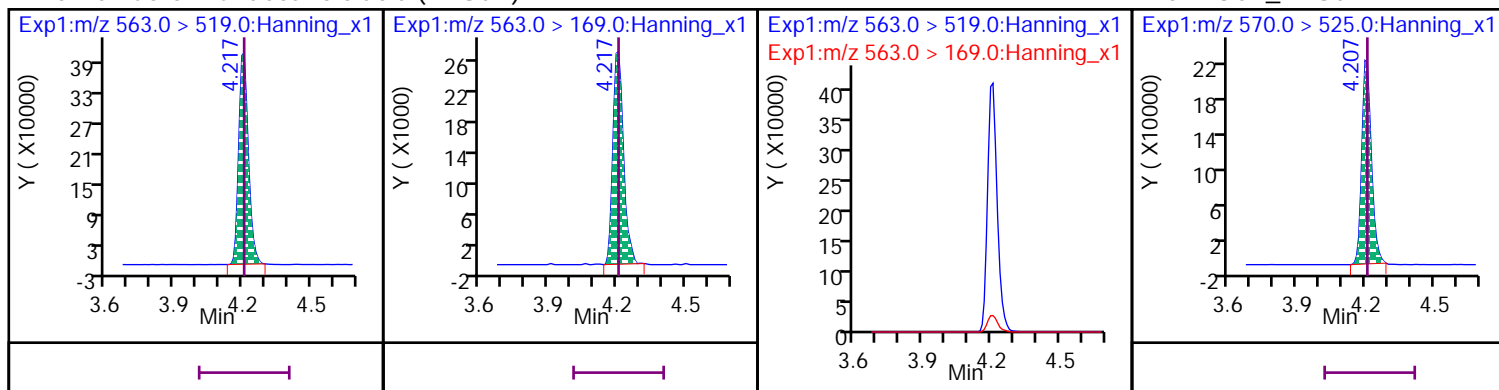
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



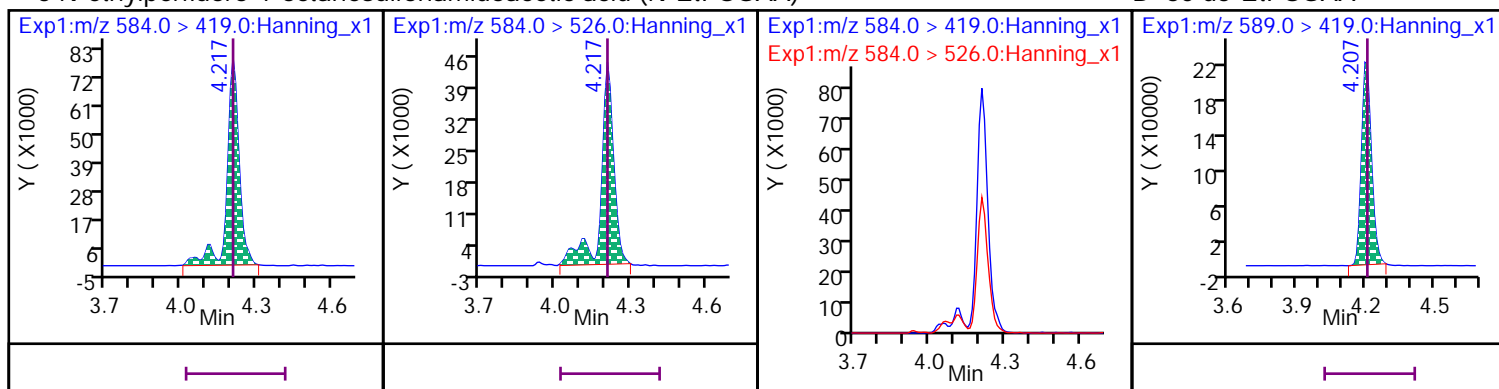
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



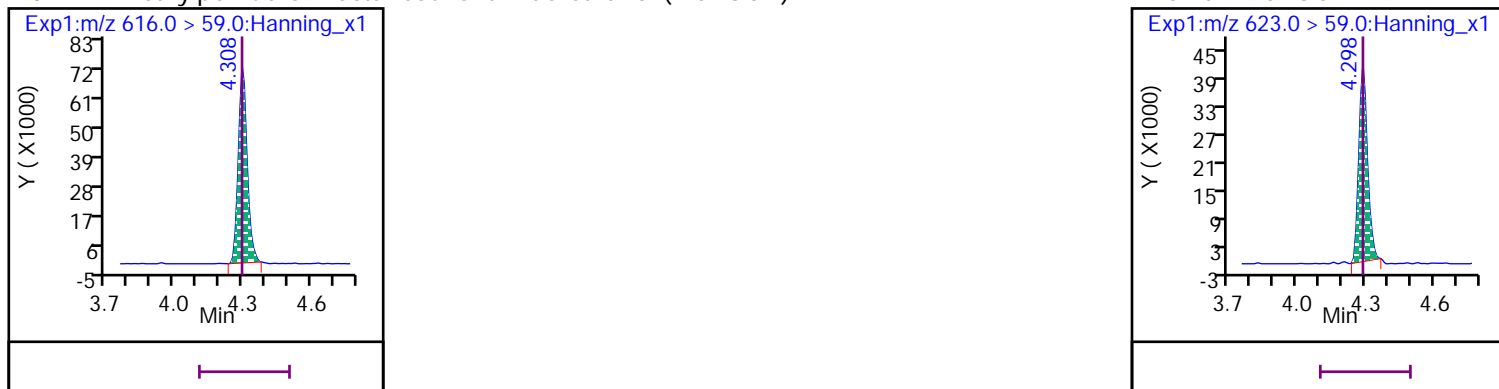
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



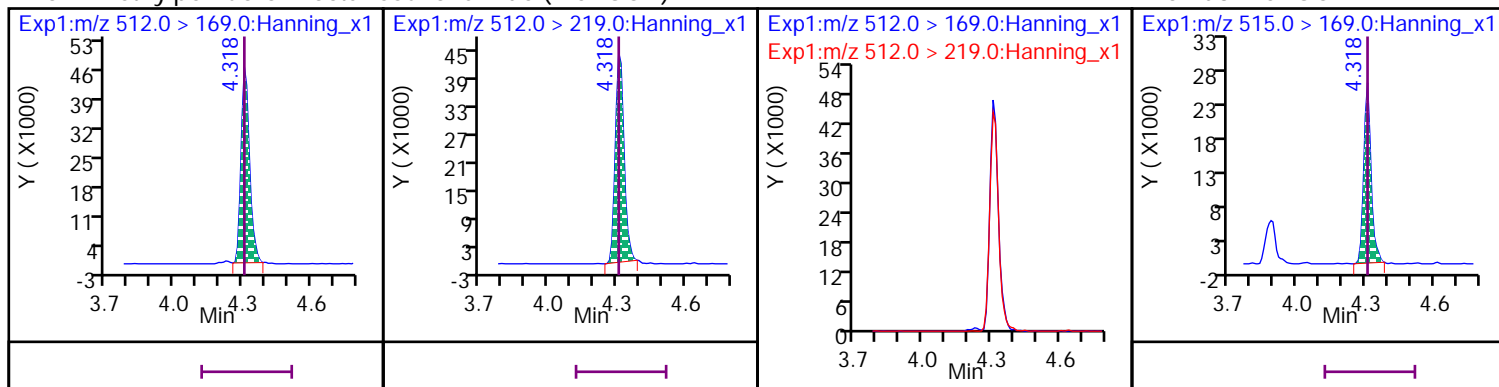
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



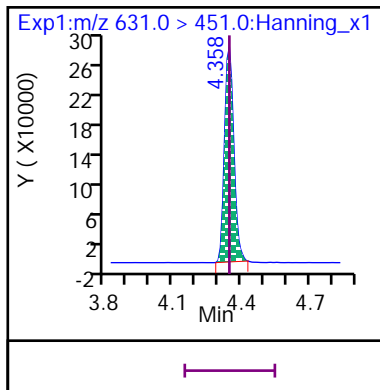
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

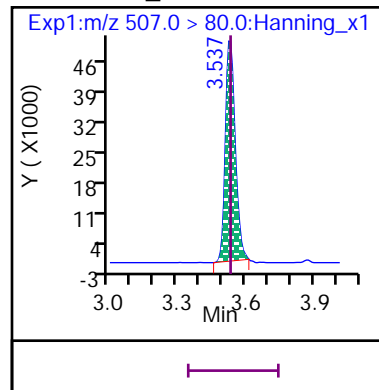




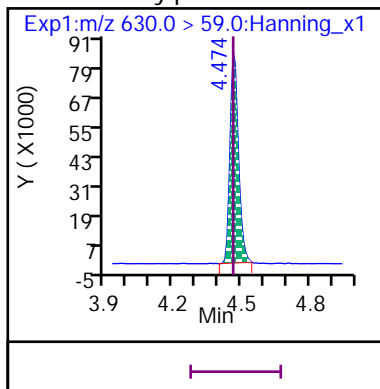
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



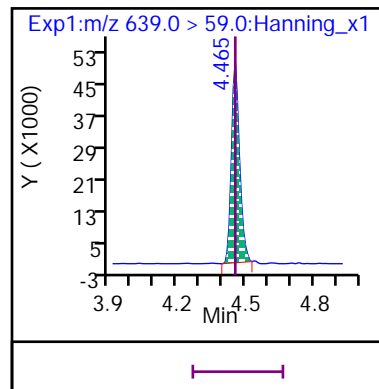
D 54 13C8\_PFOS



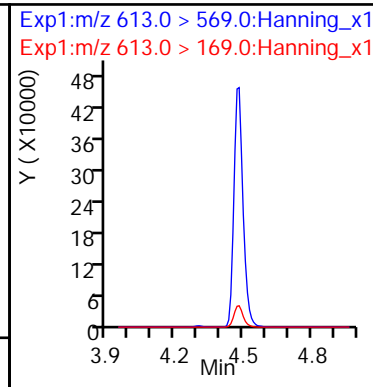
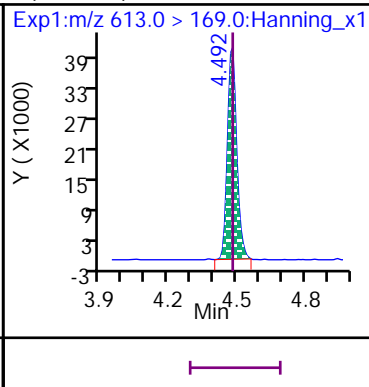
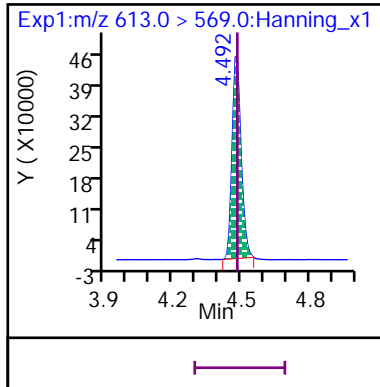
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



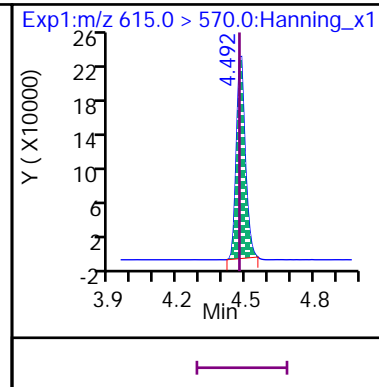
D 62 d9-EtFOSE



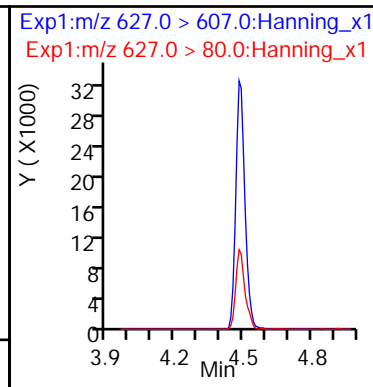
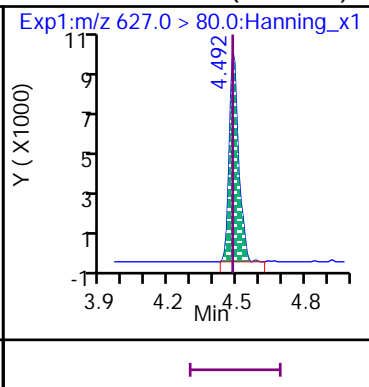
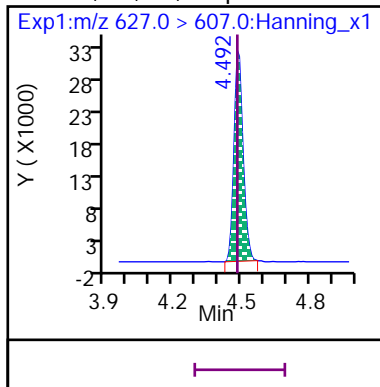
11 Perfluoro-n-dodecanoic acid (PFDoA)



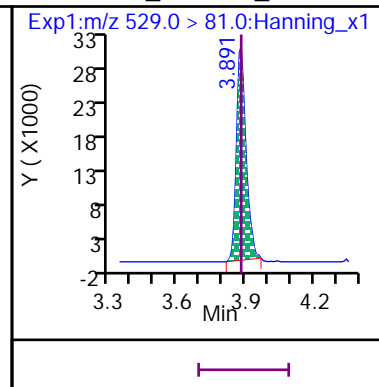
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

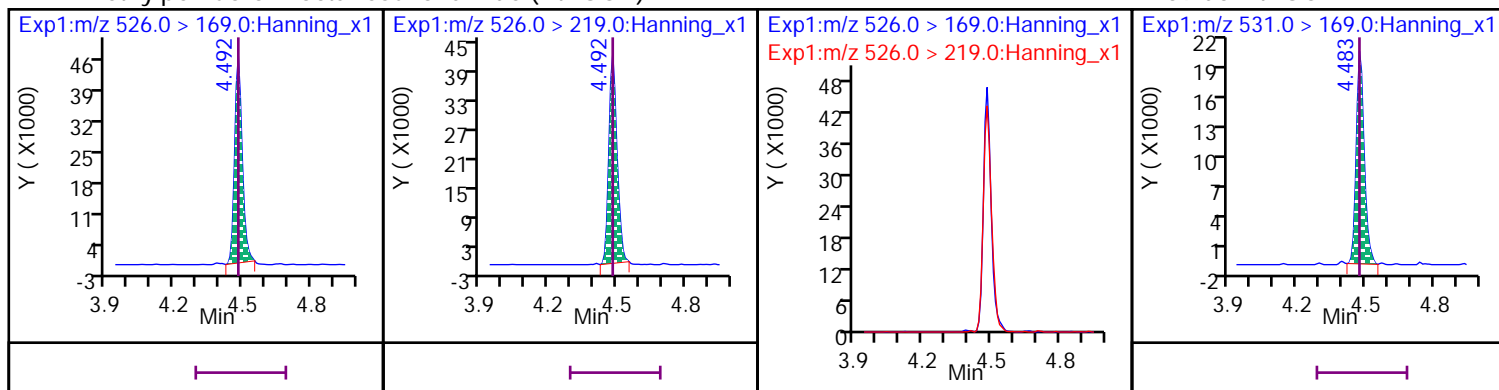


D 65 13C2\_8:2 FTS\_2



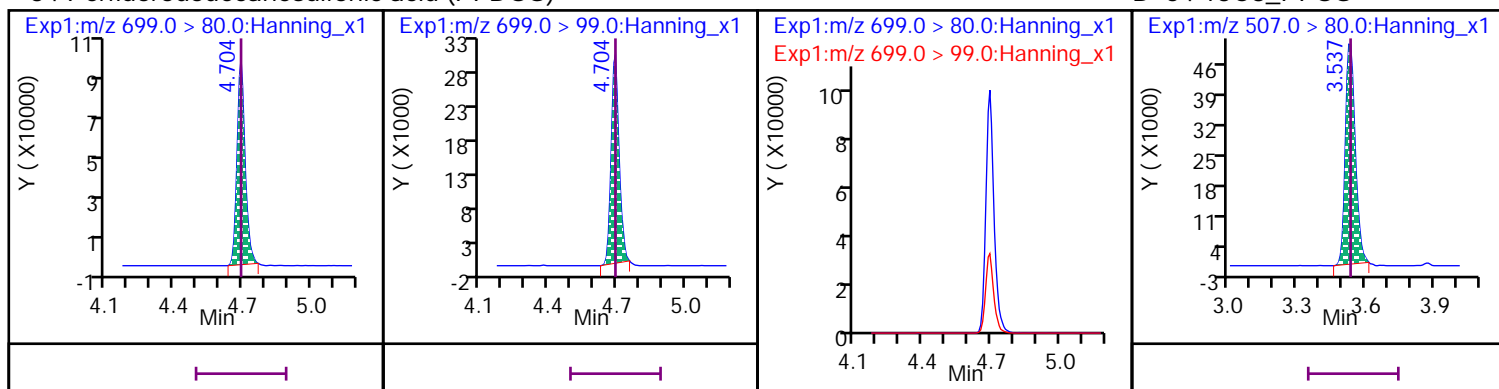
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



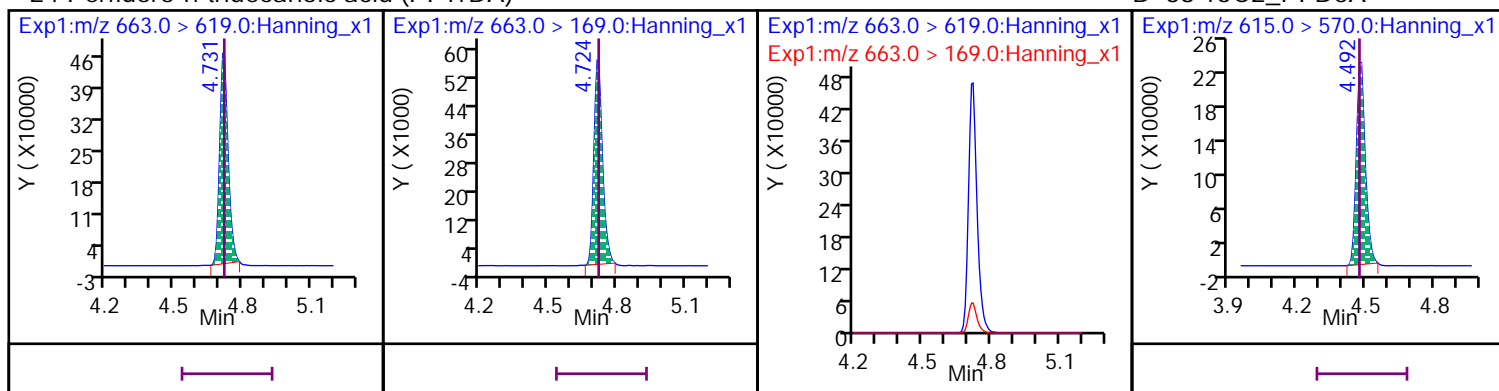
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



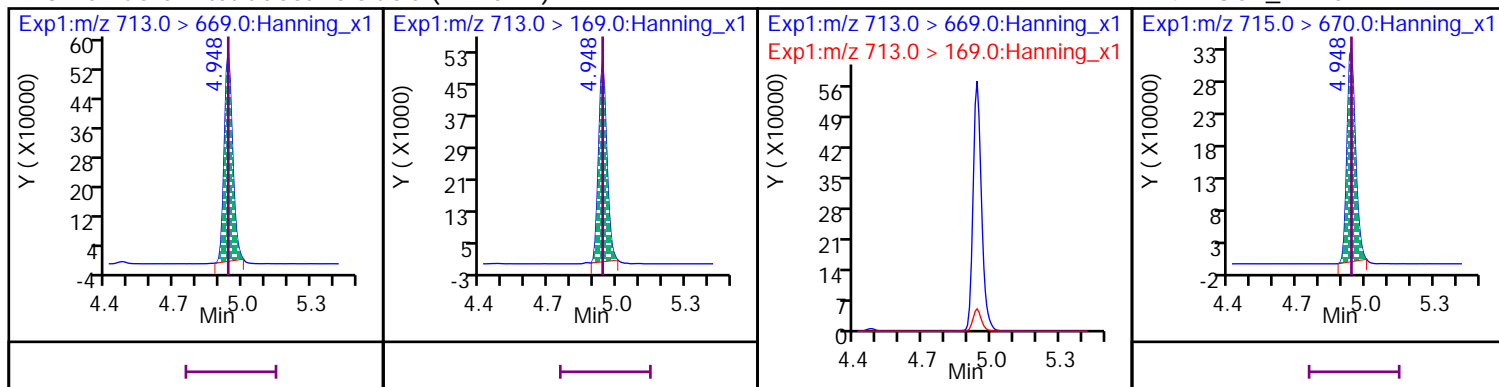
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



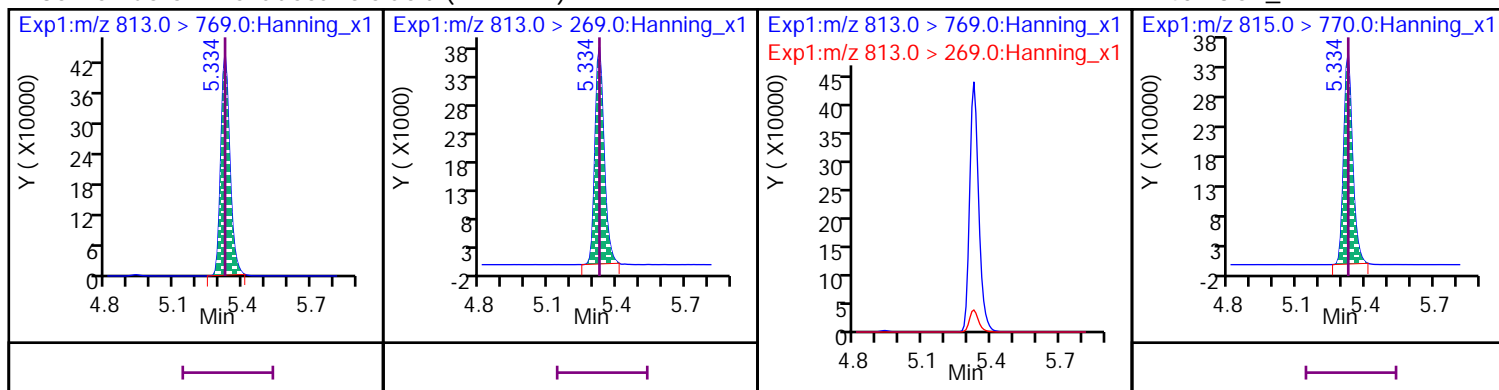
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



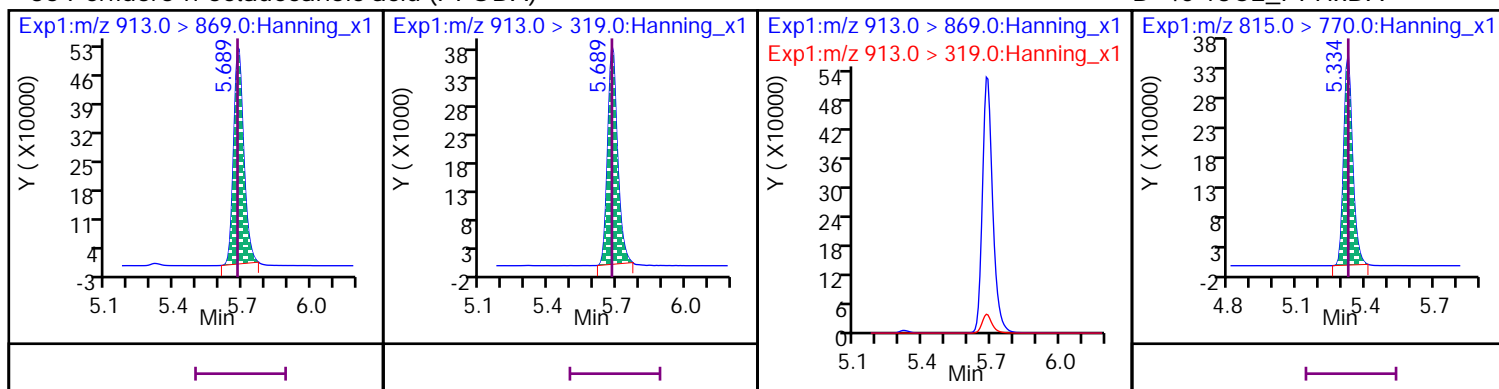
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

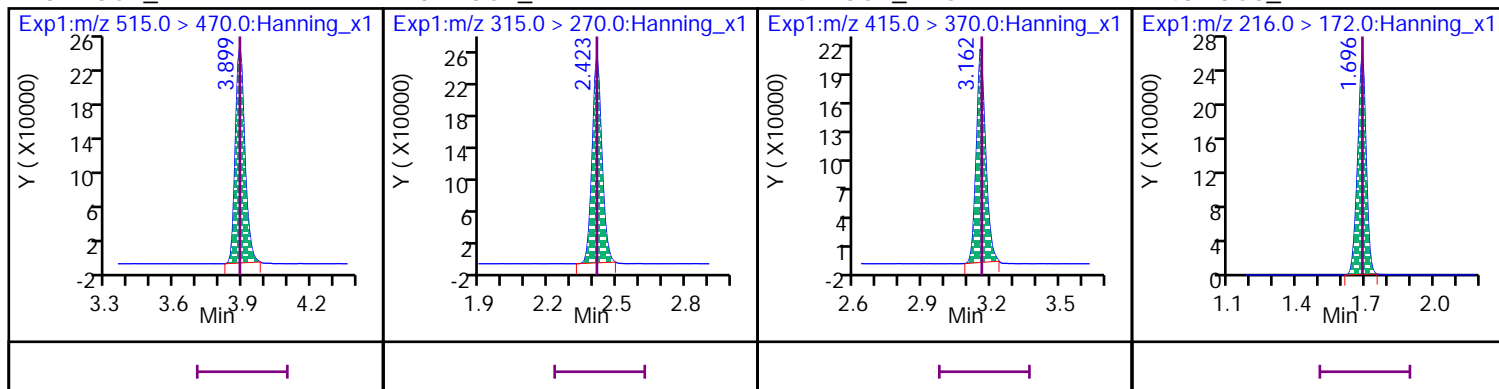


\* 37 13C2\_PFDA

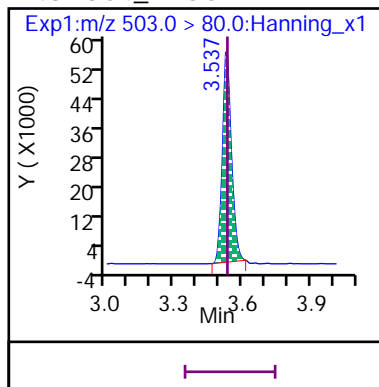
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d  
Injection Date: 17-Dec-2020 13:25:55 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 7 Auto Sampler: 7  
Sample Info: ICAL 5000\_SVLC-1225 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	689746	23	>100:1			1000.00	994.51	93.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.692	1.696	0/0	3419782	22	>100:1			5000.00	4977.97		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	673601	17	>100:1			1000.00	979.23	92.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	3416745	17	>100:1			5000.00	5045.03		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	228127	17	>100:1			1000.00	990.86	92.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	1192471	16	>100:1	Target = 3.50		4420.00	4433.46		
298.9 > 99	44	2.120	2.125		324943	17	>100:1	3.66 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	924332	19		Target = 3.10		4690.00	4670.97		
349 > 99	44	2.460	2.459		293133	19		3.15 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.388	0	119040	18	>100:1			5000.00	4917.32	94.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/1	222209	20	>100:1	Target = 1.80		4670.00	4676.69		
327 > 81	63	2.389	2.388		115910	20	>100:1	1.91 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	727937	20	>100:1			1000.00	987.61	94	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	3598068	19	>100:1	Target = 18.34		5000.00	5006.52		
313 > 119	49	2.425	2.423		180118	19	>100:1	19.97 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1322202	20	>100:1			5000.00	4964.08	93.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	1842769	20	>100:1	Target = 0.81		10000	9699.31		
285 > 185	66	2.532	2.539		2320068	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	623058	20	>100:1			1000.00	1027.05	101	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	3060279	20	>100:1	Target = 3.70		5000.00	4735.26		
363 > 169	47	2.782	2.790		814136	20	>100:1	3.75 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	169479	20				1000.00	989.78	94.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	806242	26	>100:1	Target = 3.21	0.17	4550.00	4486.69		
399 > 99	45	2.800	2.799		248855	24	>100:1	3.23 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	5088509	19	>100:1	Target = 2.97		4710.00	4729.13		
377 > 85	45	2.828	2.827		1657755	19	>100:1	3.06 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	749722	24	>100:1	Target = 3.08		4760.00	4869.59		
449 > 99	45	3.169	3.169		227757	24	>100:1	3.29 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	95449	23	>100:1			5000.00	4956.23	91.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	182873	23		Target = 1.80		4740.00	4734.47		
427 > 81	64	3.135	3.135		105682	23	>100:1	1.73 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	595770	23	>100:1			1000.00	1006.60	91	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	2890986	24	>100:1	Target = 2.87		5000.00	4759.93		
413 > 169	53	3.162	3.169		1020861	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	155392	21	>100:1			1000.00	1036.44	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	810961	60	>100:1	Target = 3.84	0.26	4640.00	4404.11		M
499 > 99	54	3.545	3.545		231102	40	>100:1	3.50 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/0	2345953	22	>100:1			4660.00	4484.51		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	517609	19	>100:1	Target = 3.07		4800.00	4352.71		
549 > 99	54	3.891	3.891		189448	18	>100:1	2.73 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	515140	18		Target = 3.03		4820.00	4567.94		
599 > 99	54	4.198	4.198		188241	16	>100:1	2.73 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	1952030	16	>100:1			4710.00	4423.32		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	564101	20		Target = 3.33		4840.00	4521.73		
699 > 99	54	4.704	4.704		178629	19	>100:1	3.15 (1.66-5.00)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	734704	20	>100:1			1000.00	978.35	92.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	3648336	21	>100:1	Target = 6.16		5000.00	4965.58		
463 > 169	56	3.545	3.545		576840	21	>100:1	6.32 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	301964	20	>100:1			1000.00	975.45	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	1472381	19	>100:1			5000.00	4948.01		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	91612	18				5000.00	4938.62	98.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	178203	21	>100:1	Target = 1.95		4790.00	4904.03		
527 > 81	65	3.891	3.891		88024	19		2.02 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	200776	16		Target = 3.14		4820.00	4741.86		
627 > 80	65	4.492	4.492		58638	16	>100:1	3.42 (1.57-4.72)					
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	666513	20	>100:1			1000.00	1004.80	95.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	3167782	19	>100:1	Target = 15.94		5000.00	4836.95		
513 > 169	51	3.899	3.899		215952	19	>100:1	14.66 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	728018	18	>100:1			5000.00	5071.91	95.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	550648	32	>100:1	Target = 1.33	0.13	5000.00	4923.29		
570 > 483	58	4.056	4.065		391998	36	>100:1	1.40 (0.66-1.99)	0.24				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	653728	17	>100:1			5000.00	4922.11	88.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/0	645216	34	>100:1	Target = 1.58	0.05	5000.00	4956.79		M
584 > 526	60	4.218	4.217		410348	37	>100:1	1.57 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	627270	19	>100:1			1000.00	992.40	92.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	2851720	17	>100:1	Target = 15.50		5000.00	4837.07		
563 > 169	52	4.218	4.217		198738	18	>100:1	14.34 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	113389	15	>100:1			1000.00	1047.88	96.7	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	488440	15	>100:1			5000.00	4584.55		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	54589	17	>100:1			1000.00	1031.60	99.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	296904	16	>100:1	Target = 1.12		5000.00	4820.84		
512 > 219	57	4.318	4.318		268904	16	>100:1	1.10 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	130009	18	>100:1			1000.00	1036.79	107	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	540165	16	>100:1			5000.00	4670.04		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	614915	16	>100:1			1000.00	1015.86	94.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	2982859	18	>100:1	Target = 10.85		5000.00	4790.16		
613 > 169	38	4.492	4.492		273421	18	>100:1	10.90 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.724	4.731	0/-1	2915284	20	>100:1	Target = 8.37		5000.00	4813.45		
663 > 169	38	4.731	4.731		344345	19	>100:1	8.46 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	48322	17	>100:1			1000.00	984.27	93.8	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	244938	15	>100:1	Target = 1.03		5000.00	4639.64		
526 > 219	59	4.492	4.492		267341	16	>100:1	0.91 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	829396	20	>100:1			1000.00	984.51	93.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	3638371	19	>100:1	Target = 12.11		5000.00	5062.93		
713 > 169	42	4.948	4.948		298096	20	>100:1	12.20 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	906655	18	>100:1			1000.00	1000.54	99.2	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	2839296	20	>100:1	Target = 11.48		5000.00	4792.88		
813 > 269	40	5.334	5.334		249529	19	>100:1	11.37 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	1/0	3981944	24	>100:1	Target = 13.88		5000.00	4961.38		
913 > 319	40	5.689	5.689		283765	24	>100:1	14.03 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	648368	19	>100:1					89.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	707776	20	>100:1					94	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	567038	23	>100:1					88	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	621648	22	>100:1					93.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.537	3.545	0	143306	19	>100:1					88.2	
----------	--	-------	-------	---	--------	----	--------	--	--	--	--	------	--

### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

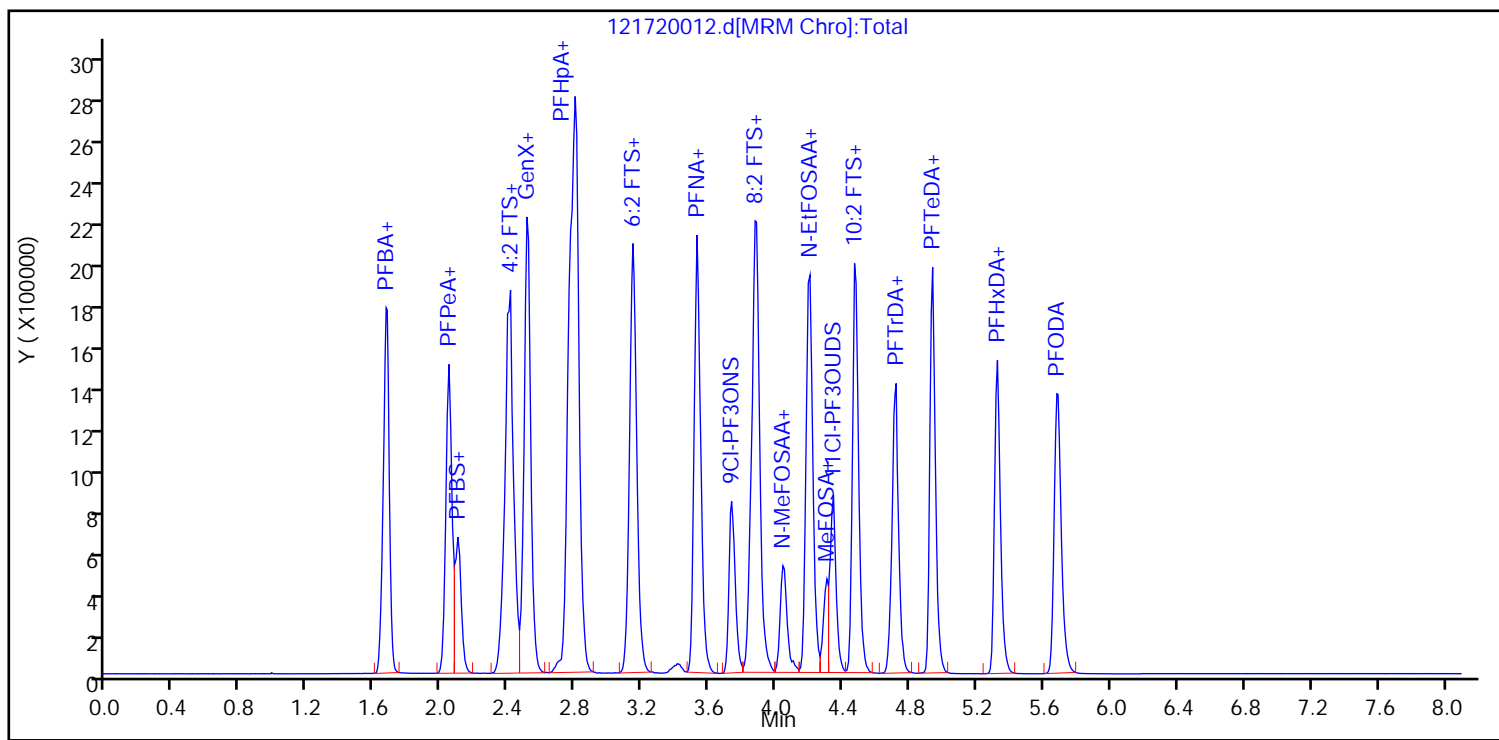
Client ID:

Lab ID: ICAL 5000\_SVLC-1225

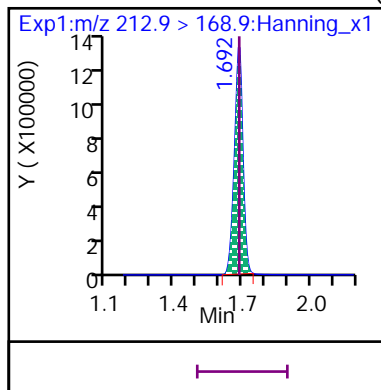
Sample Info: ICAL 5000\_SVLC-1225

Dil. Factor: 1

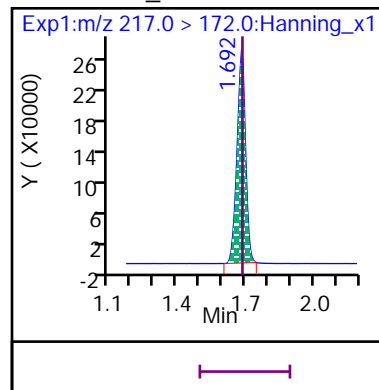
Operator: Stephen E. Somerville



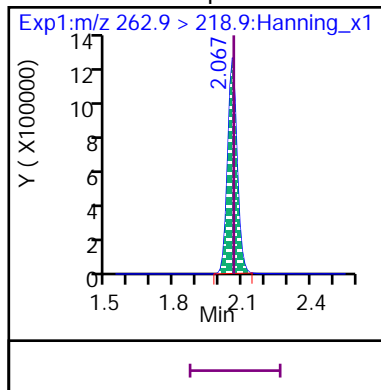
8 Perfluoro-n-butanoic acid (PFBA)



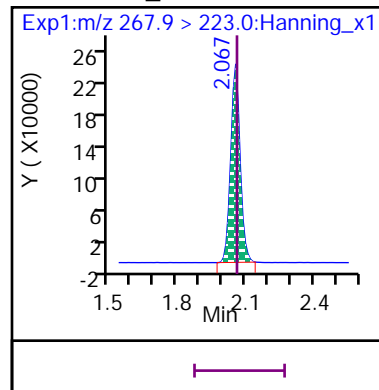
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

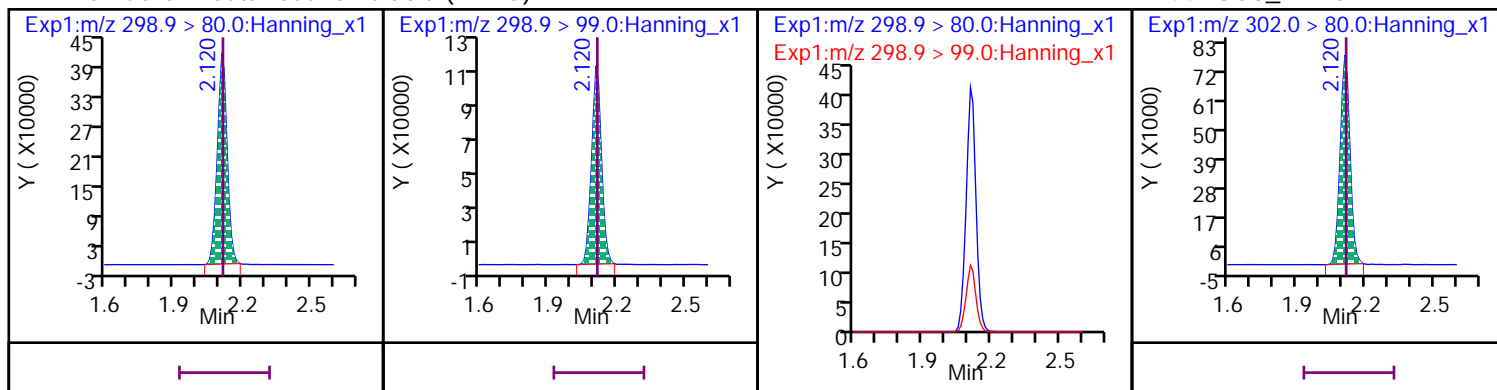


D 50 13C5\_PFPeA



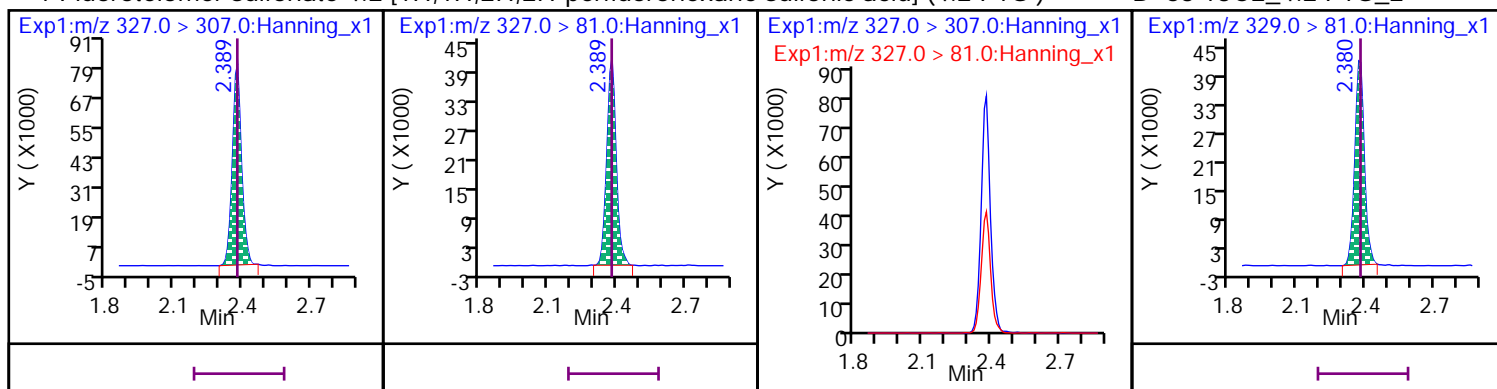
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



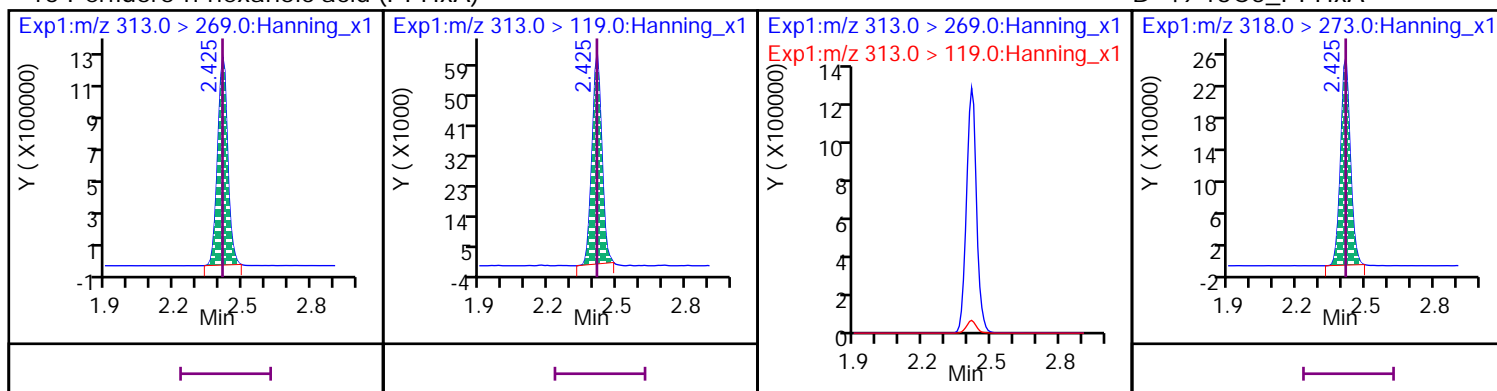
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



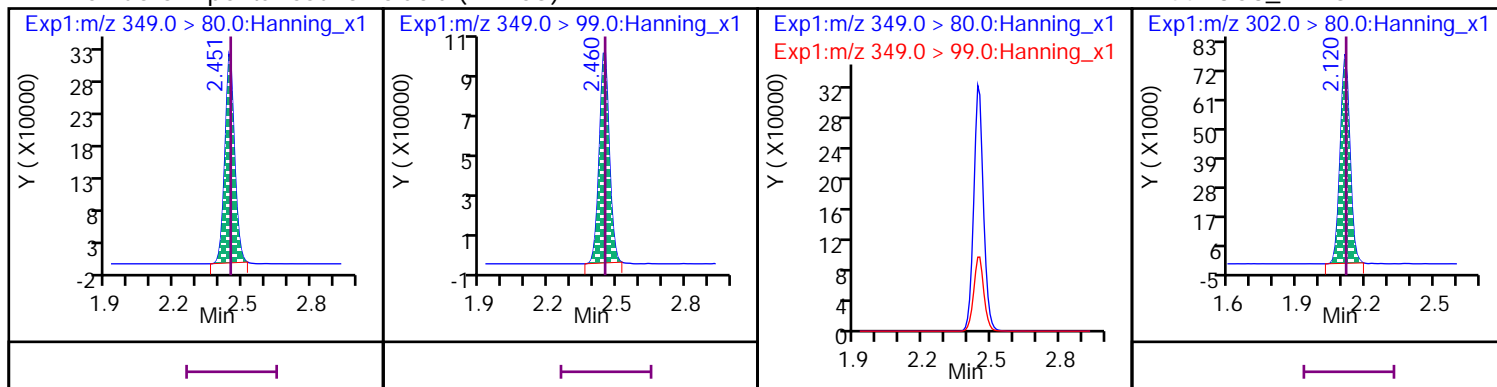
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



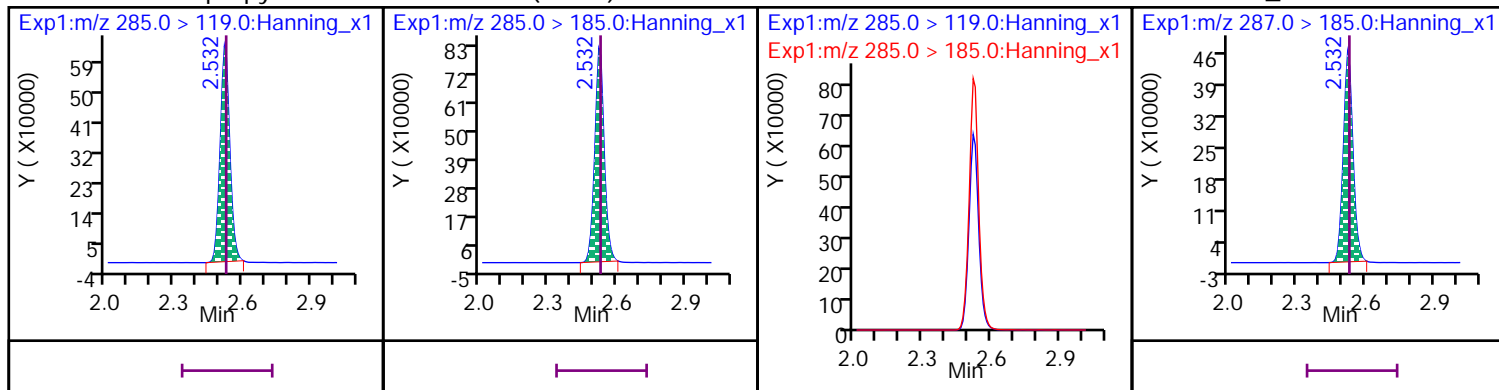
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



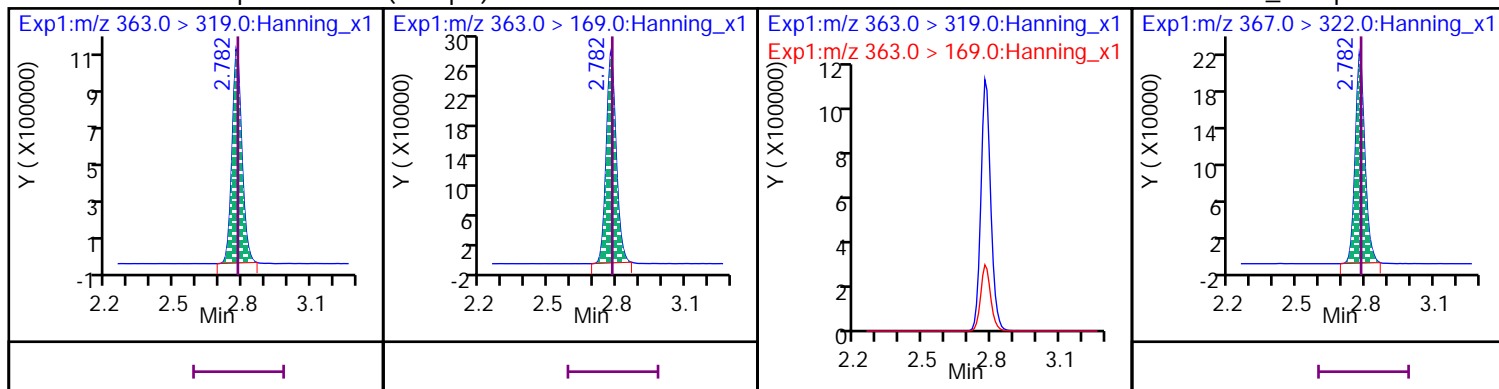
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



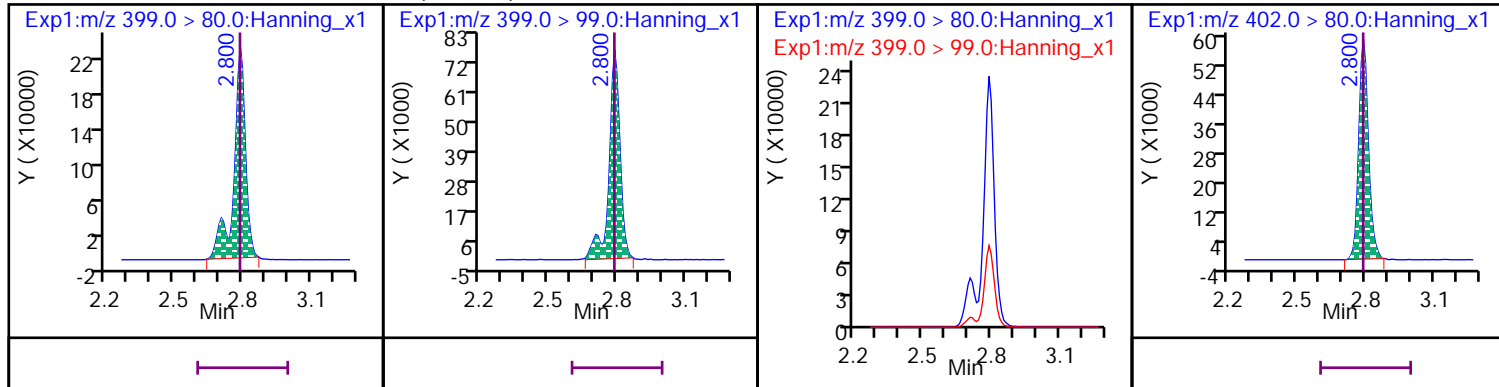
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



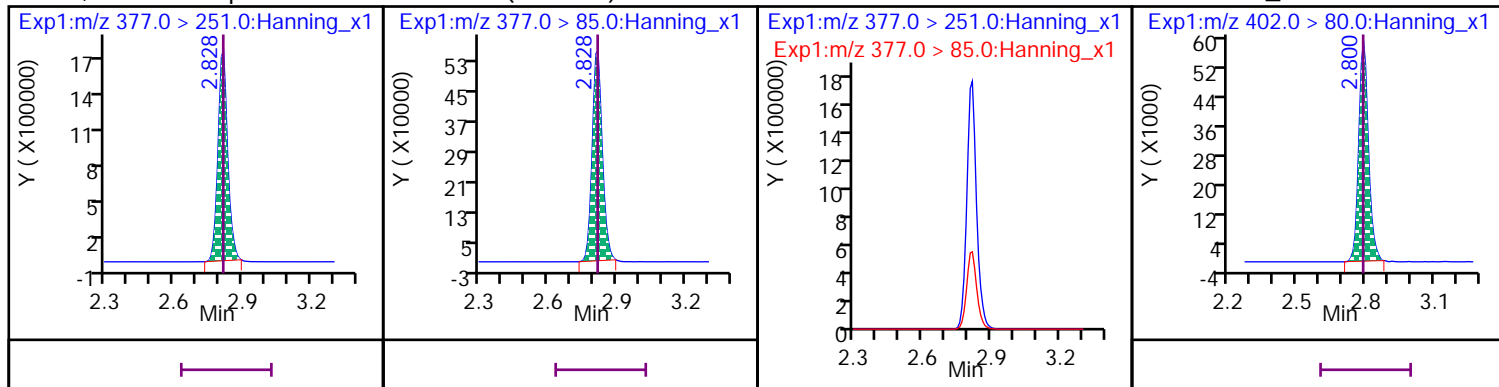
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



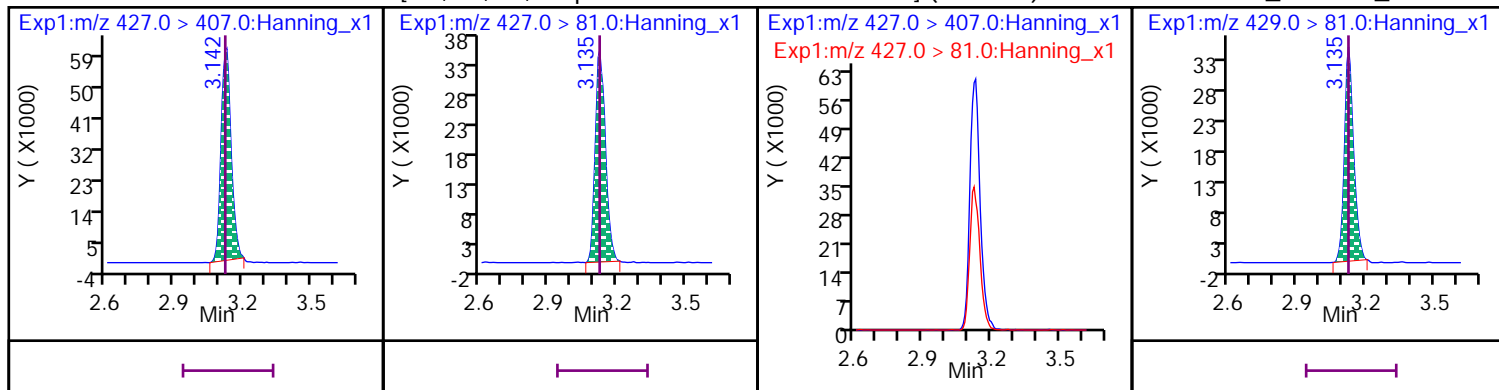
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



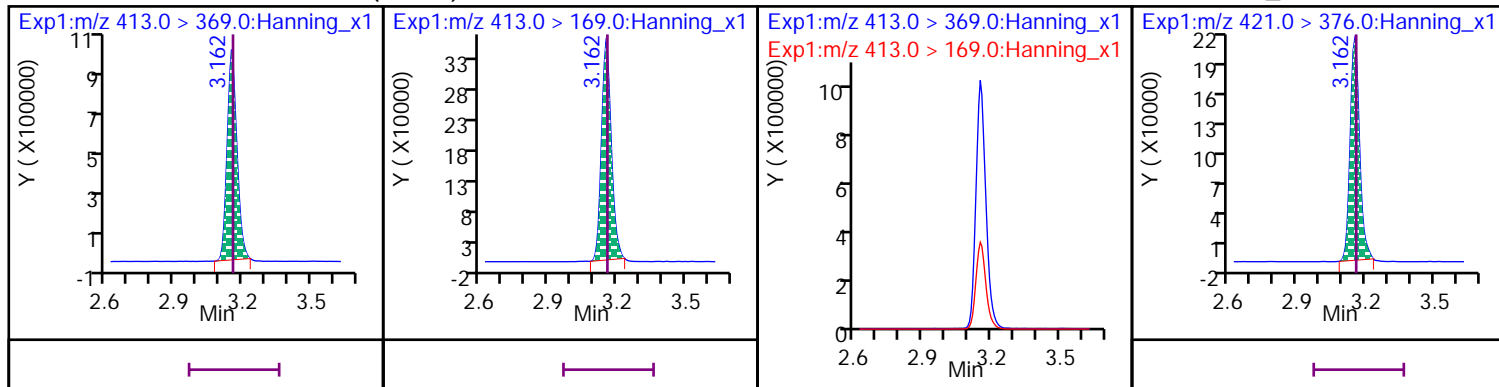
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



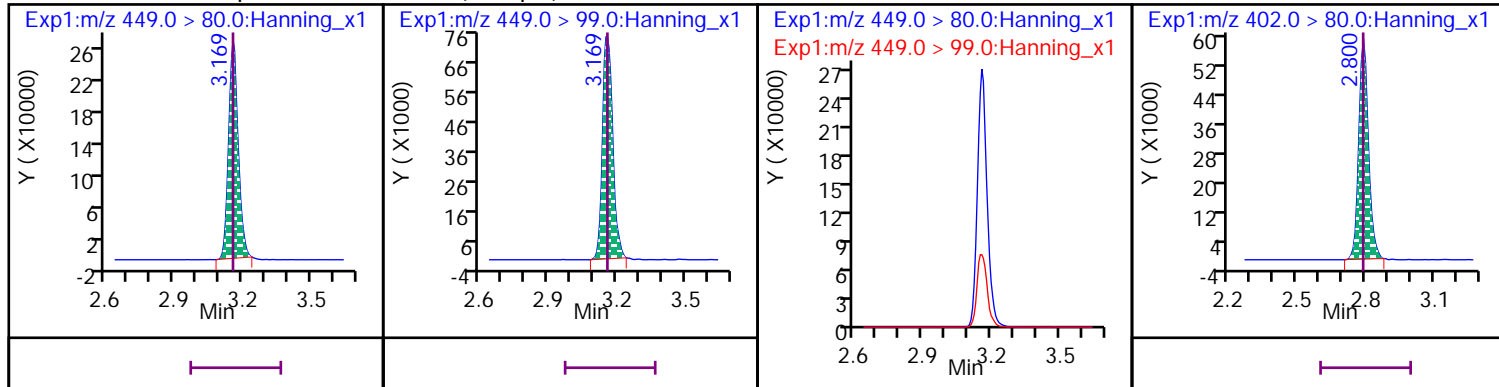
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



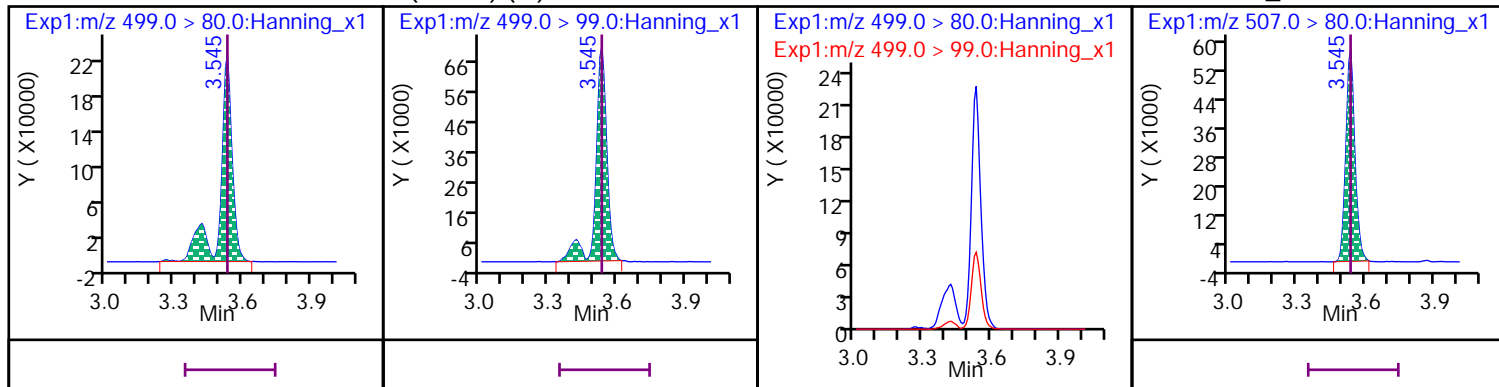
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



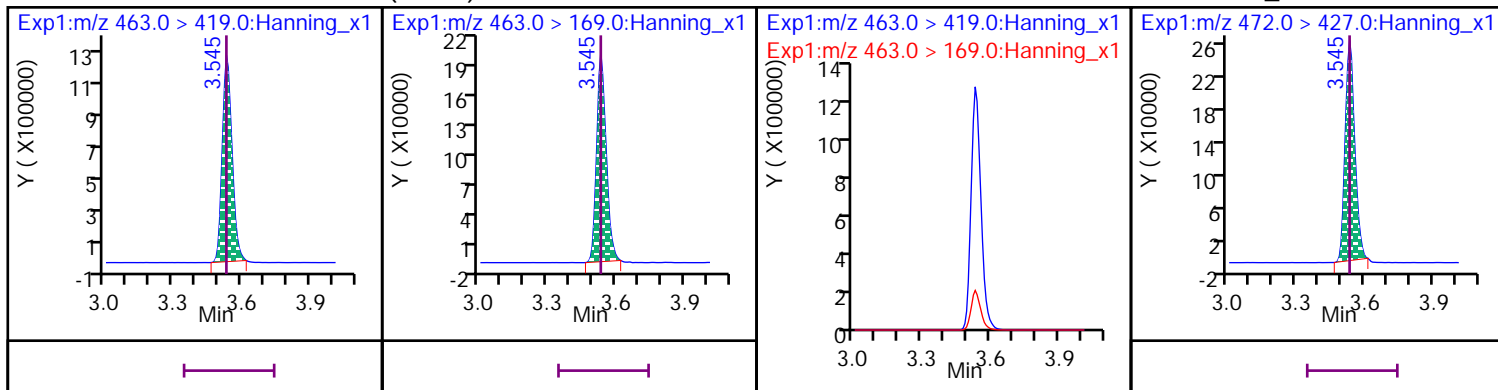
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



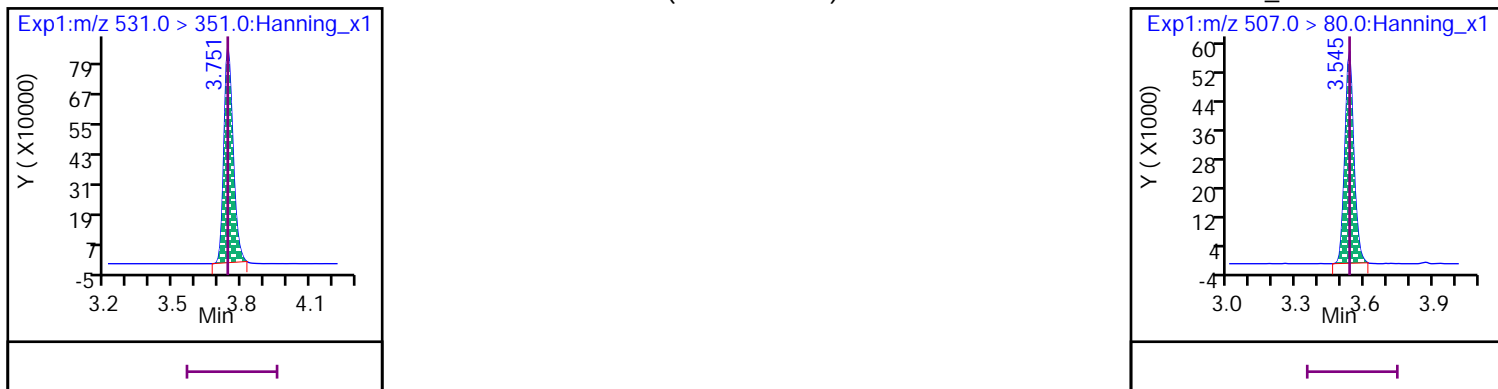
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



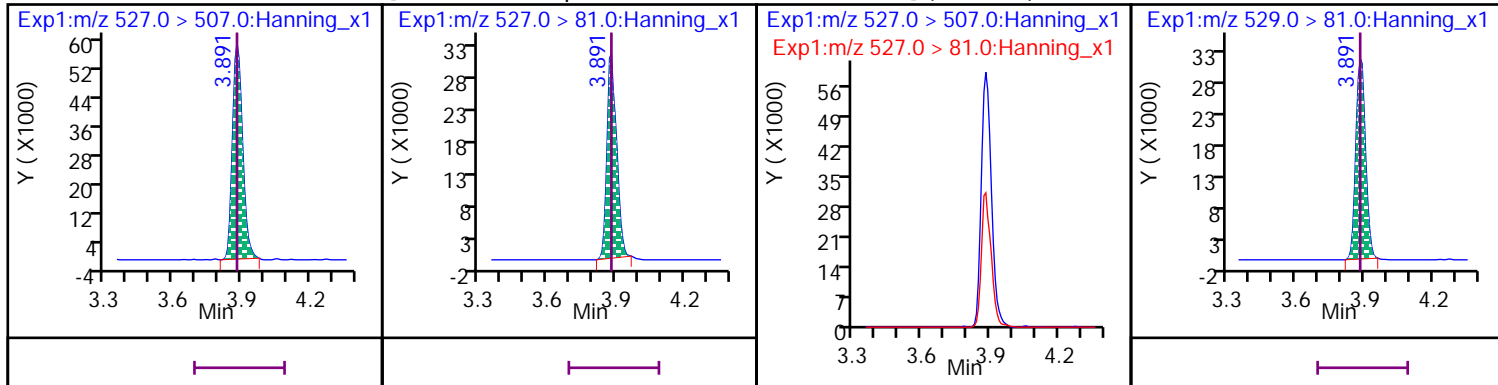
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



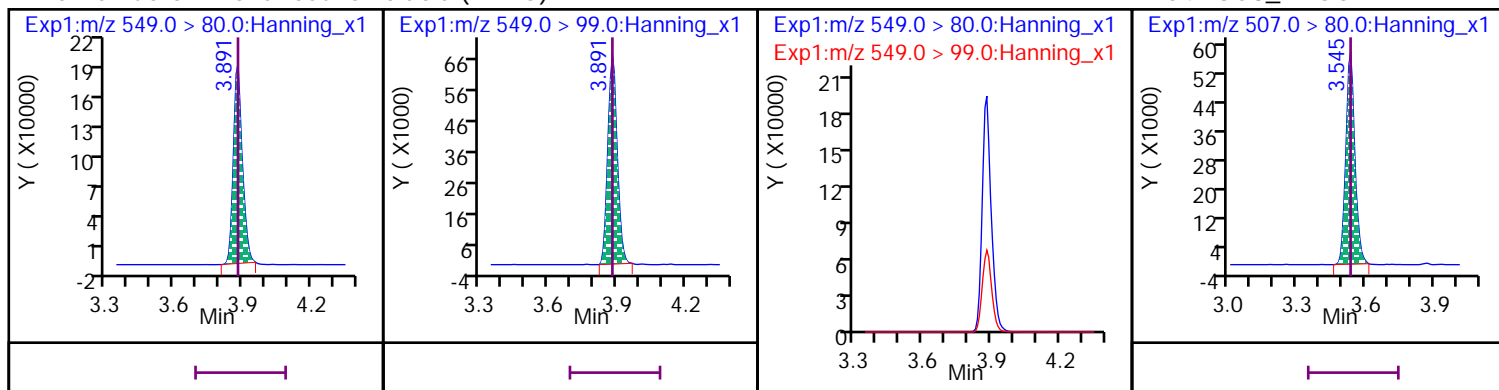
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



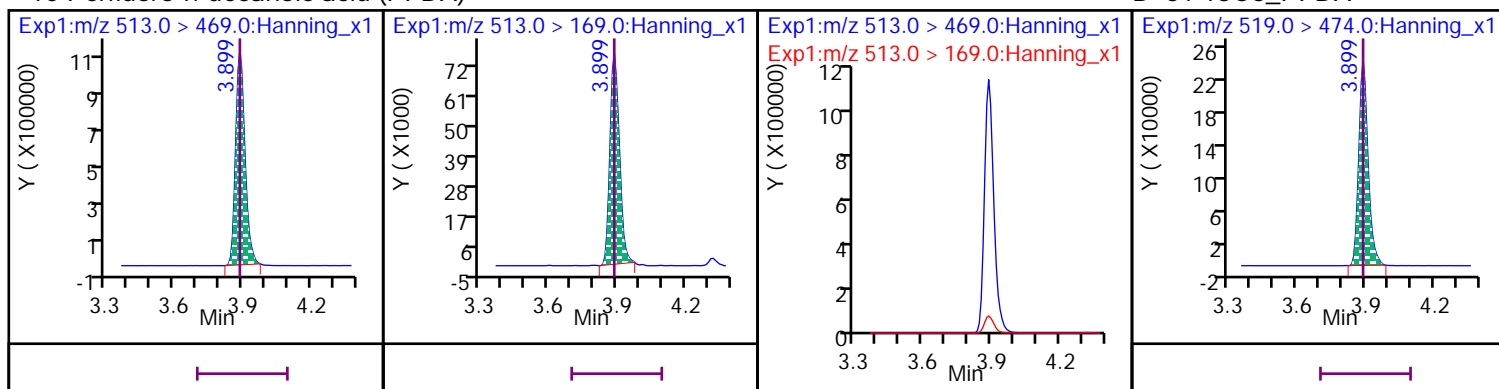
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



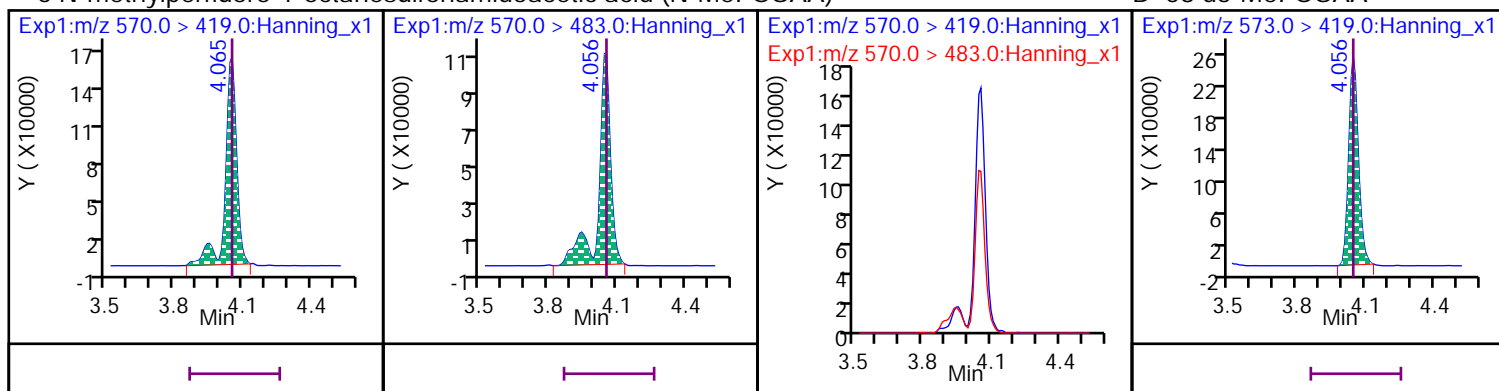
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



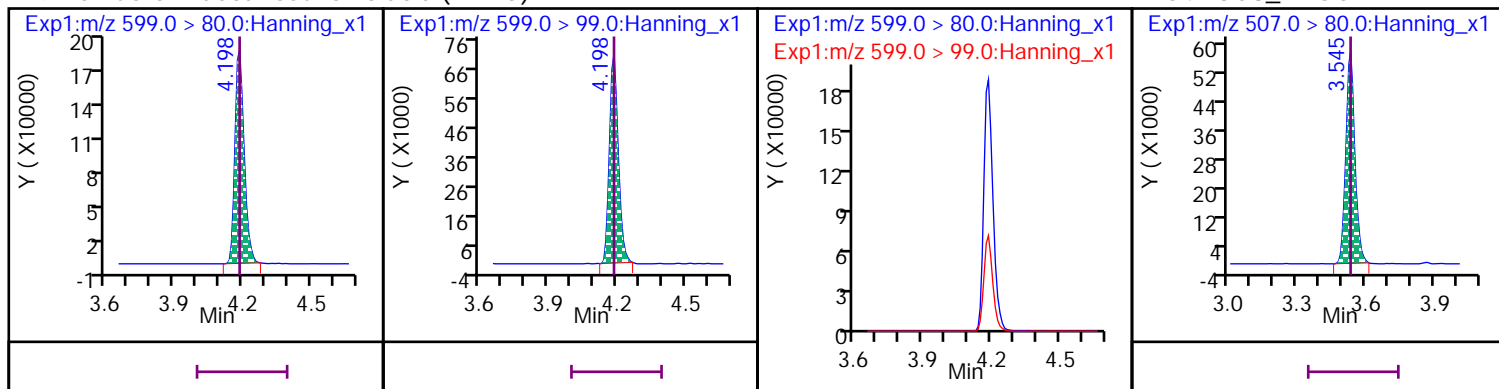
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



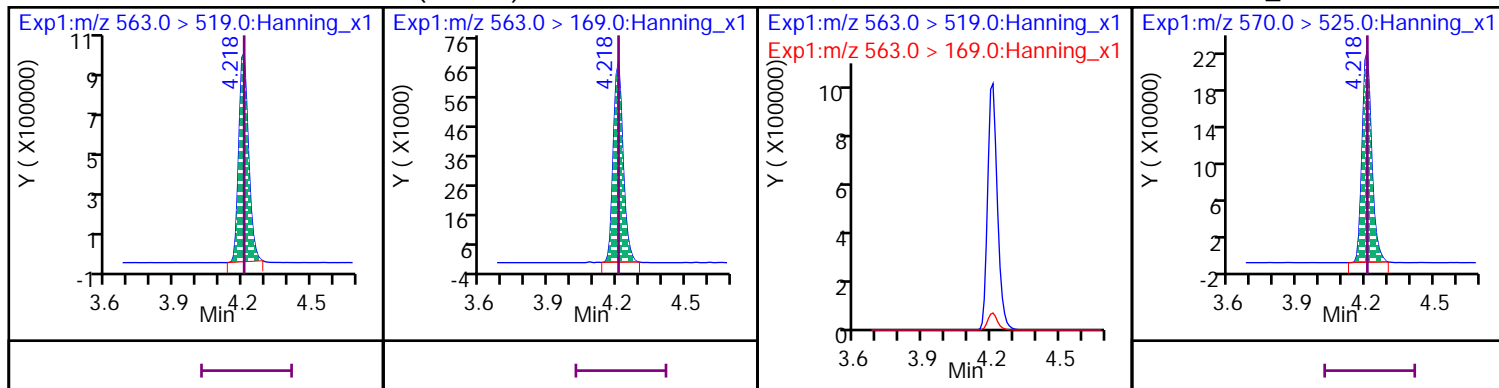
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



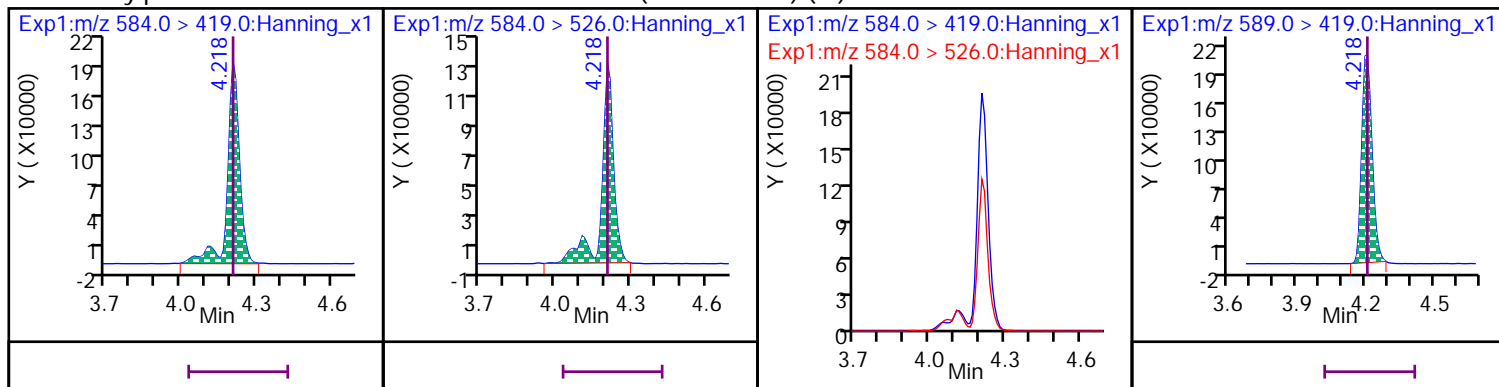
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



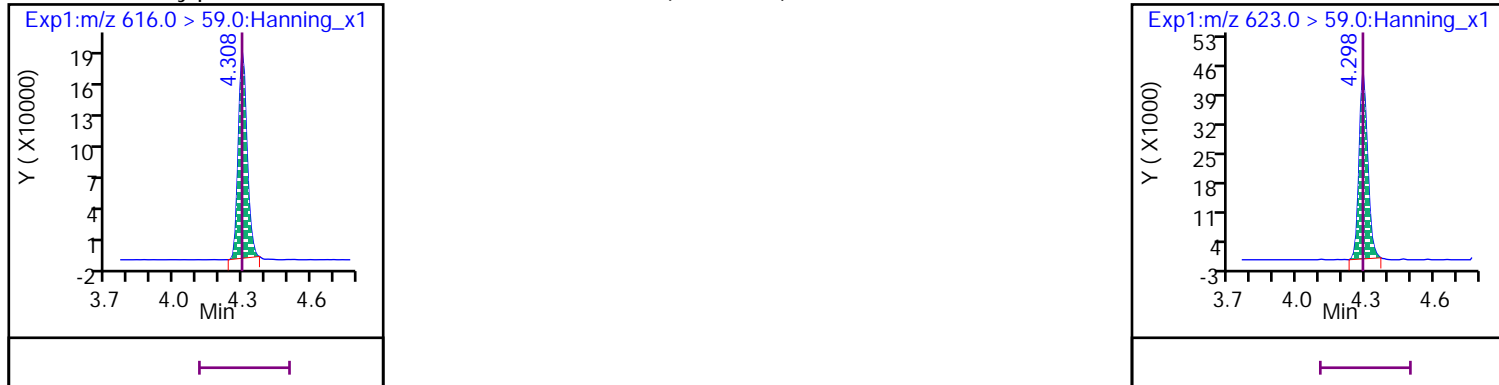
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



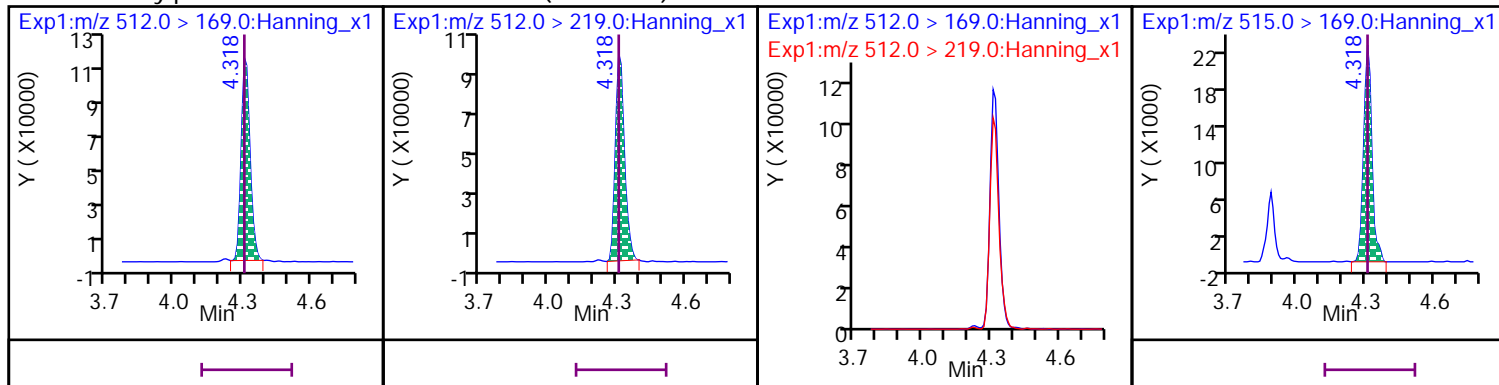
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



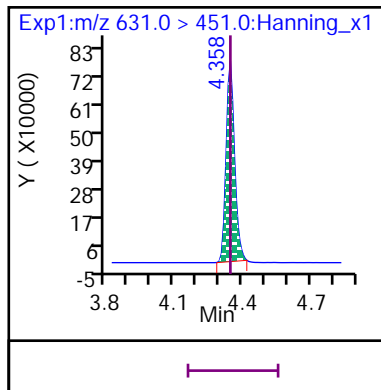
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

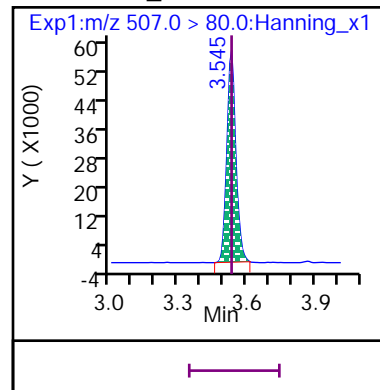




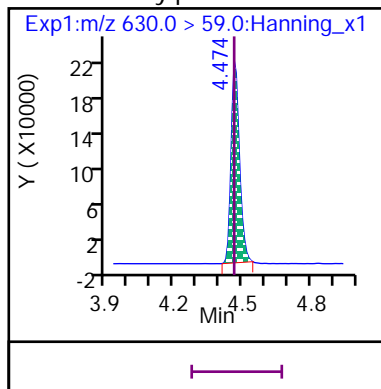
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



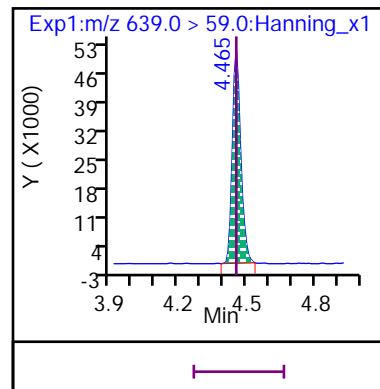
D 54 13C8\_PFOS



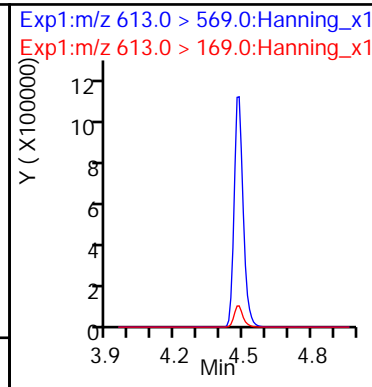
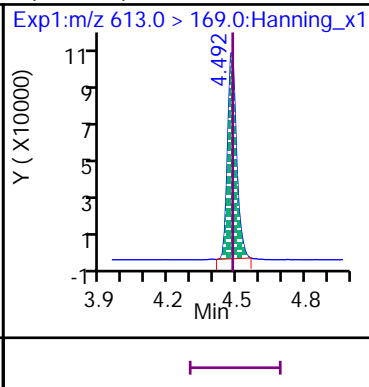
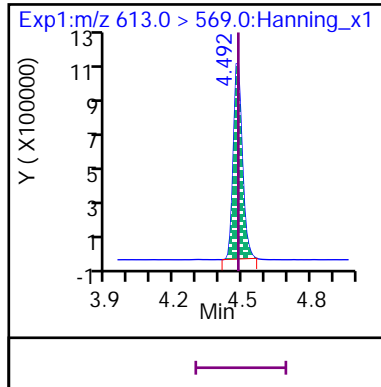
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



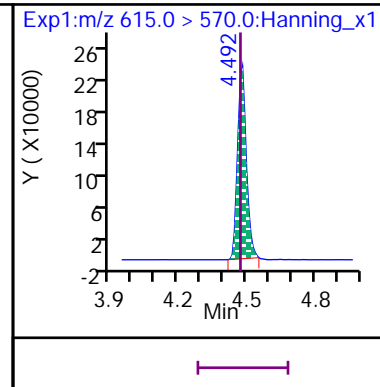
D 62 d9-EtFOSE



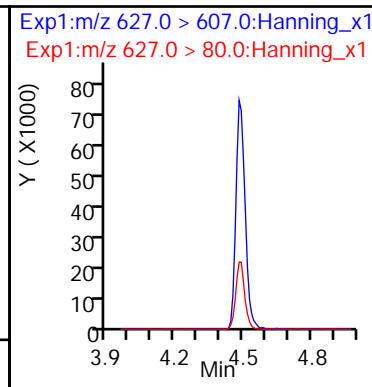
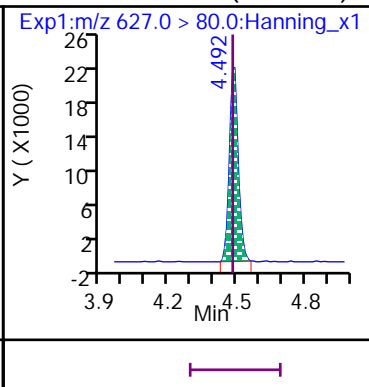
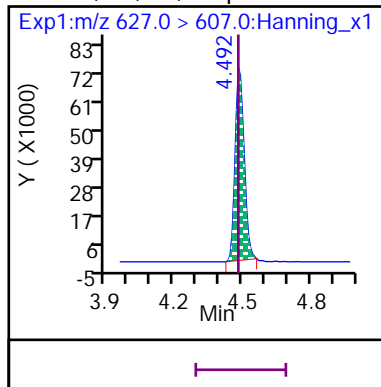
11 Perfluoro-n-dodecanoic acid (PFDoA)



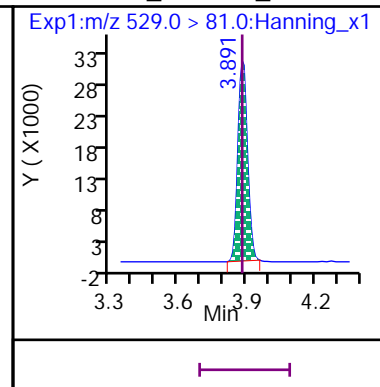
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

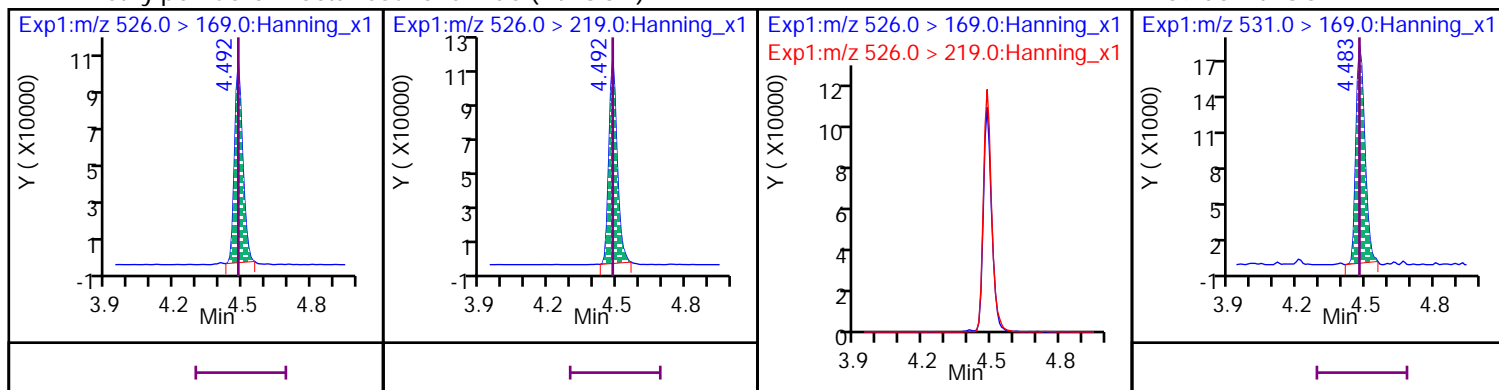


D 65 13C2\_8:2 FTS\_2



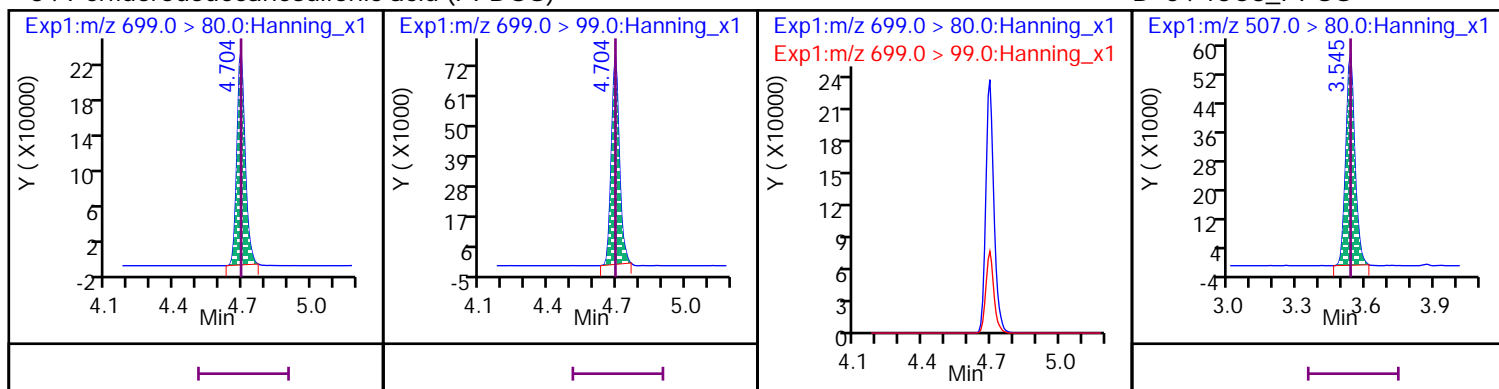
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



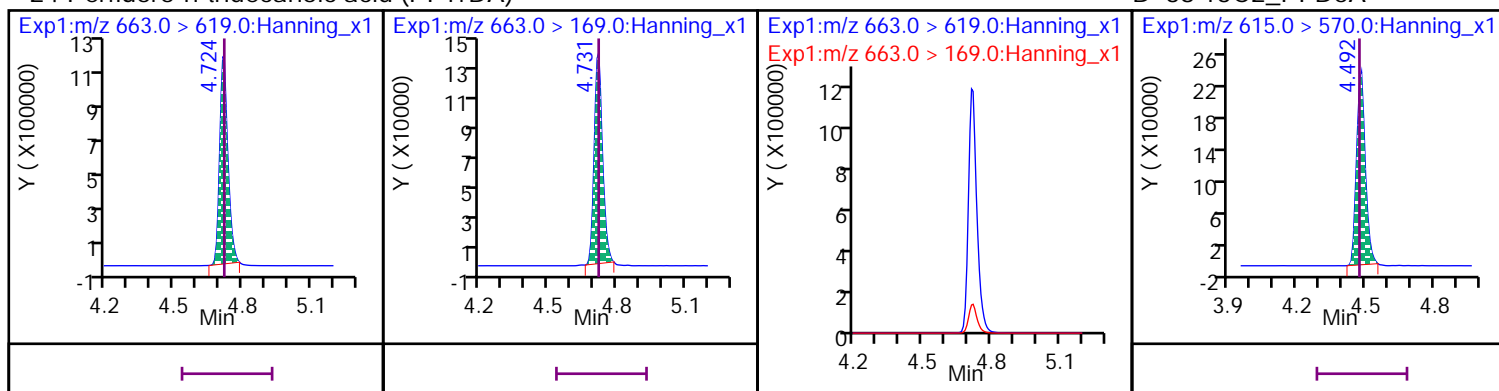
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



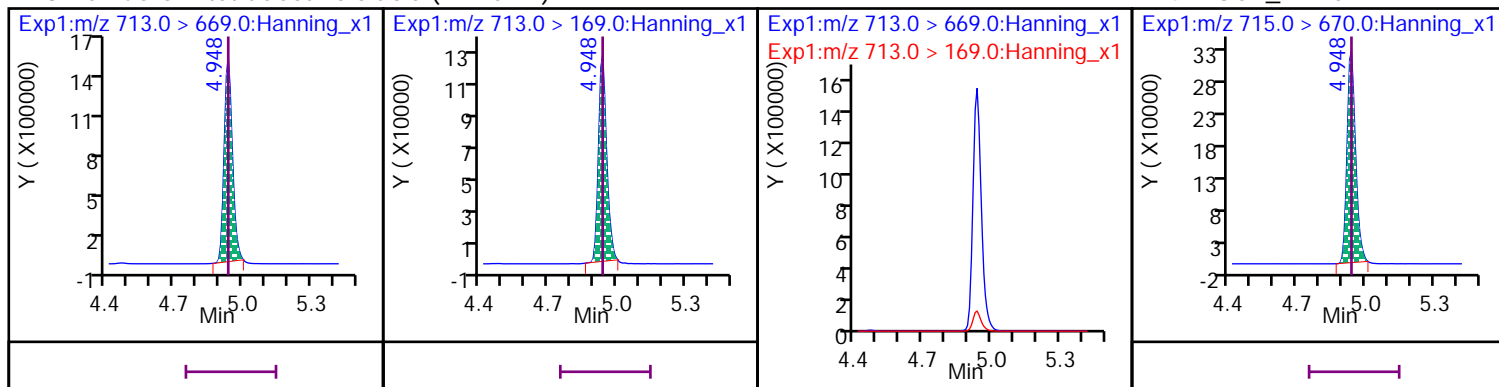
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



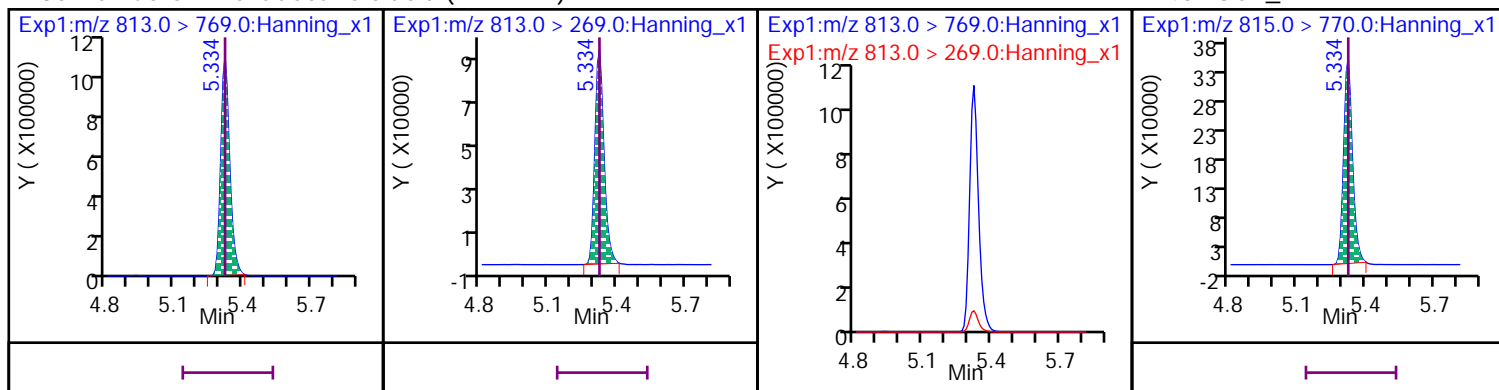
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



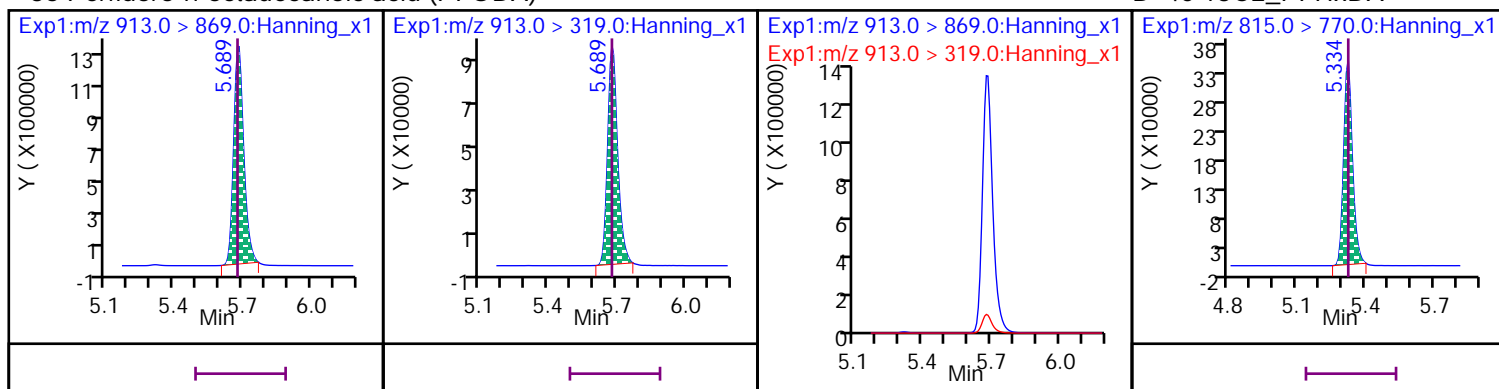
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

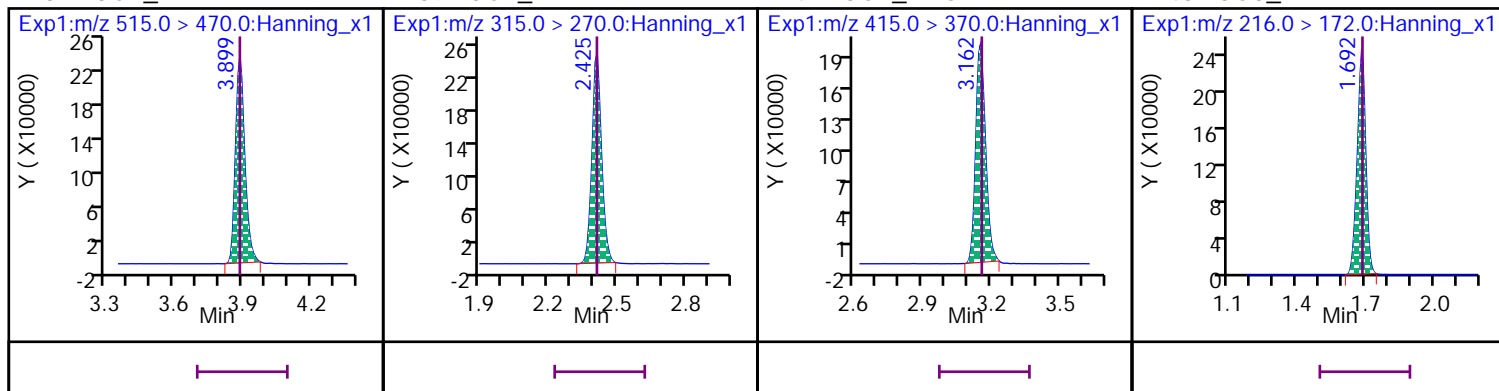


\* 37 13C2\_PFDA

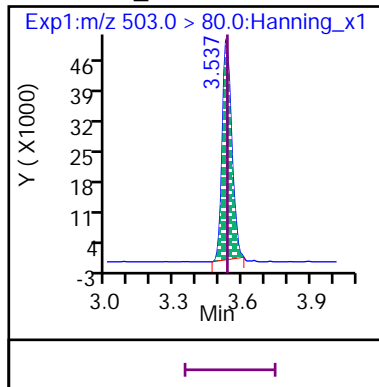
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 5000\_SVLC-1225

Sample Info: ICAL 5000\_SVLC-1225

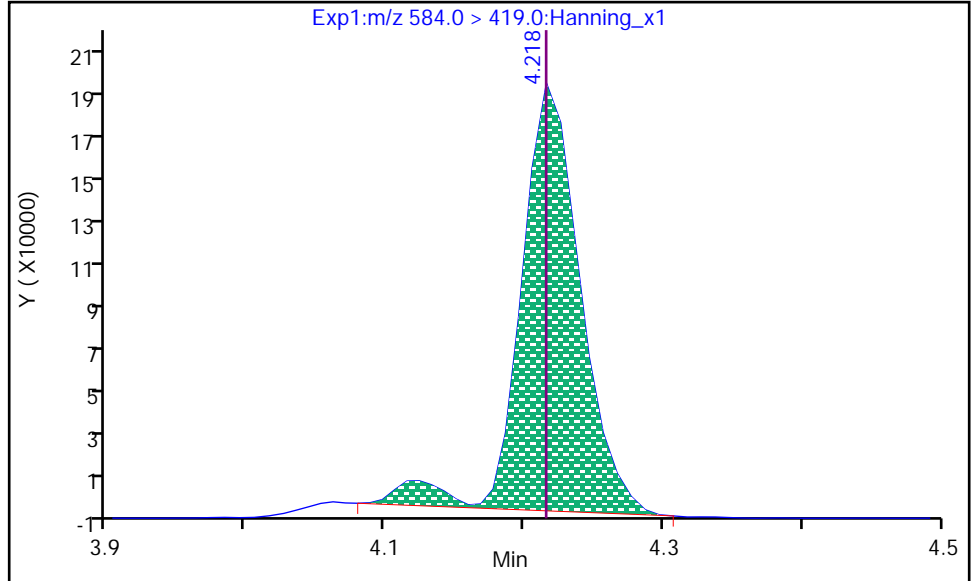
Dil. Factor: 1

Operator: Stephen E. Somerville

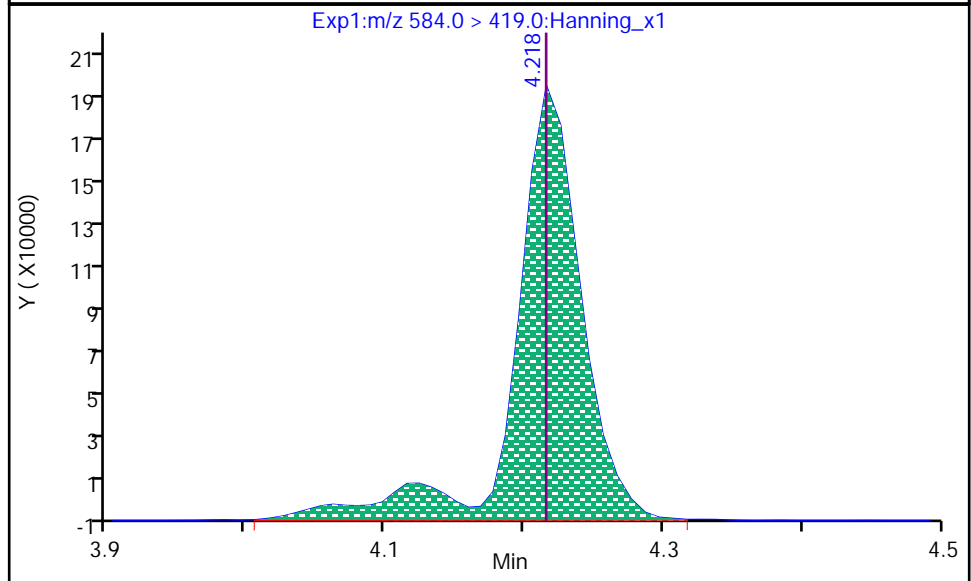
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.218  
Area: 573018  
Amount: 4451.52  
Amount Units: ng/L



RT: 4.218  
Area: 645216  
Amount: 4956.79  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:51

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 5000\_SVLC-1225

Sample Info: ICAL 5000\_SVLC-1225

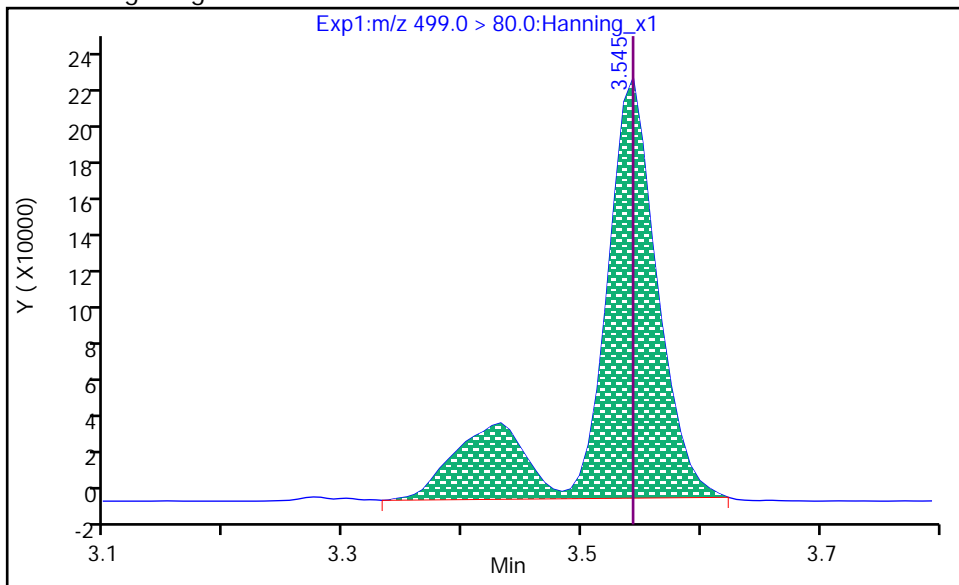
Dil. Factor: 1

Operator: Stephen E. Somerville

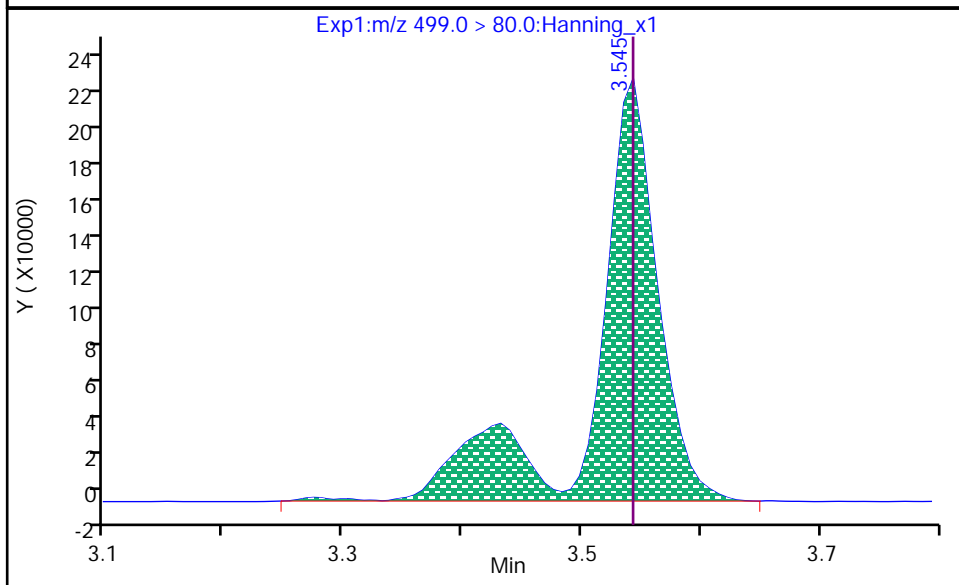
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 789465  
Amount: 4343.82  
Amount Units: ng/L



RT: 3.545  
Area: 810961  
Amount: 4404.11  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:15

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d  
Injection Date: 17-Dec-2020 13:36:34 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 8 Auto Sampler: 8  
Sample Info: ICAL 10000\_SVLC-1226 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	665321	23	>100:1			1000.00	959.30	90.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	6682046	23	>100:1			10000	10084		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.062	2.072	0	651811	17	>100:1			1000.00	947.56	89.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/1	6790971	18	>100:1			10000	10362		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	218052	17	>100:1			1000.00	947.10	88.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	2315358	17	>100:1	Target = 3.50		8840.00	9005.95		
298.9 > 99	44	2.125	2.125		654108	17	>100:1	3.53 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.459	0/-1	1865025	20	>100:1	Target = 3.10		9380.00	9860.09		
349 > 99	44	2.450	2.459		613730	20	>100:1	3.03 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	119400	18	>100:1			5000.00	4932.19	94.4	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	448819	19	>100:1	Target = 1.80		9340.00	9417.52		
327 > 81	63	2.388	2.388		244878	20	>100:1	1.83 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	706446	19	>100:1			1000.00	958.45	91.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	6775081	20	>100:1	Target = 18.34		10000	9713.95		
313 > 119	49	2.423	2.423		364236	18	>100:1	18.60 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1285178	20	>100:1			5000.00	4825.08	91	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.539	0/0	3663382	20	>100:1	Target = 0.81		20000	19837		
285 > 185	66	2.530	2.539		4666887	20	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.790	0	580132	20	>100:1			1000.00	956.29	94.2	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.790	0/0	6133989	20	>100:1	Target = 3.70		10000	10194		
363 > 169	47	2.781	2.790		1647374	20	>100:1	3.72 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	174169	22	>100:1			1000.00	1017.17	97.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	1618935	27	>100:1	Target = 3.21	0.15	9100.00	8766.68		
399 > 99	45	2.799	2.799		506329	23	>100:1	3.19 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	10167151	19	>100:1	Target = 2.97		9420.00	9194.65		
377 > 85	45	2.827	2.827		3404252	19	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.169	0/-1	1404494	25	>100:1	Target = 3.08		9520.00	8876.82		
449 > 99	45	3.168	3.169		458913	23	>100:1	3.06 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	88549	23	>100:1			5000.00	4597.94	84.6	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.134	3.135	0/-1	371537	23	>100:1	Target = 1.80		9480.00	10403		
427 > 81	64	3.134	3.135		201504	24	>100:1	1.84 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.161	3.169	0	534634	25	>100:1			1000.00	903.30	81.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.169	0/0	5555679	23	>100:1	Target = 2.87		10000	10193		
413 > 169	53	3.168	3.169		1956754	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.543	3.545	0	141411	22				1000.00	943.19	91.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.545	0/0	1590209	64	>100:1	Target = 3.84	0.26	9280.00	9489.82		M
499 > 99	54	3.543	3.545		438881	41	>100:1	3.62 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.756	3.750	1/1	4611854	22	>100:1			9320.00	9687.61		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.890	3.891	0/0	1065551	19	>100:1	Target = 3.07		9600.00	9846.40		
549 > 99	54	3.890	3.891		399238	20	>100:1	2.66 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.197	4.198	0/0	1040398	17	>100:1	Target = 3.03		9640.00	10138		
599 > 99	54	4.197	4.198		374418	17	>100:1	2.77 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.356	4.357	0/0	4032967	16	>100:1			9420.00	10042		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.703	4.704	0/0	1140180	19	>100:1	Target = 3.33		9680.00	10043		
699 > 99	54	4.703	4.704		372190	19	>100:1	3.06 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	718882	22	>100:1			1000.00	957.28	90.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.551	3.545	1/0	7162720	22	>100:1	Target = 6.16		10000	9963.41		
463 > 169	56	3.551	3.545		1131465	21	>100:1	6.33 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.866	0	303539	20	>100:1			1000.00	980.54	91.8	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.866	0/0	2958864	20	>100:1			10000	9891.81		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.890	3.891	0	89940	19				5000.00	4848.48	96.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.890	3.891	0/0	340548	19	>100:1	Target = 1.95		9580.00	9561.82		
527 > 81	65	3.890	3.891		185096	19	>100:1	1.83 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.500	4.492	1/1	392343	18	>100:1	Target = 3.14		9640.00	9438.49		
627 > 80	65	4.500	4.492		125334	17	>100:1	3.13 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.898	3.899	0	634238	19				1000.00	956.14	90.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.898	3.899	0/0	6342880	20	>100:1	Target = 15.94		10000	10178		
513 > 169	51	3.898	3.899		471315	21	>100:1	13.45 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.055	4.056	0	687461	17	96:1			5000.00	4789.36	90.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.064	4.065	0/0	1110966	34	>100:1	Target = 1.33	0.12	10000	10519		
570 > 483	58	4.064	4.065		815836	36	>100:1	1.36 (0.66-1.99)	0.22				



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.216	4.217	0	618761	18	>100:1			5000.00	4658.83	83.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.227	4.217	1/1	1178848	32	>100:1	Target = 1.58	0.13	10000	9568.13		
584 > 526	60	4.227	4.217		744745	39	>100:1	1.58 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.216	4.217	0	592993	19				1000.00	938.17	87.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.216	4.217	0/0	5844692	18	>100:1	Target = 15.50		10000	10487		
563 > 169	52	4.216	4.217		368978	17	>100:1	15.84 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.298	0	98763	15	>100:1			1000.00	912.72	84.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.308	0/0	960536	16	>100:1			10000	10351		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.318	0	52261	14	>100:1			1000.00	987.61	95.1	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.318	1/1	568014	16	>100:1	Target = 1.12		10000	9633.70		
512 > 219	57	4.327	4.318		536523	17	>100:1	1.05 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.465	0	118273	16	>100:1			1000.00	943.20	97.1	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.474	1/1	1079042	17	>100:1			10000	10255		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.491	4.483	1	581218	18				1000.00	960.19	89.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.491	4.492	0/-1	5646628	17	>100:1	Target = 10.85		10000	9593.63		
613 > 169	38	4.491	4.492		559013	17	>100:1	10.10 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.730	4.731	0/-1	5706994	20	>100:1	Target = 8.37		10000	9969.17		
663 > 169	38	4.730	4.731		699888	20	>100:1	8.15 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.483	0	45122	16	>100:1			1000.00	919.08	87.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.492	0/0	501236	16	>100:1	Target = 1.03		10000	10168		
526 > 219	59	4.491	4.492		504292	16	>100:1	0.99 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.947	4.948	0	823800	19	>100:1			1000.00	977.87	92.8	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.947	4.948	0/0	6967694	21	>100:1	Target = 12.11		10000	9761.66		
713 > 169	42	4.947	4.948		601178	20	>100:1	11.59 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.333	5.334	0	870445	18	>100:1			1000.00	960.58	95.3	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.333	5.334	0/0	5461937	19	>100:1	Target = 11.48		10000	9603.58		
813 > 269	40	5.333	5.334		485407	19	>100:1	11.25 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.694	5.689	1/1	7786374	24	>100:1	Target = 13.88		10000	10105		
913 > 319	40	5.687	5.689		568309	24	>100:1	13.70 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.898	3.899	0	678382	20	>100:1					93.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	719360	20	>100:1					95.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.161	3.169	0	571070	23	>100:1					88.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	642378	22	>100:1					96.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.543	3.545	0	163967	21	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d

Injection Date: 17-Dec-2020 13:36:34

Inst. ID: LCMSMS02

Client ID:

Lab ID:

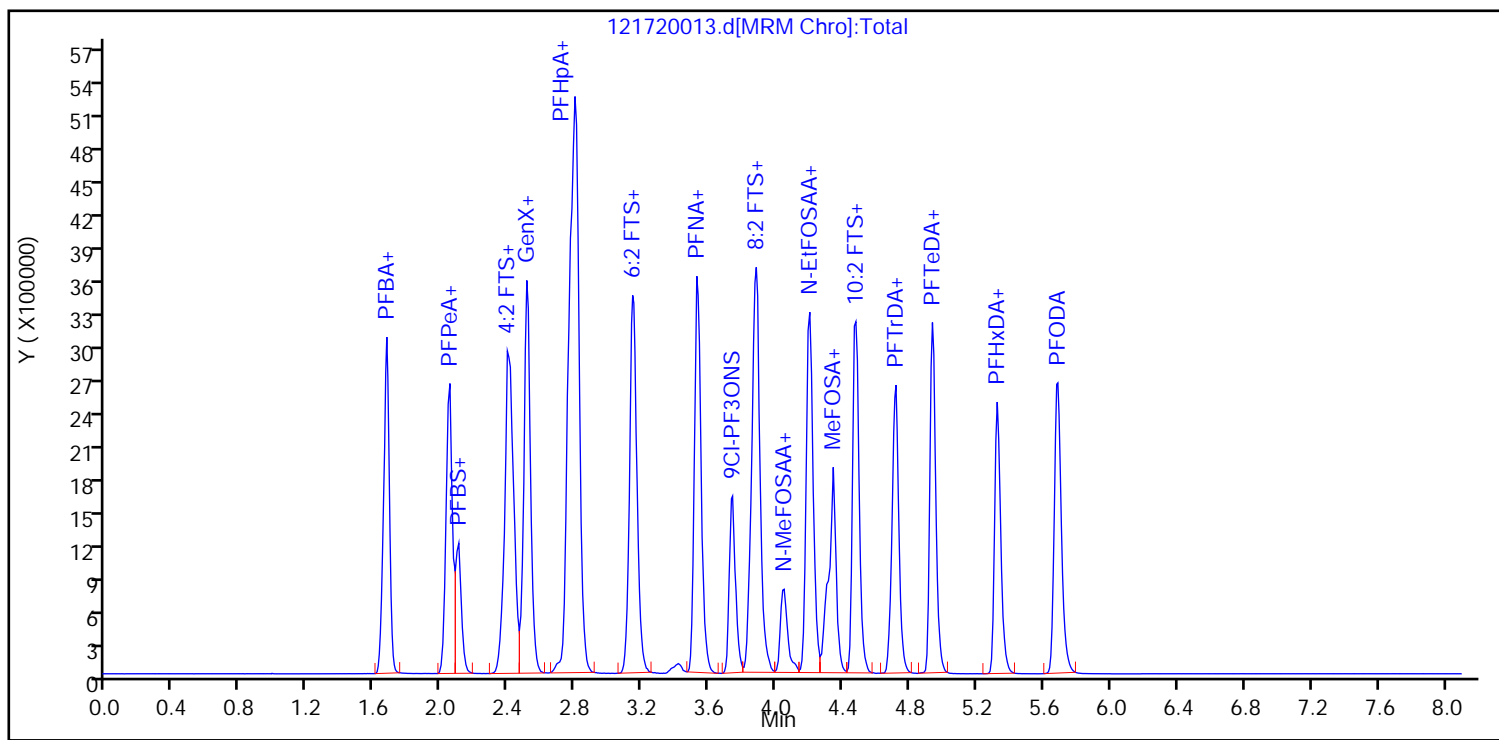
ICAL 10000\_SVLC-1226

Sample Info: ICAL 10000\_SVLC-1226

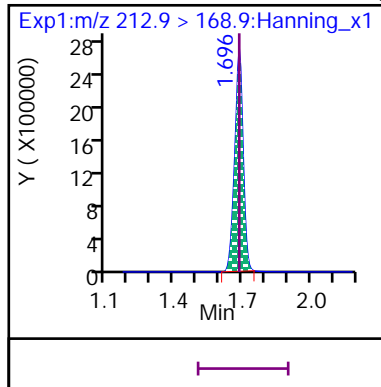
Dil. Factor: 1

Operator:

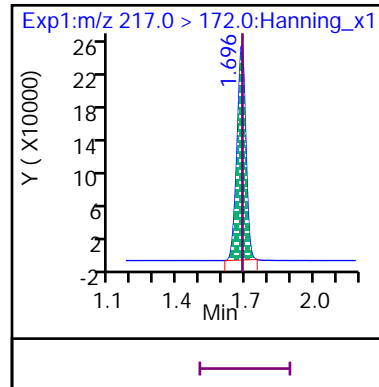
Stephen E. Somerville



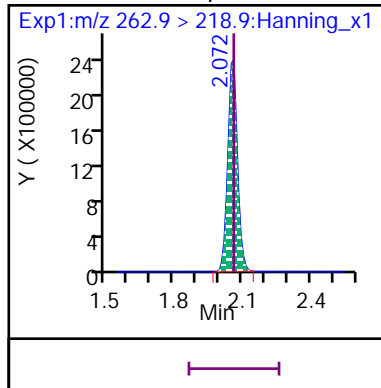
8 Perfluoro-n-butanoic acid (PFBA)



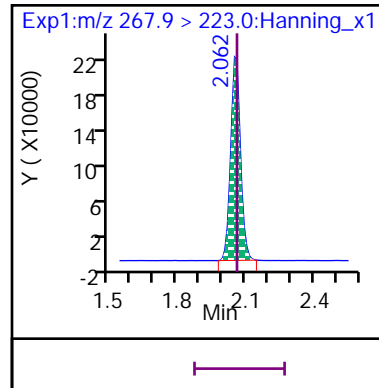
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

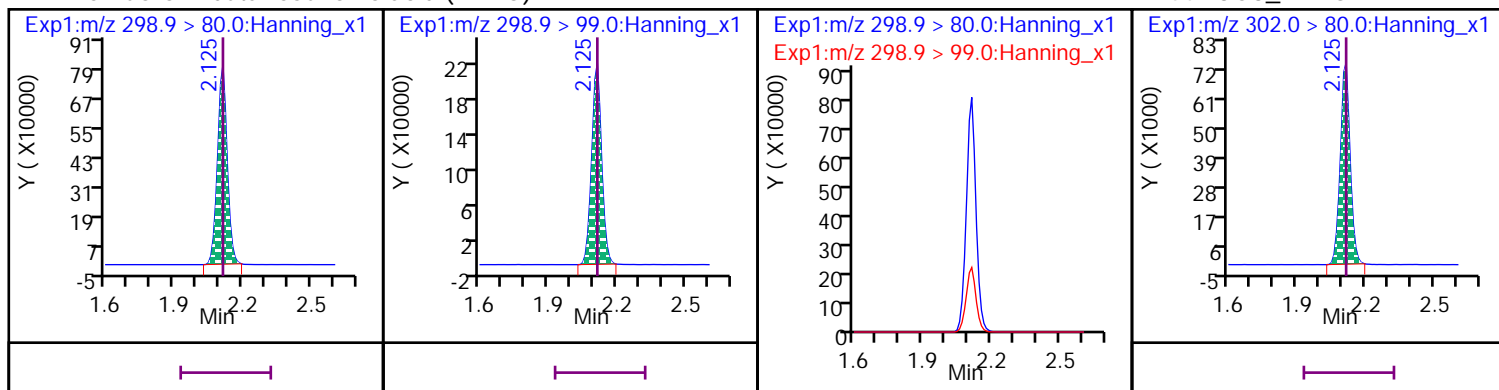


D 50 13C5\_PFPeA



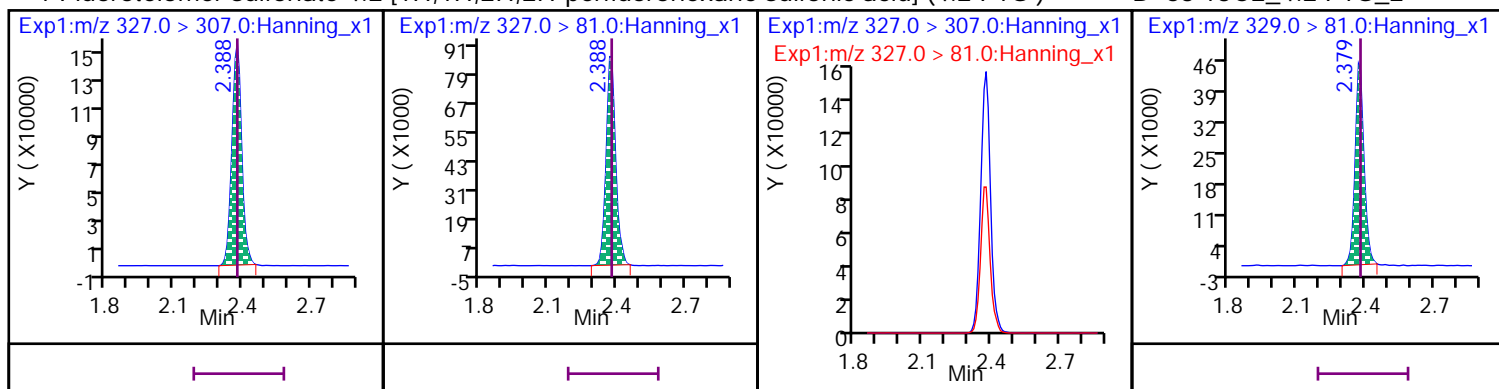
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



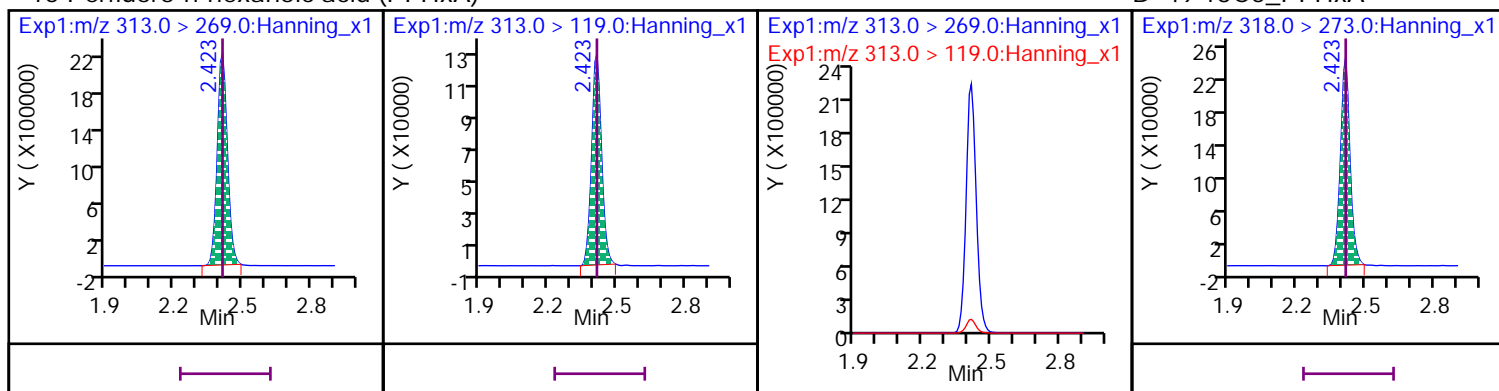
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



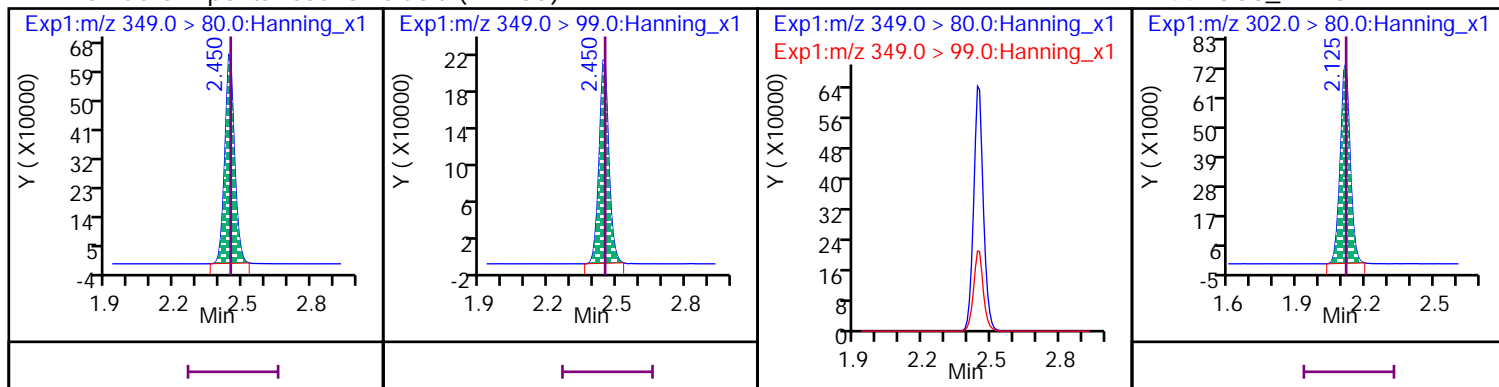
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



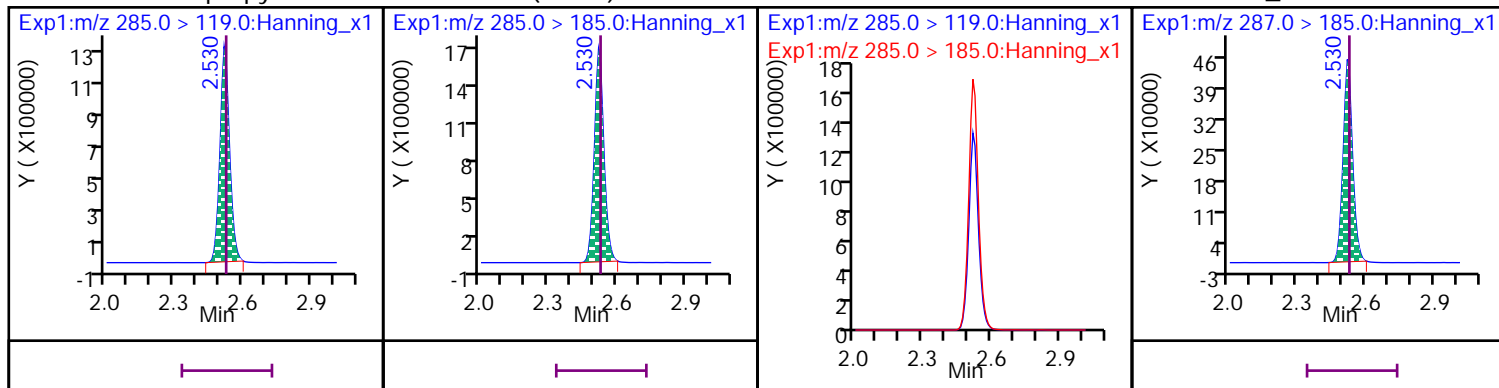
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



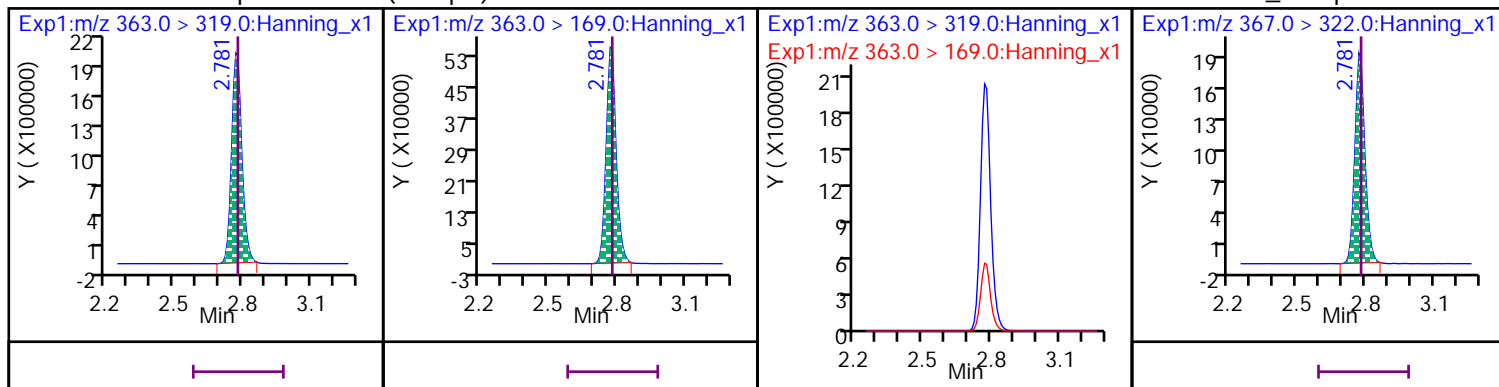
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



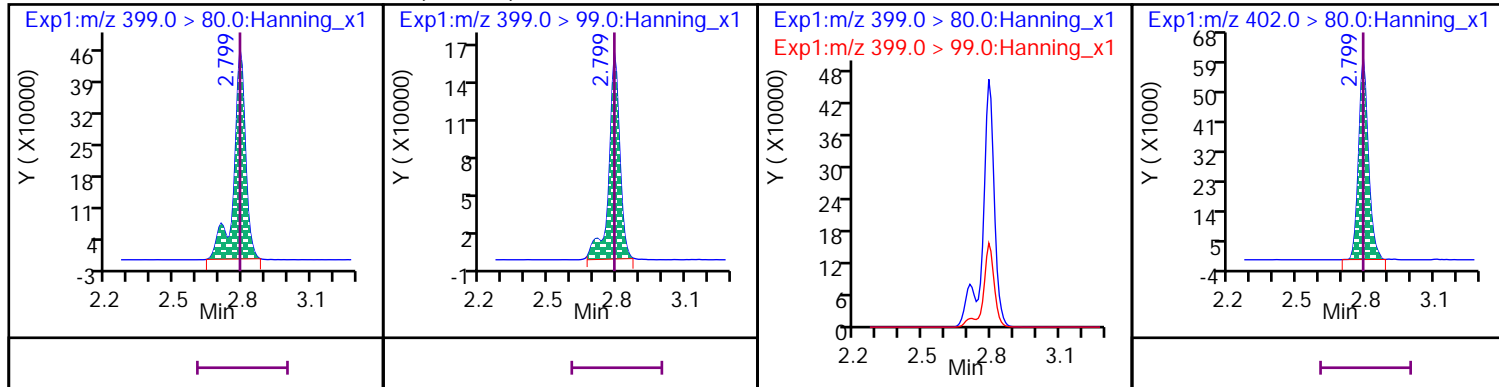
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



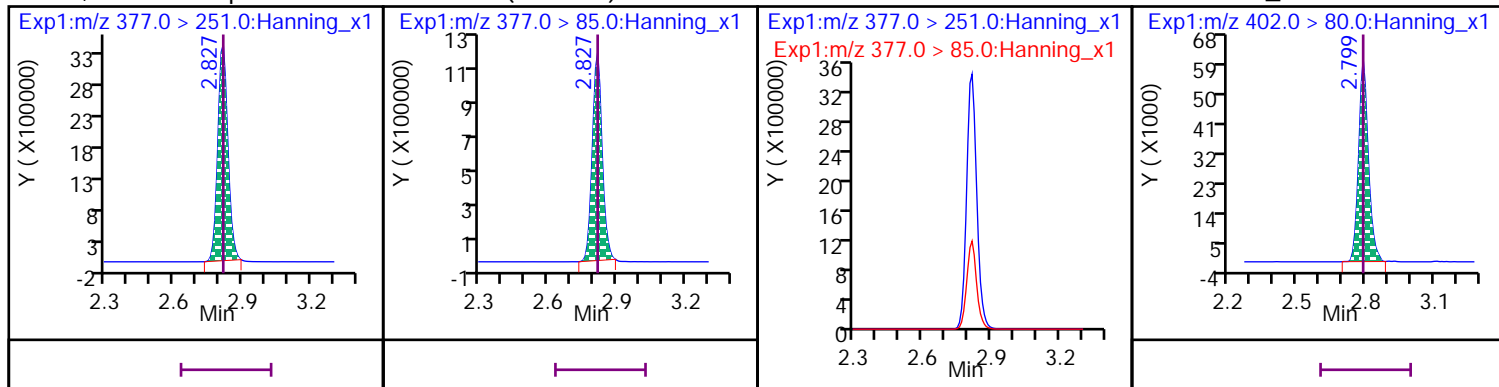
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



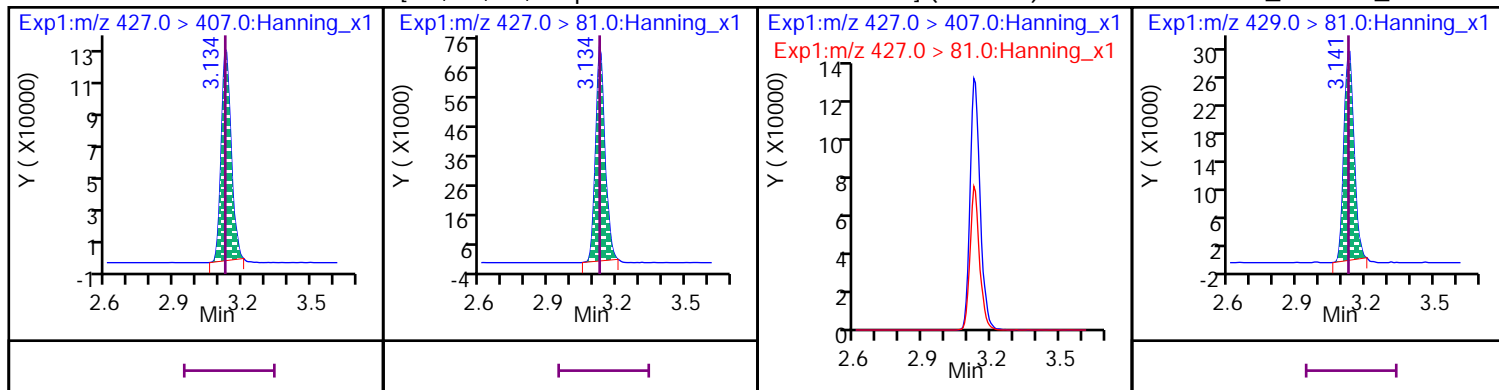
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



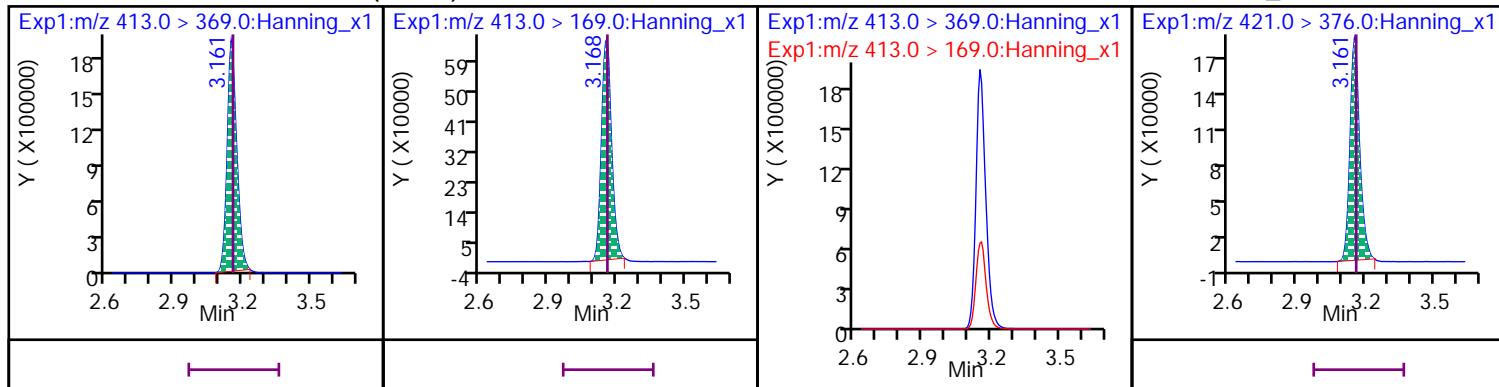
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



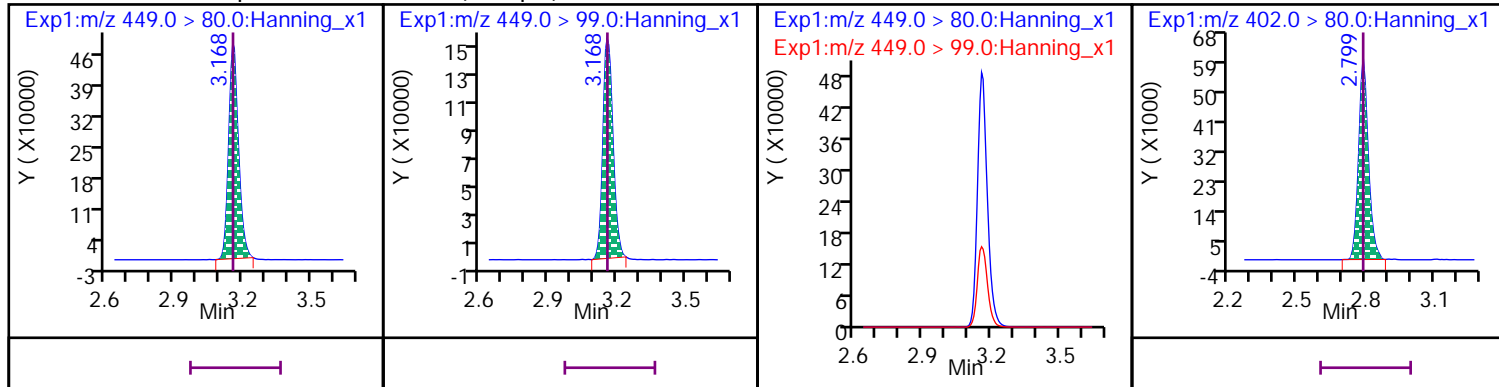
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



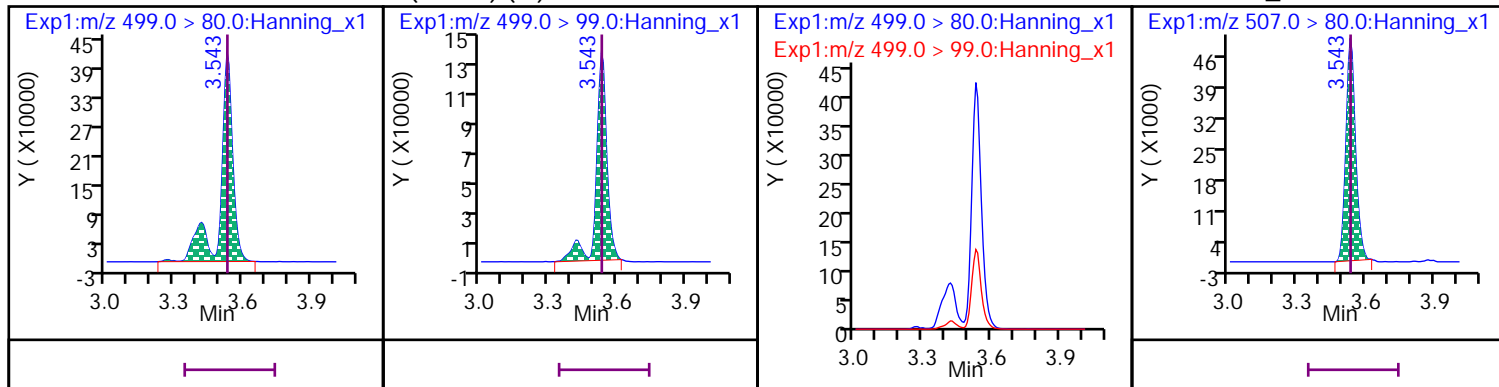
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



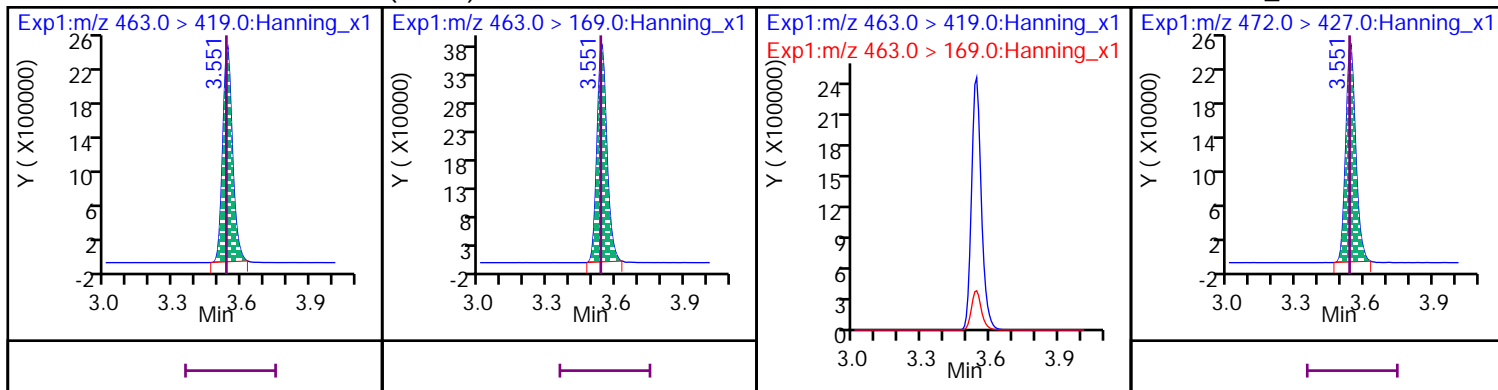
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



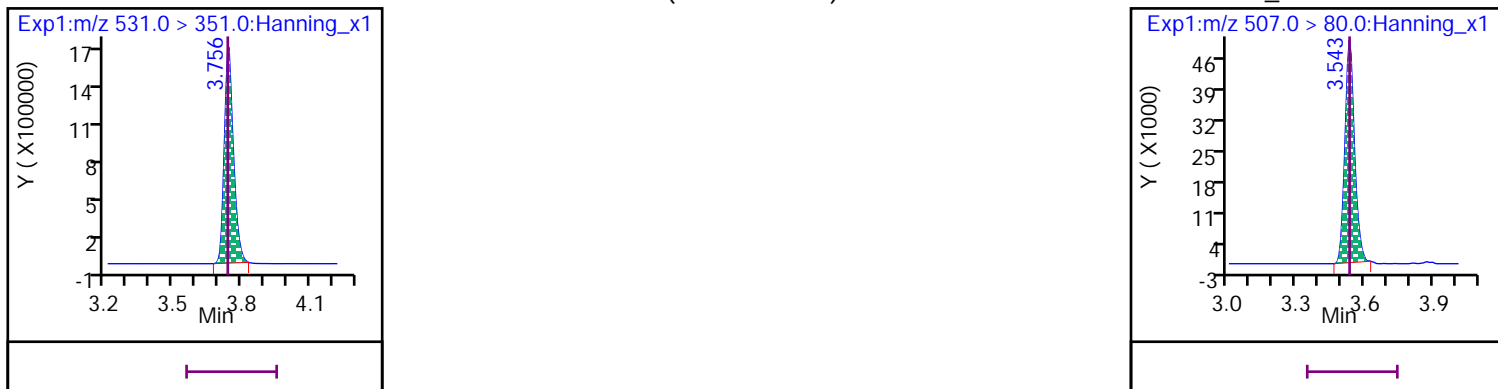
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



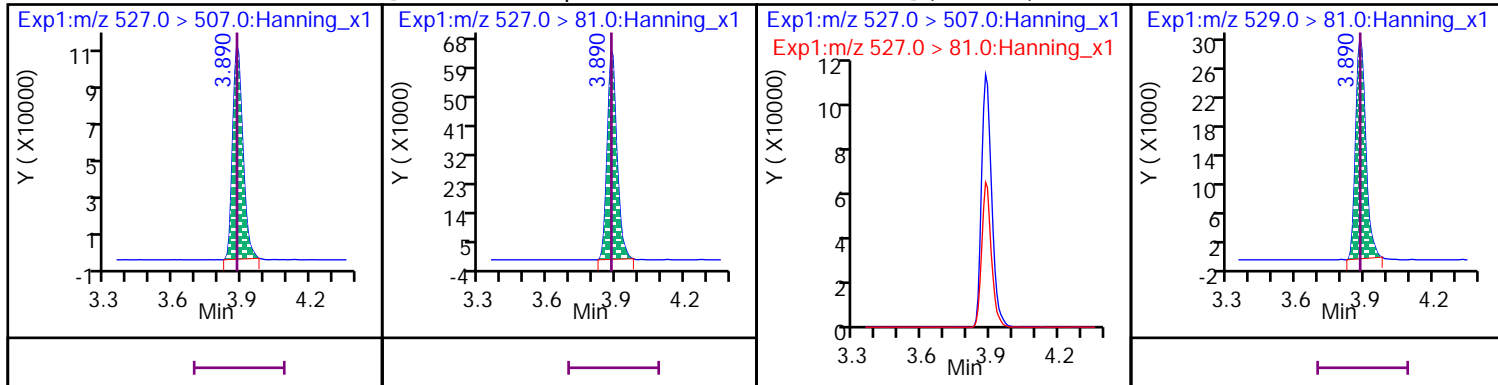
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

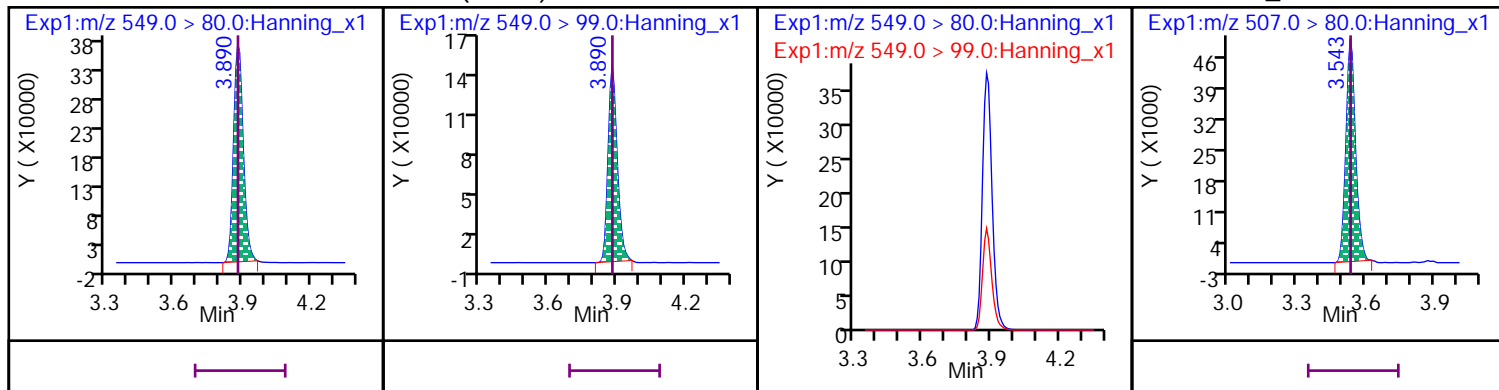
D 65 13C2\_8:2 FTS\_2





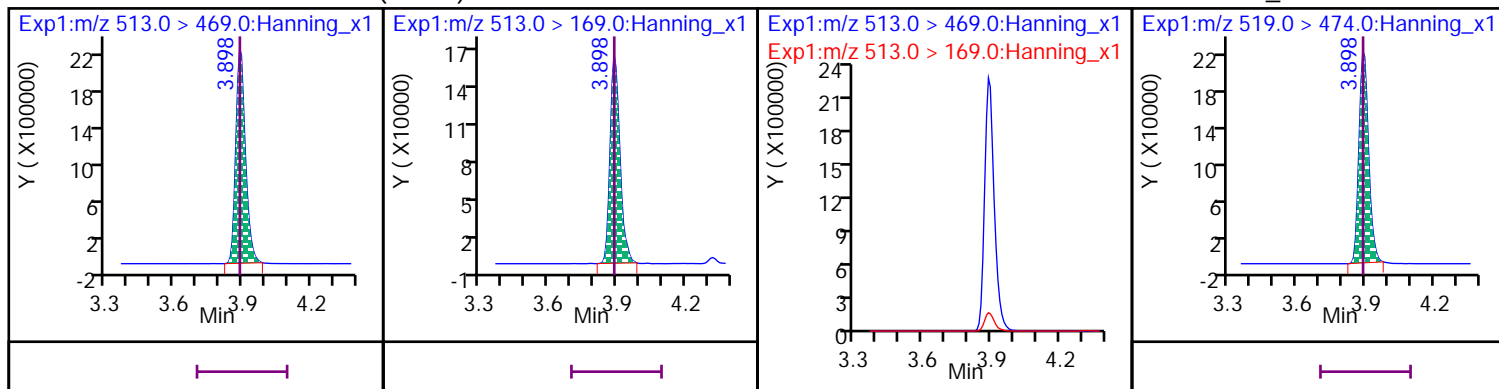
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



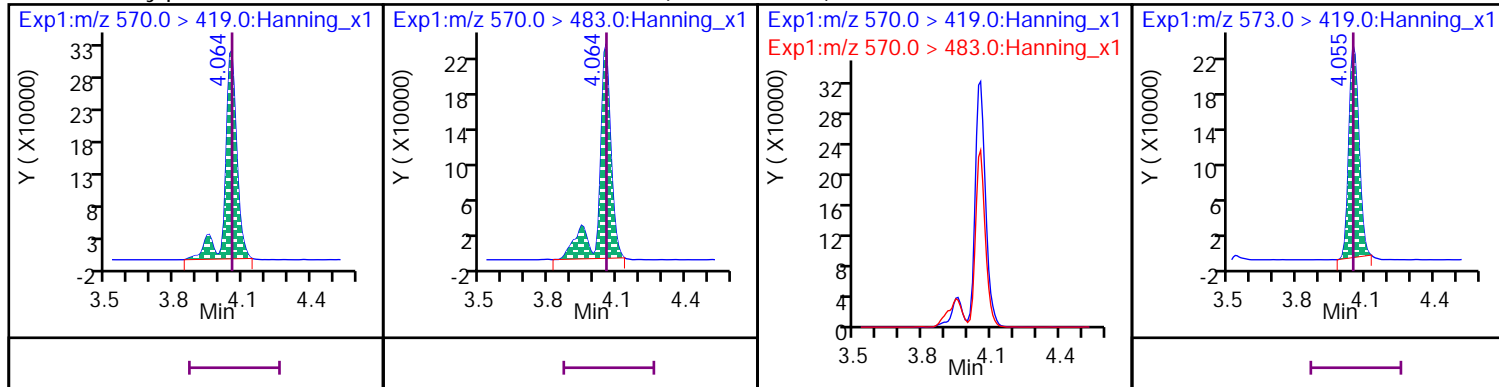
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



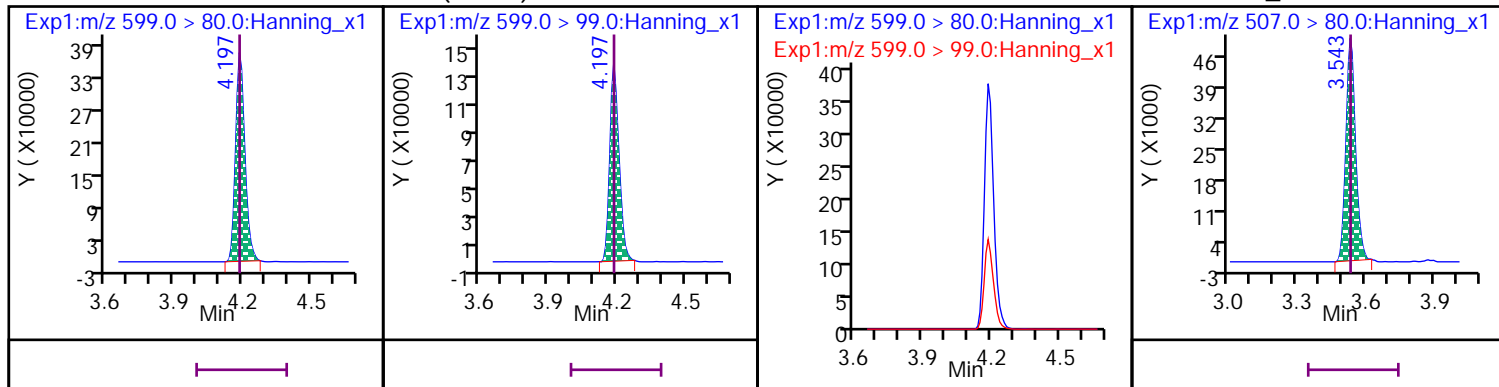
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



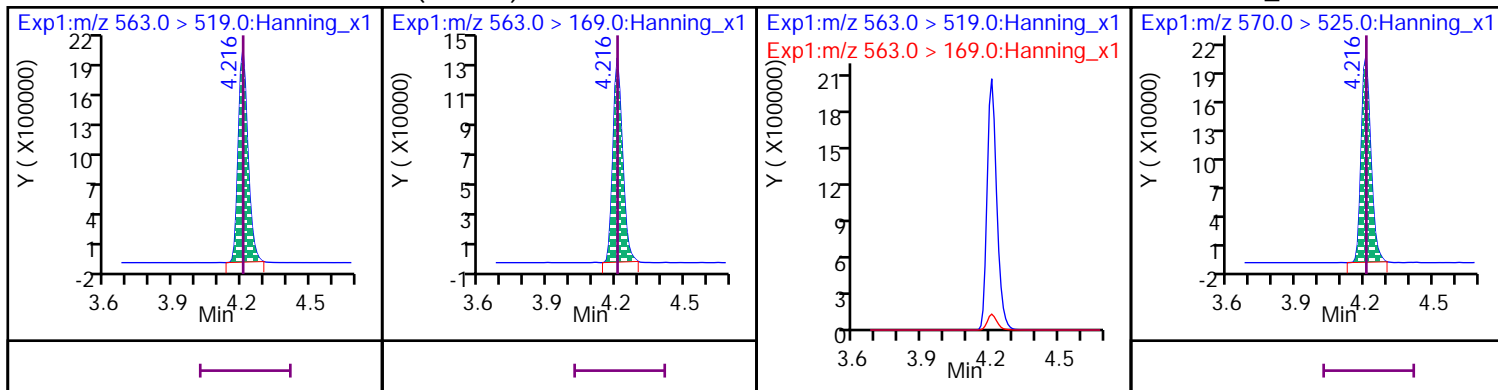
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



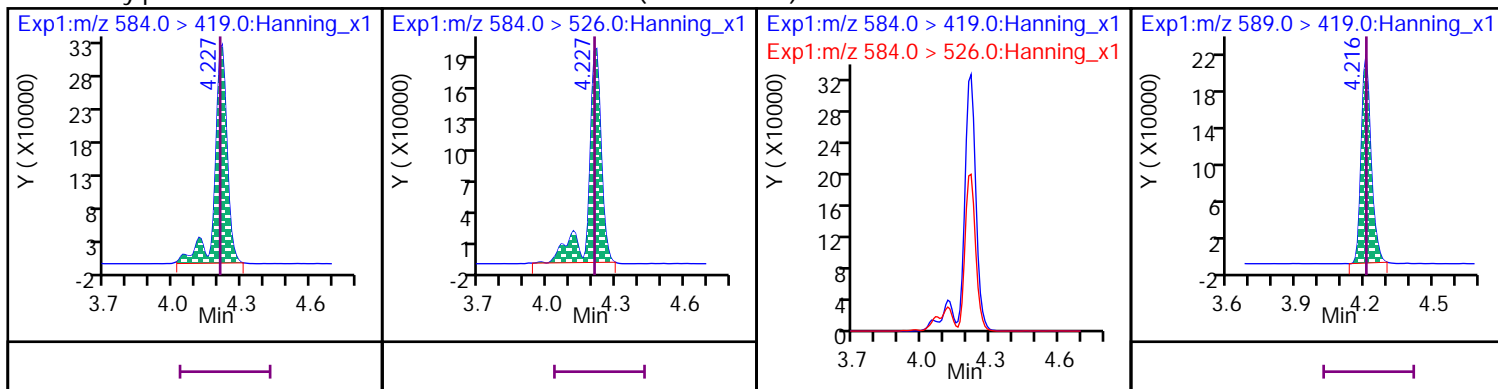
25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



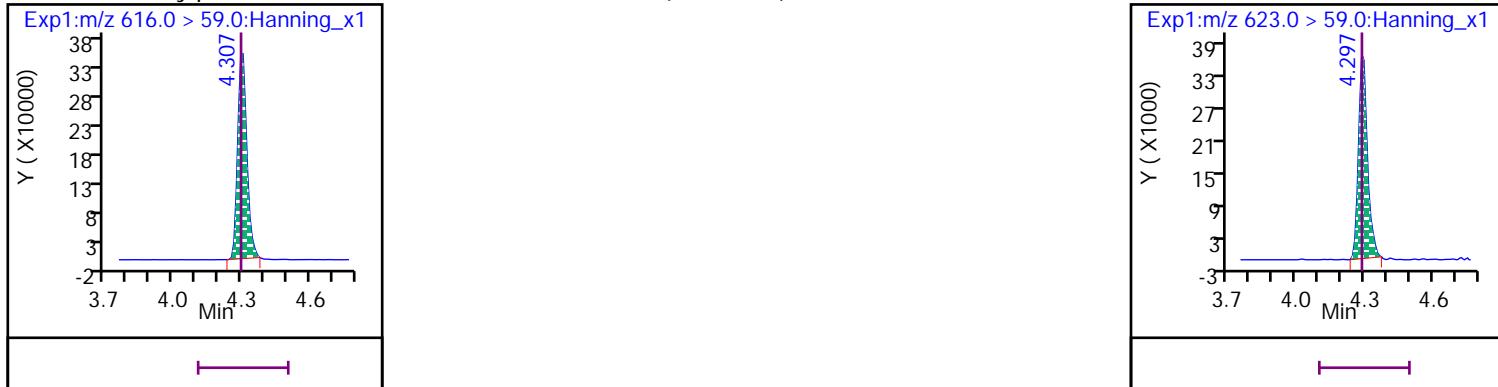
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



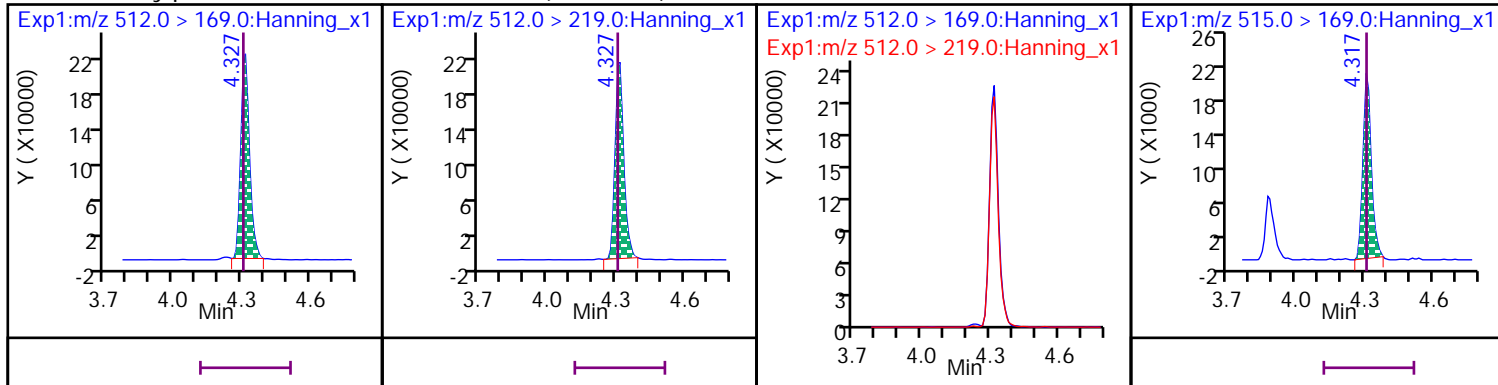
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

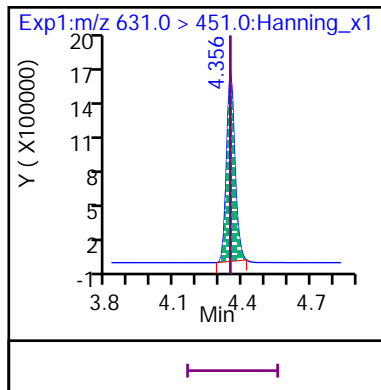


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

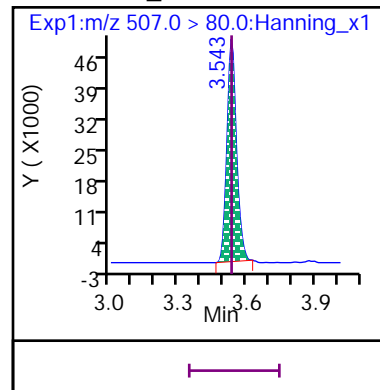
D 57 d3-MeFOSA



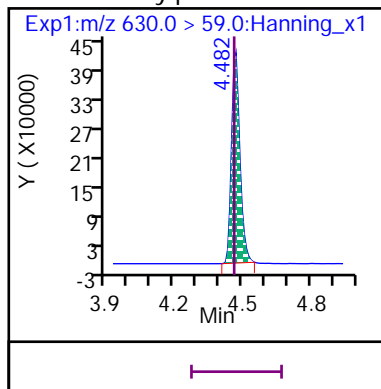
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



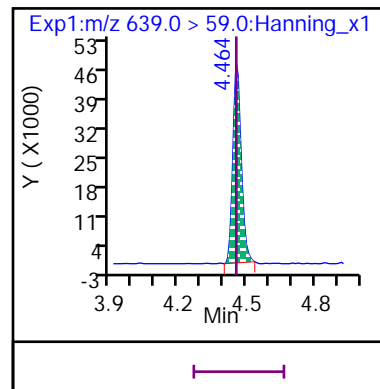
D 54 13C8\_PFOS



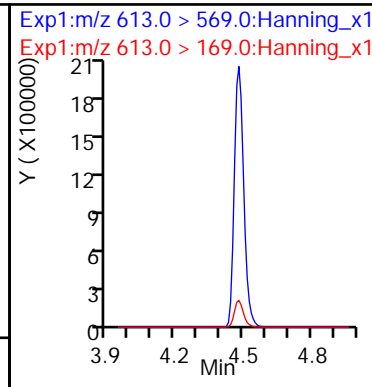
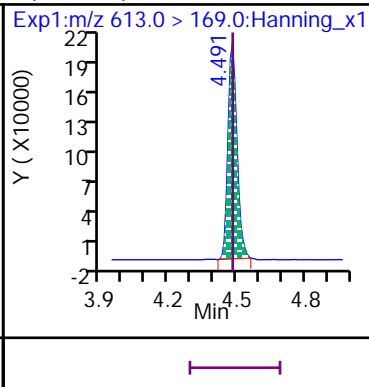
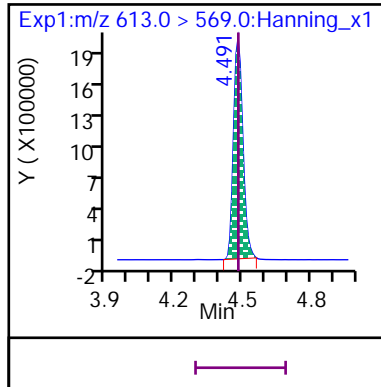
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



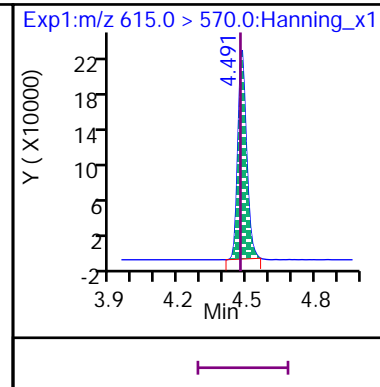
D 62 d9-EtFOSE



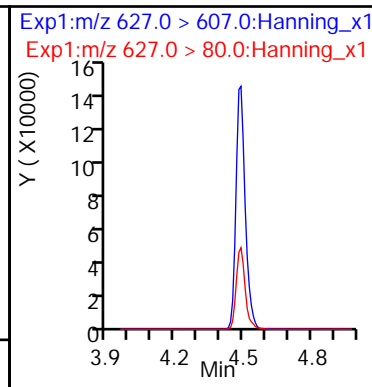
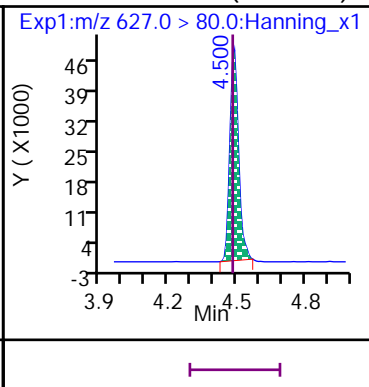
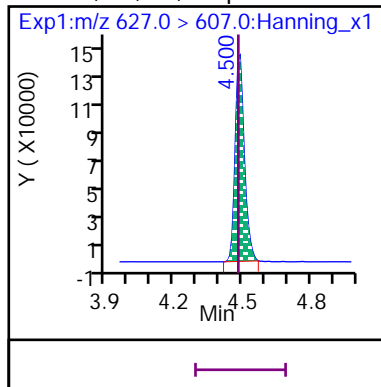
11 Perfluoro-n-dodecanoic acid (PFDoA)



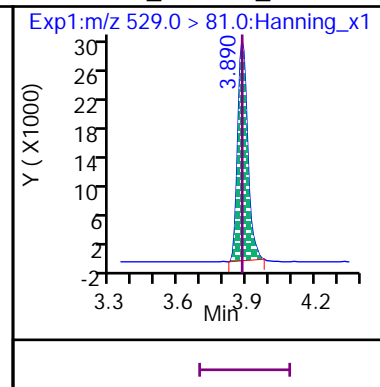
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

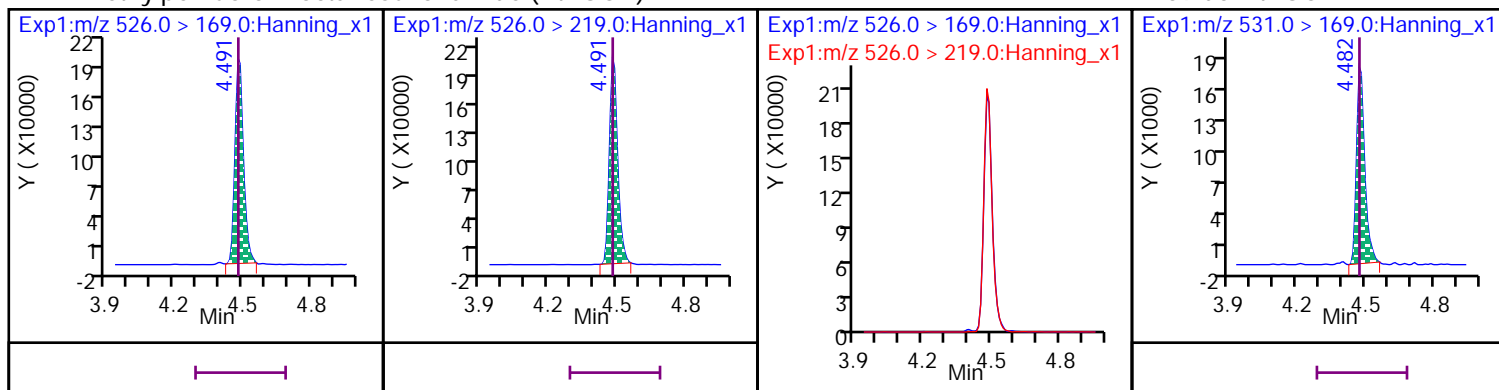


D 65 13C2\_8:2 FTS\_2



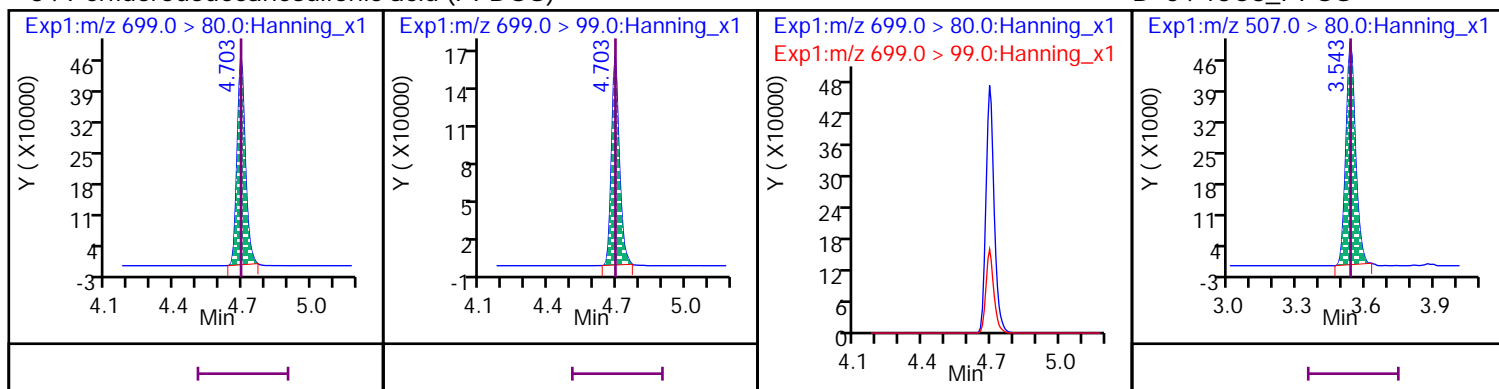
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



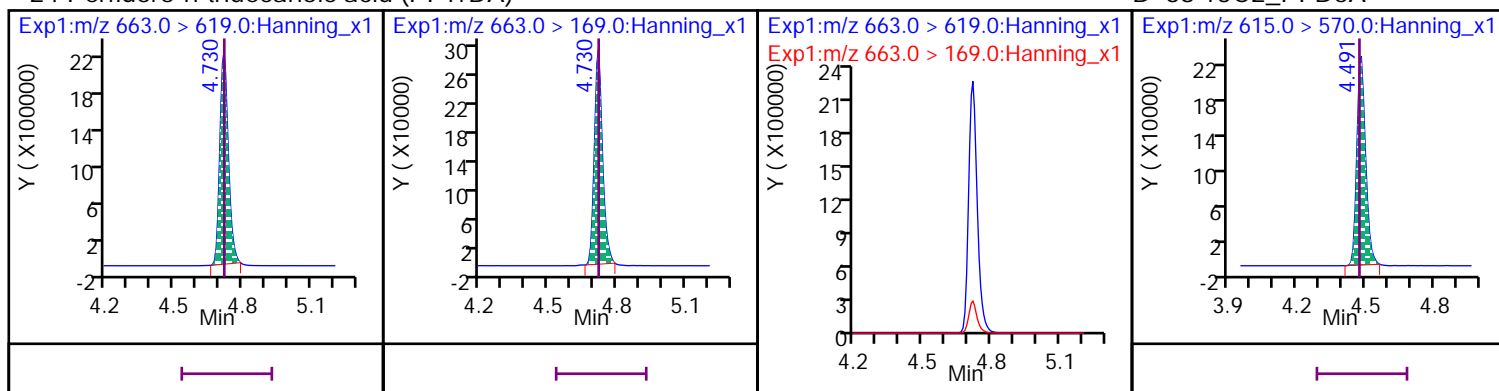
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



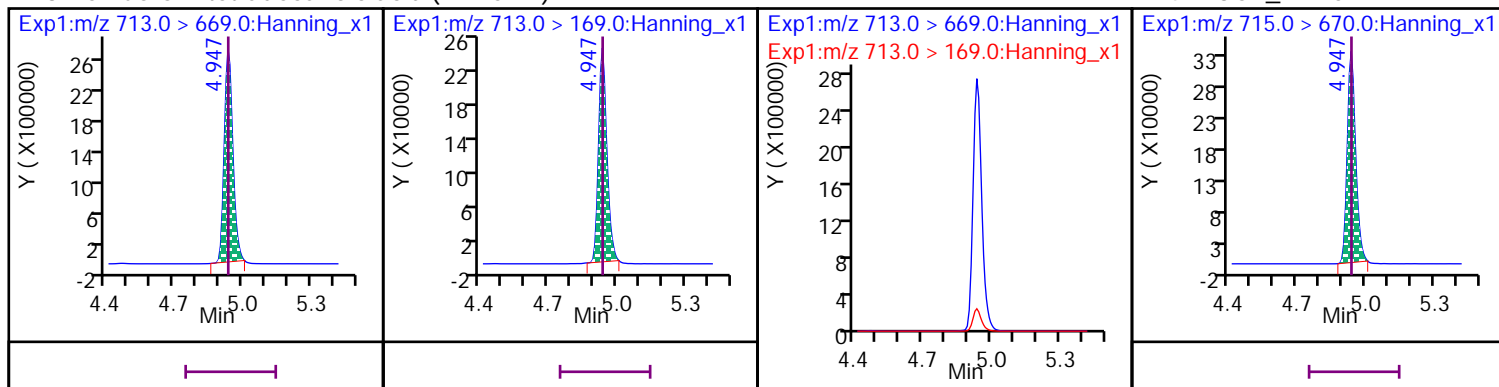
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



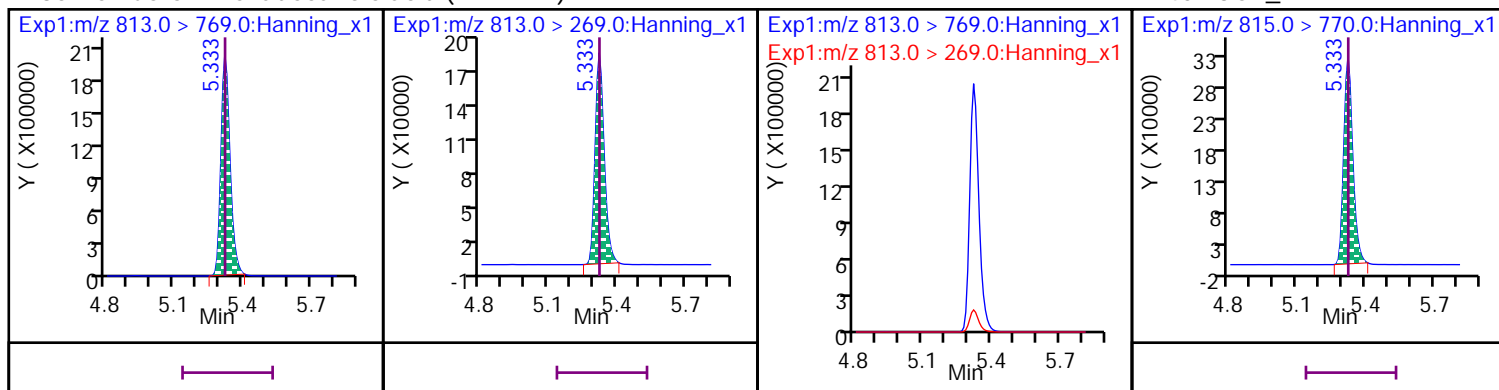
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



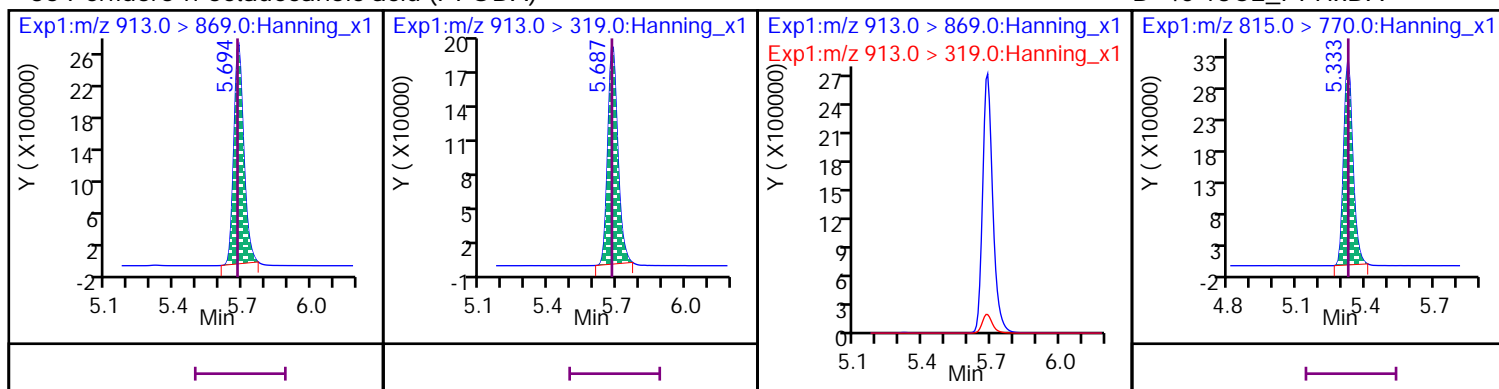
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

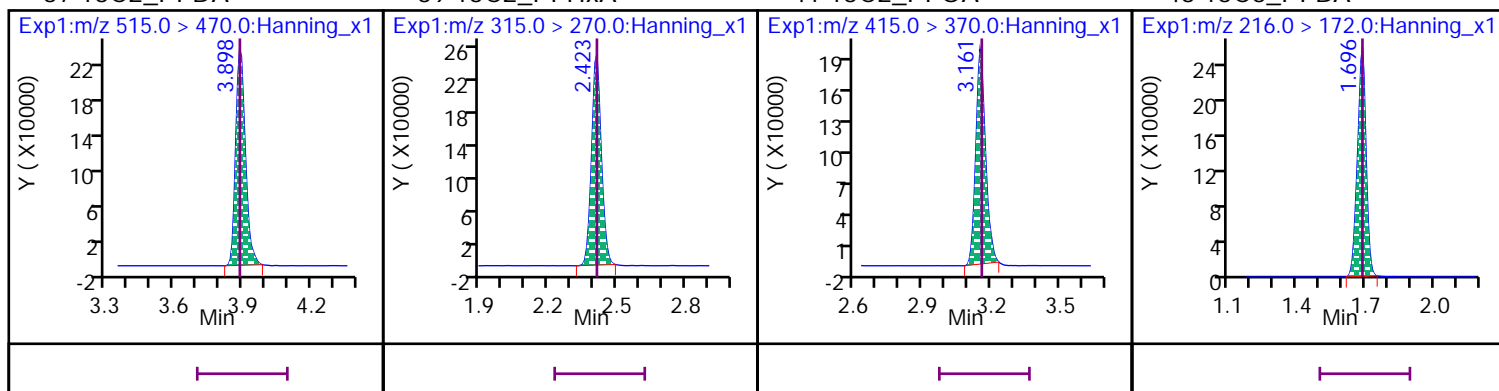


\* 37 13C2\_PFDA

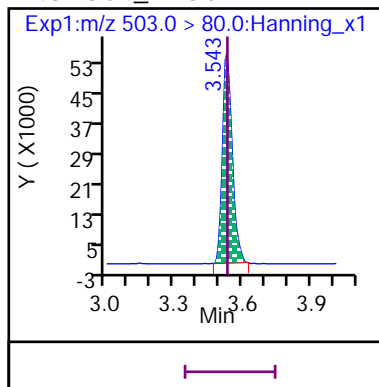
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d

Injection Date: 17-Dec-2020 13:36:34

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 10000\_SVLC-1226

Sample Info: ICAL 10000\_SVLC-1226

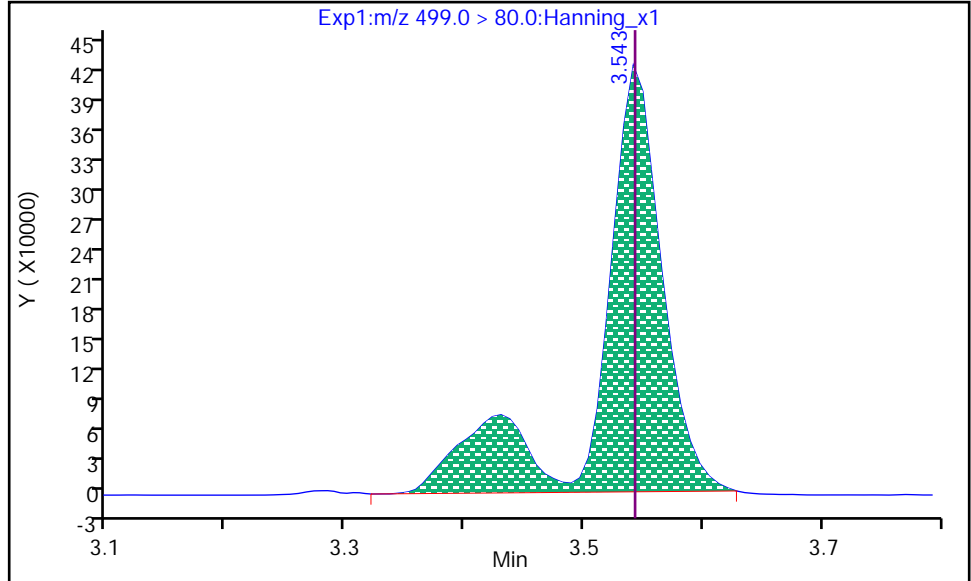
Dil. Factor: 1

Operator: Stephen E. Somerville

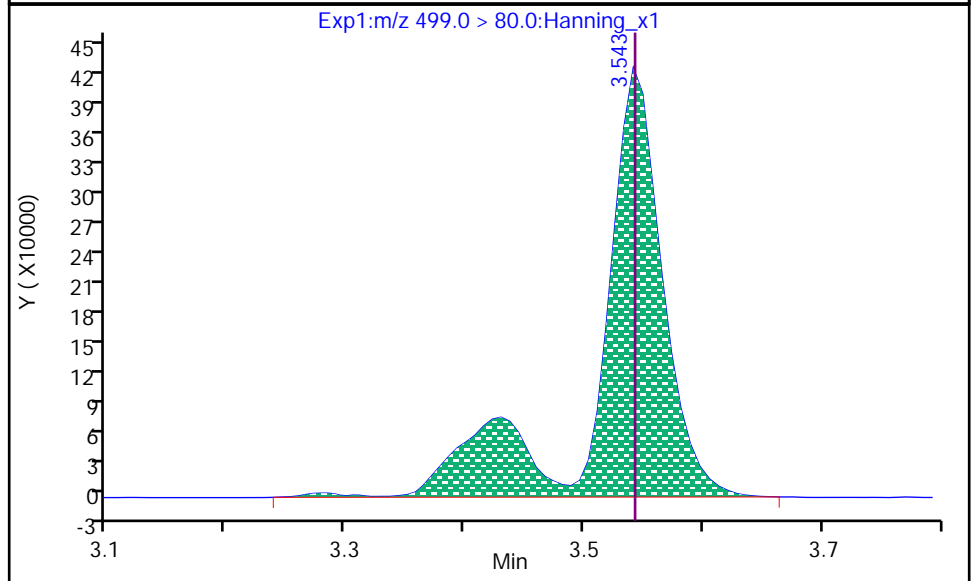
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.543  
Area: 1538391  
Amount: 9277.81  
Amount Units: ng/L



RT: 3.543  
Area: 1590209  
Amount: 9489.82  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:23

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d  
Injection Date: 17-Dec-2020 13:47:15 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 9 Auto Sampler: 9  
Sample Info: ICAL 15000\_SVLC-1227 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	666524	22	>100:1			1000.00	961.03	90.6	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	9827144	23	>100:1			15000	14803		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	663206	18	>100:1			1000.00	964.12	91.1	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	9839633	17	>100:1			15000	14757		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	218164	17	>100:1			1000.00	947.59	88.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	3471337	16	>100:1	Target = 3.50		13260	13495		
298.9 > 99	44	2.120	2.125		950786	16	>100:1	3.65 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	2732060	19	>100:1	Target = 3.10		14070	14437		
349 > 99	44	2.451	2.459		891411	19	>100:1	3.06 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	117401	20	>100:1			5000.00	4849.61	92.8	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.388	0/-1	700424	20		Target = 1.80		14010	14947		
327 > 81	63	2.389	2.388		359323	19	>100:1	1.94 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	680161	19	>100:1			1000.00	922.79	87.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	10314185	20	>100:1	Target = 18.34		15000	15360		
313 > 119	49	2.424	2.423		539071	19	>100:1	19.13 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1232123	18	>100:1			5000.00	4625.89	87.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.539	0/0	5473439	20	>100:1	Target = 0.81		30000	30915		
285 > 185	66	2.531	2.539		6844238	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.791	2.790	1	569084	20	>100:1			1000.00	938.08	92.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/-1	8899240	19	>100:1	Target = 3.70		15000	15076		
363 > 169	47	2.782	2.790		2385602	20	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	157718	27	>100:1			1000.00	921.10	88	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	2357954	28	>100:1	Target = 3.21	0.16	13650	14100		
399 > 99	45	2.800	2.799		734466	25	>100:1	3.21 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	14639276	20	>100:1	Target = 2.97		14130	14620		
377 > 85	45	2.828	2.827		4990640	20	>100:1	2.93 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.176	3.169	1/0	2040587	24	>100:1	Target = 3.08		14280	14242		
449 > 99	45	3.176	3.169		639128	24	>100:1	3.19 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	93776	23	>100:1			5000.00	4869.36	89.6	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	528953	23	>100:1	Target = 1.80		14220	13995		
427 > 81	64	3.142	3.135		300117	24	>100:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	0	540395	23	>100:1			1000.00	913.04	82.5	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	0/0	8294244	24	>100:1	Target = 2.87		15000	15056		
413 > 169	53	3.169	3.169		2817783	24	>100:1	2.94 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	140164	19	>100:1			1000.00	934.87	90.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	2401122	64	>100:1	Target = 3.84	0.27	13920	14457		M
499 > 99	54	3.545	3.545		658264	39	>100:1	3.64 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/0	7132279	22	>100:1			13980	15115		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	1527466	19	>100:1	Target = 3.07		14400	14240		
549 > 99	54	3.899	3.891		534303	20	>100:1	2.85 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	1561930	17	>100:1	Target = 3.03		14460	15355		
599 > 99	54	4.198	4.198		552442	17	>100:1	2.82 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	5555764	17	>100:1			14130	13957		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	1710650	19	>100:1	Target = 3.33		14520	15202		
699 > 99	54	4.704	4.704		522503	18	>100:1	3.27 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	712934	20	>100:1			1000.00	949.36	90	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	10223367	22	>100:1	Target = 6.16		15000	14339		
463 > 169	56	3.553	3.545		1703495	21	>100:1	6.00 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.874	3.866	1	302106	20	>100:1			1000.00	975.91	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.874	3.866	1/0	4348697	20	>100:1			15000	14607		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.899	3.891	1	87098	18	>100:1			5000.00	4695.27	93.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	513089	21	>100:1	Target = 1.95		14370	14886		
527 > 81	65	3.891	3.891		267531	18	>100:1	1.91 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.501	4.492	1/0	567999	18	>100:1	Target = 3.14		14460	14110		
627 > 80	65	4.501	4.492		173331	18	>100:1	3.27 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.907	3.899	1	618084	20	>100:1			1000.00	931.79	88.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.907	3.899	1/0	9369624	20	>100:1	Target = 15.94		15000	15428		
513 > 169	51	3.907	3.899		692722	20	>100:1	13.52 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	696167	18	69:1			5000.00	4850.01	91.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	1599526	34	>100:1	Target = 1.33	0.12	15000	14956		
570 > 483	58	4.065	4.065		1235143	33	>100:1	1.29 (0.66-1.99)	0.22				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	1	600812	17	>100:1			5000.00	4523.69	81.4	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	1739580	33	>100:1	Target = 1.58	0.15	15000	14541		
584 > 526	60	4.228	4.217		1098135	31	>100:1	1.58 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	1	600565	18	>100:1			1000.00	950.15	88.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/0	8350413	17	>100:1	Target = 15.50		15000	14794		
563 > 169	52	4.217	4.217		578317	18	>100:1	14.43 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	106887	15	>100:1			1000.00	987.79	91.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	1435117	16	>100:1			15000	14290		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	58102	15	>100:1			1000.00	1097.99	106	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	863864	15	>100:1	Target = 1.12		15000	13179		
512 > 219	57	4.328	4.318		802425	15	>100:1	1.07 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	120117	17	>100:1			1000.00	957.91	98.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	1649195	17	>100:1			15000	15432		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	526602	17	>100:1			1000.00	869.96	81.1	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	8292794	17	>100:1	Target = 10.85		15000	15551		
613 > 169	38	4.492	4.492		791057	17	>100:1	10.48 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	8352213	20	>100:1	Target = 8.37		15000	16103		
663 > 169	38	4.731	4.731		1011491	20	>100:1	8.25 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.492	4.483	1	48687	18	>100:1			1000.00	991.70	94.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	722634	17	>100:1	Target = 1.03		15000	13586		
526 > 219	59	4.492	4.492		740958	18	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	822708	20	>100:1			1000.00	976.57	92.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	10429810	21	>100:1	Target = 12.11		15000	14631		
713 > 169	42	4.948	4.948		893504	21	>100:1	11.67 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	883988	19	>100:1			1000.00	975.53	96.8	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	7973247	20	>100:1	Target = 11.48		15000	13804		
813 > 269	40	5.334	5.334		722415	19	>100:1	11.03 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	0/-1	11528747	24	>100:1	Target = 13.88		15000	14733		
913 > 319	40	5.689	5.689		853976	24	>100:1	13.50 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.907	3.899	1	640826	20	>100:1					88.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	727334	19	>100:1					96.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	0	533004	25	>100:1					82.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	606649	22	>100:1					91.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	156417	21	>100:1					96.3	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Injection Date: 17-Dec-2020 13:47:15

Inst. ID: LCMSMS02

Client ID:

Lab ID:

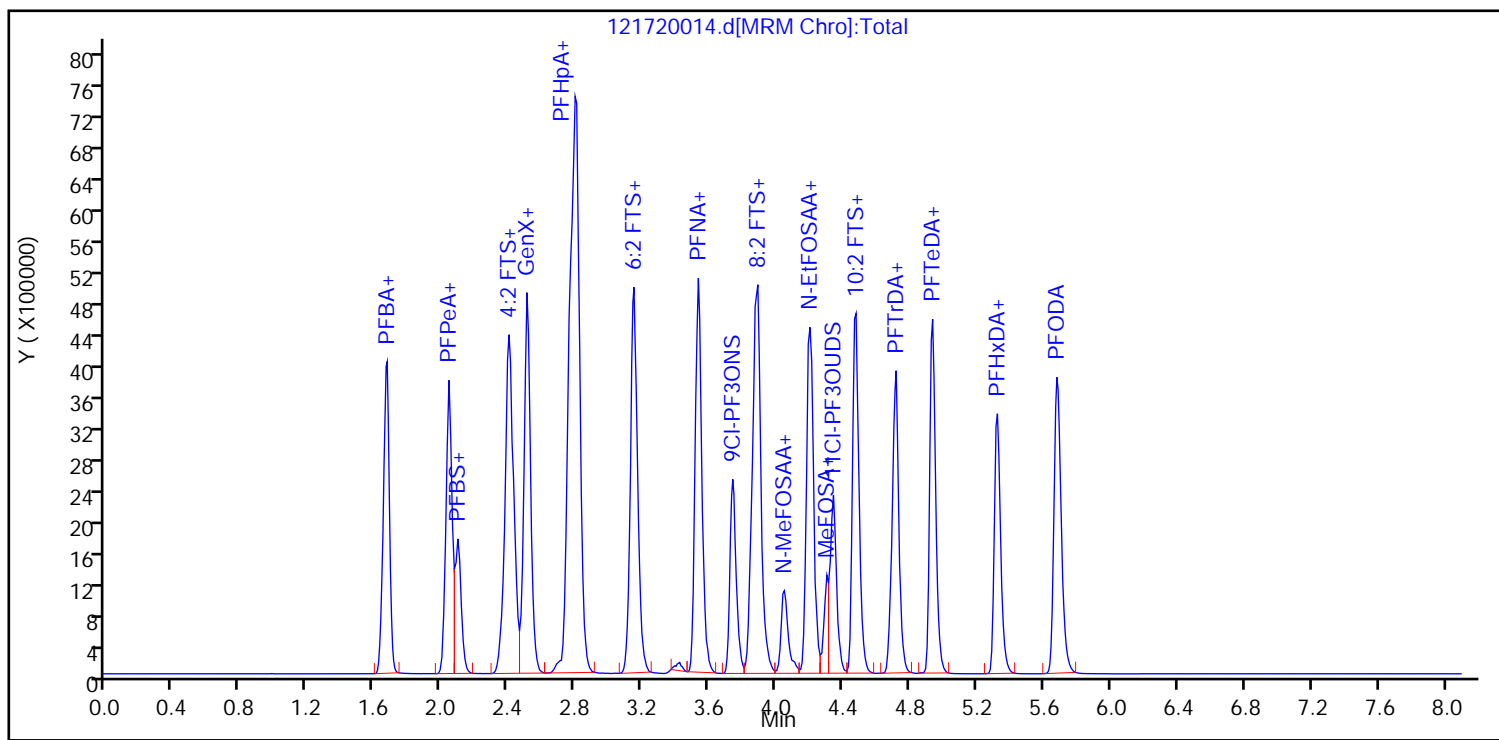
ICAL 15000\_SVLC-1227

Sample Info: ICAL 15000\_SVLC-1227

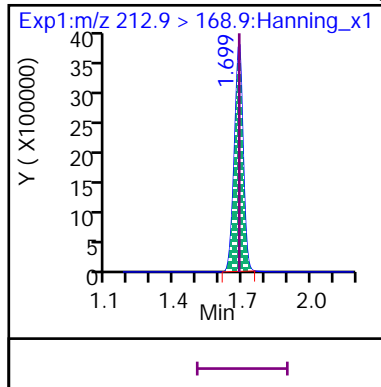
Dil. Factor: 1

Operator:

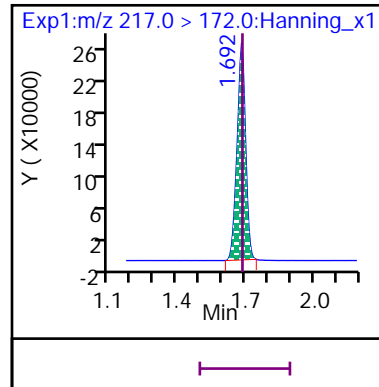
Stephen E. Somerville



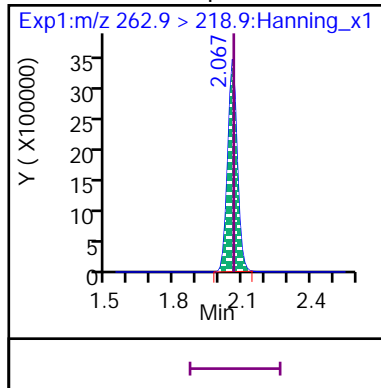
8 Perfluoro-n-butanoic acid (PFBA)



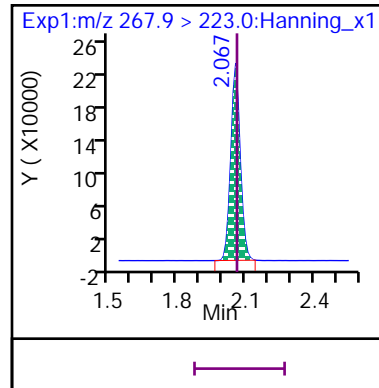
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

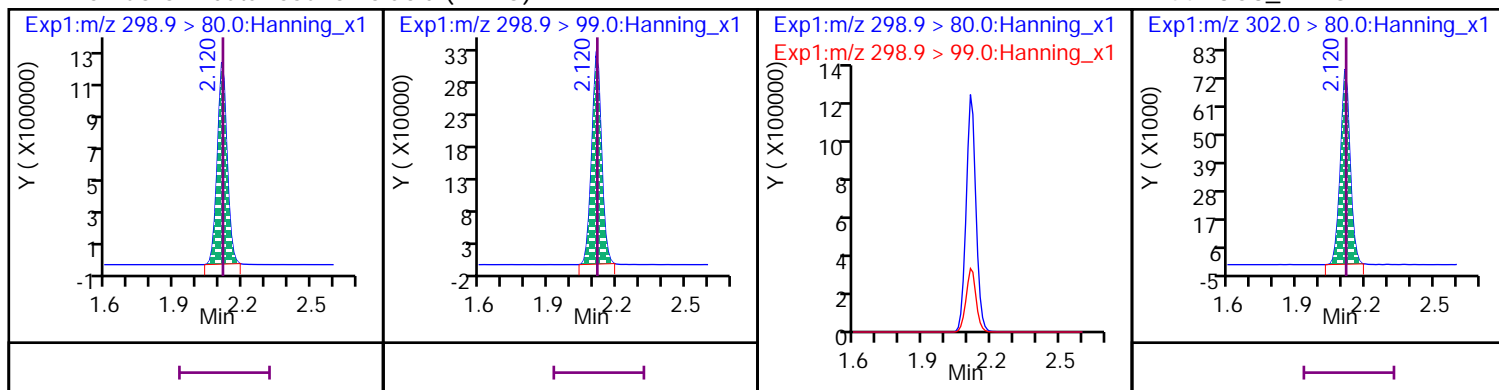


D 50 13C5\_PFPeA



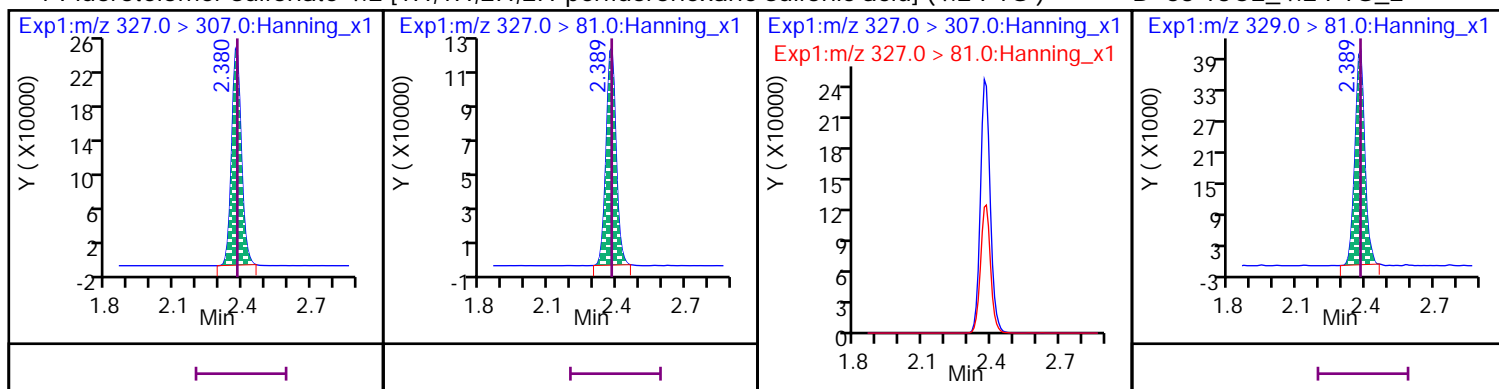
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



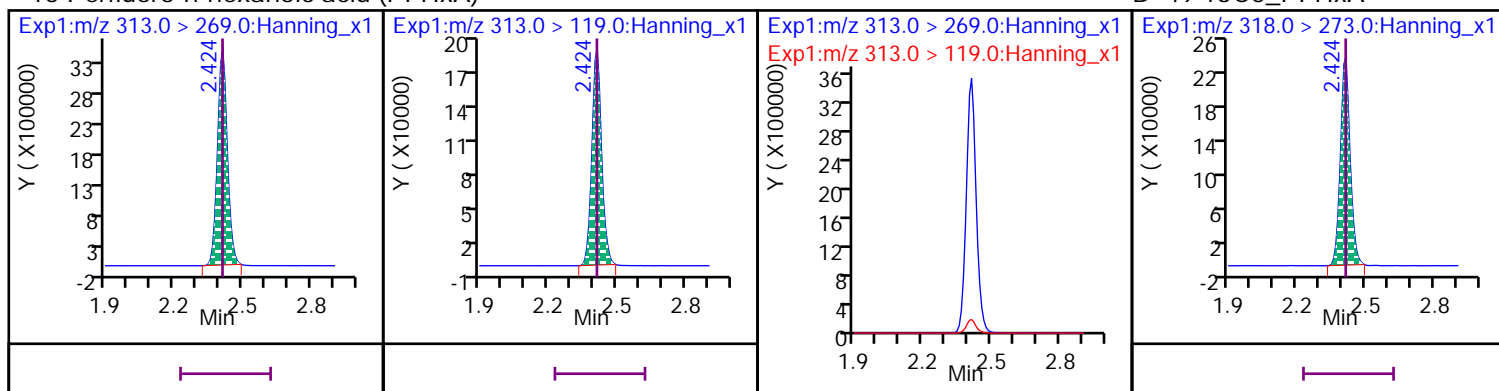
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



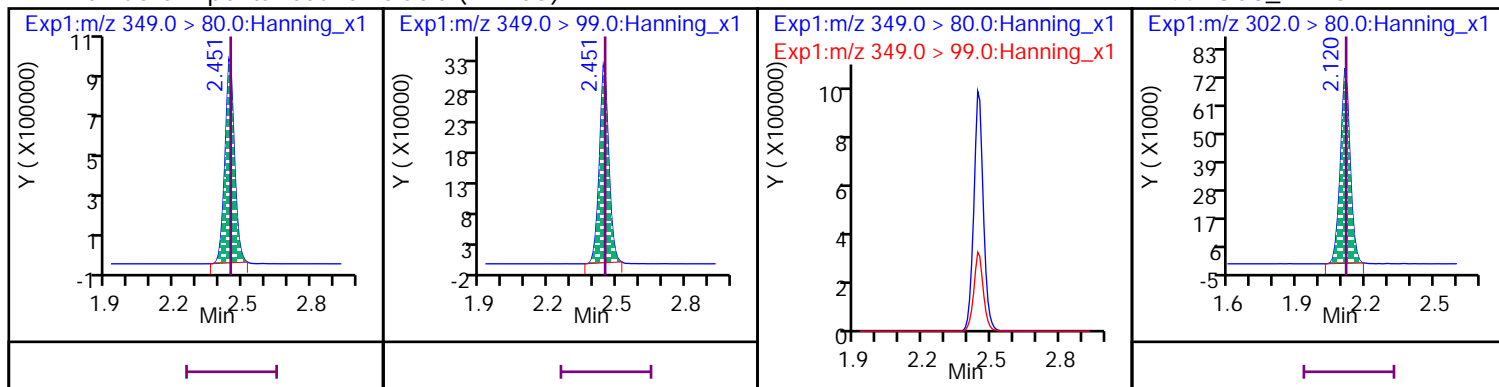
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



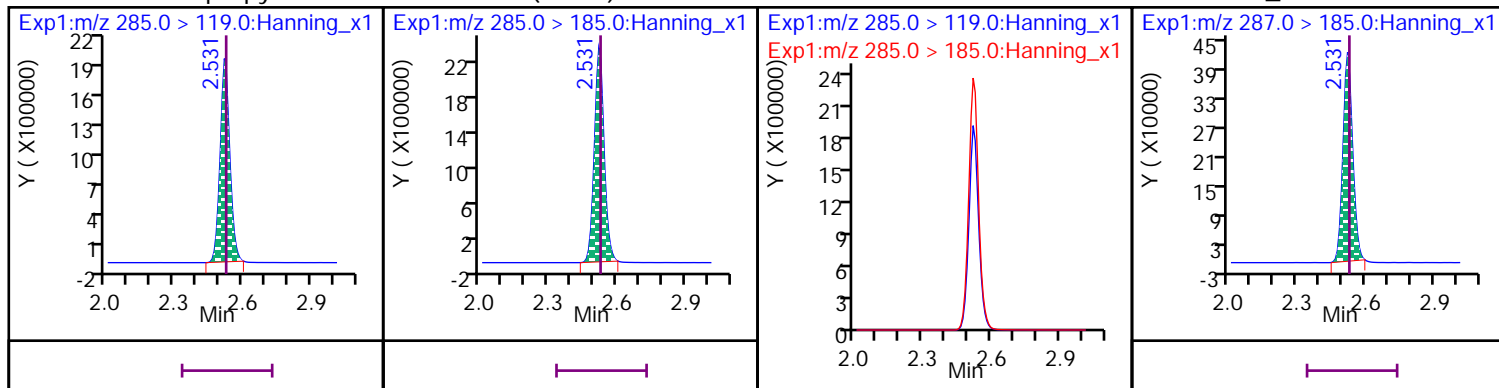
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



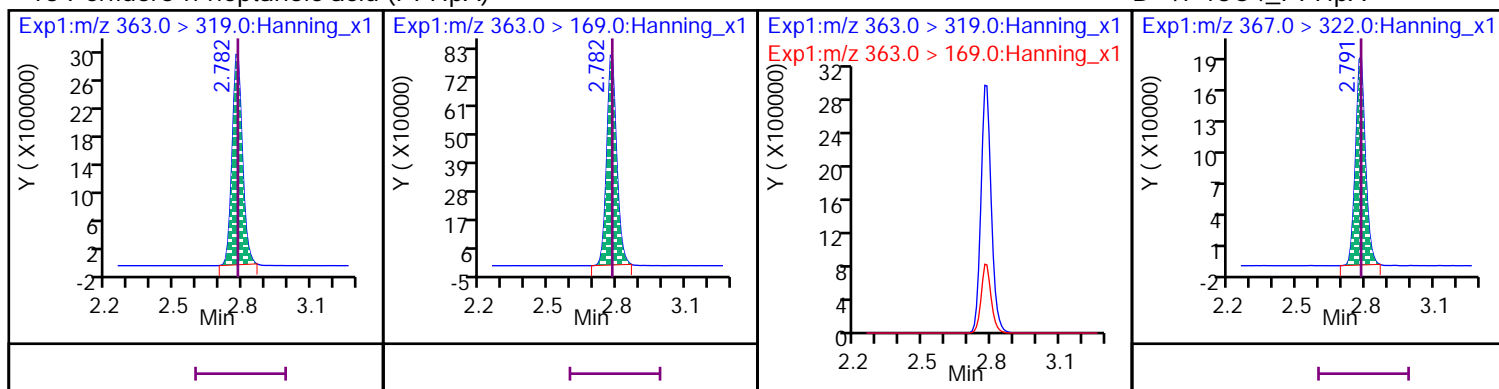
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



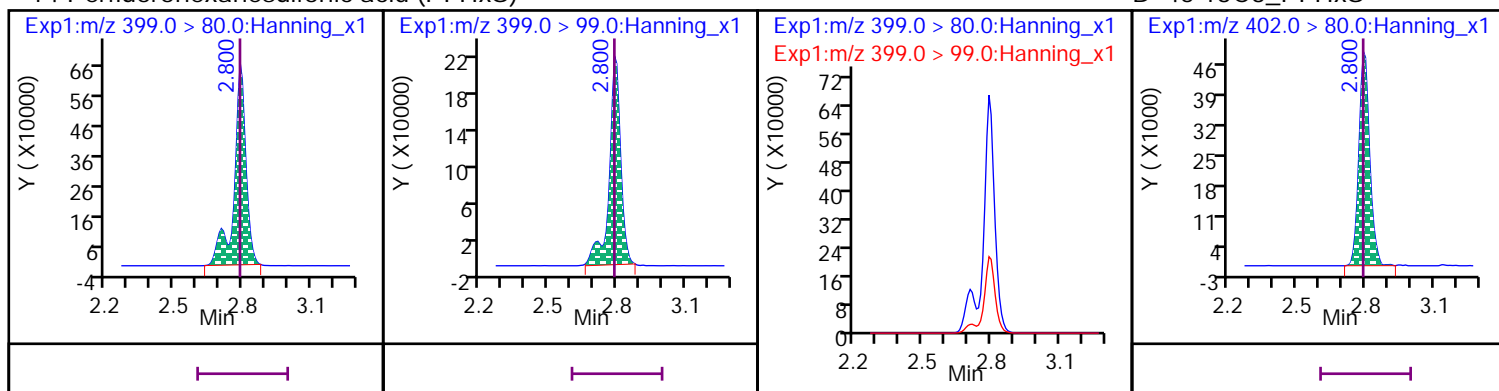
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



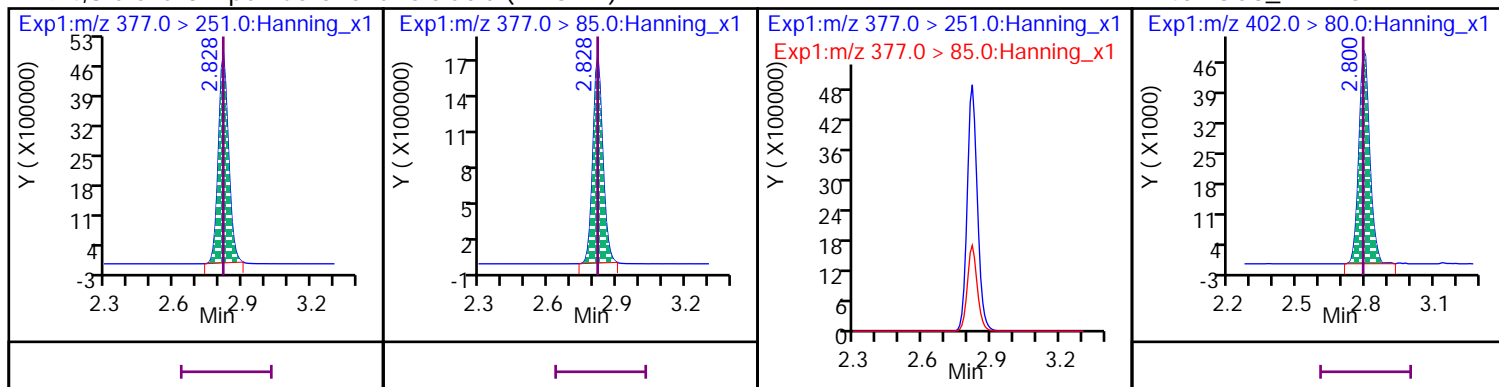
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



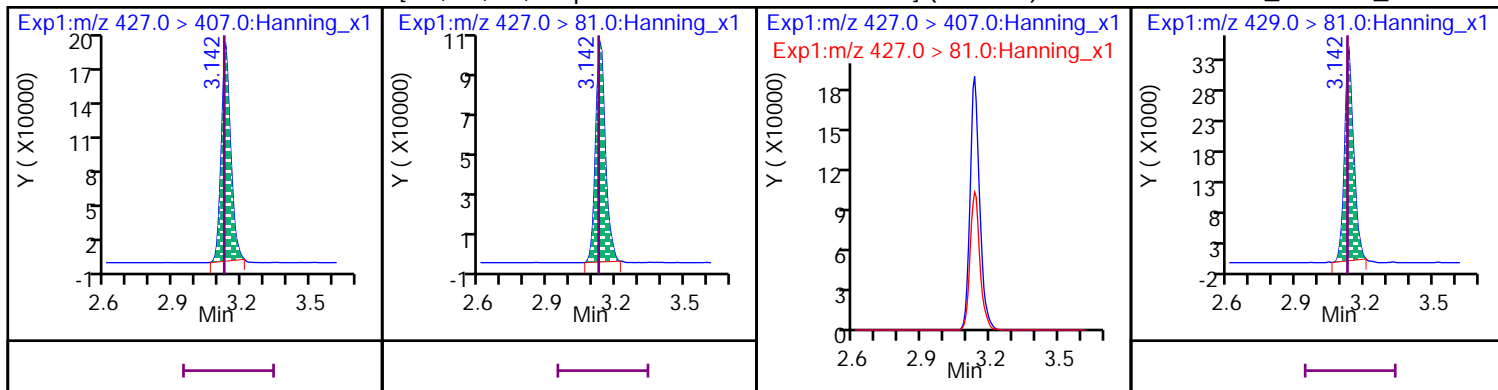
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



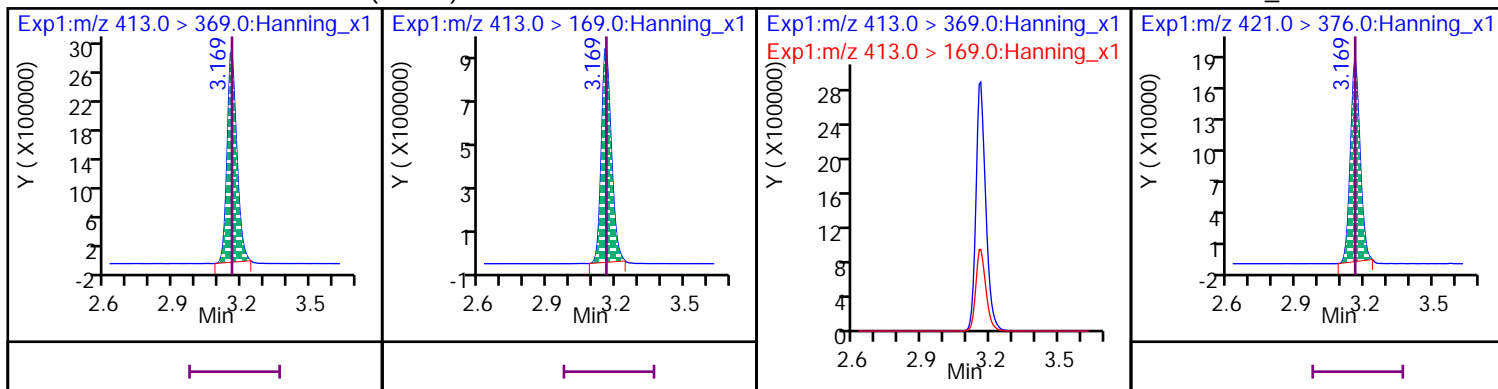
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



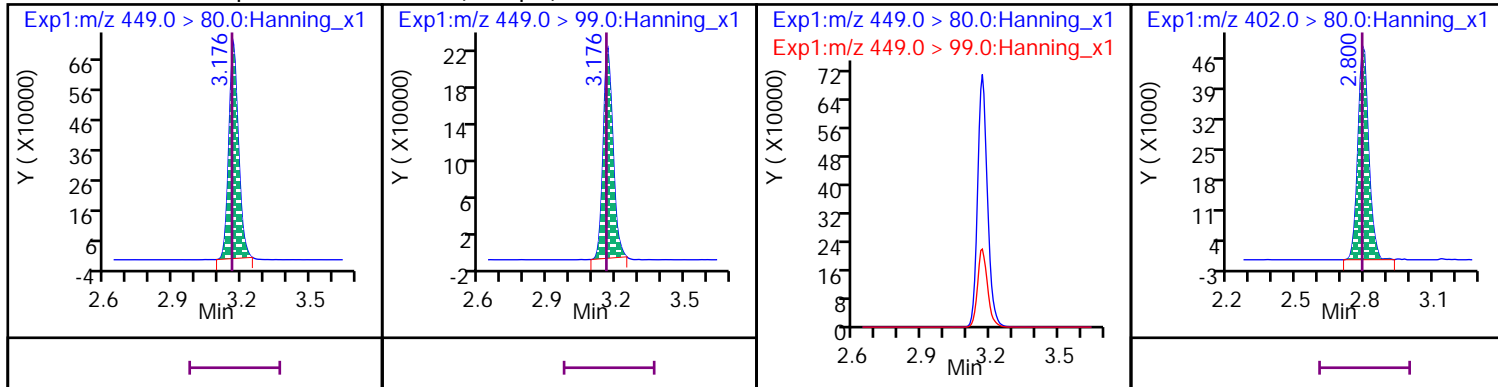
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



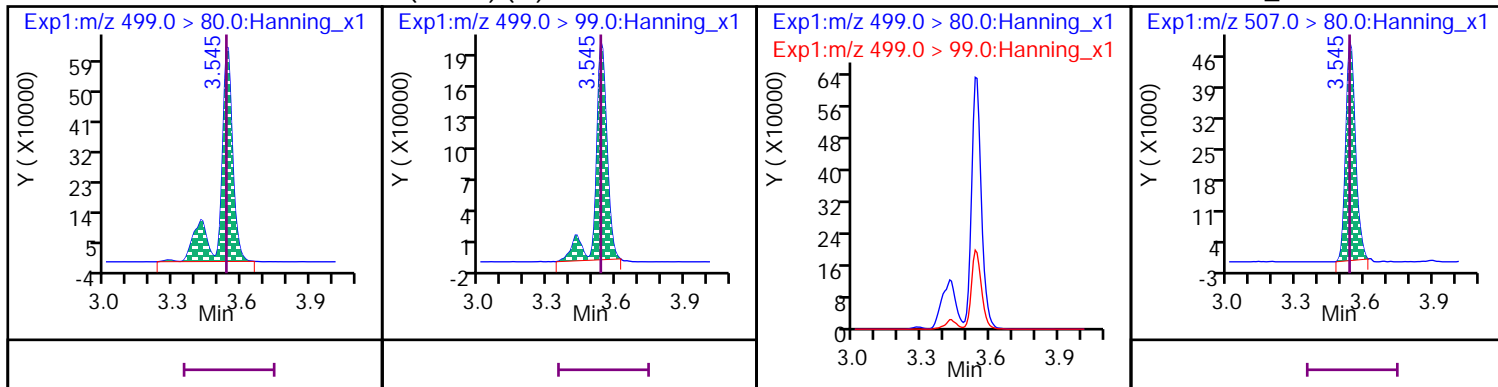
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS) (M)

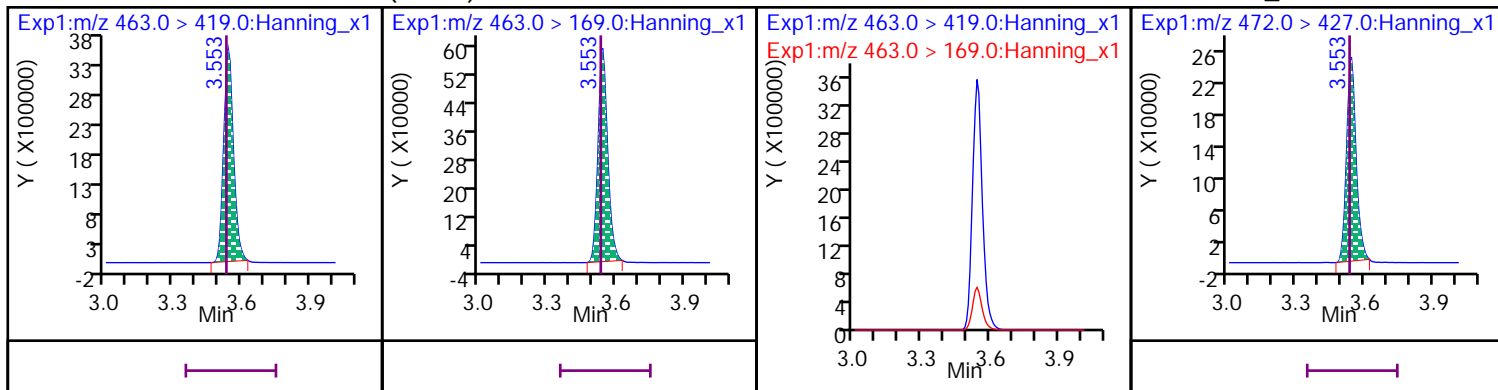
D 54 13C8\_PFOS





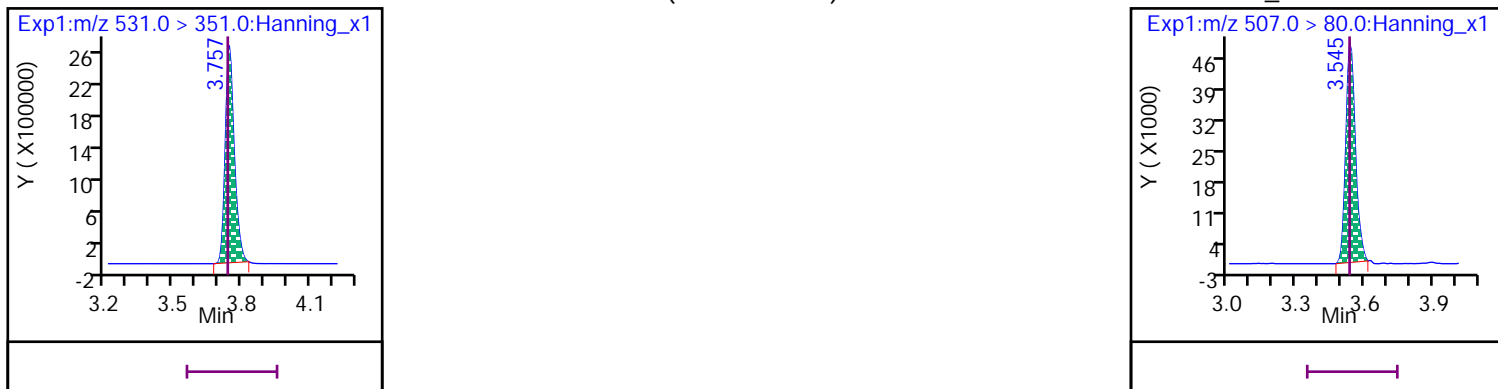
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



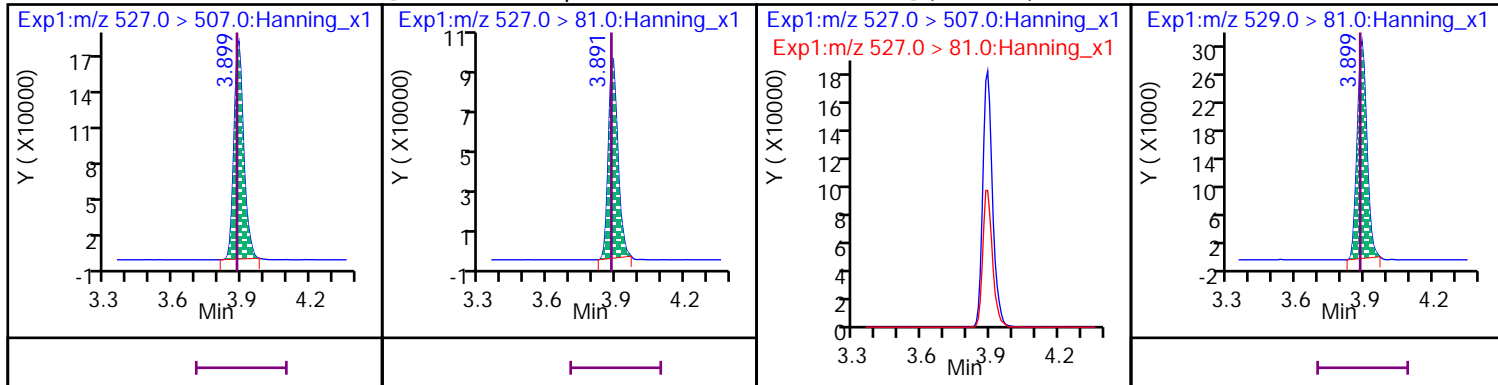
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



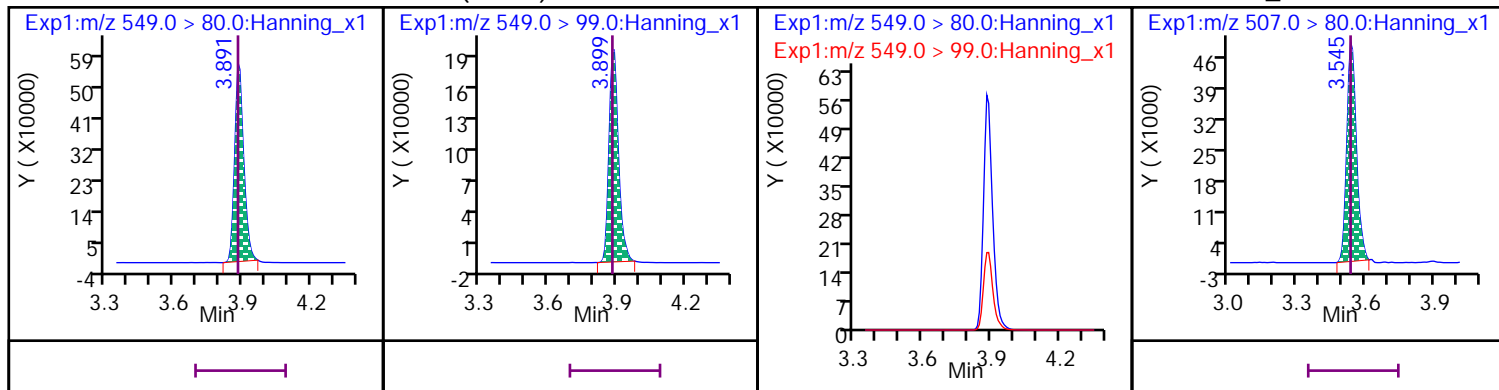
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



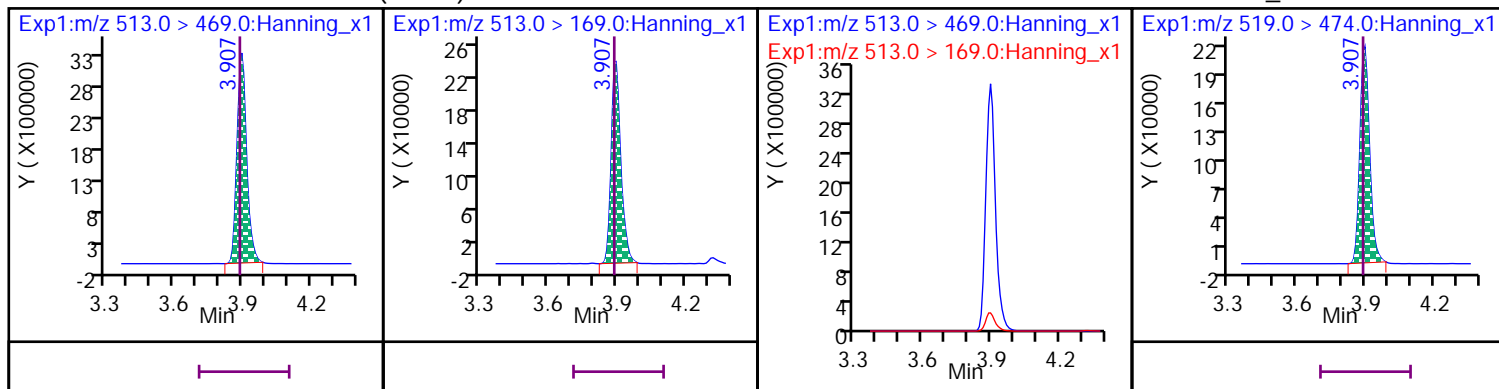
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



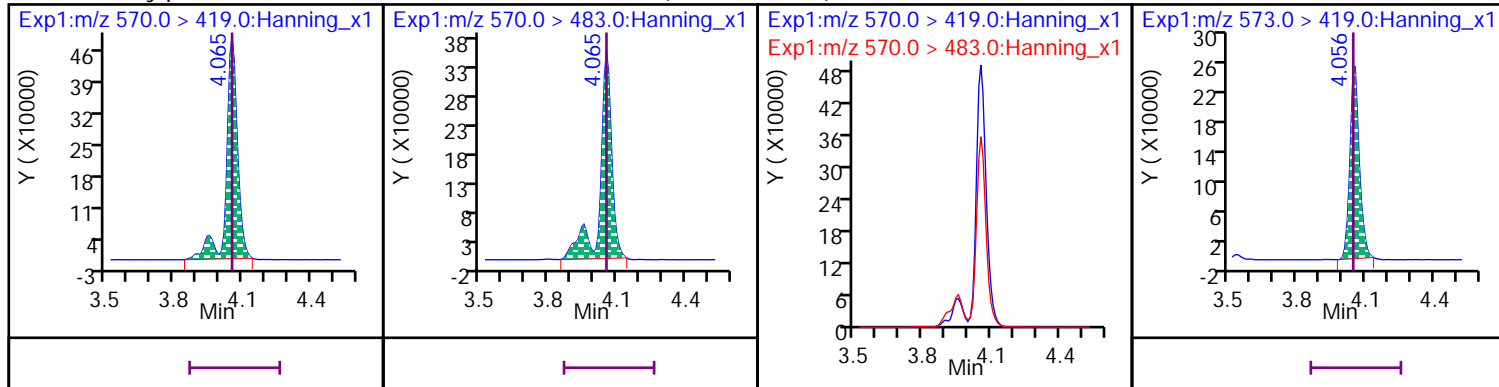
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



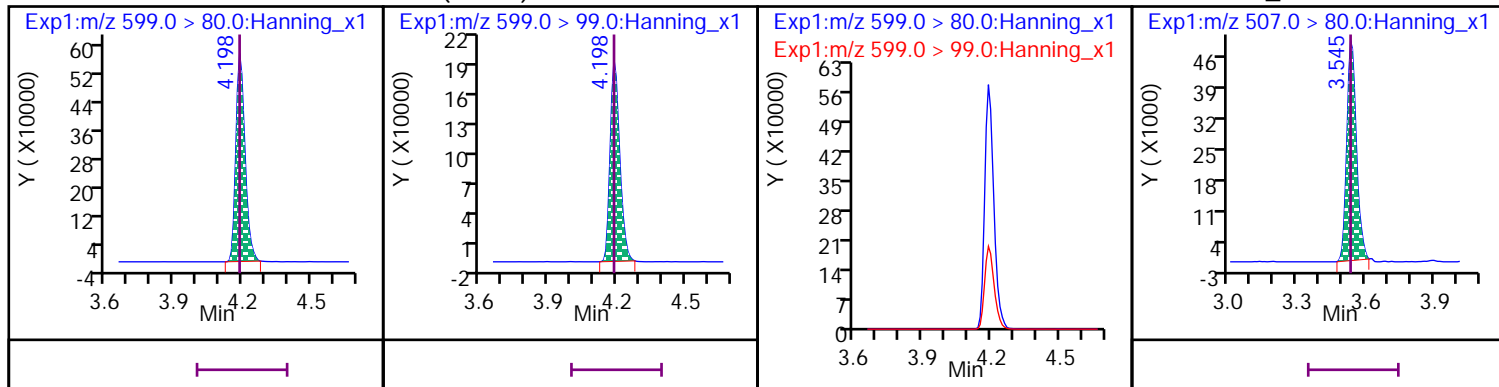
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



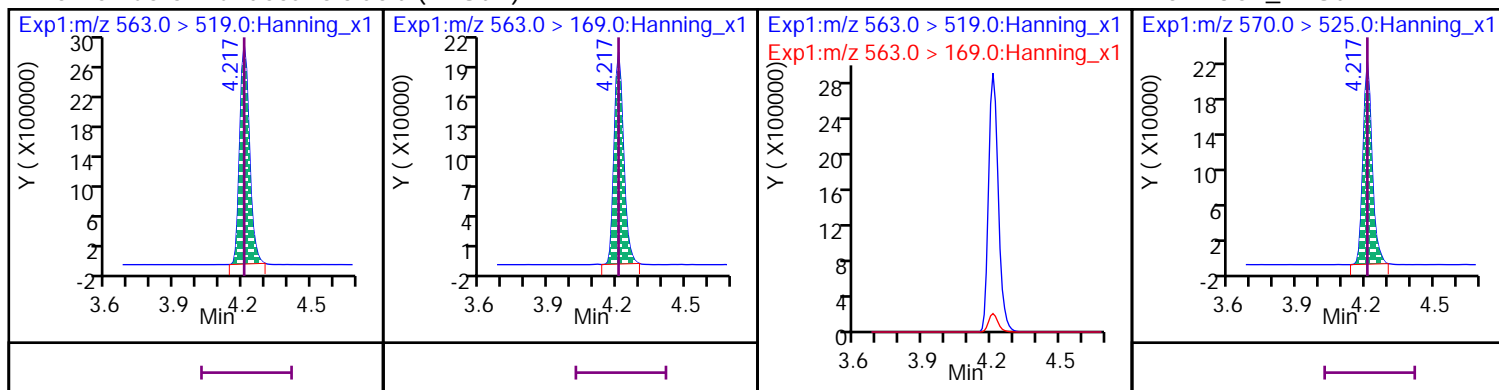
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



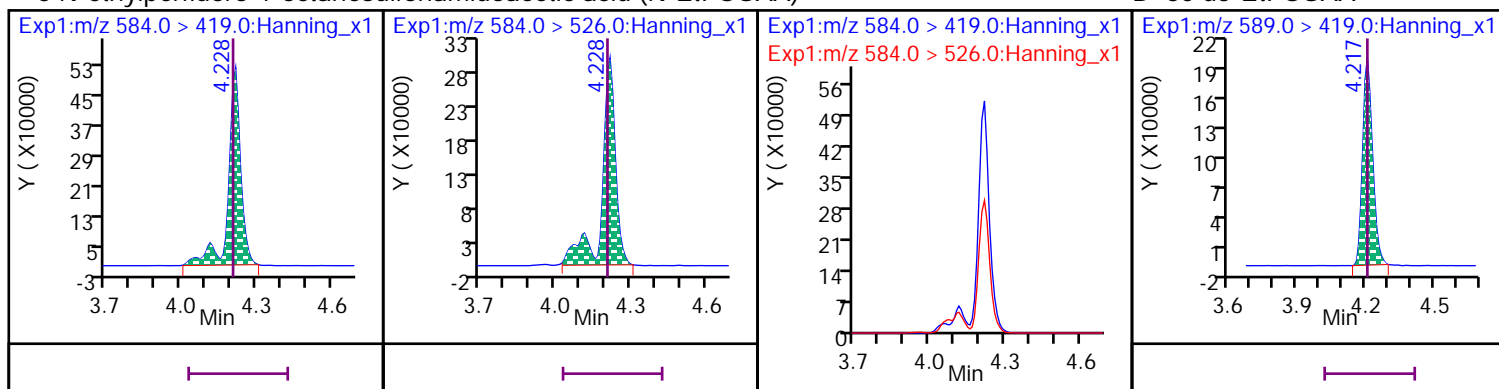
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



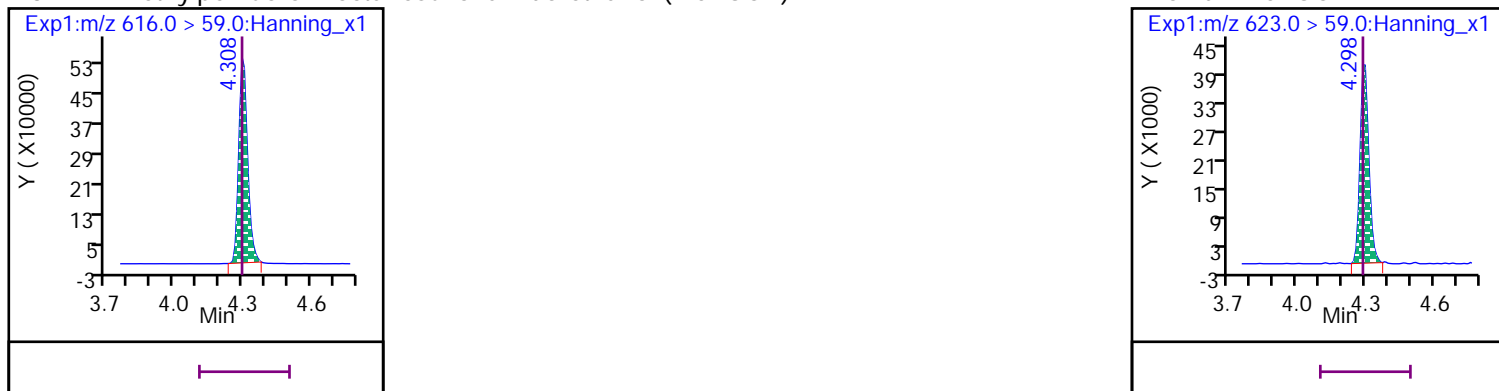
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



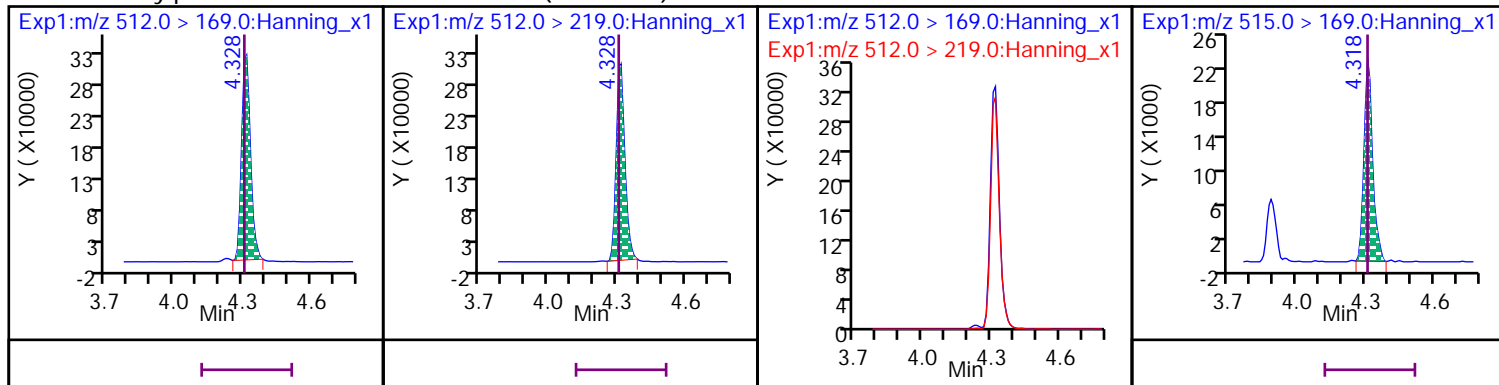
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

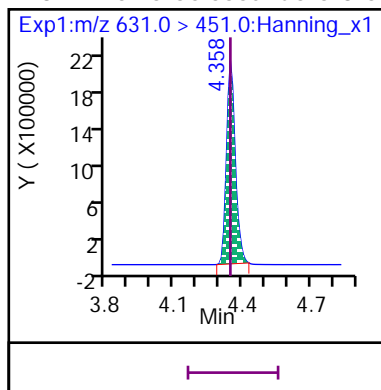


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

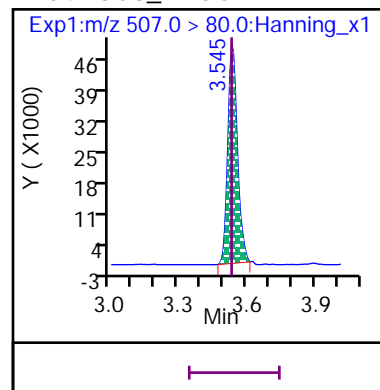
D 57 d3-MeFOSA



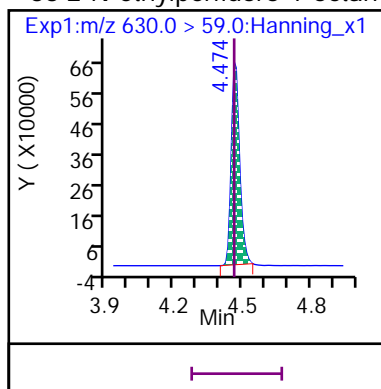
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



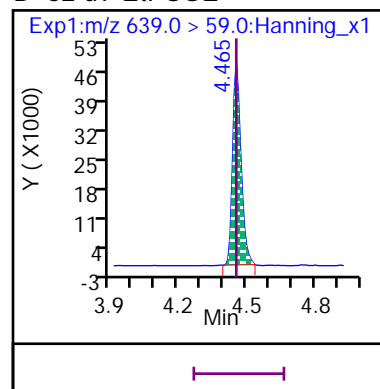
D 54 13C8\_PFOS



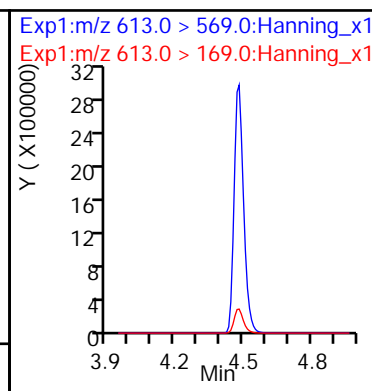
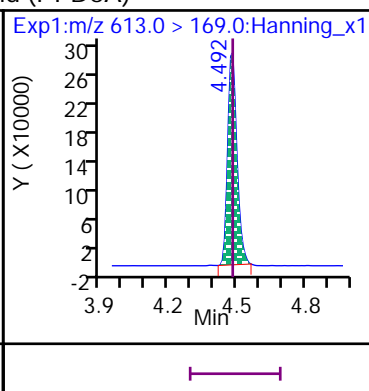
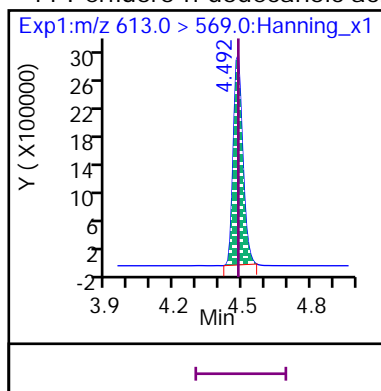
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



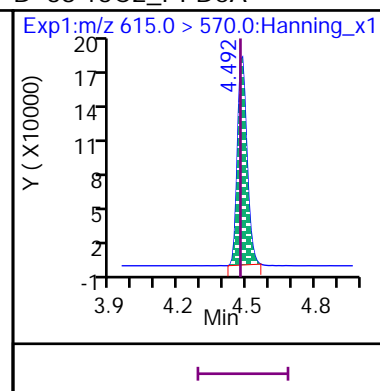
D 62 d9-EtFOSE



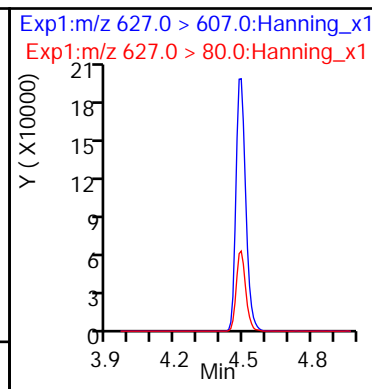
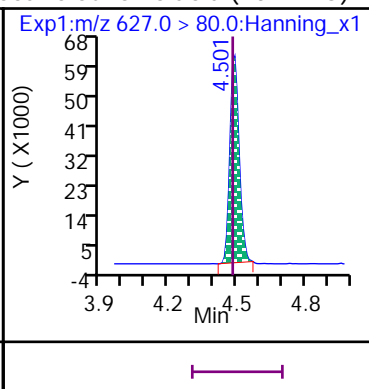
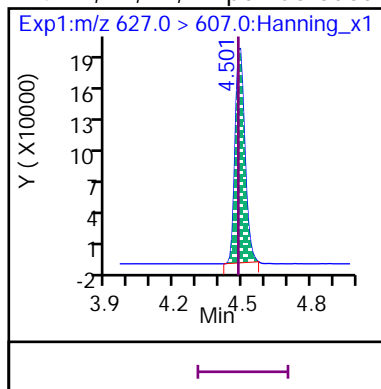
11 Perfluoro-n-dodecanoic acid (PFDaA)



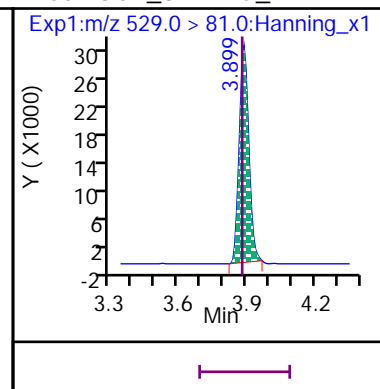
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

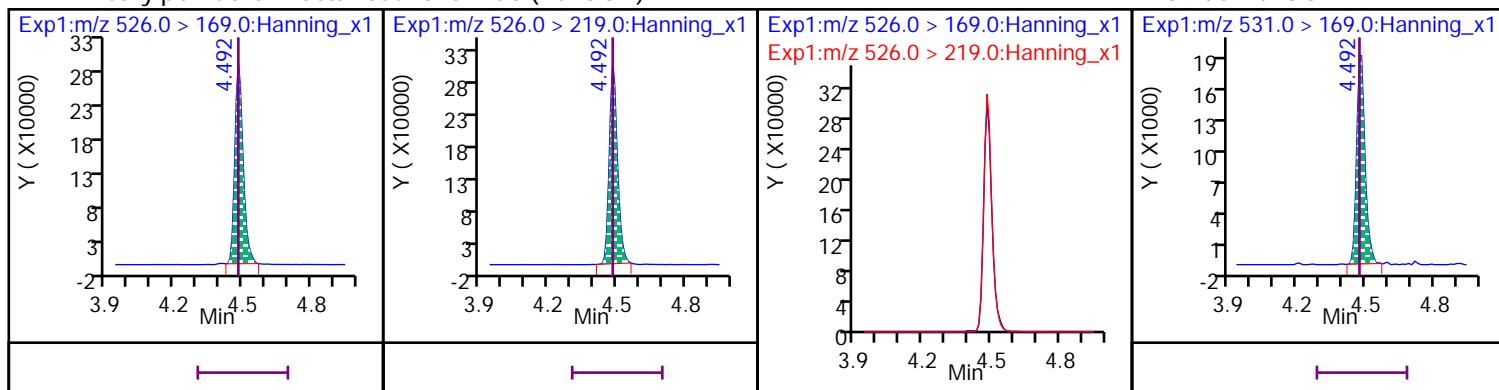


D 65 13C2\_8:2 FTS\_2



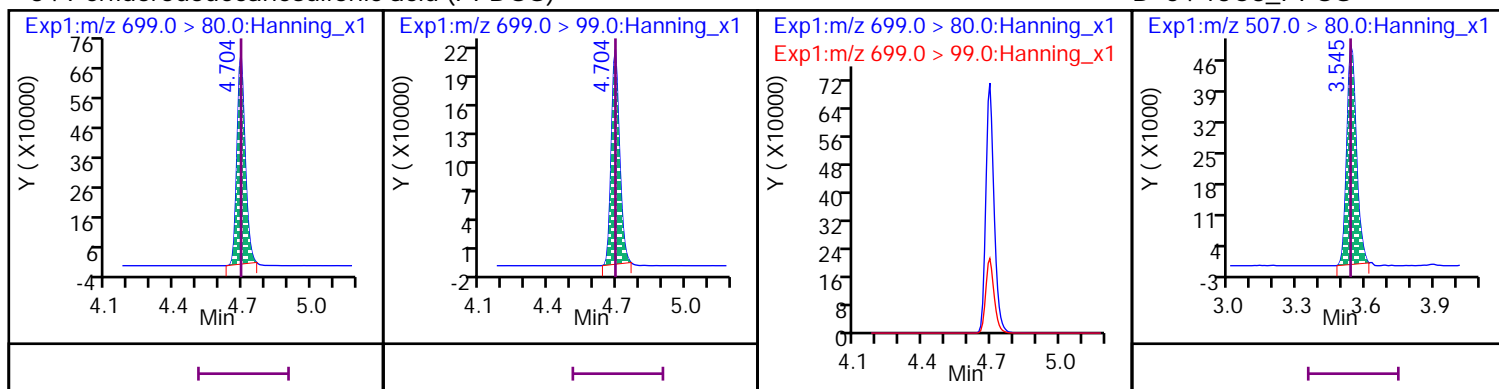
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



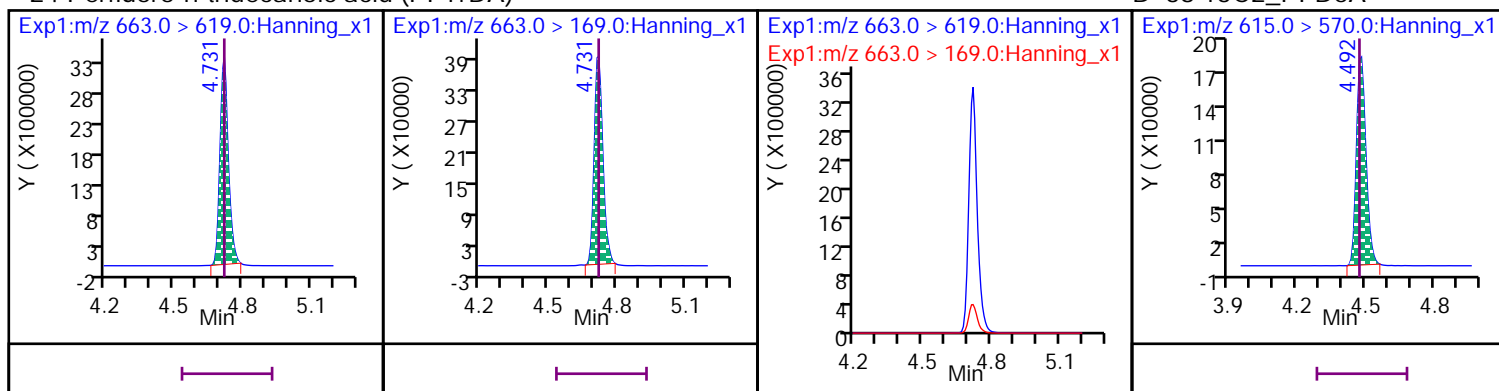
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



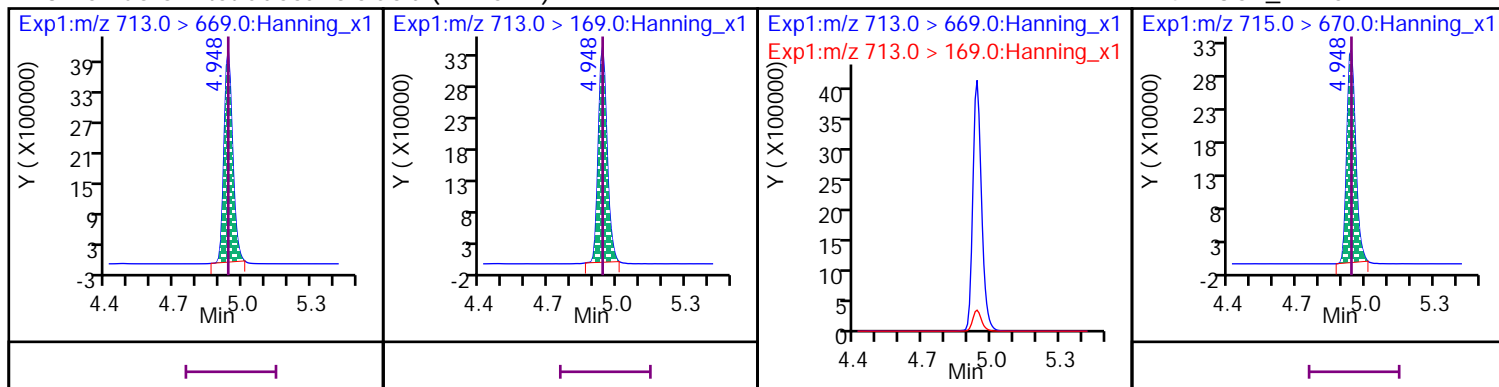
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



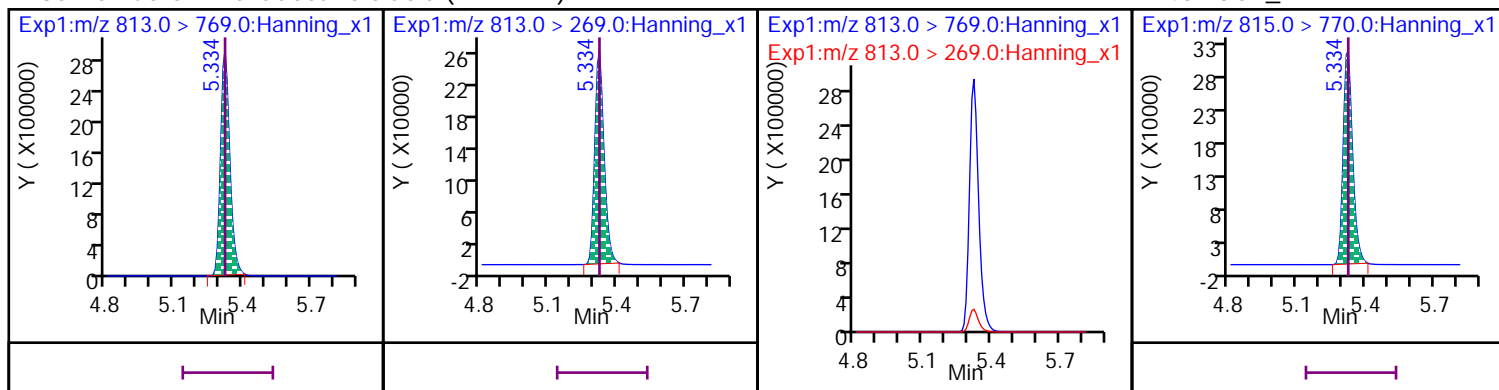
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



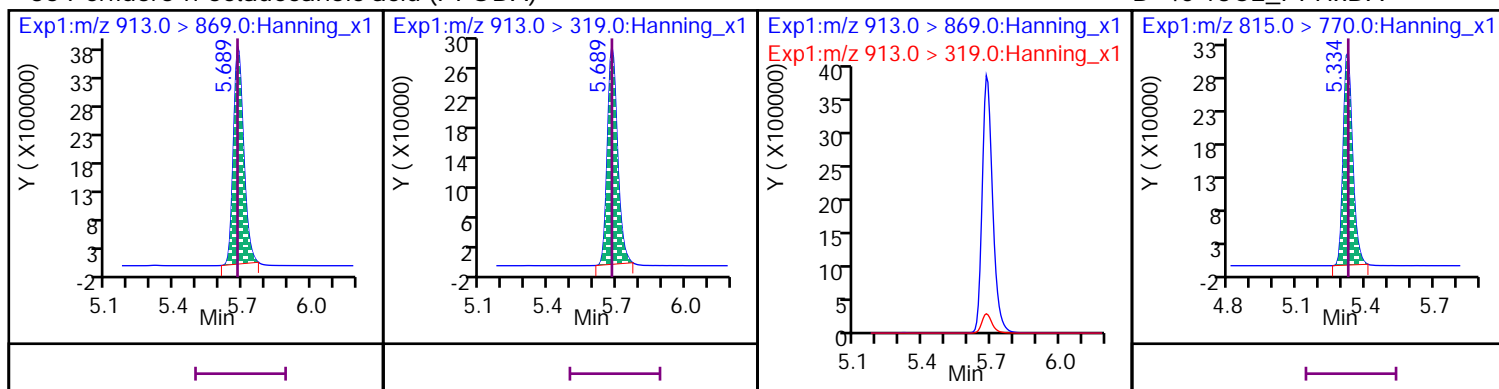
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

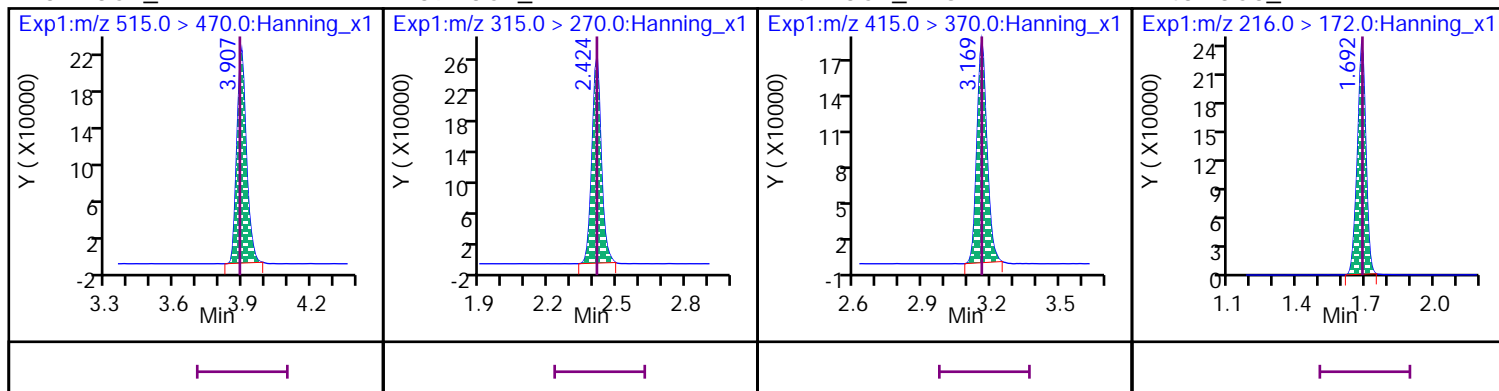


\* 37 13C2\_PFDA

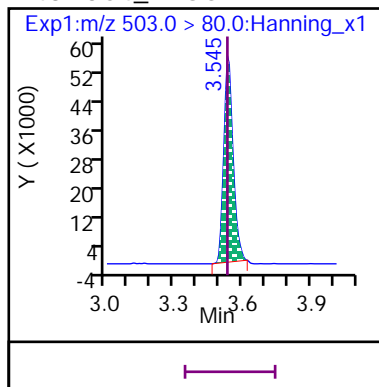
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Injection Date: 17-Dec-2020 13:47:15

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 15000\_SVLC-1227

Sample Info: ICAL 15000\_SVLC-1227

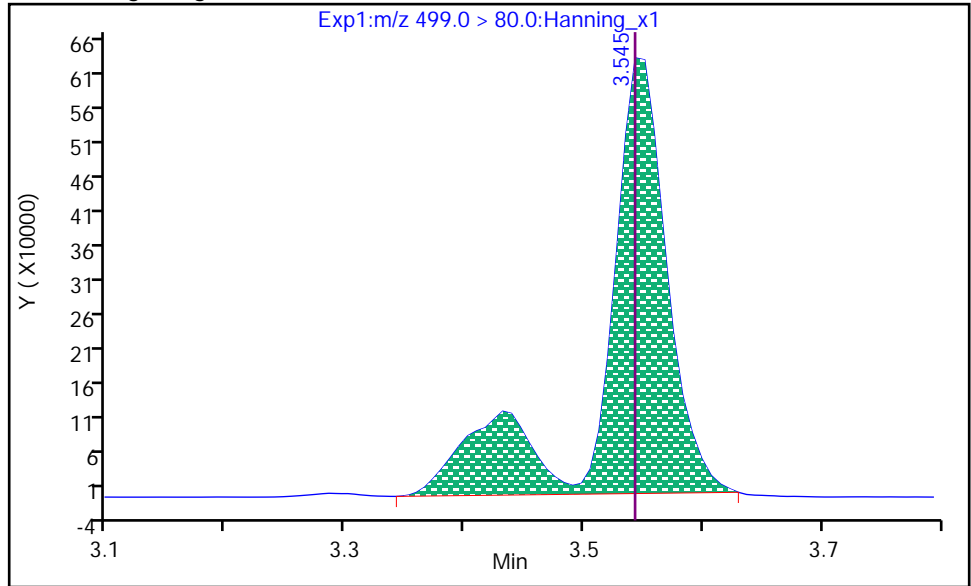
Dil. Factor: 1

Operator: Stephen E. Somerville

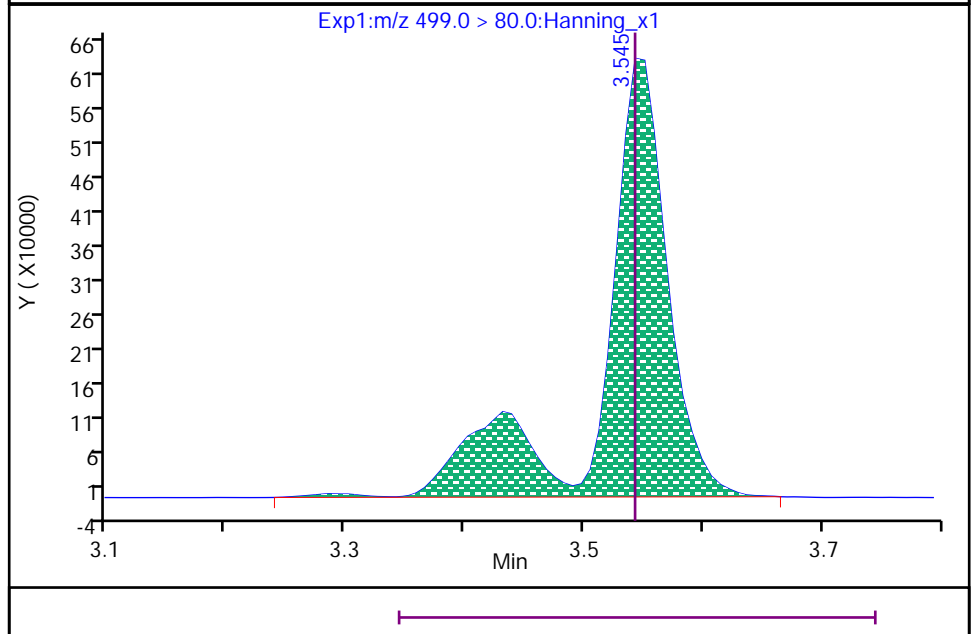
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 2327456  
Amount: 14114  
Amount Units: ng/L



RT: 3.545  
Area: 2401122  
Amount: 14457  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:30

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d  
Injection Date: 17-Dec-2020 13:57:55 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 10 Auto Sampler: 10  
Sample Info: ICAL 20000\_SVLC-1228 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.693	1.696	0	670075	22	>100:1			1000.00	966.15	91.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	13025794	23	>100:1			20000	19517		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	649876	16	>100:1			1000.00	944.74	89.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	12792943	17	>100:1			20000	19579		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	220082	16	>100:1			1000.00	955.92	88.9	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	4687642	18	>100:1	Target = 3.50		17680	18065		
298.9 > 99	44	2.120	2.125		1270618	16	>100:1	3.68 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	3788032	19		Target = 3.10		18760	19842		
349 > 99	44	2.451	2.459		1211114	19	>100:1	3.12 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.388	0	125554	18	>100:1			5000.00	5186.40	99.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/1	908357	18	>100:1	Target = 1.80		18680	18126		
327 > 81	63	2.389	2.388		465233	19	>100:1	1.95 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	703908	20	>100:1			1000.00	955.01	90.9	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	13671450	19	>100:1	Target = 18.34		20000	19672		
313 > 119	49	2.425	2.423		730813	19	>100:1	18.70 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1284072	20	>100:1			5000.00	4820.92	90.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	7308102	20	>100:1	Target = 0.81		40000	39608		
285 > 185	66	2.532	2.539		9123862	20	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	609009	20	>100:1			1000.00	1003.89	98.9	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	11978188	19	>100:1	Target = 3.70		20000	18962		
363 > 169	47	2.782	2.790		3259573	19	>100:1	3.67 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.801	2.799	1	153282	19	>100:1			1000.00	895.19	85.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.801	2.799	1/0	3091076	28	>100:1	Target = 3.21	0.20	18200	19019		
399 > 99	45	2.801	2.799		1002424	25	>100:1	3.08 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	19754392	21	>100:1	Target = 2.97		18840	20299		
377 > 85	45	2.828	2.827		6850495	19	>100:1	2.88 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	2590841	24	>100:1	Target = 3.08		19040	18606		
449 > 99	45	3.169	3.169		858330	24	>100:1	3.01 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.136	3.135	1	89950	25	>100:1			5000.00	4670.69	86	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.136	3.135	1/0	722713	25	>100:1	Target = 1.80		18960	19947		
427 > 81	64	3.136	3.135		380946	23	>100:1	1.89 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	535572	23	>100:1			1000.00	904.89	81.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	10485888	24	>100:1	Target = 2.87		20000	19205		
413 > 169	53	3.162	3.169		3816512	25	>100:1	2.74 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	145625	19	>100:1			1000.00	971.29	94.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/1	3340366	65	>100:1	Target = 3.84	0.26	18560	19357		M
499 > 99	54	3.545	3.545		918527	39	>100:1	3.63 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/1	9237909	22	>100:1			18640	18844		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.883	3.891	0/0	2041151	21	>100:1	Target = 3.07		19200	18316		
549 > 99	54	3.891	3.891		725525	20	>100:1	2.81 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.188	4.198	0/0	1951749	17	>100:1	Target = 3.03		19280	18468		
599 > 99	54	4.188	4.198		745570	19	>100:1	2.61 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/1	7819762	17	>100:1			18840	18908		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.697	4.704	0/0	2271201	19	>100:1	Target = 3.33		19360	19427		
699 > 99	54	4.697	4.704		731085	19	>100:1	3.10 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	726828	21	>100:1			1000.00	967.86	91.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	14144518	21	>100:1	Target = 6.16		20000	19460		
463 > 169	56	3.545	3.545		2265972	21	>100:1	6.24 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	286198	20	>100:1			1000.00	924.52	86.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	5864519	20	>100:1			20000	20794		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	92635	20				5000.00	4993.76	99.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	679202	19	>100:1	Target = 1.95		19160	18531		
527 > 81	65	3.891	3.891		362505	20	>100:1	1.87 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	755148	17		Target = 3.14		19280	17638		
627 > 80	65	4.492	4.492		230501	16		3.27 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	638714	19	>100:1			1000.00	962.89	91.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	11882751	20	>100:1	Target = 15.94		20000	18934		
513 > 169	51	3.899	3.899		898257	20	>100:1	13.22 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	733711	20	49:1			5000.00	5111.57	96.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.056	4.065	0/-1	2232283	33	>100:1	Target = 1.33	0.11	20000	19804		
570 > 483	58	4.056	4.065		1659506	33	>100:1	1.34 (0.66-1.99)	0.22				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.217	0	556076	19	>100:1			5000.00	4186.86	75.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/1	2255329	33	>100:1	Target = 1.58	0.14	20000	20369		
584 > 526	60	4.218	4.217		1423459	33	>100:1	1.58 (0.79-2.37)	0.25				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.207	4.217	0	591898	17	>100:1			1000.00	936.44	87.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.207	4.217	0/0	10456451	17	>100:1	Target = 15.50		20000	18796		
563 > 169	52	4.207	4.217		772432	17	>100:1	13.53 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	110386	16	>100:1			1000.00	1020.13	94.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	1976969	15	>100:1			20000	19061		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.319	4.318	1	52621	15	>100:1			1000.00	994.41	95.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.318	1/0	1153715	16	>100:1	Target = 1.12		20000	19434		
512 > 219	57	4.319	4.318		1104600	15	>100:1	1.04 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	129932	18	>100:1			1000.00	1036.18	107	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/1	2138227	17	>100:1			20000	18497		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	1	573941	16	>100:1			1000.00	948.17	88.4	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.483	4.492	0/-1	10629213	18	>100:1	Target = 10.85		20000	18288		
613 > 169	38	4.483	4.492		1032339	17	>100:1	10.29 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.725	4.731	0/-1	10906551	20	>100:1	Target = 8.37		20000	19294		
663 > 169	38	4.725	4.731		1321952	19	>100:1	8.25 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49215	16	>100:1			1000.00	1002.45	95.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	1041046	16	>100:1	Target = 1.03		20000	19362		
526 > 219	59	4.492	4.492		1036700	19	>100:1	1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.940	4.948	0	837427	19	>100:1			1000.00	994.05	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/1	13577068	21	>100:1	Target = 12.11		20000	18712		
713 > 169	42	4.948	4.948		1187683	21	>100:1	11.43 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	886840	19	>100:1			1000.00	978.67	97.1	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	10474146	19	>100:1	Target = 11.48		20000	18076		
813 > 269	40	5.334	5.334		976974	19	>100:1	10.72 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.688	5.689	0/-1	15583360	26	>100:1	Target = 13.88		20000	19850		
913 > 319	40	5.688	5.689		1159653	24	>100:1	13.43 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	655979	20	>100:1					90.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	724179	19	>100:1					96.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	567967	24	>100:1					88.2	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.693	1.696	0	622072	23	>100:1					93.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	162431	21	>100:1					100	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d

Injection Date: 17-Dec-2020 13:57:55

Inst. ID: LCMSMS02

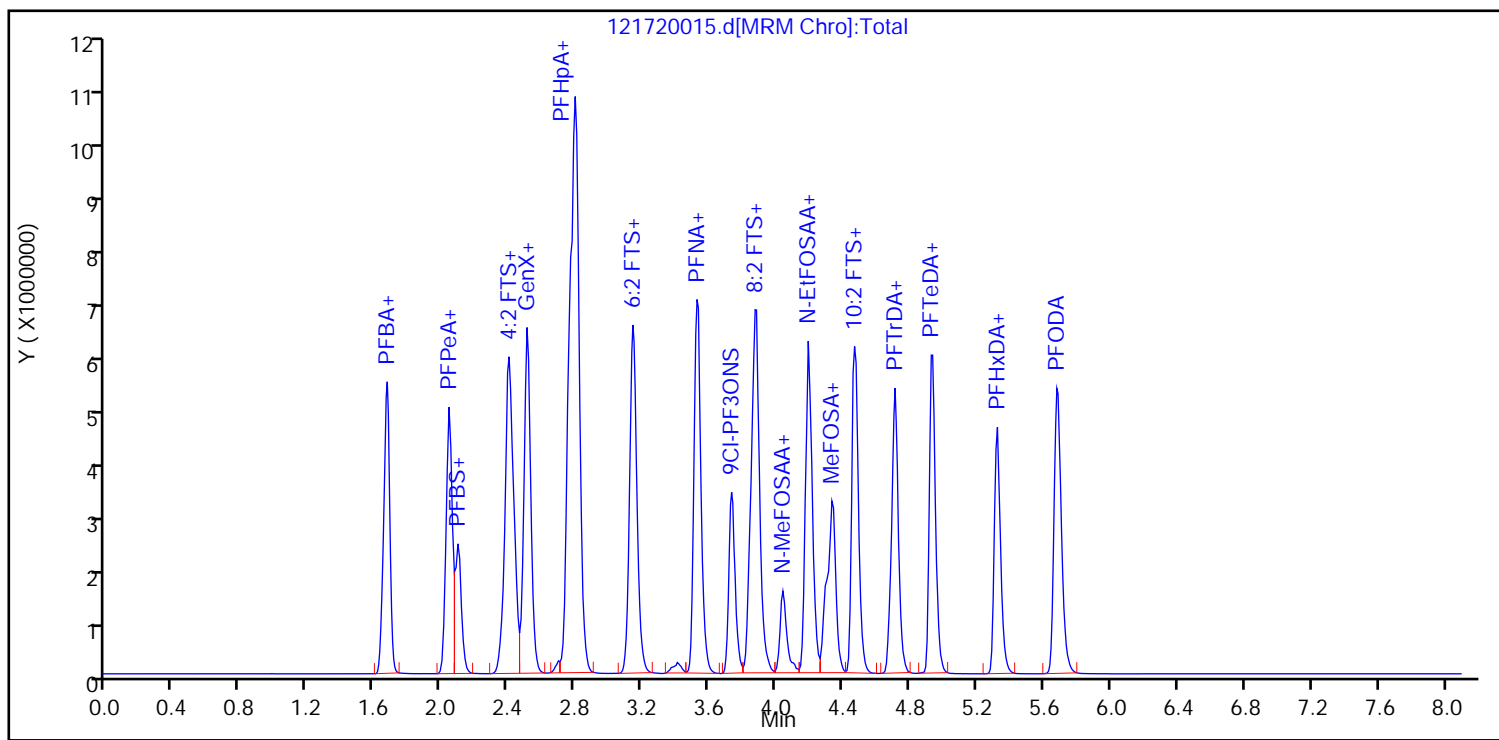
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Lab ID: ICAL 20000\_SVLC-1228

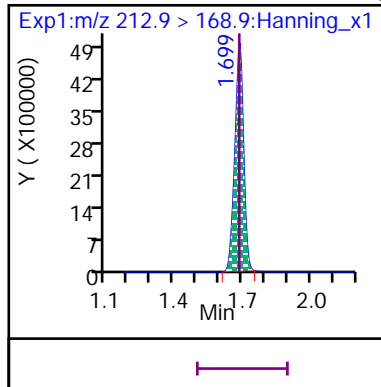
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Dil. Factor: 1

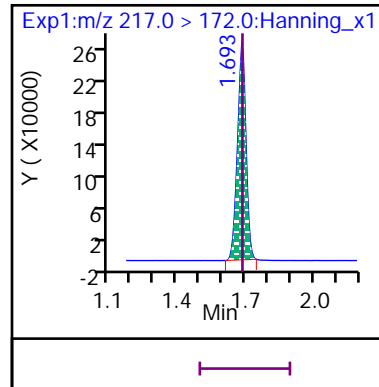
Operator: Stephen E. Somerville



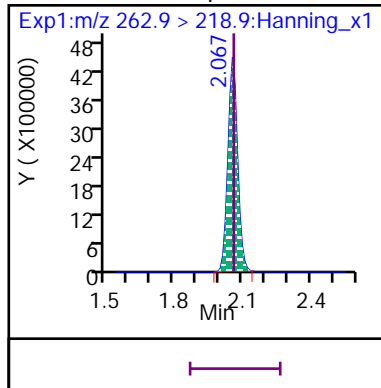
8 Perfluoro-n-butanoic acid (PFBA)



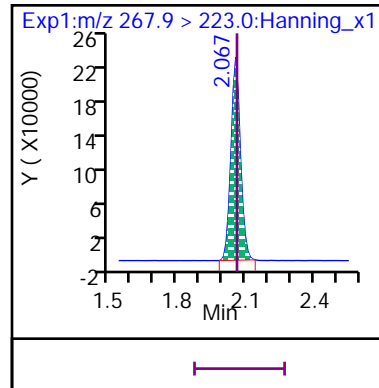
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

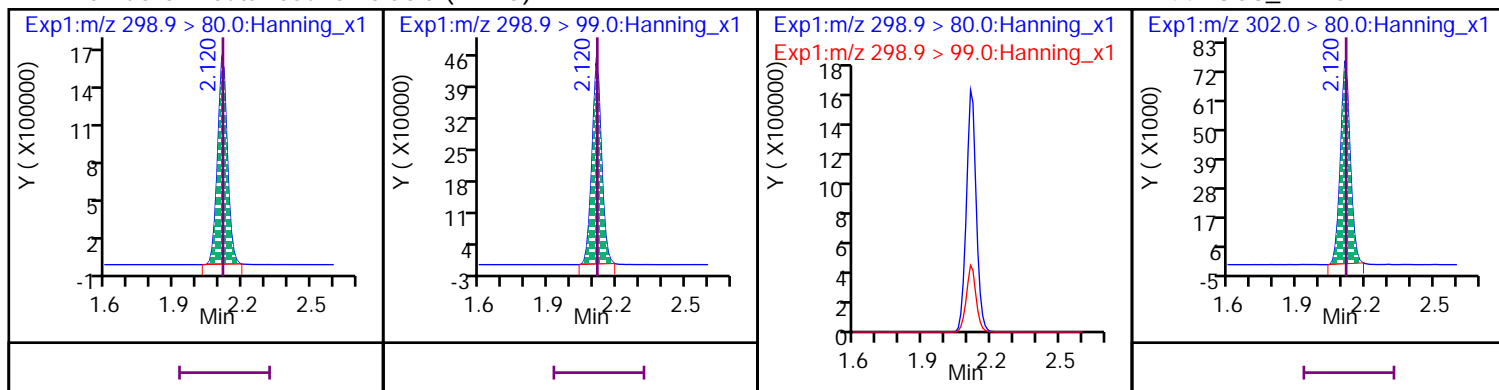


D 50 13C5\_PFPeA



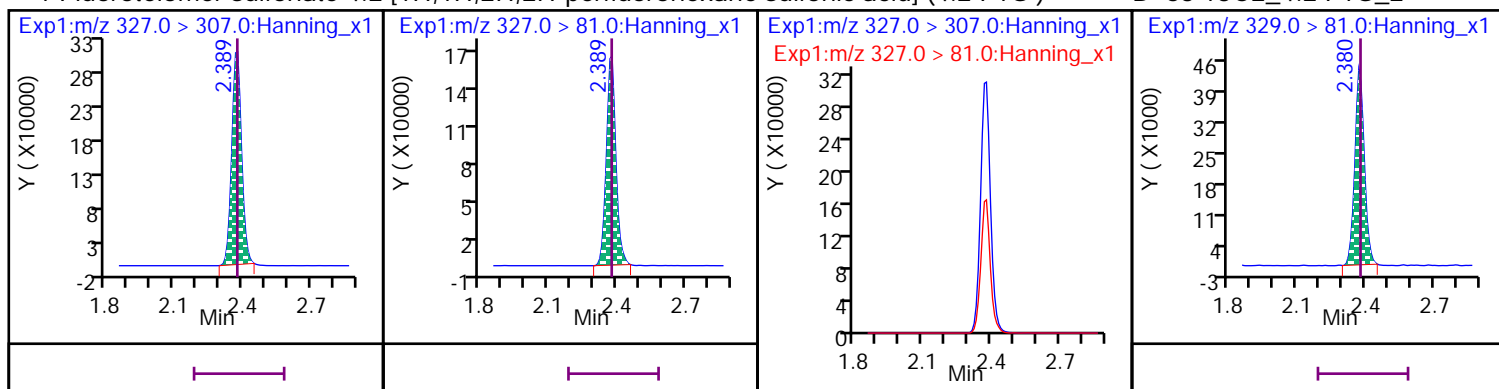
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



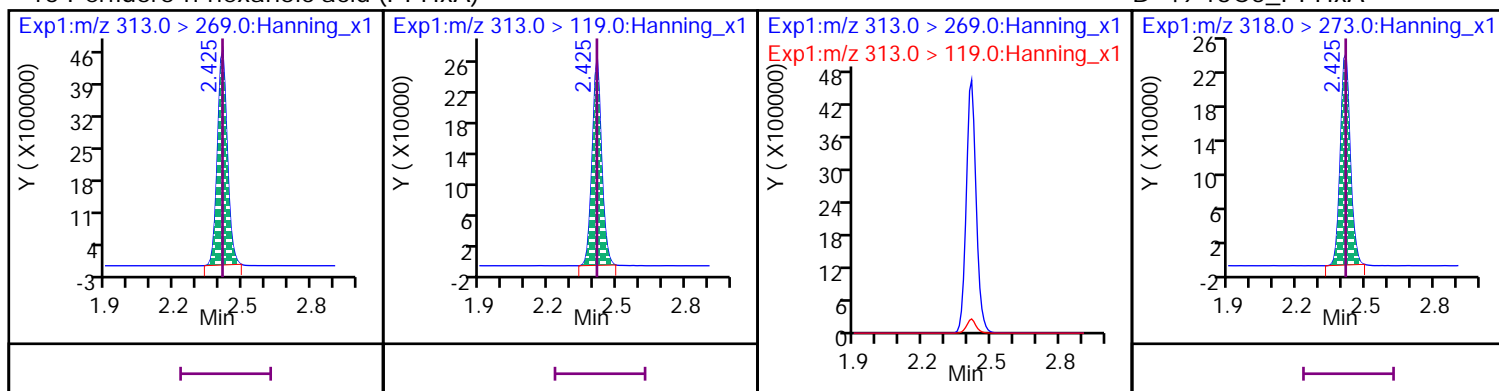
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



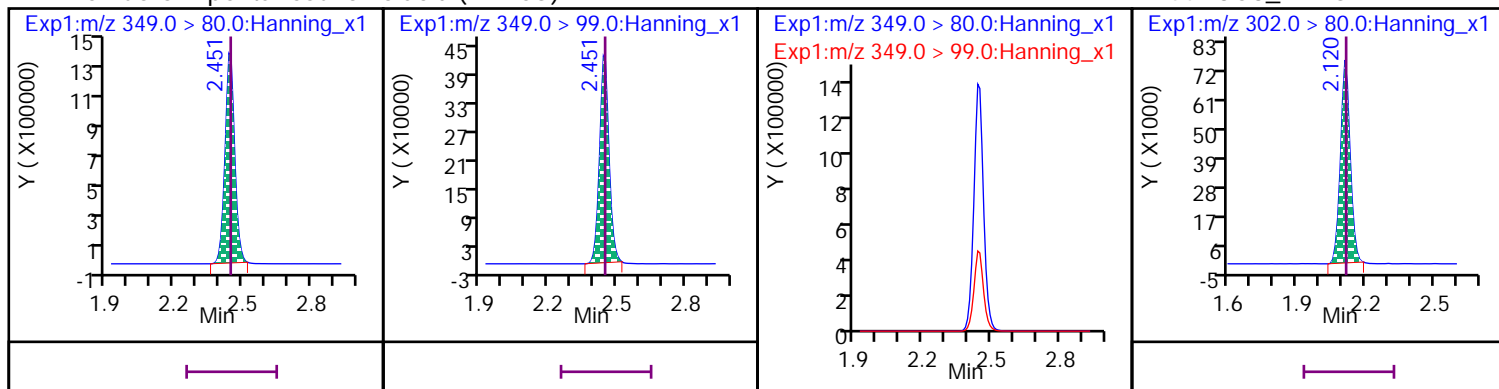
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



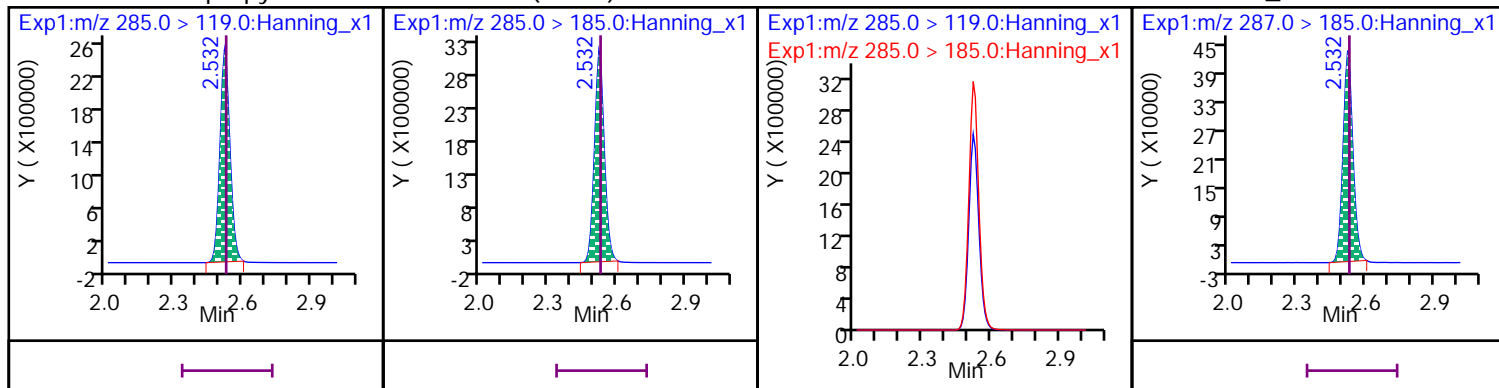
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



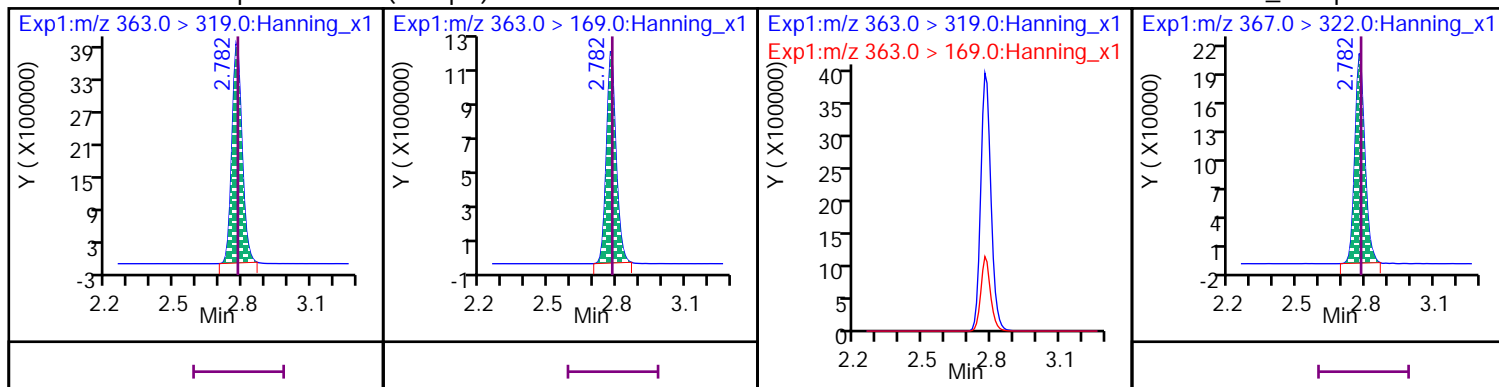
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



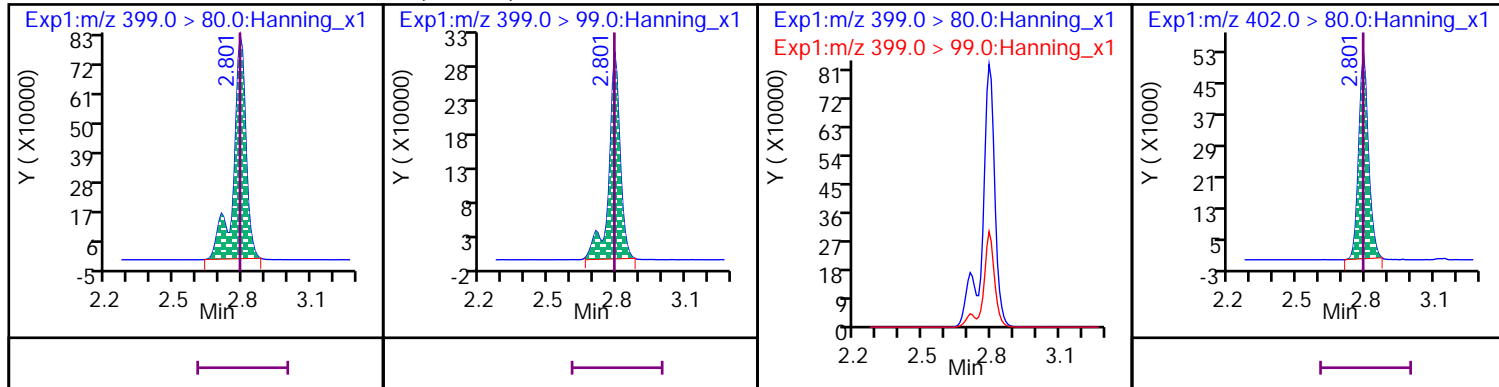
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



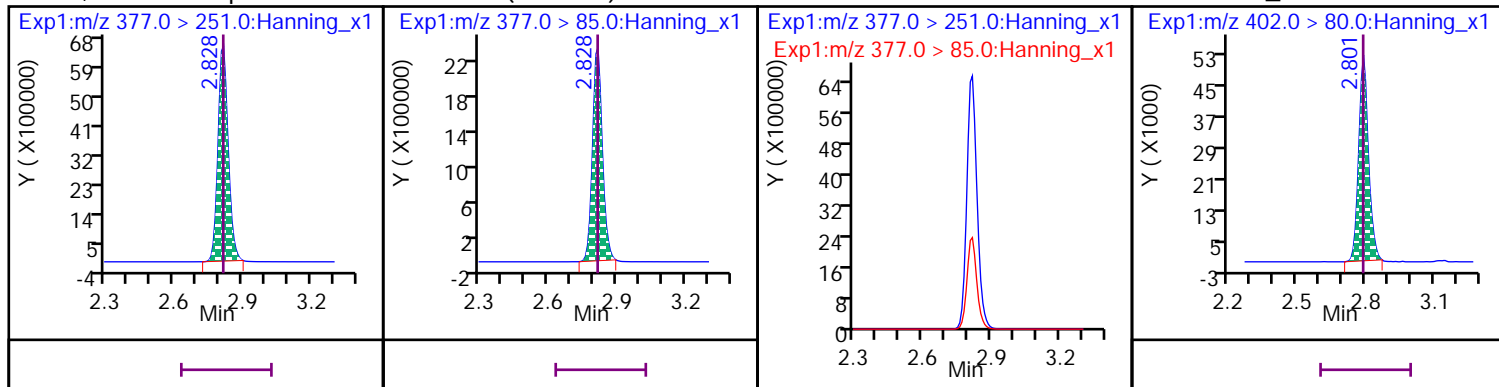
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

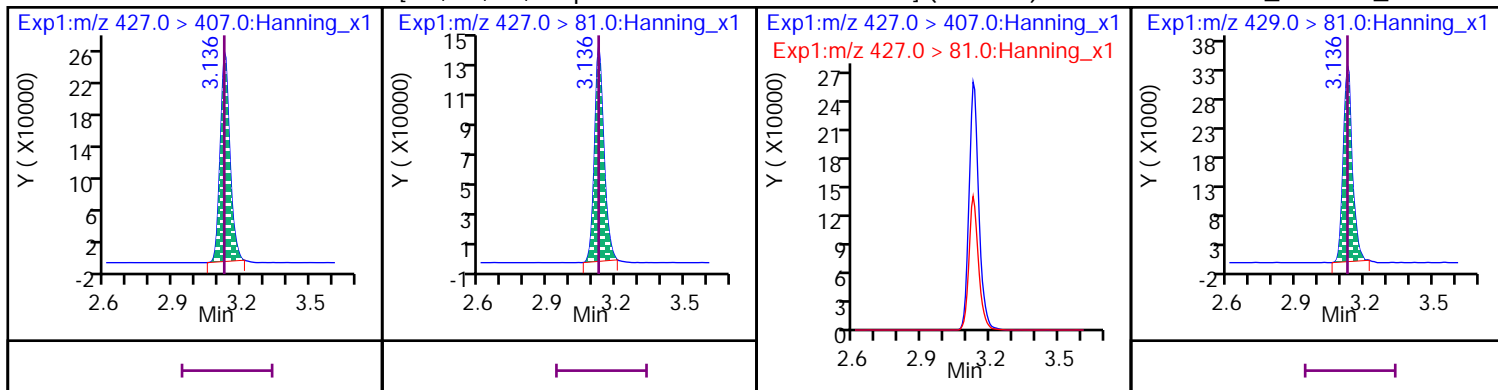
D 45 13C3\_PFHxS





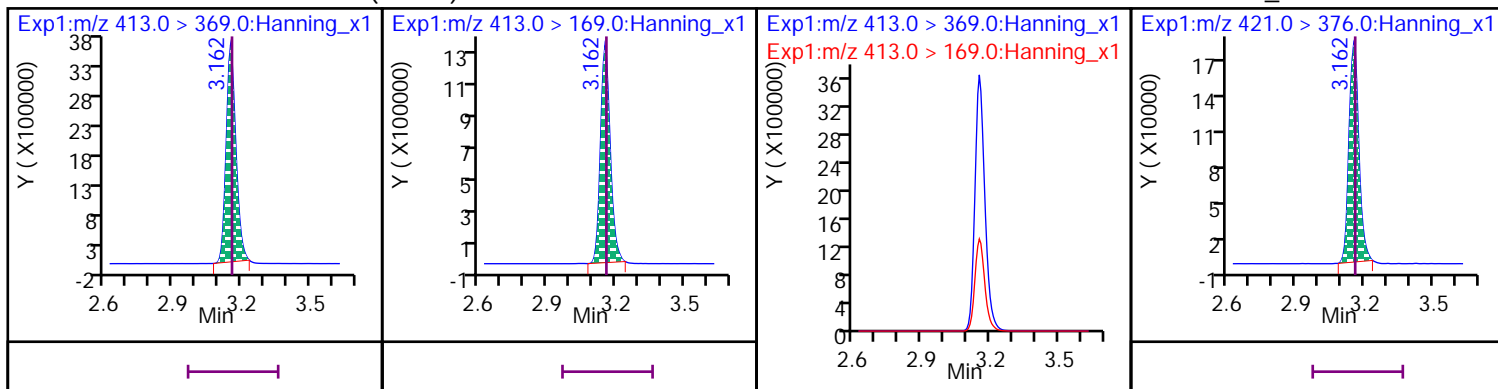
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



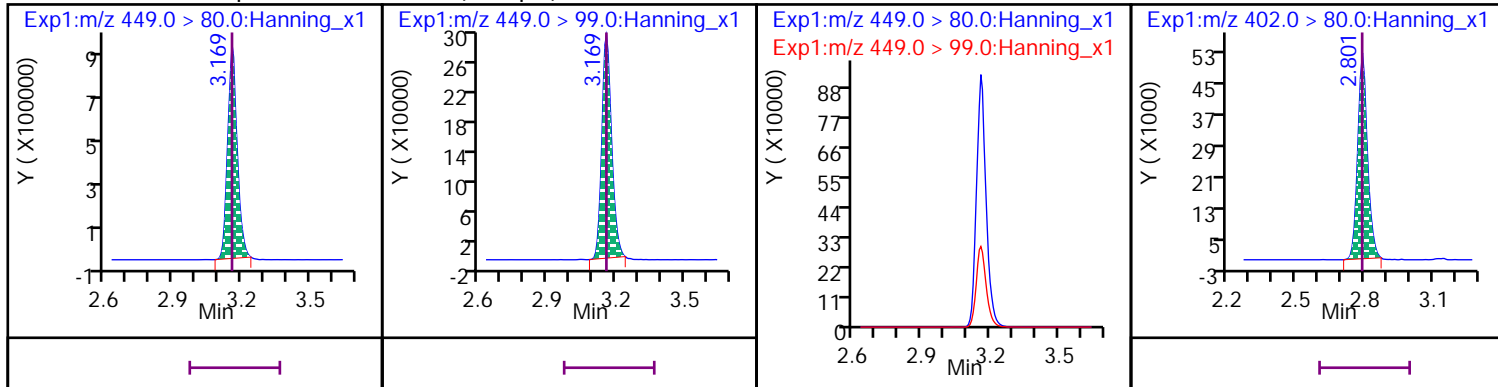
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



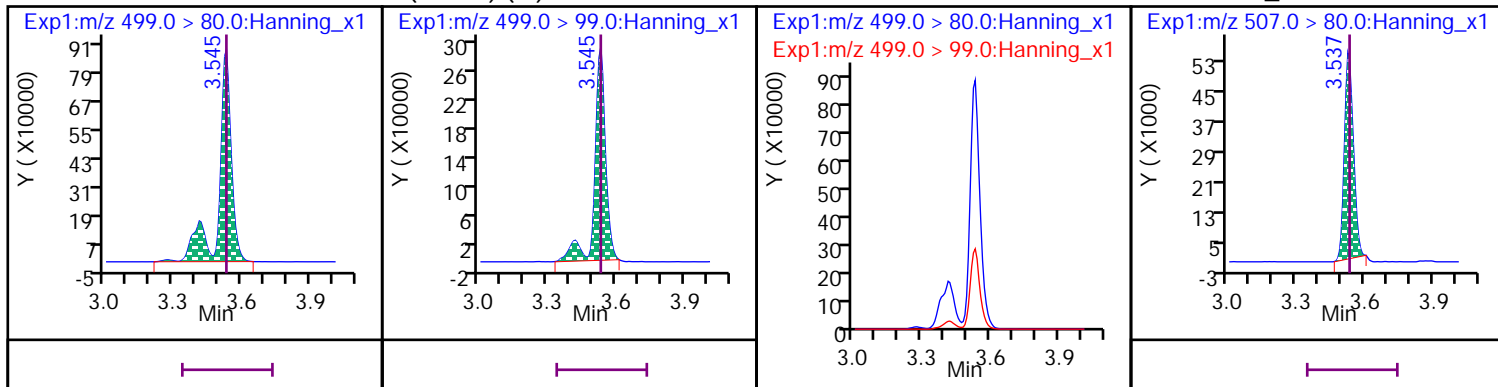
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



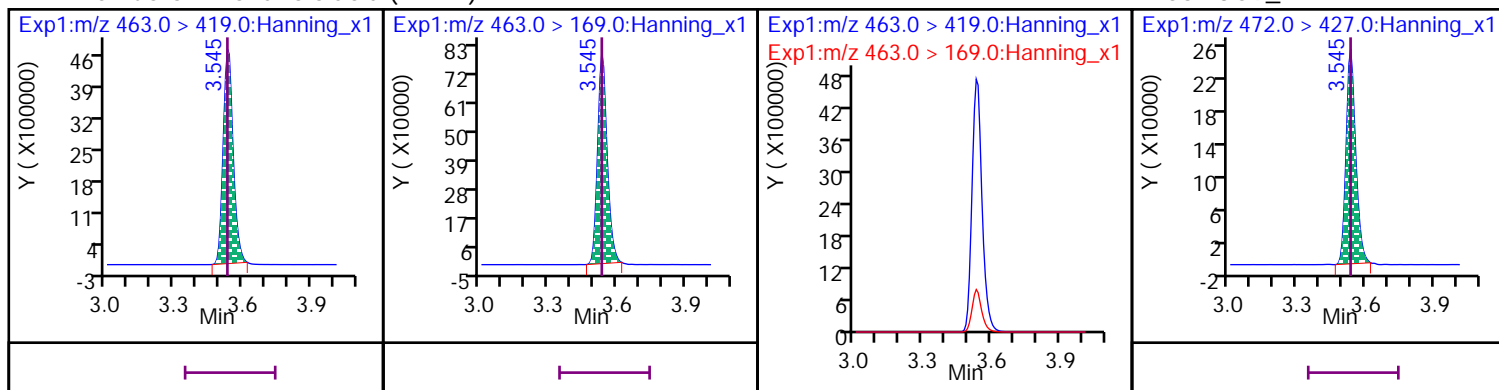
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



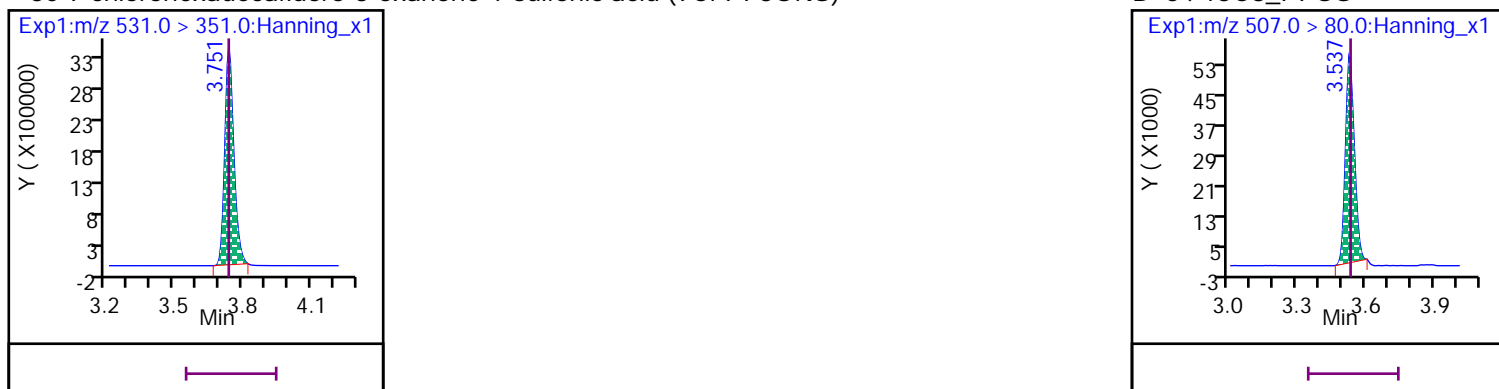
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



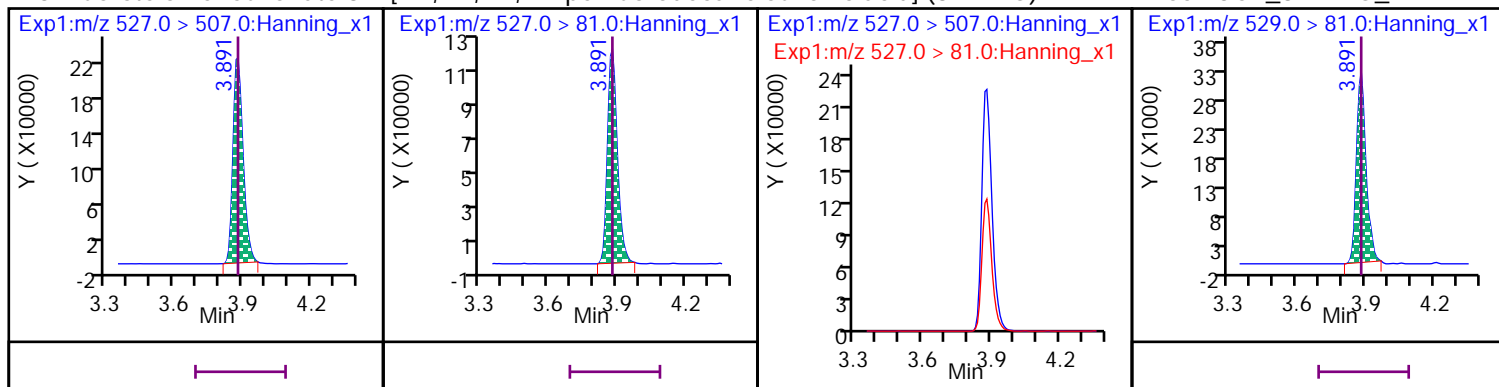
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



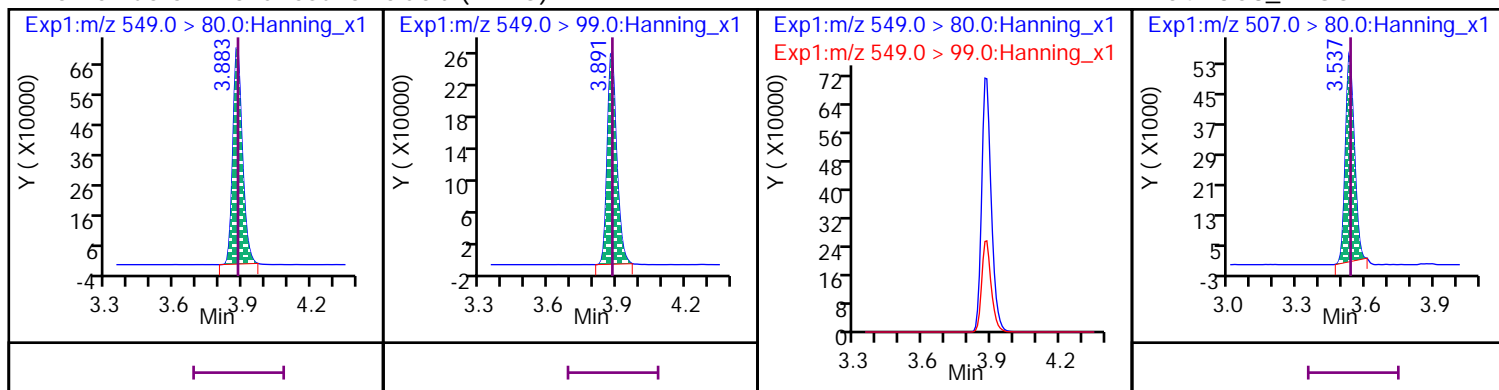
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



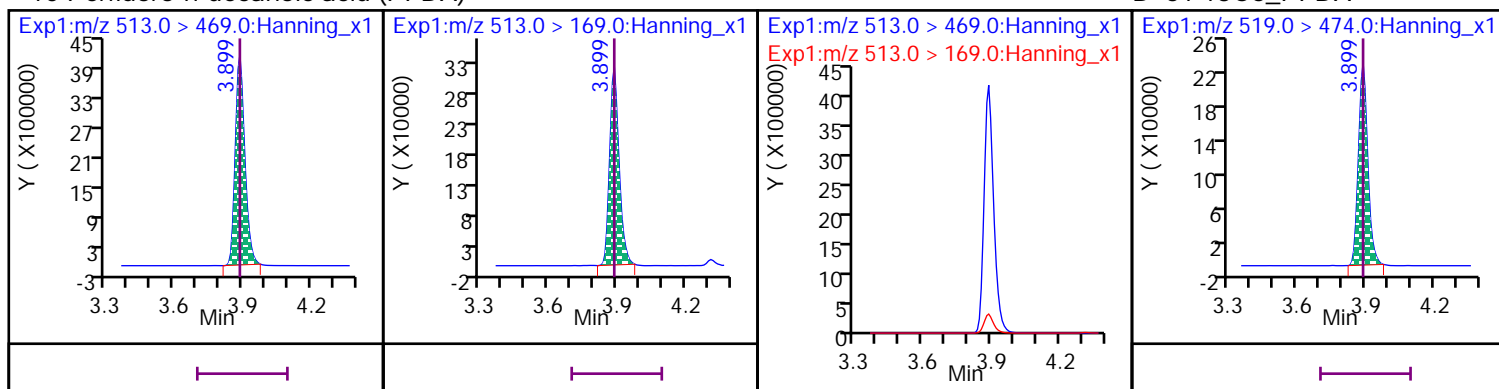
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



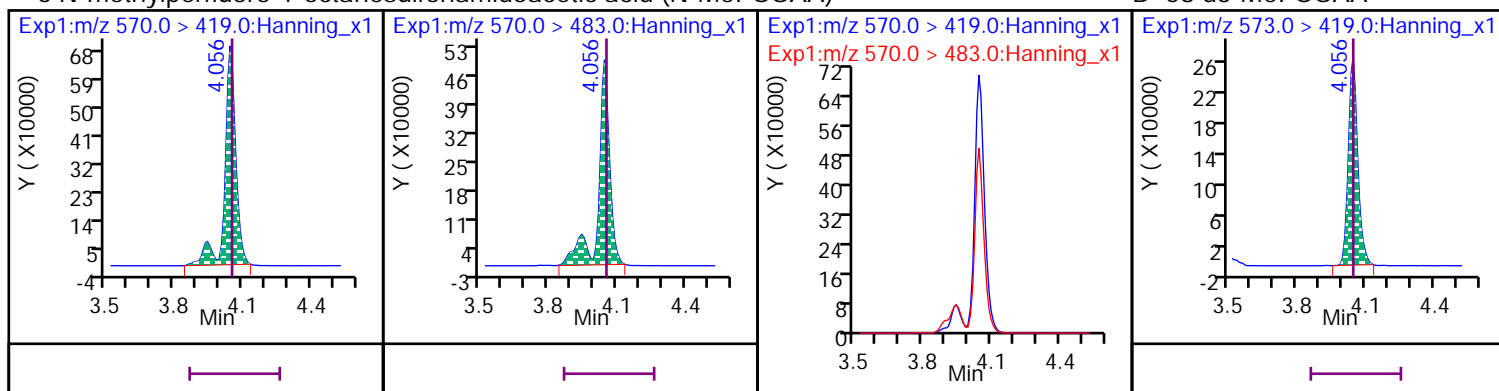
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



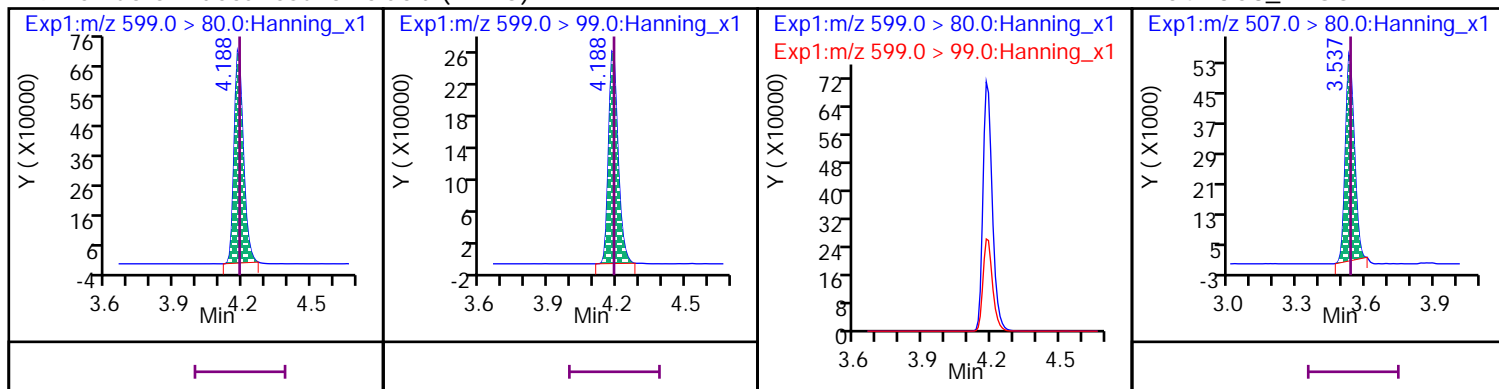
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



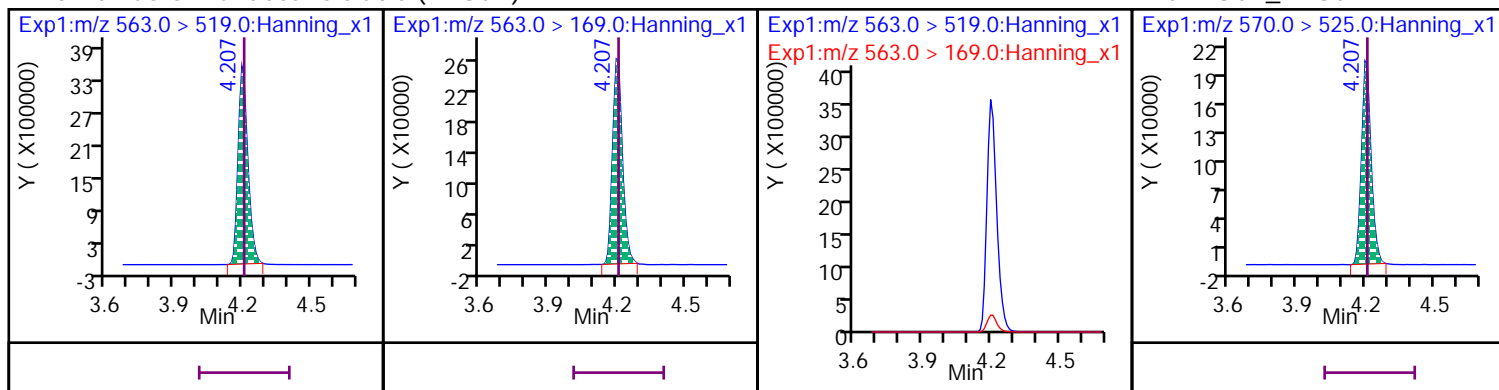
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



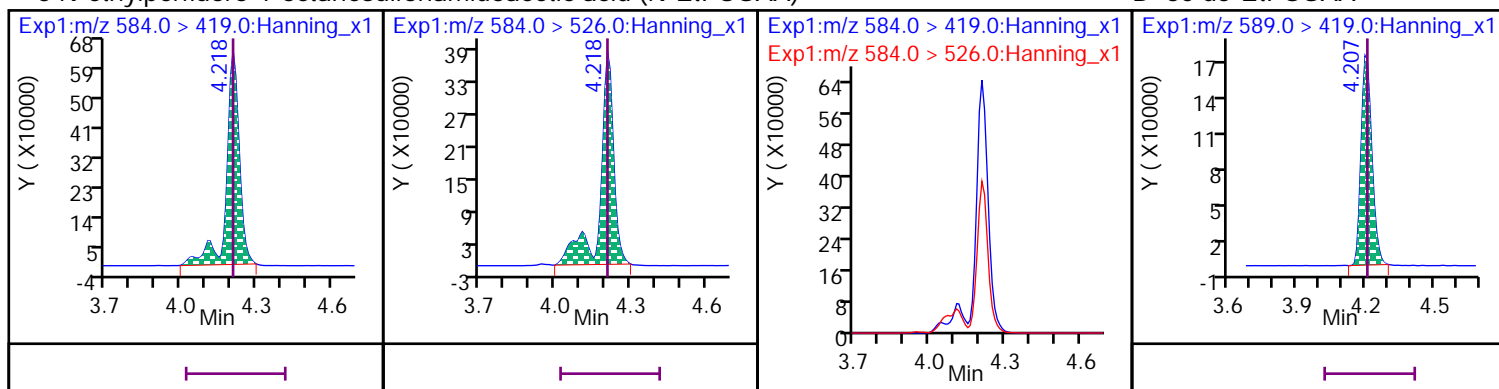
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



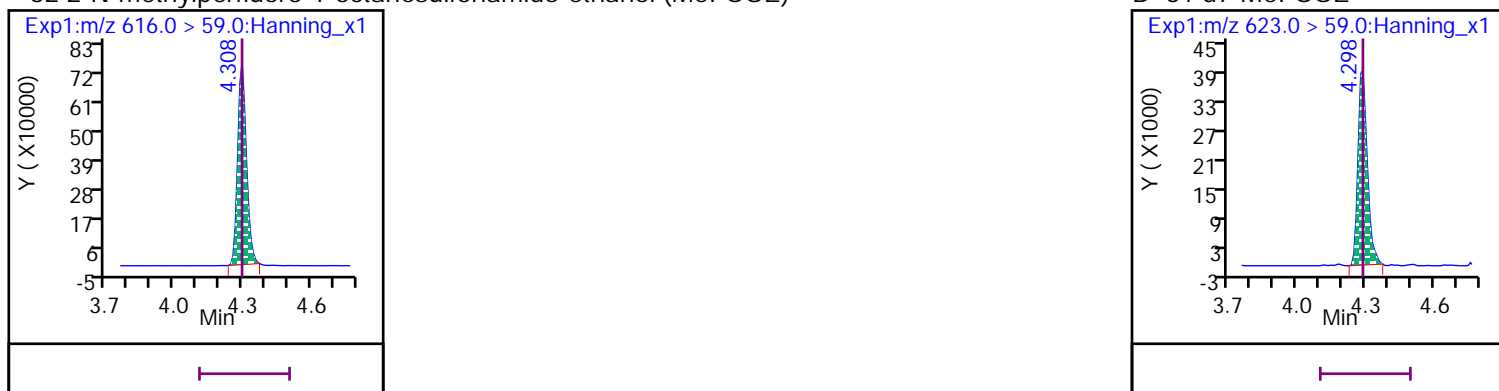
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



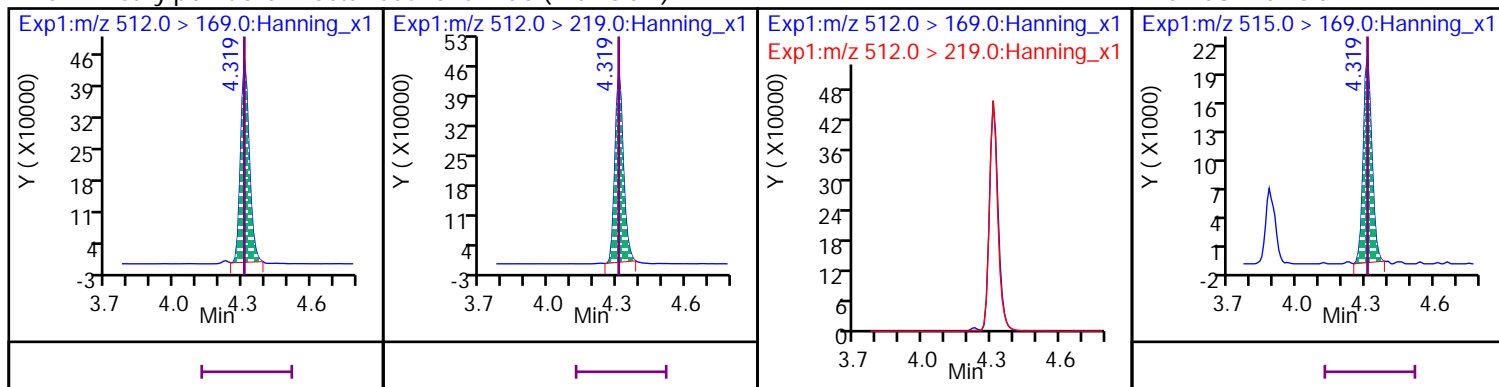
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

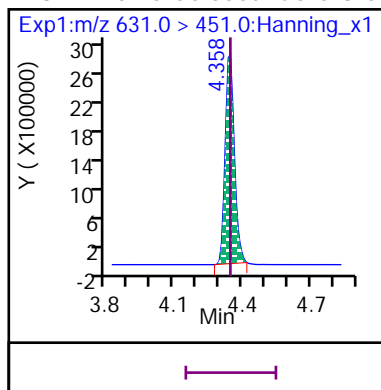


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

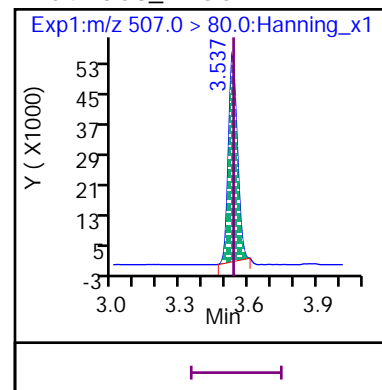
D 57 d3-MeFOSA



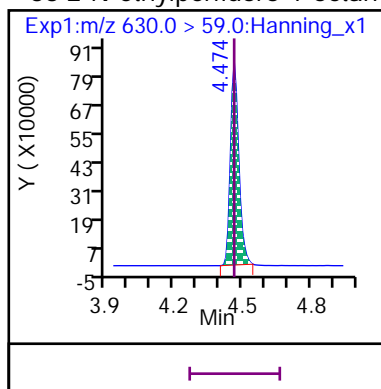
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



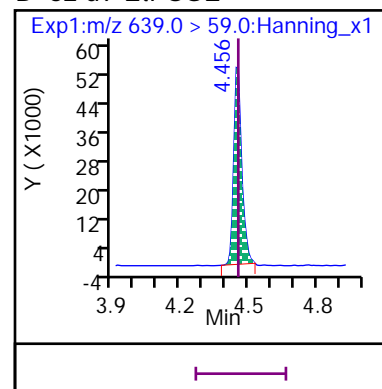
D 54 13C8\_PFOS



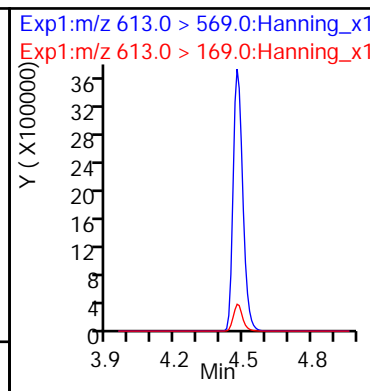
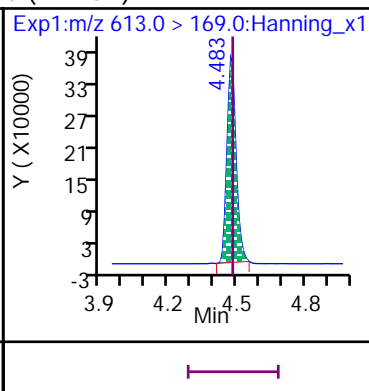
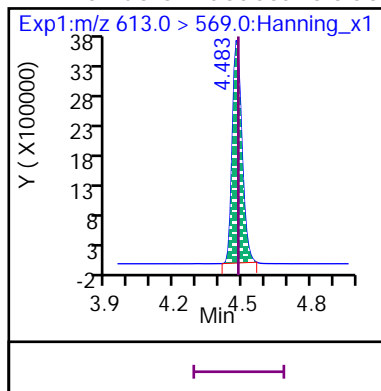
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



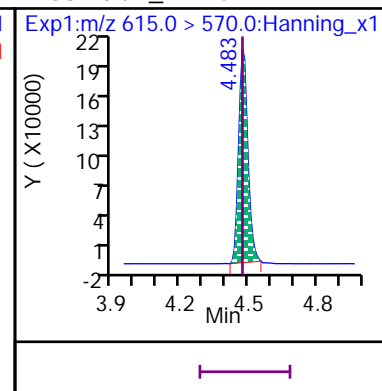
D 62 d9-EtFOSE



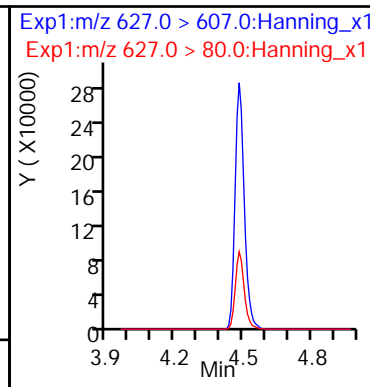
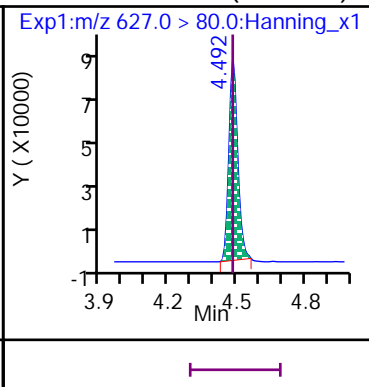
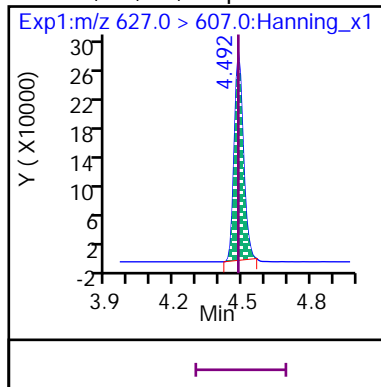
11 Perfluoro-n-dodecanoic acid (PFDaA)



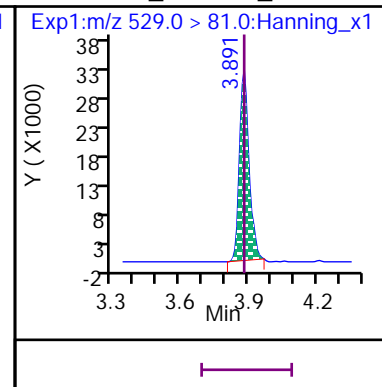
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

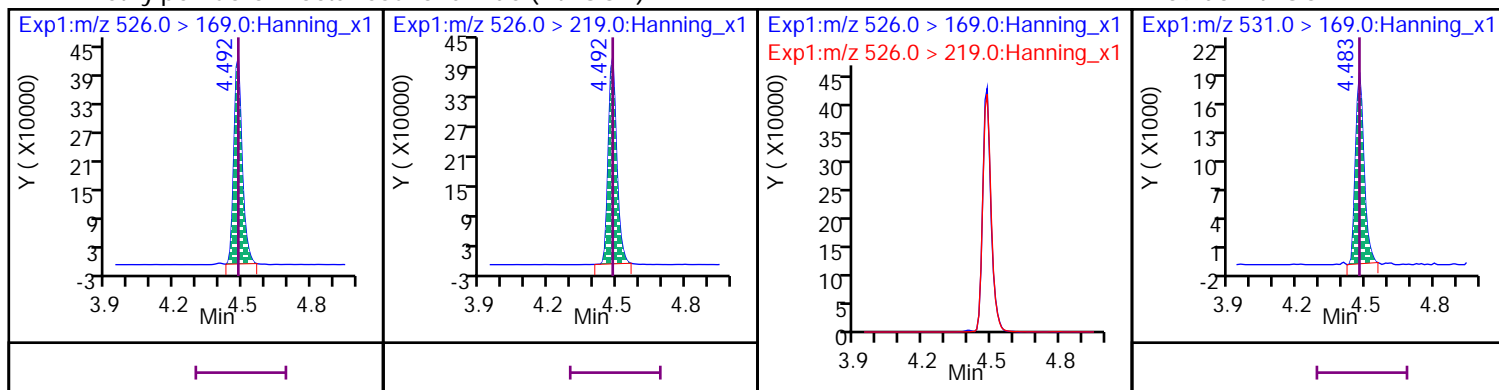


D 65 13C2\_8:2 FTS\_2



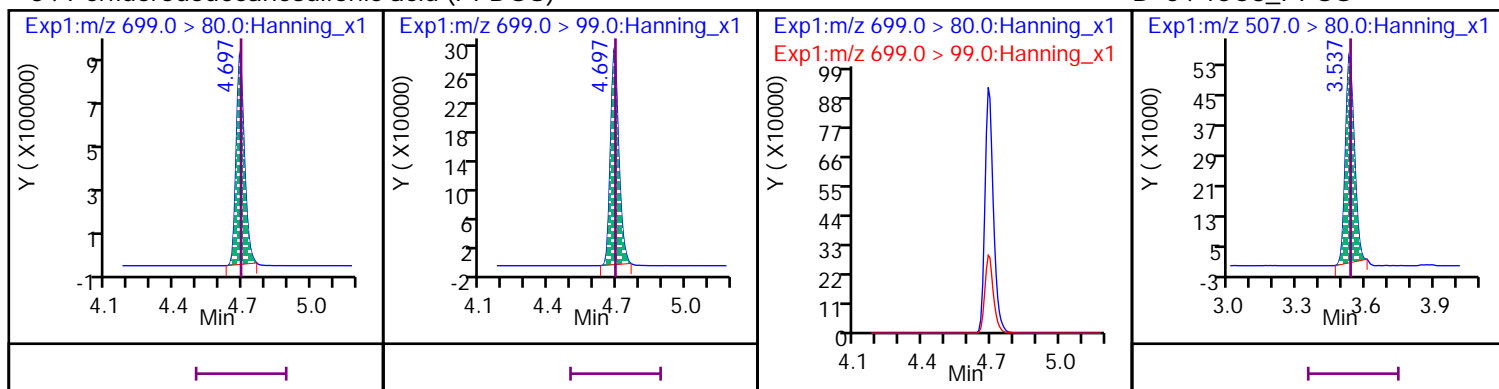
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



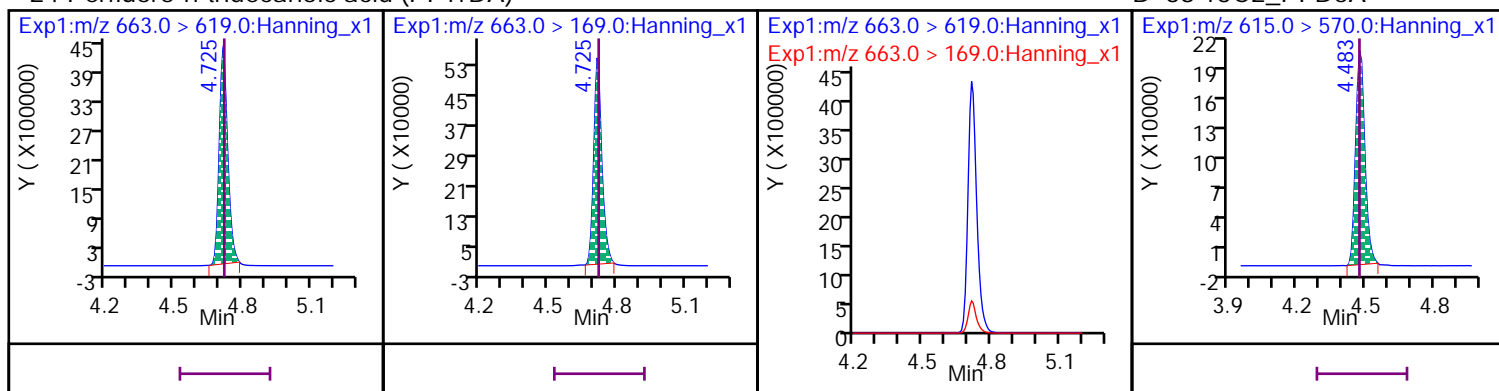
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



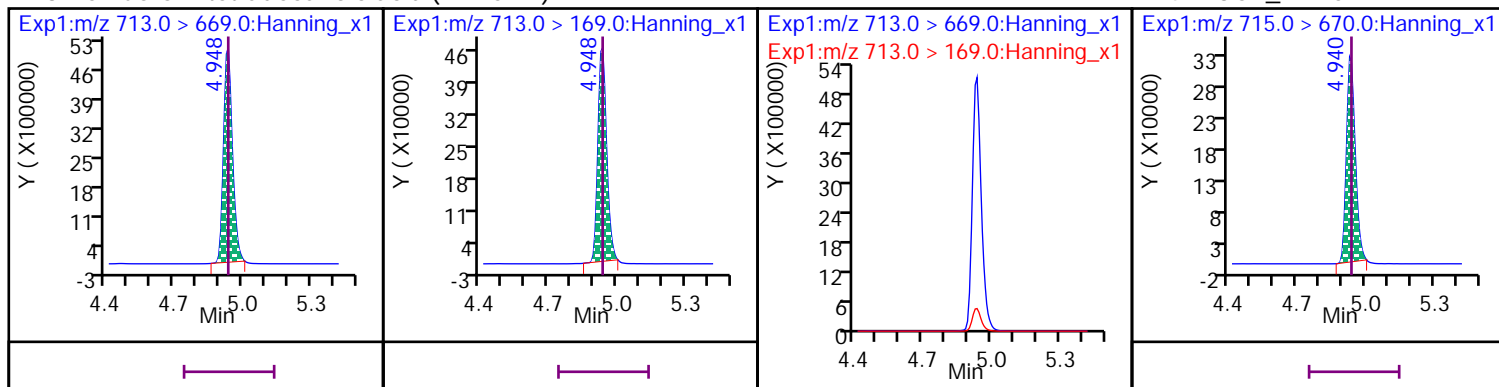
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



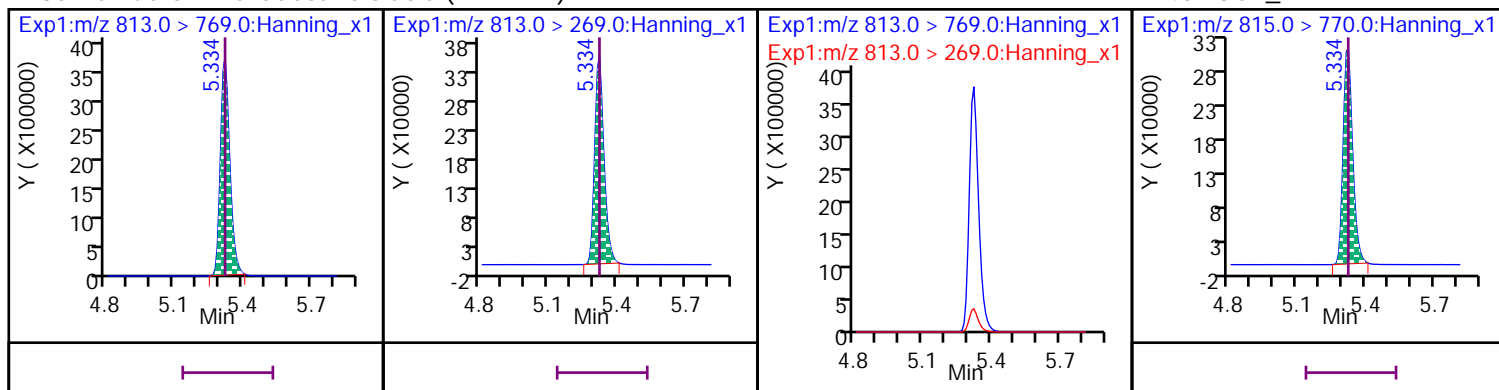
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



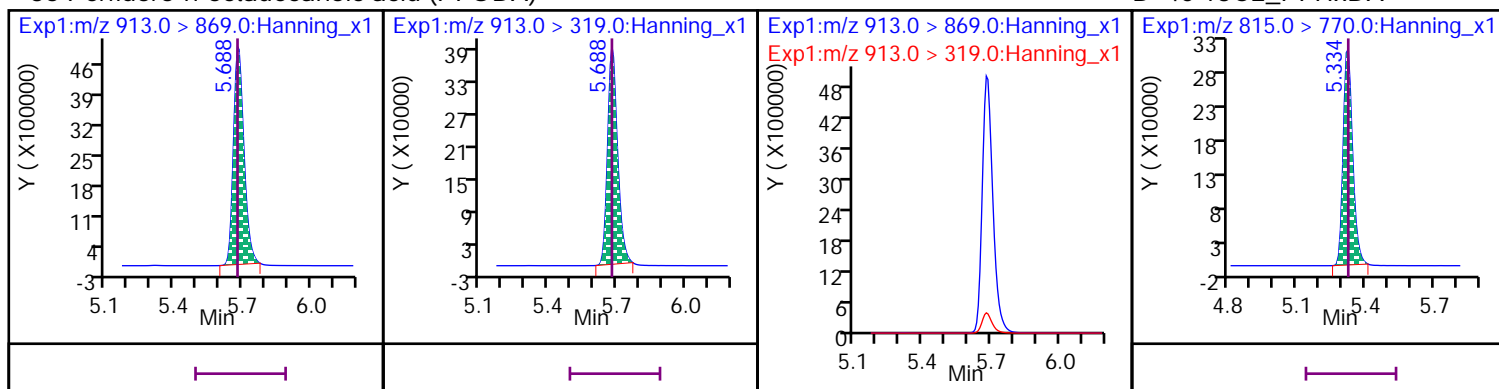
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

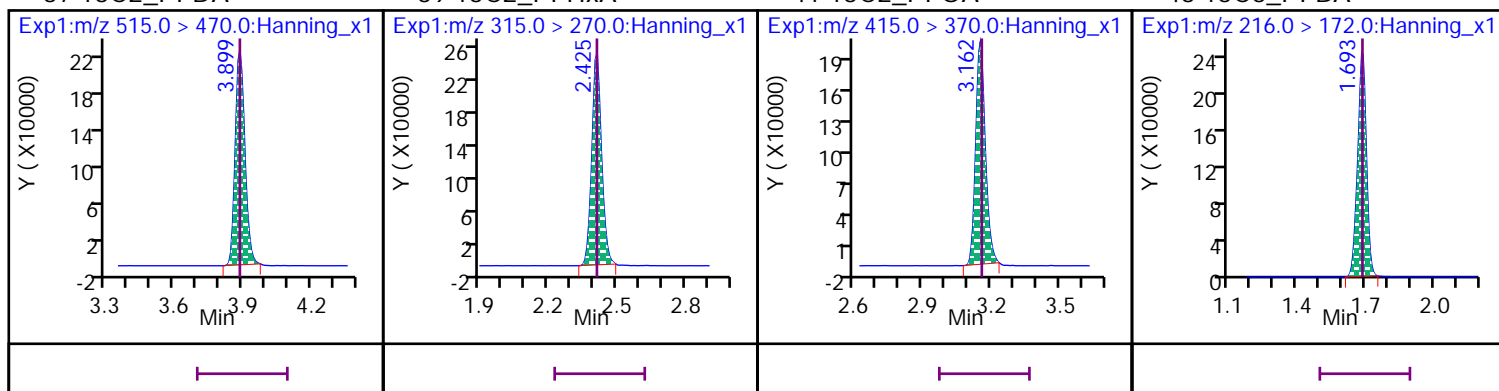


\* 37 13C2\_PFDA

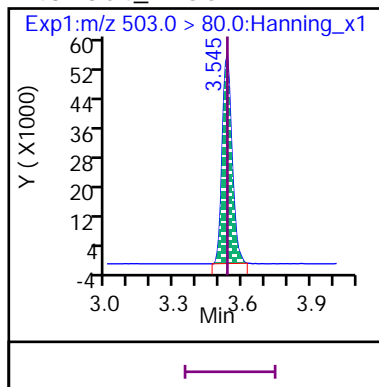
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d

Injection Date: 17-Dec-2020 13:57:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 20000\_SVLC-1228

Sample Info: ICAL 20000\_SVLC-1228

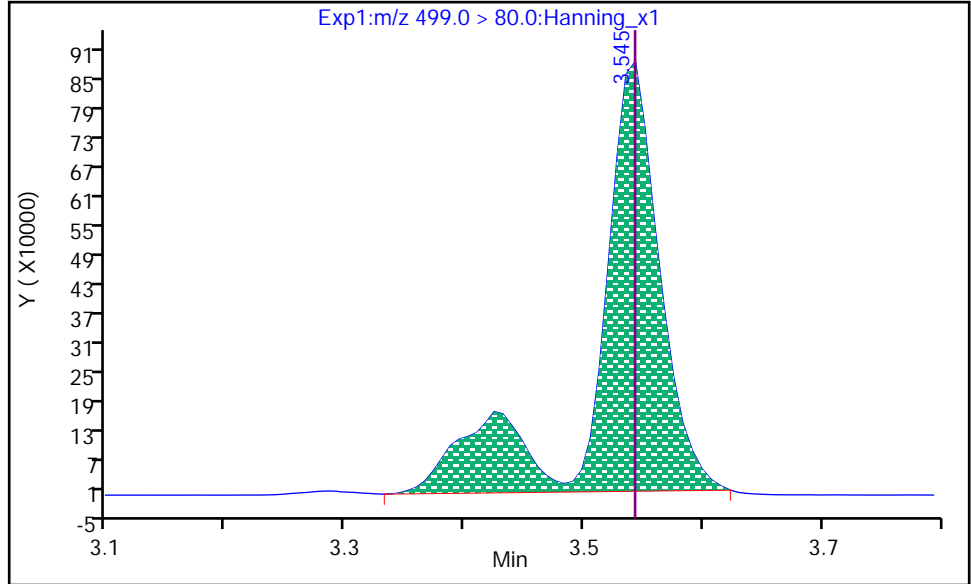
Dil. Factor: 1

Operator: Stephen E. Somerville

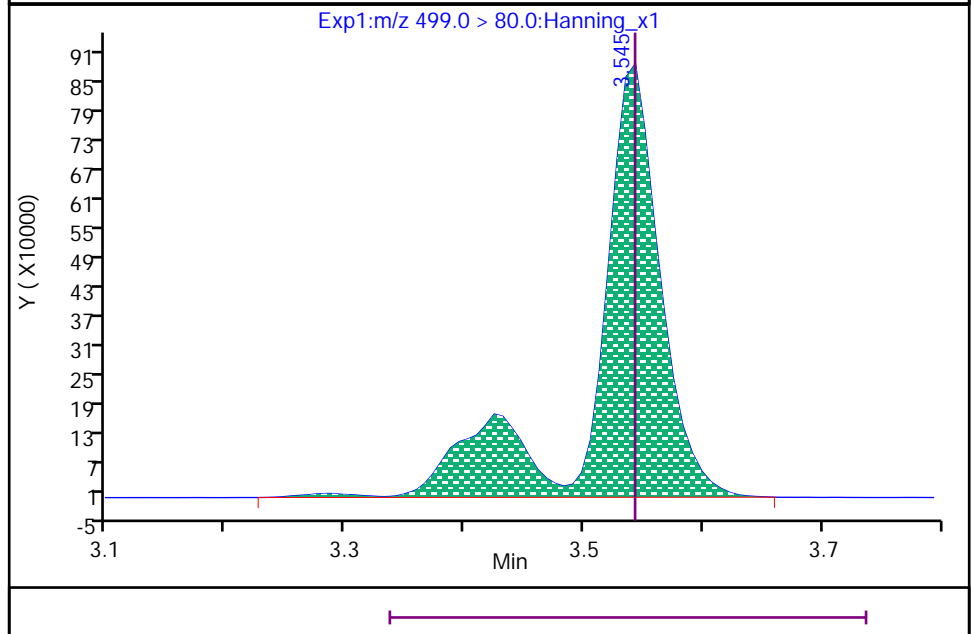
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 3213533  
Amount: 18696  
Amount Units: ng/L



RT: 3.545  
Area: 3340366  
Amount: 19357  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:38

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d  
Injection Date: 17-Dec-2020 14:08:35 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 11  
Lab Sample ID: IBLK A Lab Prep. Batch:  
Sample Info: IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA</b>	CAS: SESI-0111												
217 > 172		1.692	1.696	0	720620	22	>100:1			1001.00	1039.03	98	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>	CAS: 375-22-4												U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>	CAS: SESI-0112												
267.9 > 223		2.067	2.072	0	739146	17	>100:1			1001.00	1074.52	102	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>	CAS: 2706-90-3												U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBS</b>	CAS: SESI-0116												
302 > 80		2.120	2.125	0	251085	16	>100:1			1001.00	1090.58	101	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS)</b>	CAS: 375-73-5												U
298.9 > 80	44		2.125		ND								
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS)</b>	CAS: 2706-91-4												U
349 > 80	44		2.459		ND								
<b>D 63 13C2_4:2 FTS_2</b>	CAS: SESI-0104												
329 > 81		2.380	2.388	0	122855	20	>100:1			5005.00	5074.91	97.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)</b>	CAS: 757124-72-4												U
327 > 307	63		2.388		ND								
<b>D 49 13C5_PFHxA</b>	CAS: SESI-0113												
318 > 273		2.425	2.423	1	759718	19	>100:1			1001.00	1030.73	98.1	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>	CAS: 307-24-4												U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>	CAS: SESI-0121												
287 > 185		2.532	2.539	0	1347116	18	>100:1			5005.00	5057.62	95.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>	CAS: 13252-13-6												U
285 > 119	66		2.539		ND								
<b>D 47 13C4_PFHpA</b>	CAS: SESI-0114												
367 > 322		2.782	2.790	0	642310	20	>100:1			1001.00	1058.79	104	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>	CAS: 375-85-9												U
363 > 319	47		2.790		ND								
<b>D 45 13C3_PFHxS</b>	CAS: SESI-0096												
402 > 80		2.801	2.799	1	187413	21				1001.00	1094.52	105	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>	CAS: 355-46-4												U
399 > 80	45		2.799		ND								
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)</b>	CAS: 919005-14-4												U
377 > 251	45		2.827		ND								
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS)</b>	CAS: 375-92-8												U
449 > 80	45		3.169		ND								
<b>D 64 13C2_6:2 FTS_2</b>	CAS: SESI-0105												
429 > 81		3.135	3.135	1	102859	25	>100:1			5005.00	5340.99	98.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)</b>	CAS: 27619-97-2												U
427 > 407	64		3.135		ND								

Data File: \\org\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA</b>	<b>CAS: SESI-0097</b>												
421 > 376		3.162	3.169	0	631632	24	>100:1			1001.00	1067.19	96.4	
<b>20 Perfluoro-n-octanoic acid (PFOA)</b>	<b>CAS: 335-67-1</b>												
413 > 369	53		3.169		ND								U
<b>D 54 13C8_PFOS</b>	<b>CAS: SESI-0098</b>												
507 > 80		3.545	3.545	1	155998	19	>100:1			1001.00	1040.48	101	
<b>18 Perfluorooctanesulfonic acid (PFOS)</b>	<b>CAS: 1763-23-1</b>												
499 > 80	54		3.545		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)</b>	<b>CAS: 756426-58-1</b>												
531 > 351	54		3.750		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS)</b>	<b>CAS: 68259-12-1</b>												
549 > 80	54		3.891		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS)</b>	<b>CAS: 335-77-3</b>												
599 > 80	54		4.198		ND								U
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)</b>	<b>CAS: 763051-92-9</b>												
631 > 451	54	4.358	4.357	1/0	1406	20	15:1			3.1768	3.1768		
<b>34 Perfluorododecanesulfonic acid (PFDOS)</b>	<b>CAS: 79780-39-5</b>												
699 > 80	54		4.704		ND								U
<b>D 56 13C9_PFNA</b>	<b>CAS: SESI-0099</b>												
472 > 427		3.545	3.545	1	789130	21	>100:1			1001.00	1050.82	99.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA)</b>	<b>CAS: 375-95-1</b>												
463 > 419	56		3.545		ND								U
<b>D 55 13C8_PFOA</b>	<b>CAS: SESI-0107</b>												
506 > 78		3.866	3.866	1	319134	18	>100:1			1001.00	1030.91	96.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA)</b>	<b>CAS: 754-91-6</b>												
498 > 78	55		3.866		ND								U
<b>D 65 13C2_8:2 FTS_2</b>	<b>CAS: SESI-0106</b>												
529 > 81		3.891	3.891	1	95879	19	>100:1			5005.00	5168.64	103	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)</b>	<b>CAS: 39108-34-4</b>												
527 > 507	65		3.891		ND								U
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)</b>	<b>CAS: 120226-60-0</b>												
627 > 607	65		4.492		ND								U
<b>D 51 13C6_PFDA</b>	<b>CAS: SESI-0115</b>												
519 > 474		3.899	3.899	1	704949	20	>100:1			1001.00	1062.74	101	
<b>10 Perfluoro-n-decanoic acid (PFDA)</b>	<b>CAS: 335-76-2</b>												
513 > 469	51		3.899		ND								U
<b>D 58 d3-MeFOSAA</b>	<b>CAS: SESI-0102</b>												
573 > 419		4.056	4.056	1	720944	18	>100:1			5005.00	5022.62	94.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)</b>	<b>CAS: 2355-31-9</b>												
570 > 419	58		4.065		ND								U
<b>D 60 d5-EtFOSAA</b>	<b>CAS: SESI-0110</b>												
589 > 419		4.207	4.217	0	727040	17	>100:1			5005.00	5474.09	98.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)</b>	<b>CAS: 2991-50-6</b>												
584 > 419	60		4.217		ND								U
<b>D 52 13C7_PFUdA</b>	<b>CAS: SESI-0117</b>												
570 > 525		4.207	4.217	0	644782	18	>100:1			1001.00	1020.10	95	
<b>25 Perfluoro-n-undecanoic acid (PFUdA)</b>	<b>CAS: 2058-94-8</b>												
563 > 519	52		4.217		ND								U
<b>D 61 d7-MeFOSE</b>	<b>CAS: SESI-0129</b>												
623 > 59		4.298	4.298	1	115262	20	>100:1			1001.00	1065.19	98.3	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)</b>	<b>CAS: 24448-09-7</b>												
616 > 59	61		4.308		ND								U
<b>D 57 d3-MeFOSA</b>	<b>CAS: SESI-0109</b>												
515 > 169		4.318	4.318	1	50845	15	86:1			1001.00	960.85	92.5	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)</b>	<b>CAS: 31506-32-8</b>												
512 > 169	57		4.318		ND								U
<b>D 62 d9-EtFOSE</b>	<b>CAS: SESI-0130</b>												
639 > 59		4.465	4.465	1	118730	17	>100:1			1001.00	946.84	97.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62	4.474			ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	1	680403	17	>100:1			1001.00	1124.04	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38	4.492			ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38	4.731			ND								
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	52282	16	>100:1			1001.00	1064.93	101	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.501	4.492	1/0	1080	11	12:1	Target = 1.08		18.927	18.927		
526 > 219	59	4.492	4.492		1693	22	19:1	0.63 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	871016	18	>100:1			1001.00	1033.92	98.2	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42	4.948			ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.335	5.334	1	914527	19	>100:1			1001.00	1009.23	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.335	5.334	1/0	7917	17	9.0:1	Target = 11.43		13.263	13.263		
813 > 269	40	5.343	5.334		837	19	8.6:1	9.45 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	5527	13	4.1:1	Target = 13.84		6.8340	6.8340		M
913 > 319	40	5.675	5.689		450	15	11:1	12.28 (6.92-20.76)					M
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	732833	19	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	830273	19	>100:1					110	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	628179	24	>100:1					97.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	681258	22	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.545	3.545	1	168271	23	>100:1					104	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

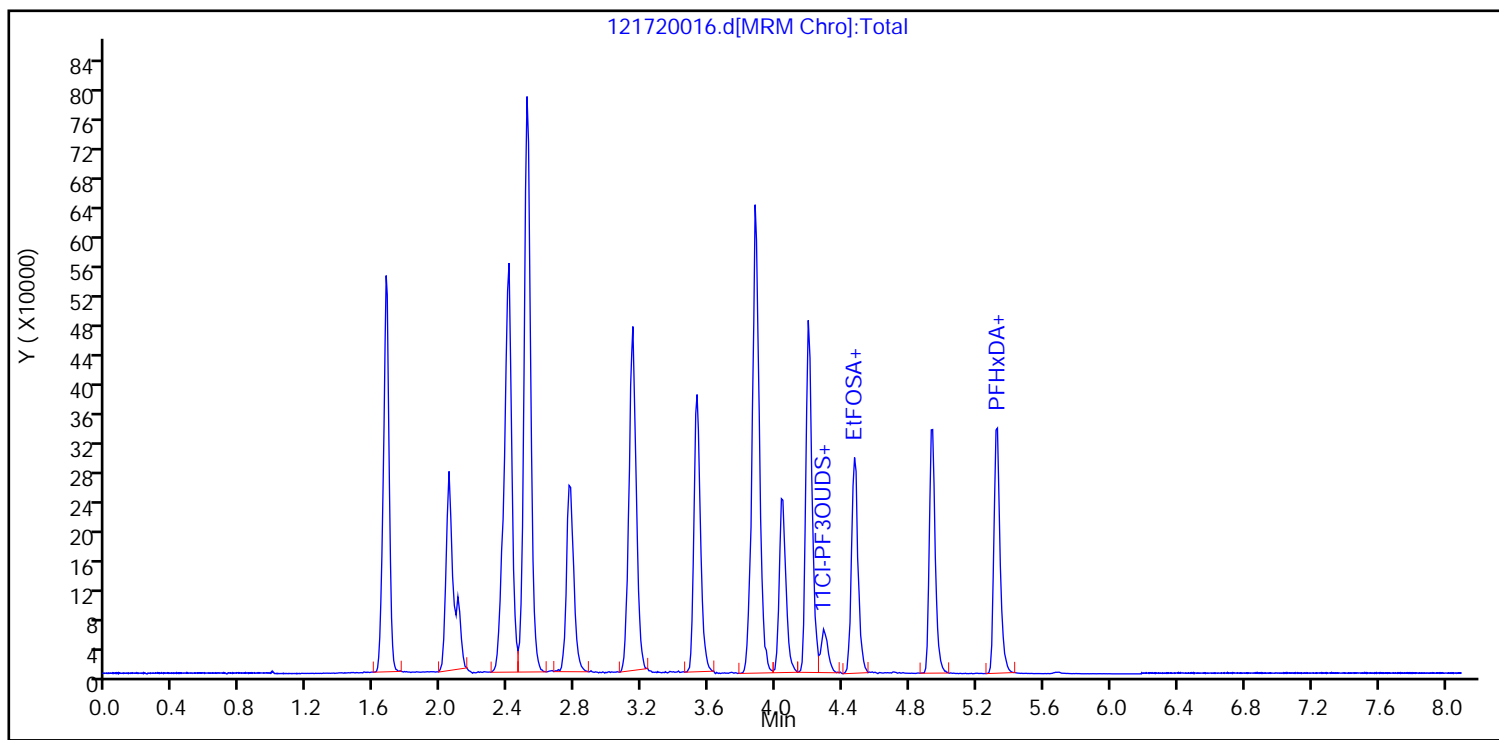
Client ID:

Lab ID: IBLK A

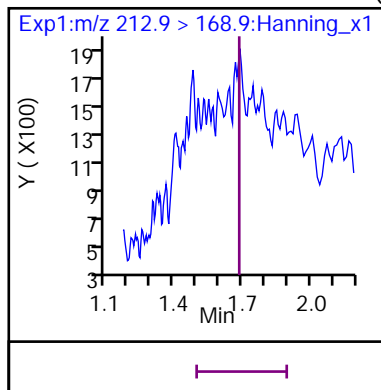
Sample Info: IBLK A

Dil. Factor: 1

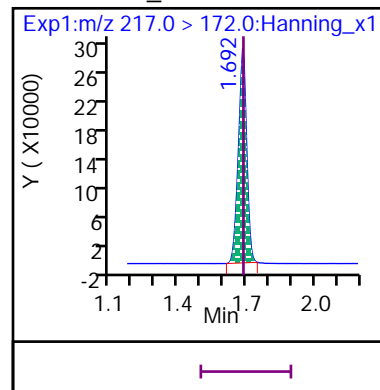
Operator: Stephen E. Somerville



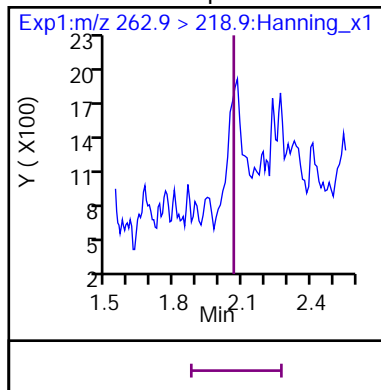
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



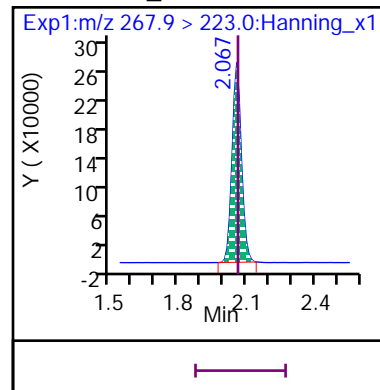
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

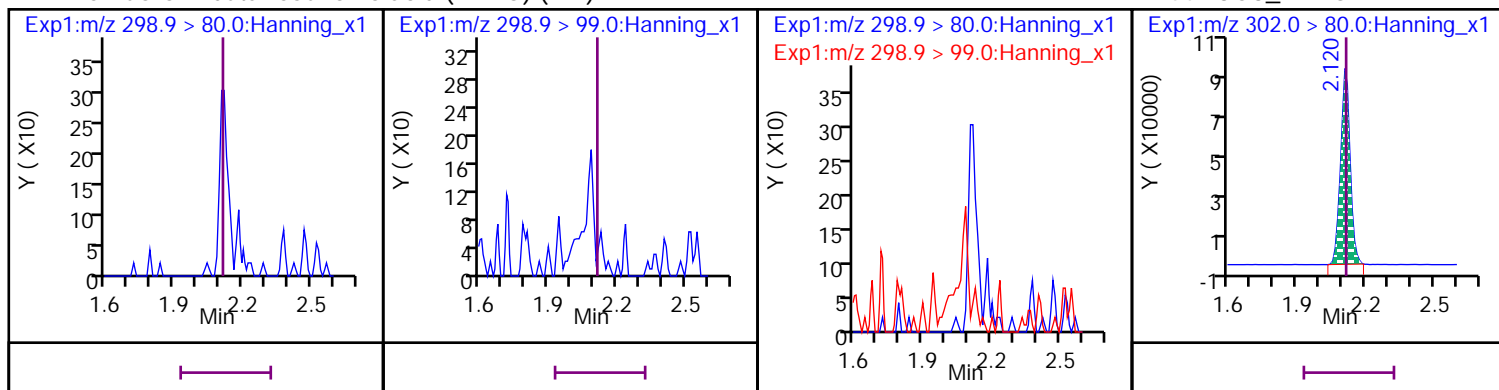


D 50 13C5\_PFPeA



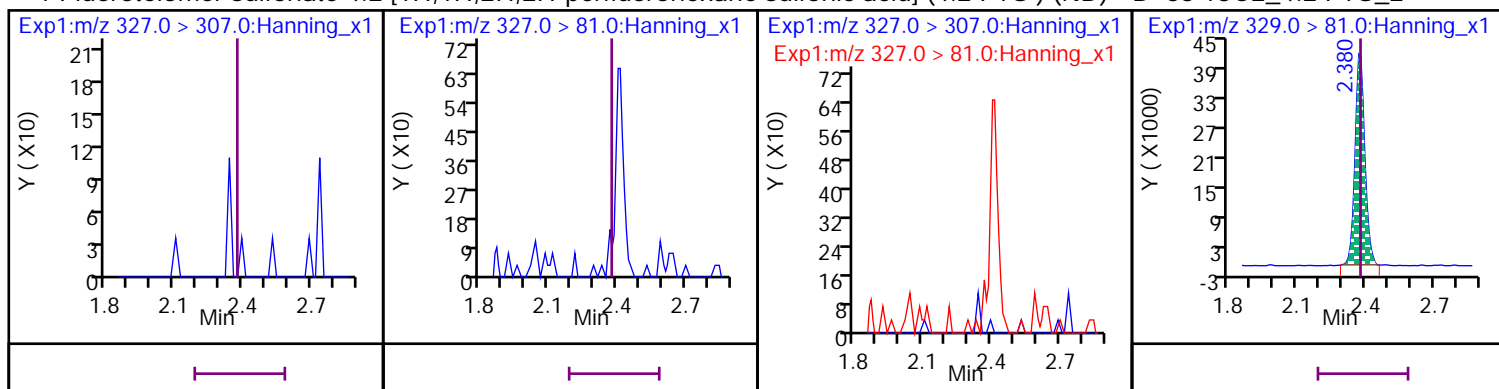
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



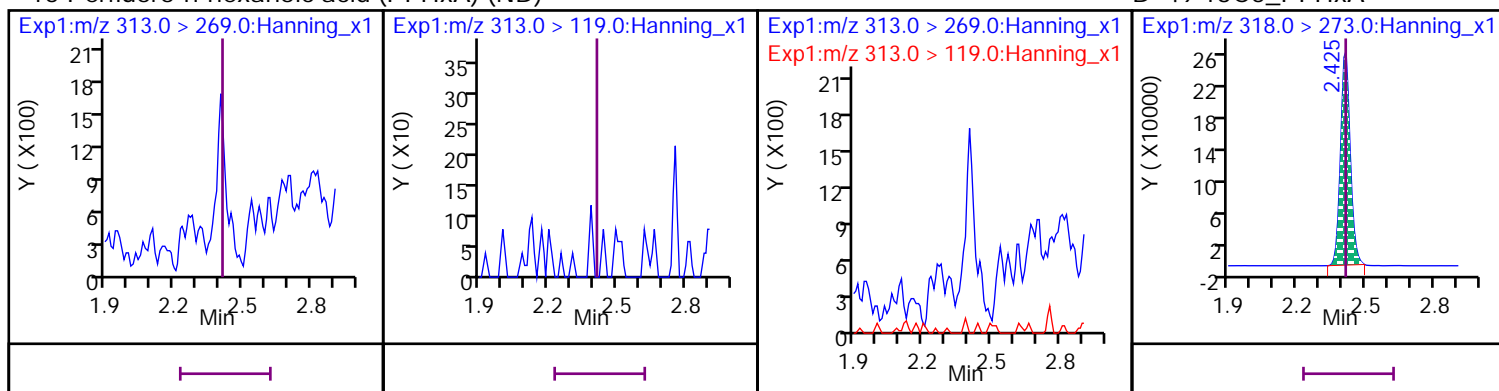
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



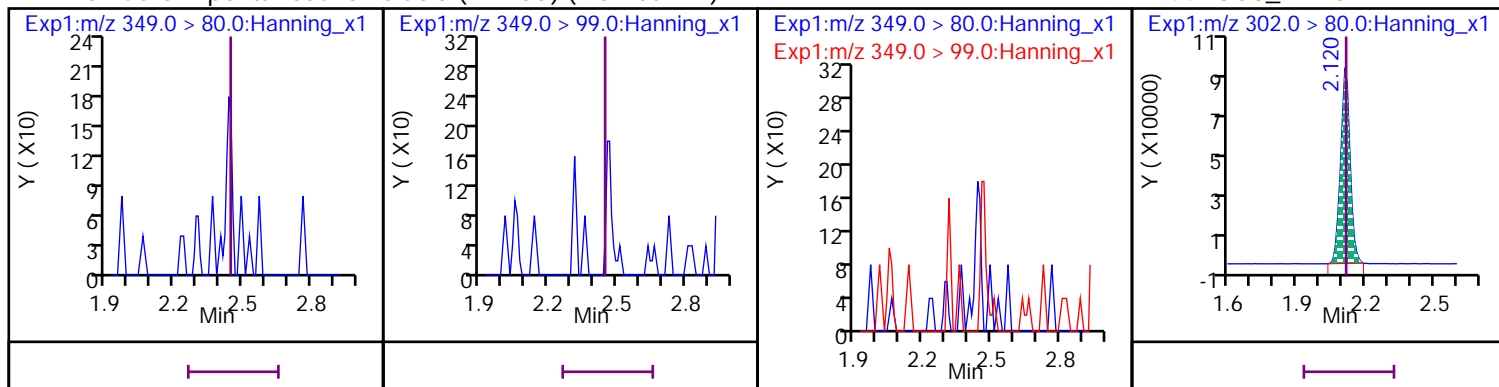
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



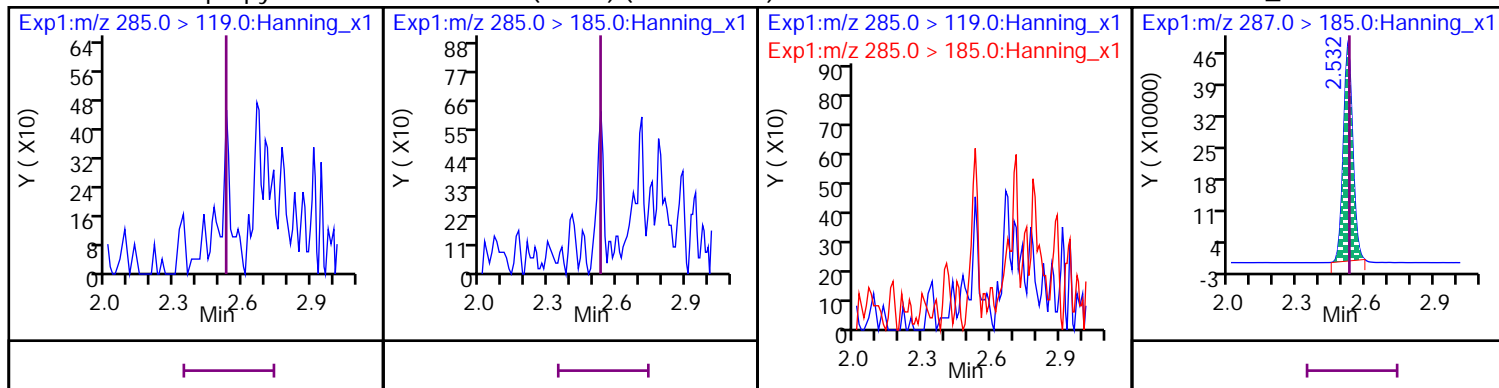
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (Marked ND)

D 44 13C3\_PFBS



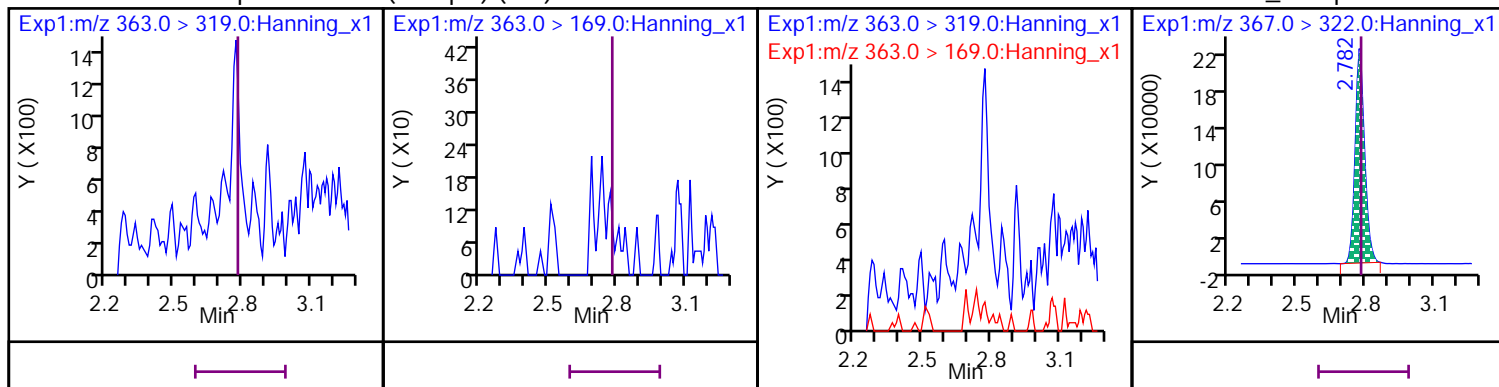
## 28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



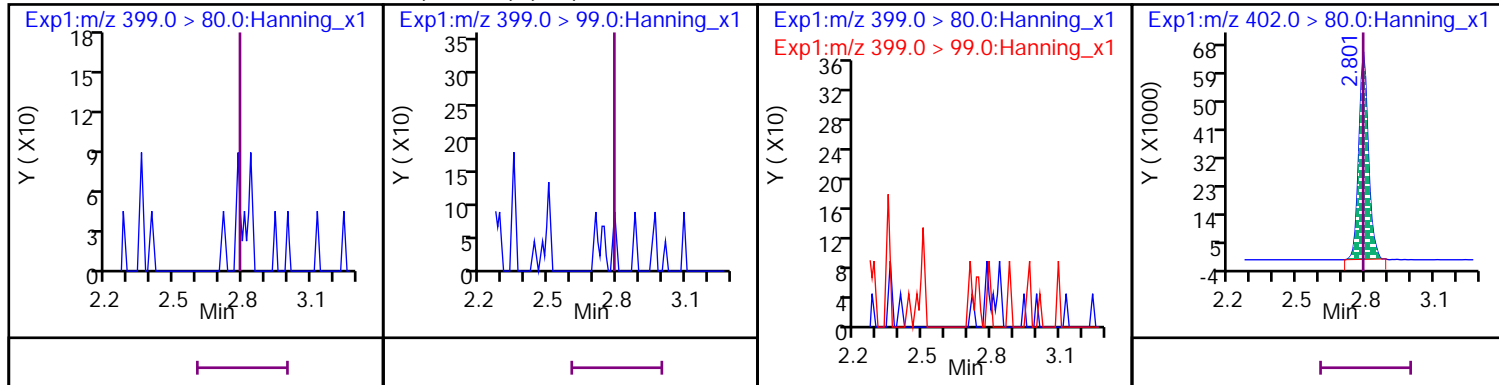
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



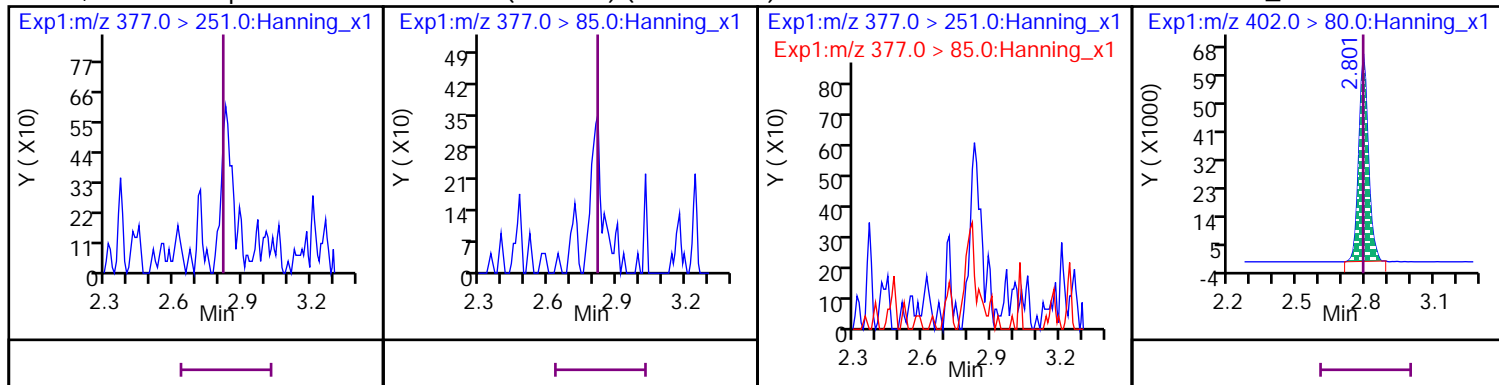
## 14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS

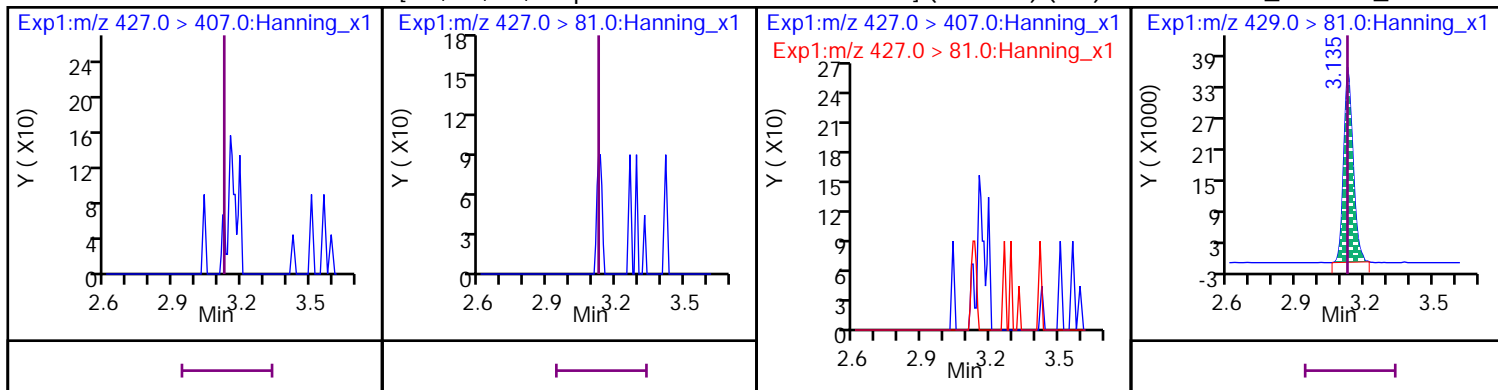


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (Marked ND)

D 45 13C3\_PFHxS

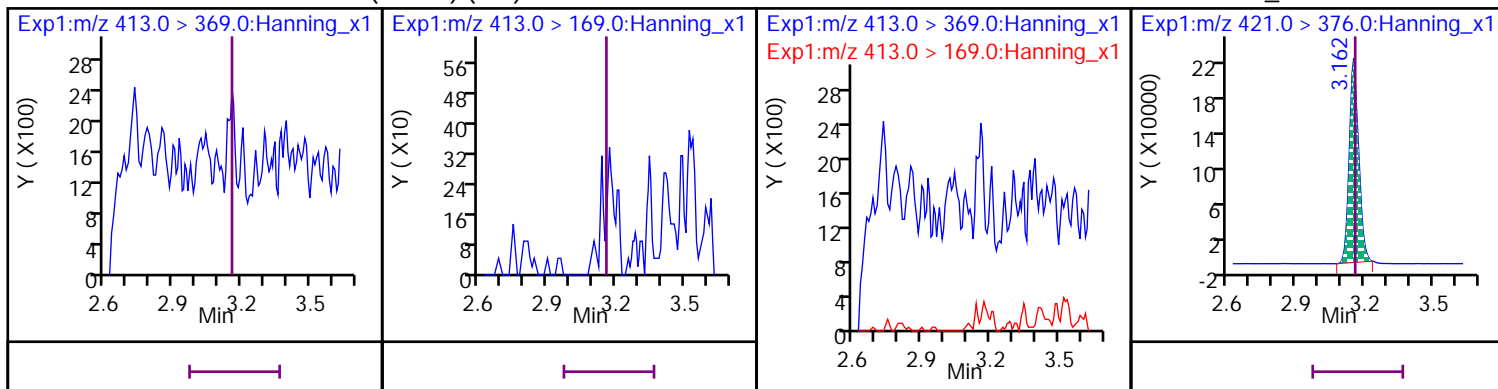


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



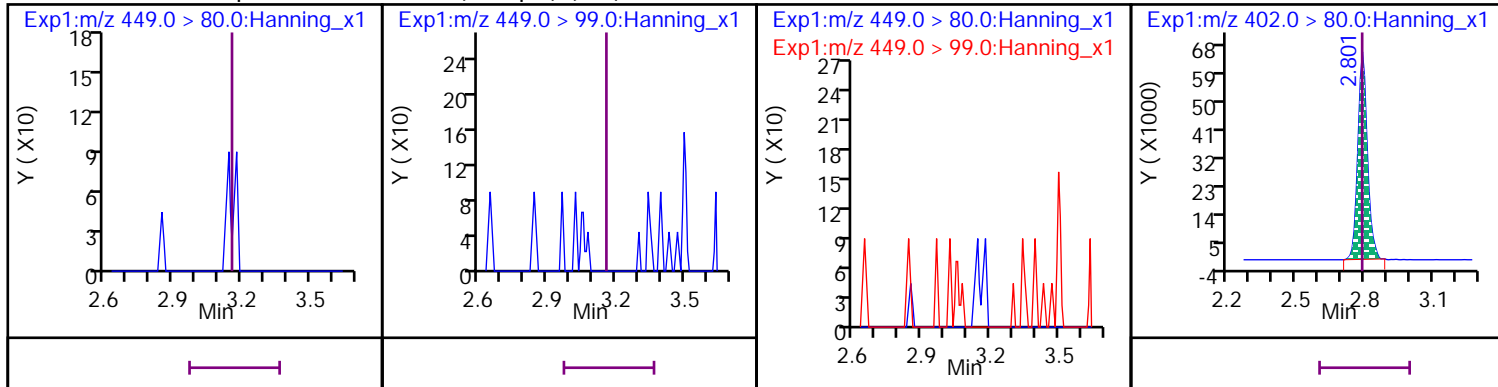
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



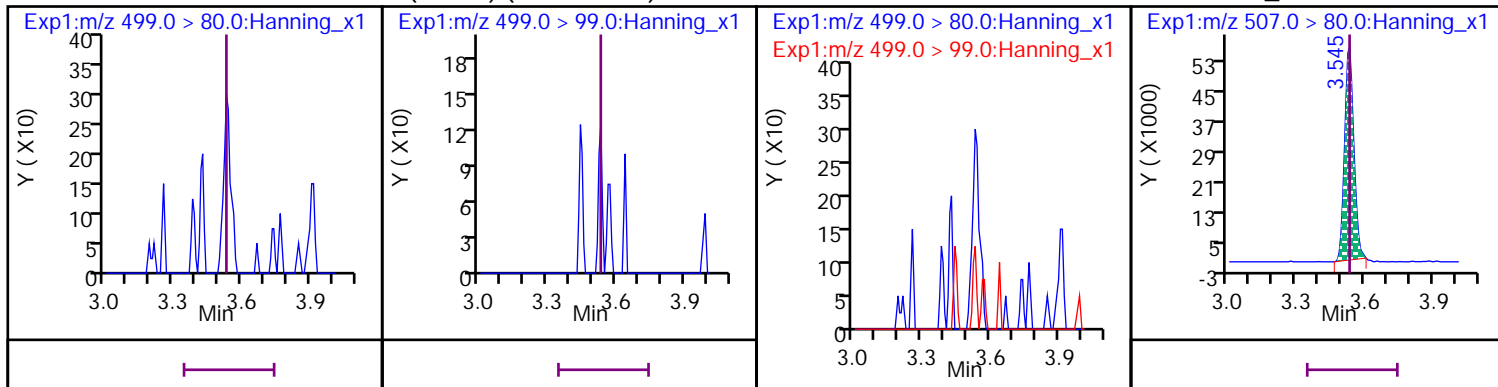
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

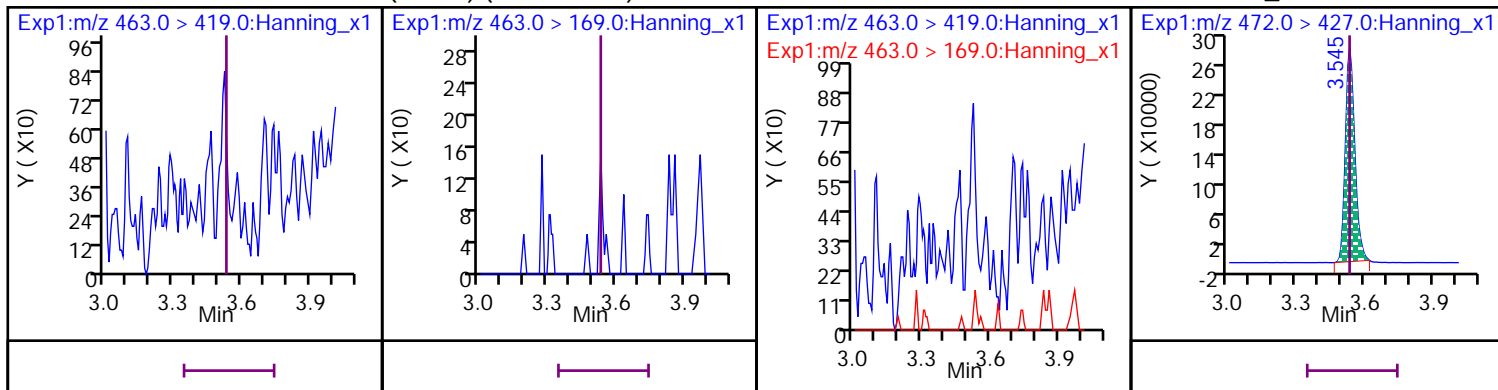
D 54 13C8\_PFOS





17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



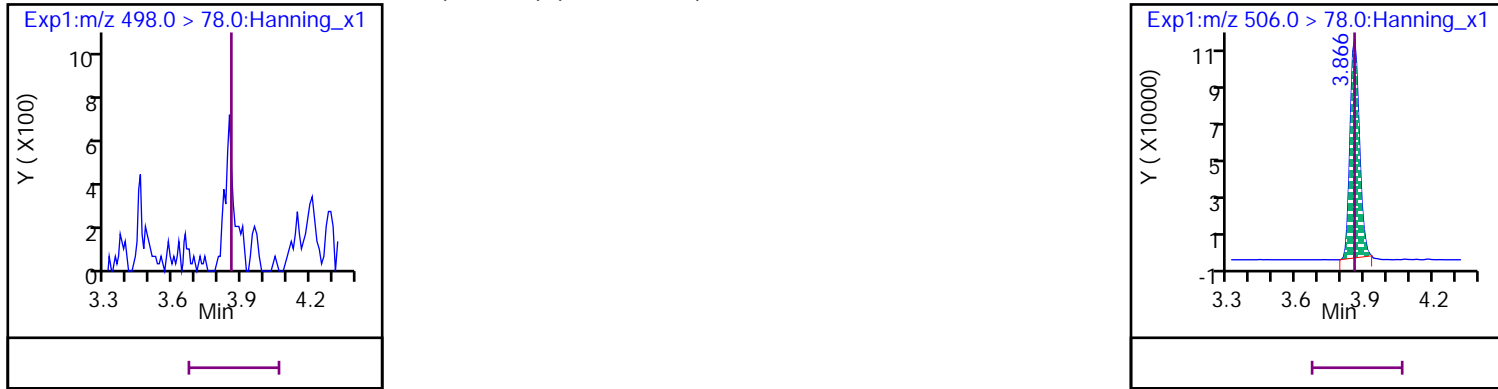
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



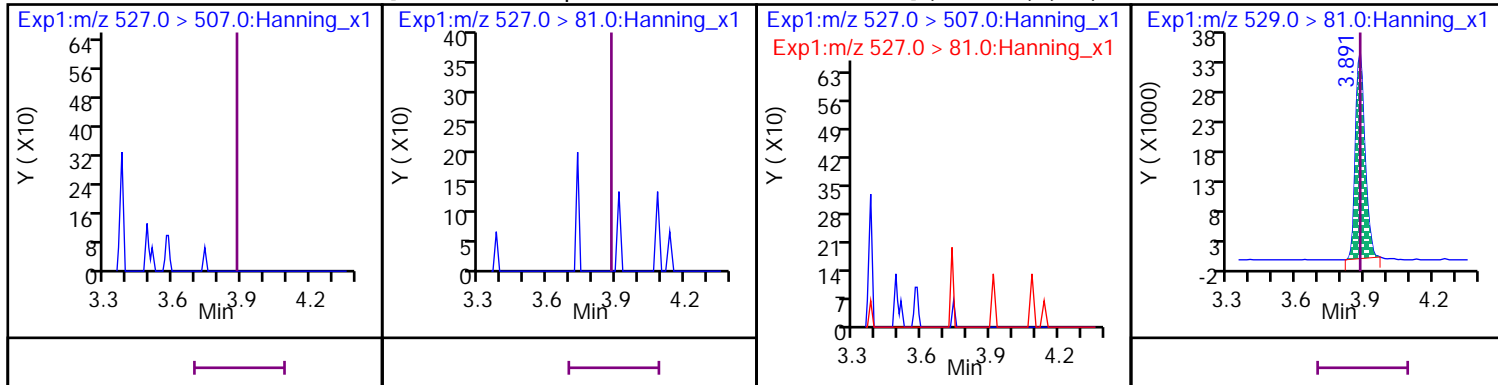
19 Perfluoro-1-octanesulfonamide (PFOSA) (Marked ND)

D 55 13C8\_PFOSA



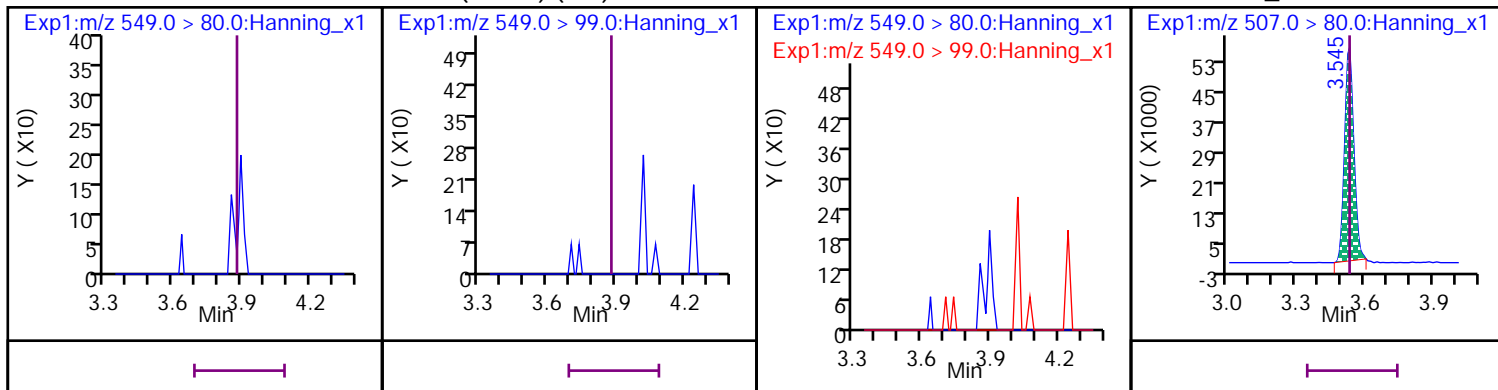
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



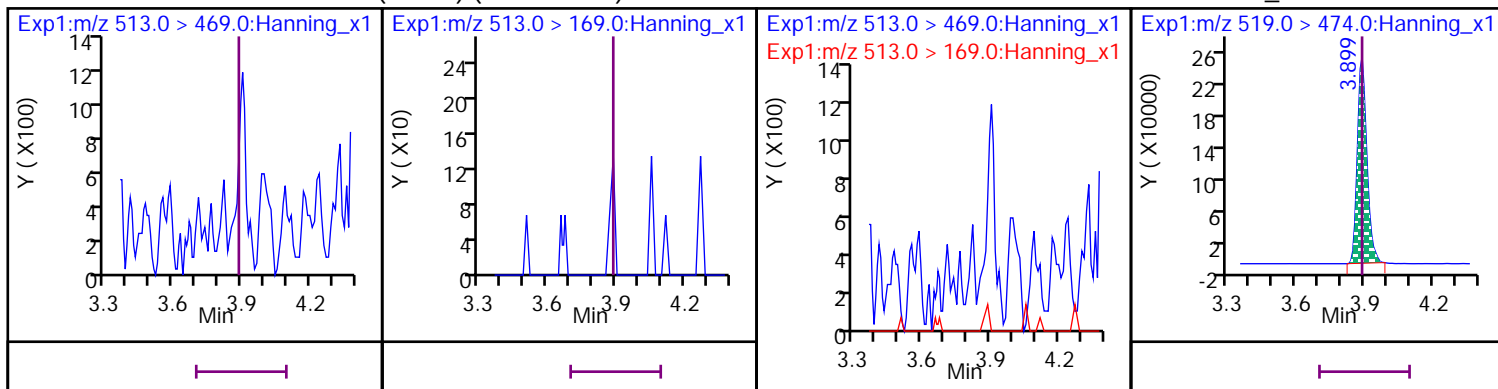
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



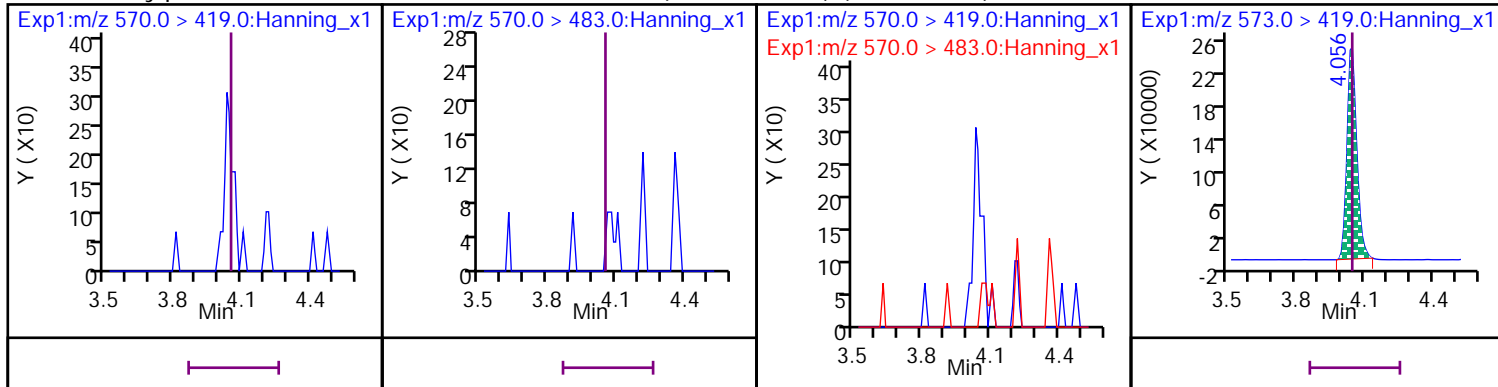
10 Perfluoro-n-decanoic acid (PFDA) (Marked ND)

D 51 13C6\_PFDA



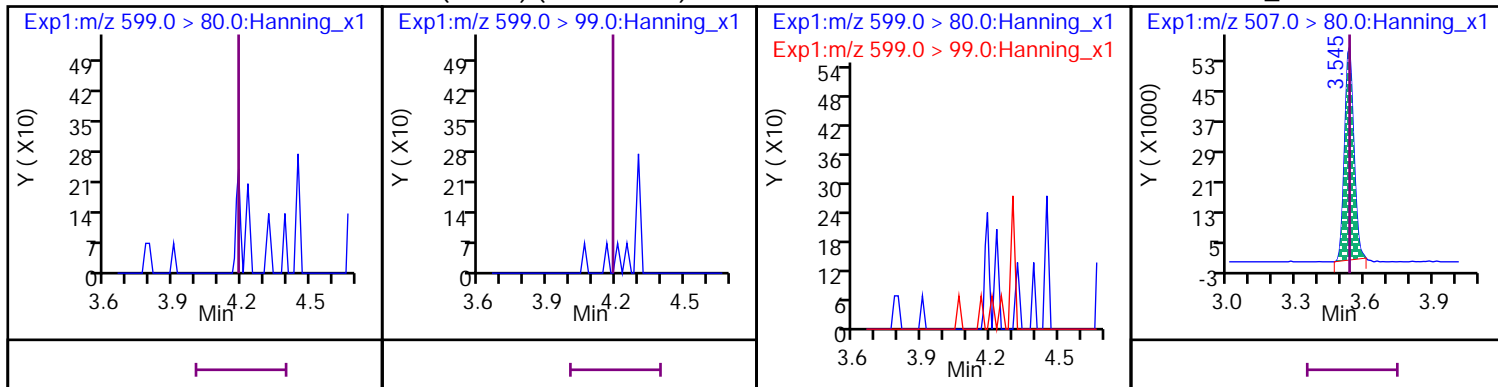
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



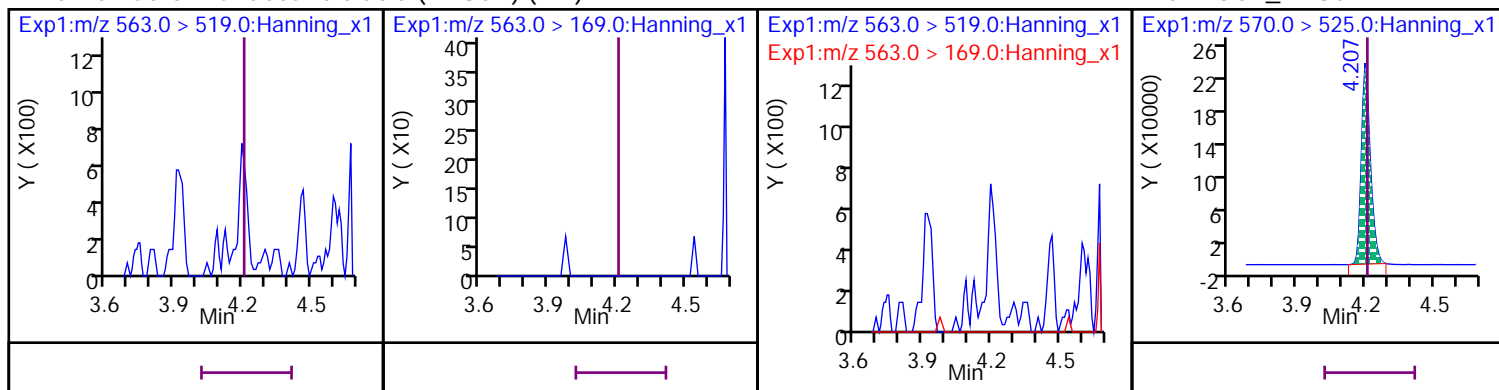
9 Perfluoro-1-decanesulfonic acid (PFDS) (Marked ND)

D 54 13C8\_PFOS



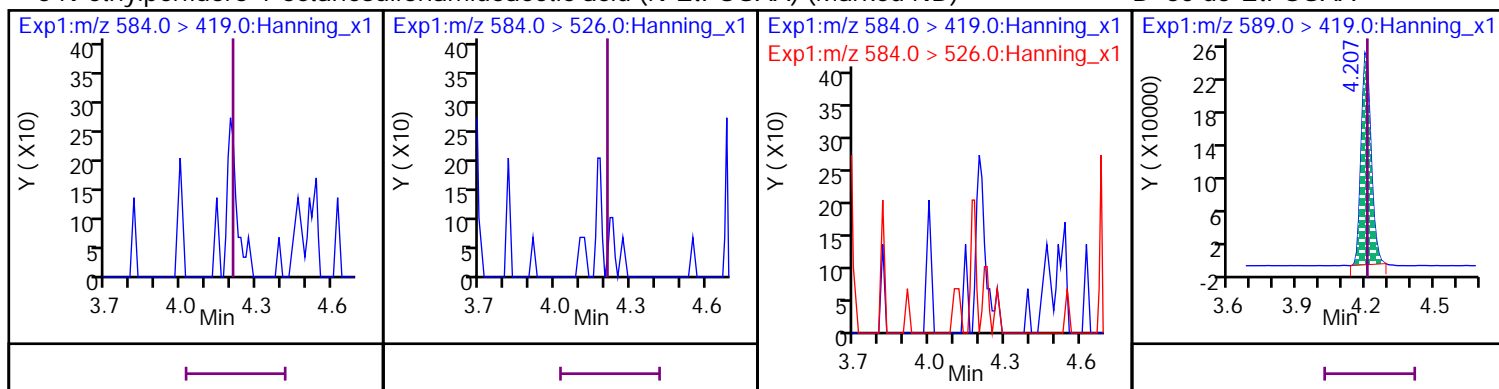
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



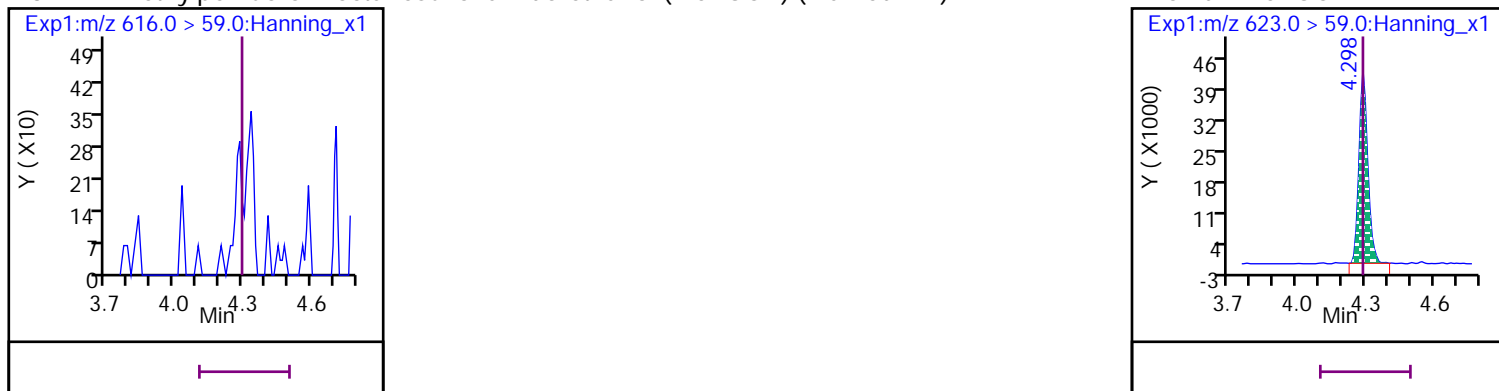
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

D 60 d5-EtFOSAA



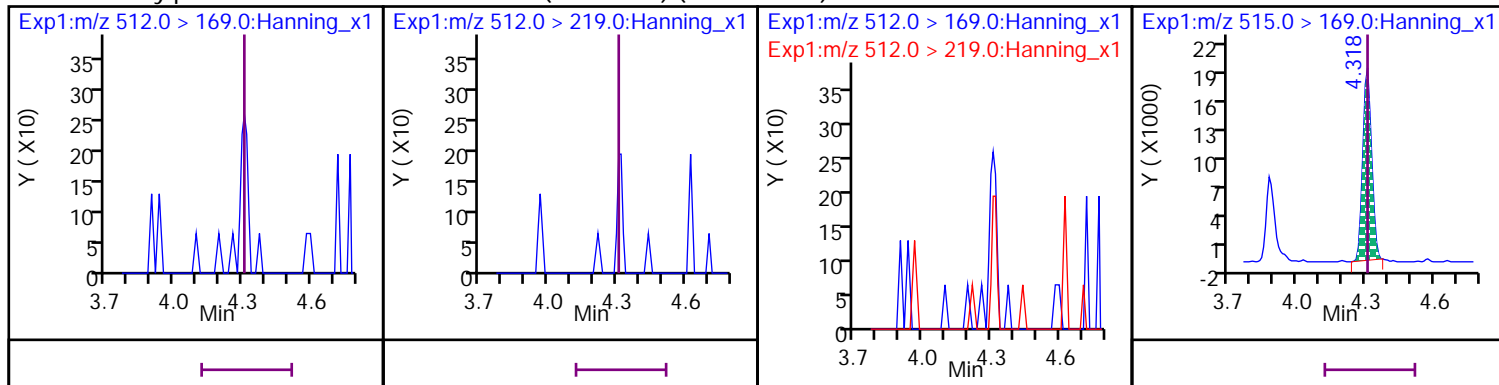
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

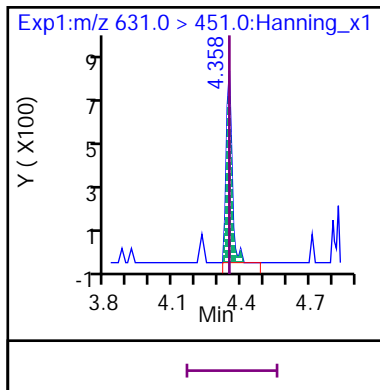


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (Marked ND)

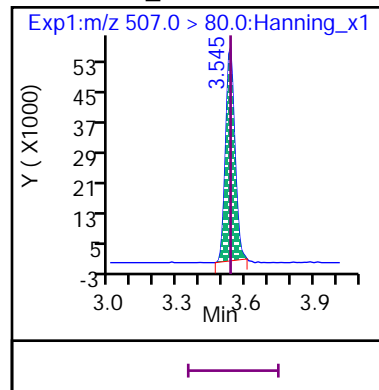
D 57 d3-MeFOSA



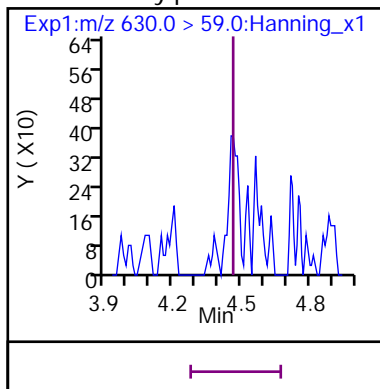
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



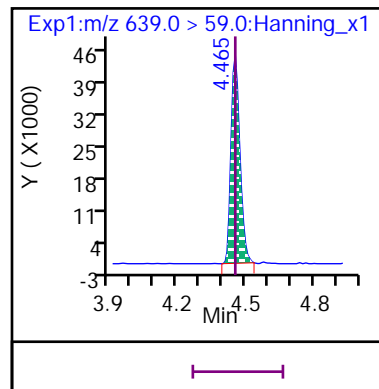
D 54 13C8\_PFOS



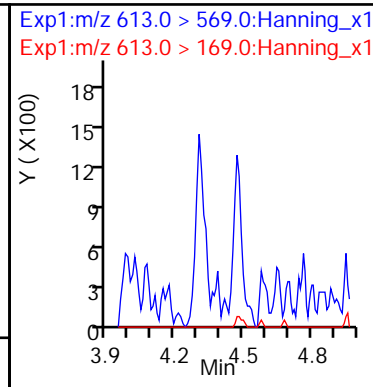
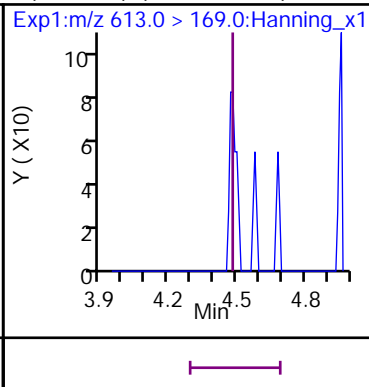
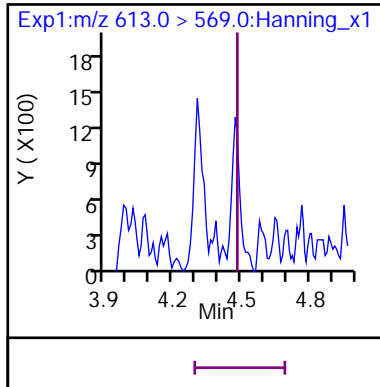
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (Marked ND)



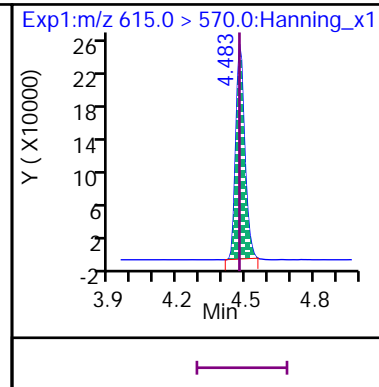
D 62 d9-EtFOSE



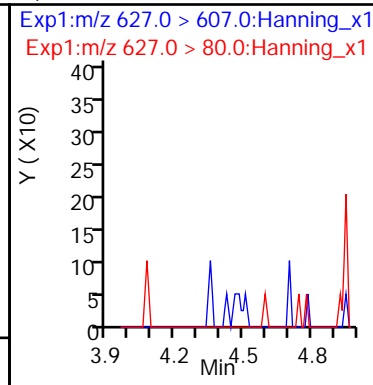
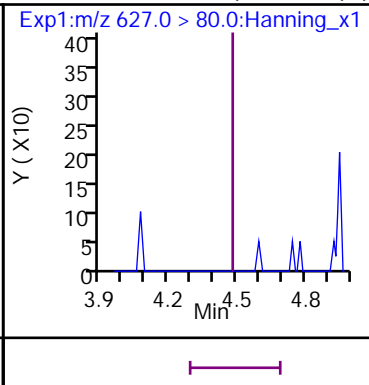
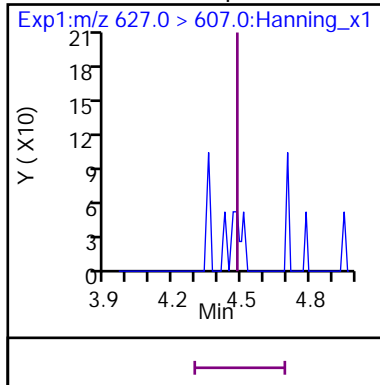
11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



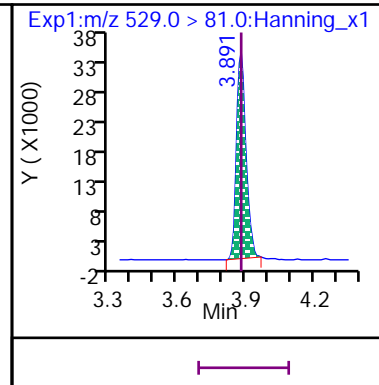
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

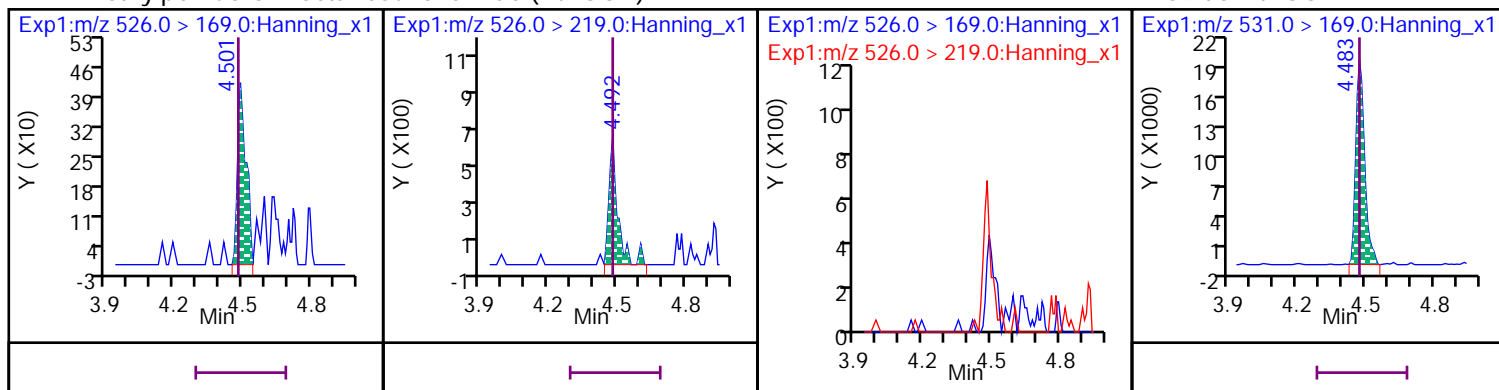


D 65 13C2\_8:2 FTS\_2



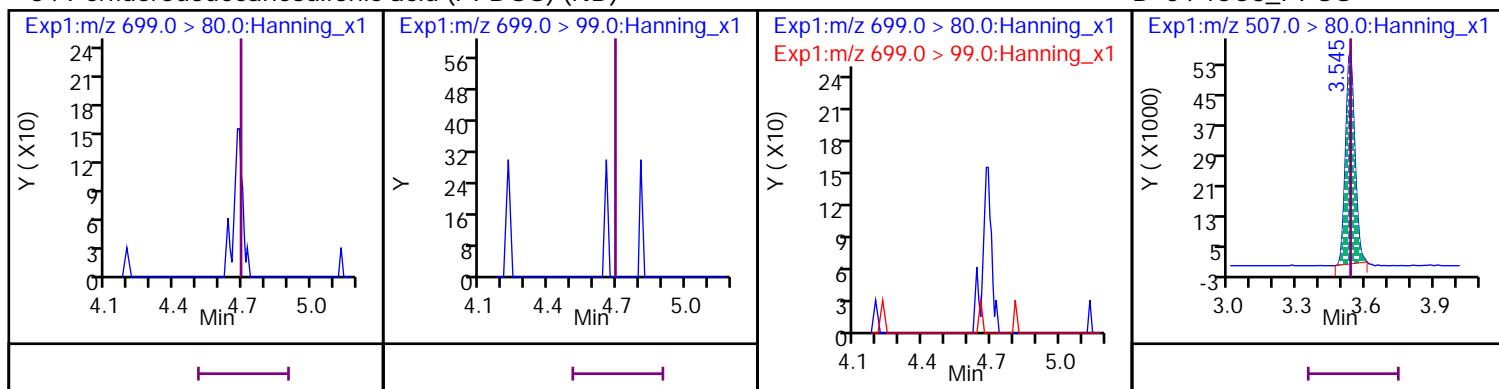
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



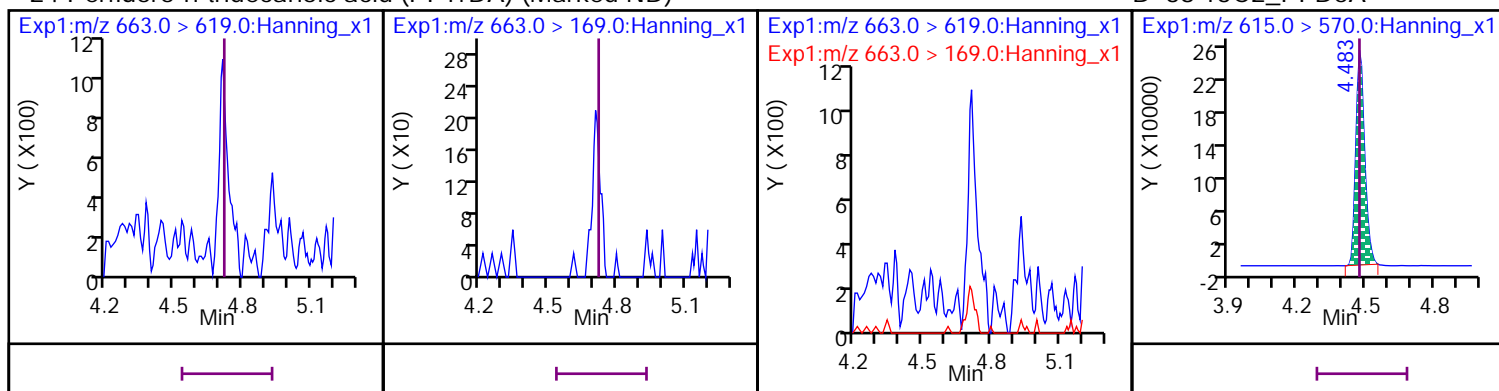
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

## D 54 13C8\_PFOS



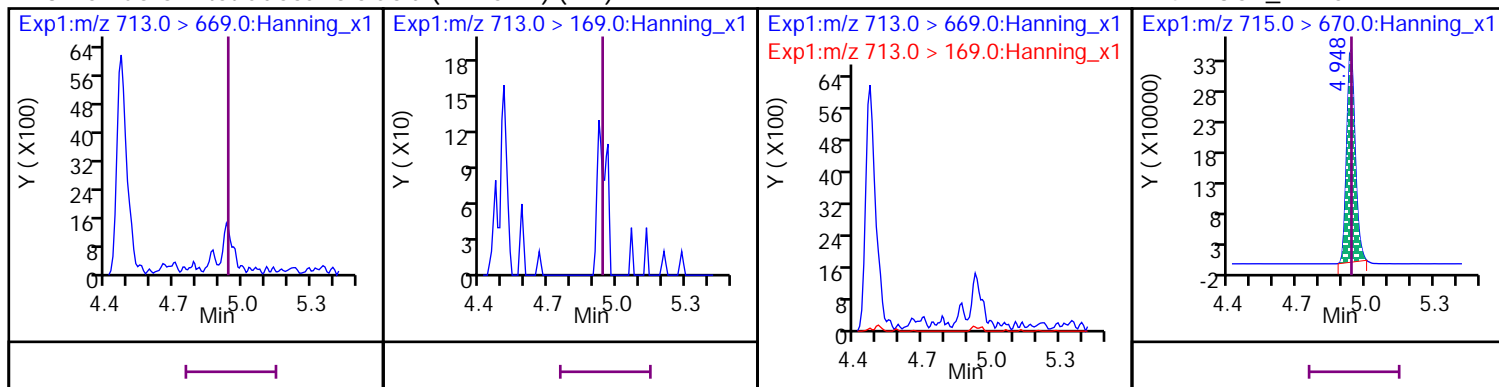
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (Marked ND)

## D 38 13C2\_PFDaA



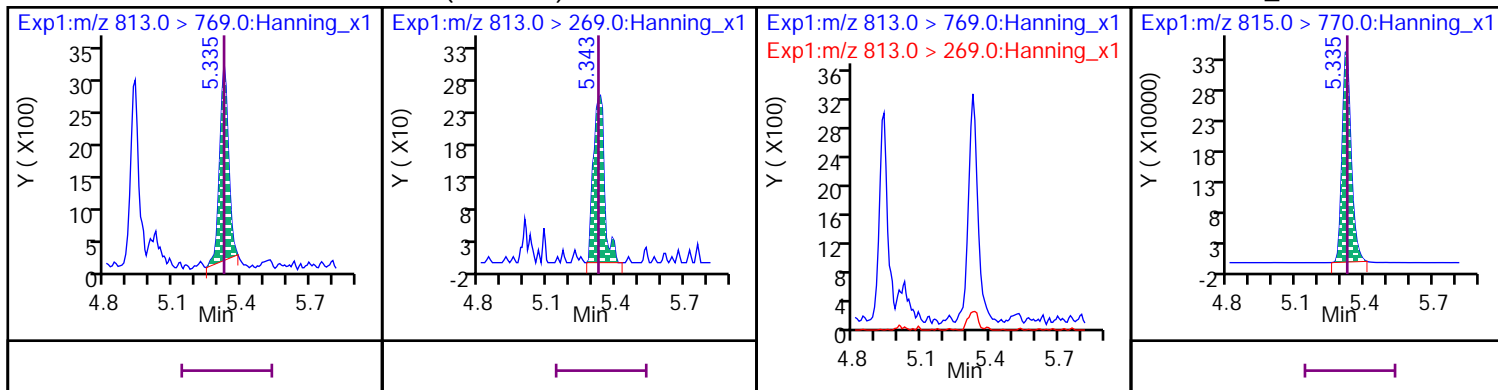
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

## D 42 13C2\_PFTeDA



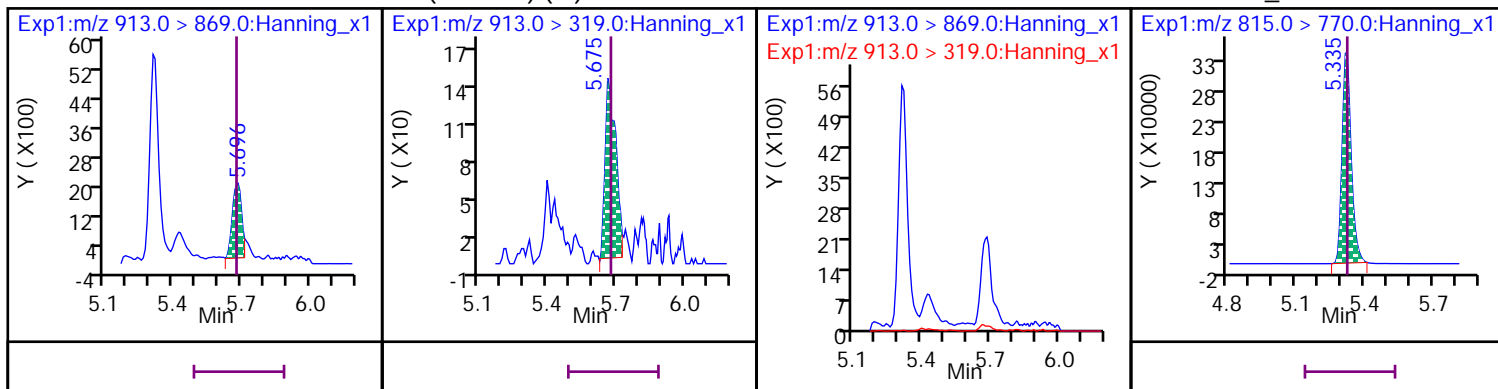
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (M)

D 40 13C2\_PFHxDA

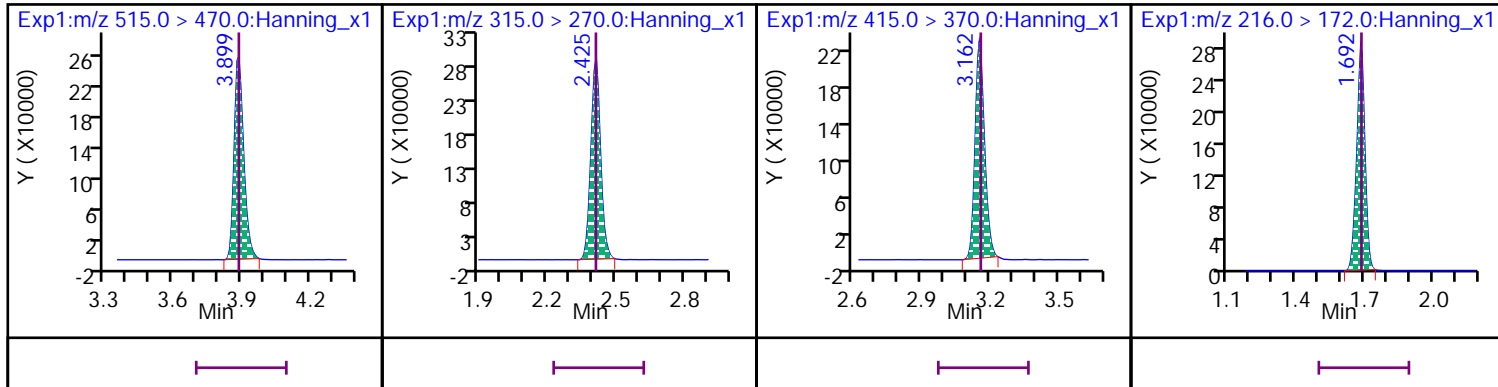


\* 37 13C2\_PFDA

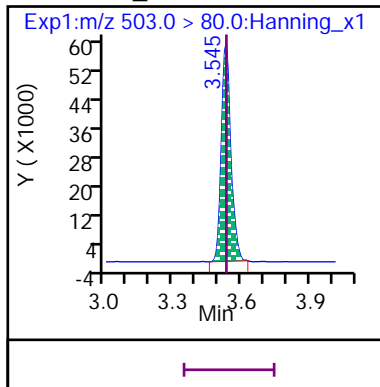
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

Client ID:

Lab ID: IBLK A

Sample Info: IBLK A

Dil. Factor: 1

Operator: Stephen E. Somerville

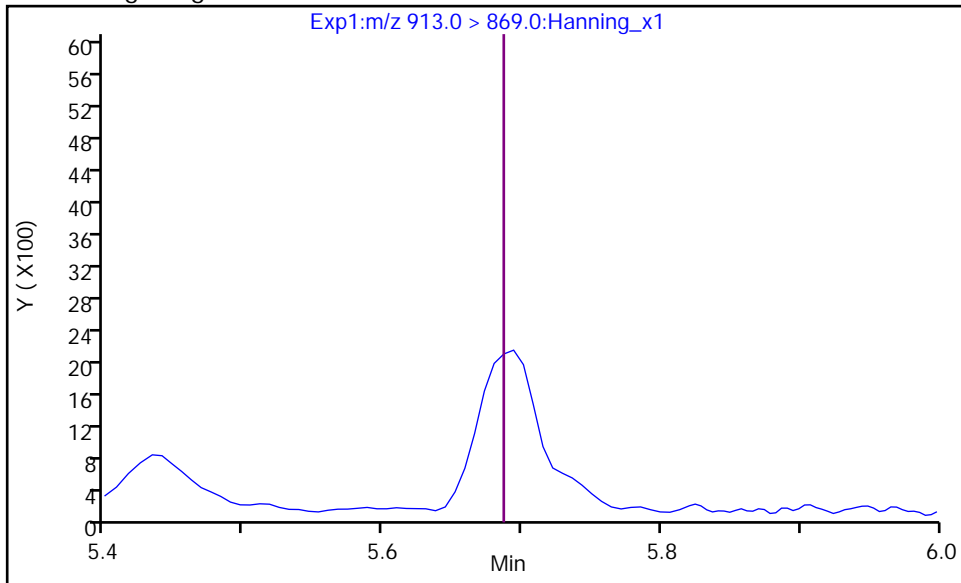
36 PFODA, CAS: 16517-11-6

Not Detected

Expected RT: 5.689

RT Window: 5.489-5.889

Processing Integration Results

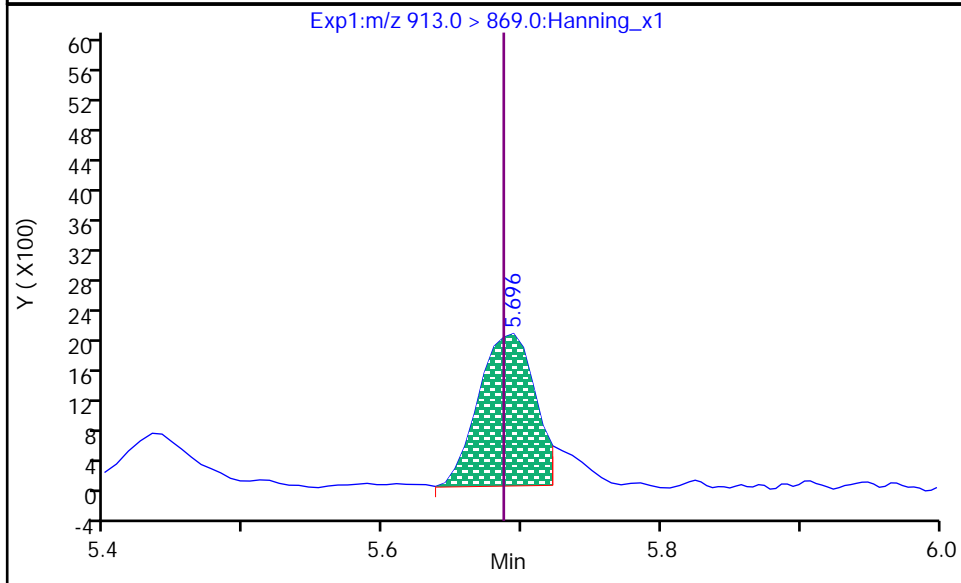


RT: 5.696

Area: 5527

Amount: 6.8340

Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:25

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

Client ID:

Lab ID: IBLK A

Sample Info: IBLK A

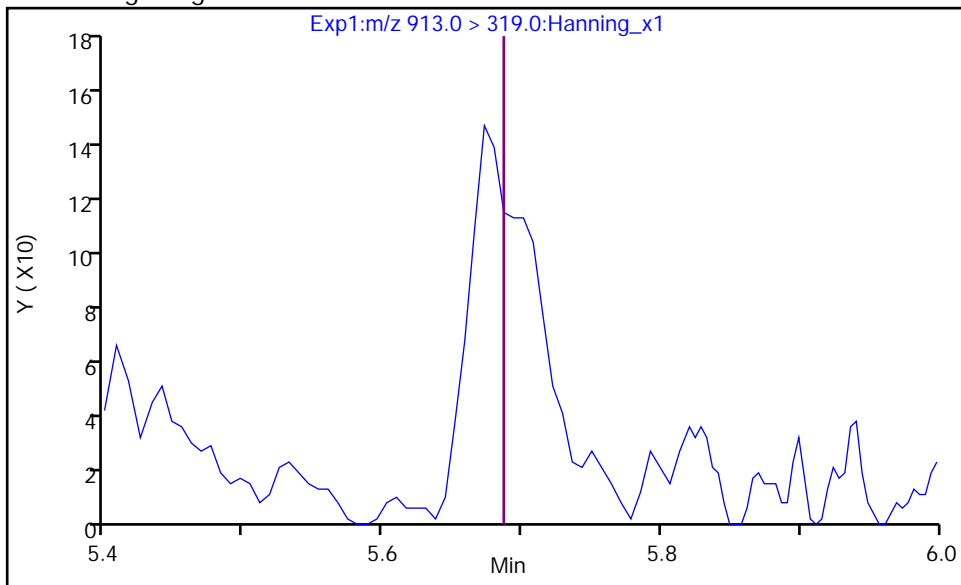
Dil. Factor: 1

Operator: Stephen E. Somerville

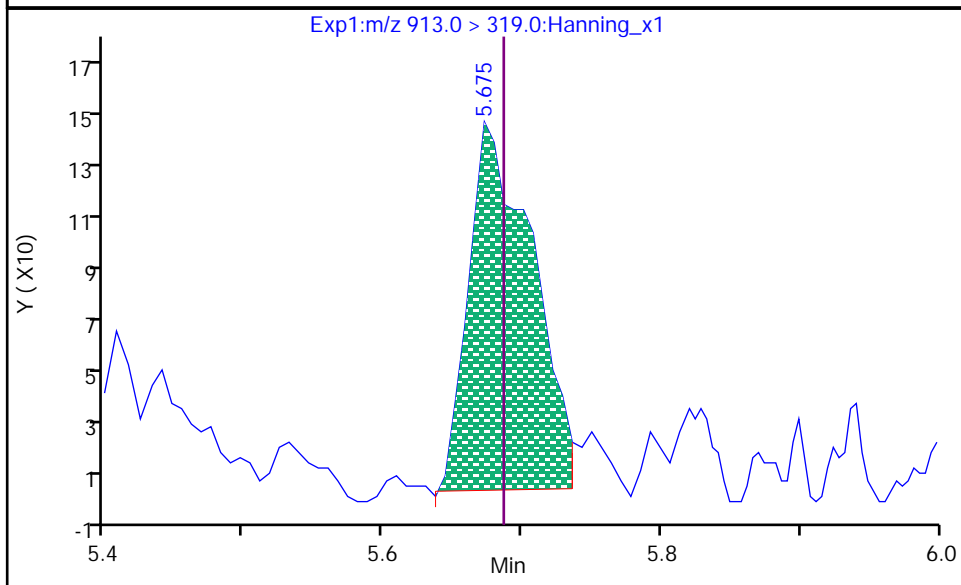
36 PFODA, CAS: 16517-11-6

Not Detected  
Expected RT: 5.689  
RT Window: 5.489-5.889

Processing Integration Results



RT: 5.675  
Area: 450  
Amount: 6.8340  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:28

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Initial Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d  
Injection Date: 17-Dec-2020 14:19:09 Injection Vol: 10.0 uL  
Sample Type: ICV Auto Sampler: 12  
Sample Info: ICV 500\_SVLC-1202 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	512.21	102	70 - 130
D 46 13C4_PFBA	735341	643365			87.5	50 - 150
D 50 13C5_PFPeA	728206	651160			89.4	50 - 150
21 PFPeA			500.00	500.16	100	70 - 130
7 PFBS			442.50	456.05	103	70 - 130
D 44 13C3_PFBS	247575	212100			85.7	50 - 150
1 4:2 FTS			467.50	422.49	90.4	70 - 130
D 63 13C2_4:2 FTS_2	126464	126006			99.6	50 - 150
D 49 13C5_PFHxA	774364	685028			88.5	50 - 150
15 PFHxA			500.00	499.42	99.9	70 - 130
22 PFPeS			470.00	482.04	103	70 - 130
28 GenX			2500.00	2442.01	97.7	70 - 130
D 66 13C3_GenX	1412202	1290991			91.4	50 - 150
D 47 13C4_PFHpA	616003	545911			88.6	50 - 150
13 PFHpA			500.00	530.93	106	70 - 130
D 45 13C3_PFHxS	179294	170363			95	50 - 150
14 PFHxS			456.00	451.51	99	70 - 130
29 ADONA			2355.00	2277.41	96.7	70 - 130
D 64 13C2_6:2 FTS_2	104623	96230			92	50 - 150
2 6:2 FTS			475.00	446.09	93.9	70 - 130
20 PFOA			500.00	507.71	102	70 - 130
D 53 13C8_PFOA	654941	554312			84.6	50 - 150
12 PFHpS			475.00	477.92	101	70 - 130
18 PFOS			462.75	456.80	98.7	70 - 130
17 PFNA			500.00	530.27	106	70 - 130
D 56 13C9_PFNA	792377	707712			89.3	50 - 150
D 54 13C8_PFOS	154357	140776			91.2	50 - 150
30 9CI-PF3ONS			2330.00	2303.83	98.9	70 - 130
D 55 13C8_PFOSA	330552	308618			93.4	50 - 150
19 PFOSA			500.00	494.28	98.9	70 - 130
16 PFNS			480.00	473.30	98.6	70 - 130
D 65 13C2_8:2 FTS_2	93314	86455			92.6	50 - 150
3 8:2 FTS			480.00	512.60	107	70 - 130
10 PFDA			500.00	521.43	104	70 - 130
D 51 13C6_PFDA	698114	632221			90.6	50 - 150
D 58 d3-MeFOSAA	762102	665192			87.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	608.79	122	70 - 130
9 PFDS			482.50	507.23	105	70 - 130
5 N-EtFOSAA			500.00	473.18	94.6	70 - 130
25 PFUdA			500.00	492.40	98.5	70 - 130
D 60 d5-EtFOSAA	738335	687855			93.2	50 - 150
D 52 13C7_PFUdA	678701	604183			89	50 - 150
D 61 d7-MeFOSE	117292	104869			89.4	50 - 150
D 57 d3-MeFOSA	54969	52474			95.5	50 - 150
31 11Cl-PF3OUDS			2355.00	2228.58	94.6	70 - 130
D 62 d9-EtFOSE	121851	121349			99.6	50 - 150
D 59 d5-EtFOSA	51517	54509			106	50 - 150
D 38 13C2_PFDoA	649290	602249			92.8	50 - 150
4 10:2 FTS			2410.00	3205.61	133	70 - 130
11 PFDoA			500.00	529.03	106	70 - 130
24 PFTrDA			500.00	537.17	107	70 - 130
23 PFTeDA			500.00	528.05	106	70 - 130
D 42 13C2_PFTeDA	887372	779838			87.9	50 - 150
D 40 13C2_PFHxDA	913664	843023			92.3	50 - 150

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d  
Injection Date: 17-Dec-2020 14:19:09 Injection Vol: 10.0 uL  
Sample Type: ICV Auto Sampler: 12  
Sample Info: ICV 500\_SVLC-1202 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.691	1.696	0	643365	22	>100:1			1000.00	927.64	87.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.696	1/1	328216	23	>100:1			500.00	512.21		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.066	2.072	0	651160	17	>100:1			1000.00	946.61	89.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.066	2.072	0/0	327449	18	>100:1			500.00	500.16		
<b>D 44 13C3_PFBs CAS: SESI-0116</b>													
302 > 80		2.119	2.125	0	212100	16	>100:1			1000.00	921.25	85.7	
<b>7 Perfluoro-1-butanefulfonic acid (PFBs) CAS: 375-73-5</b>													
298.9 > 80	44	2.119	2.125	0/0	114046	18	>100:1	Target = 3.50		442.50	456.05		
298.9 > 99	44	2.119	2.125		33662	17	>100:1	3.38 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/1	88688	19		Target = 3.10		470.00	482.04		
349 > 99	44	2.450	2.459		30745	20	>100:1	2.88 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	126006	20	>100:1			5000.00	5205.07	99.6	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.379	2.388	0/0	21249	18	>100:1	Target = 1.80		467.50	422.49		
327 > 81	63	2.388	2.388		10322	19	61:1	2.05 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	685028	20	>100:1			1000.00	929.39	88.5	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	337767	18	>100:1	Target = 18.34		500.00	499.42		
313 > 119	49	2.424	2.423		16063	19	65:1	21.02 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1290991	19	>100:1			5000.00	4846.90	91.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.539	0/0	453005	19	>100:1	Target = 0.81		2500.00	2442.01		
285 > 185	66	2.531	2.539		580531	19	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	545911	19	>100:1			1000.00	899.88	88.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	300642	19	>100:1	Target = 3.70		500.00	530.93		
363 > 169	47	2.790	2.790		77231	18	>100:1	3.89 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	170363	20				1000.00	994.94	95	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	81558	27	>100:1	Target = 3.21	0.19	456.00	451.51		
399 > 99	45	2.799	2.799		24780	19	46:1	3.29 (1.60-4.81)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	2463258	19	>100:1	Target = 2.97		2355.00	2277.41		
377 > 85	45	2.827	2.827		812746	19	>100:1	3.03 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.175	3.169	1/0	73964	23	>100:1	Target = 3.08		475.00	477.92		
449 > 99	45	3.175	3.169		22064	28	>100:1	3.35 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	96230	22	>100:1			5000.00	4996.78	92	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.135	1/0	18390	17		Target = 1.80		475.00	446.09		M
427 > 81	64	3.148	3.135		12835	27	>100:1	1.43 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.168	3.169	0	554312	22	>100:1			1000.00	936.55	84.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.168	3.169	0/0	286903	22	>100:1	Target = 2.87		500.00	507.71		
413 > 169	53	3.168	3.169		95151	23	>100:1	3.01 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.543	3.545	0	140776	22				1000.00	938.95	91.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.545	0/0	76202	40	>100:1	Target = 3.84	0.27	462.75	456.80		
499 > 99	54	3.543	3.545		23683	40		3.21 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/1	1091829	20	>100:1			2330.00	2303.83		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.898	3.891	1/1	50989	14		Target = 3.07		480.00	473.30		M
549 > 99	54	3.890	3.891		18212	16	77:1	2.79 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.197	4.198	0/0	51821	17	>100:1	Target = 3.03		482.50	507.23		
599 > 99	54	4.197	4.198		15980	13	45:1	3.24 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.357	4.357	0/0	890977	17	>100:1			2355.00	2228.58		
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	707712	21	>100:1			1000.00	942.41	89.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.551	3.545	1/0	375289	23	>100:1	Target = 6.16		500.00	530.27		
463 > 169	56	3.551	3.545		59121	19	>100:1	6.34 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.866	0	308618	19	>100:1			1000.00	996.94	93.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.866	0/0	150323	18	>100:1			500.00	494.28		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.890	3.891	0	86455	18	>100:1			5000.00	4660.61	92.6	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorododecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.898	3.891	1/1	18094	13	87:1	Target = 1.95		480.00	512.60		M
527 > 81	65	3.898	3.891		8875	22	39:1	2.03 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.491	4.492	0/0	128089	17	>100:1	Target = 3.14		2410.00	3205.61		
627 > 80	65	4.491	4.492		40301	17	>100:1	3.17 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.898	3.899	0	632221	19	>100:1			1000.00	953.10	90.6	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.898	3.899	0/0	323924	20	>100:1	Target = 15.94		500.00	521.43		
513 > 169	51	3.898	3.899		21233	18	>100:1	15.25 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.055	4.056	0	665192	18	>100:1			5000.00	4634.21	87.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.064	4.065	0/0	62214	28	>100:1	Target = 1.33		500.00	608.79		
570 > 483	58	4.055	4.065		39696	17		1.56 (0.66-1.99)					
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	0	687855	19	>100:1			5000.00	5179.06	93.2	

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	0/0	64809	16	>100:1	Target = 1.58		500.00	473.18		
584 > 526	60	4.217	4.217		42015	16	>100:1	1.54 (0.79-2.37)					
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	0	604183	18				1000.00	955.87	89	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.206	4.217	0/0	279615	18	>100:1	Target = 15.50		500.00	492.40		
563 > 169	52	4.206	4.217		17415	23	43:1	16.05 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.298	0	104869	15	>100:1			1000.00	969.14	89.4	
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.318	0	52474	15	>100:1			1000.00	991.63	95.5	
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.465	0	121349	19	>100:1			1000.00	967.73	99.6	
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.482	4.483	0	602249	17				1000.00	994.93	92.8	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													
613 > 569	38	4.482	4.492	0/0	322647	16	>100:1	Target = 10.85		500.00	529.03		
613 > 169	38	4.482	4.492		30334	15	>100:1	10.63 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.723	4.731	0/0	318637	21	>100:1	Target = 8.37		500.00	537.17		
663 > 169	38	4.723	4.731		36831	15	>100:1	8.65 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.483	0	54509	15	>100:1			1000.00	1110.29	106	
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.939	4.948	0	779838	19	>100:1			1000.00	925.69	87.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.939	4.948	0/0	356796	21	55:1	Target = 12.11		500.00	528.05		
713 > 169	42	4.939	4.948		29979	19	>100:1	11.90 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.325	5.334	0	843023	19	>100:1			1000.00	930.32	92.3	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.898	3.899	0	677376	18	>100:1					93.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	701658	19	>100:1					93.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.168	3.169	0	602537	24	>100:1					93.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.696	1	638097	23	>100:1					95.8	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.543	3.545	0	159151	22	>100:1					98	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

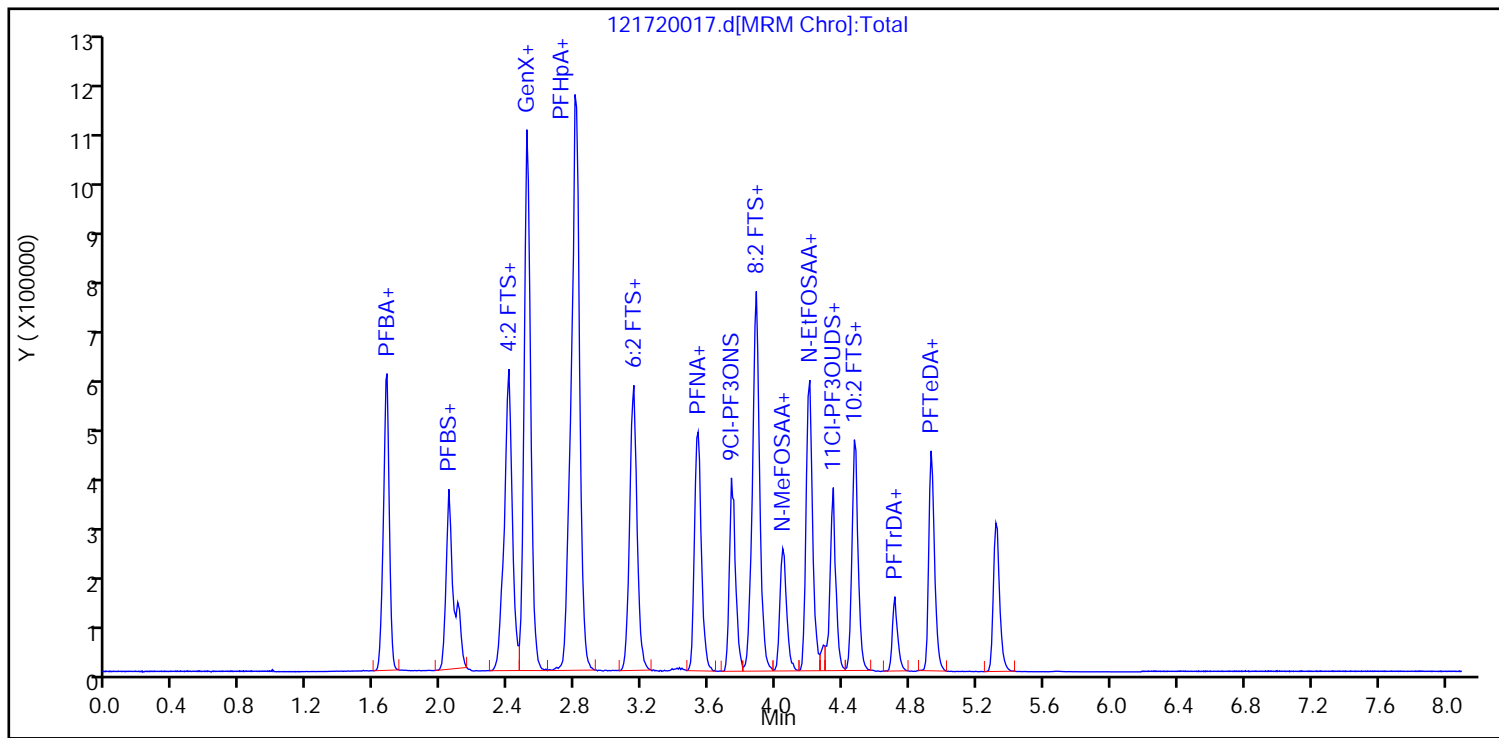
Client ID:

Lab ID: ICV 500\_SVLC-1202

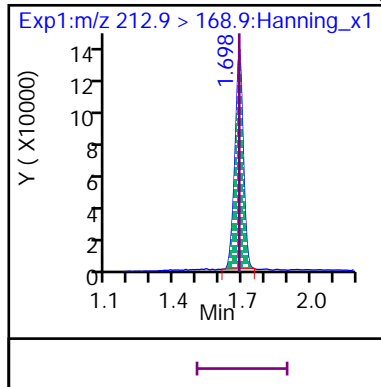
Sample Info: ICV 500\_SVLC-1202

Dil. Factor: 1

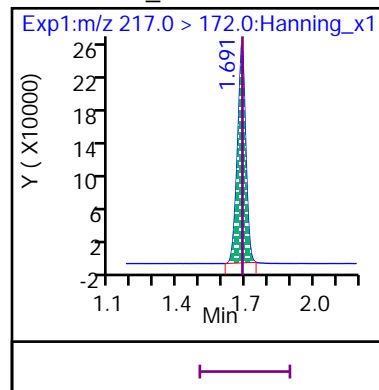
Operator: Stephen E. Somerville



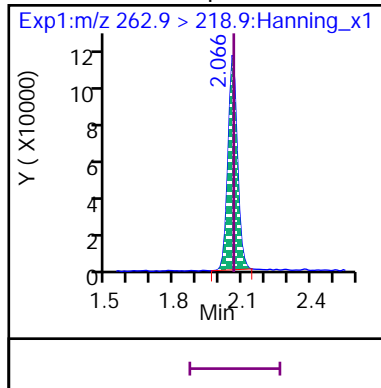
8 Perfluoro-n-butanoic acid (PFBA)



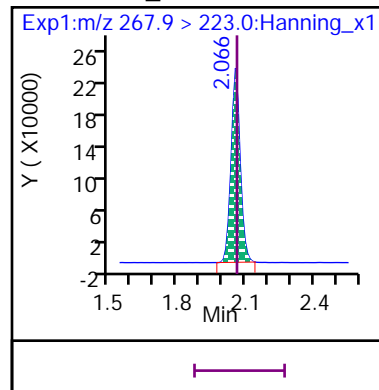
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

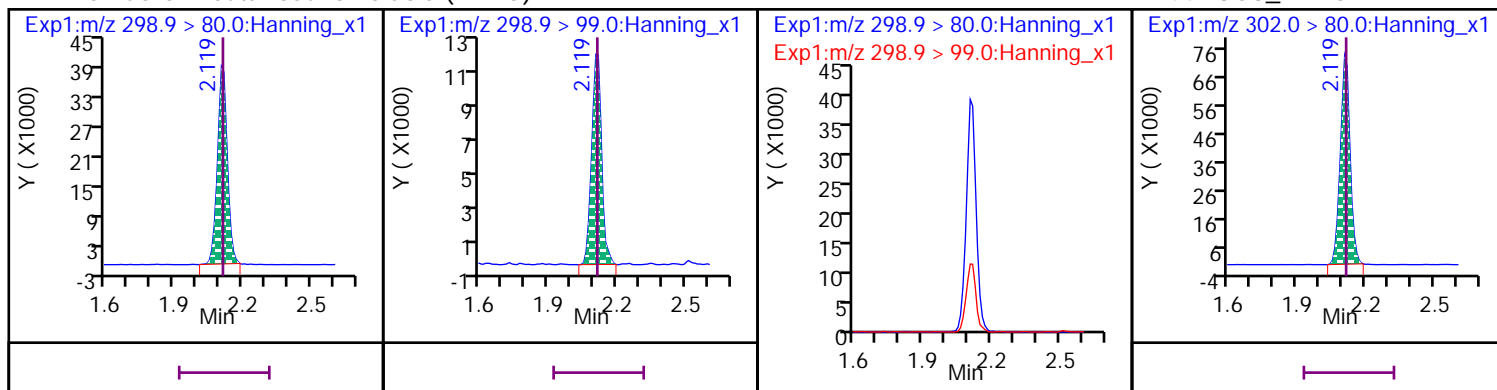


D 50 13C5\_PFPeA



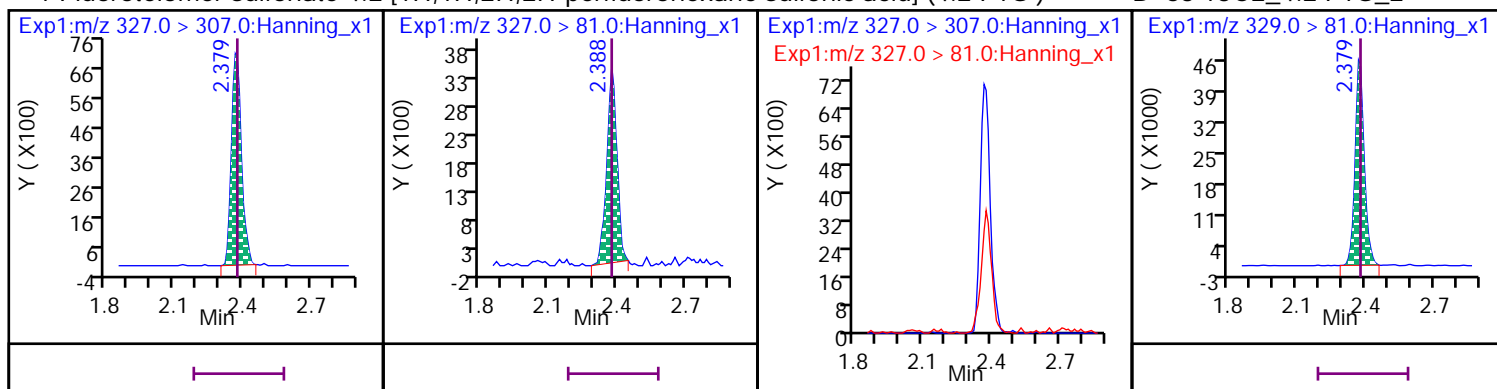
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



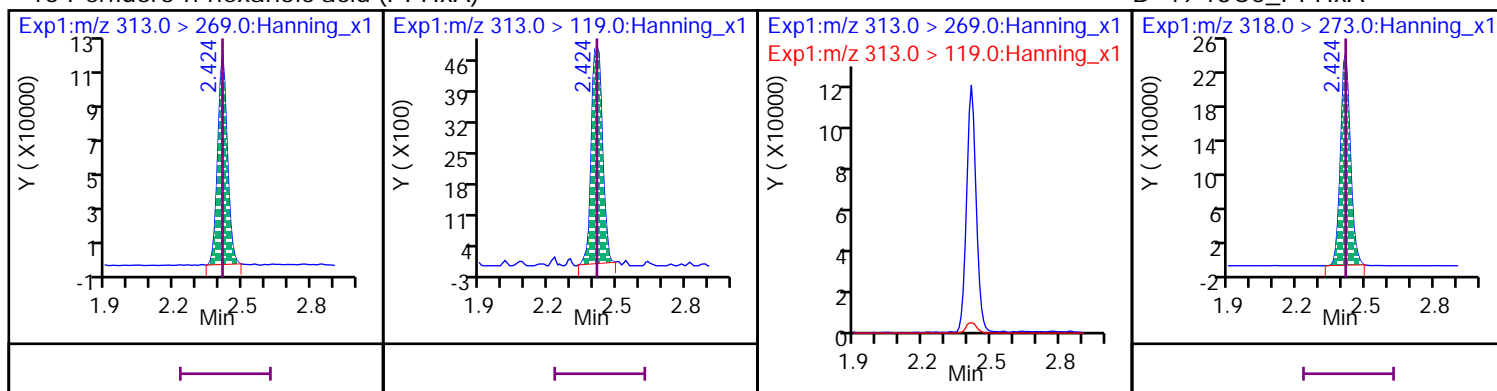
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



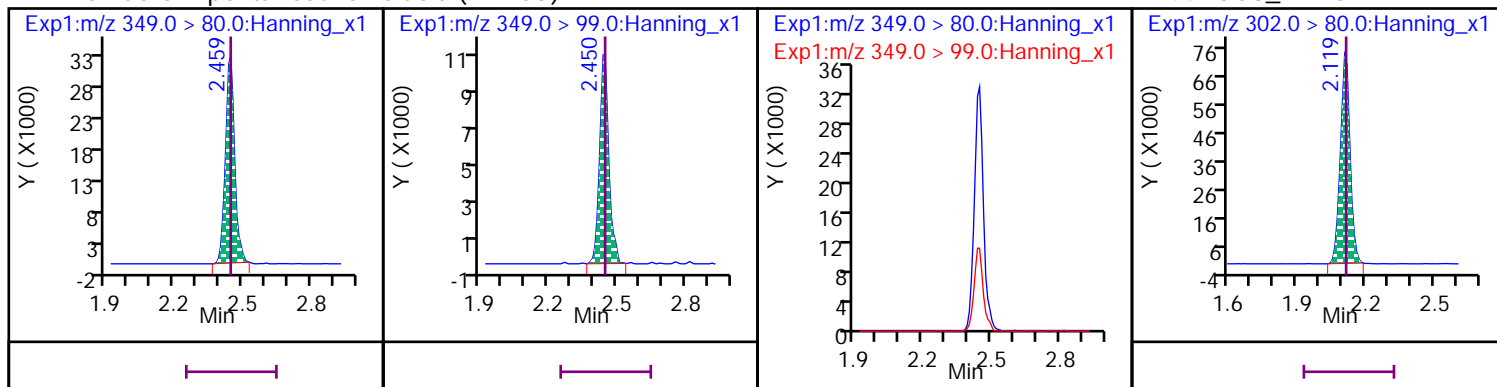
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



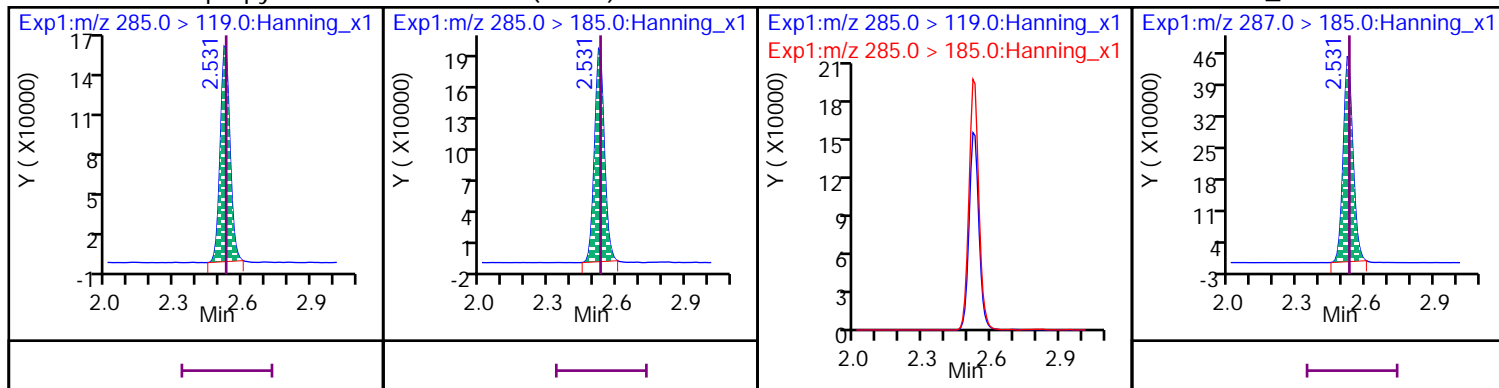
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



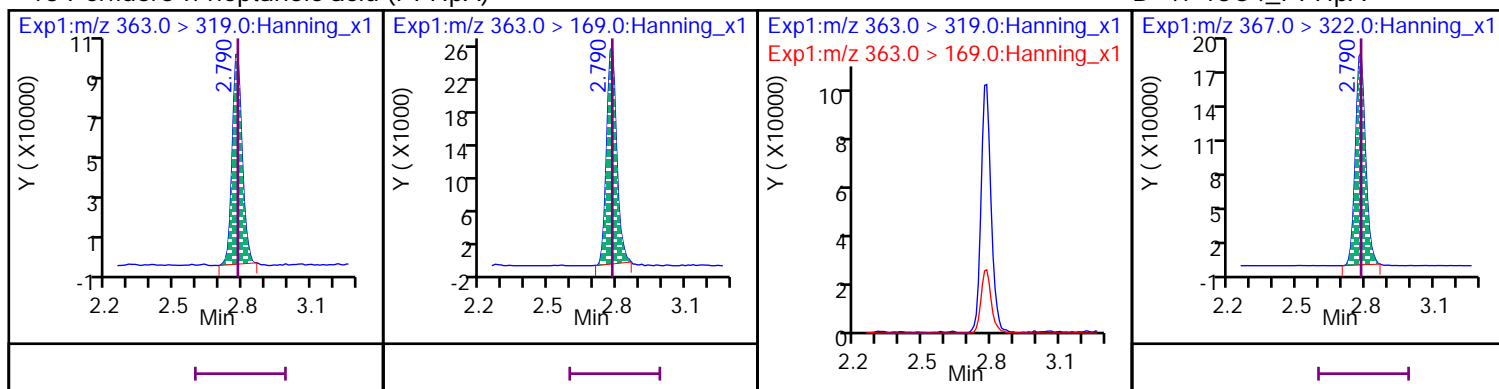
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



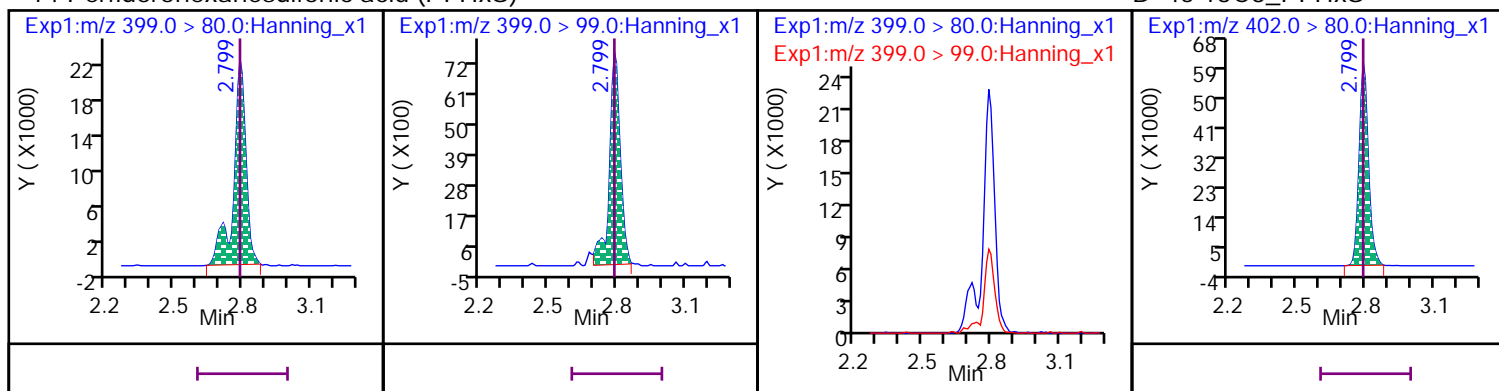
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



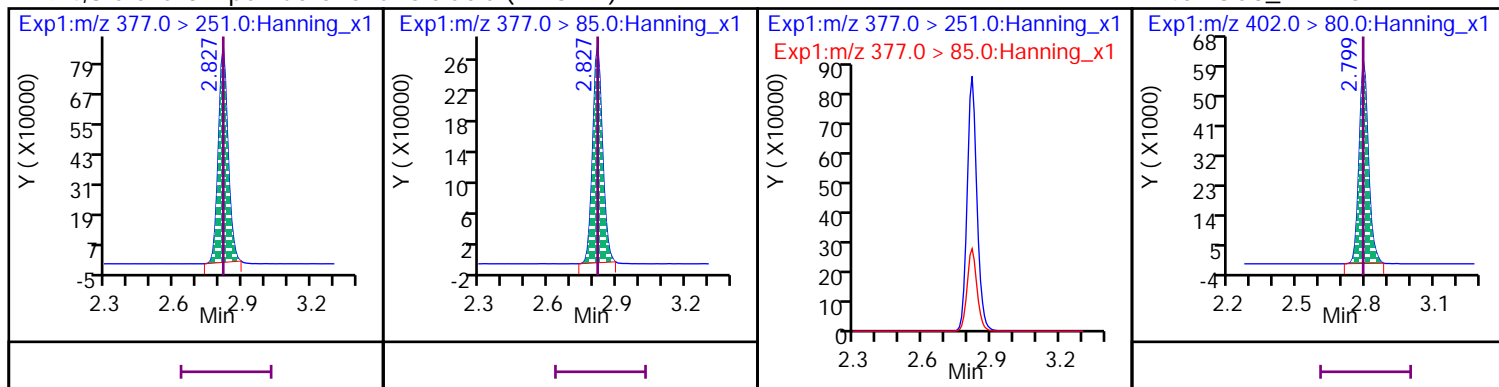
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



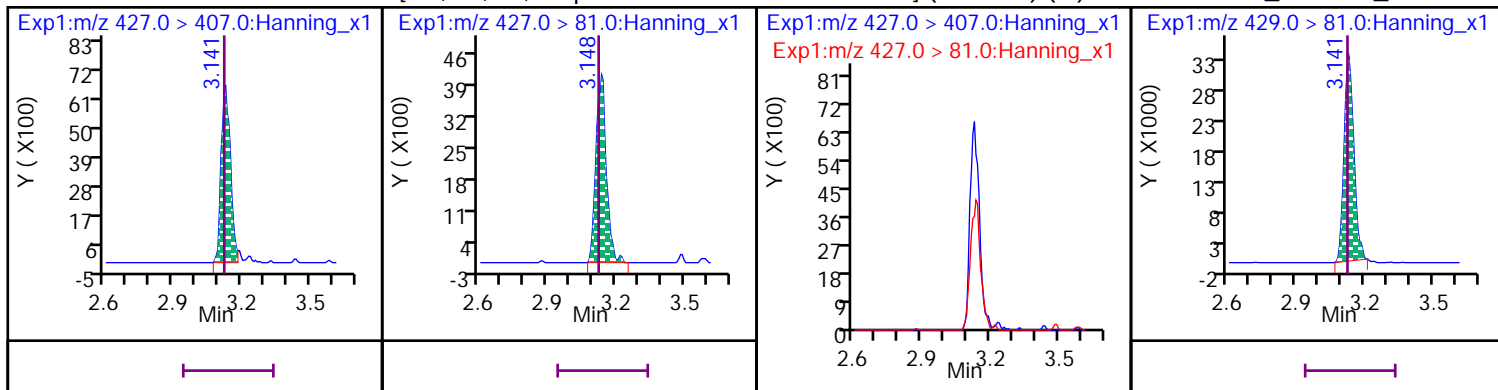
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



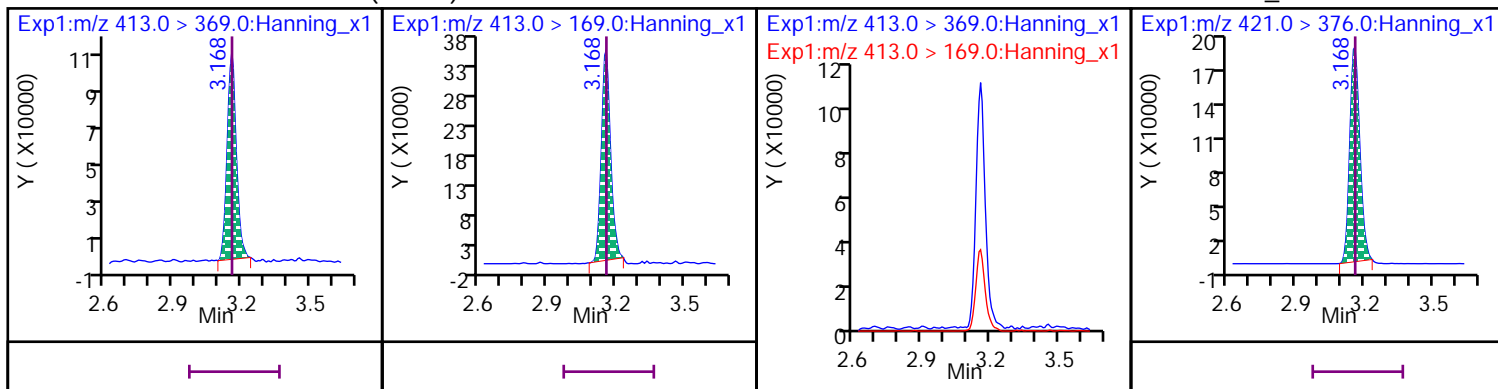


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M) D 64 13C2\_6:2 FTS\_2



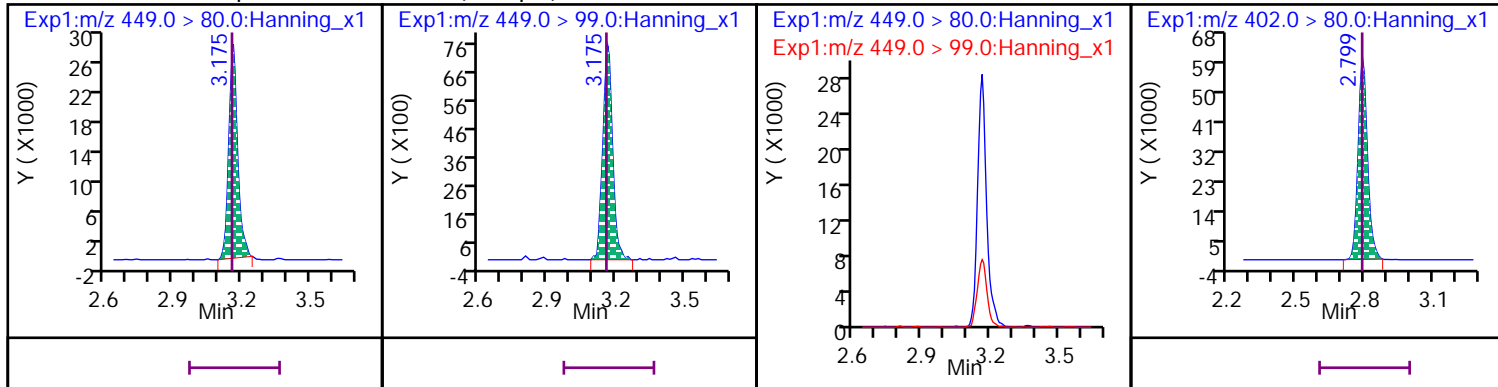
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



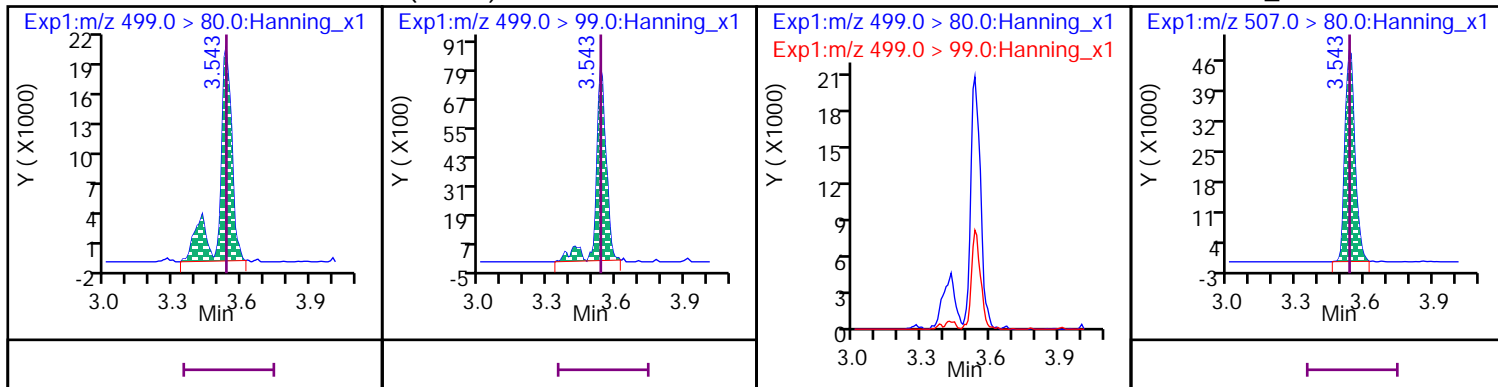
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



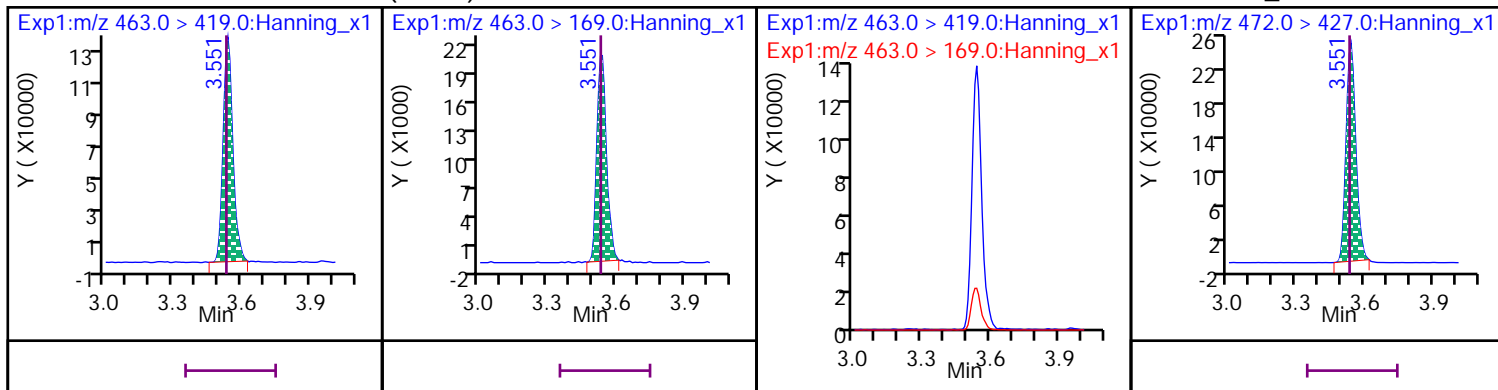
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



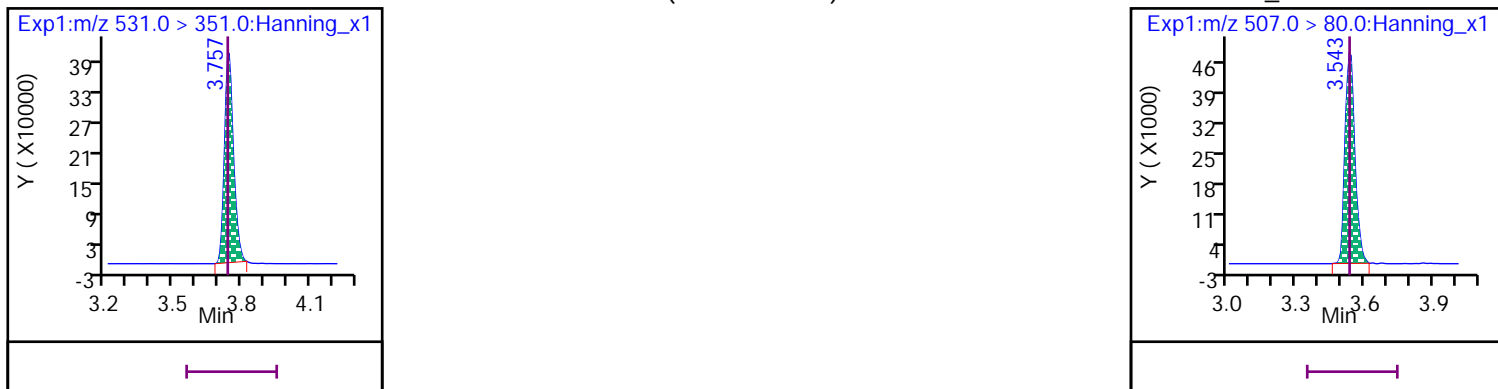
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



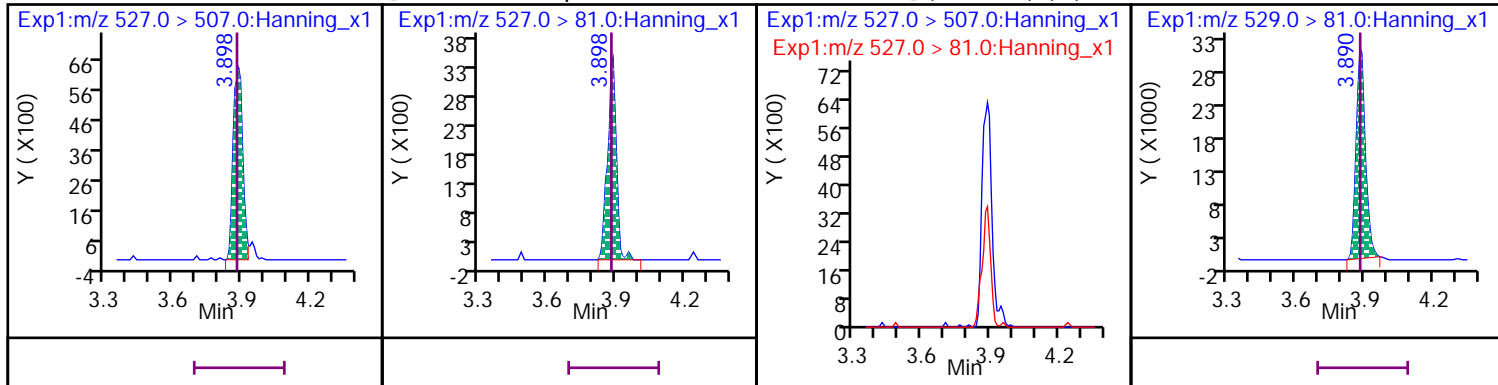
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



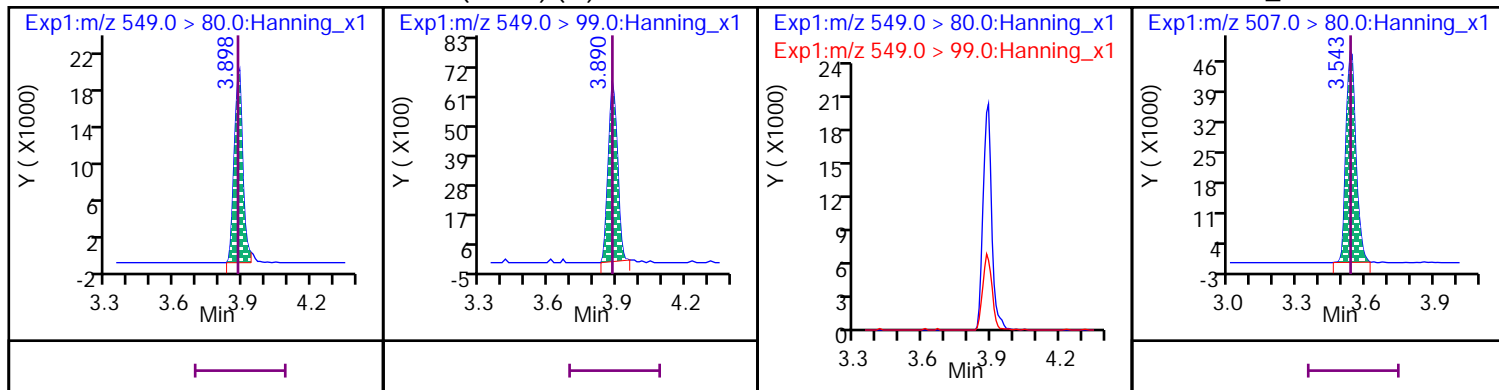
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



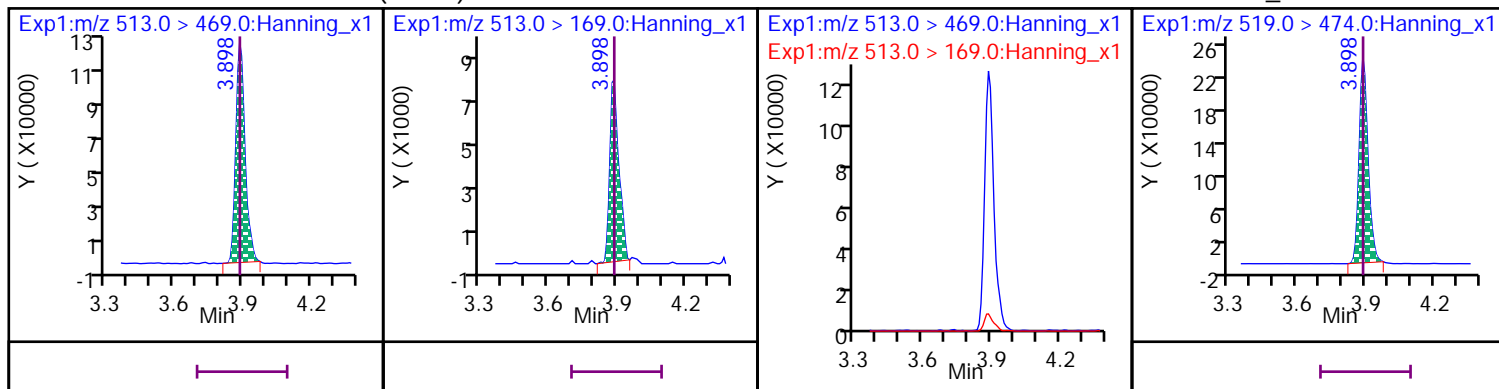
16 Perfluoro-1-nonanesulfonic acid (PFNS) (M)

D 54 13C8\_PFOS



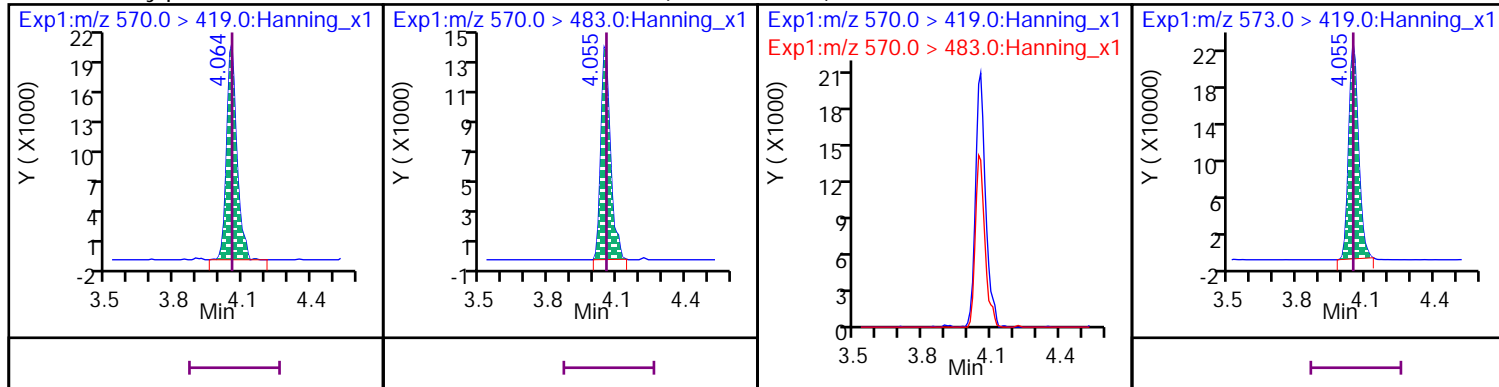
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



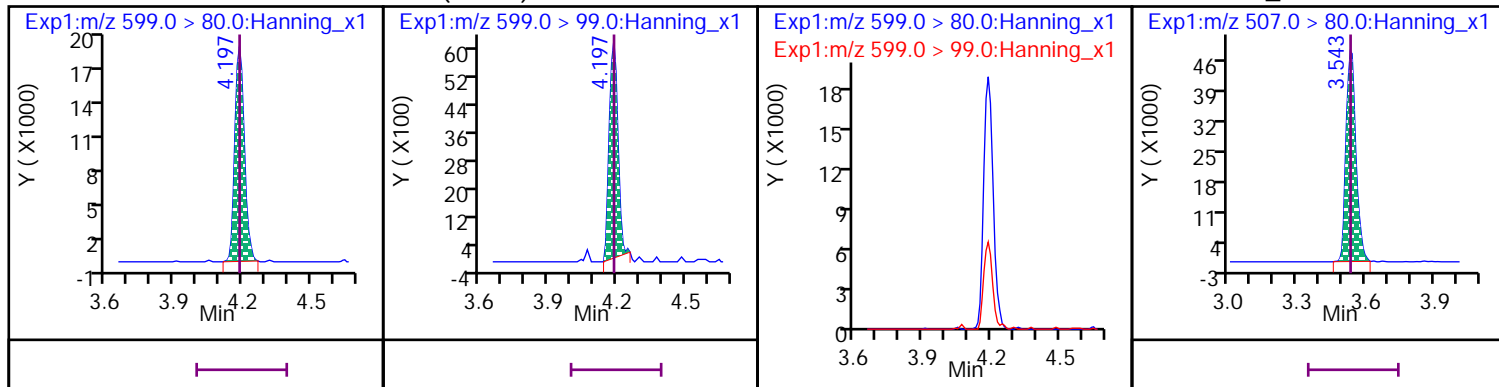
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



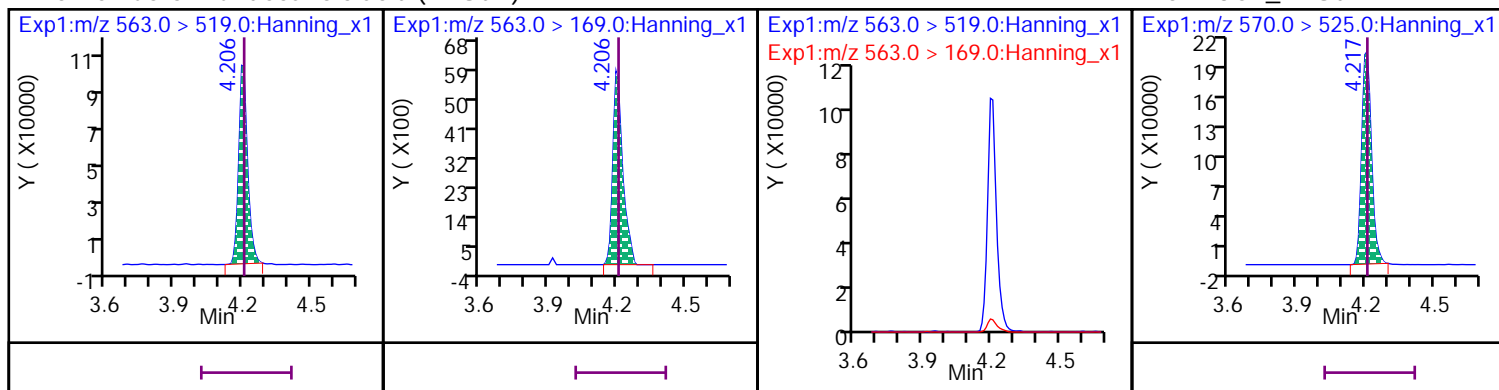
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



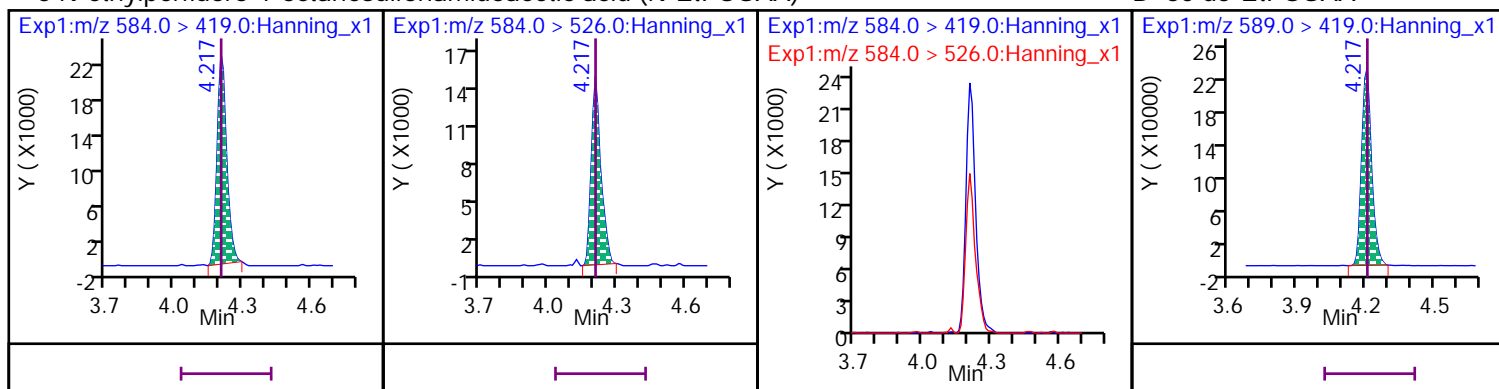
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



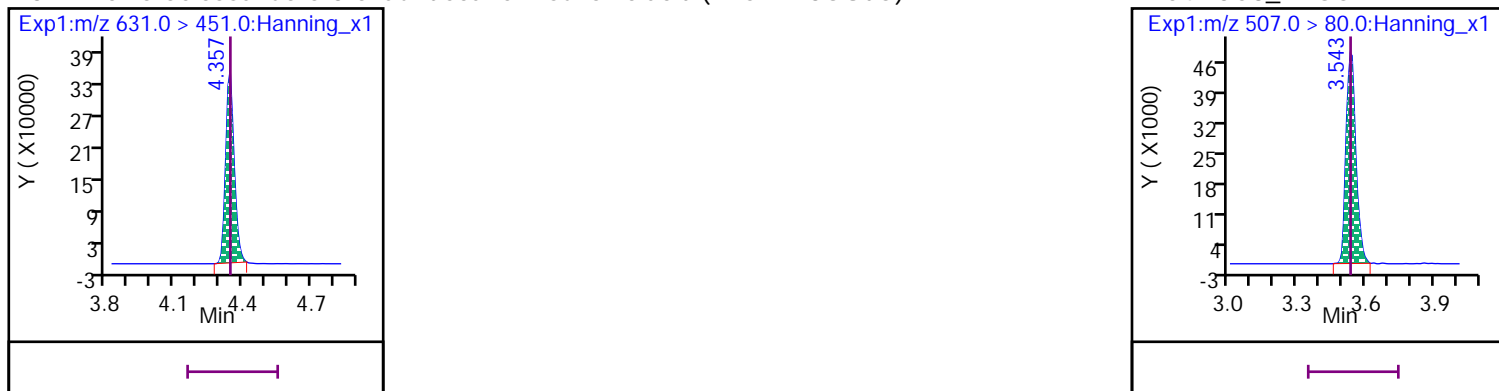
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



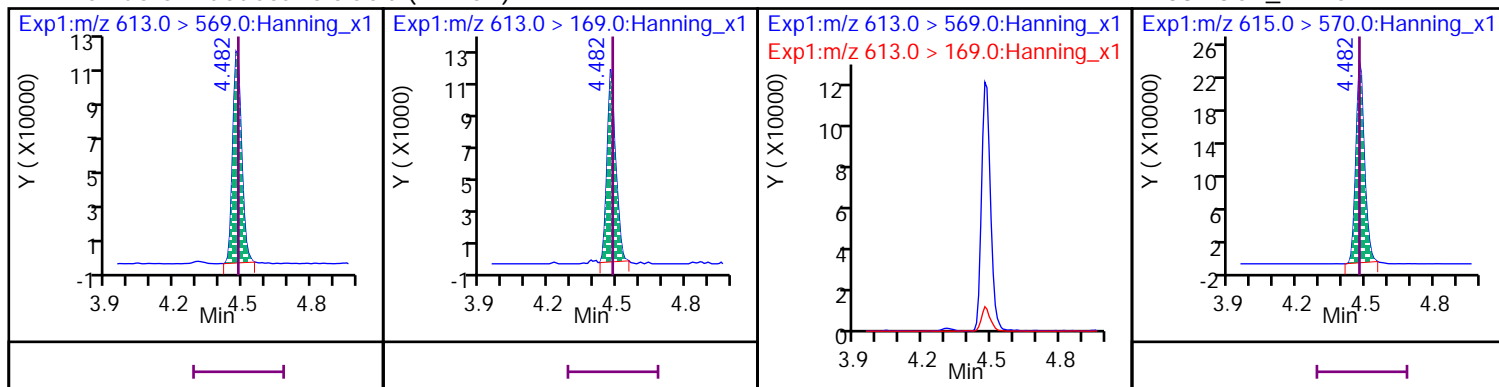
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)

D 54 13C8\_PFOS



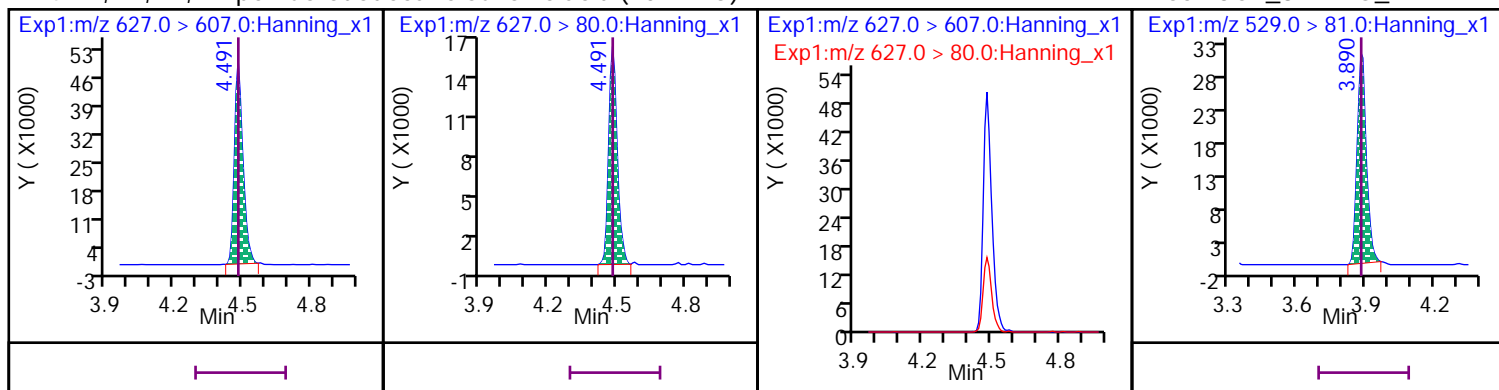
## 11 Perfluoro-n-dodecanoic acid (PFDaA)

D 38 13C2\_PFDaA



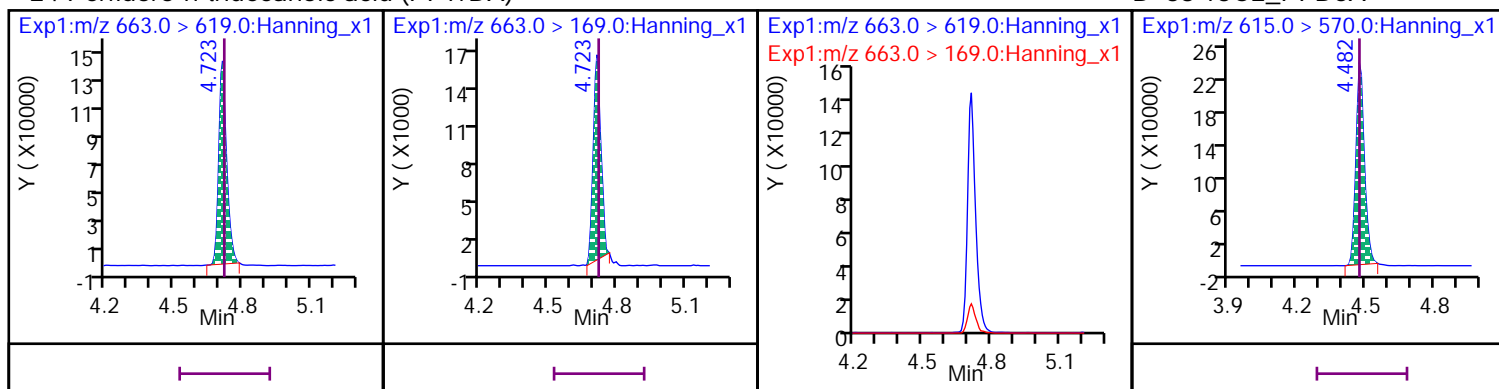
## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

## D 65 13C2\_8:2 FTS\_2



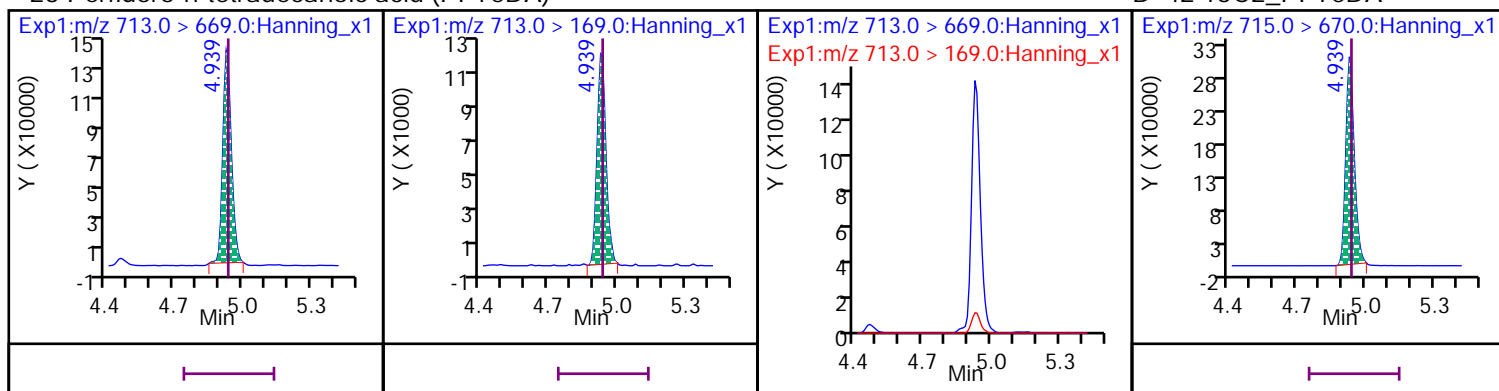
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTTeDA)

## D 42 13C2\_PFTTeDA

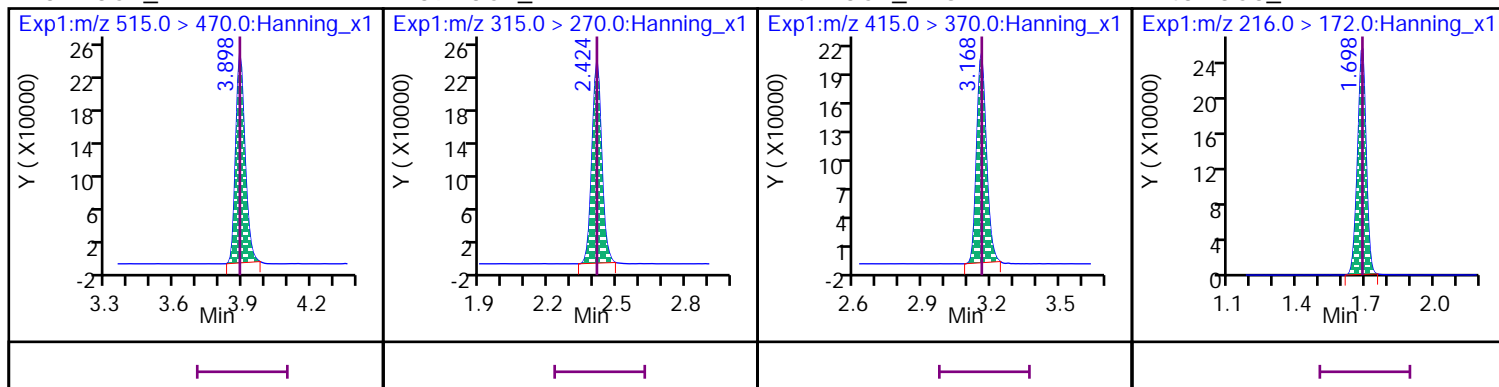


## \* 37 13C2\_PFDA

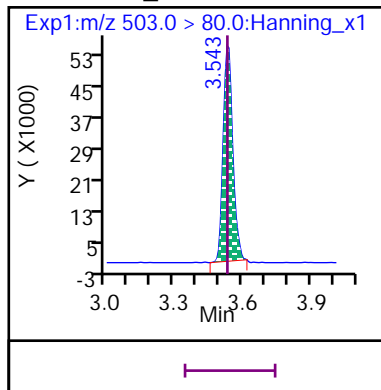
## \* 39 13C2\_PFHxA

## \* 41 13C2\_PFOA

## \* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

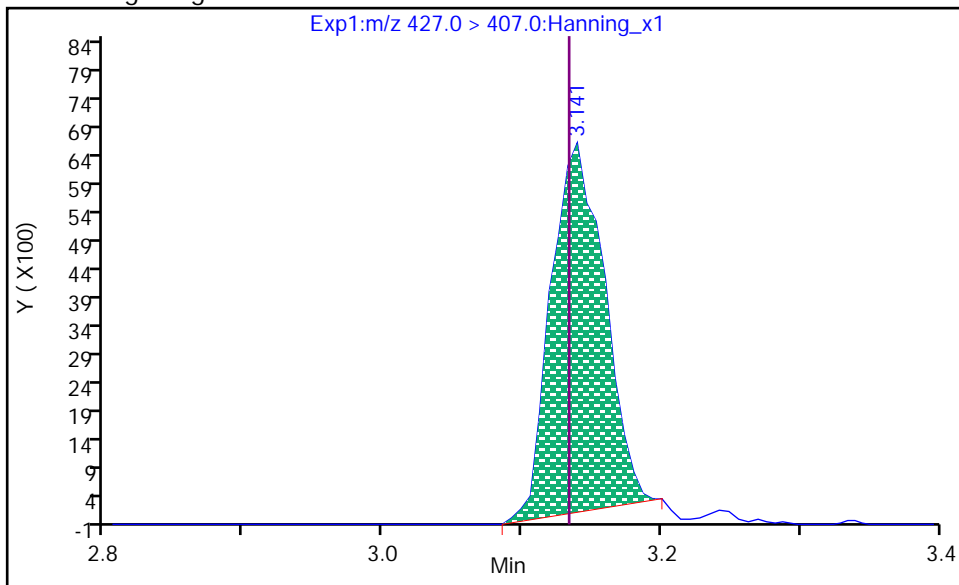
Dil. Factor: 1

Operator: Stephen E. Somerville

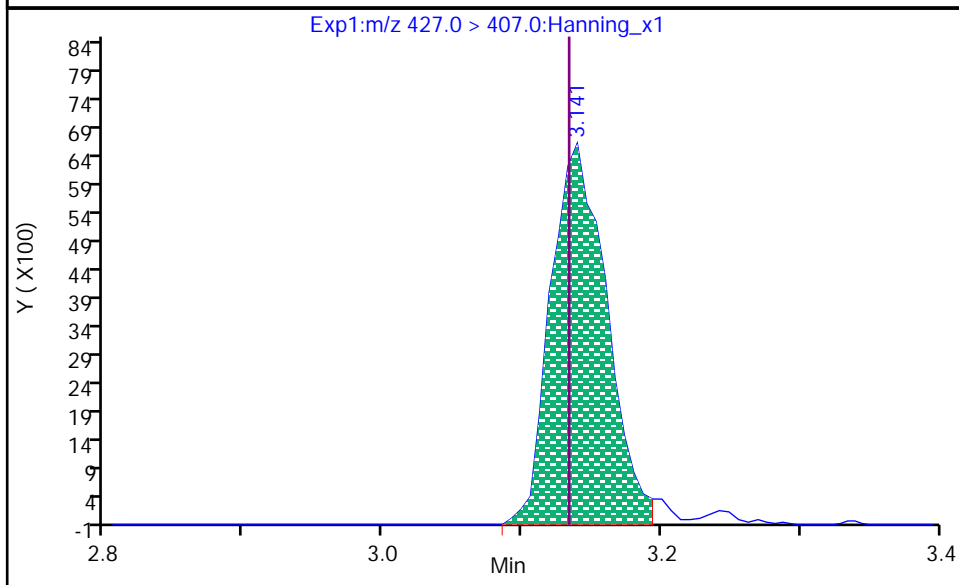
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

RT: 3.141  
Area: 17032  
Amount: 411.01  
Amount Units: ng/L



RT: 3.141  
Area: 18390  
Amount: 446.09  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:54

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

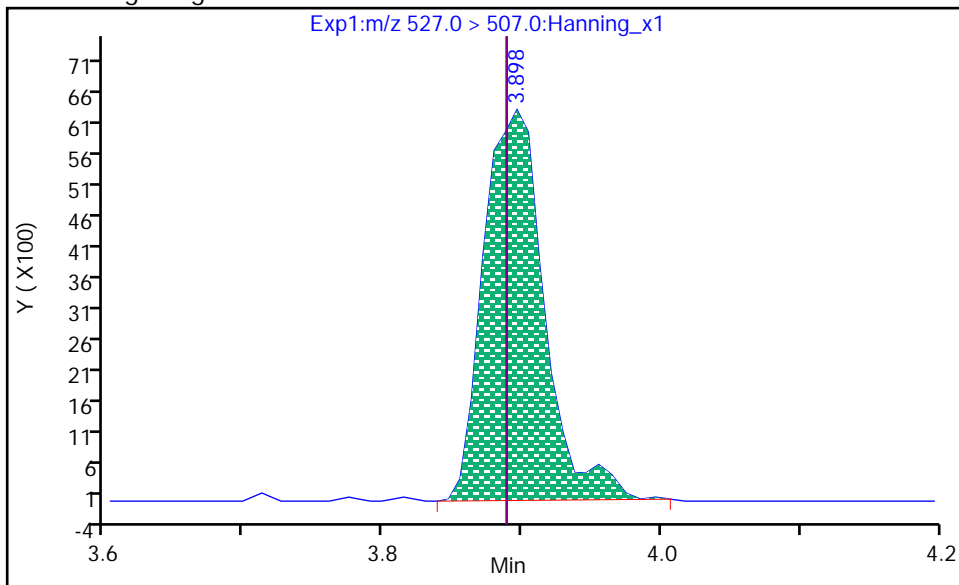
Dil. Factor: 1

Operator: Stephen E. Somerville

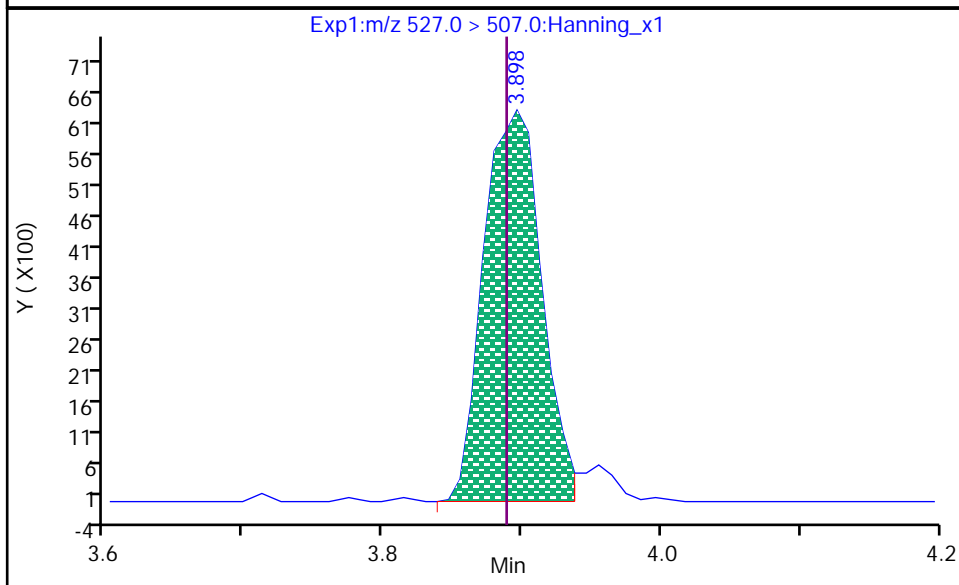
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.898  
Area: 19021  
Amount: 539.73  
Amount Units: ng/L



RT: 3.898  
Area: 18094  
Amount: 512.60  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:18:05

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

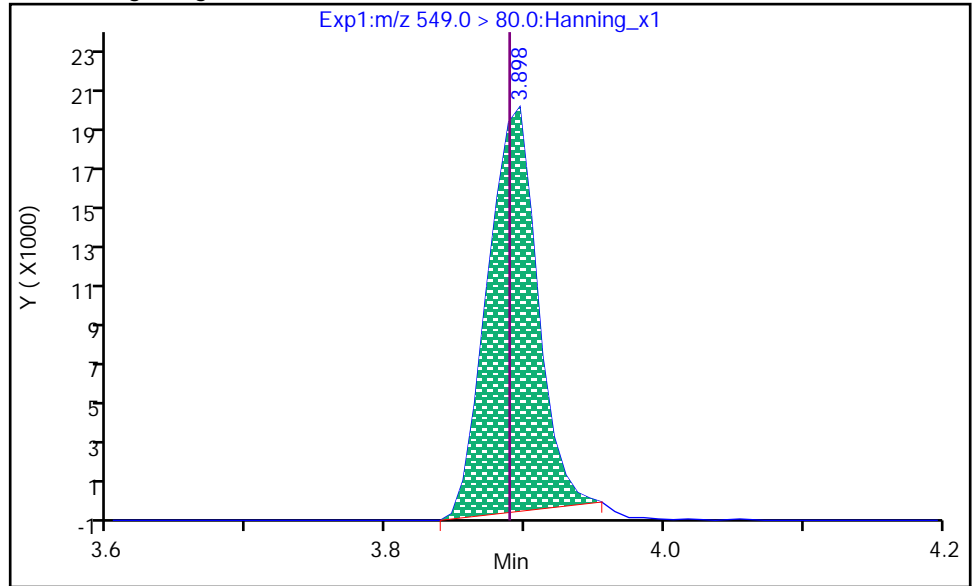
Dil. Factor: 1

Operator: Stephen E. Somerville

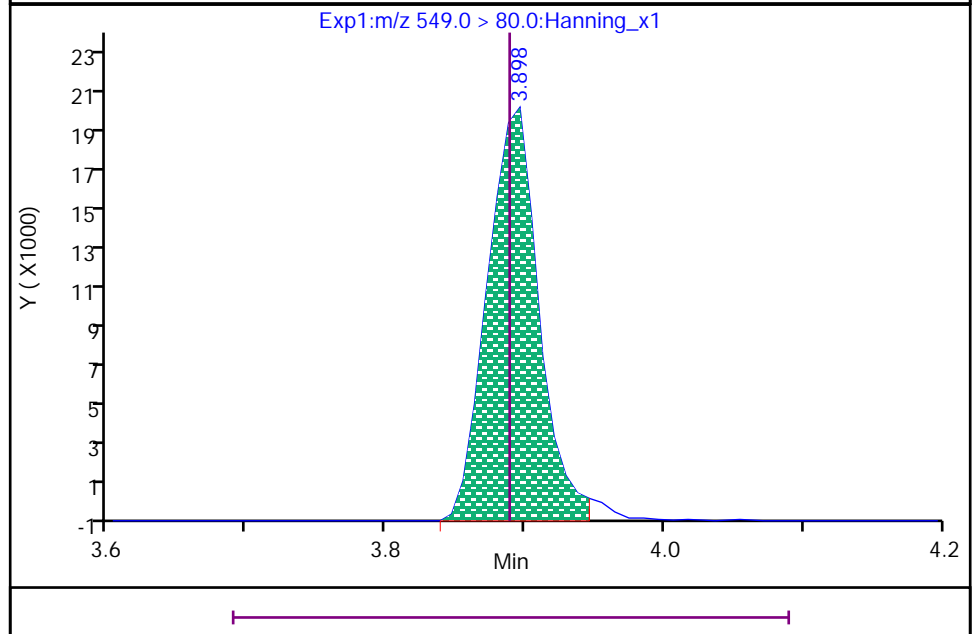
16 PFNS, CAS: 68259-12-1

Processing Integration Results

RT: 3.898  
Area: 48422  
Amount: 449.47  
Amount Units: ng/L



RT: 3.898  
Area: 50989  
Amount: 473.30  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:18:14

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d  
 Injection Date: 17-Dec-2020 14:29:42 Injection Vol: 10.0 uL  
 Sample Type: CheckStd Auto Sampler: 13  
 Sample Info: ISOMER CHECK\_SVLC-1189 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.693	1.696	0	665750	23	>100:1			1000.00	959.91	90.5	
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	665744	18	>100:1			1000.00	967.81	91.4	
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	225554	17	>100:1			1000.00	979.69	91.1	
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	109159	17	>100:1			5000.00	4509.15	86.3	
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	694964	19	>100:1			1000.00	942.87	89.7	
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1237526	19	>100:1			5000.00	4646.17	87.6	
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.792	2.790	1	570788	18	>100:1			1000.00	940.89	92.7	
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.801	2.799	1	169210	20				1000.00	988.21	94.4	
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.136	3.135	1	81816	22	>100:1			5000.00	4248.33	78.2	
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.163	3.169	0	557445	23	>100:1			1000.00	941.85	85.1	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.163	3.169	0/0	5462959	44	>100:1	Target = 2.85	0.17	10000	9613.01		
413 > 169	53	3.163	3.169		2033553	36	>100:1	2.68 (1.42-4.28)	0.23				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	147658	22	>100:1			1000.00	984.85	95.7	
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	682696	22	>100:1			1000.00	909.09	86.2	
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.867	3.866	1	287269	21	>100:1			1000.00	927.98	86.9	
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	89668	16	>100:1			5000.00	4833.82	96.1	
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.891	3.899	0	628227	20	>100:1			1000.00	947.08	90	
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.057	4.056	1	723448	19	>100:1			5000.00	5040.07	94.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.057	4.065	0/-1	1244979	33	>100:1	Target = 1.34	0.13	10000	11202		
570 > 483	58	4.057	4.065		943967	34	>100:1	1.31 (0.67-2.02)	0.24				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.208	4.217	0	734221	17	>100:1			5000.00	5528.16	99.4	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/1	1556003	34	>100:1	Target = 1.71	0.10	10000	10643		M
584 > 526	60	4.218	4.217		946015	34	>100:1	1.64 (0.85-2.57)	0.21				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 52 13C7_PFUdA</b>		<b>CAS: SESI-0117</b>											
570 > 525		4.208	4.217	0	615250	18				1000.00	973.38	90.7	
<b>D 61 d7-MeFOSE</b>		<b>CAS: SESI-0129</b>											
623 > 59		4.299	4.298	1	108995	18	>100:1			1000.00	1007.27	92.9	
<b>D 57 d3-MeFOSA</b>		<b>CAS: SESI-0109</b>											
515 > 169		4.319	4.318	1	49951	22	>100:1			1000.00	943.95	90.9	
<b>D 62 d9-EtFOSE</b>		<b>CAS: SESI-0130</b>											
639 > 59		4.458	4.465	0	126181	18	>100:1			1000.00	1006.26	104	
<b>D 38 13C2_PFDoA</b>		<b>CAS: SESI-0118</b>											
615 > 570		4.485	4.483	1	677017	18				1000.00	1118.45	104	
<b>D 59 d5-EtFOSA</b>		<b>CAS: SESI-0108</b>											
531 > 169		4.485	4.483	1	47545	16	>100:1			1000.00	968.44	92.3	
<b>D 42 13C2_PFTeDA</b>		<b>CAS: SESI-0119</b>											
715 > 670		4.941	4.948	0	884306	18	>100:1			1000.00	1049.69	99.7	
<b>D 40 13C2_PFHxDA</b>		<b>CAS: SESI-0103</b>											
815 > 770		5.327	5.334	0	819475	19	>100:1			1000.00	904.33	89.7	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.891	3.899	0	648561	20	>100:1					89.3	
<b>* 39 13C2_PFHxA</b>		<b>CAS: SESI-0120</b>											
315 > 270		2.425	2.423	1	676716	19	>100:1					89.9	
<b>* 41 13C2_PFOA</b>		<b>CAS: 864071-08-9</b>											
415 > 370		3.163	3.169	0	577829	22	>100:1					89.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	608048	23	>100:1					91.3	
<b>* 48 13C4_PFOS</b>		<b>CAS: 2795-39-3</b>											
503 > 80		3.537	3.545	0	139201	19						85.7	

### Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d

Injection Date: 17-Dec-2020 14:29:42

Inst. ID: LCMSMS02

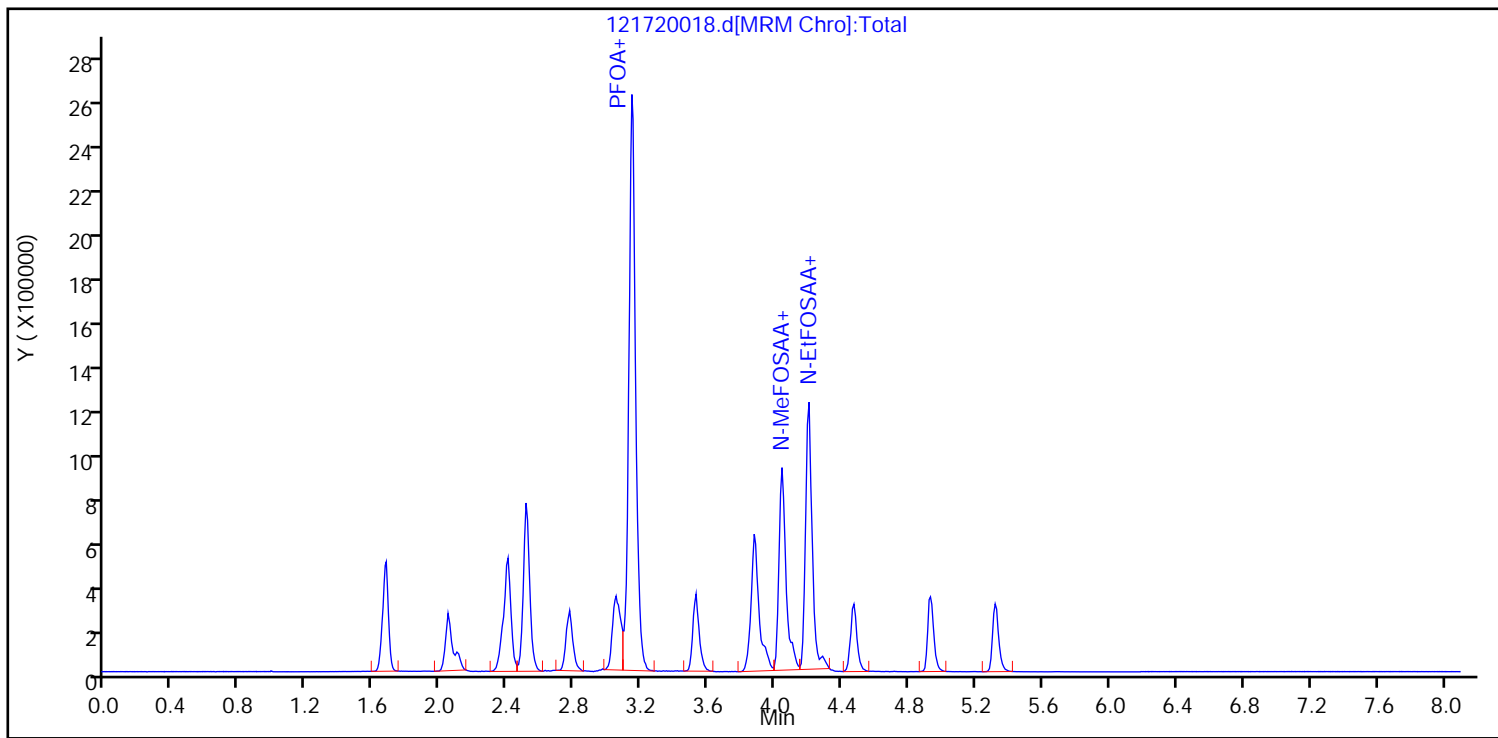
Client ID:

Lab ID: ISOMER CHECK\_SVLC-1189

Sample Info: ISOMER CHECK\_SVLC-1189

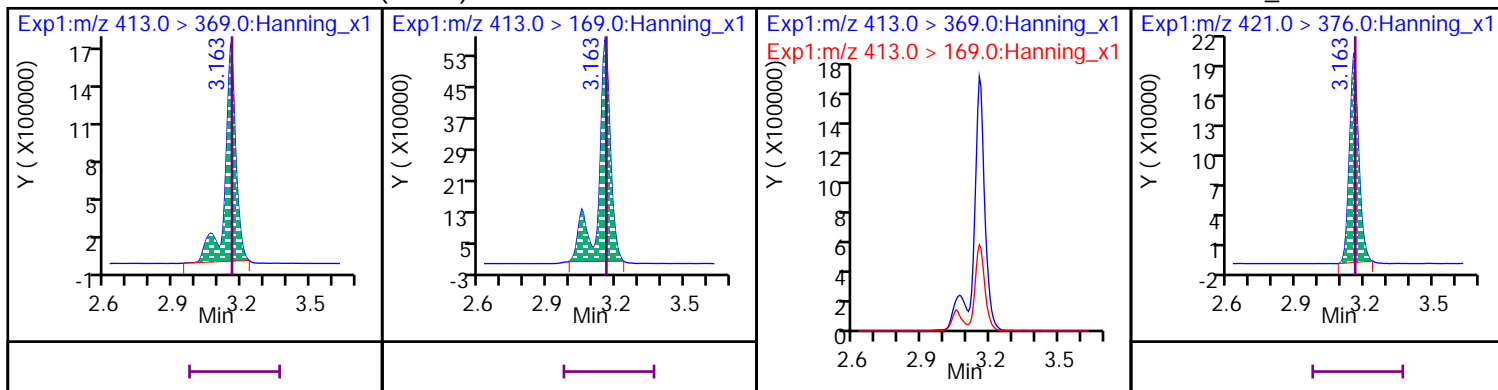
Dil. Factor: 1

Operator: Stephen E. Somerville



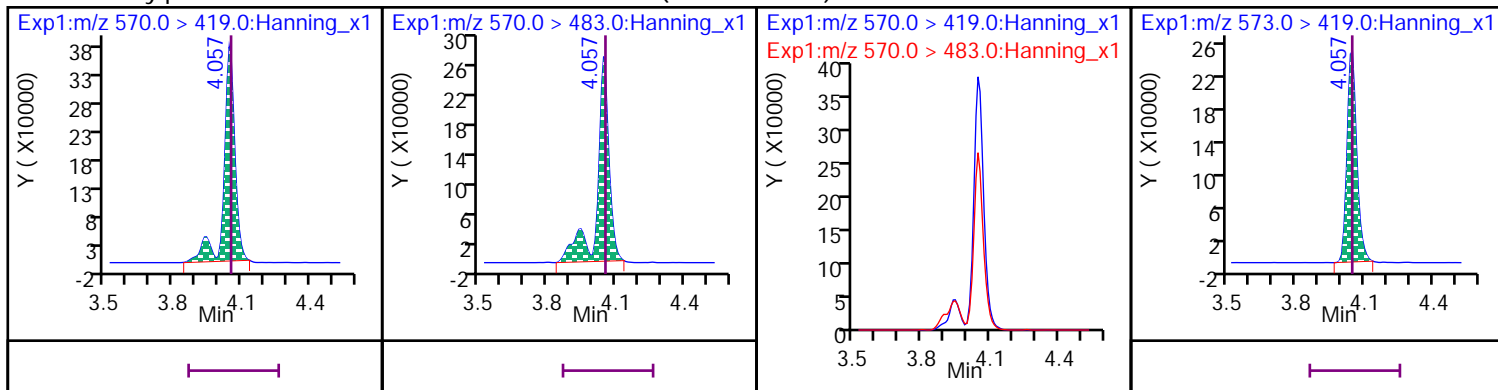
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



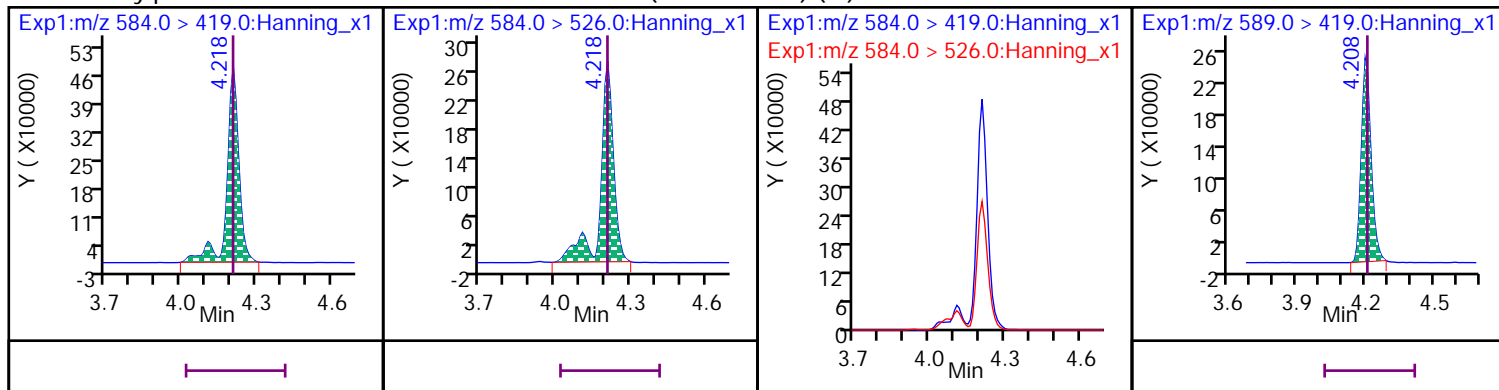
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA

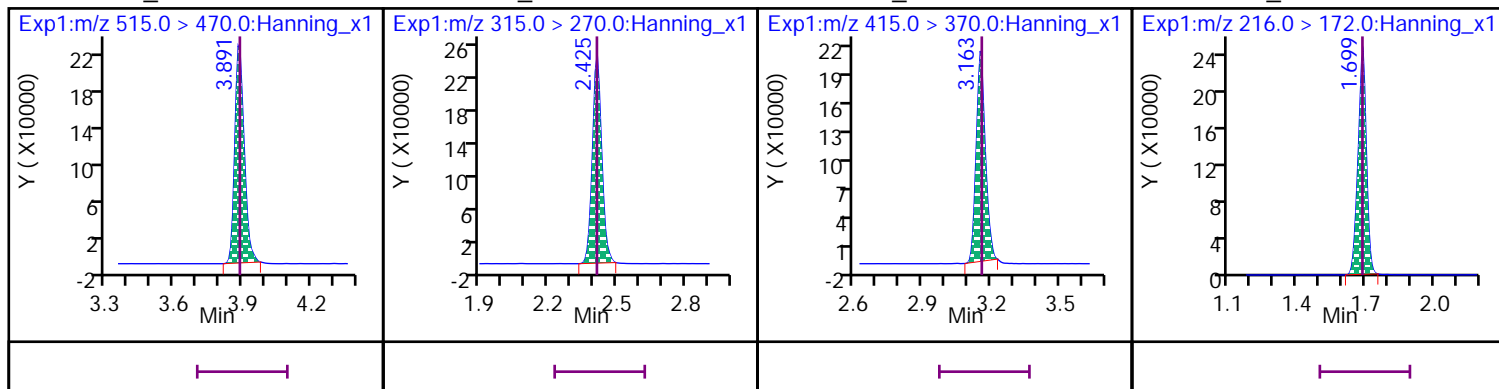


\* 37 13C2\_PFDA

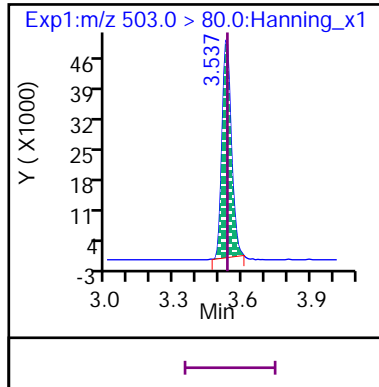
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d

Injection Date: 17-Dec-2020 14:29:42

Inst. ID: LCMSMS02

Client ID:

Lab ID: ISOMER CHECK\_SVLC-1189

Sample Info: ISOMER CHECK\_SVLC-1189

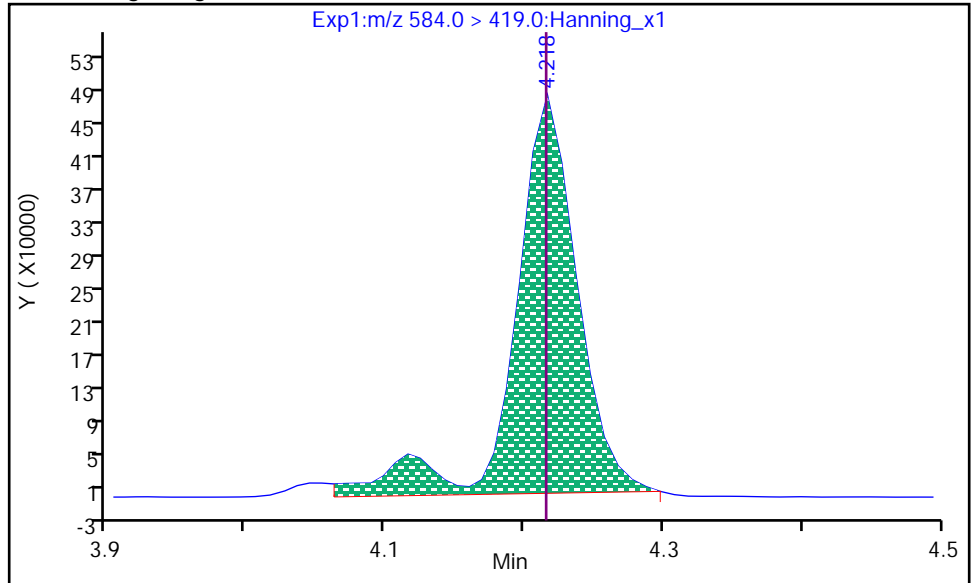
Dil. Factor: 1

Operator: Stephen E. Somerville

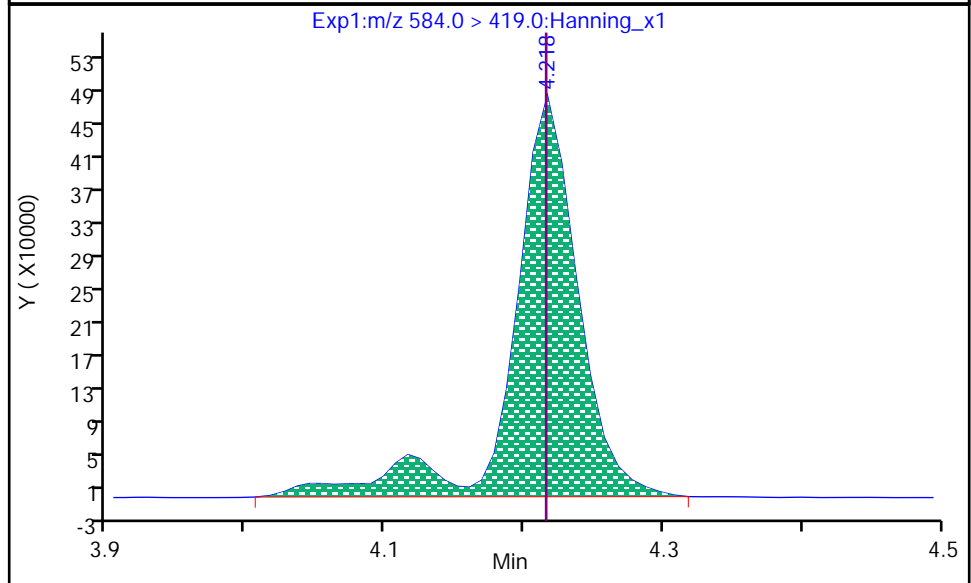
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.218  
Area: 1484300  
Amount: 10153  
Amount Units: ng/L



RT: 4.218  
Area: 1556003  
Amount: 10643  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:05:13

Audit Action: Mint

Audit Reason: Isomers

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d  
Injection Date: 23-Dec-2020 11:20:59 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	101.05	101	70 - 130
D 46 13C4_PFBA	735341	659896			89.7	50 - 150
D 50 13C5_PFPeA	728206	681912			93.6	50 - 150
21 PFPeA			100.00	98.758	98.8	70 - 130
7 PFBS			88.400	95.408	108	70 - 130
D 44 13C3_PFBS	247575	234990			94.9	50 - 150
1 4:2 FTS			93.400	108.14	116	70 - 130
D 63 13C2_4:2 FTS_2	126464	145673			115	50 - 150
D 49 13C5_PFHxA	774364	739934			95.6	50 - 150
15 PFHxA			100.00	108.79	109	70 - 130
22 PFPeS			93.800	102.15	109	70 - 130
28 GenX			200.00	205.33	103	70 - 130
D 66 13C3_GenX	1412202	1382147			97.9	50 - 150
D 47 13C4_PFHpA	616003	612609			99.4	50 - 150
13 PFHpA			100.00	109.98	110	70 - 130
D 45 13C3_PFHxS	179294	185632			104	50 - 150
14 PFHxS			91.000	81.718	89.8	70 - 130
29 ADONA			94.200	87.046	92.4	70 - 130
D 64 13C2_6:2 FTS_2	104623	118188			113	50 - 150
2 6:2 FTS			94.800	70.733	74.6	70 - 130
20 PFOA			100.00	106.60	107	70 - 130
D 53 13C8_PFOA	654941	612317			93.5	50 - 150
12 PFHpS			95.200	98.486	103	70 - 130
18 PFOS			92.800	100.67	108	70 - 130
17 PFNA			100.00	116.99	117	70 - 130
D 56 13C9_PFNA	792377	732148			92.4	50 - 150
D 54 13C8_PFOS	154357	151103			97.9	50 - 150
30 9CI-PF3ONS			93.200	94.703	102	70 - 130
D 55 13C8_PFOSA	330552	323224			97.8	50 - 150
19 PFOSA			100.00	110.06	110	70 - 130
16 PFNS			96.000	79.172	82.5	70 - 130
D 65 13C2_8:2 FTS_2	93314	93513			100	50 - 150
3 8:2 FTS			95.800	83.736	87.4	70 - 130
10 PFDA			100.00	112.54	113	70 - 130
D 51 13C6_PFDA	698114	641610			91.9	50 - 150
D 58 d3-MeFOSAA	762102	810340			106	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	79.298	79.3	70 - 130
9 PFDS			96.400	92.960	96.4	70 - 130
5 N-EtFOSAA			100.00	89.704	89.7	70 - 130
25 PFUdA			100.00	101.79	102	70 - 130
D 60 d5-EtFOSAA	738335	763091			103	50 - 150
D 52 13C7_PFUdA	678701	652802			96.2	50 - 150
D 61 d7-MeFOSE	117292	103832			88.5	50 - 150
32 MeFOSE			100.00	107.30	107	70 - 130
26 MeFOSA			100.00	94.121	94.1	70 - 130
D 57 d3-MeFOSA	54969	49874			90.7	50 - 150
31 11Cl-PF3OUDS			94.200	108.42	115	70 - 130
D 62 d9-EtFOSE	121851	117283			96.3	50 - 150
33 EtFOSE			100.00	110.61	111	70 - 130
D 59 d5-EtFOSA	51517	52571			102	50 - 150
D 38 13C2_PFDoA	649290	604828			93.2	50 - 150
4 10:2 FTS			96.400	110.46	115	70 - 130
27 EtFOSA			100.00	77.253	77.3	70 - 130
11 PFDoA			100.00	100.02	100	70 - 130
34 PFDOS			96.800	105.16	109	70 - 130
24 PFTrDA			100.00	106.58	107	70 - 130
23 PFTeDA			100.00	109.61	110	70 - 130
D 42 13C2_PFTeDA	887372	781191			88	50 - 150
35 PFHxDA			100.00	109.65	110	70 - 130
D 40 13C2_PFHxDA	913664	893092			97.7	50 - 150
36 PFODA			100.00	100.79	101	70 - 130



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d  
 Injection Date: 23-Dec-2020 11:20:59 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 95  
 Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.705	1	659896	23	>100:1			1000.00	951.47	89.7	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/0	66415	22	32:1			100.00	101.05		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	1	681912	18	>100:1			1000.00	991.32	93.6	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	1/0	67709	16	98:1			100.00	98.758		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	234990	17	>100:1			1000.00	1020.67	94.9	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.141	2.141	1/0	26434	18	>100:1	Target = 3.50		88.400	95.408		
298.9 > 99	44	2.130	2.141		6850	17	41:1	3.85 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.461	2.461	1/0	20823	24	>100:1	Target = 3.10		93.800	102.15		
349 > 99	44	2.470	2.461		6651	17	59:1	3.13 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.389	1	145673	20	>100:1			5000.00	6017.48	115	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.398	2.398	1/0	6288	20		Target = 1.80		93.400	108.14		
327 > 81	63	2.389	2.398		3391	19	18:1	1.85 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.425	1	739934	20	>100:1			1000.00	1003.88	95.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.425	1/0	79473	26	75:1	Target = 18.34		100.00	108.79		
313 > 119	49	2.425	2.425		3659	11	36:1	21.71 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.532	0	1382147	20	>100:1			5000.00	5189.14	97.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.532	0/0	40779	19	>100:1	Target = 0.81		200.00	205.33		
285 > 185	66	2.532	2.532		48898	22	>100:1	0.83 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.783	2.783	0	612609	19	>100:1			1000.00	1009.83	99.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.783	2.783	0/0	69886	25	97:1	Target = 3.70		100.00	109.98		
363 > 169	47	2.792	2.783		15998	22	72:1	4.36 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.801	2.801	1	185632	20				1000.00	1084.12	104	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.810	2.810	0/-1	16084	37	64:1	Target = 3.21	0.20	91.000	81.718		
399 > 99	45	2.792	2.810		6250	27	25:1	2.57 (1.60-4.81)	0.10				M
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.828	1/0	102587	19	>100:1	Target = 2.97		94.200	87.046		
377 > 85	45	2.828	2.828		32698	21	>100:1	3.13 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	16608	24	>100:1	Target = 3.08		95.200	98.486		
449 > 99	45	3.183	3.169		4679	25	19:1	3.54 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.142	1	118188	23	>100:1			5000.00	6136.96	113	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.162	3.162	3/2	4743	21	43:1	Target = 1.80		94.800	70.733		M
427 > 81	64	3.142	3.162		3420	27	21:1	1.38 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	1	612317	24	>100:1			1000.00	1034.56	93.5	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/0	66545	26	33:1	Target = 2.87		100.00	106.60		
413 > 169	53	3.162	3.169		23535	38	91:1	2.82 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	151103	22	>100:1			1000.00	1007.83	97.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.553	3.553	1/0	18026	41	>100:1	Target = 3.84	0.39	92.800	100.67		
499 > 99	54	3.545	3.553		5906	36	33:1	3.05 (1.92-5.76)	0.16				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.751	1/0	48174	22	>100:1			93.200	94.703		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.883	3.883	0/-1	9155	24	63:1	Target = 3.07		96.000	79.172		
549 > 99	54	3.891	3.883		4577	18	47:1	2.00 (1.53-4.61)					M
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	10194	22		Target = 3.03		96.400	92.960		
599 > 99	54	4.198	4.198		6240	16	24:1	1.63 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.349	4.349	0/-1	46524	20	>100:1			94.200	108.42		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.698	4.698	0/-1	12757	26		Target = 3.33		96.800	105.16		
699 > 99	54	4.705	4.698		3995	22	76:1	3.19 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.553	1	732148	22	>100:1			1000.00	974.95	92.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.553	1/0	85658	28	>100:1	Target = 6.16		100.00	116.99		
463 > 169	56	3.553	3.553		14136	24	>100:1	6.05 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.867	3.867	1	323224	21	>100:1			1000.00	1044.13	97.8	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.875	3.875	1/0	35057	20	>100:1			100.00	110.06		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	93513	18	>100:1			5000.00	5041.09	100	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	0/-1	3718	13	19:1	Target = 1.95		95.800	83.736		M
527 > 81	65	3.891	3.891		1550	16	11:1	2.39 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.494	4.494	1/0	4774	22	26:1	Target = 3.14		96.400	110.46		
627 > 80	65	4.494	4.494		685	18		6.96 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	641610	19	>100:1			1000.00	967.25	91.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	70947	22	97:1	Target = 15.94		100.00	112.54		
513 > 169	51	3.908	3.899		6411	16	32:1	11.06 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.057	4.057	1	810340	19	>100:1			5000.00	5645.42	106	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	9872	29	41:1	Target = 1.33	0.06	100.00	79.298		M
570 > 483	58	4.057	4.065		10338	41		0.95 (0.66-1.99)	0.33				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.208	4.208	0	763091	17	>100:1			5000.00	5745.53	103	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.228	0/0	13630	29	95:1	Target = 1.58		100.00	89.704		M
584 > 526	60	4.198	4.228		8514	29	29:1	1.60 (0.79-2.37)					M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.208	4.208	0	652802	17	>100:1			1000.00	1032.79	96.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.218	1/1	62452	18	93:1	Target = 15.50		100.00	101.79		
563 > 169	52	4.208	4.218		4873	13		12.81 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.309	4.309	1	103832	16	>100:1			1000.00	959.56	88.5	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.309	4.309	0/-1	10468	18	40:1			100.00	107.30		M
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.319	4.319	1	49874	16	>100:1			1000.00	942.50	90.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.319	1/0	5296	12	29:1	Target = 1.12		100.00	94.121		
512 > 219	57	4.329	4.319		8069	20		0.65 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.467	4.467	1	117283	16	>100:1			1000.00	935.31	96.3	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.476	4.476	1/0	11542	23	53:1			100.00	110.61		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.485	4.485	1	604828	18	>100:1			1000.00	999.19	93.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.476	4.476	0/-1	61259	20	29:1	Target = 10.85		100.00	100.02		
613 > 169	38	4.485	4.476		5719	17	19:1	10.71 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.719	4.719	0/-1	63489	20	>100:1	Target = 8.37		100.00	106.58		
663 > 169	38	4.725	4.719		9006	27	85:1	7.04 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.485	4.485	1	52571	18	>100:1			1000.00	1070.81	102	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.494	4.494	1/0	4437	18	21:1	Target = 1.03		100.00	77.253		
526 > 219	59	4.494	4.494		4430	22	32:1	1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.933	4.933	0	781191	20	>100:1			1000.00	927.29	88	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.933	4.933	0/0	74191	19	11:1	Target = 12.11		100.00	109.61		
713 > 169	42	4.933	4.933		6220	19	>100:1	11.92 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.318	5.318	0	893092	19	>100:1			1000.00	985.57	97.7	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.318	5.318	0/0	63985	20	26:1	Target = 11.48		100.00	109.65		
813 > 269	40	5.318	5.318		5671	19	>100:1	11.28 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.668	5.668	-1/-1	79681	24	12:1	Target = 13.88		100.00	100.79		
913 > 319	40	5.668	5.668		5676	22	>100:1	14.03 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	725248	21	>100:1					99.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.425	1	729807	20	>100:1					97	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	1	619740	24	>100:1					96.2	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	606999	23	>100:1					91.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	159868	19	>100:1					98.4	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

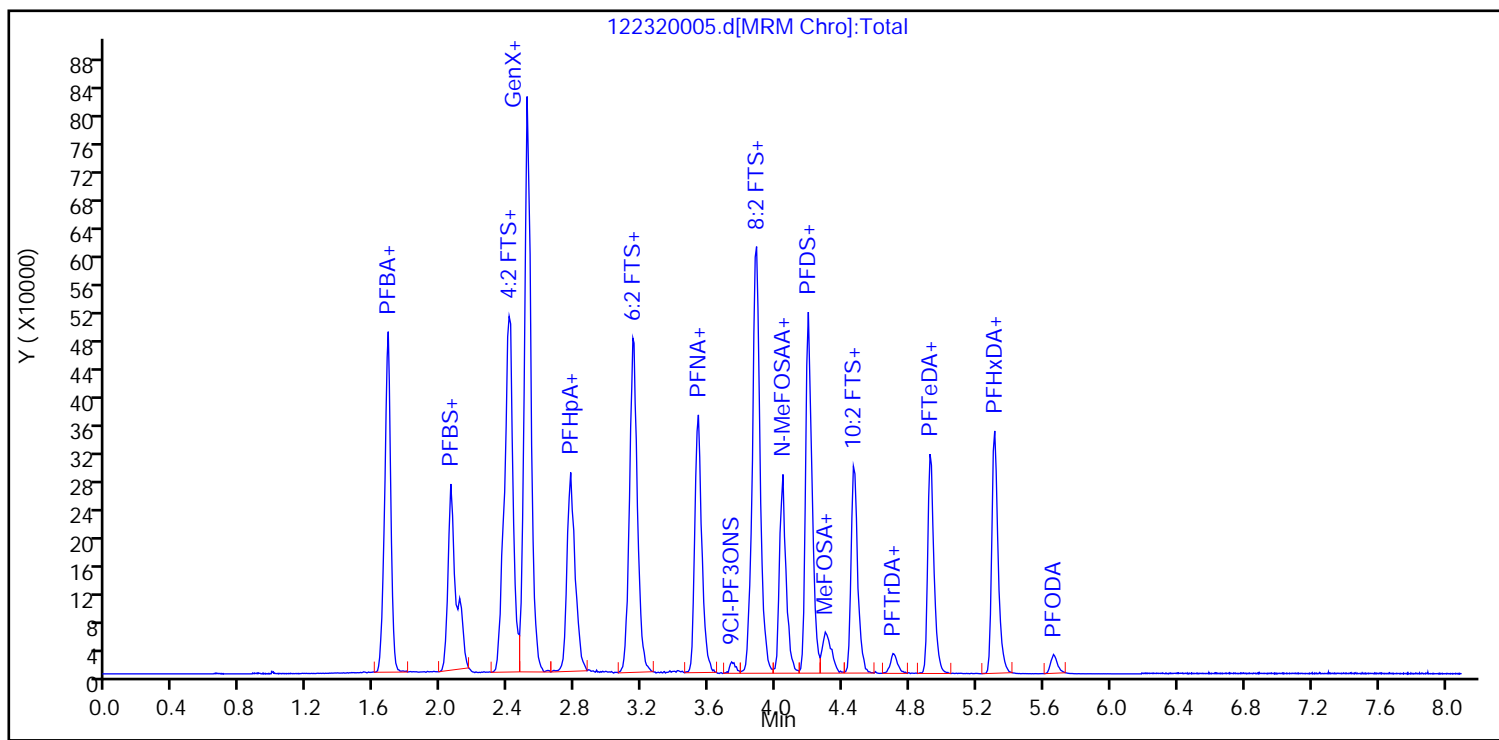
Client ID:

Lab ID: ID CCV 100\_SVLC-1220

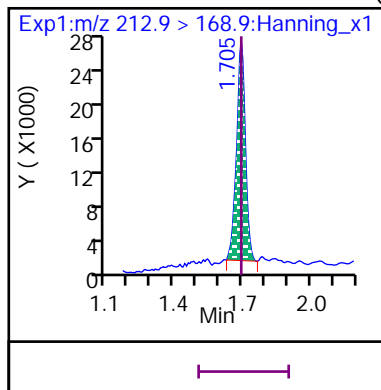
Sample Info: ID CCV 100\_SVLC-1220

Dil. Factor: 1

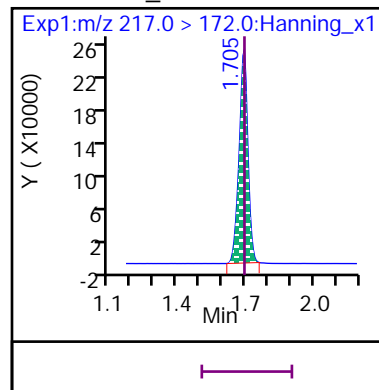
Operator: Stephen E. Somerville



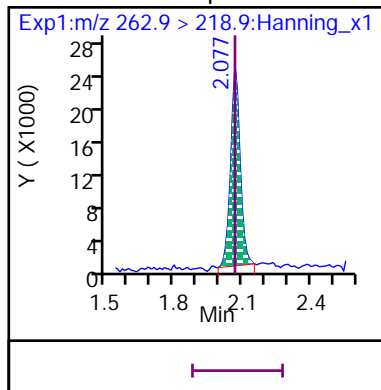
8 Perfluoro-n-butanoic acid (PFBA)



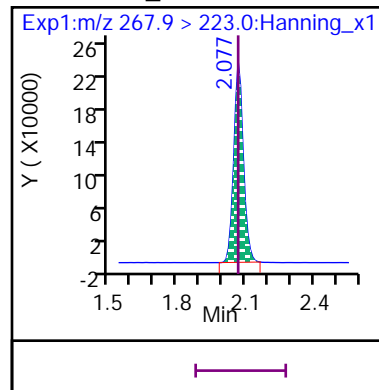
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

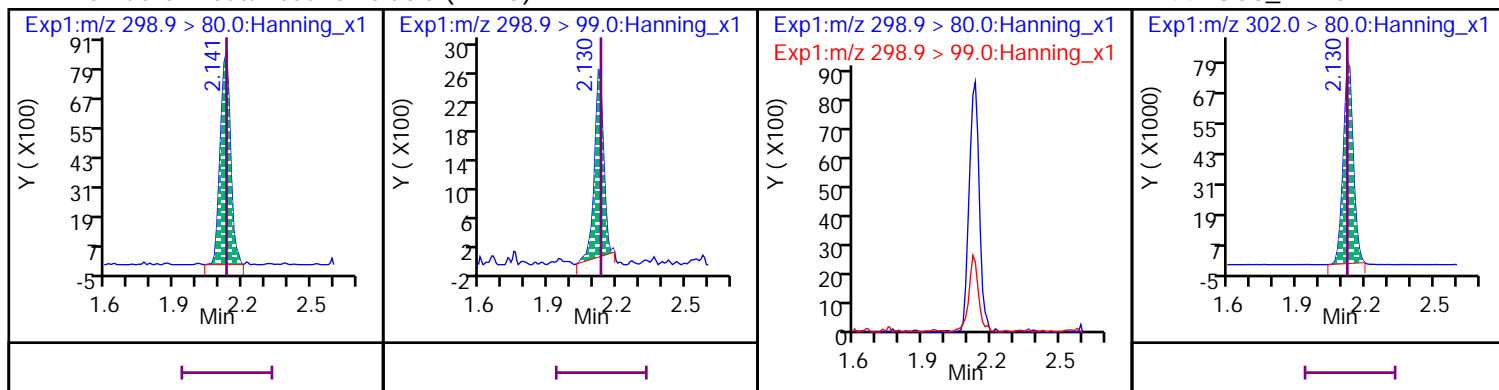


D 50 13C5\_PFPeA



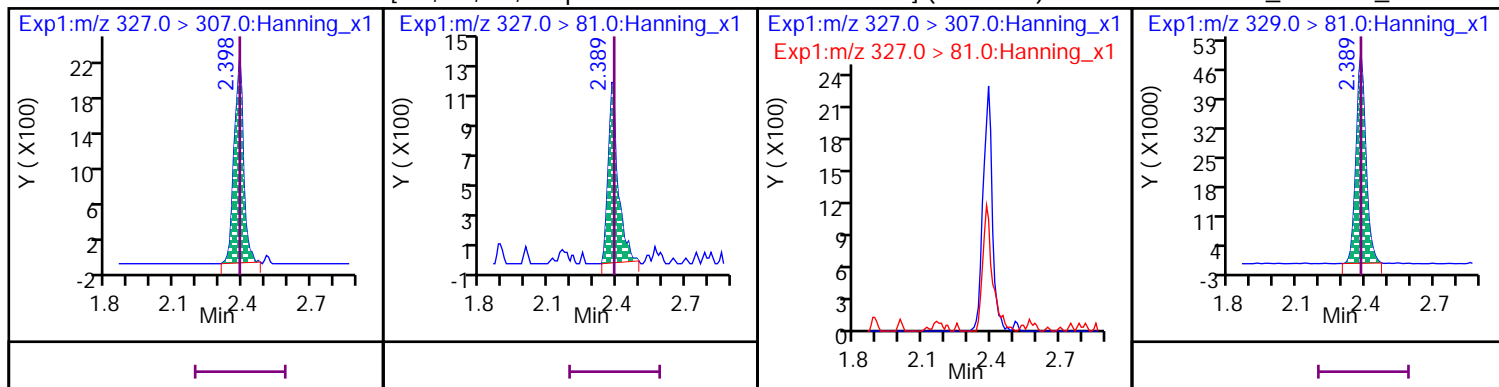
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



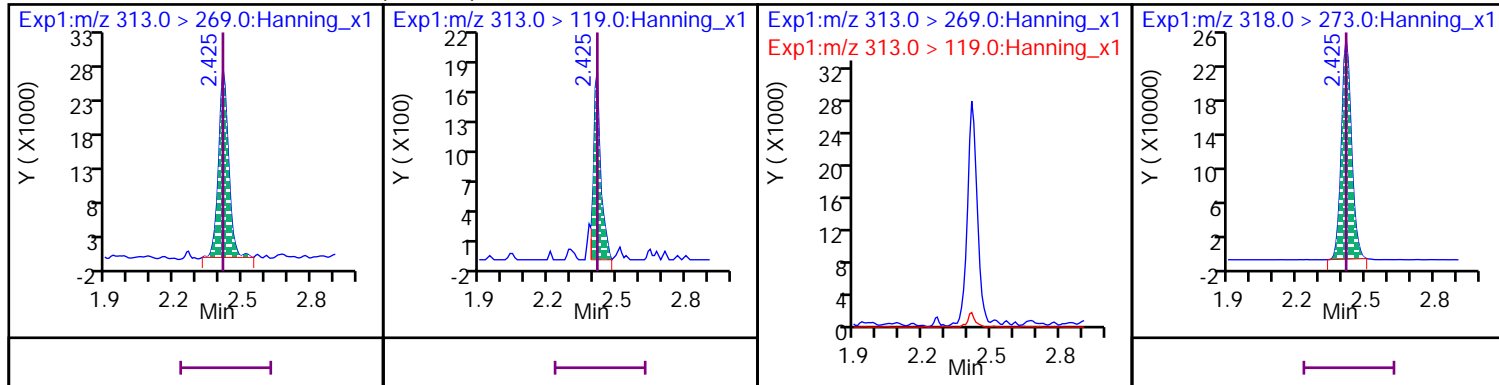
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



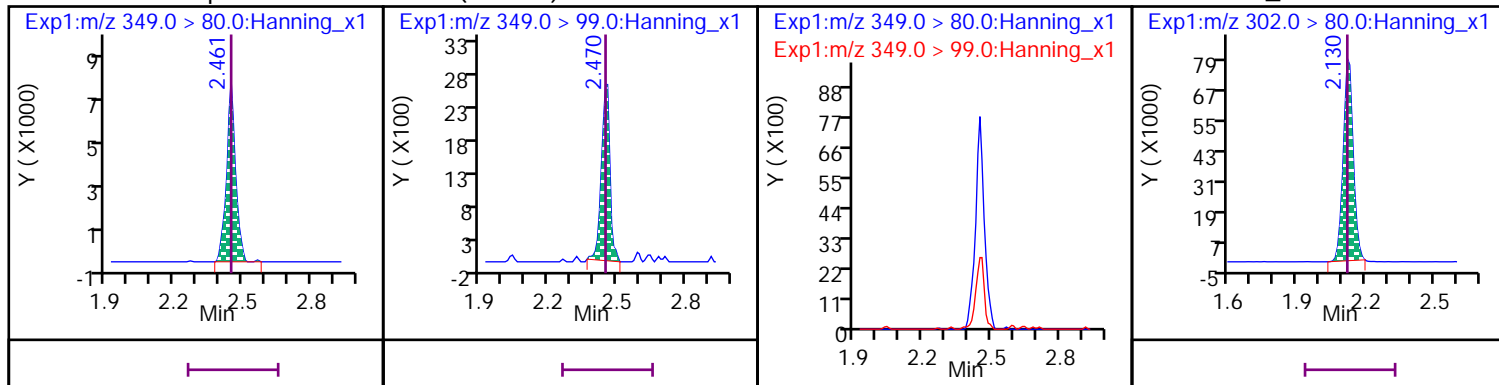
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



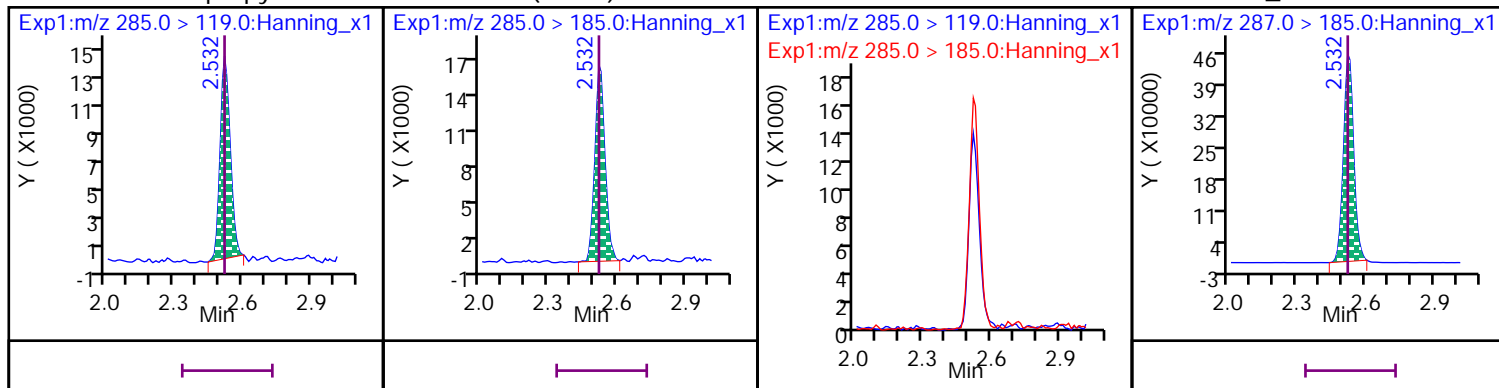
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



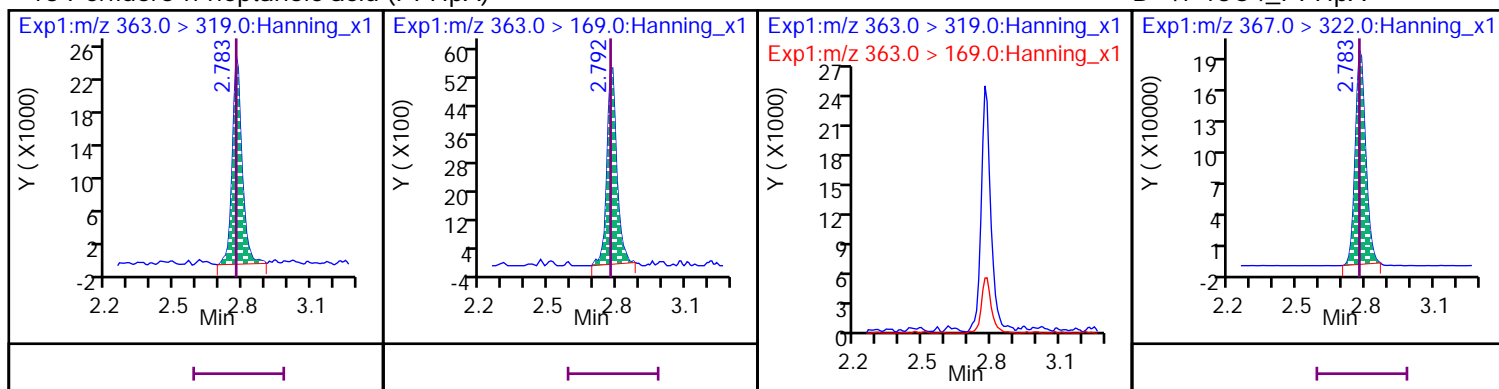
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



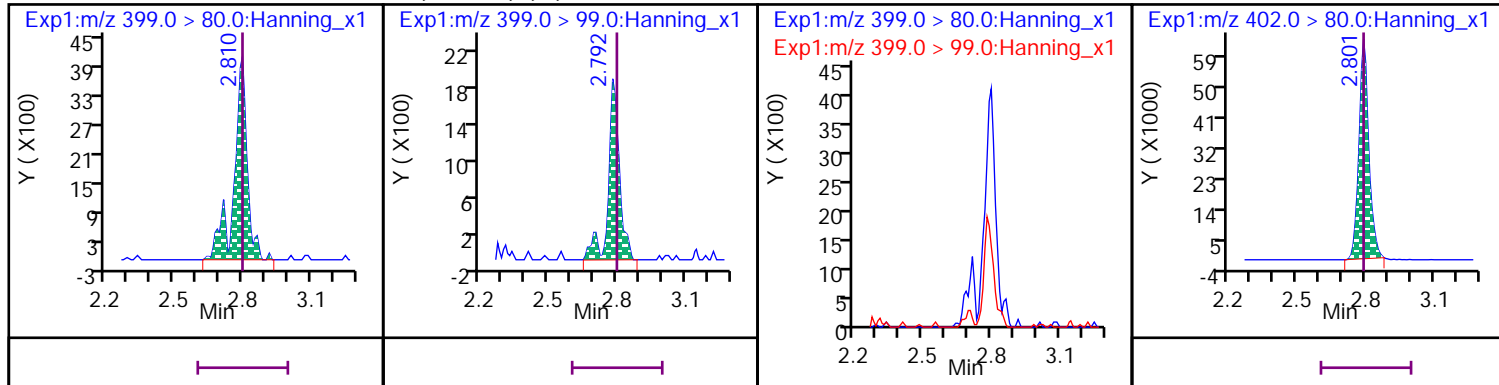
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



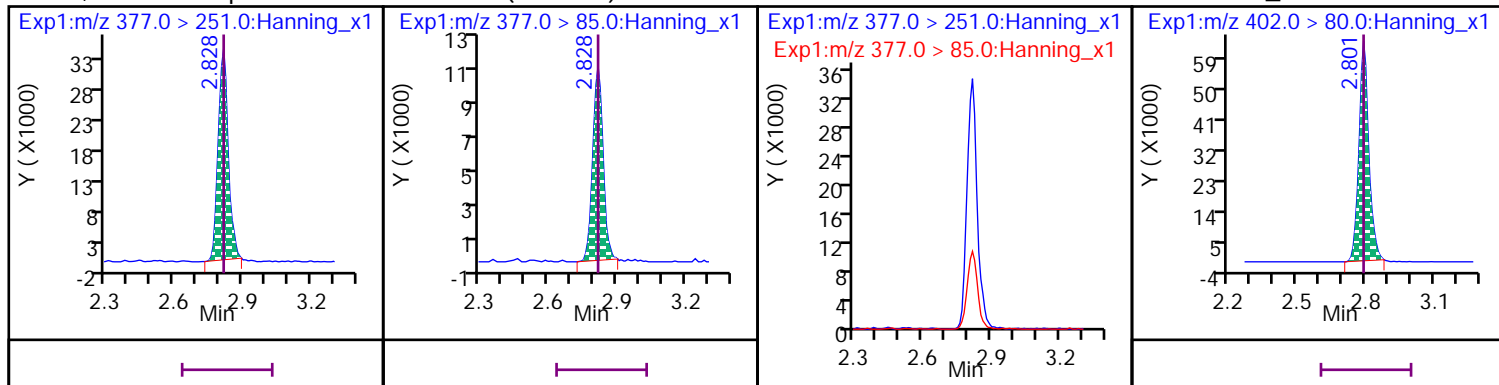
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



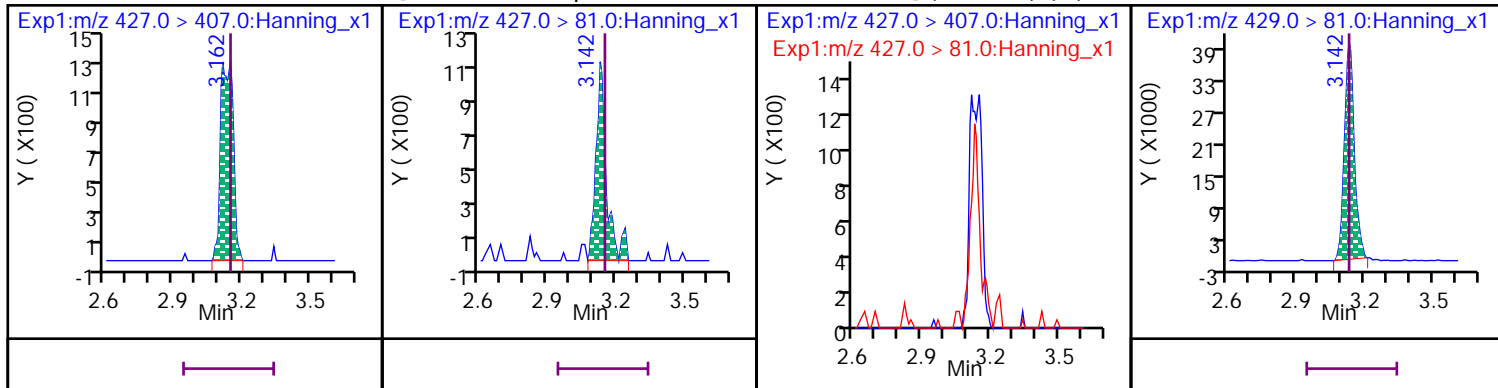
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



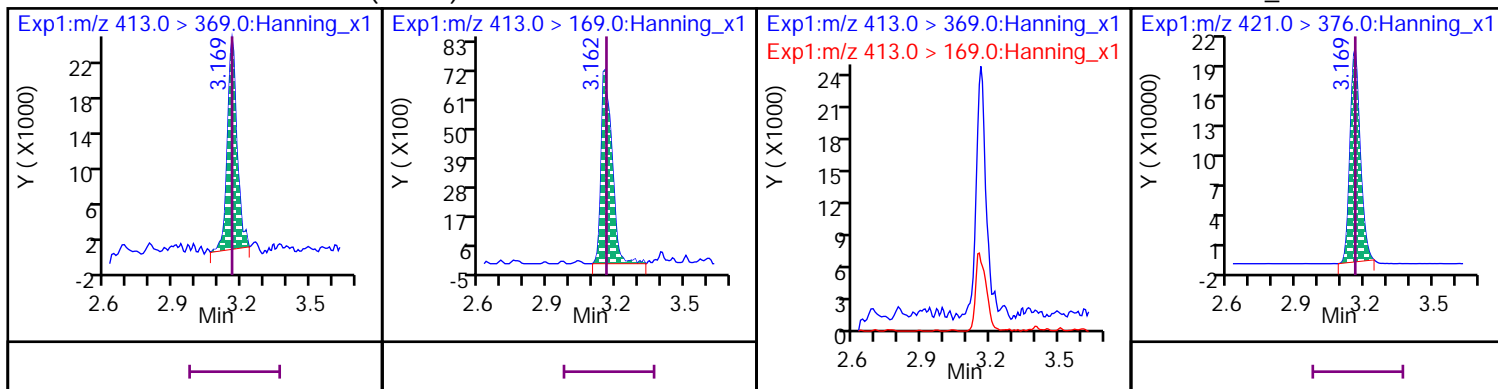
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M)

D 64 13C2\_6:2 FTS\_2



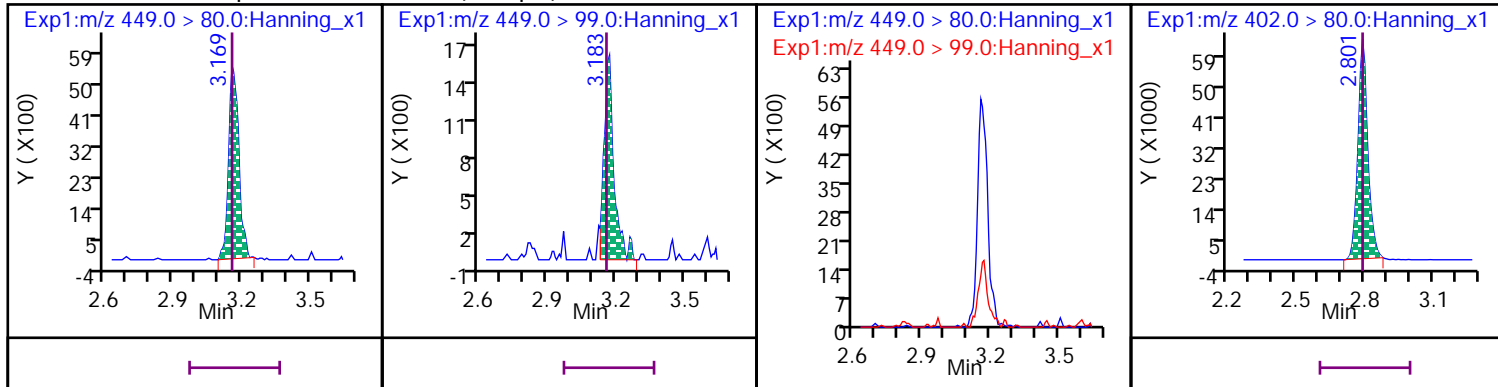
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



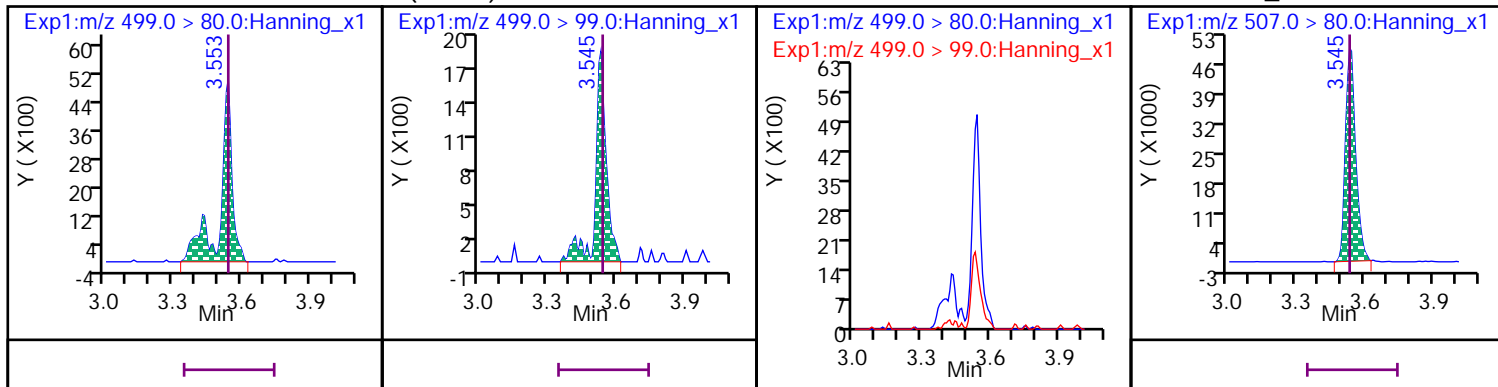
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

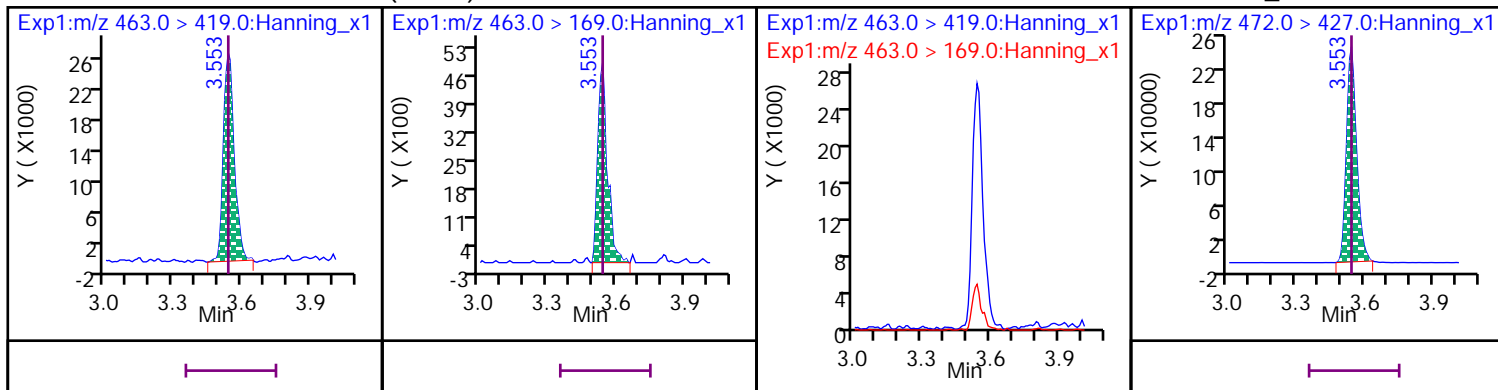
D 54 13C8\_PFOS





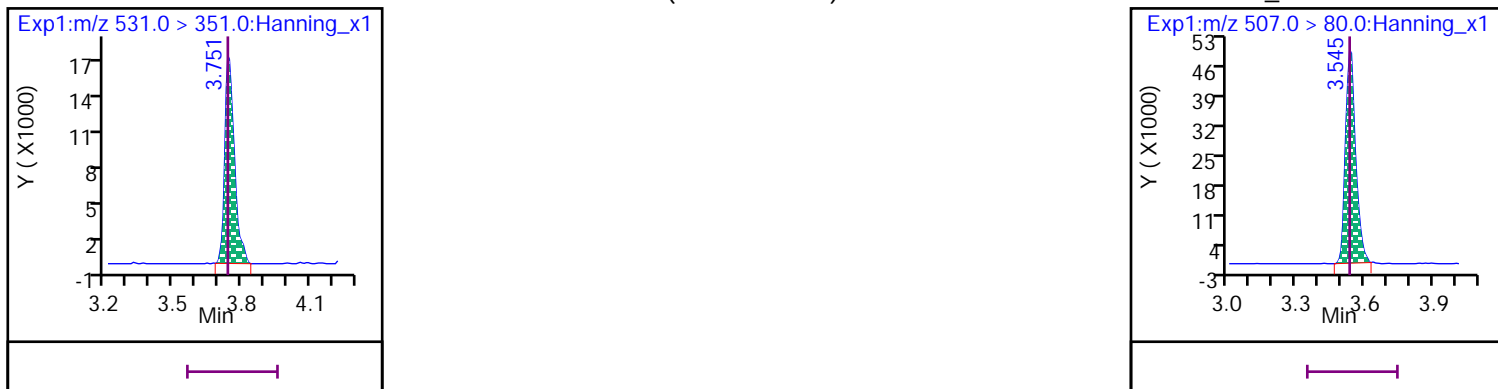
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



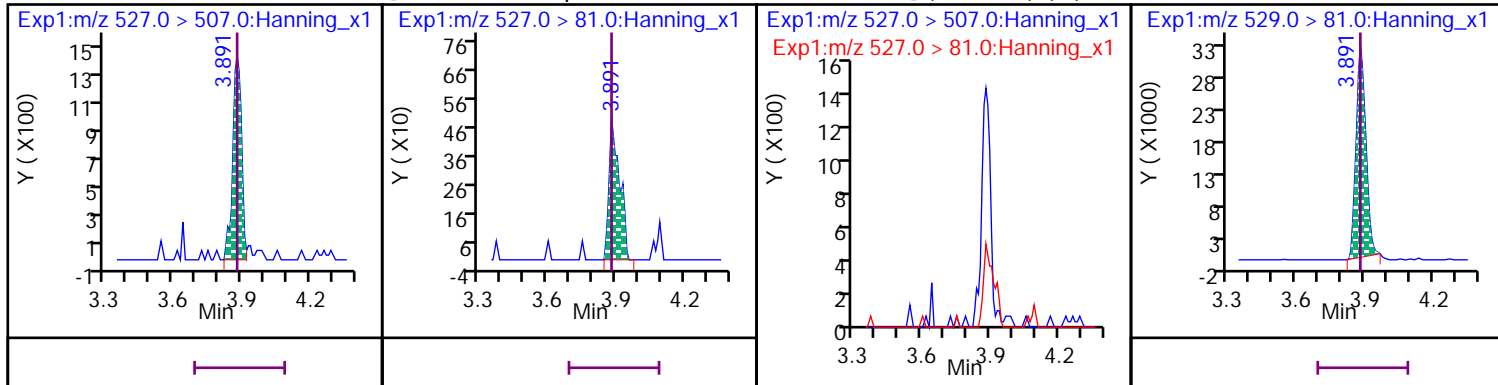
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



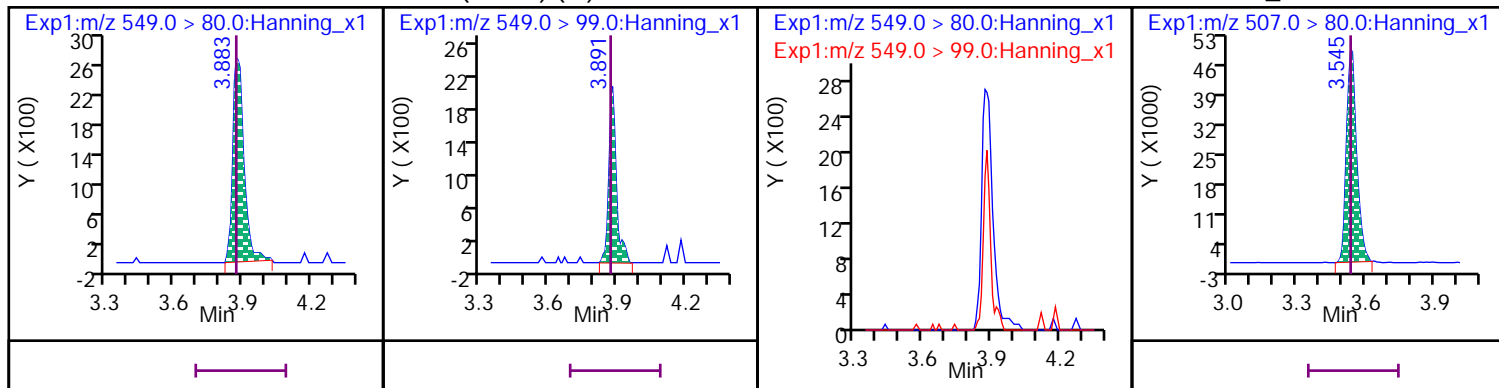
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



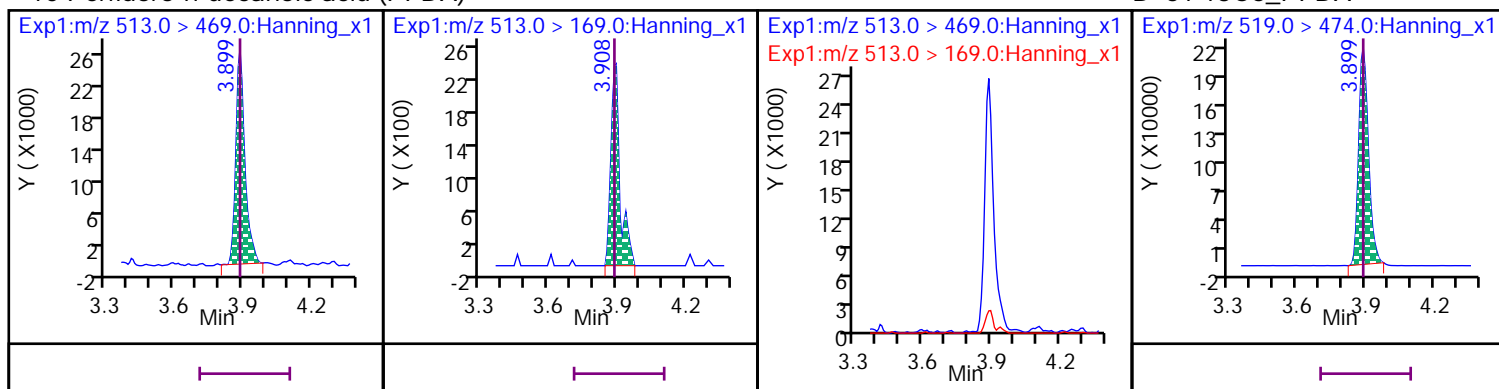
## 16 Perfluoro-1-nonanesulfonic acid (PFNS) (M)

D 54 13C8\_PFOS



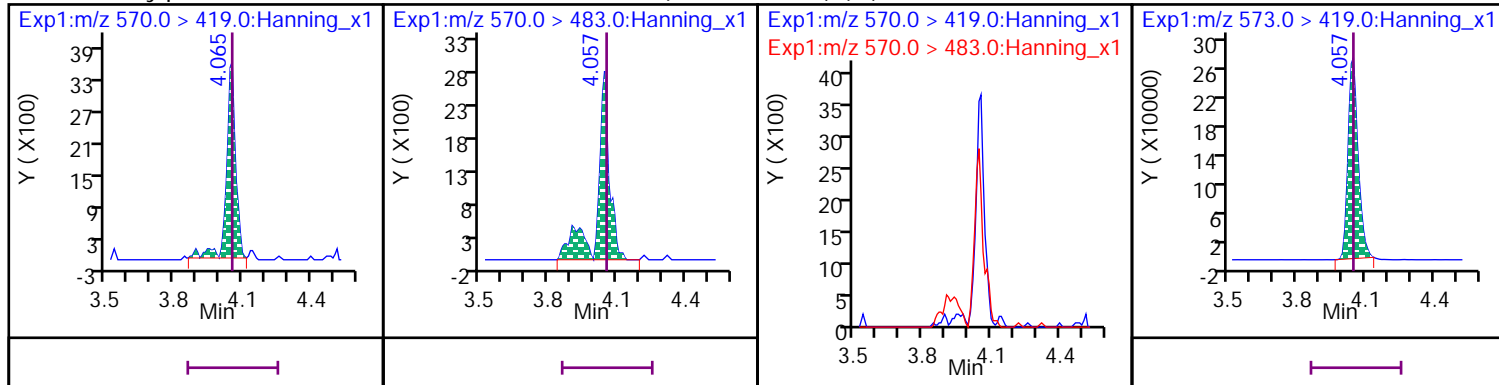
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



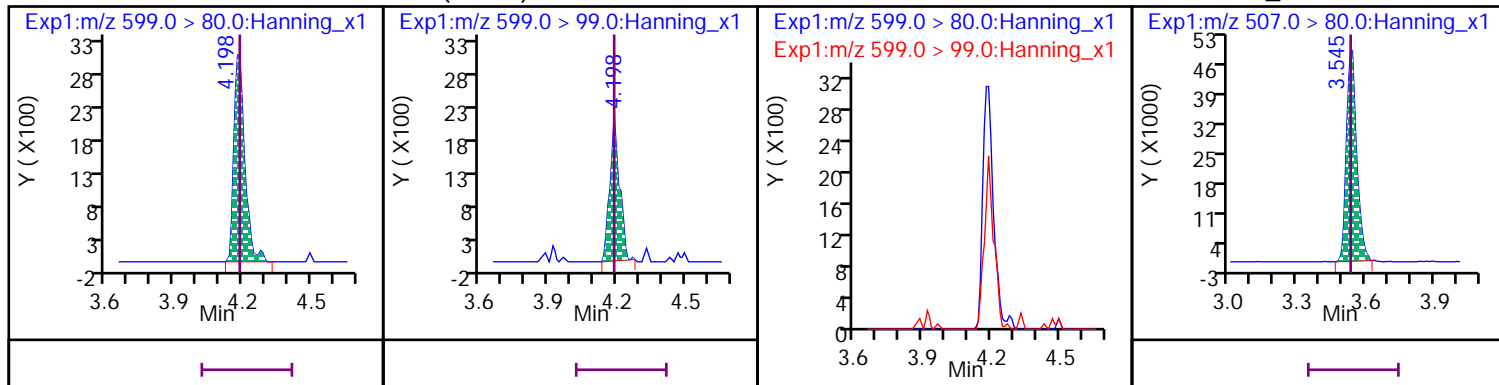
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



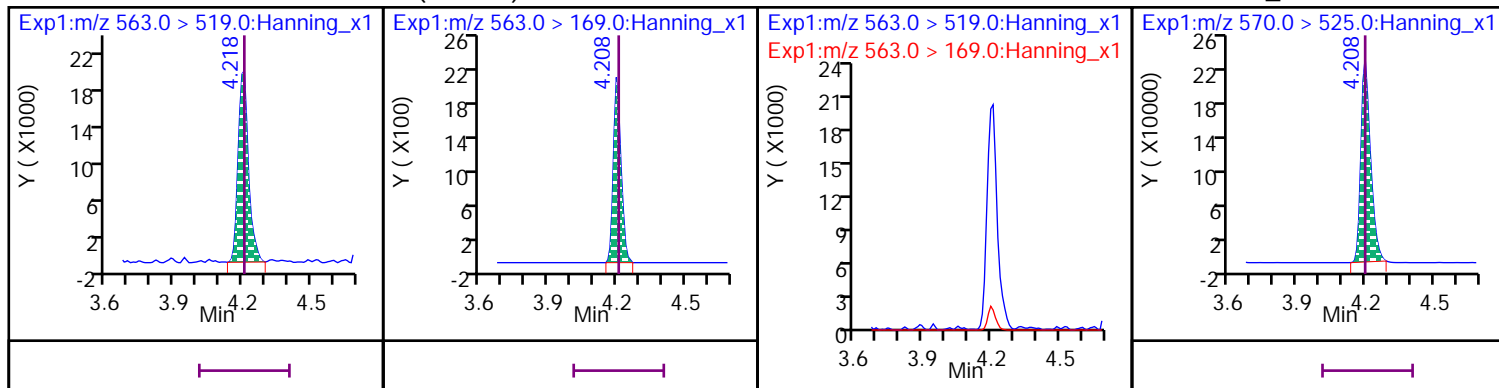
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



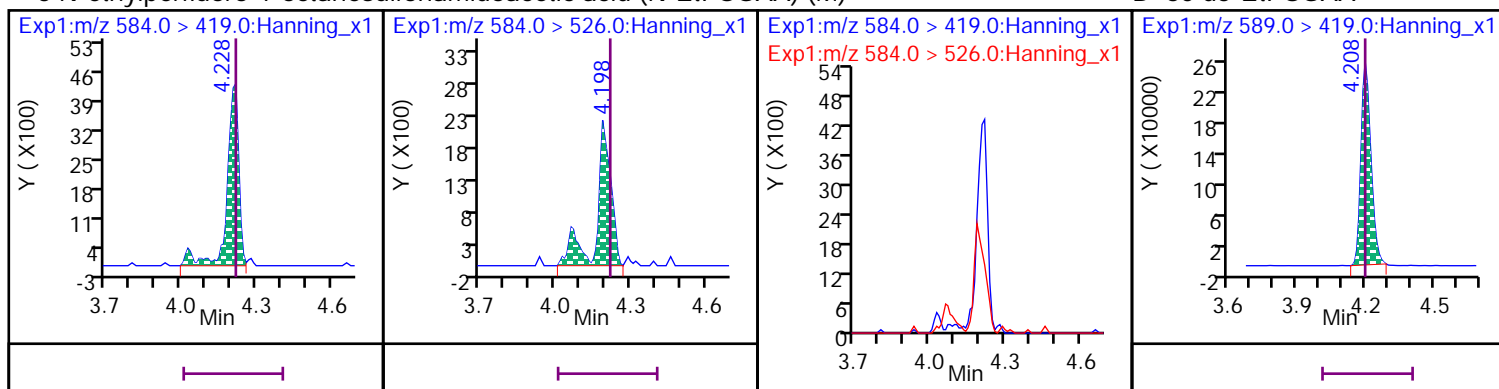
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



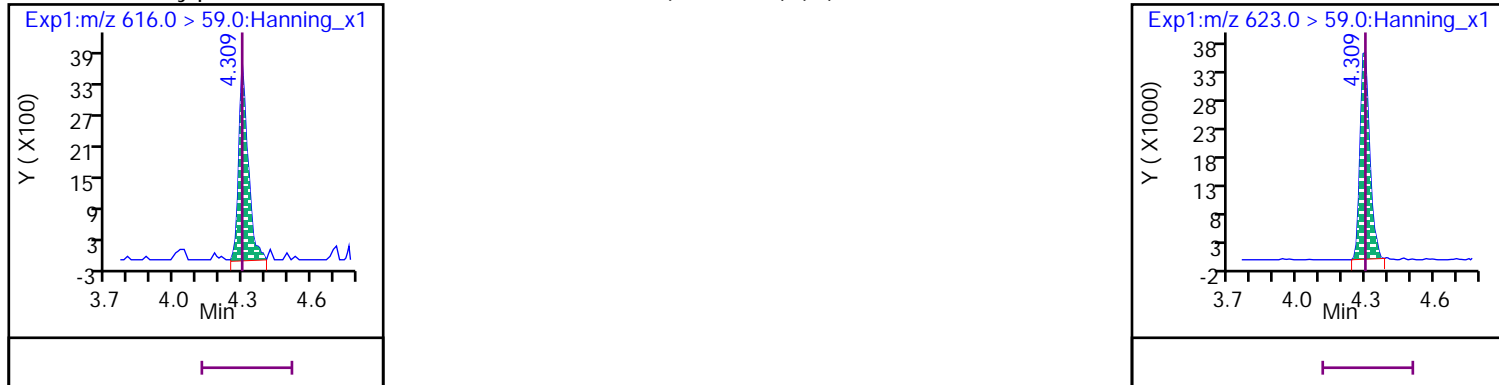
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



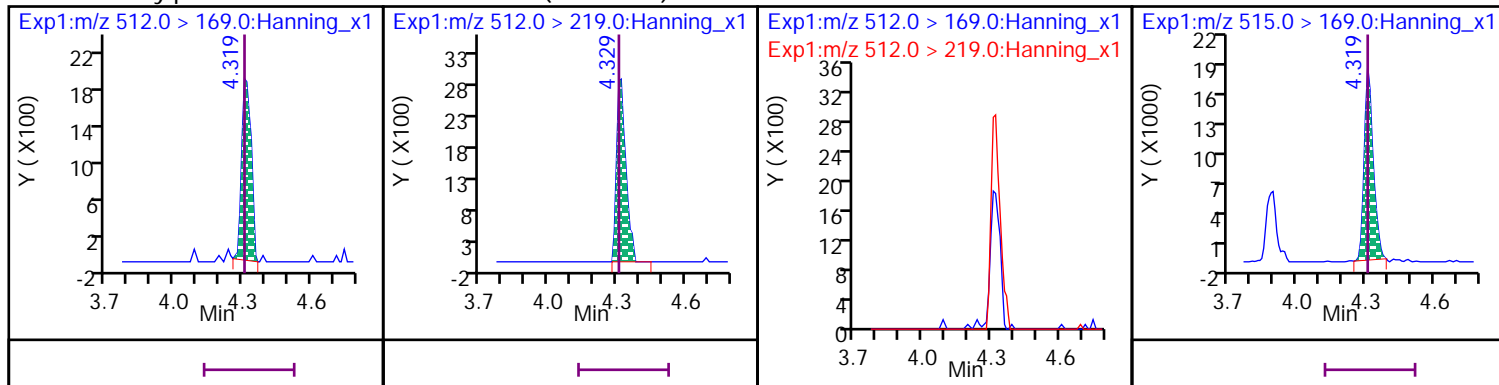
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (M)

D 61 d7-MeFOSE

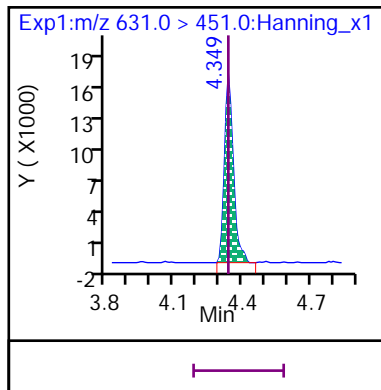


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

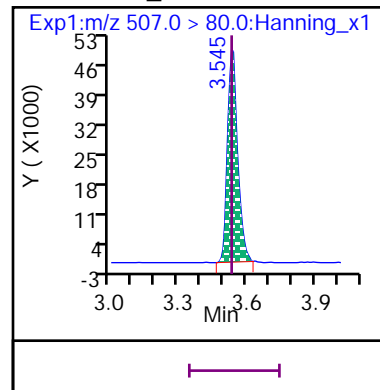
D 57 d3-MeFOSA



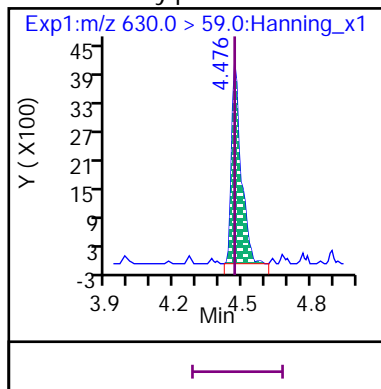
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



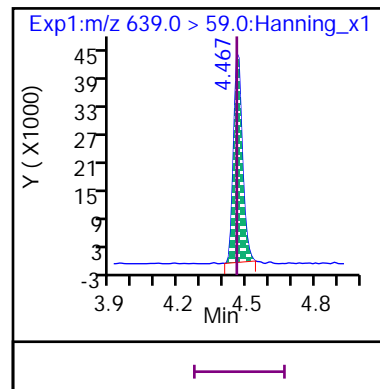
D 54 13C8\_PFOS



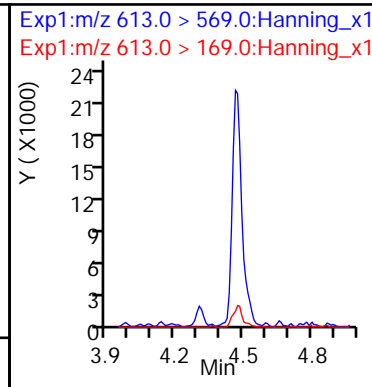
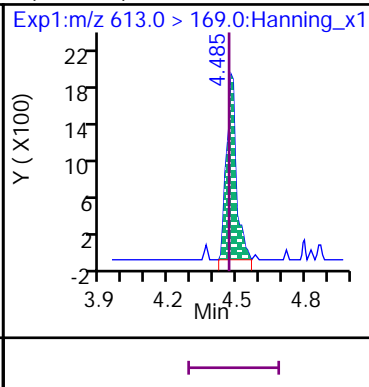
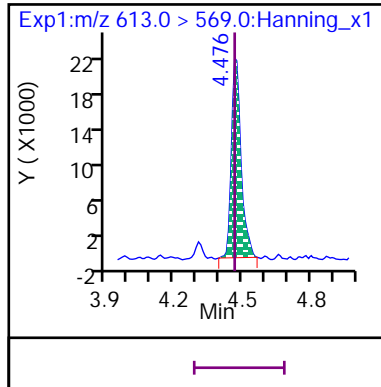
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



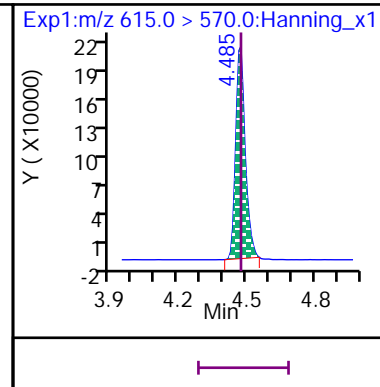
D 62 d9-EtFOSE



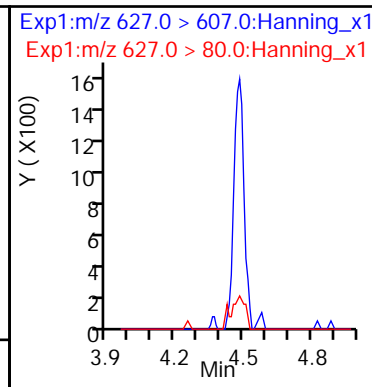
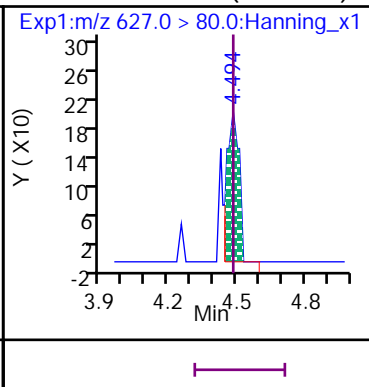
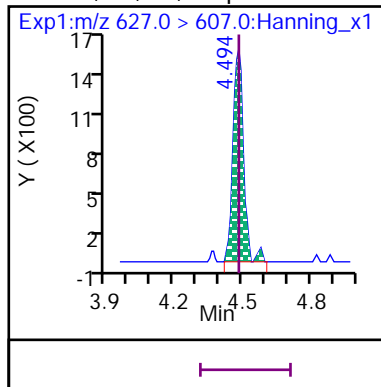
11 Perfluoro-n-dodecanoic acid (PFDoA)



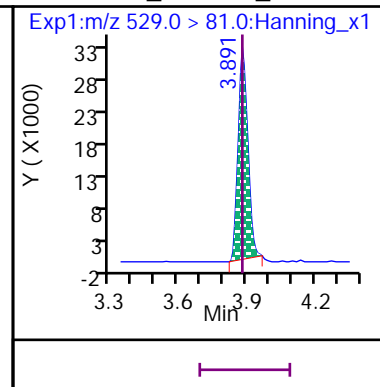
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

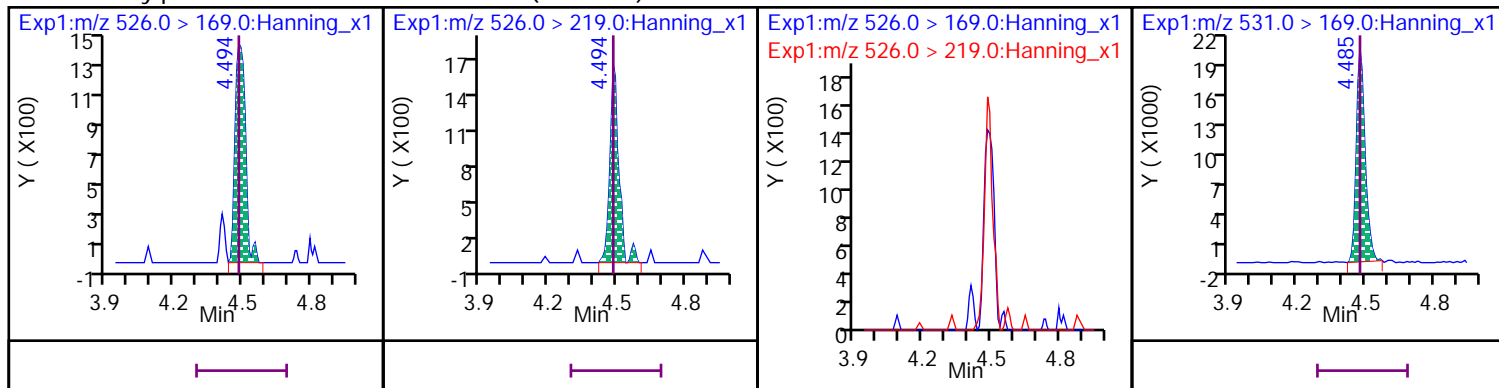


D 65 13C2\_8:2 FTS\_2



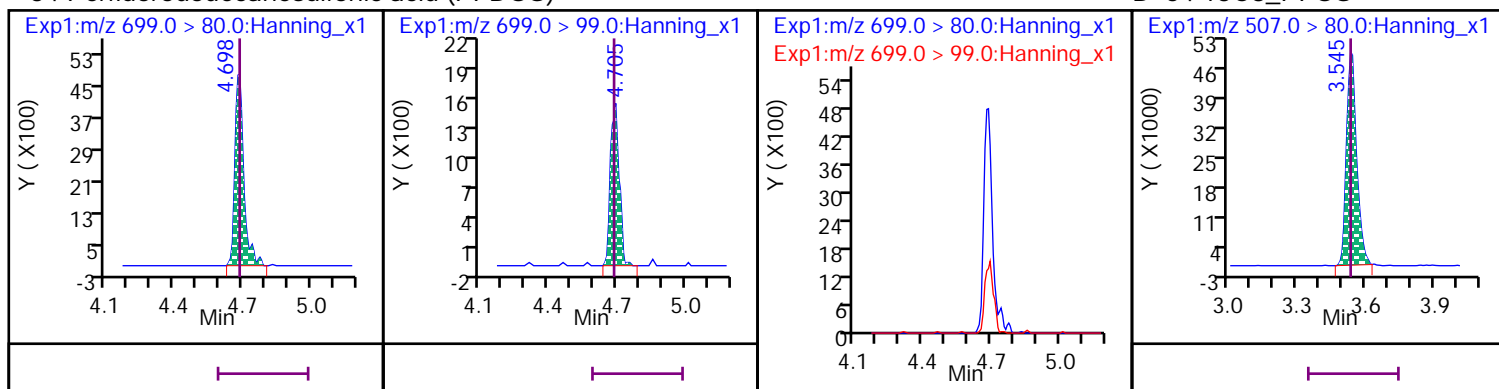
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



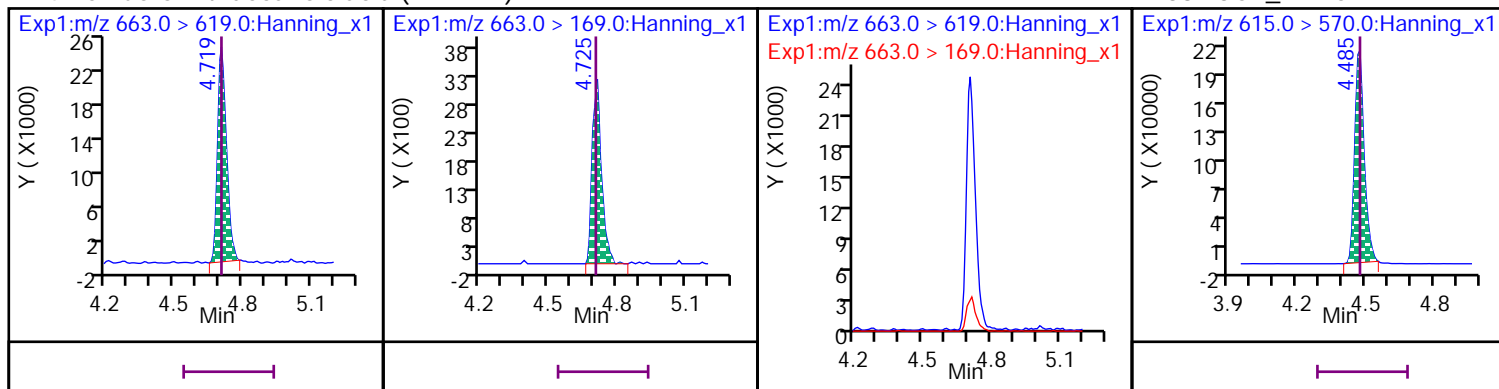
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



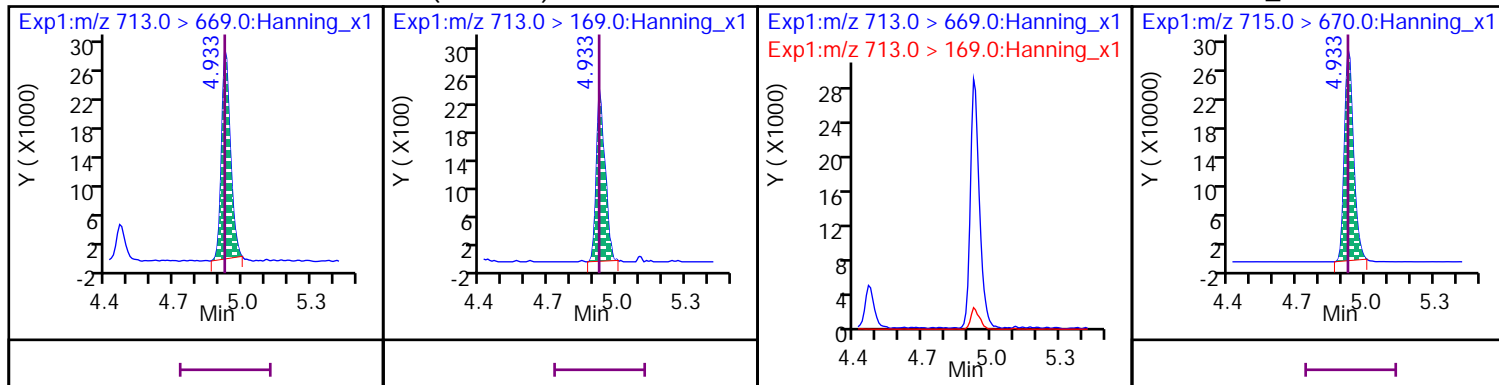
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



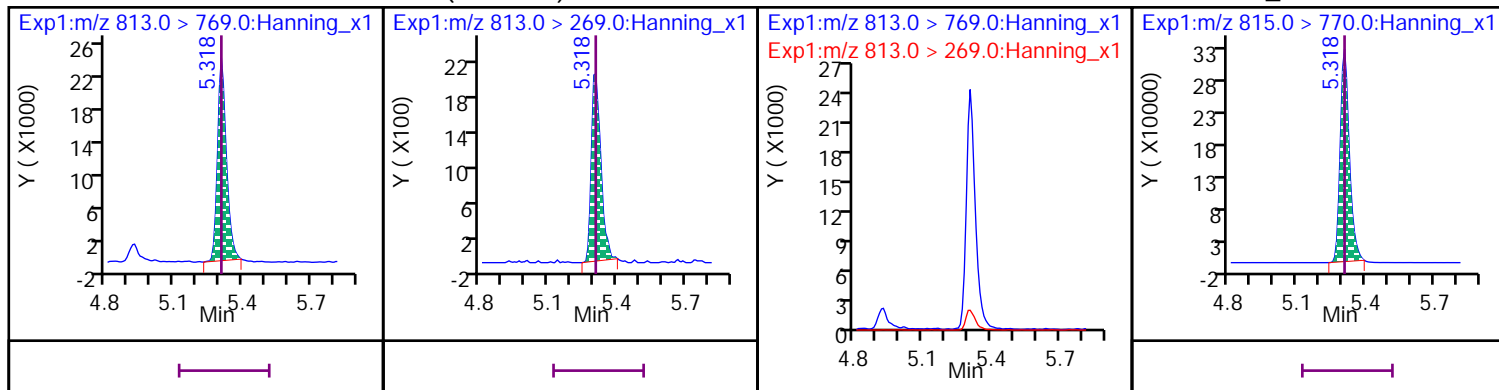
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



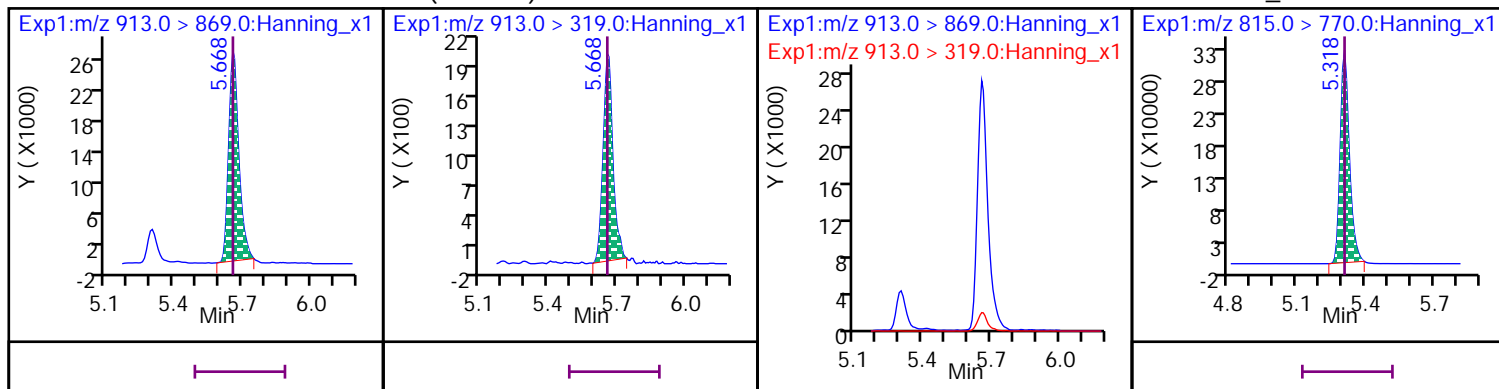
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

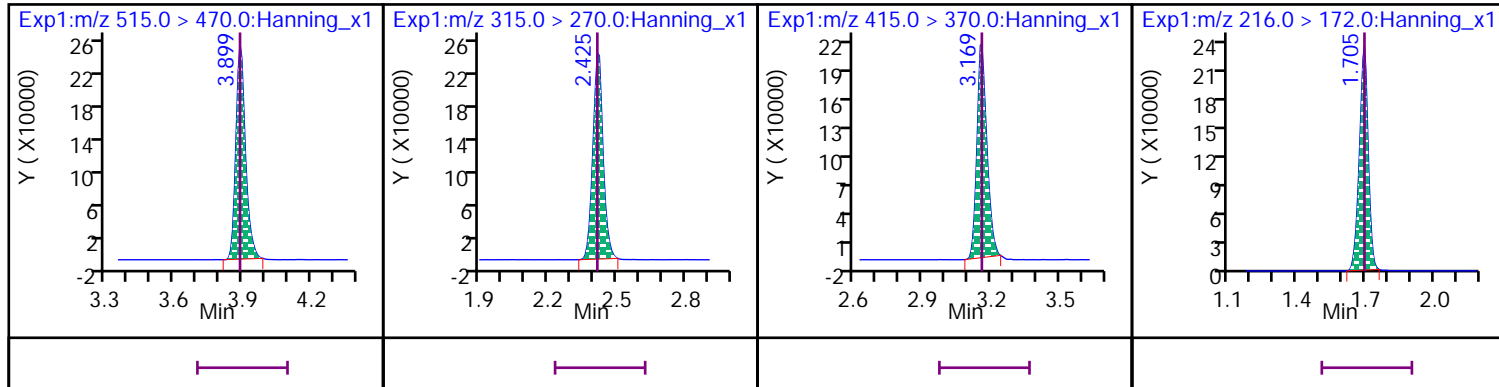


\* 37 13C2\_PFDA

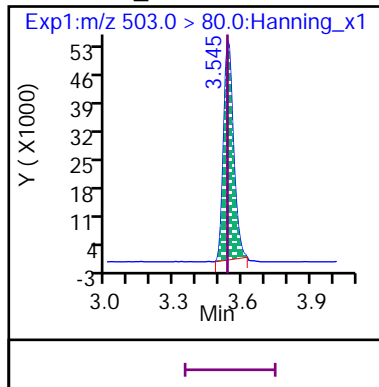
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

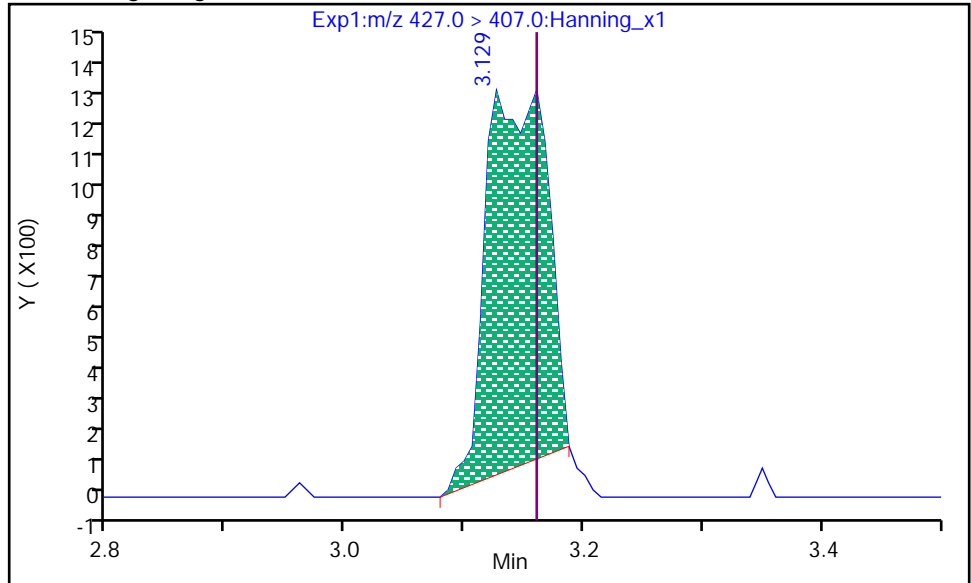
Dil. Factor: 1

Operator: Stephen E. Somerville

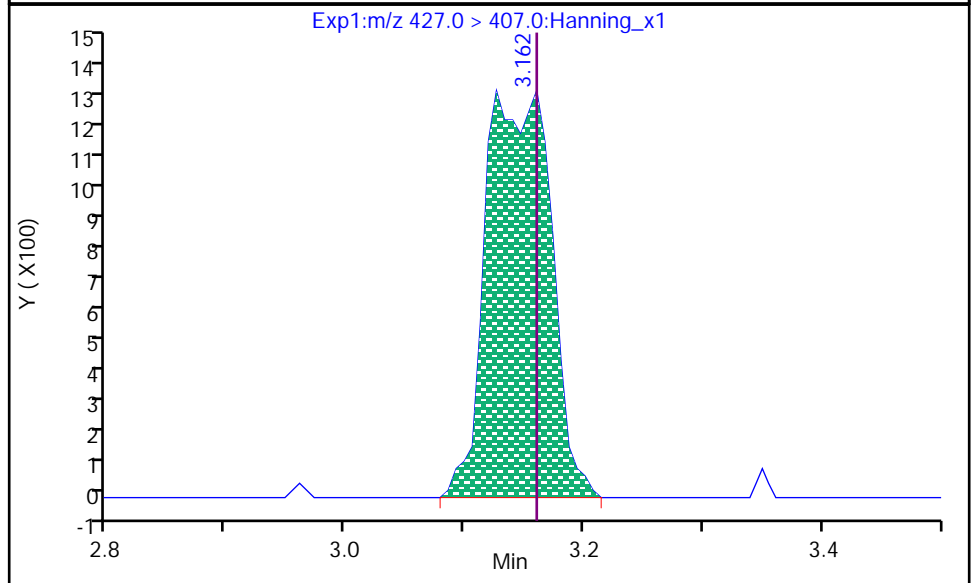
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

RT: 3.129  
Area: 4136  
Amount: 57.964  
Amount Units: ng/L



RT: 3.162  
Area: 4743  
Amount: 70.733  
Amount Units: ng/L



Data Editor: stephen.somerville, 23-Dec-2020 11:46:06

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

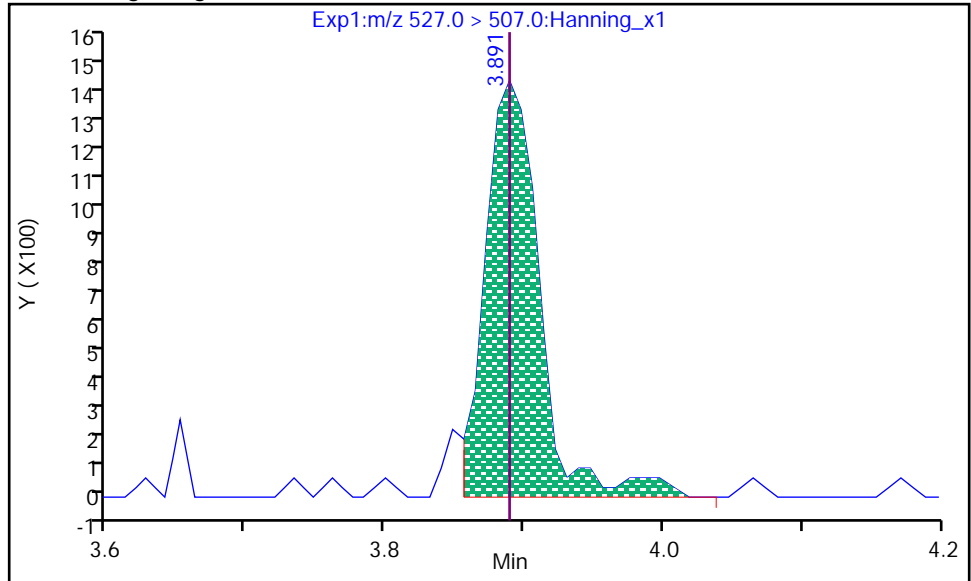
Dil. Factor: 1

Operator: Stephen E. Somerville

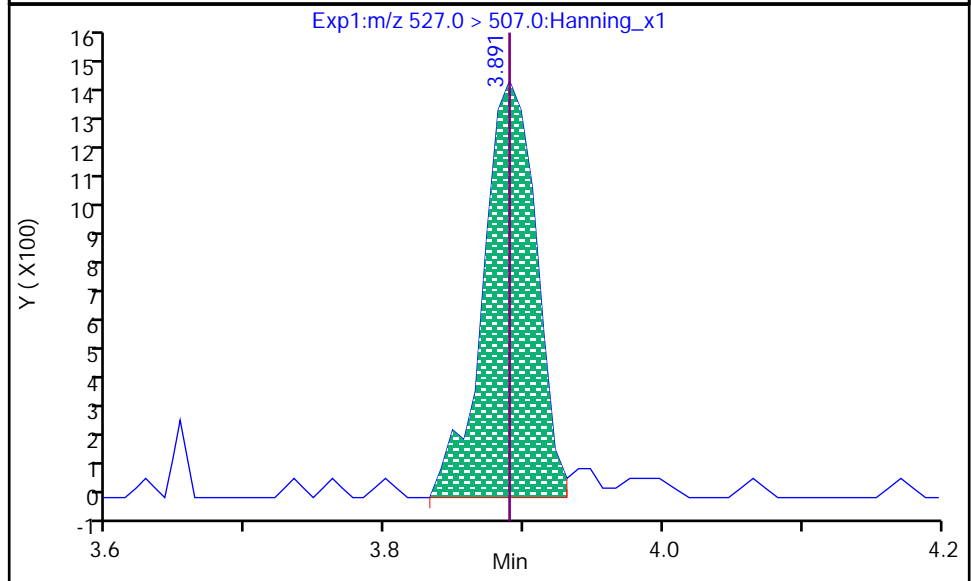
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.891  
Area: 3806  
Amount: 86.116  
Amount Units: ng/L



RT: 3.891  
Area: 3718  
Amount: 83.736  
Amount Units: ng/L



Data Editor: stephen.somerville, 23-Dec-2020 11:46:19

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

Dil. Factor: 1

Operator: Stephen E. Somerville

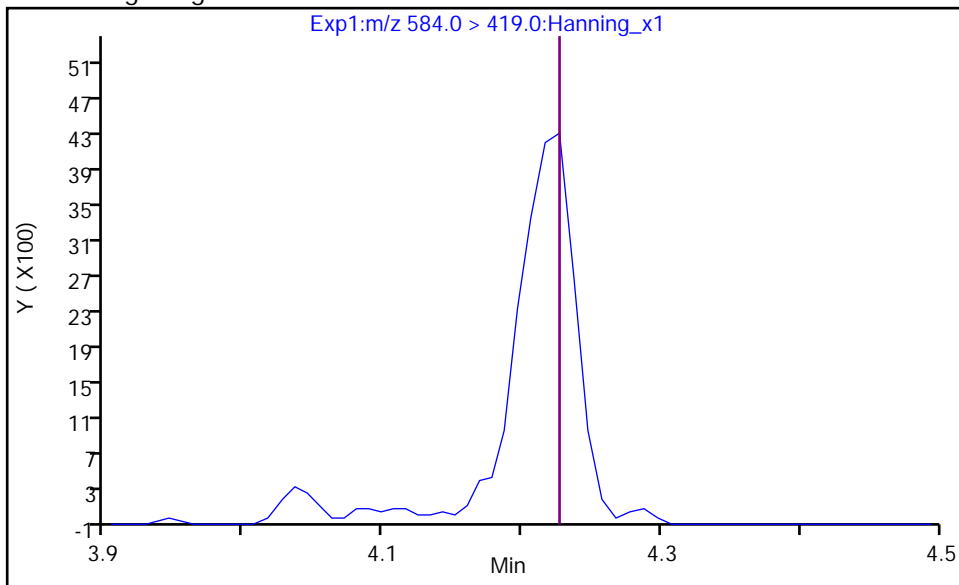
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

Not Detected

Expected RT: 4.228

RT Window: 4.008-4.408

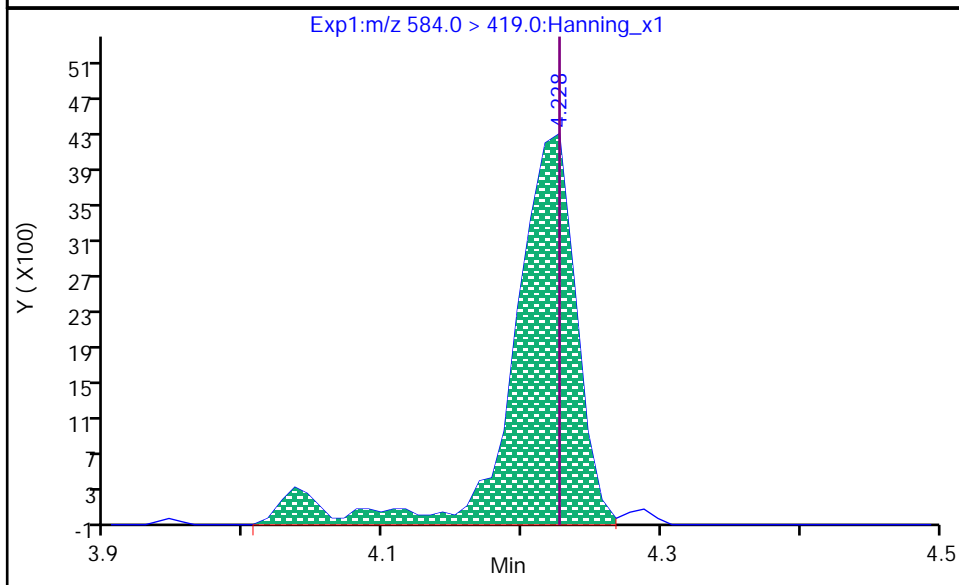


RT: 4.228

Area: 13630

Amount: 89.704

Amount Units: ng/L



Data Editor: stephen.somerville, 23-Dec-2020 11:44:42

Audit Action: Mint

Audit Reason: Assign Peak

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

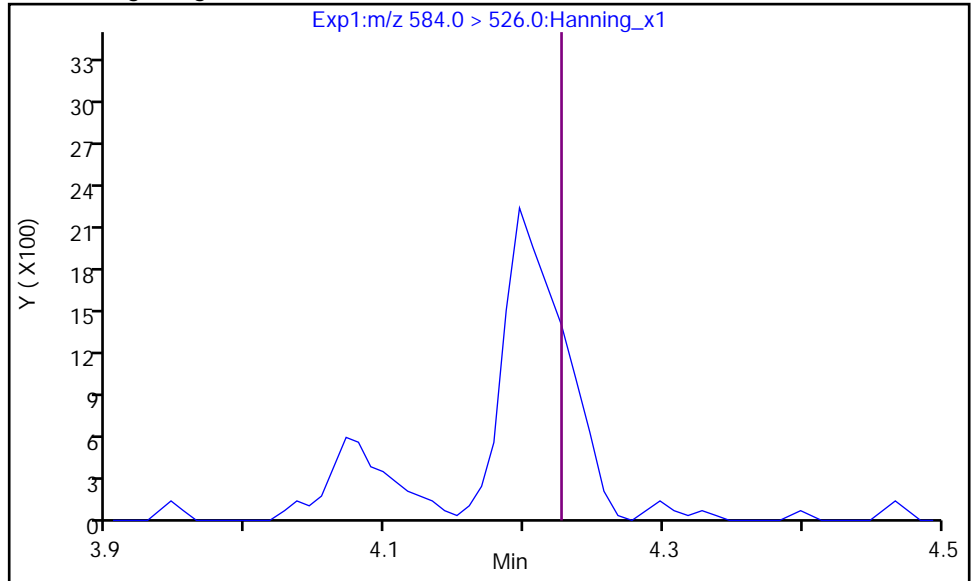
Dil. Factor: 1

Operator: Stephen E. Somerville

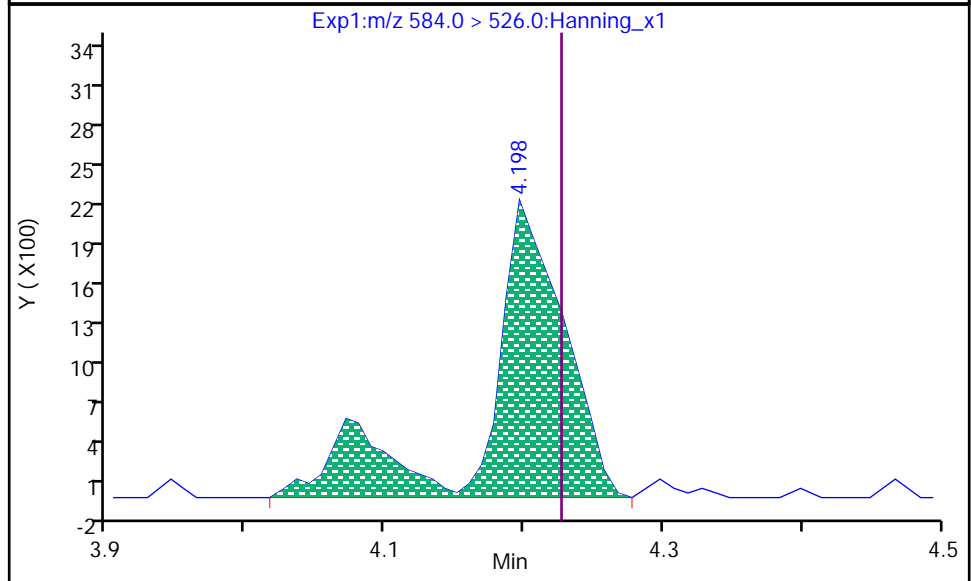
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

Not Detected  
Expected RT: 4.228  
RT Window: 4.008-4.408



RT: 4.198  
Area: 8514  
Amount: 89.704  
Amount Units: ng/L



Data Editor: stephen.somerville, 23-Dec-2020 11:44:48

Audit Action: Mint

Audit Reason: Assign Peak

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

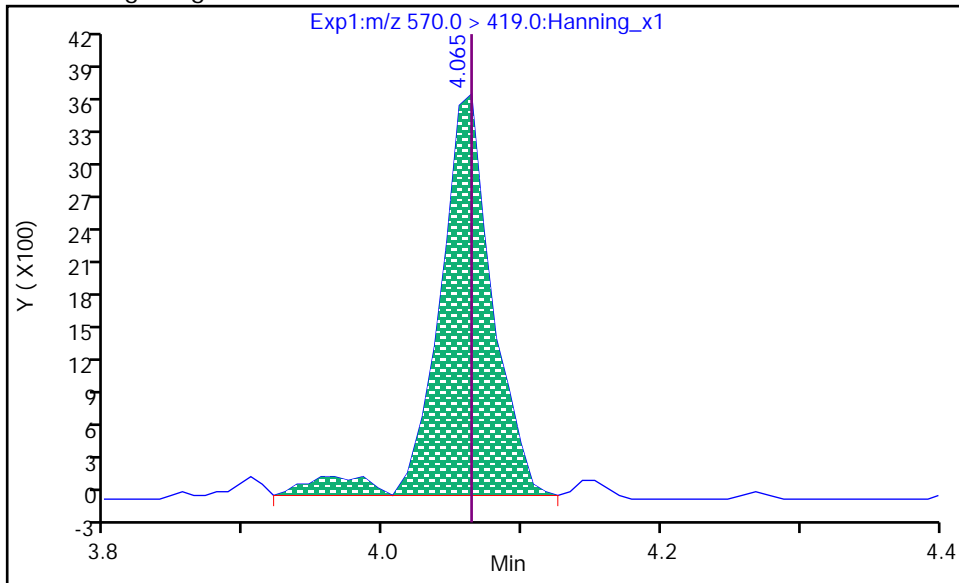
Dil. Factor: 1

Operator: Stephen E. Somerville

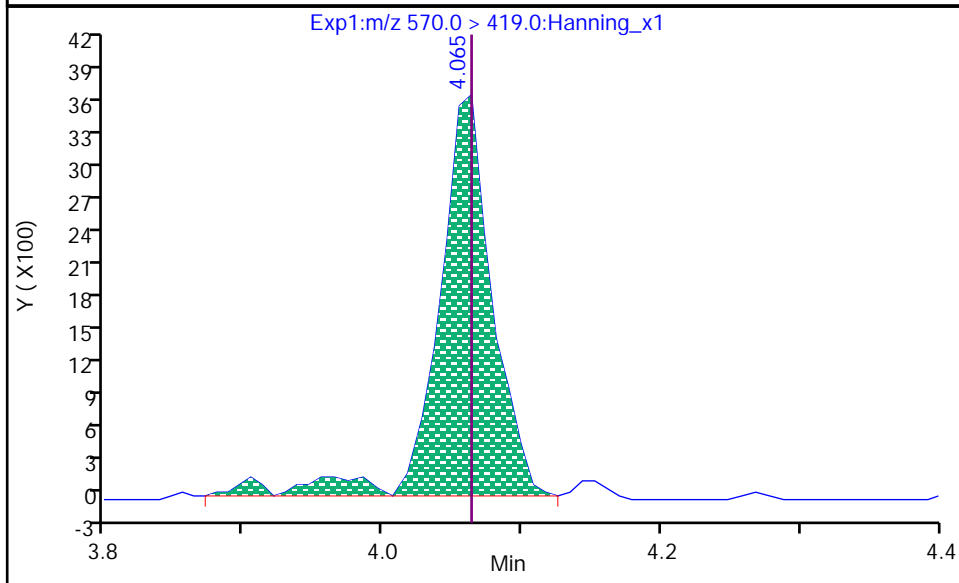
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.065  
Area: 9656  
Amount: 77.563  
Amount Units: ng/L

Processing Integration Results



RT: 4.065  
Area: 9872  
Amount: 79.298  
Amount Units: ng/L



Data Editor: stephen.somerville, 23-Dec-2020 11:44:59

Audit Action: Mint

Audit Reason: Isomers

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

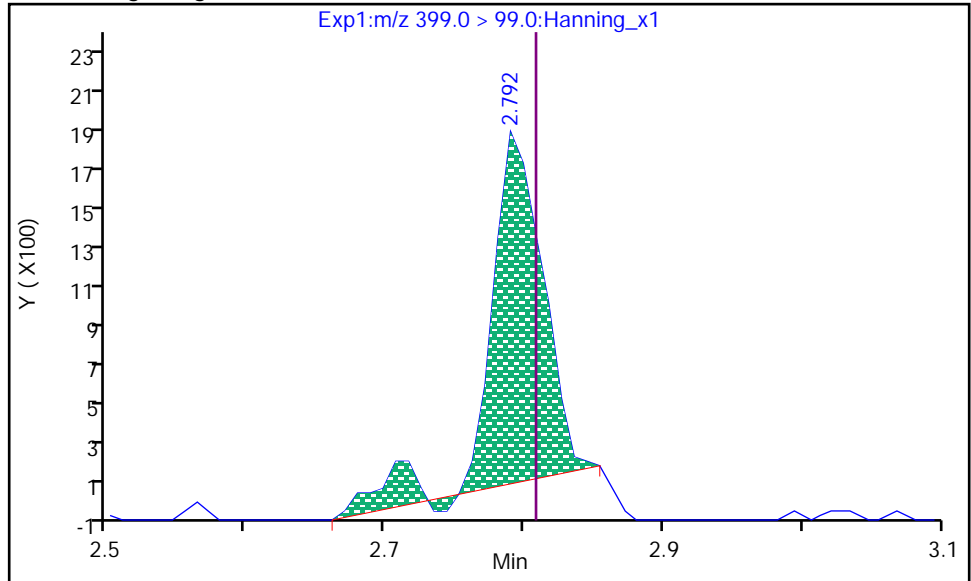
Dil. Factor: 1

Operator: Stephen E. Somerville

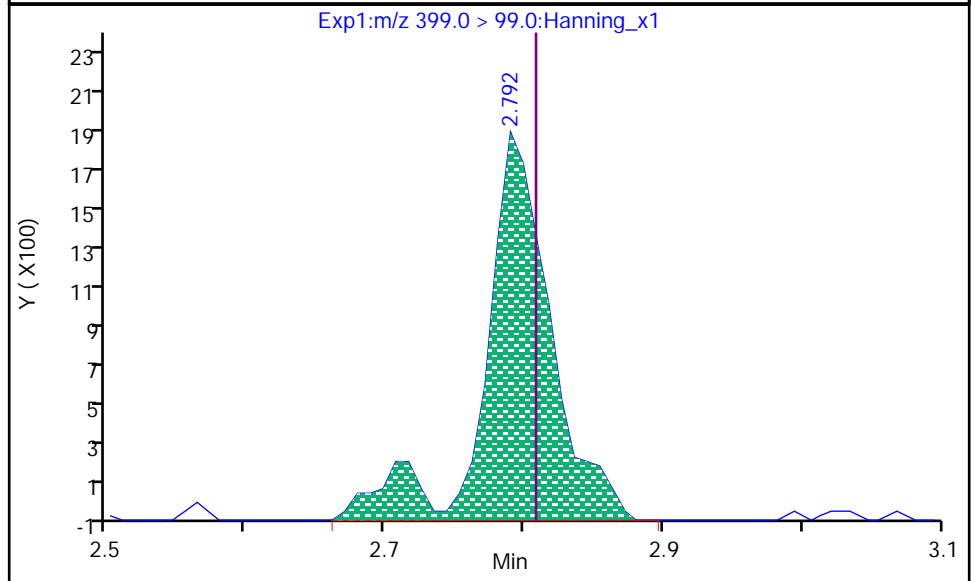
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.792  
Area: 4541  
Amount: 81.718  
Amount Units: ng/L



RT: 2.792  
Area: 6250  
Amount: 81.718  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:37:09

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

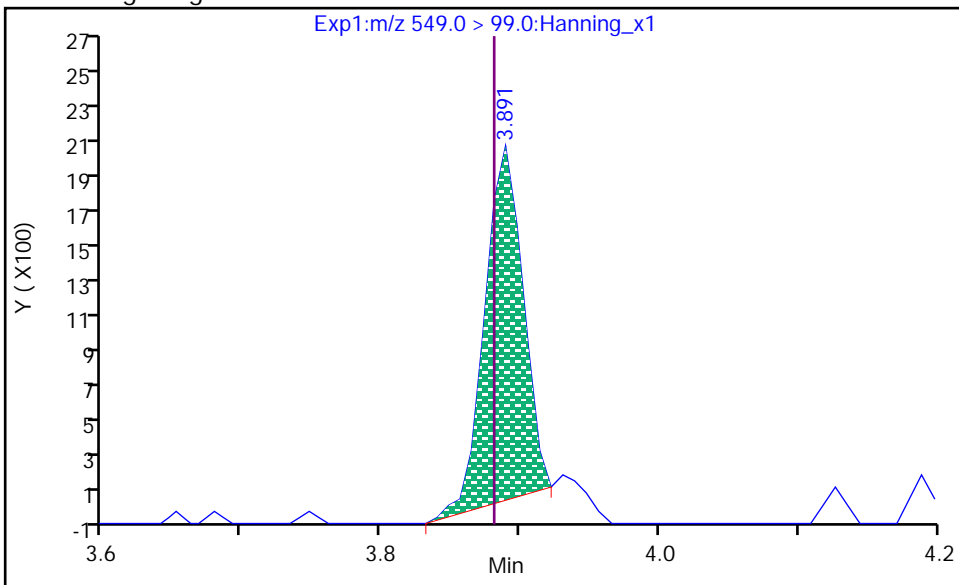
Dil. Factor: 1

Operator: Stephen E. Somerville

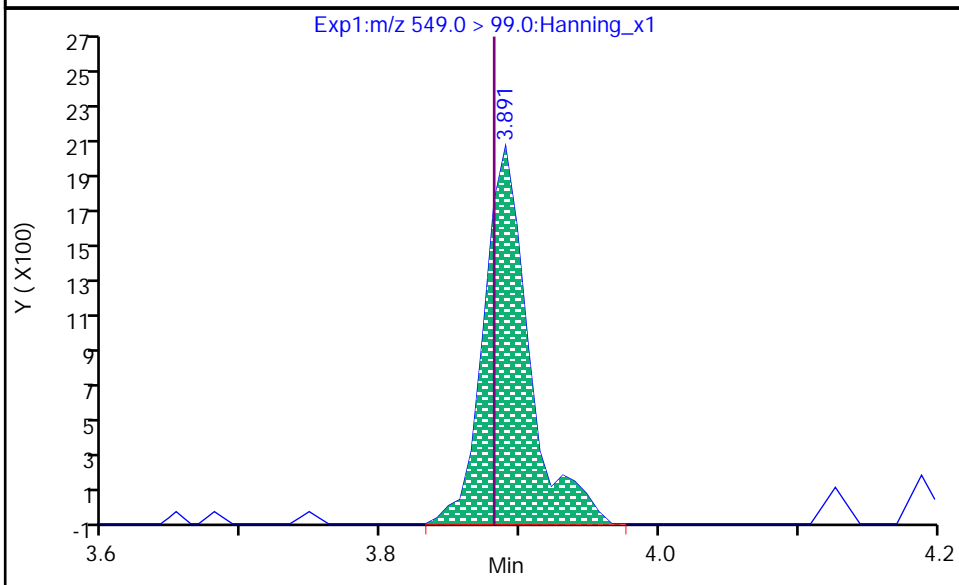
16 PFNS, CAS: 68259-12-1

Processing Integration Results

RT: 3.891  
Area: 3599  
Amount: 79.172  
Amount Units: ng/L



RT: 3.891  
Area: 4577  
Amount: 79.172  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:37:19

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320005.d

Injection Date: 23-Dec-2020 11:20:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

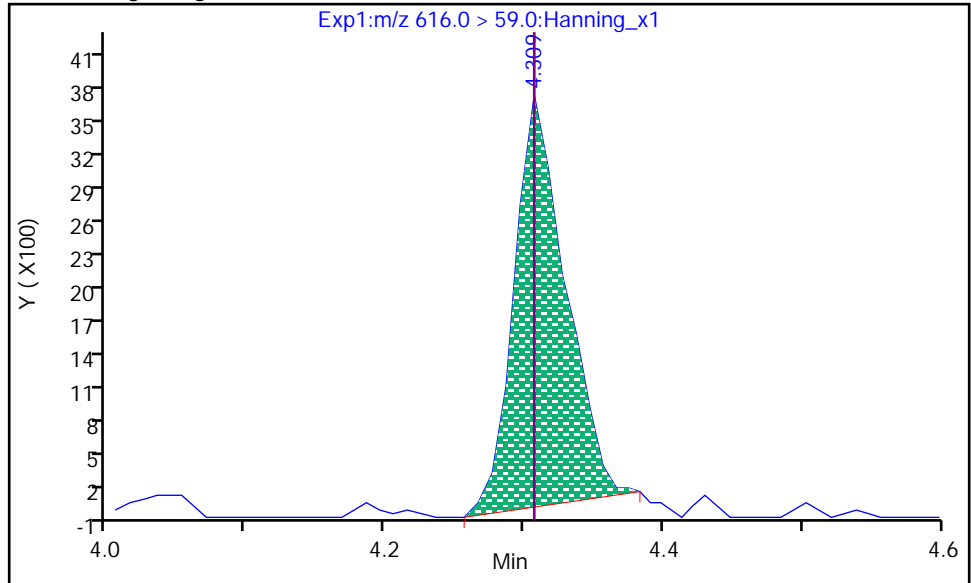
Dil. Factor: 1

Operator: Stephen E. Somerville

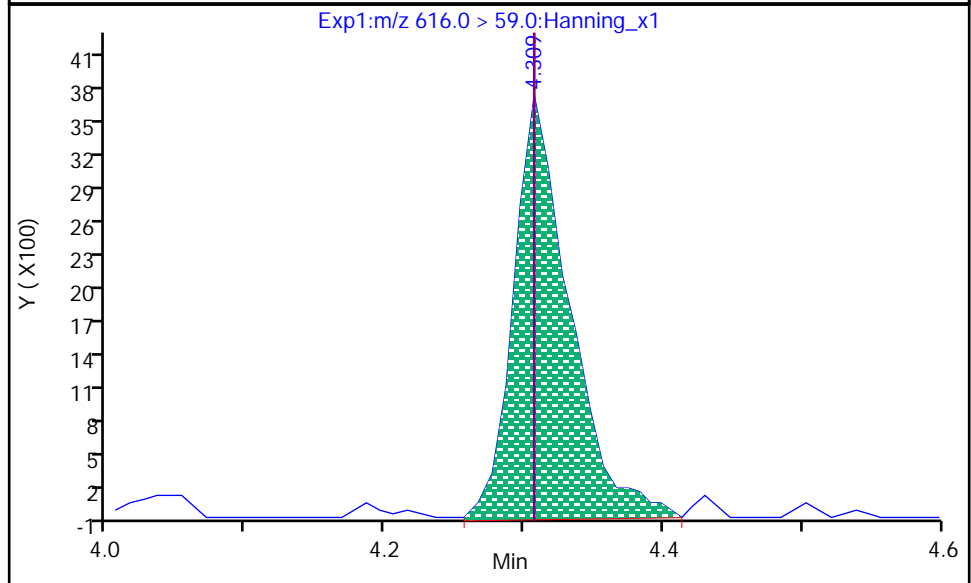
32 MeFOSE, CAS: 24448-09-7

Processing Integration Results

RT: 4.309  
Area: 9270  
Amount: 95.018  
Amount Units: ng/L



RT: 4.309  
Area: 10468  
Amount: 107.30  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:37:30

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d  
Injection Date: 23-Dec-2020 11:31:37 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	205.77	103	70 - 130
D 46 13C4_PFBA	659896	653844			99.1	50 - 150
D 50 13C5_PFPeA	681912	675253			99	50 - 150
21 PFPeA			200.00	203.91	102	70 - 130
7 PFBS			176.80	182.40	103	70 - 130
D 44 13C3_PFBS	234990	237926			101	50 - 150
1 4:2 FTS			186.80	167.33	89.6	70 - 130
D 63 13C2_4:2 FTS_2	145673	146417			101	50 - 150
D 49 13C5_PFHxA	739934	743441			100	50 - 150
15 PFHxA			200.00	211.07	106	70 - 130
22 PFPeS			187.60	200.98	107	70 - 130
28 GenX			400.00	394.17	98.5	70 - 130
D 66 13C3_GenX	1382147	1365285			98.8	50 - 150
D 47 13C4_PFHpA	612609	603260			98.5	50 - 150
13 PFHpA			200.00	201.77	101	70 - 130
D 45 13C3_PFHxS	185632	180038			97	50 - 150
14 PFHxS			182.00	195.97	108	70 - 130
29 ADONA			188.40	180.54	95.8	70 - 130
D 64 13C2_6:2 FTS_2	118188	108754			92	50 - 150
2 6:2 FTS			189.60	232.22	122	70 - 130
20 PFOA			200.00	204.60	102	70 - 130
D 53 13C8_PFOA	612317	612612			100	50 - 150
12 PFHpS			190.40	199.73	105	70 - 130
18 PFOS			185.60	206.83	111	70 - 130
17 PFNA			200.00	210.59	105	70 - 130
D 56 13C9_PFNA	732148	743703			102	50 - 150
D 54 13C8_PFOS	151103	161247			107	50 - 150
30 9CI-PF3ONS			186.40	177.07	95	70 - 130
D 55 13C8_PFOSA	323224	308208			95.4	50 - 150
19 PFOSA			200.00	203.33	102	70 - 130
16 PFNS			192.00	173.55	90.4	70 - 130
D 65 13C2_8:2 FTS_2	93513	107670			115	50 - 150
3 8:2 FTS			191.60	261.95	137	70 - 130
10 PFDA			200.00	224.52	112	70 - 130
D 51 13C6_PFDA	641610	676693			105	50 - 150
D 58 d3-MeFOSAA	810340	783409			96.7	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	207.58	104	70 - 130
9 PFDS			192.80	228.55	119	70 - 130
5 N-EtFOSAA			200.00	222.53	111	70 - 130
25 PFUdA			200.00	187.37	93.7	70 - 130
D 60 d5-EtFOSAA	763091	758715			99.4	50 - 150
D 52 13C7_PFUdA	652802	669848			103	50 - 150
D 61 d7-MeFOSE	103832	98859			95.2	50 - 150
32 MeFOSE			200.00	179.04	89.5	70 - 130
26 MeFOSA			200.00	196.32	98.2	70 - 130
D 57 d3-MeFOSA	49874	51952			104	50 - 150
31 11Cl-PF3OUDS			188.40	185.56	98.5	70 - 130
D 62 d9-EtFOSE	117283	119102			102	50 - 150
33 EtFOSE			200.00	217.72	109	70 - 130
D 59 d5-EtFOSA	52571	46290			88.1	50 - 150
D 38 13C2_PFDoA	604828	621697			103	50 - 150
4 10:2 FTS			192.80	187.69	97.3	70 - 130
27 EtFOSA			200.00	250.97	125	70 - 130
11 PFDoA			200.00	189.23	94.6	70 - 130
34 PFDOS			193.60	201.96	104	70 - 130
24 PFTrDA			200.00	205.78	103	70 - 130
23 PFTeDA			200.00	208.01	104	70 - 130
D 42 13C2_PFTeDA	781191	819673			105	50 - 150
35 PFHxDA			200.00	205.65	103	70 - 130
D 40 13C2_PFHxDA	893092	949215			106	50 - 150
36 PFODA			200.00	191.72	95.9	70 - 130



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d  
 Injection Date: 23-Dec-2020 11:31:37 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 96  
 Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.705	0	653844	24	>100:1			1000.00	942.75	99.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/1	134005	22	67:1			200.00	205.77		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	0	675253	17	>100:1			1000.00	981.64	99	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	0/0	138439	16	>100:1			200.00	203.91		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	0	237926	16	>100:1			1000.00	1033.42	101	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.141	2.141	0/0	51167	19	>100:1	Target = 3.50		176.80	182.40		
298.9 > 99	44	2.130	2.141		13063	13	97:1	3.91 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.460	2.461	0/0	41480	18	>100:1	Target = 3.10		187.60	200.98		
349 > 99	44	2.451	2.461		13236	18	67:1	3.13 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.389	0	146417	19	>100:1			5000.00	6048.21	101	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.398	-1/-1	9779	17	>100:1	Target = 1.80		186.80	167.33		
327 > 81	63	2.389	2.398		6998	20	77:1	1.39 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.425	0	743441	19	>100:1			1000.00	1008.64	100	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.425	0/0	154921	19	>100:1	Target = 18.34		200.00	211.07		
313 > 119	49	2.424	2.425		6785	23	37:1	22.83 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.532	0	1365285	20	>100:1			5000.00	5125.83	98.8	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.532	0/0	77329	18	>100:1	Target = 0.81		400.00	394.17		
285 > 185	66	2.531	2.532		100056	18	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.783	0	603260	20	>100:1			1000.00	994.42	98.5	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.783	0/0	126258	19	>100:1	Target = 3.70		200.00	201.77		
363 > 169	47	2.782	2.783		32567	18	>100:1	3.87 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.801	0	180038	20				1000.00	1051.45	97	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.810	0/0	37409	27	>100:1	Target = 3.21	0.15	182.00	195.97		M
399 > 99	45	2.800	2.810		12424	28	56:1	3.01 (1.60-4.81)	0.07				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.828	0/0	206362	21	>100:1	Target = 2.97		188.40	180.54		
377 > 85	45	2.819	2.828		69524	19	>100:1	2.96 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	0/0	32666	23		Target = 3.08		190.40	199.73		
449 > 99	45	3.169	3.169		10571	22	52:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.142	0	108754	22	>100:1			5000.00	5647.09	92	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.129	3.162	0/0	11428	21	51:1	Target = 1.80		189.60	232.22		
427 > 81	64	3.142	3.162		6543	27		1.74 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	612612	24	>100:1			1000.00	1035.05	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	127778	23	67:1	Target = 2.87		200.00	204.60		
413 > 169	53	3.162	3.169		44177	24	>100:1	2.89 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	161247	20	>100:1			1000.00	1075.49	107	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.537	3.553	0/0	39521	45	>100:1	Target = 3.84	0.27	185.60	206.83		
499 > 99	54	3.537	3.553		10247	35	50:1	3.85 (1.92-5.76)	0.18				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.751	0/0	96119	20	>100:1			186.40	177.07		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.883	3.883	0/0	21416	25		Target = 3.07		192.00	173.55		
549 > 99	54	3.875	3.883		8576	23	69:1	2.49 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.189	4.198	0/0	26745	16	66:1	Target = 3.03		192.80	228.55		
599 > 99	54	4.180	4.198		9004	25	34:1	2.97 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.348	4.349	0/0	84973	19	>100:1			188.40	185.56		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.690	4.698	0/0	26144	21	>100:1	Target = 3.33		193.60	201.96		
699 > 99	54	4.690	4.698		7181	17		3.64 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.553	0	743703	22	>100:1			1000.00	990.33	102	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.553	0/0	156622	21	>100:1	Target = 6.16		200.00	210.59		
463 > 169	56	3.545	3.553		24959	18	>100:1	6.27 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.867	3.867	0	308208	19	>100:1			1000.00	995.62	95.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.875	0/0	61755	19	>100:1			200.00	203.33		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	0	107670	25				5000.00	5804.27	115	M
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.883	3.891	0/0	11866	17	54:1	Target = 1.95		191.60	261.95		
527 > 81	65	3.891	3.891		5079	16	17:1	2.33 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.485	4.494	0/0	9340	16	99:1	Target = 3.14		192.80	187.69		
627 > 80	65	4.485	4.494		3098	20	37:1	3.01 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.891	3.899	0	676693	20	>100:1			1000.00	1020.14	105	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.891	3.899	0/0	149288	19	>100:1	Target = 15.94		200.00	224.52		
513 > 169	51	3.891	3.899		10468	17	37:1	14.26 (7.97-23.91)					M
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.048	4.057	0	783409	19	>100:1			5000.00	5457.80	96.7	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	0/0	24983	30	85:1	Target = 1.33	0.10	200.00	207.58		
570 > 483	58	4.048	4.065		19255	33	>100:1	1.29 (0.66-1.99)	0.18				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.208	4.208	0	758715	18	>100:1			5000.00	5712.58	99.4	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.208	4.228	-1/-1	33618	32		Target = 1.58	0.11	200.00	222.53		M
584 > 526	60	4.208	4.228		20024	33	87:1	1.67 (0.79-2.37)	0.17				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.208	4.208	0	669848	17	>100:1			1000.00	1059.76	103	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.208	4.218	0/0	117960	16	>100:1	Target = 15.50		200.00	187.37		
563 > 169	52	4.198	4.218		7996	21		14.75 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.299	4.309	0	98859	16	>100:1			1000.00	913.60	95.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.309	4.309	0/0	16631	16	69:1			200.00	179.04		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.319	4.319	0	51952	15	>100:1			1000.00	981.77	104	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.319	0/0	11507	10	76:1	Target = 1.12		200.00	196.32		M
512 > 219	57	4.319	4.319		10490	20	44:1	1.09 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.467	4.467	0	119102	18	>100:1			1000.00	949.81	102	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.476	4.476	0/0	23070	25	>100:1			200.00	217.72		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.476	4.485	0	621697	17	>100:1			1000.00	1027.06	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.476	4.476	0/0	119136	18	65:1	Target = 10.85		200.00	189.23		
613 > 169	38	4.476	4.476		11634	16	88:1	10.24 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.718	4.719	0/0	126008	34	>100:1	Target = 8.37		200.00	205.78		
663 > 169	38	4.718	4.719		16403	39	>100:1	7.68 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.485	4.485	0	46290	15	>100:1			1000.00	942.88	88.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.494	4.494	0/0	12692	18	83:1	Target = 1.03		200.00	250.97		
526 > 219	59	4.494	4.494		11044	24	>100:1	1.14 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.933	4.933	0	819673	19	>100:1			1000.00	972.97	105	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.933	4.933	0/0	147732	21	23:1	Target = 12.11		200.00	208.01		
713 > 169	42	4.933	4.933		11668	27	78:1	12.66 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.310	5.318	0	949215	19	>100:1			1000.00	1047.51	106	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.318	5.318	0/0	127545	21	42:1	Target = 11.48		200.00	205.65		
813 > 269	40	5.310	5.318		11856	18	>100:1	10.75 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.661	5.668	0/0	161097	25	20:1	Target = 13.88		200.00	191.72		
913 > 319	40	5.661	5.668		12157	31	>100:1	13.25 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.891	3.899	0	710606	21	>100:1					98	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.425	0	735245	19	>100:1					101	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	611309	25	>100:1					98.6	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	608821	23	>100:1					100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	0	172457	22	>100:1					108	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

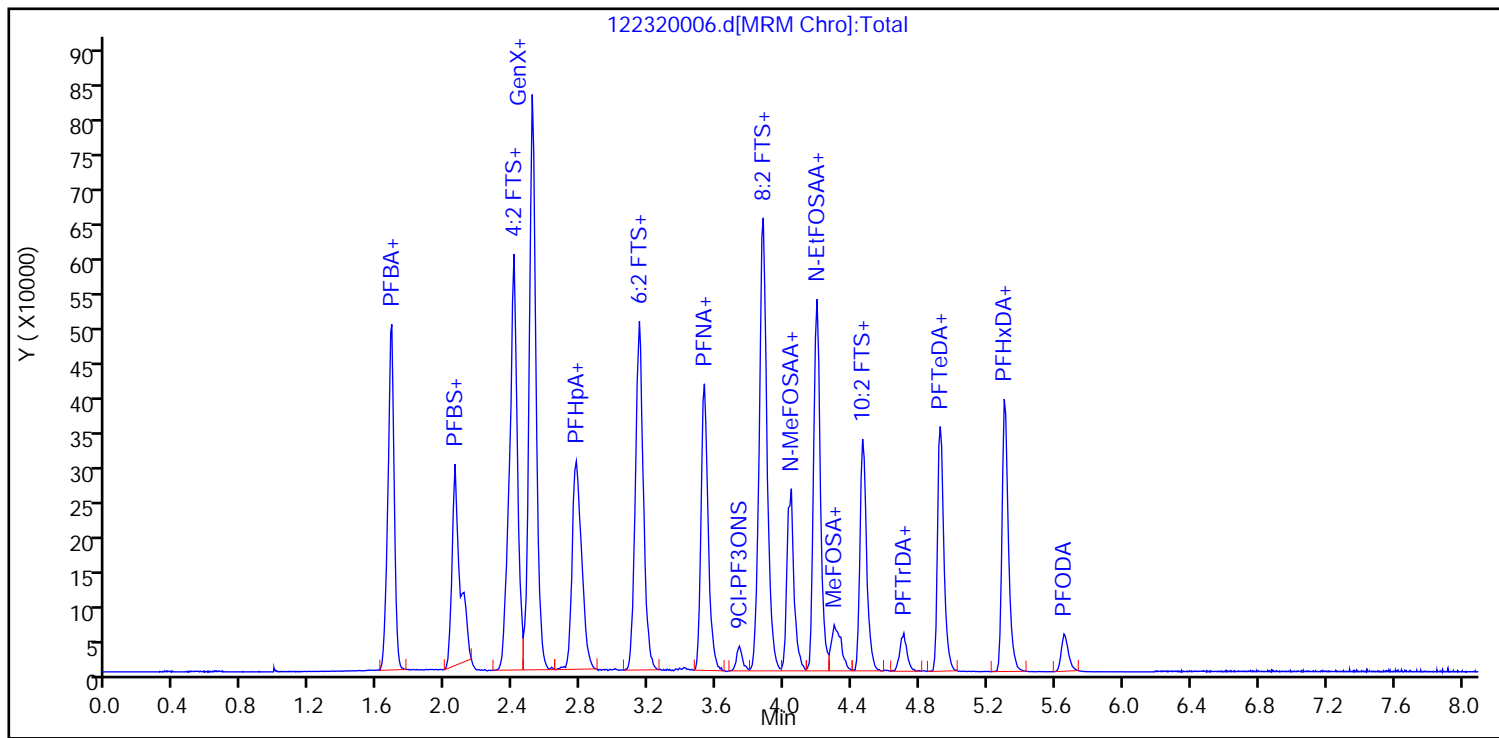
Client ID:

Lab ID: ID CCV 200\_SVLC-1221

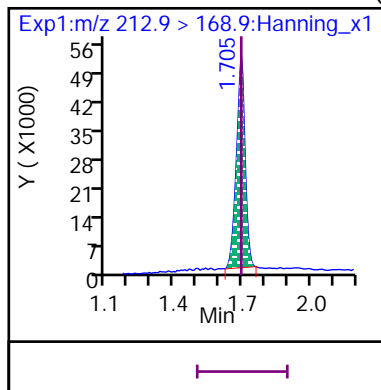
Sample Info: ID CCV 200\_SVLC-1221

Dil. Factor: 1

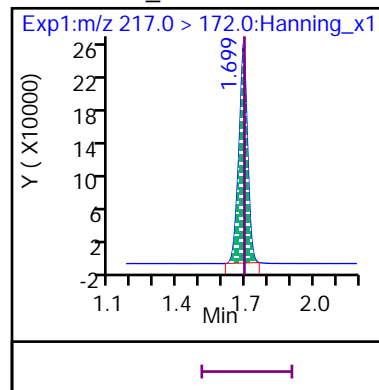
Operator: Stephen E. Somerville



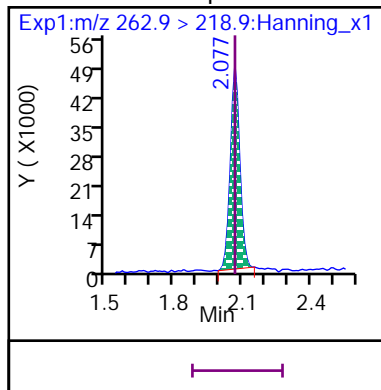
8 Perfluoro-n-butanoic acid (PFBA)



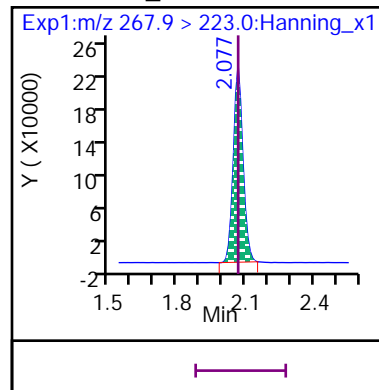
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

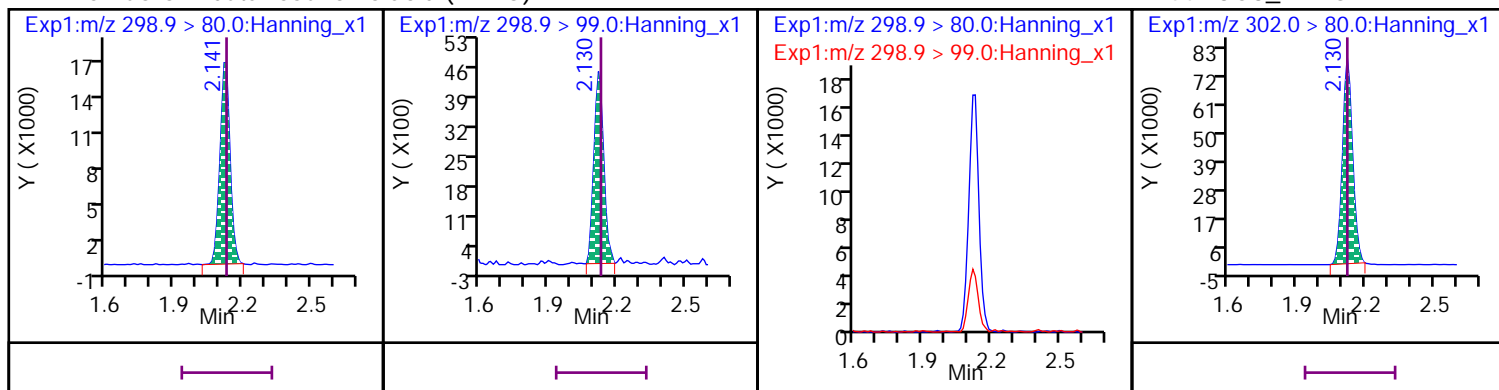


D 50 13C5\_PFPeA



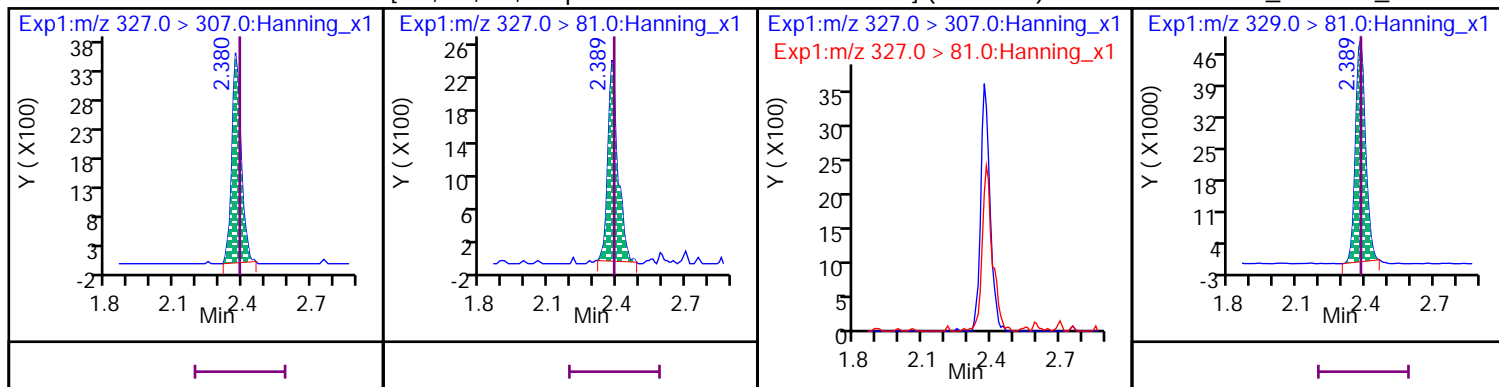
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



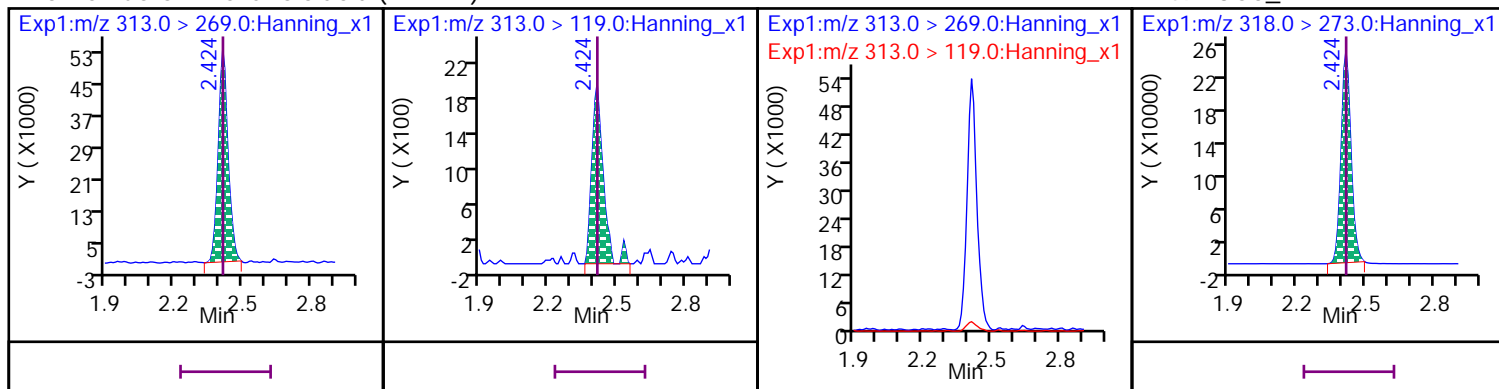
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



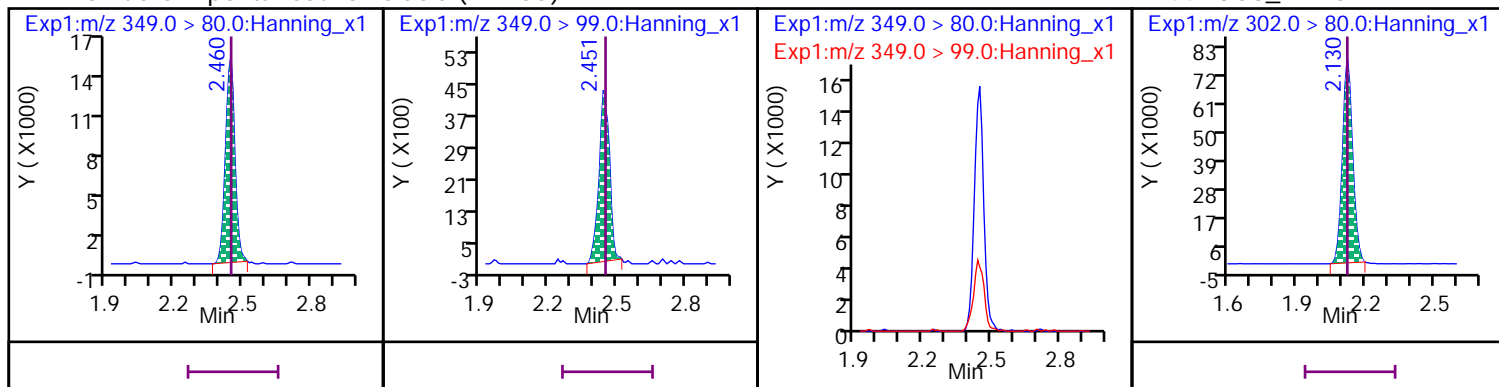
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



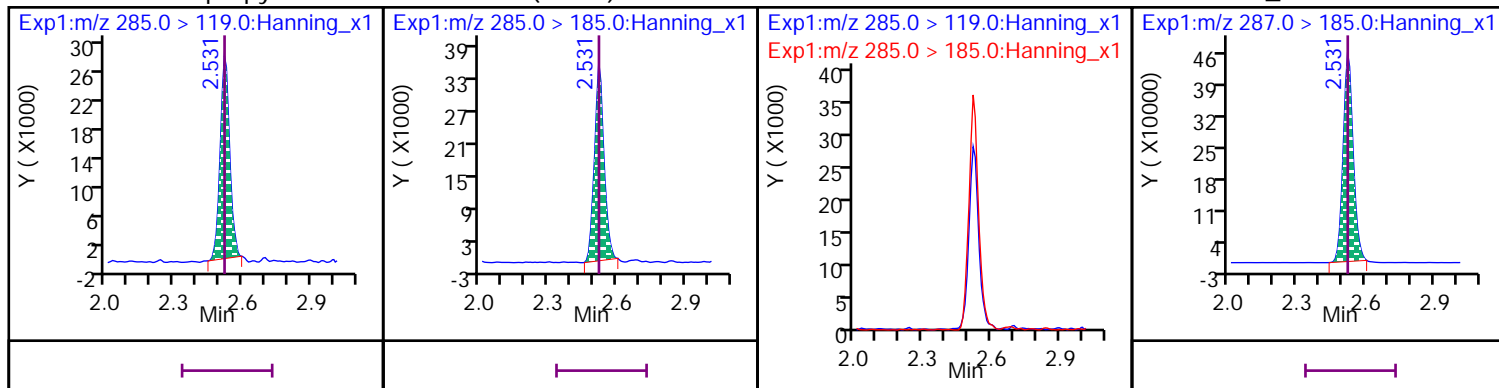
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



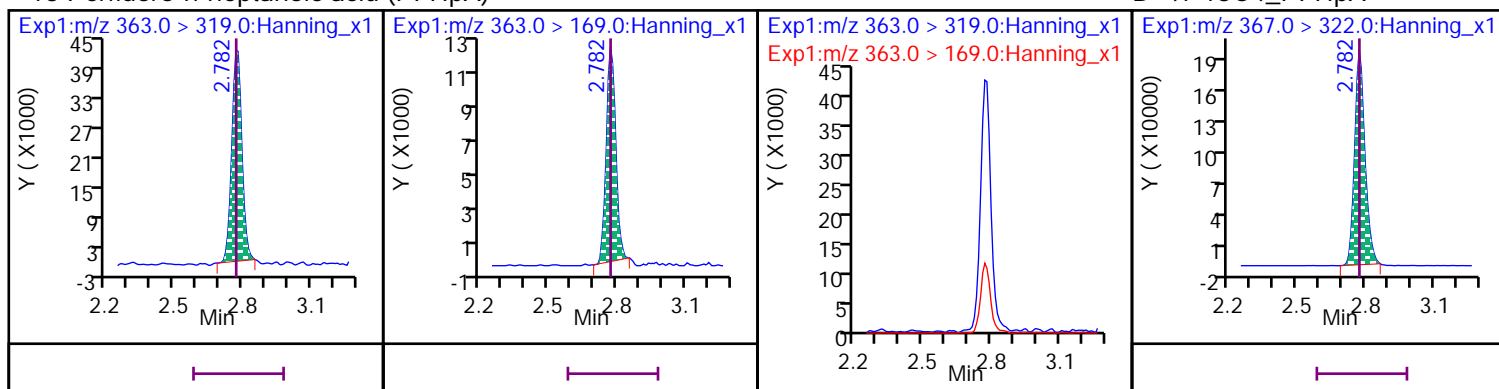
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



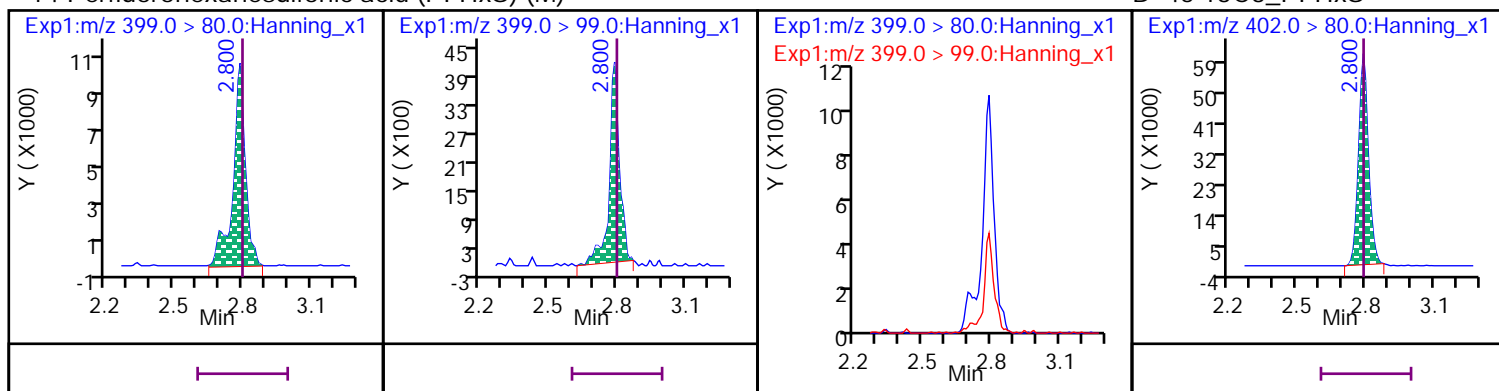
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



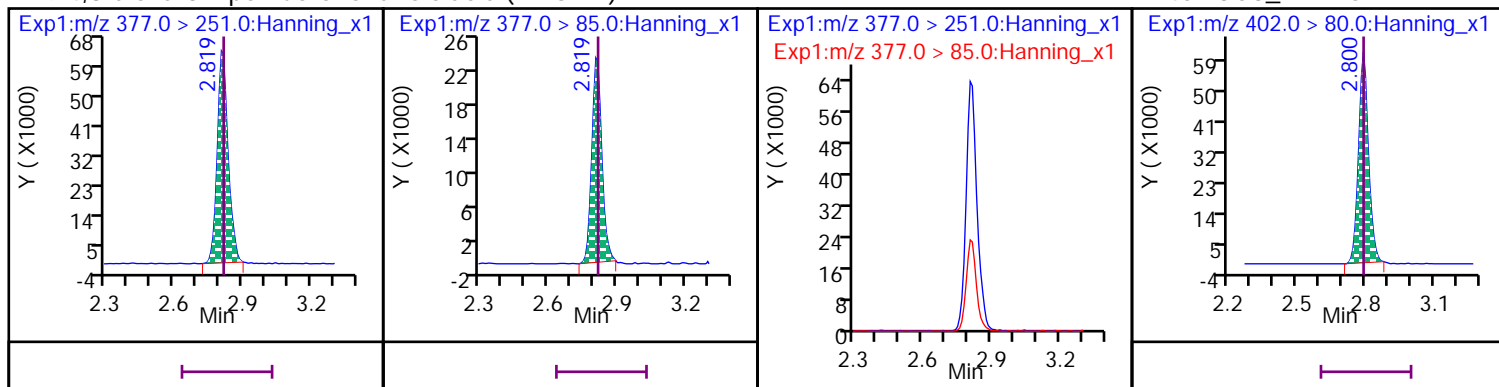
14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



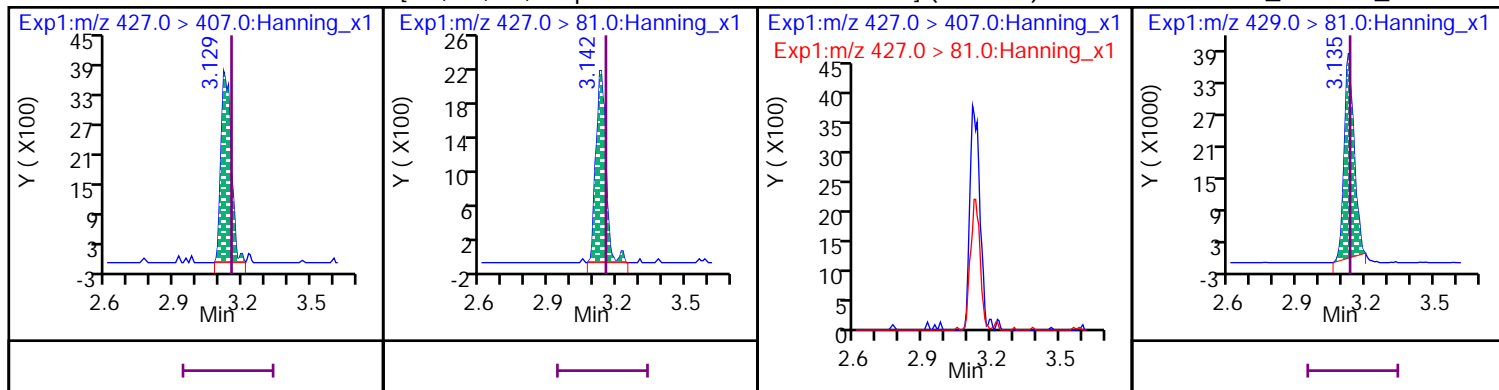
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



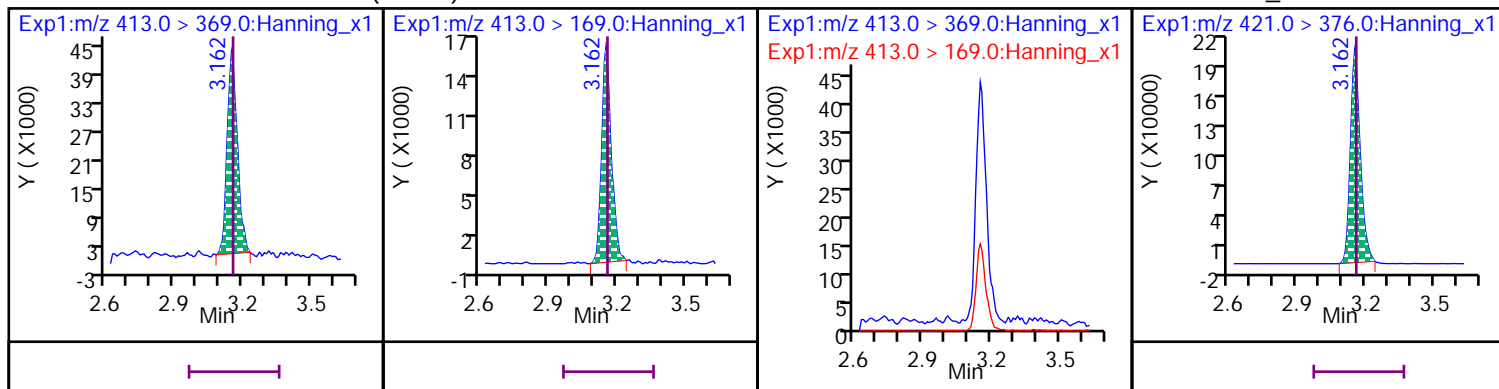
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



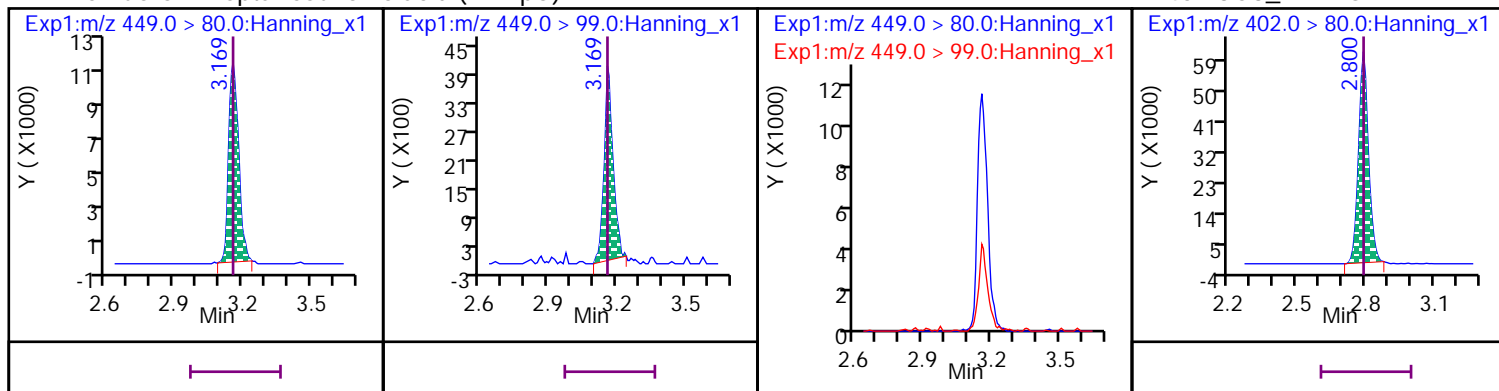
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



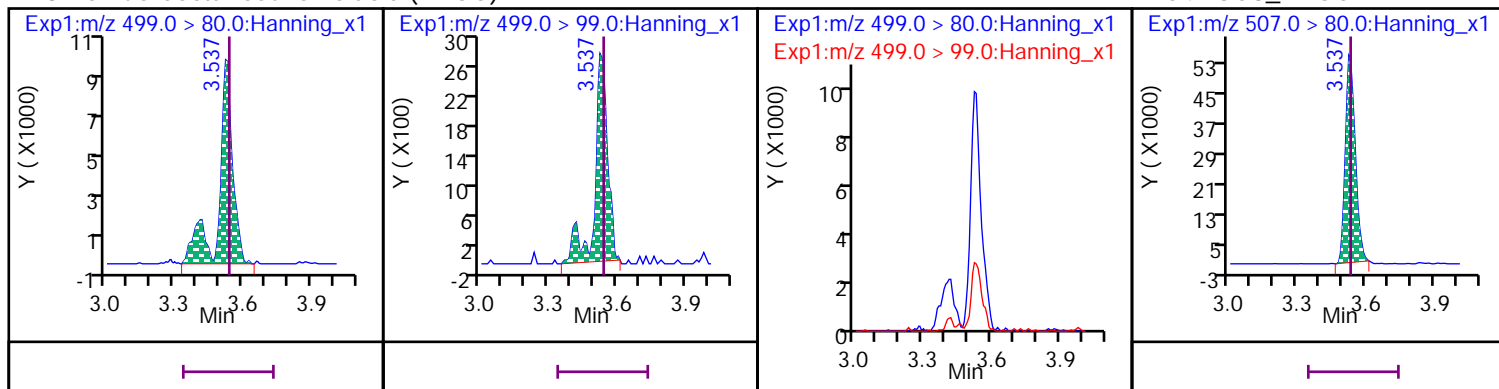
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

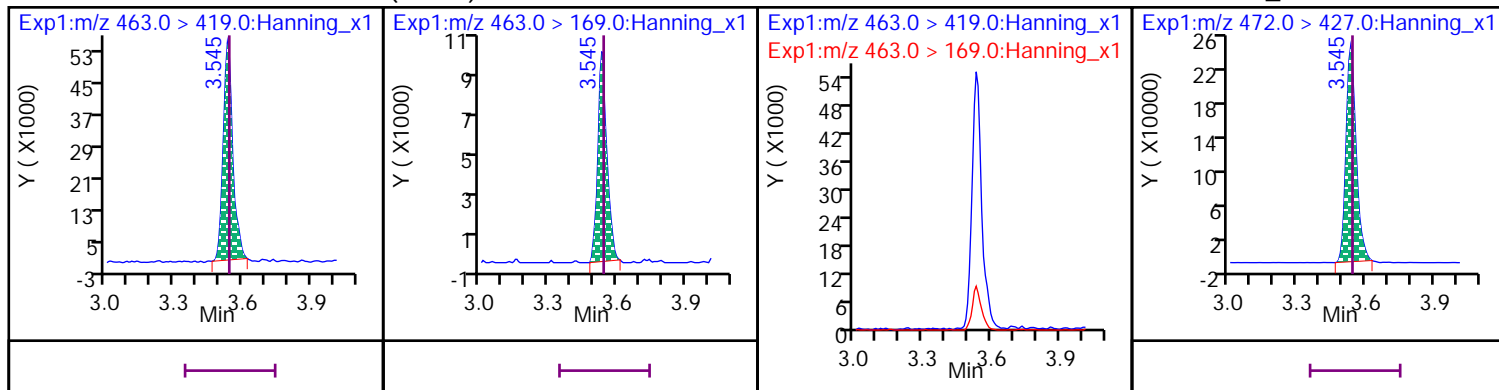
D 54 13C8\_PFOS





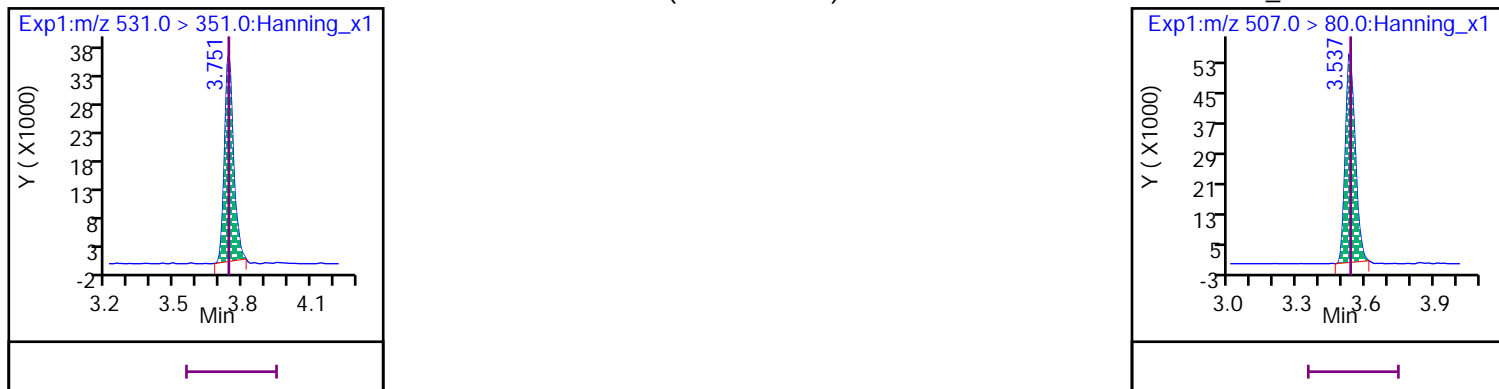
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



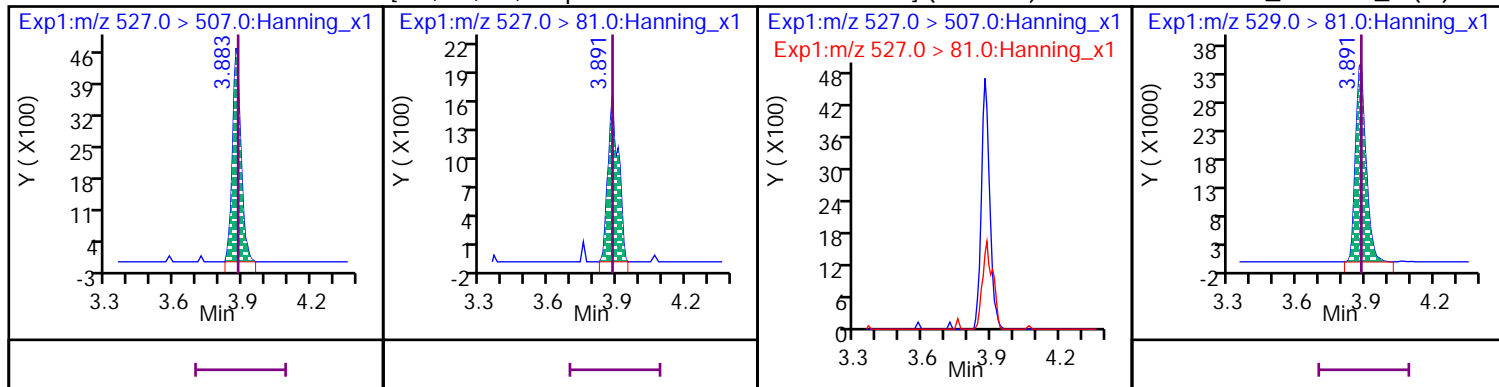
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



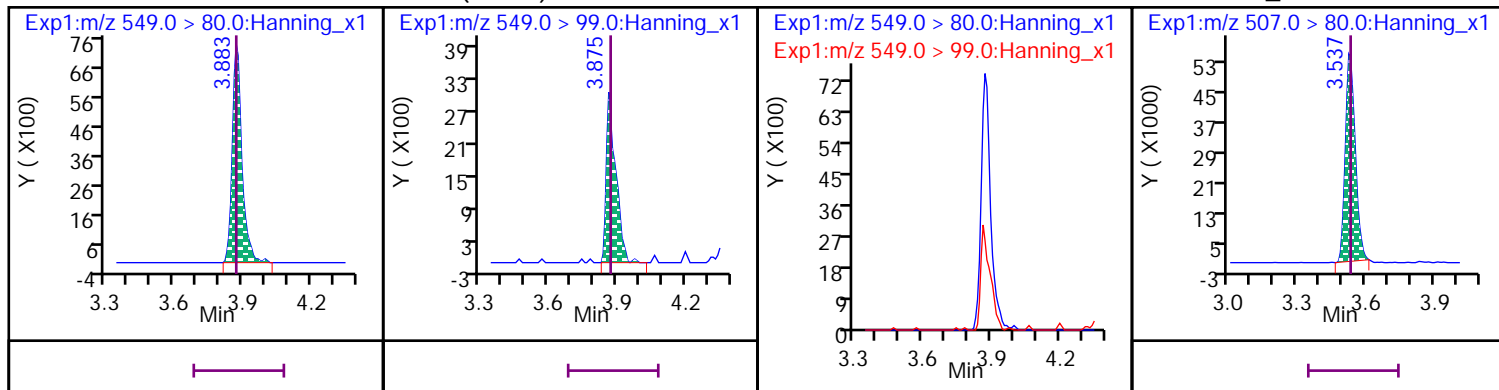
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2 (M)



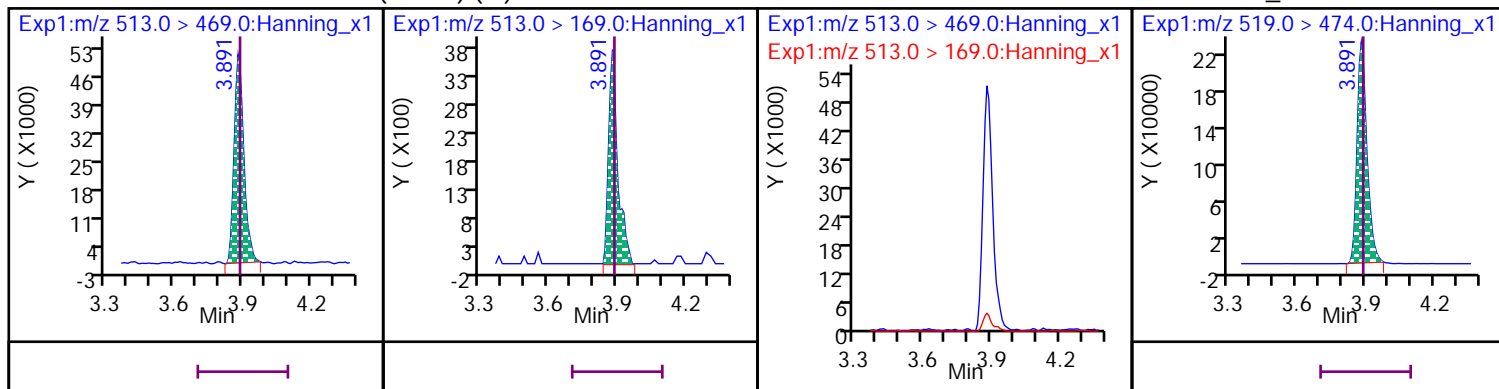
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



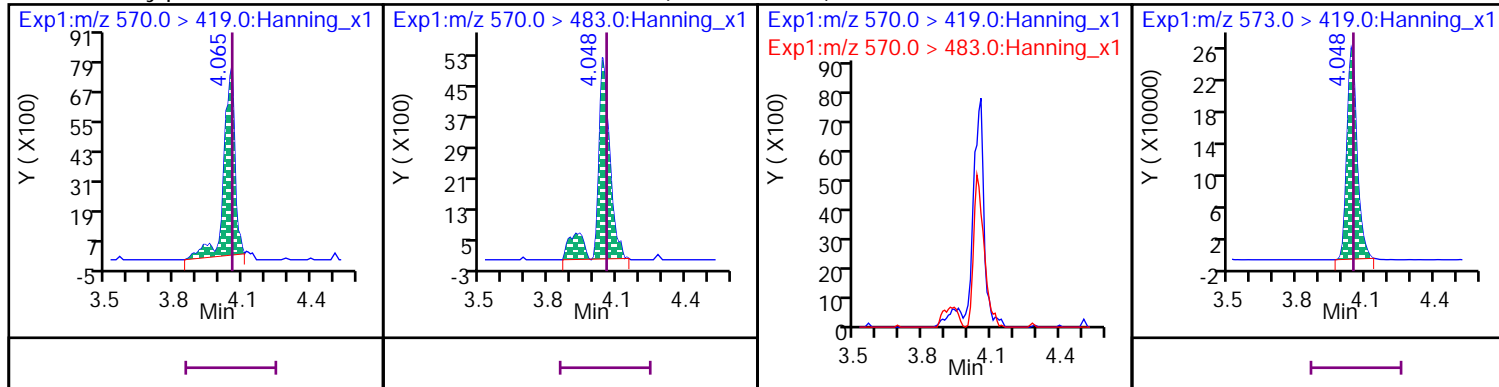
10 Perfluoro-n-decanoic acid (PFDA) (M)

D 51 13C6\_PFDA



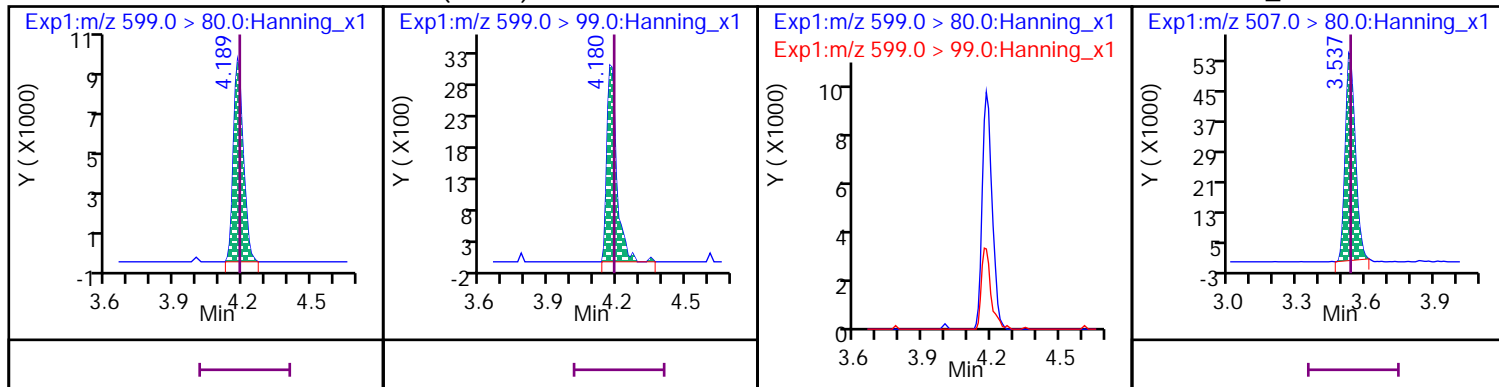
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



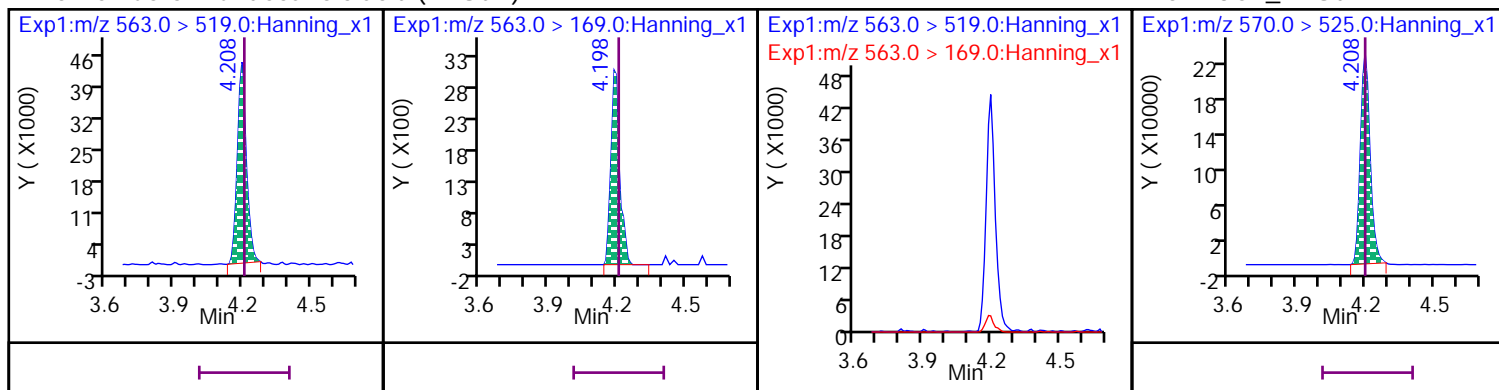
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



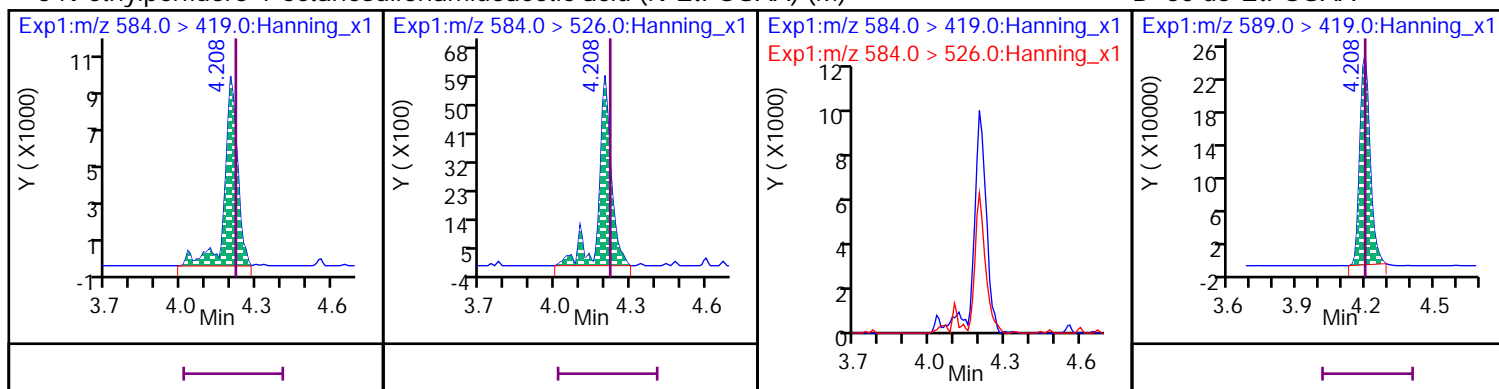
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



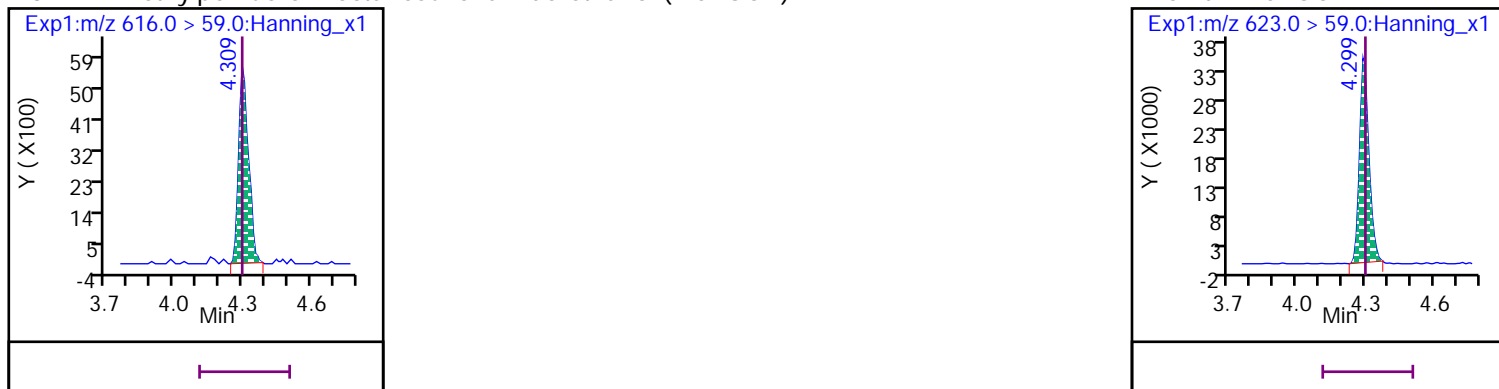
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



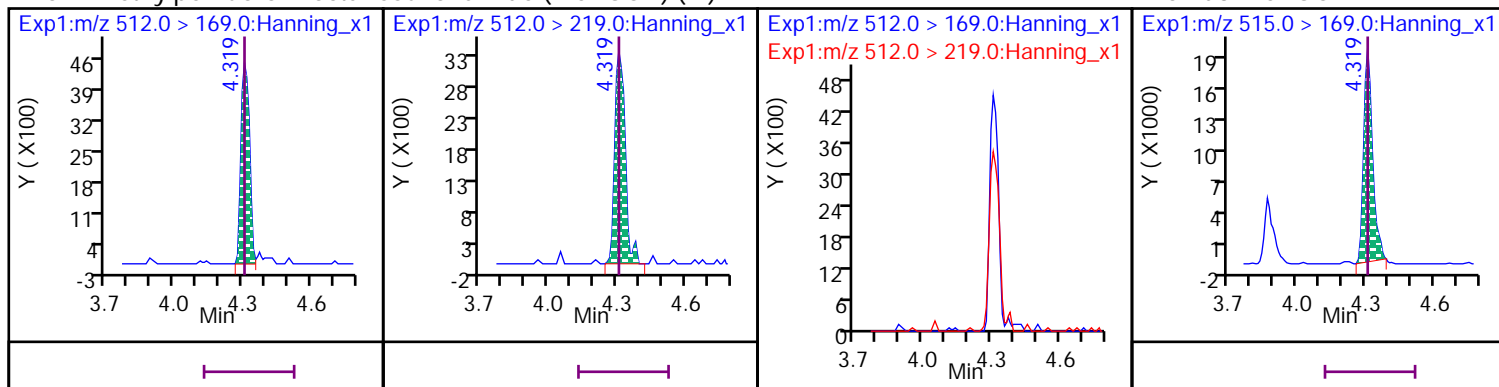
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

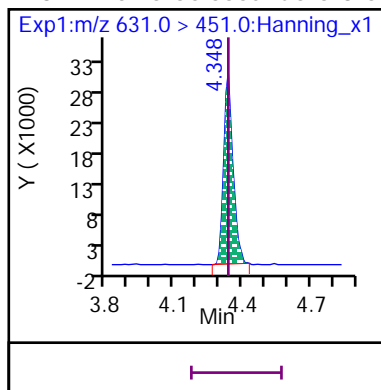


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (M)

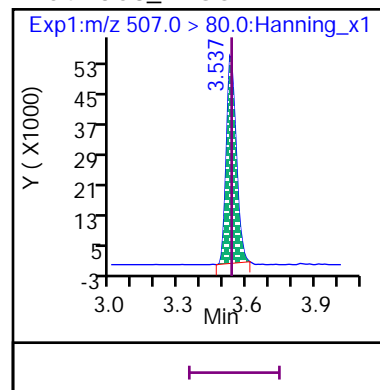
D 57 d3-MeFOSA



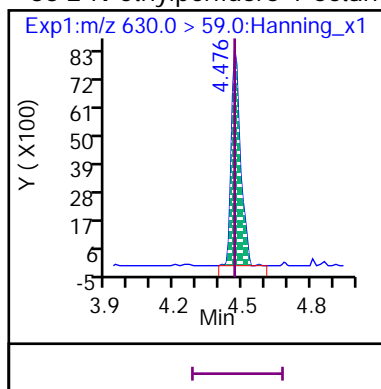
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



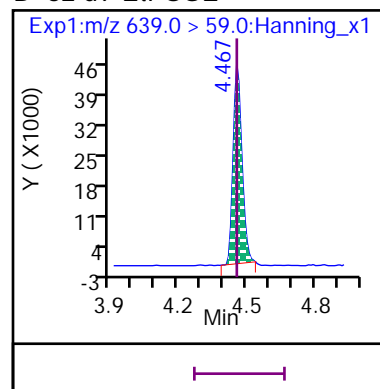
D 54 13C8\_PFOS



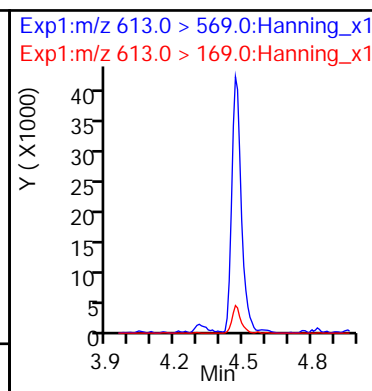
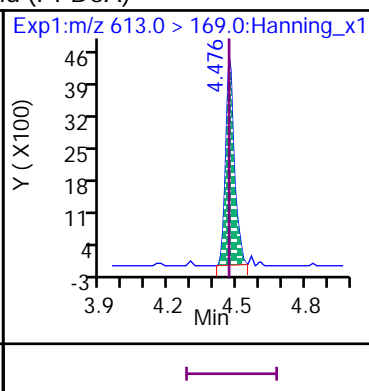
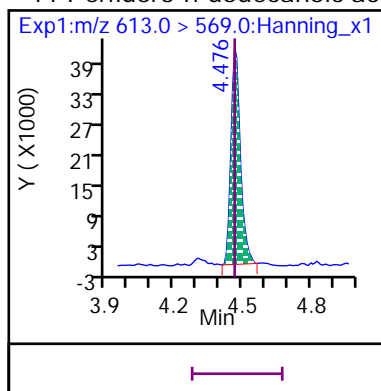
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



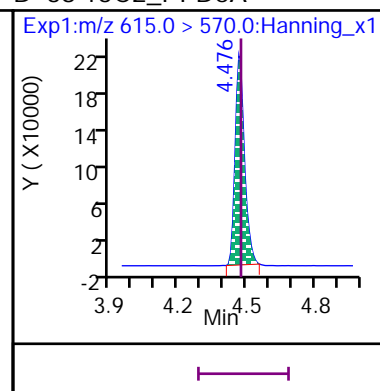
D 62 d9-EtFOSE



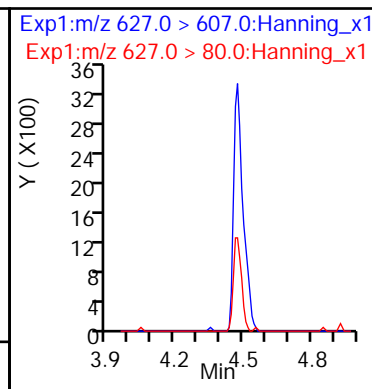
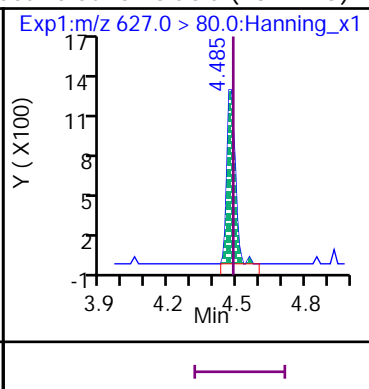
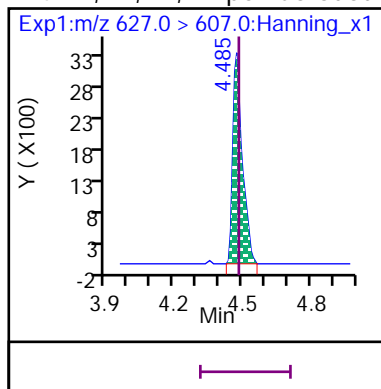
11 Perfluoro-n-dodecanoic acid (PFDoA)



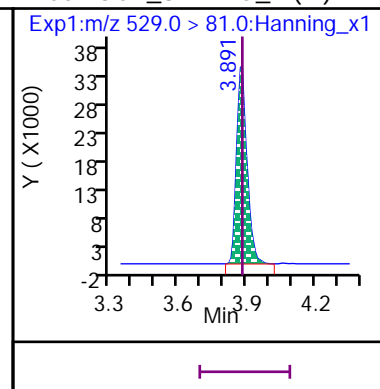
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

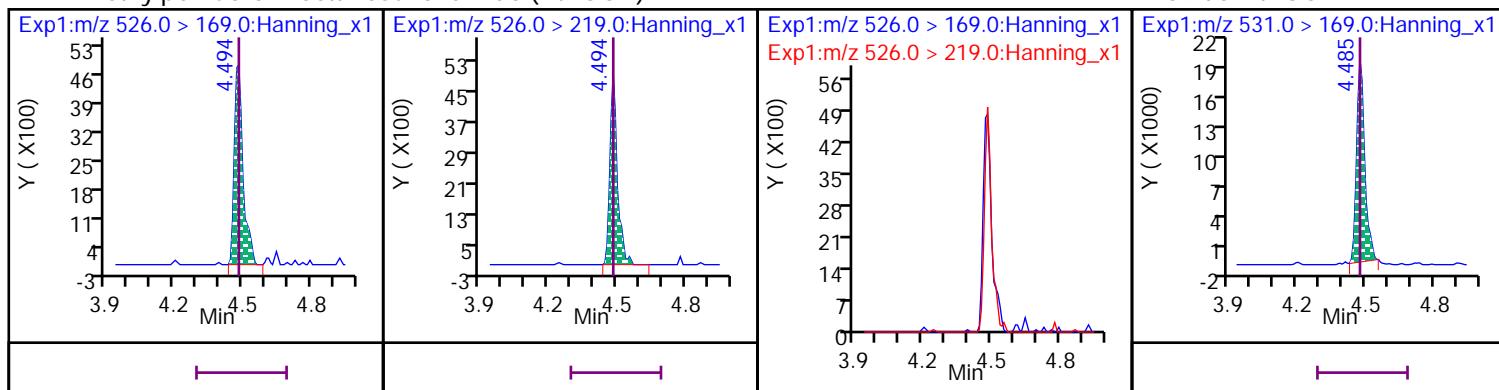


D 65 13C2\_8:2 FTS\_2 (M)



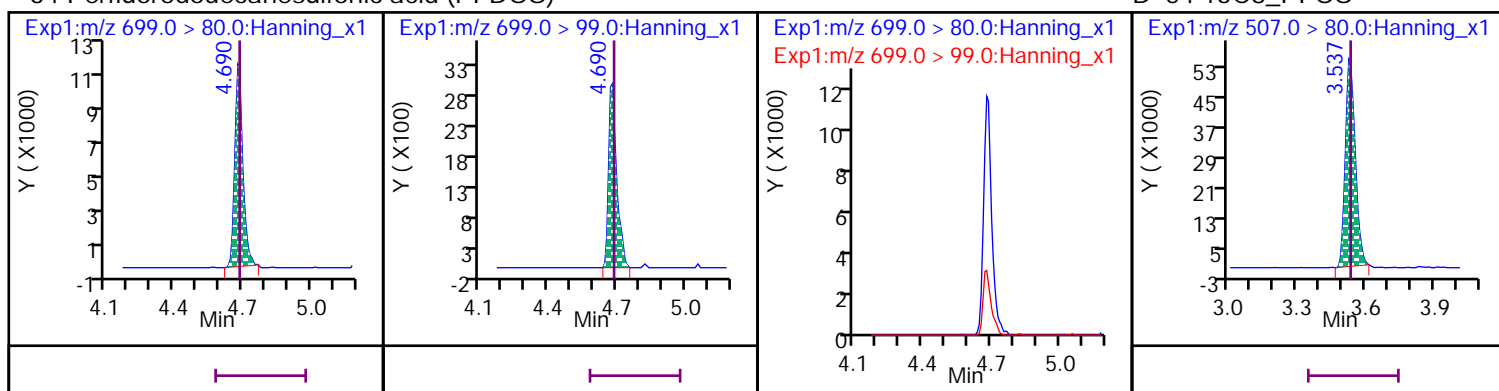
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



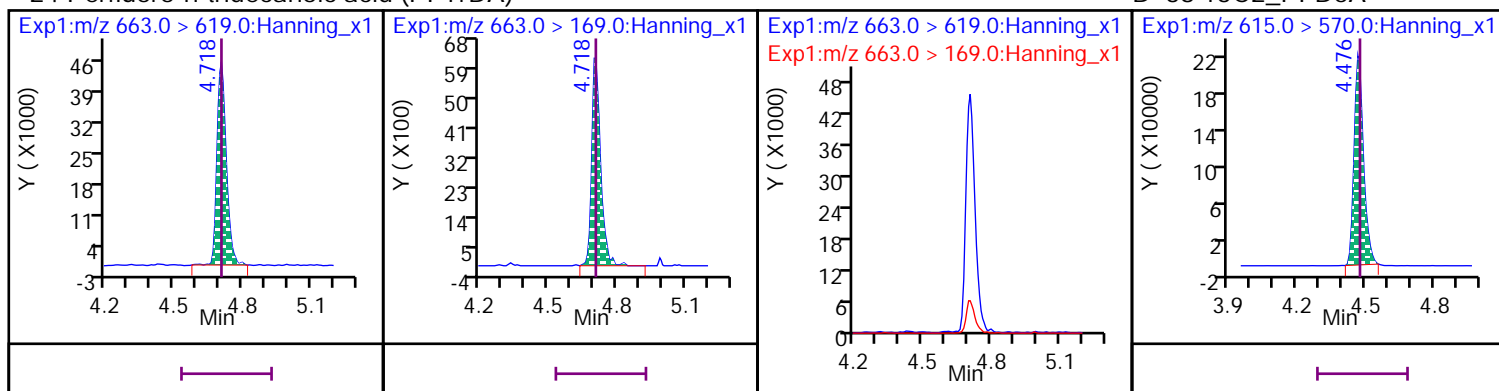
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



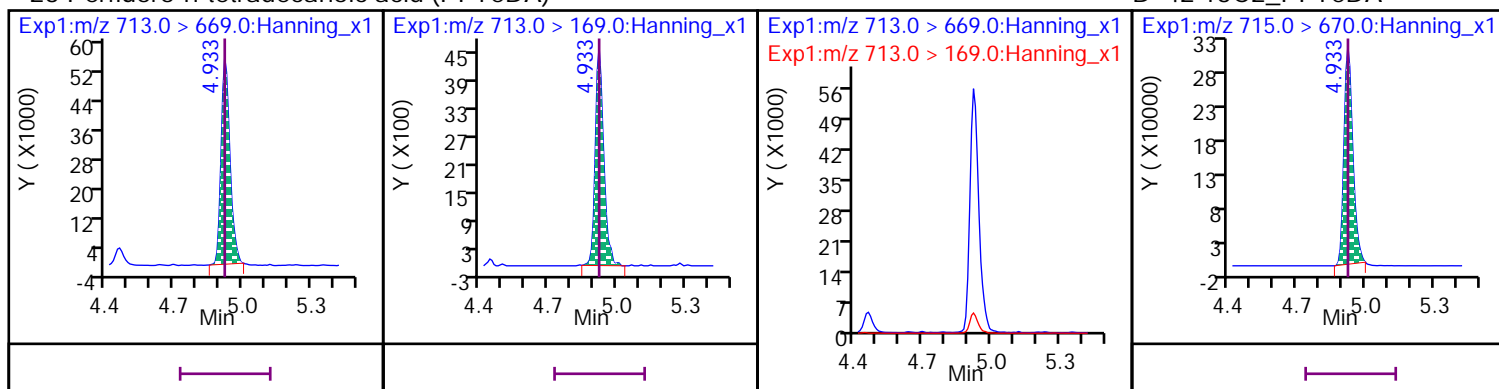
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



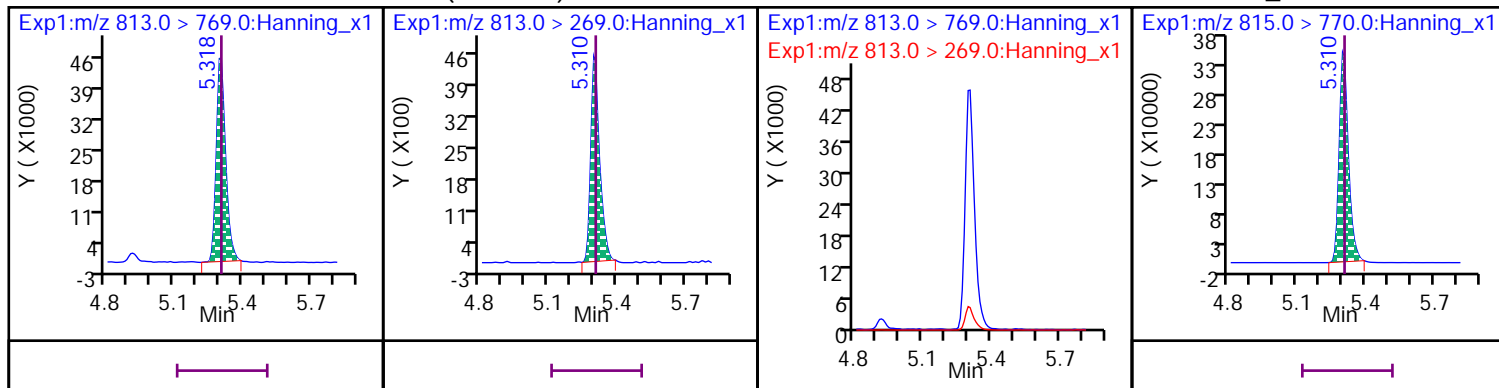
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



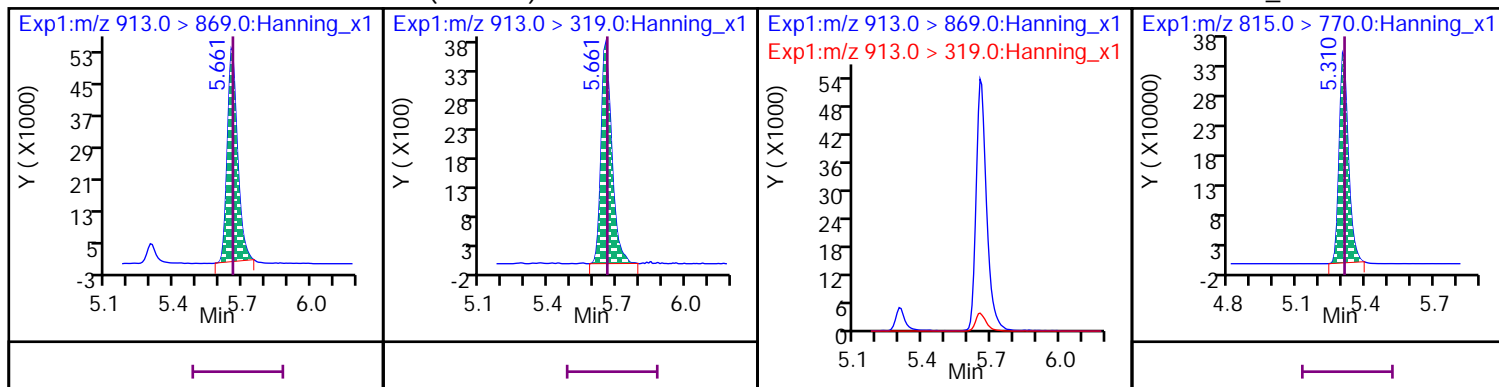
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

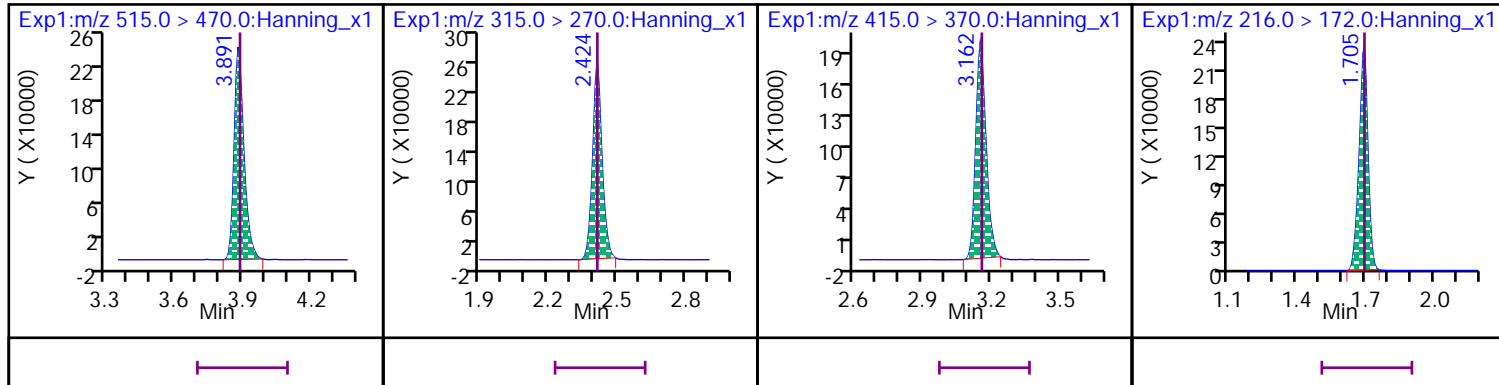


\* 37 13C2\_PFDA

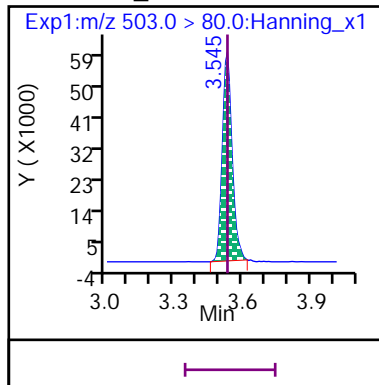
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

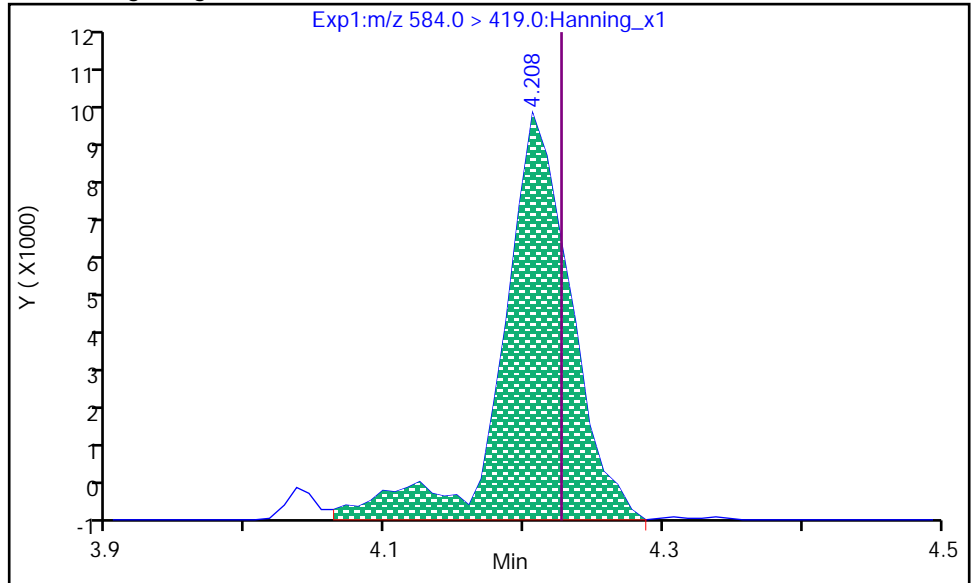
Dil. Factor: 1

Operator: Stephen E. Somerville

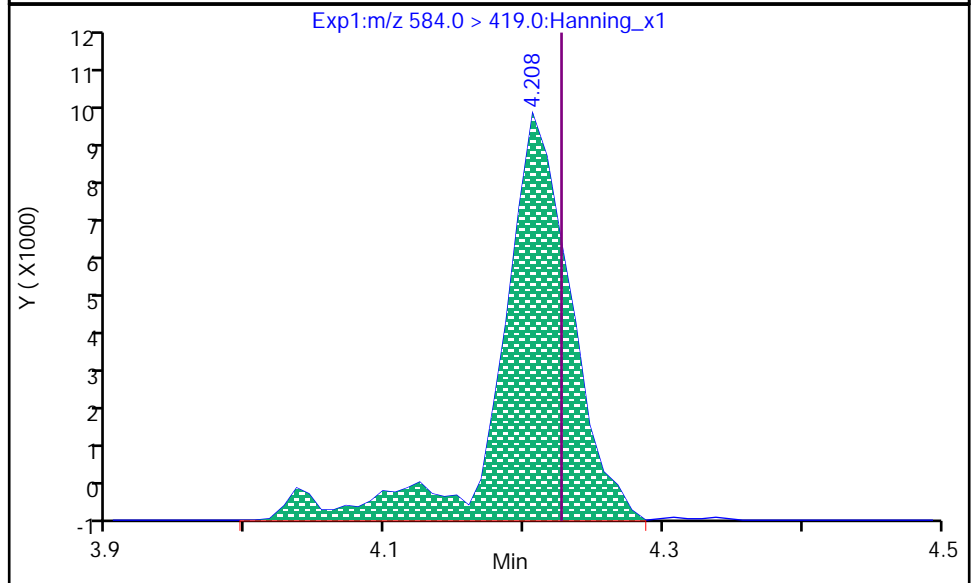
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.208  
Area: 32209  
Amount: 213.20  
Amount Units: ng/L



RT: 4.208  
Area: 33618  
Amount: 222.53  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:38:53

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

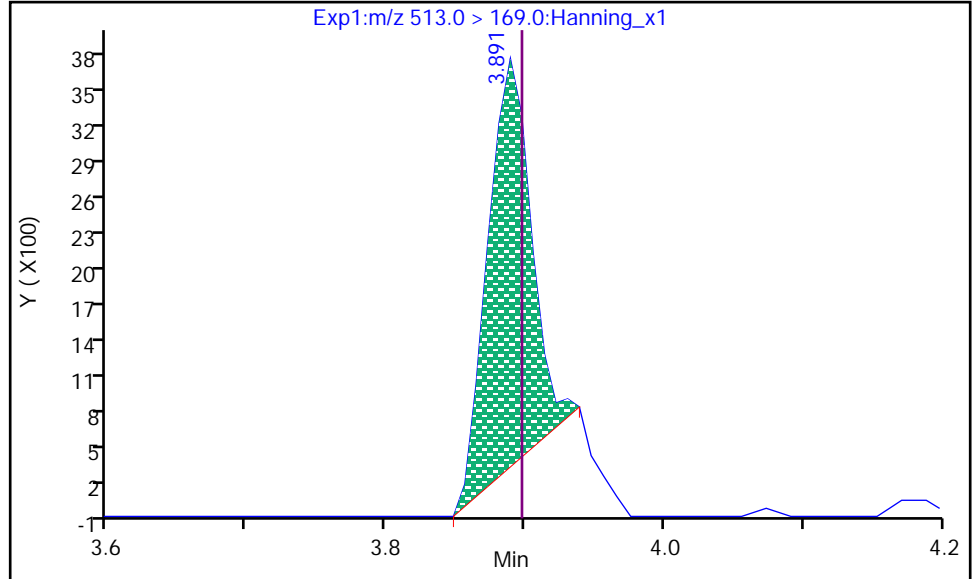
Dil. Factor: 1

Operator: Stephen E. Somerville

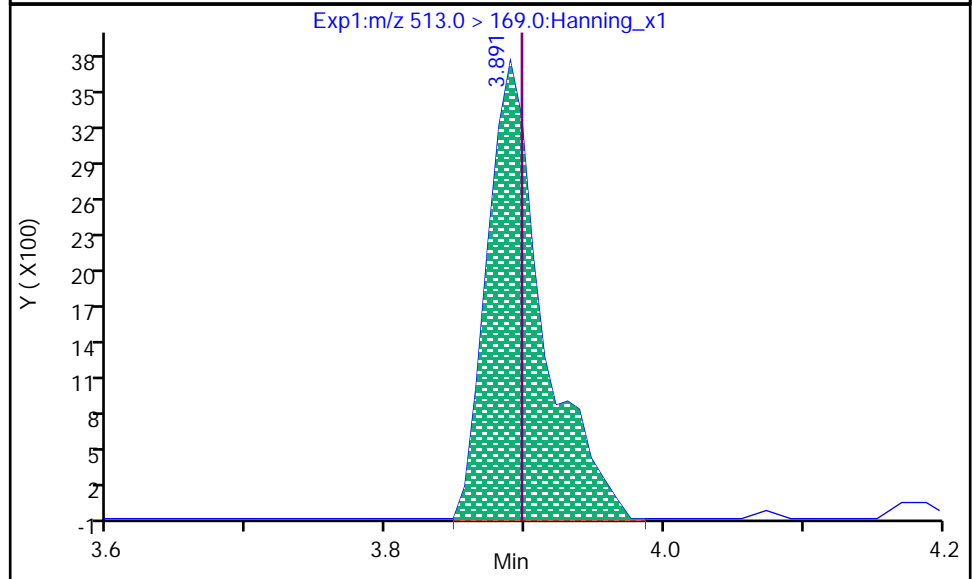
10 PFDA, CAS: 335-76-2

RT: 3.891  
Area: 7161  
Amount: 224.52  
Amount Units: ng/L

Processing Integration Results



RT: 3.891  
Area: 10468  
Amount: 224.52  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:38:06

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

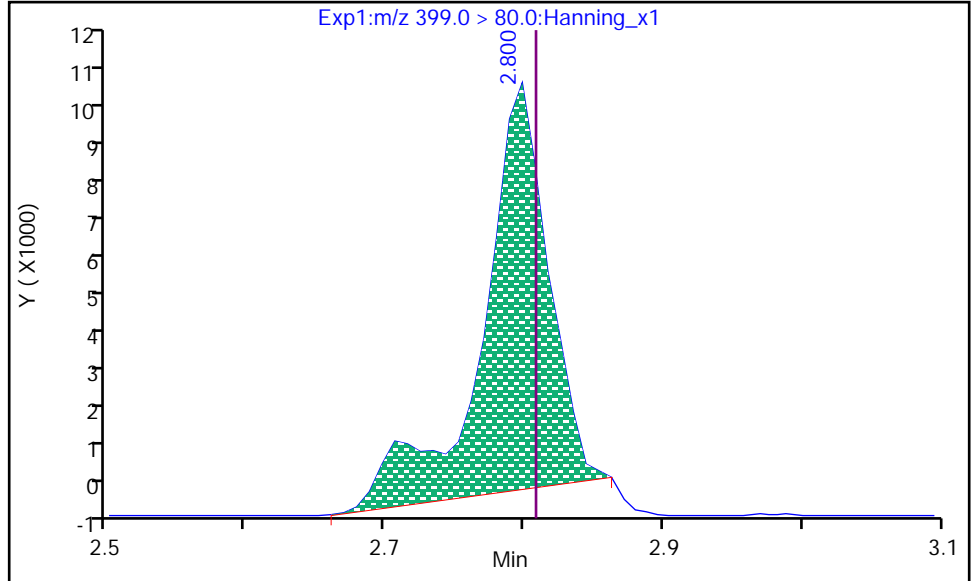
Dil. Factor: 1

Operator: Stephen E. Somerville

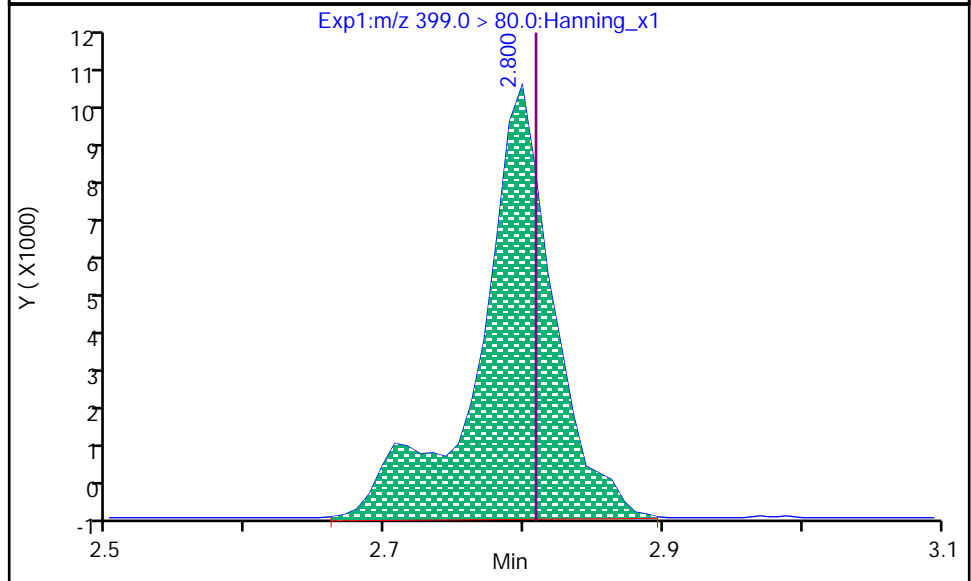
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.800  
Area: 30991  
Amount: 162.35  
Amount Units: ng/L



RT: 2.800  
Area: 37409  
Amount: 195.97  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:37:55

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

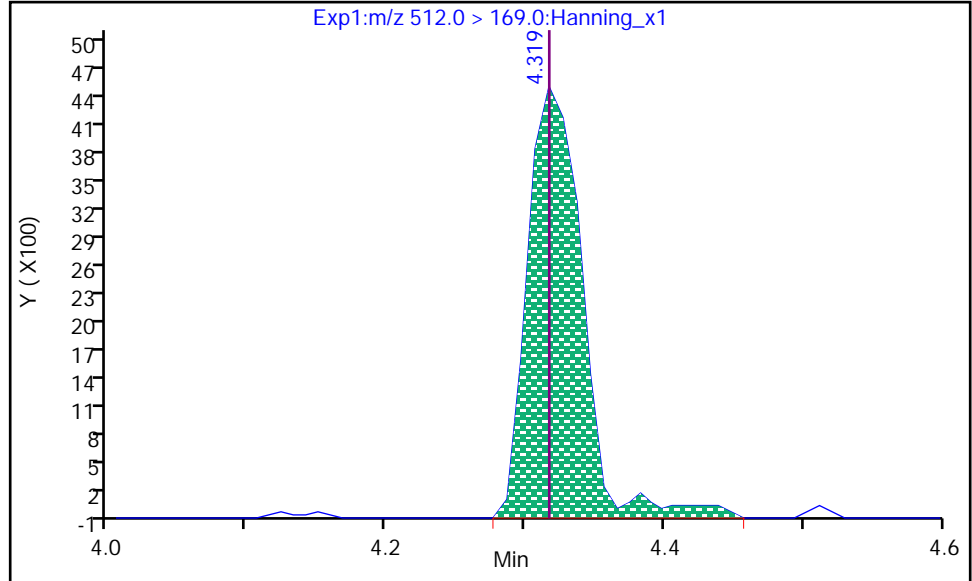
Dil. Factor: 1

Operator: Stephen E. Somerville

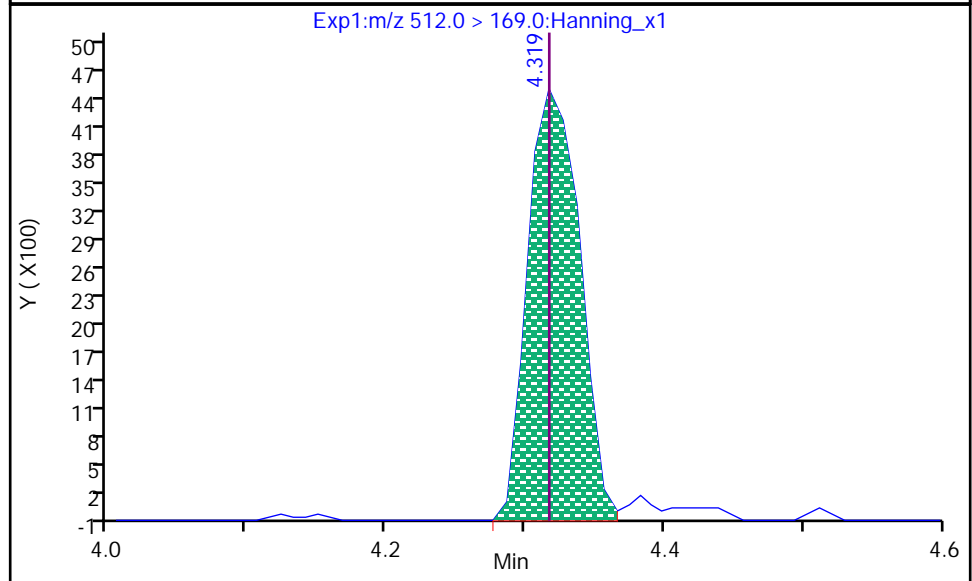
26 MeFOSA, CAS: 31506-32-8

RT: 4.319  
Area: 12173  
Amount: 207.69  
Amount Units: ng/L

Processing Integration Results



RT: 4.319  
Area: 11507  
Amount: 196.32  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:39:01

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320006.d

Injection Date: 23-Dec-2020 11:31:37

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

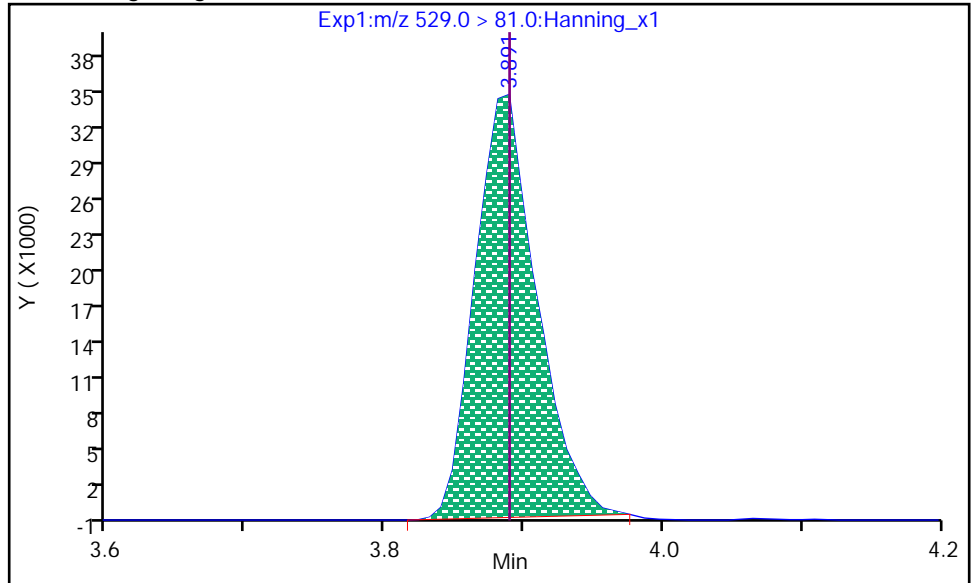
Dil. Factor: 1

Operator: Stephen E. Somerville

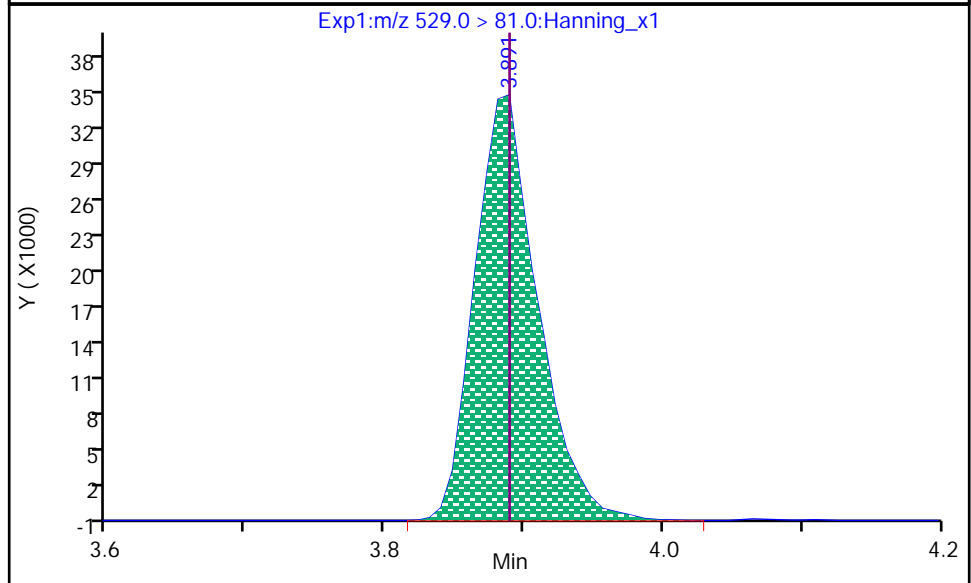
D 65 13C2\_8:2 FTS\_2, CAS: SESI-0106

Processing Integration Results

RT: 3.891  
Area: 104767  
Amount: 5647.77  
Amount Units: ng/L



RT: 3.891  
Area: 107670  
Amount: 5804.27  
Amount Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 10:21:58

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320022.d  
Injection Date: 23-Dec-2020 14:21:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 14  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	939.89	94	70 - 130
D 46 13C4_PFBA	659896	650524			98.6	50 - 150
D 50 13C5_PFPeA	681912	699151			103	50 - 150
21 PFPeA			1000.00	887.55	88.8	70 - 130
7 PFBS			884.00	786.14	88.9	70 - 130
D 44 13C3_PFBS	234990	249025			106	50 - 150
1 4:2 FTS			934.00	879.45	94.2	70 - 130
D 63 13C2_4:2 FTS_2	145673	141288			97	50 - 150
D 49 13C5_PFHxA	739934	764417			103	50 - 150
15 PFHxA			1000.00	910.78	91.1	70 - 130
22 PFPeS			938.00	879.89	93.8	70 - 130
28 GenX			2000.00	1878.77	93.9	70 - 130
D 66 13C3_GenX	1382147	1350847			97.7	50 - 150
D 47 13C4_PFHpA	612609	596214			97.3	50 - 150
13 PFHpA			1000.00	925.18	92.5	70 - 130
D 45 13C3_PFHxS	185632	191168			103	50 - 150
14 PFHxS			910.00	820.08	90.1	70 - 130
29 ADONA			942.00	811.13	86.1	70 - 130
D 64 13C2_6:2 FTS_2	118188	110507			93.5	50 - 150
2 6:2 FTS			948.00	933.05	98.4	70 - 130
20 PFOA			1000.00	972.64	97.3	70 - 130
D 53 13C8_PFOA	612317	594795			97.1	50 - 150
12 PFHpS			952.00	886.49	93.1	70 - 130
18 PFOS			928.00	834.50	89.9	70 - 130
17 PFNA			1000.00	908.68	90.9	70 - 130
D 56 13C9_PFNA	732148	769201			105	50 - 150
D 54 13C8_PFOS	151103	157350			104	50 - 150
30 9CI-PF3ONS			932.00	853.89	91.6	70 - 130
D 55 13C8_PFOSA	323224	318710			98.6	50 - 150
19 PFOSA			1000.00	928.43	92.8	70 - 130
16 PFNS			960.00	856.13	89.2	70 - 130
D 65 13C2_8:2 FTS_2	93513	101692			109	50 - 150
3 8:2 FTS			958.00	825.50	86.2	70 - 130
10 PFDA			1000.00	903.50	90.4	70 - 130
D 51 13C6_PFDA	641610	683085			106	50 - 150
D 58 d3-MeFOSAA	810340	815884			101	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	981.20	98.1	70 - 130
9 PFDS			964.00	871.47	90.4	70 - 130
5 N-EtFOSAA			1000.00	926.48	92.6	70 - 130
25 PFUdA			1000.00	971.26	97.1	70 - 130
D 60 d5-EtFOSAA	763091	698620			91.6	50 - 150
D 52 13C7_PFUdA	652802	623722			95.5	50 - 150
D 61 d7-MeFOSE	103832	110070			106	50 - 150
32 MeFOSE			1000.00	917.06	91.7	70 - 130
26 MeFOSA			1000.00	1196.73	120	70 - 130
D 57 d3-MeFOSA	49874	43518			87.3	50 - 150
31 11Cl-PF3OUDS			942.00	884.87	93.9	70 - 130
D 62 d9-EtFOSE	117283	109428			93.3	50 - 150
33 EtFOSE			1000.00	993.09	99.3	70 - 130
D 59 d5-EtFOSA	52571	48781			92.8	50 - 150
D 38 13C2_PFDoA	604828	586764			97	50 - 150
4 10:2 FTS			964.00	737.47	76.5	70 - 130
27 EtFOSA			1000.00	938.98	93.9	70 - 130
11 PFDoA			1000.00	929.86	93	70 - 130
34 PFDOS			968.00	925.55	95.6	70 - 130
24 PFTrDA			1000.00	972.99	97.3	70 - 130
23 PFTeDA			1000.00	957.71	95.8	70 - 130
D 42 13C2_PFTeDA	781191	813628			104	50 - 150
35 PFHxDA			1000.00	955.54	95.6	70 - 130
D 40 13C2_PFHxDA	893092	916848			103	50 - 150
36 PFODA			1000.00	948.61	94.9	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320022.d  
Injection Date: 23-Dec-2020 14:21:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 14  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.709	1.705	1	650524	24	>100:1			1000.00	937.96	98.6	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.709	1.705	1/0	608974	24	>100:1			1000.00	939.89		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.083	2.077	1	699151	17	>100:1			1000.00	1016.38	103	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.083	2.077	1/0	623896	18	>100:1			1000.00	887.55		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.136	2.130	1	249025	17	>100:1			1000.00	1081.63	106	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.136	2.141	0/-1	230818	16	>100:1	Target = 3.50		884.00	786.14		
298.9 > 99	44	2.136	2.141		67737	17	>100:1	3.40 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.461	0/-1	190070	20	>100:1	Target = 3.10		938.00	879.89		
349 > 99	44	2.459	2.461		65350	21	>100:1	2.90 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.389	0	141288	20	>100:1			5000.00	5836.34	97	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.398	0/0	49596	17	>100:1	Target = 1.80		934.00	879.45		
327 > 81	63	2.397	2.398		25822	20	>100:1	1.92 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.425	0	764417	20	>100:1			1000.00	1037.10	103	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.425	0/0	687359	20	>100:1	Target = 18.34		1000.00	910.78		
313 > 119	49	2.424	2.425		34913	24	>100:1	19.68 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.532	0	1350847	21	>100:1			5000.00	5071.62	97.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.532	0/0	364680	19	>100:1	Target = 0.81		2000.00	1878.77		
285 > 185	66	2.531	2.532		452192	19	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.783	0	596214	22	>100:1			1000.00	982.80	97.3	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.783	0/0	572162	21	>100:1	Target = 3.70		1000.00	925.18		
363 > 169	47	2.781	2.783		153187	20	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.801	0	191168	21	>100:1			1000.00	1116.45	103	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.810	0/0	166225	27	>100:1	Target = 3.21	0.17	910.00	820.08		
399 > 99	45	2.799	2.810		50379	27	>100:1	3.29 (1.60-4.81)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.828	0/0	984461	21	>100:1	Target = 2.97		942.00	811.13		
377 > 85	45	2.818	2.828		313977	22	>100:1	3.13 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.169	0/0	153950	24	>100:1	Target = 3.08		952.00	886.49		
449 > 99	45	3.168	3.169		45920	23	>100:1	3.35 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.142	0	110507	27	>100:1			5000.00	5738.12	93.5	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.134	3.162	-1/-1	42762	23	>100:1	Target = 1.80		948.00	933.05		
427 > 81	64	3.141	3.162		23085	26	>100:1	1.85 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.155	3.169	0	594795	25	>100:1			1000.00	1004.95	97.1	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.169	0/0	589774	23	>100:1	Target = 2.87		1000.00	972.64		
413 > 169	53	3.161	3.169		201954	25	>100:1	2.92 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.535	3.545	0	157350	20	>100:1			1000.00	1049.50	104	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.553	0/0	155598	42	>100:1	Target = 3.84	0.25	928.00	834.50		
499 > 99	54	3.535	3.553		45982	37	>100:1	3.38 (1.92-5.76)	0.15				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.750	3.751	0/0	452316	22	>100:1			932.00	853.89		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.882	3.883	0/0	103091	20	>100:1	Target = 3.07		960.00	856.13		
549 > 99	54	3.882	3.883		39602	27	>100:1	2.60 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.187	4.198	0/0	99516	16	>100:1	Target = 3.03		964.00	871.47		
599 > 99	54	4.187	4.198		37859	23	>100:1	2.62 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.347	4.349	0/0	395419	17	>100:1			942.00	884.87		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.688	4.698	0/0	116920	19	>100:1	Target = 3.33		968.00	925.55		
699 > 99	54	4.688	4.698		35975	19	>100:1	3.25 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.543	3.553	0	769201	22	>100:1			1000.00	1024.29	105	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.543	3.553	0/0	698977	23	>100:1	Target = 6.16		1000.00	908.68		
463 > 169	56	3.543	3.553		106056	23	>100:1	6.59 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.867	0	318710	20	>100:1			1000.00	1029.54	98.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.875	0/0	291594	22	>100:1			1000.00	928.43		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.882	3.891	0	101692	18	>100:1			5000.00	5482.01	109	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.882	3.891	0/0	33861	18	>100:1	Target = 1.95		958.00	825.50		
527 > 81	65	3.890	3.891		17315	21	55:1	1.95 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.473	4.494	-1/-1	34661	21		Target = 3.14		964.00	737.47		
627 > 80	65	4.482	4.494		10710	16		3.23 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.890	3.899	0	683085	20	>100:1			1000.00	1029.78	106	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.890	3.899	0/0	606427	20	>100:1	Target = 15.94		1000.00	903.50		
513 > 169	51	3.898	3.899		43932	19	>100:1	13.80 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.046	4.057	0	815884	17	>100:1			5000.00	5684.04	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.046	4.065	-1/-1	122988	35	>100:1	Target = 1.33	0.10	1000.00	981.20		
570 > 483	58	4.046	4.065		83772	37	>100:1	1.46 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.197	4.208	0	698620	20	>100:1			5000.00	5260.11	91.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.206	4.228	-1/-1	128880	35	>100:1	Target = 1.58	0.12	1000.00	926.48		
584 > 526	60	4.206	4.228		82404	33	>100:1	1.56 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.197	4.208	0	623722	20				1000.00	986.79	95.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.197	4.218	-1/-1	569370	18	>100:1	Target = 15.50		1000.00	971.26		
563 > 169	52	4.197	4.218		35657	23	>100:1	15.96 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.307	4.309	0	110070	17	>100:1			1000.00	1017.21	106	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.317	4.309	1/1	94844	17	>100:1			1000.00	917.06		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.327	4.319	1	43518	13	>100:1			1000.00	822.38	87.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.319	1/0	58756	19	>100:1	Target = 1.12		1000.00	1196.73		
512 > 219	57	4.317	4.319		63880	20		0.91 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.473	4.467	1	109428	16	>100:1			1000.00	872.66	93.3	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.476	1/0	96683	17	>100:1			1000.00	993.09		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.473	4.485	0	586764	18	>100:1			1000.00	969.35	97	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.473	4.476	0/0	552521	20	>100:1	Target = 10.85		1000.00	929.86		
613 > 169	38	4.473	4.476		49751	18	>100:1	11.10 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.710	4.719	0/0	562318	20	>100:1	Target = 8.37		1000.00	972.99		
663 > 169	38	4.710	4.719		70880	20	>100:1	7.93 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.485	0	48781	16	>100:1			1000.00	993.61	92.8	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.494	0/0	50042	16	>100:1	Target = 1.03		1000.00	938.98		
526 > 219	59	4.491	4.494		50109	17	>100:1	0.99 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.923	4.933	0	813628	17	>100:1			1000.00	965.80	104	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.923	4.933	0/0	675157	20	>100:1	Target = 12.11		1000.00	957.71		
713 > 169	42	4.923	4.933		57317	19	>100:1	11.77 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.299	5.318	-1	916848	19	>100:1			1000.00	1011.79	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.308	5.318	0/1	572424	19	>100:1	Target = 11.48		1000.00	955.54		
813 > 269	40	5.308	5.318		50872	21	>100:1	11.25 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.653	5.668	0/1	769903	25	88:1	Target = 13.88		1000.00	948.61		
913 > 319	40	5.653	5.668		53875	22	>100:1	14.29 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.890	3.899	0	688624	20	>100:1					95	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.425	0	727177	20	>100:1					99.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.161	3.169	0	603801	24	>100:1					97.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.709	1.705	1	595918	24	>100:1					98.2	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.535	3.545	0	163229	22	>100:1					102	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320022.d

Injection Date: 23-Dec-2020 14:21:21

Inst. ID: LCMSMS02

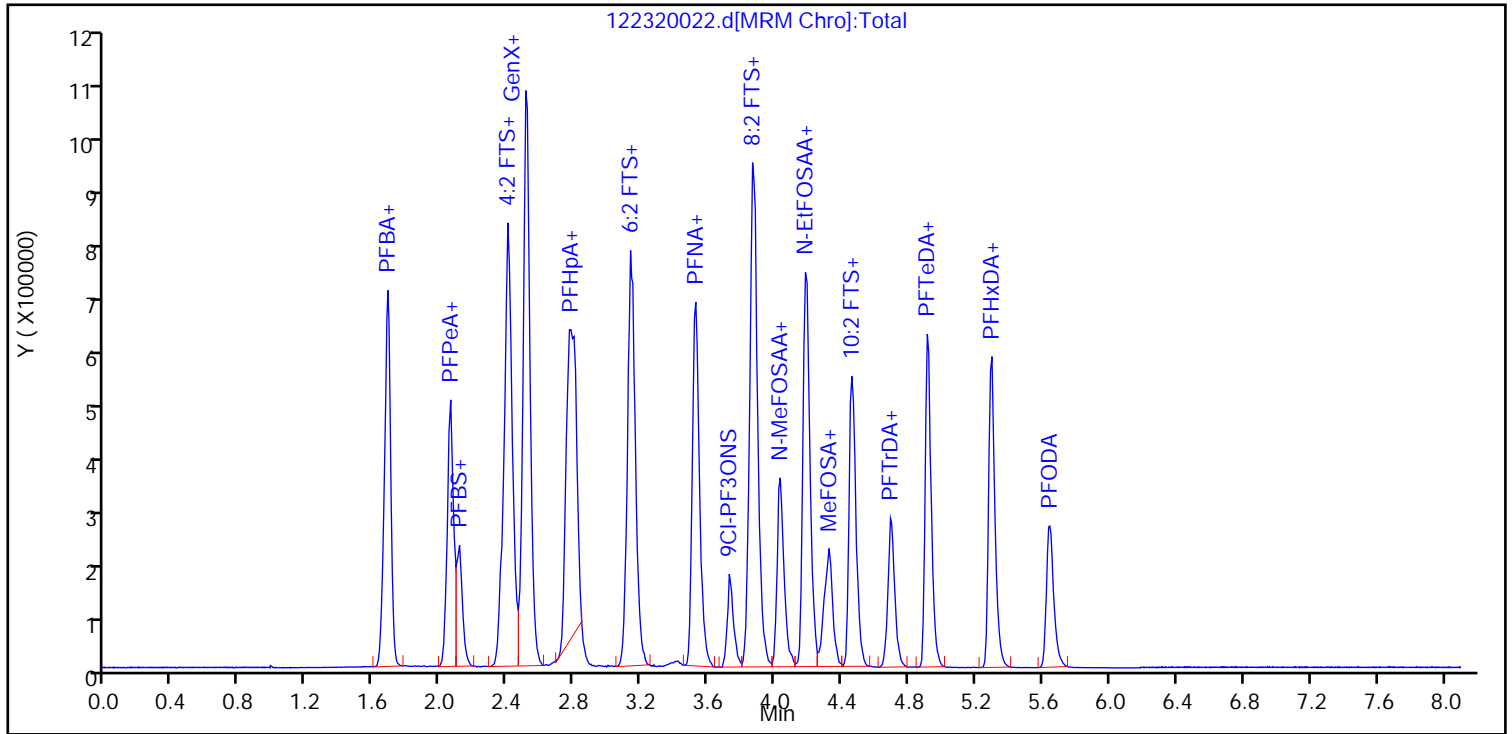
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

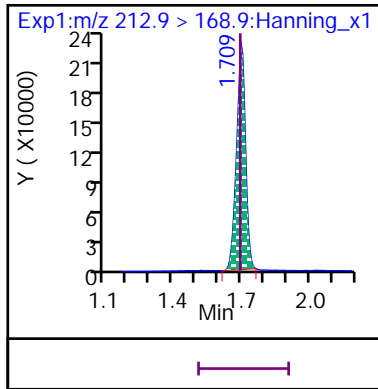
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

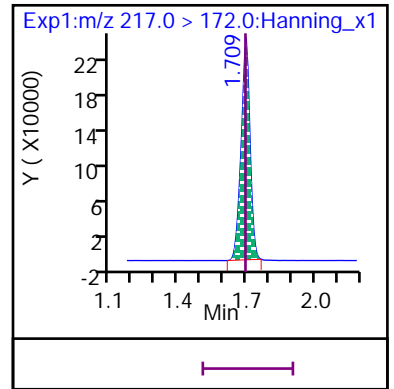
Operator: Stephen E. Somerville



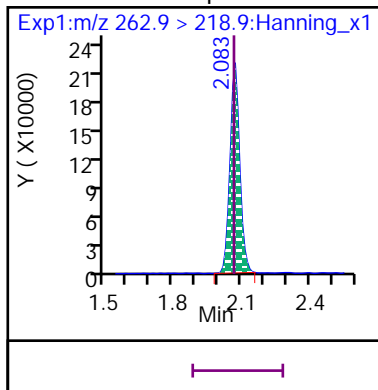
8 Perfluoro-n-butanoic acid (PFBA)



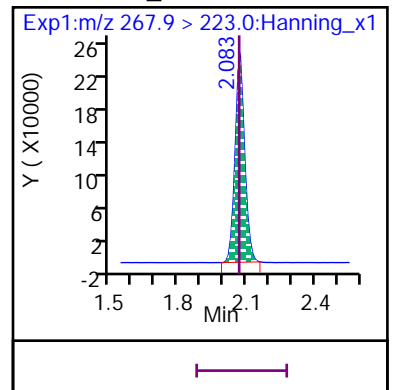
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

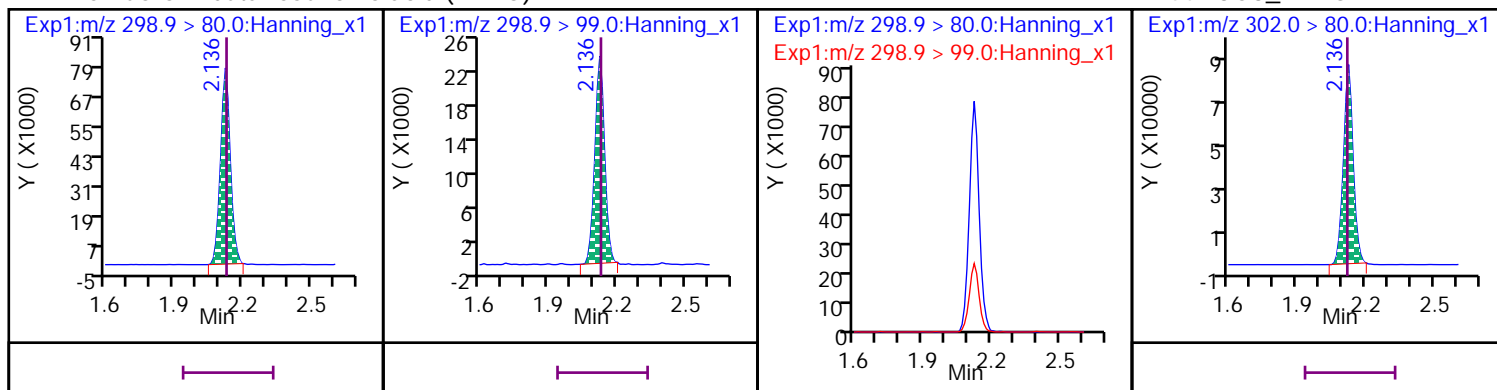


D 50 13C5\_PFPeA



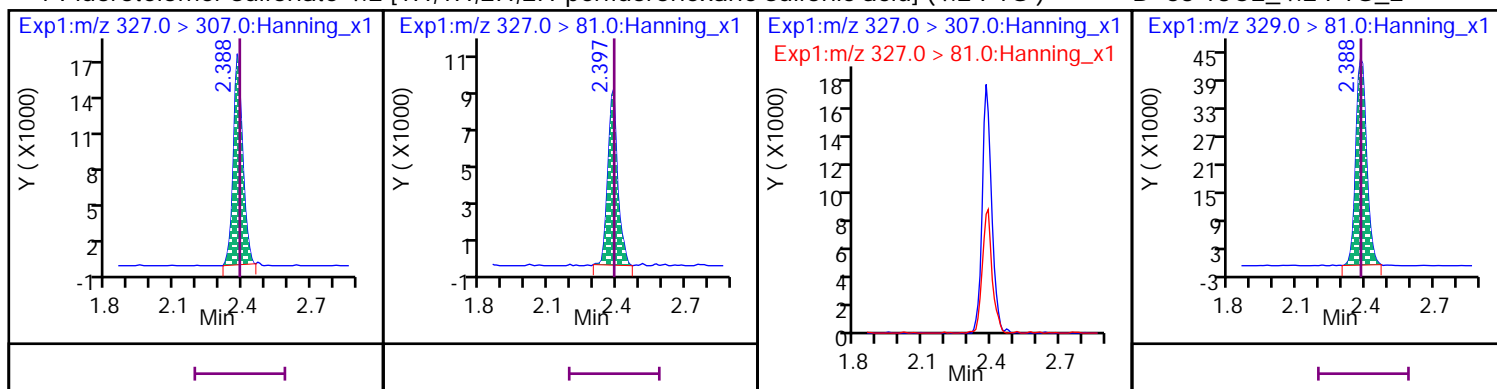
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



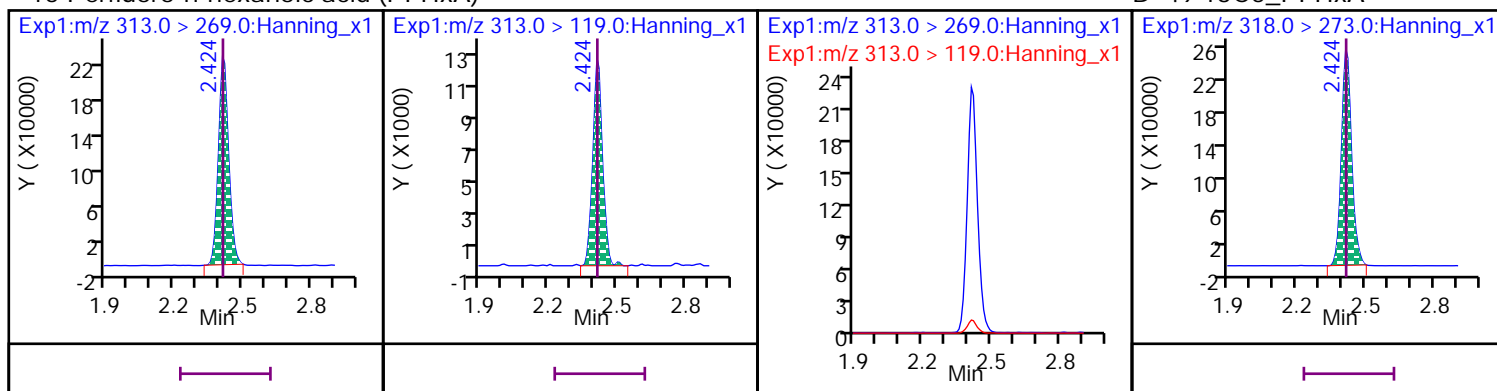
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



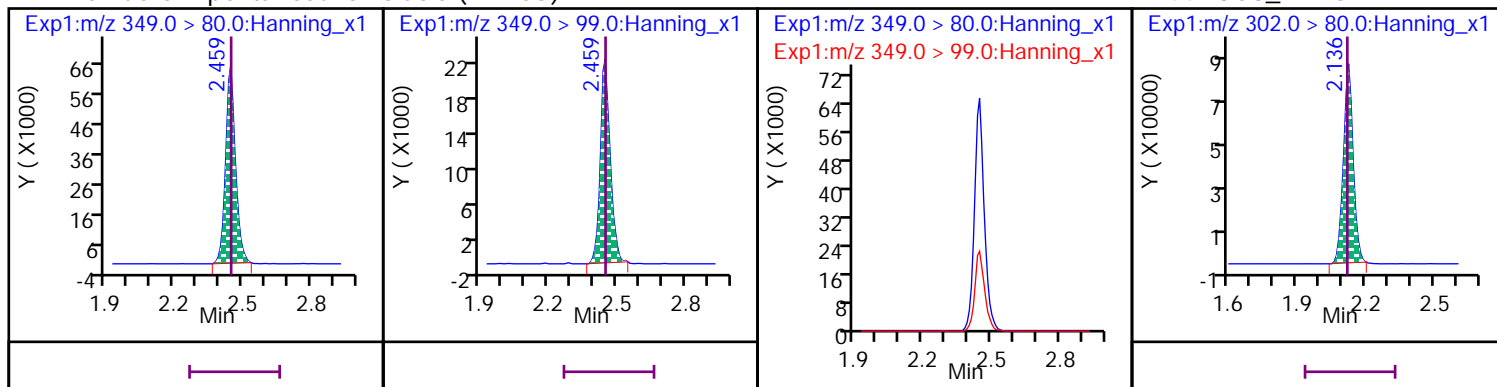
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



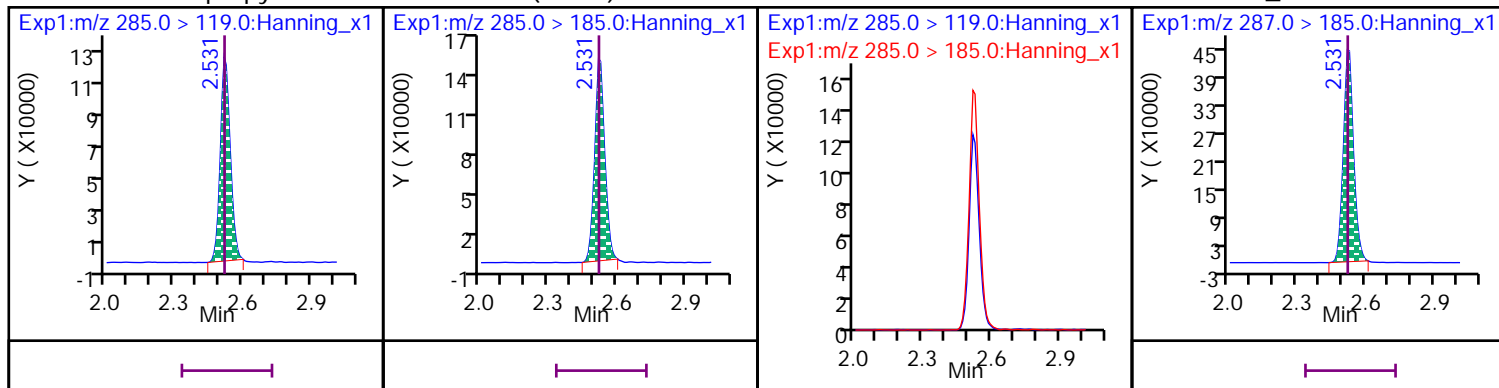
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



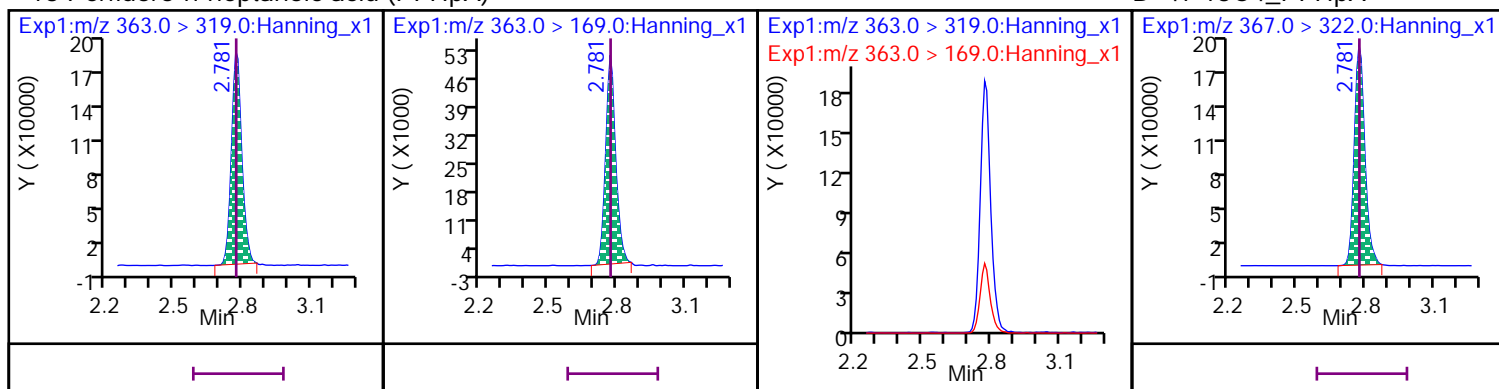
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



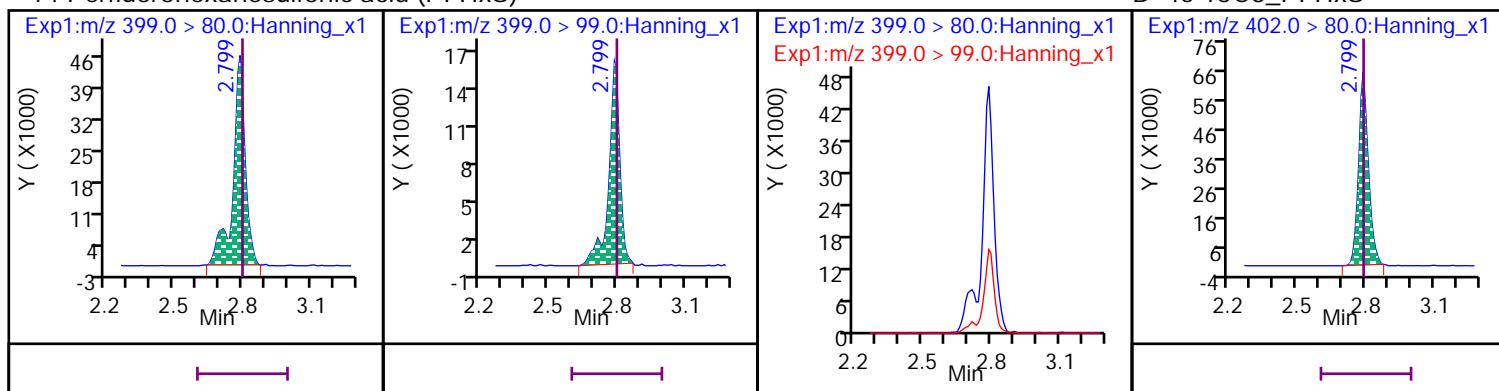
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



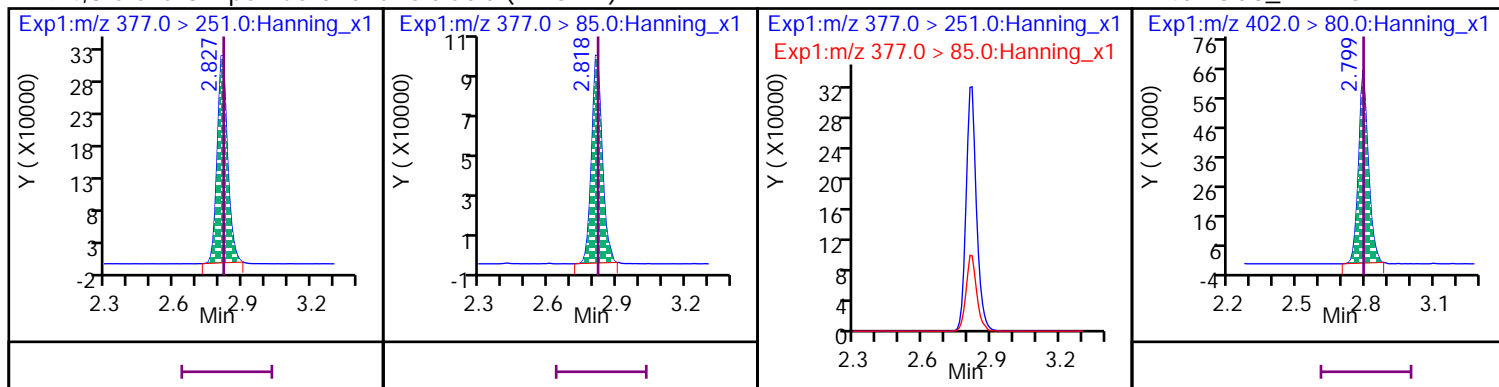
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



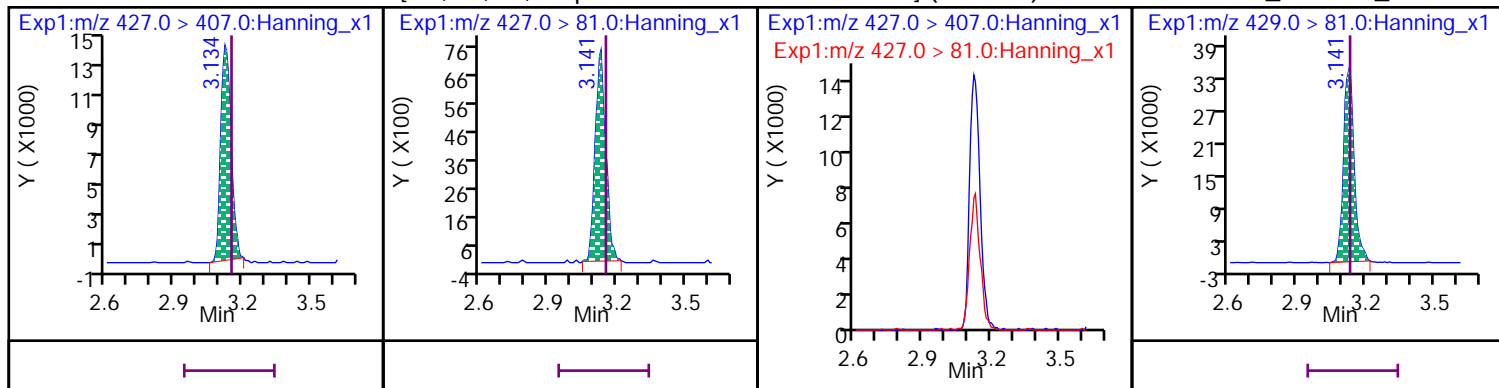
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



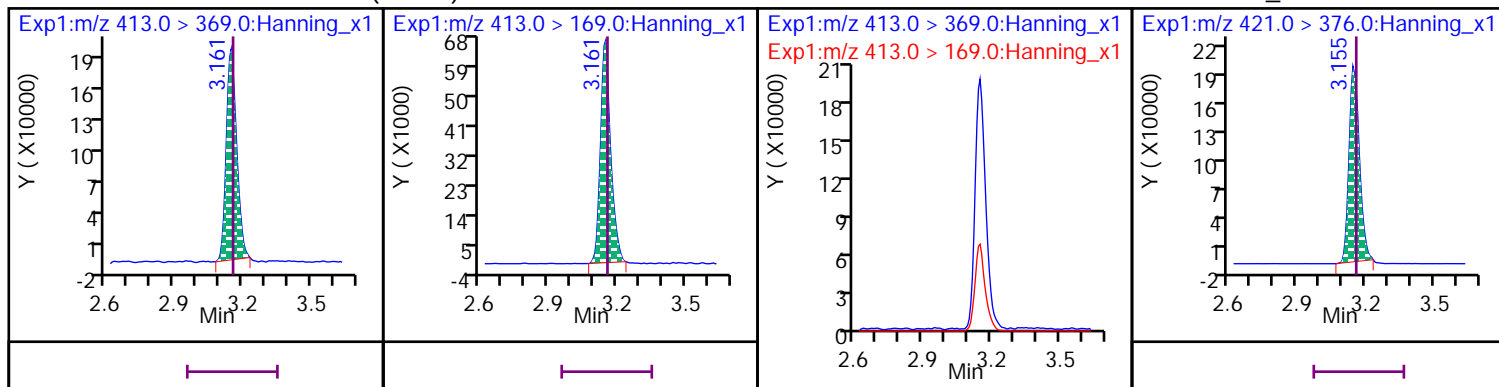
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



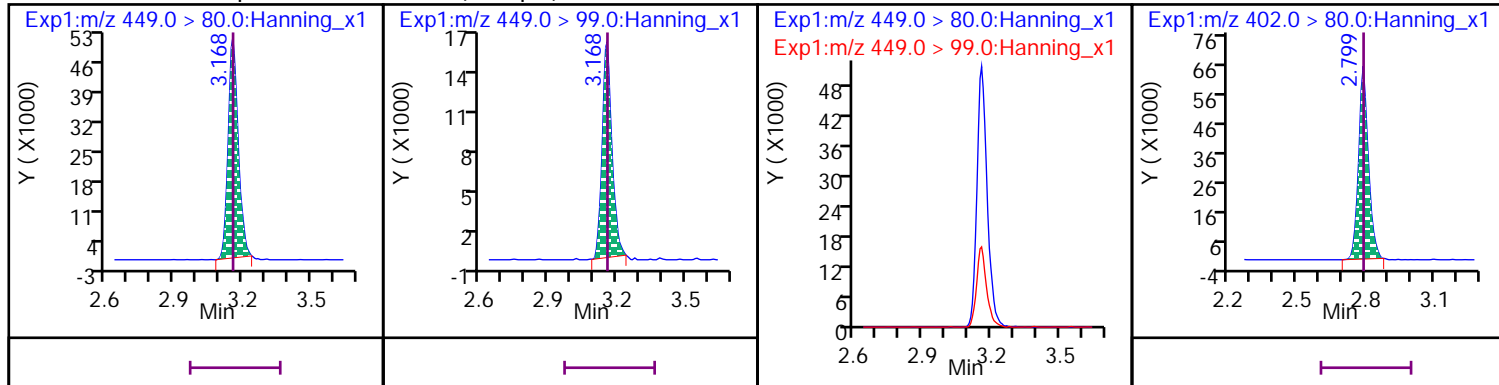
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



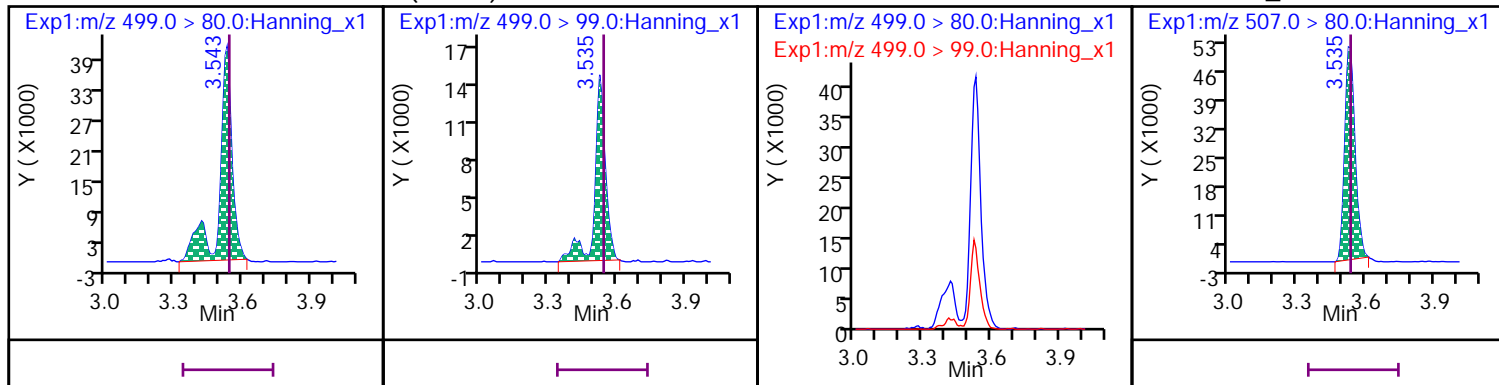
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



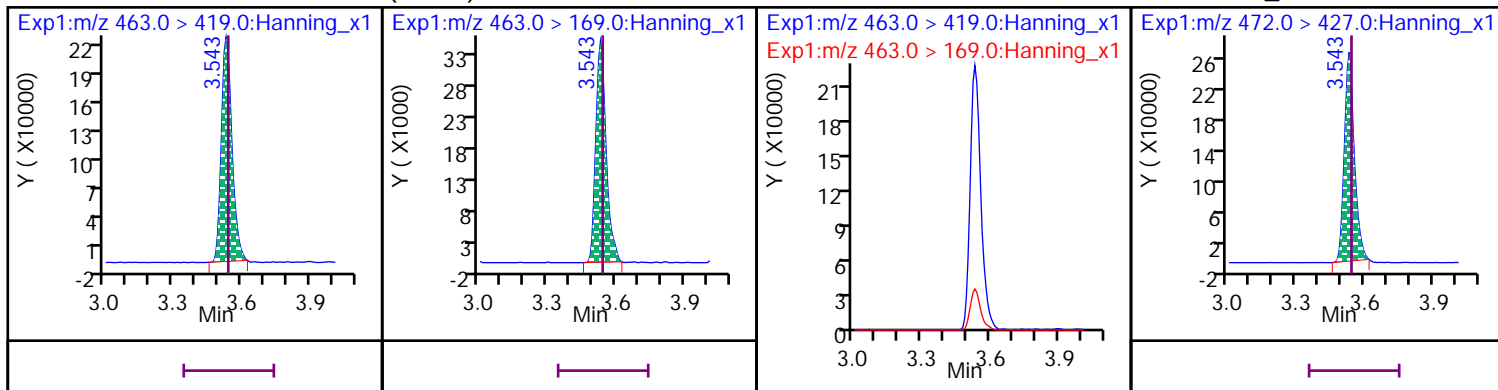
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



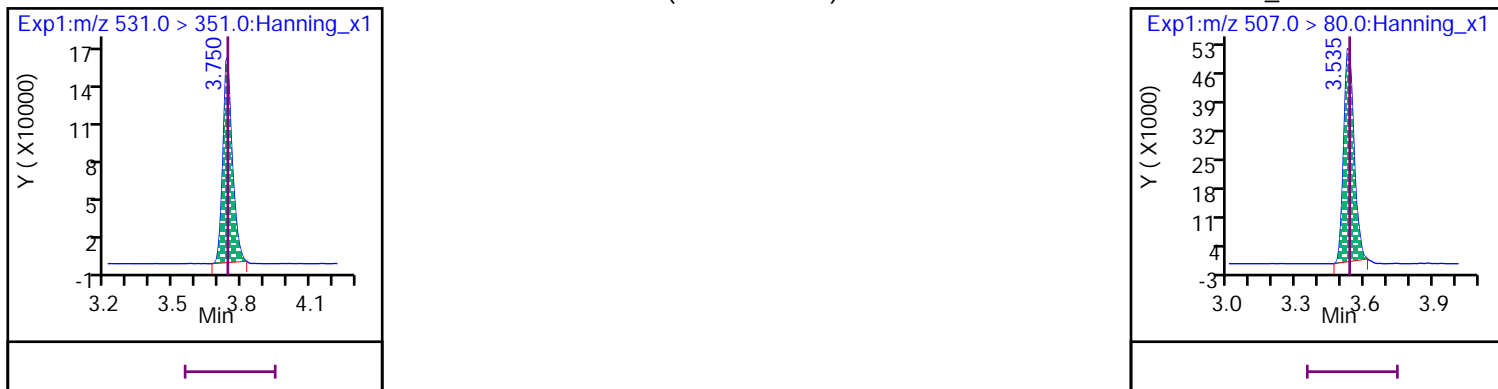
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



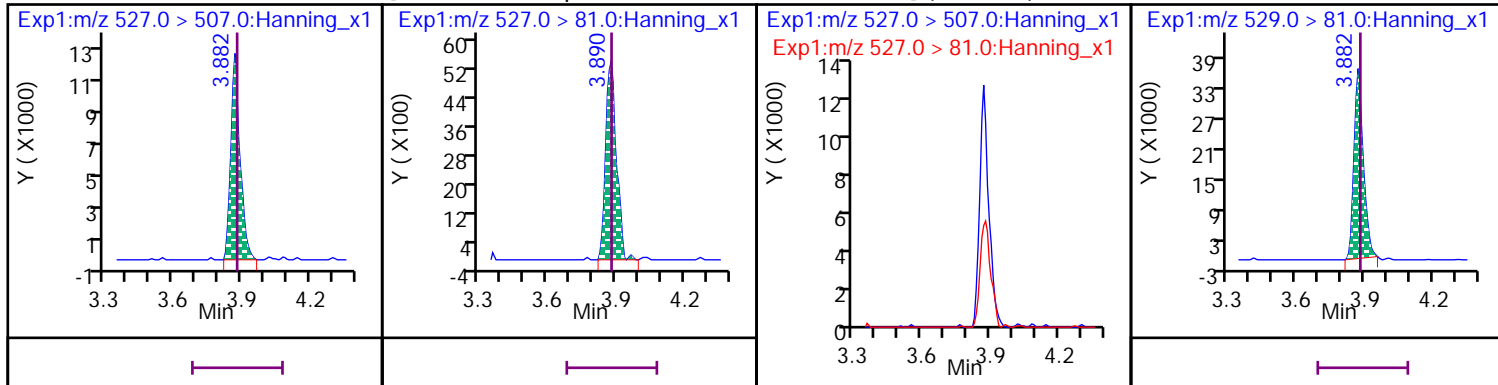
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



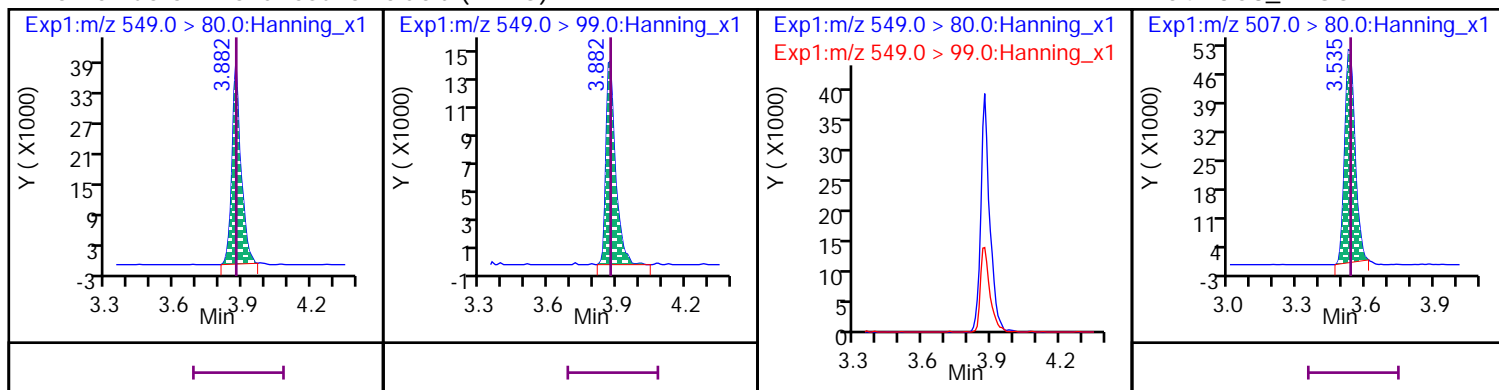
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



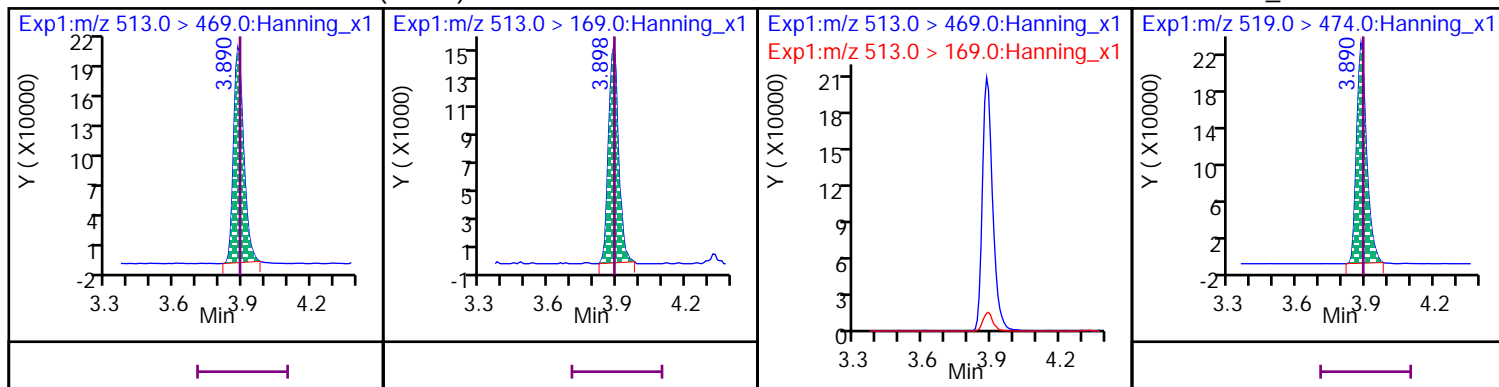
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



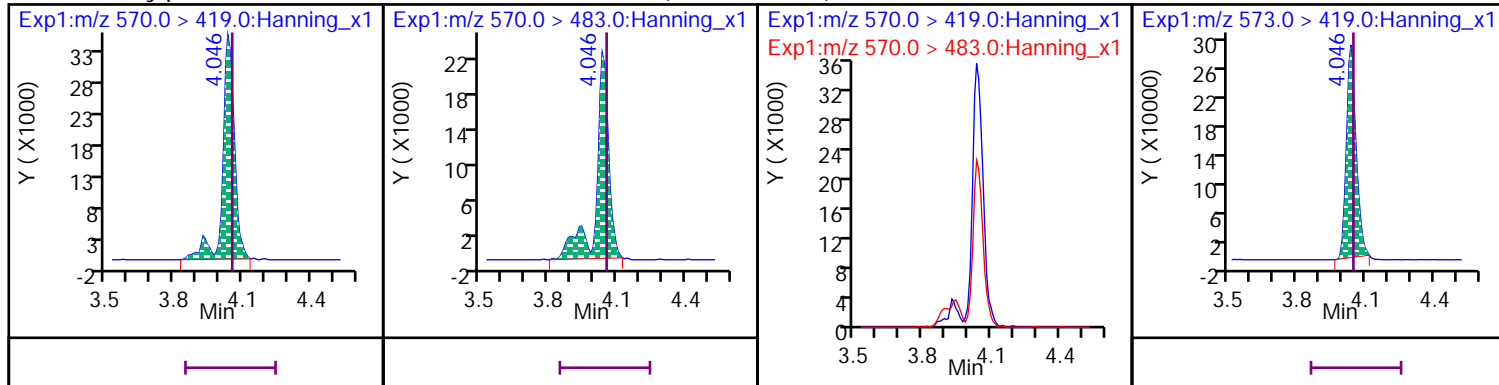
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



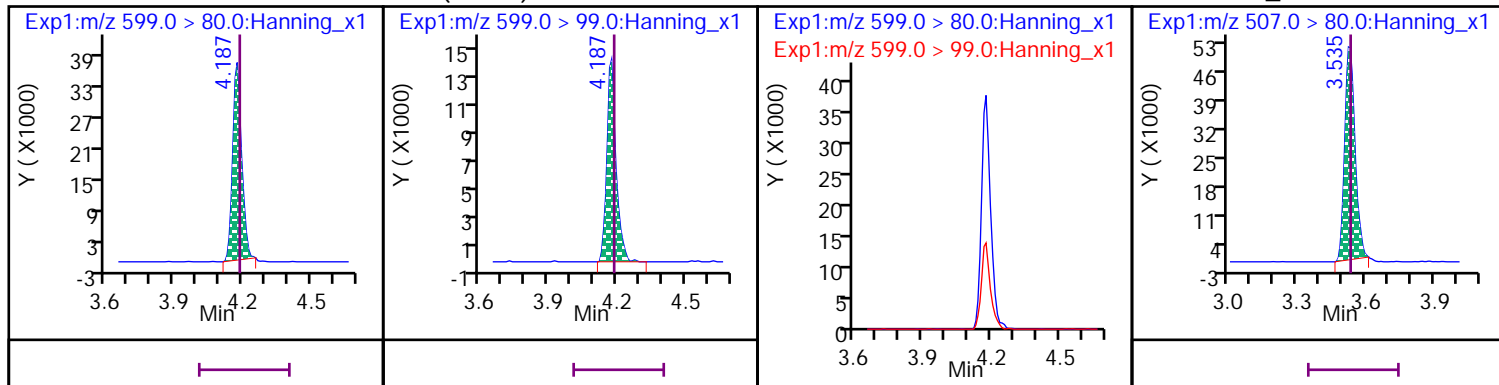
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



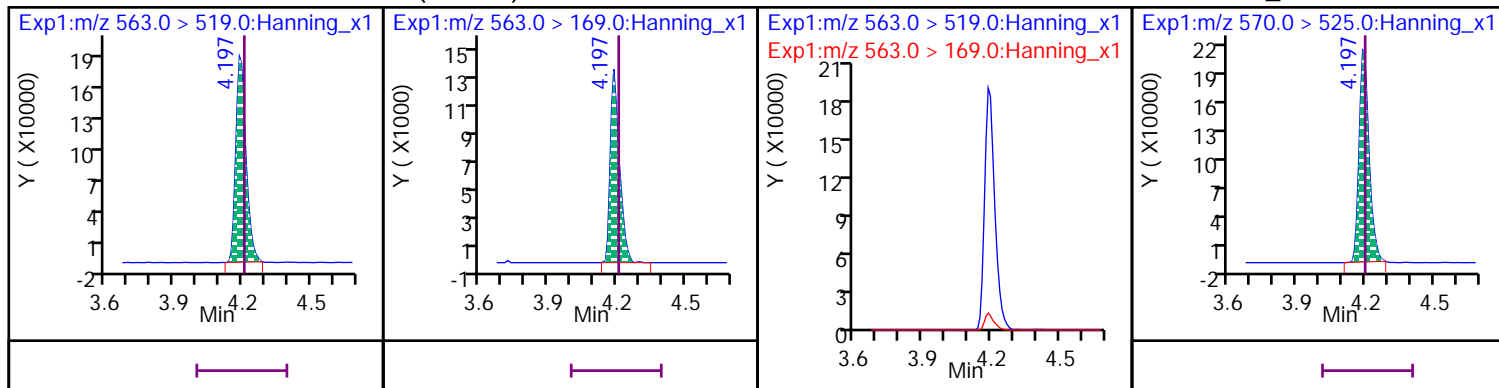
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



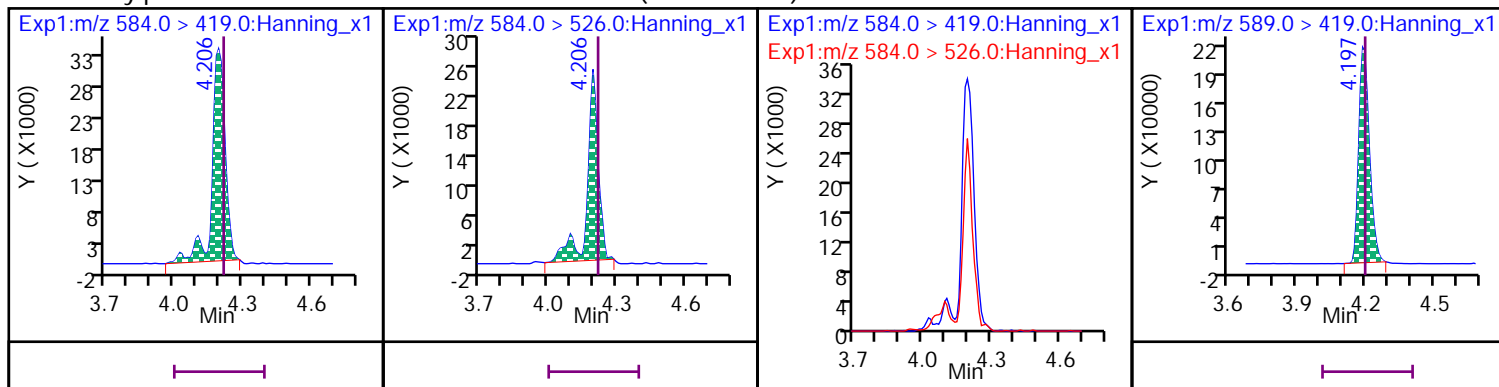
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



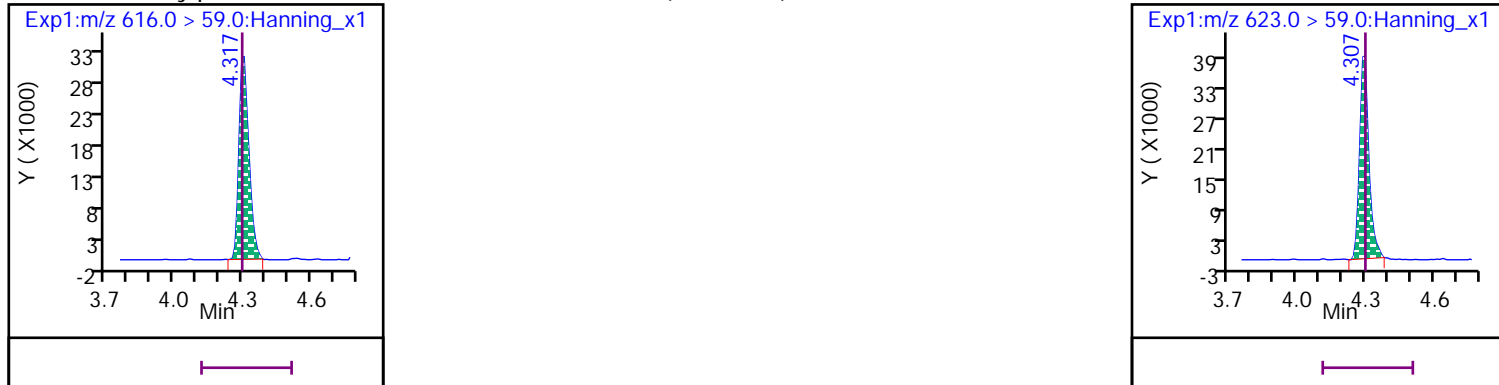
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



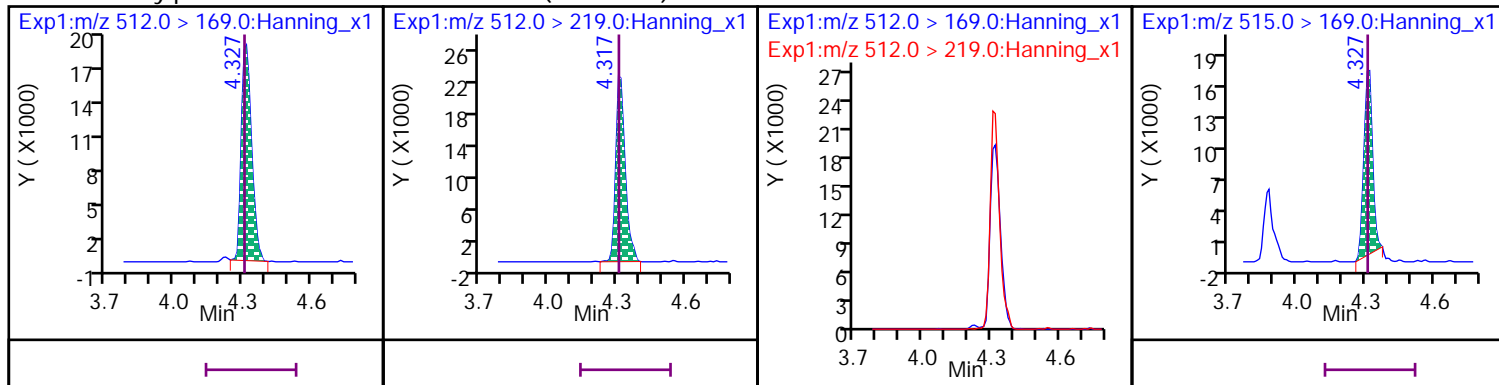
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



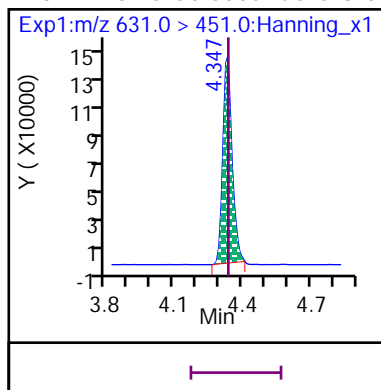
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

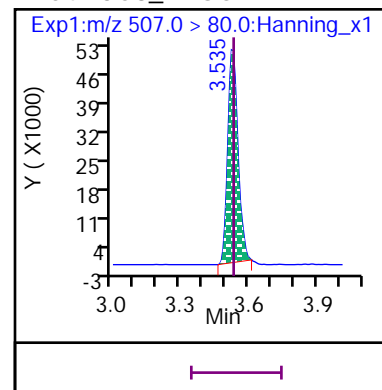




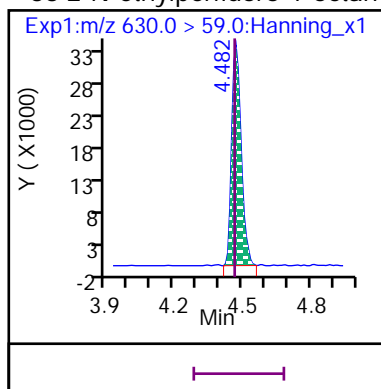
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



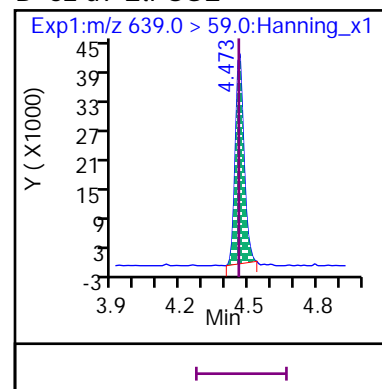
D 54 13C8\_PFOS



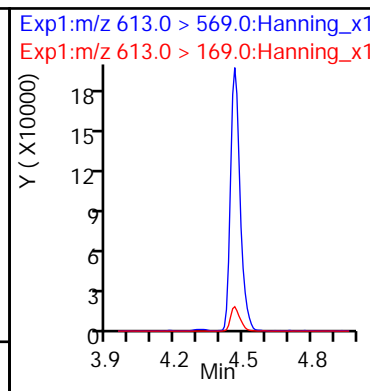
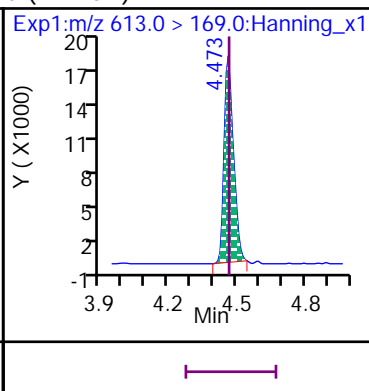
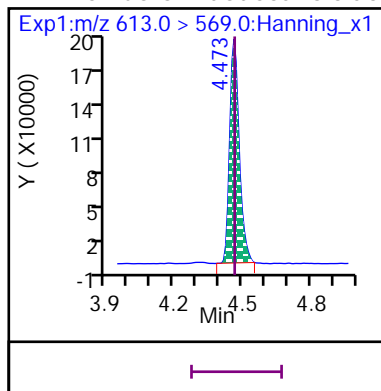
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



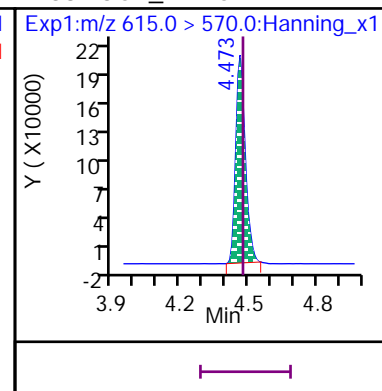
D 62 d9-EtFOSE



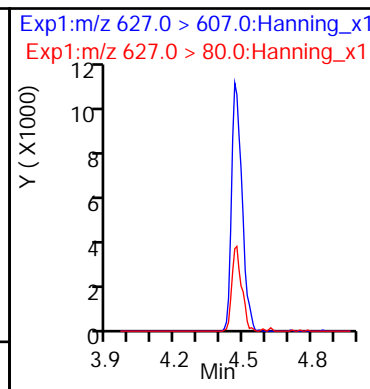
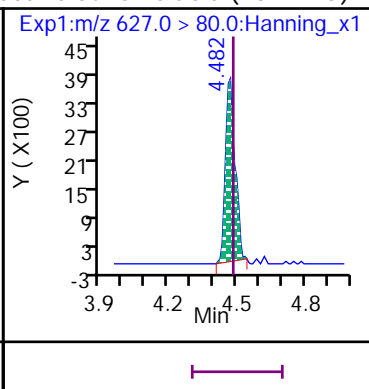
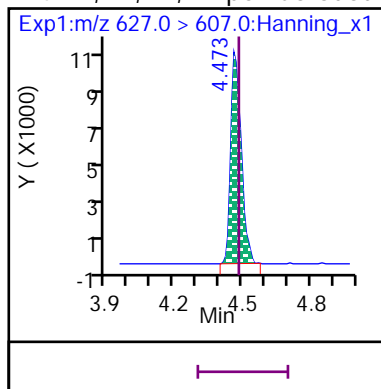
11 Perfluoro-n-dodecanoic acid (PFDaA)



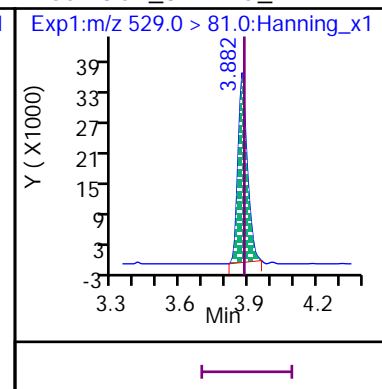
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

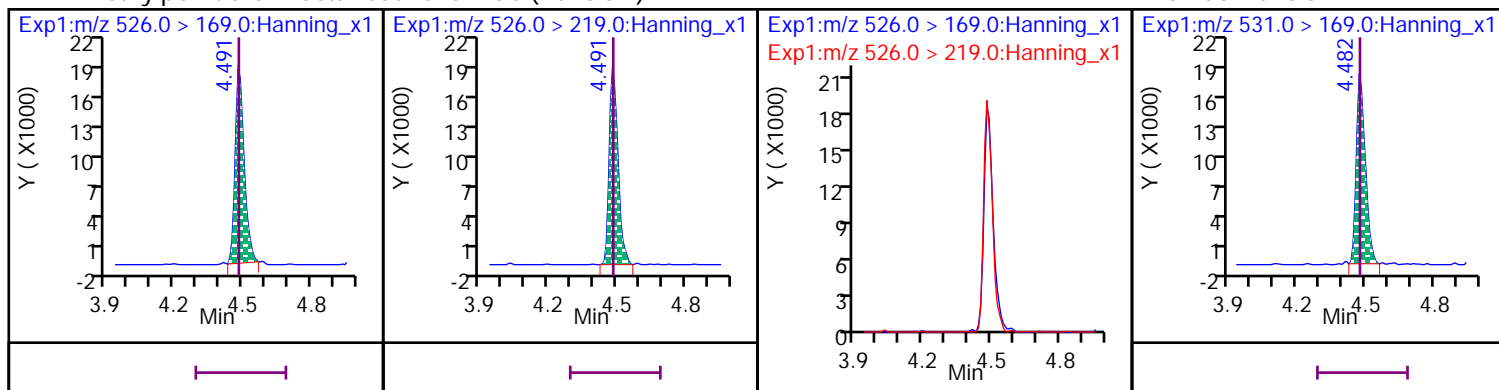


D 65 13C2\_8:2 FTS\_2



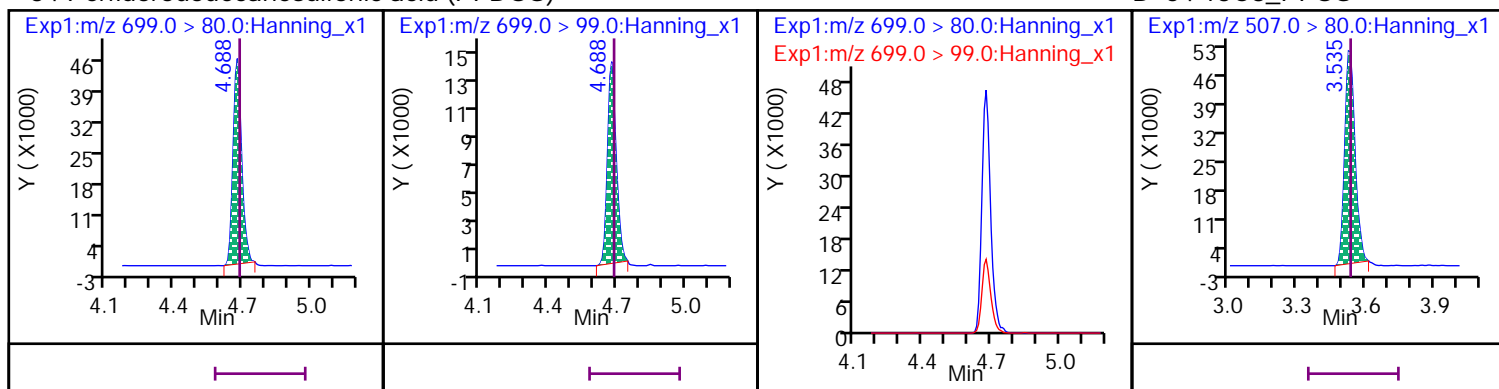
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



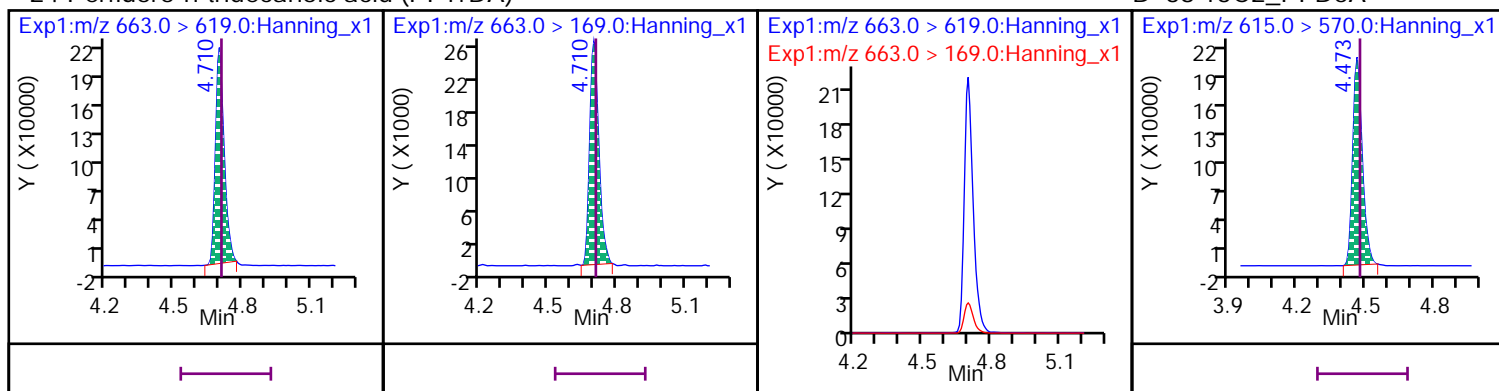
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



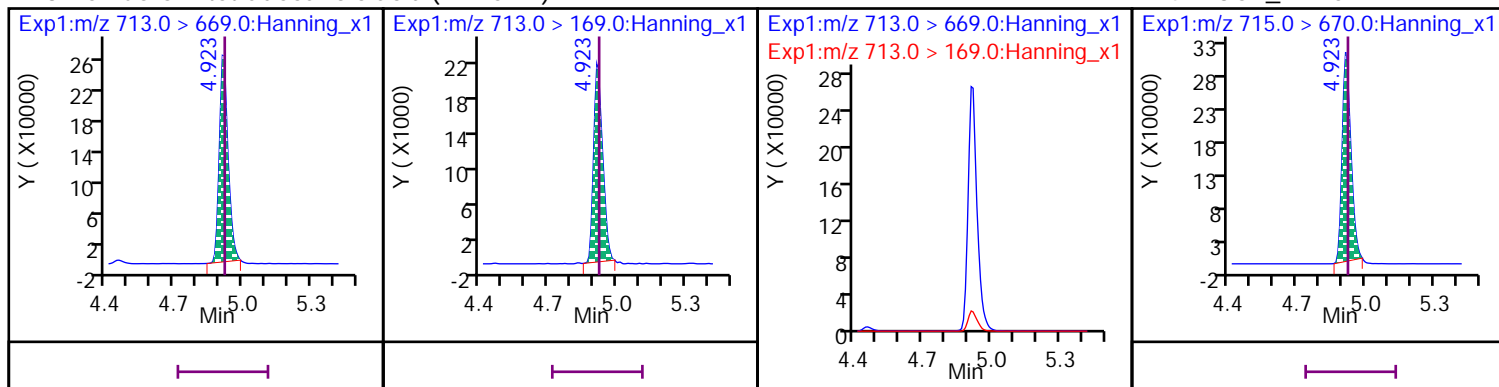
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



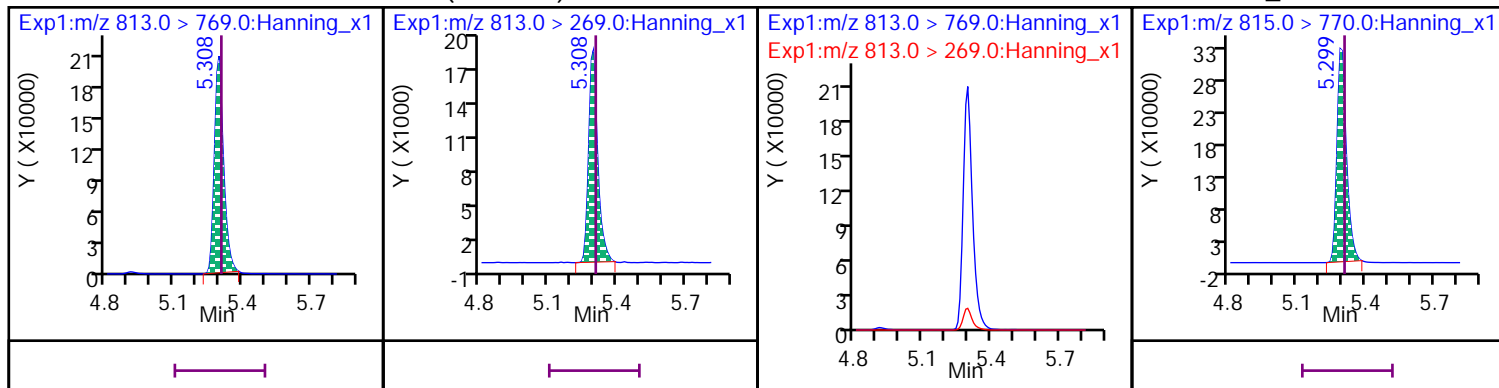
## 23 Perfluoro-n-tetradecanoic acid (PFTTeDA)

## D 42 13C2\_PFTeDA



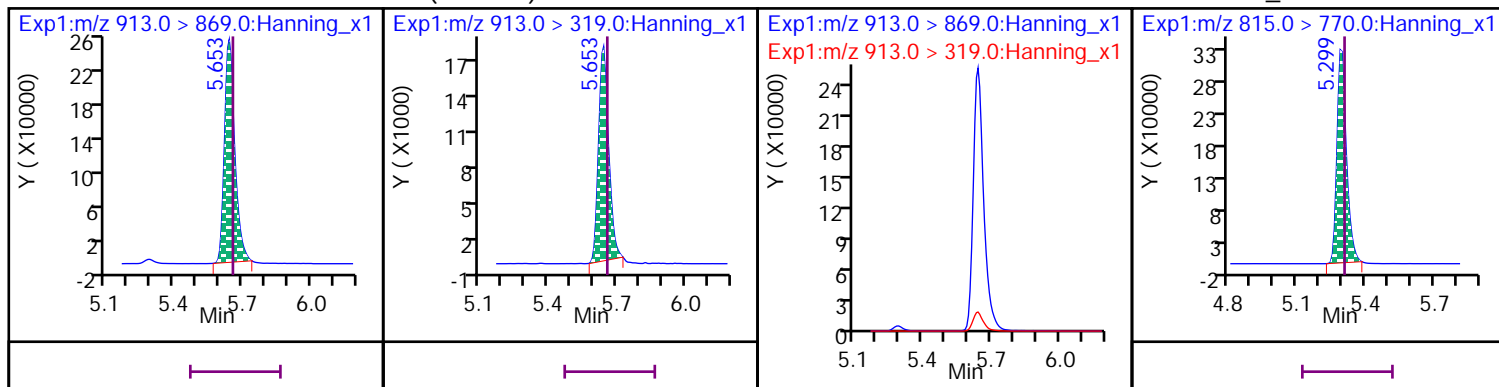
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

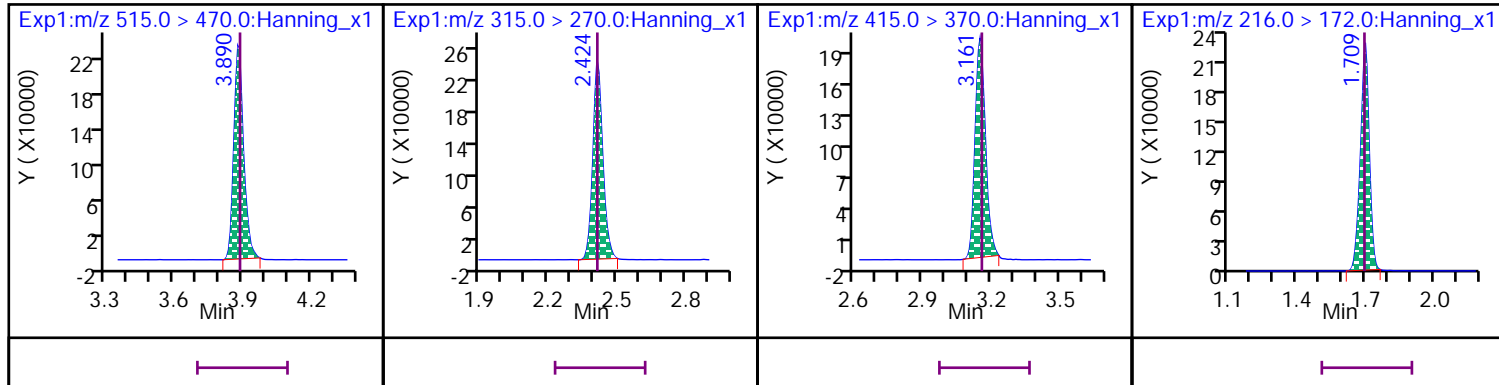


\* 37 13C2\_PFDA

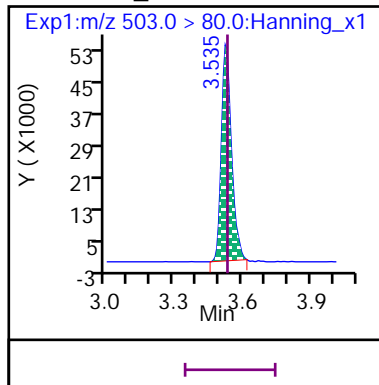
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320035.d  
Injection Date: 23-Dec-2020 16:39:30 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 27  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	938.63	93.9	70 - 130
D 46 13C4_PFBA	659896	674337			102	50 - 150
D 50 13C5_PFPeA	681912	705466			103	50 - 150
21 PFPeA			1000.00	917.00	91.7	70 - 130
7 PFBS			884.00	766.76	86.7	70 - 130
D 44 13C3_PFBS	234990	254717			108	50 - 150
1 4:2 FTS			934.00	934.49	100	70 - 130
D 63 13C2_4:2 FTS_2	145673	135760			93.2	50 - 150
D 49 13C5_PFHxA	739934	745788			101	50 - 150
15 PFHxA			1000.00	933.43	93.3	70 - 130
22 PFPeS			938.00	872.83	93.1	70 - 130
28 GenX			2000.00	1814.03	90.7	70 - 130
D 66 13C3_GenX	1382147	1392305			101	50 - 150
D 47 13C4_PFHpA	612609	625291			102	50 - 150
13 PFHpA			1000.00	992.61	99.3	70 - 130
D 45 13C3_PFHxS	185632	183702			99	50 - 150
14 PFHxS			910.00	885.65	97.3	70 - 130
29 ADONA			942.00	881.21	93.5	70 - 130
D 64 13C2_6:2 FTS_2	118188	113586			96.1	50 - 150
2 6:2 FTS			948.00	976.64	103	70 - 130
20 PFOA			1000.00	922.06	92.2	70 - 130
D 53 13C8_PFOA	612317	615350			100	50 - 150
12 PFHpS			952.00	909.48	95.5	70 - 130
18 PFOS			928.00	780.83	84.1	70 - 130
17 PFNA			1000.00	954.88	95.5	70 - 130
D 56 13C9_PFNA	732148	763271			104	50 - 150
D 54 13C8_PFOS	151103	160563			106	50 - 150
30 9CI-PF3ONS			932.00	869.30	93.3	70 - 130
D 55 13C8_PFOSA	323224	328380			102	50 - 150
19 PFOSA			1000.00	955.87	95.6	70 - 130
16 PFNS			960.00	880.42	91.7	70 - 130
D 65 13C2_8:2 FTS_2	93513	100262			107	50 - 150
3 8:2 FTS			958.00	995.62	104	70 - 130
10 PFDA			1000.00	933.54	93.4	70 - 130
D 51 13C6_PFDA	641610	708617			110	50 - 150
D 58 d3-MeFOSAA	810340	771784			95.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1026.13	103	70 - 130
9 PFDS			964.00	939.47	97.5	70 - 130
5 N-EtFOSAA			1000.00	855.48	85.5	70 - 130
25 PFUdA			1000.00	952.84	95.3	70 - 130
D 60 d5-EtFOSAA	763091	786459			103	50 - 150
D 52 13C7_PFUdA	652802	651479			99.8	50 - 150
D 61 d7-MeFOSE	103832	106470			103	50 - 150
32 MeFOSE			1000.00	924.72	92.5	70 - 130
26 MeFOSA			1000.00	950.90	95.1	70 - 130
D 57 d3-MeFOSA	49874	56323			113	50 - 150
31 11Cl-PF3OUDS			942.00	907.62	96.4	70 - 130
D 62 d9-EtFOSE	117283	122793			105	50 - 150
33 EtFOSE			1000.00	959.42	95.9	70 - 130
D 59 d5-EtFOSA	52571	51836			98.6	50 - 150
D 38 13C2_PFDoA	604828	604504			99.9	50 - 150
4 10:2 FTS			964.00	822.61	85.3	70 - 130
27 EtFOSA			1000.00	948.31	94.8	70 - 130
11 PFDoA			1000.00	1012.30	101	70 - 130
34 PFDOS			968.00	861.08	89	70 - 130
24 PFTrDA			1000.00	1033.34	103	70 - 130
23 PFTeDA			1000.00	951.43	95.1	70 - 130
D 42 13C2_PFTeDA	781191	810010			104	50 - 150
35 PFHxDA			1000.00	979.55	98	70 - 130
D 40 13C2_PFHxDA	893092	961374			108	50 - 150
36 PFODA			1000.00	911.51	91.2	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320035.d  
Injection Date: 23-Dec-2020 16:39:30 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 27  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.705	1	674337	24	>100:1			1000.00	972.30	102	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/0	630421	23	>100:1			1000.00	938.63		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	0	705466	17	>100:1			1000.00	1025.56	103	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	0/0	650416	17	>100:1			1000.00	917.00		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	0	254717	17	>100:1			1000.00	1106.36	108	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.141	0/0	230275	17	>100:1	Target = 3.50		884.00	766.76		
298.9 > 99	44	2.130	2.141		67585	17	>100:1	3.40 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.461	0/0	192855	20	>100:1	Target = 3.10		938.00	872.83		
349 > 99	44	2.451	2.461		58667	18	>100:1	3.28 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.389	0	135760	21	>100:1			5000.00	5607.99	93.2	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.398	0/0	50638	16	>100:1	Target = 1.80		934.00	934.49		
327 > 81	63	2.389	2.398		27967	18	>100:1	1.81 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.425	0	745788	19	>100:1			1000.00	1011.83	101	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.425	0/0	687287	21	>100:1	Target = 18.34		1000.00	933.43		
313 > 119	49	2.425	2.425		35752	17	>100:1	19.22 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.532	0	1392305	20	>100:1			5000.00	5227.27	101	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.532	0/0	362920	20	>100:1	Target = 0.81		2000.00	1814.03		
285 > 185	66	2.531	2.532		464488	20	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.783	0	625291	19	>100:1			1000.00	1030.73	102	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.783	0/0	643798	21	>100:1	Target = 3.70		1000.00	992.61		
363 > 169	47	2.782	2.783		164807	20	>100:1	3.90 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.801	0	183702	20	>100:1			1000.00	1072.85	99	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.810	-1/-1	172504	28	>100:1	Target = 3.21	0.16	910.00	885.65		
399 > 99	45	2.800	2.810		54846	27	>100:1	3.14 (1.60-4.81)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.828	0/0	1027743	20	>100:1	Target = 2.97		942.00	881.21		
377 > 85	45	2.819	2.828		339372	20	>100:1	3.02 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.156	3.169	0/0	151774	24	>100:1	Target = 3.08		952.00	909.48		
449 > 99	45	3.162	3.169		52100	24	>100:1	2.91 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.142	-1	113586	24	>100:1			5000.00	5898.00	96.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.162	-2/-1	45945	22	>100:1	Target = 1.80		948.00	976.64		
427 > 81	64	3.135	3.162		22415	21	>100:1	2.04 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.169	-1	615350	24	>100:1			1000.00	1039.68	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.169	-1/0	578426	23	>100:1	Target = 2.87		1000.00	922.06		
413 > 169	53	3.149	3.169		190909	23	>100:1	3.02 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.529	3.545	0	160563	21	>100:1			1000.00	1070.93	106	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.553	-1/-1	148565	42	>100:1	Target = 3.84	0.25	928.00	780.83		
499 > 99	54	3.537	3.553		48981	38	>100:1	3.03 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.751	0/0	469884	23	>100:1			932.00	869.30		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.883	0/0	108181	20	>100:1	Target = 3.07		960.00	880.42		
549 > 99	54	3.866	3.883		44076	19		2.45 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.179	4.198	-1/-1	109472	17		Target = 3.03		964.00	939.47		
599 > 99	54	4.179	4.198		35886	17	>100:1	3.05 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.338	4.349	0/0	413865	16	>100:1			942.00	907.62		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.681	4.698	-1/-1	110998	19		Target = 3.33		968.00	861.08		
699 > 99	54	4.681	4.698		37432	19		2.96 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.529	3.553	-1	763271	21	>100:1			1000.00	1016.39	104	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.553	-1/0	728856	22	>100:1	Target = 6.16		1000.00	954.88		
463 > 169	56	3.537	3.553		111260	20	>100:1	6.55 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.867	0	328380	22	>100:1			1000.00	1060.78	102	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.875	-1/-1	309320	20	>100:1			1000.00	955.87		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.891	-1	100262	20	>100:1			5000.00	5404.92	107	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.874	3.891	-1/0	40127	25	>100:1	Target = 1.95		958.00	995.62		
527 > 81	65	3.874	3.891		19280	20		2.08 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.494	-1/0	38119	16	>100:1	Target = 3.14		964.00	822.61		
627 > 80	65	4.465	4.494		11564	26	82:1	3.29 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.882	3.899	-1	708617	22	>100:1			1000.00	1068.27	110	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.899	-1/0	650007	20	>100:1	Target = 15.94		1000.00	933.54		
513 > 169	51	3.882	3.899		44109	18	>100:1	14.73 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.057	-1	771784	19	>100:1			5000.00	5376.81	95.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.065	-1/0	121667	29	>100:1	Target = 1.33	0.08	1000.00	1026.13		
570 > 483	58	4.047	4.065		86080	33	>100:1	1.41 (0.66-1.99)	0.29				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.208	-1	786459	18	>100:1			5000.00	5921.48	103	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.228	-1/0	133966	26	78:1	Target = 1.58	0.05	1000.00	855.48		
584 > 526	60	4.198	4.228		88598	33	>100:1	1.51 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.198	4.208	0	651479	18	>100:1			1000.00	1030.70	99.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.218	-1/-1	583434	19	>100:1	Target = 15.50		1000.00	952.84		
563 > 169	52	4.188	4.218		42700	19	>100:1	13.66 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.309	0	106470	17	>100:1			1000.00	983.94	103	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.309	0/0	92508	16	>100:1			1000.00	924.72		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.319	0	56323	20	>100:1			1000.00	1064.37	113	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.319	0/0	60424	15	>100:1	Target = 1.12		1000.00	950.90		
512 > 219	57	4.318	4.319		53625	15	>100:1	1.12 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.467	0	122793	18	>100:1			1000.00	979.25	105	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.476	0/0	104813	16	>100:1			1000.00	959.42		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.485	-1	604504	18	>100:1			1000.00	998.66	99.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.476	0/1	619691	18	>100:1	Target = 10.85		1000.00	1012.30		
613 > 169	38	4.474	4.476		51652	19	>100:1	11.99 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.704	4.719	0/1	615250	20	>100:1	Target = 8.37		1000.00	1033.34		
663 > 169	38	4.704	4.719		77282	20	>100:1	7.96 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.485	0	51836	24	>100:1			1000.00	1055.84	98.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.494	0/0	53704	17	>100:1	Target = 1.03		1000.00	948.31		
526 > 219	59	4.483	4.494		49257	15	>100:1	1.09 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.924	4.933	0	810010	19	>100:1			1000.00	961.50	104	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.924	4.933	0/0	667748	21	>100:1	Target = 12.11		1000.00	951.43		
713 > 169	42	4.924	4.933		56175	19	>100:1	11.88 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.300	5.318	-1	961374	20	>100:1			1000.00	1060.93	108	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.300	5.318	-1/0	615308	19	>100:1	Target = 11.48		1000.00	979.55		
813 > 269	40	5.300	5.318		53362	17	>100:1	11.53 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.647	5.668	-1/0	775723	24	90:1	Target = 13.88		1000.00	911.51		
913 > 319	40	5.647	5.668		57843	26	>100:1	13.41 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.899	-1	706179	22	>100:1					97.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.425	0	759493	20	>100:1					104	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.169	-1	579518	23	>100:1					93.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	625632	24	>100:1					103	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80      3.529   3.545   0      163753   22   >100:1      102

### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320035.d

Injection Date: 23-Dec-2020 16:39:30

Inst. ID: LCMSMS02

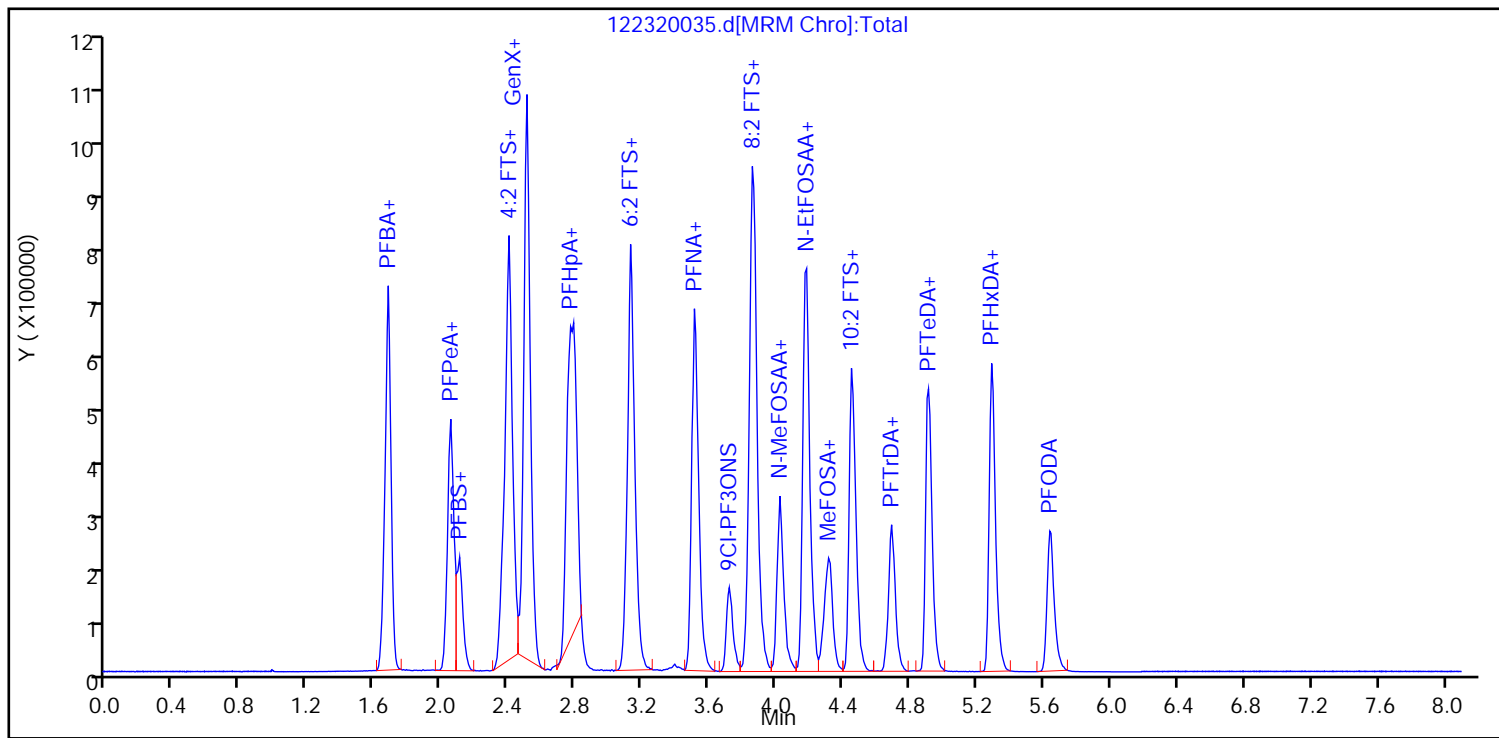
Client ID:

Lab ID: ID CCV 1000A\_SVLC-1248

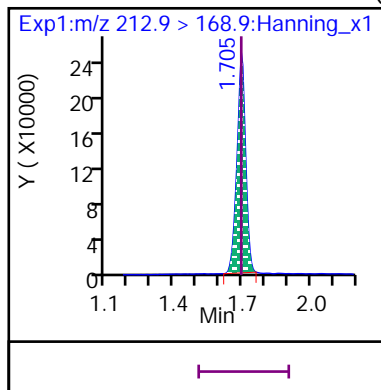
Sample Info: ID CCV 1000A\_SVLC-1248

Dil. Factor: 1

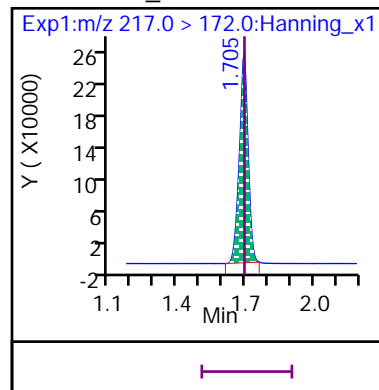
Operator: Stephen E. Somerville



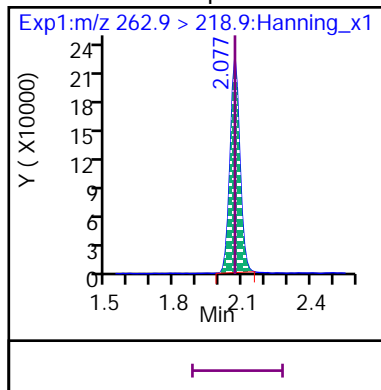
8 Perfluoro-n-butanoic acid (PFBA)



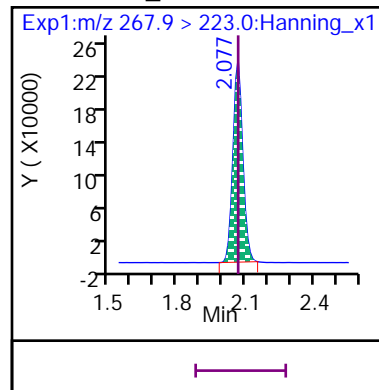
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

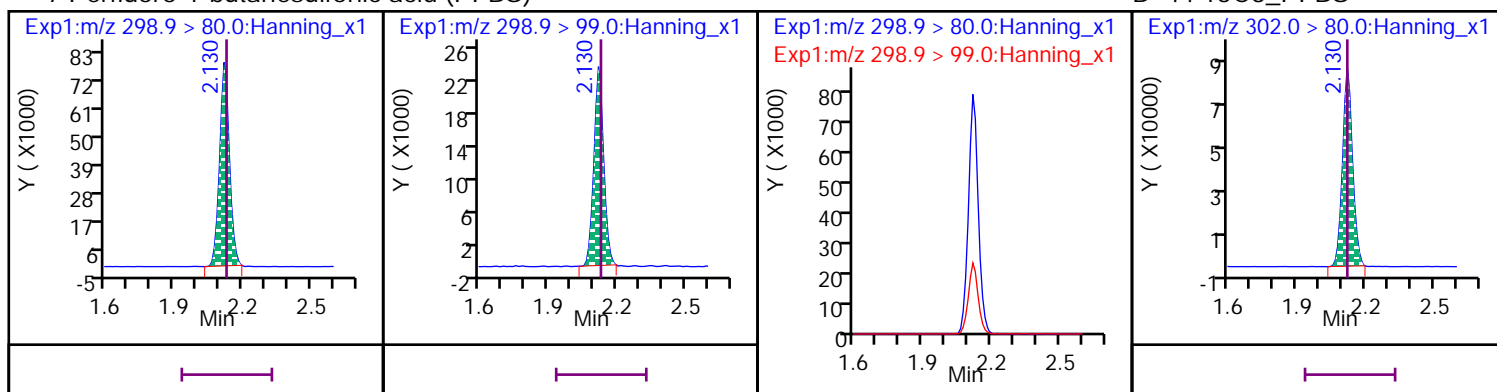


D 50 13C5\_PFPeA



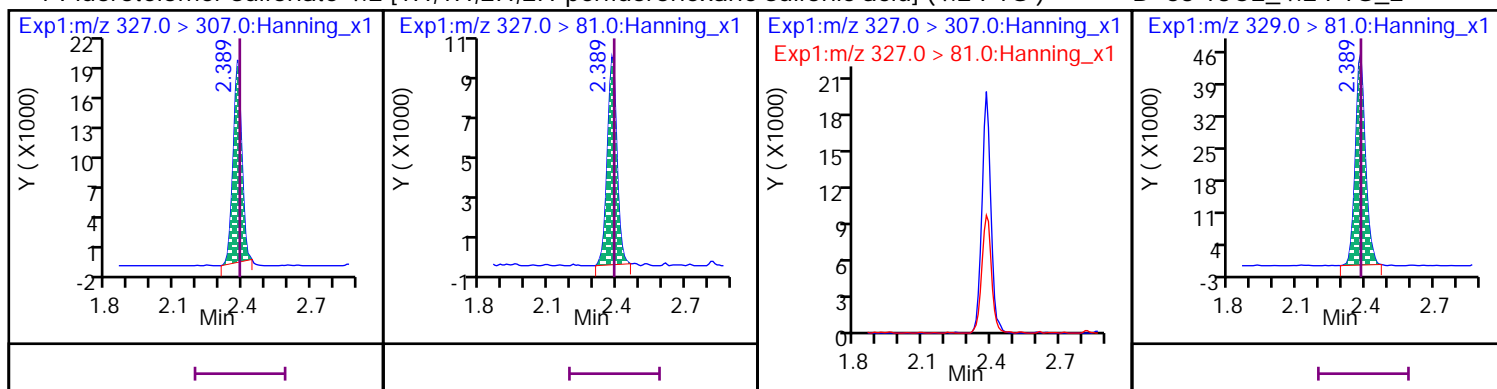
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



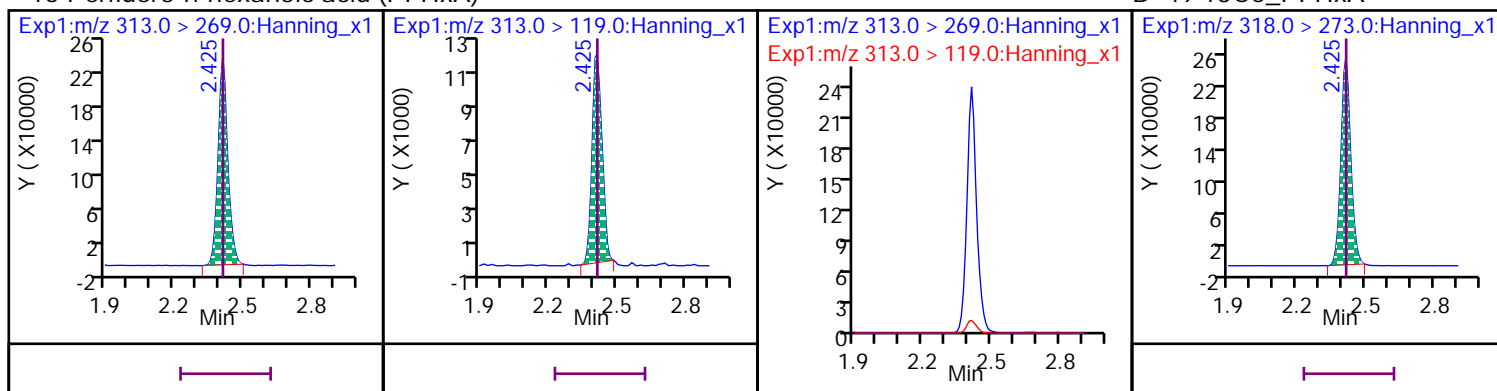
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



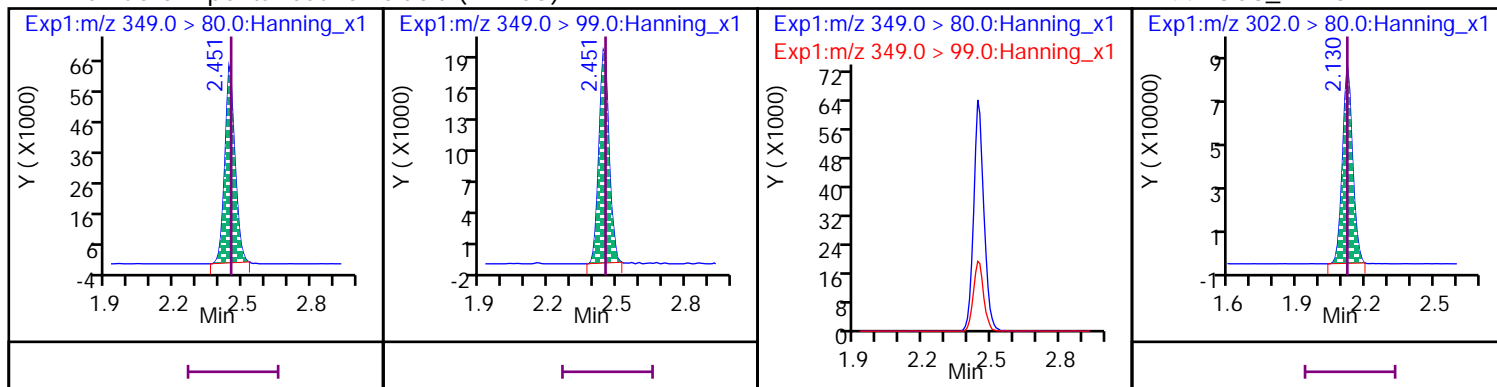
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



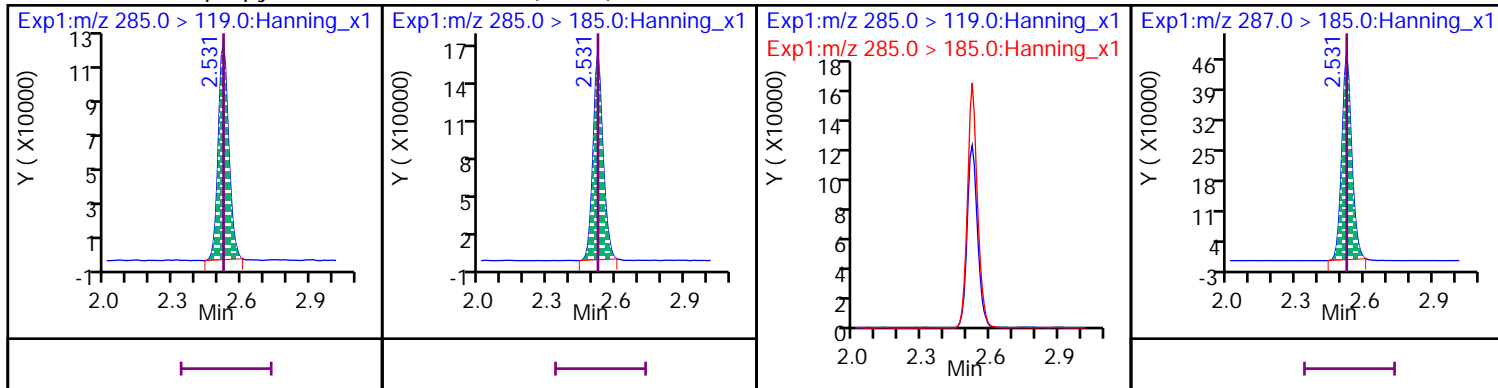
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



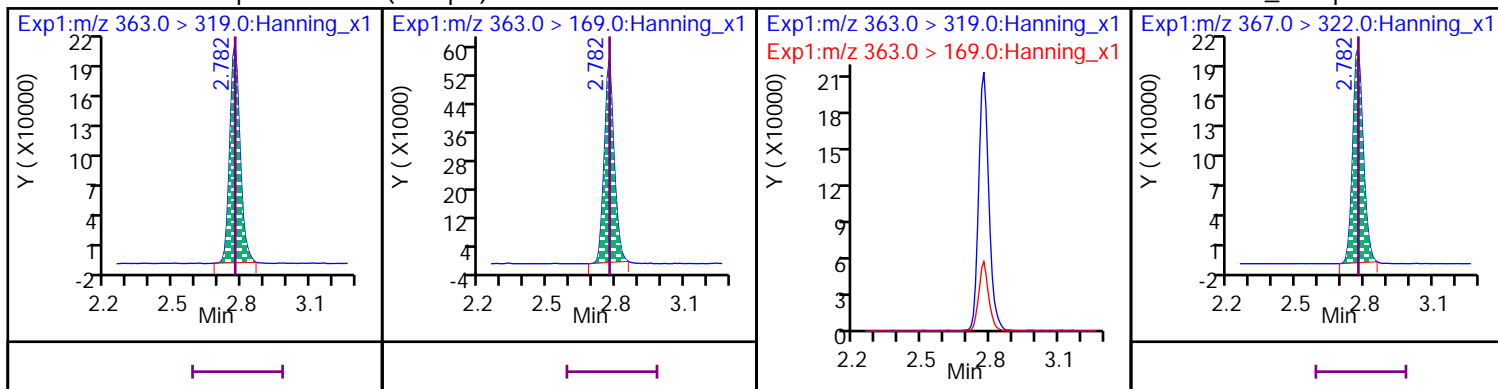
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



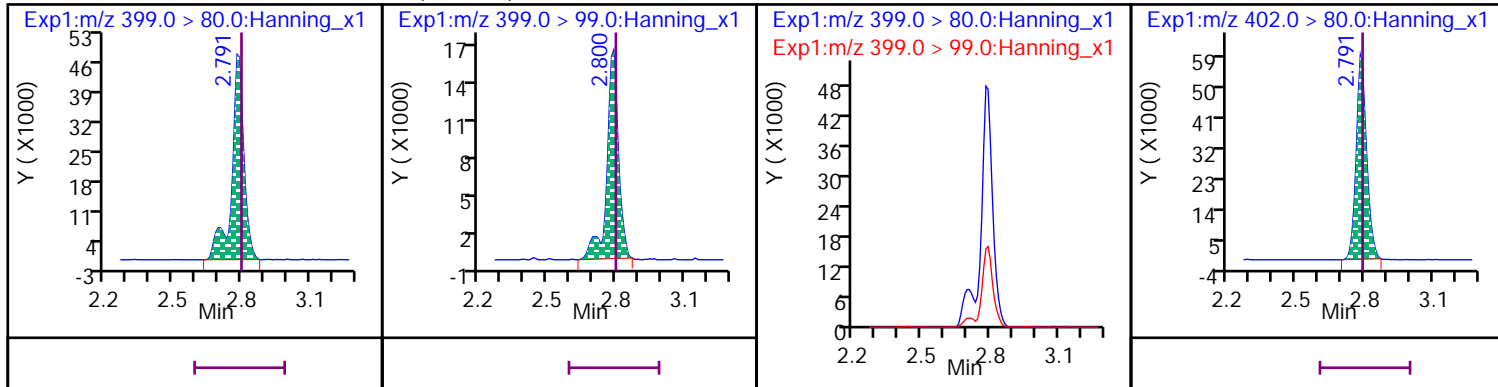
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



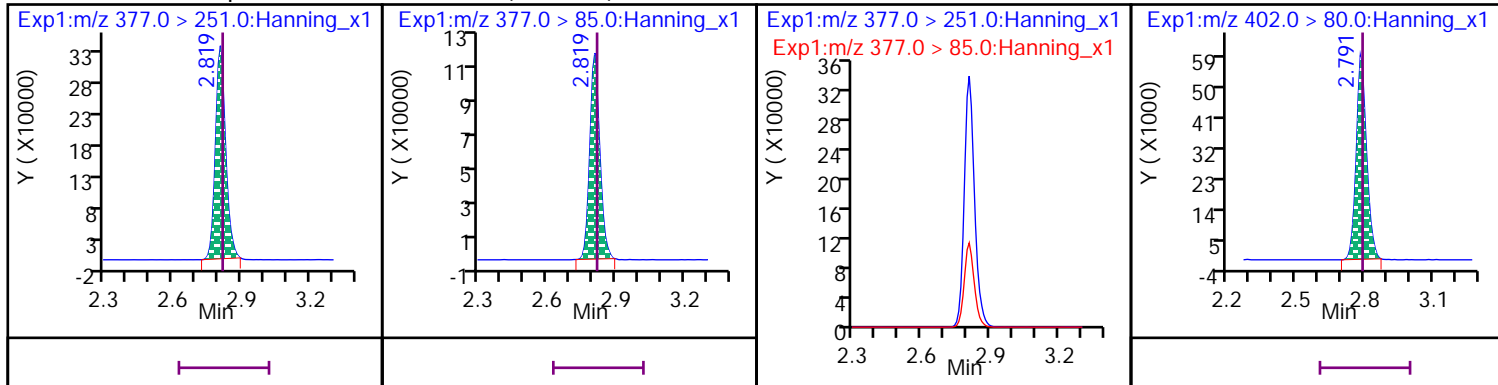
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



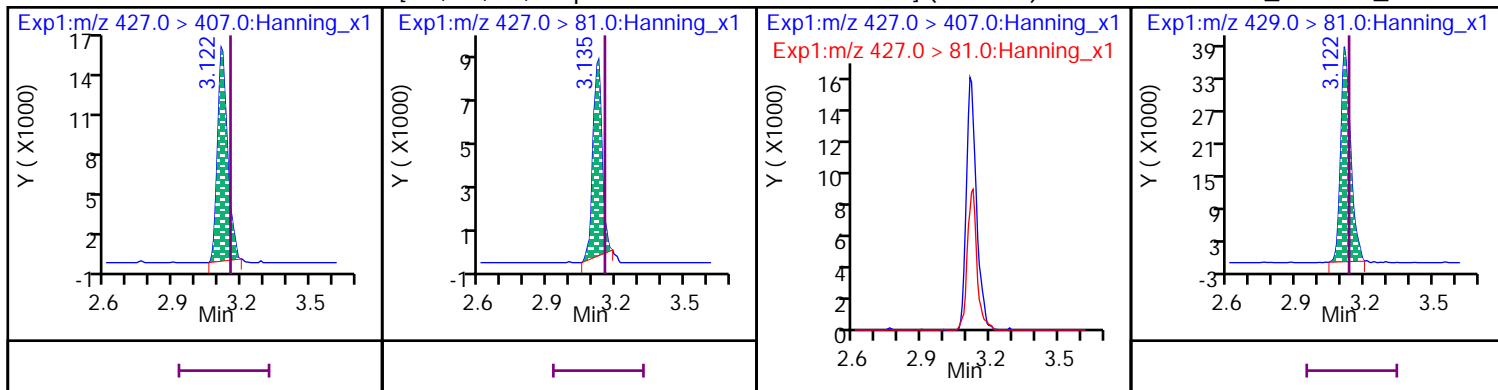
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



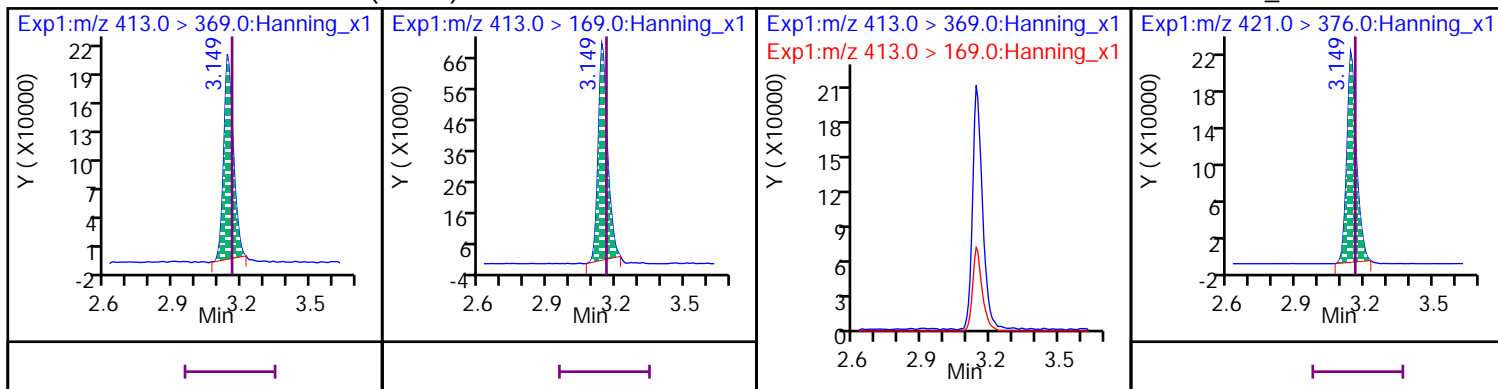
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



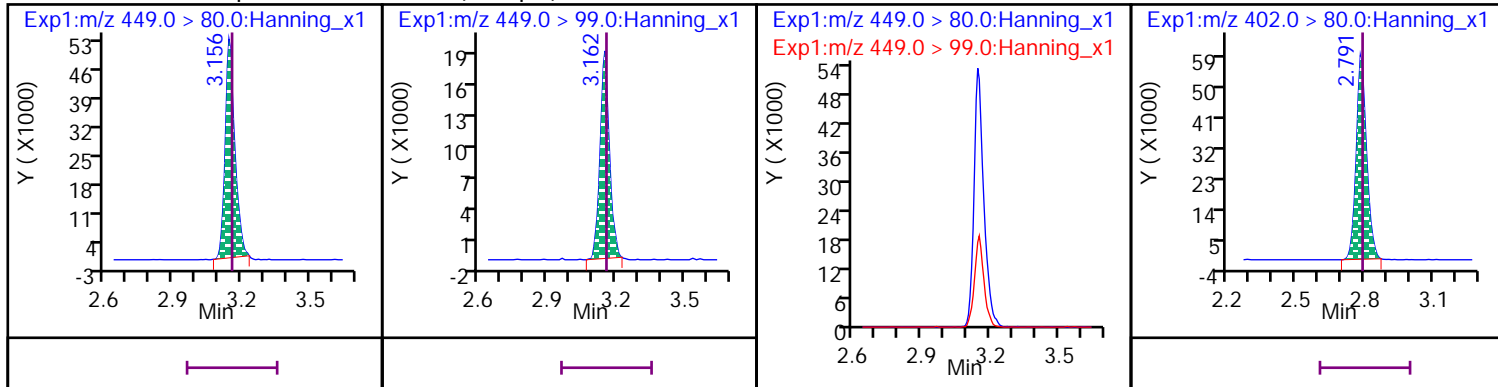
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



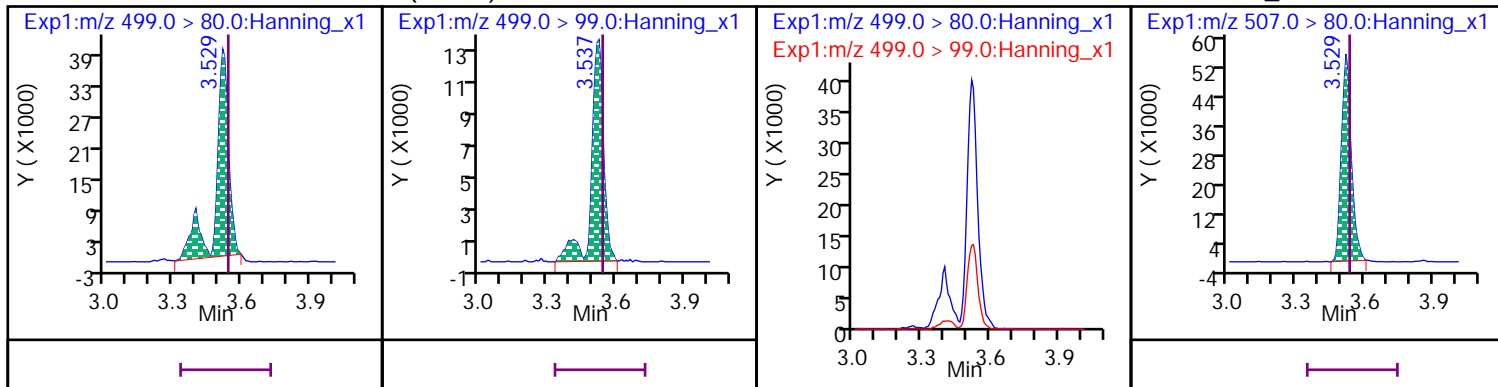
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



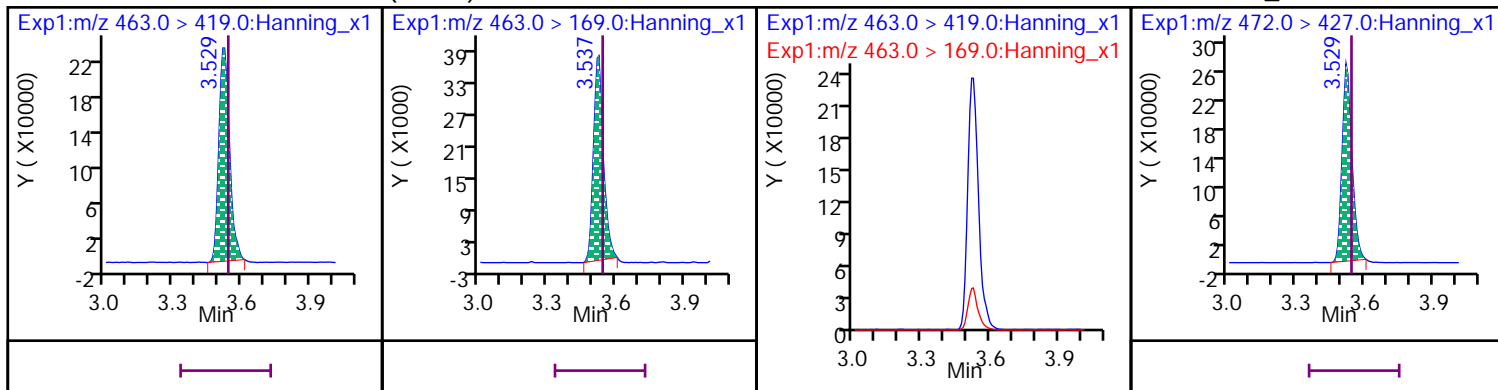
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



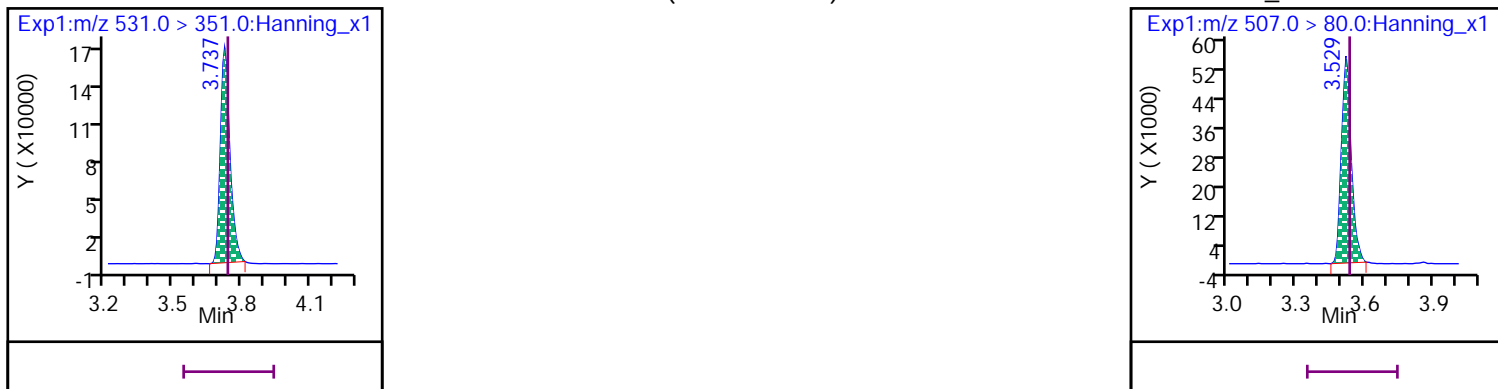
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



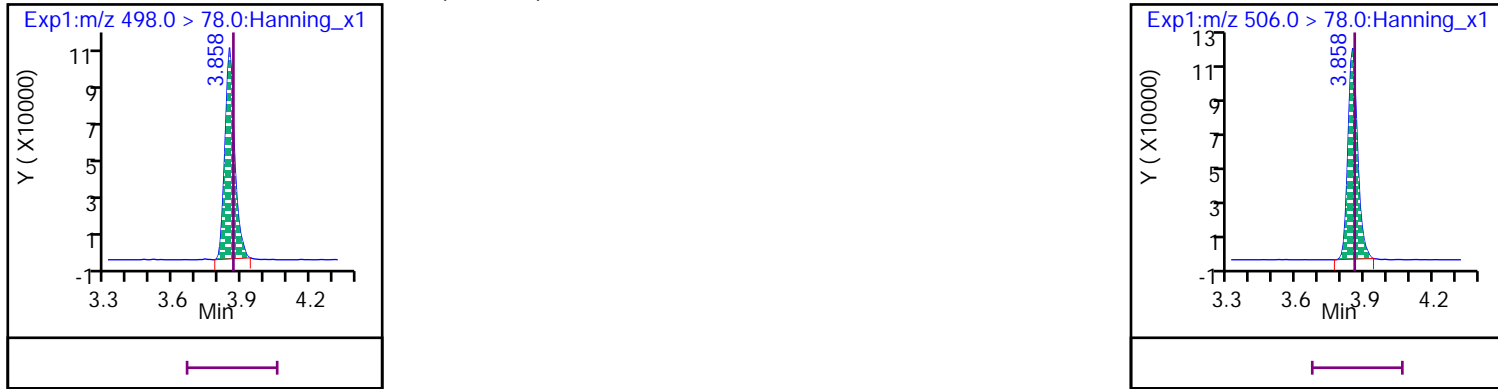
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



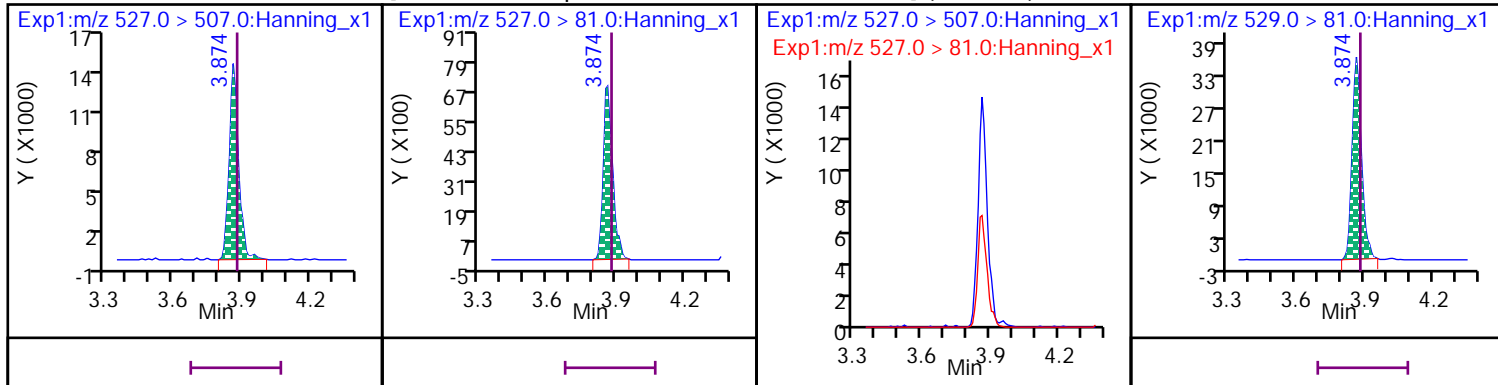
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



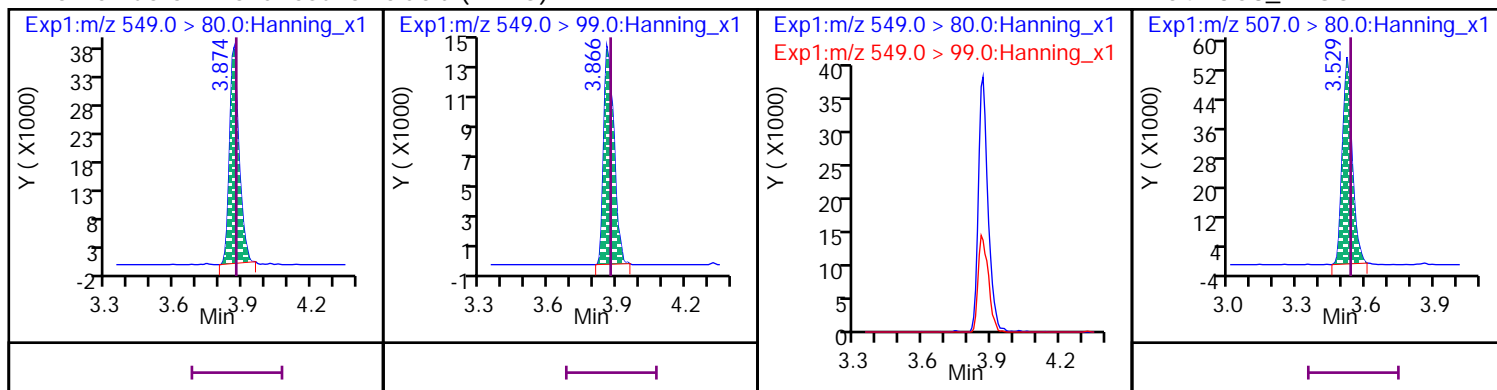
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



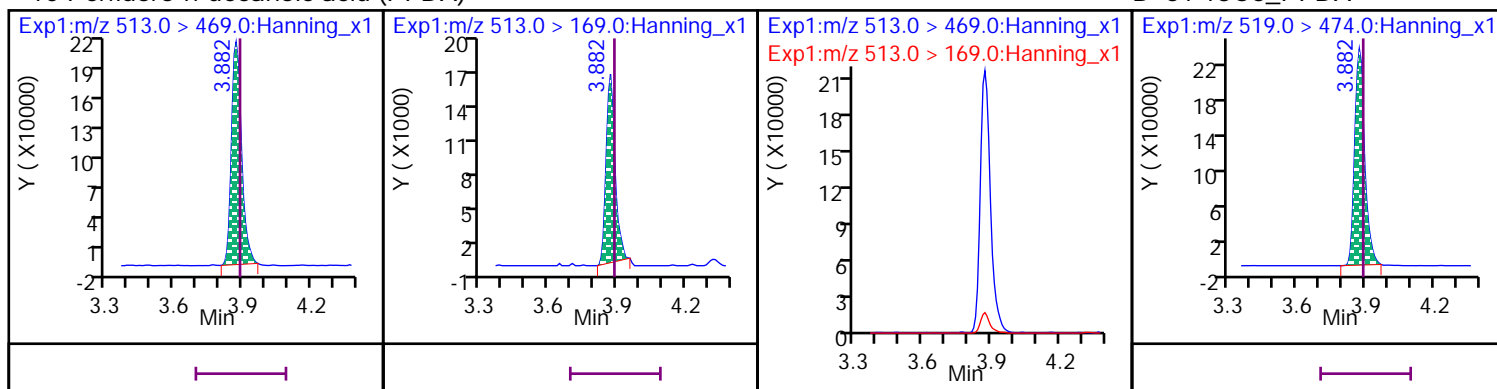
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



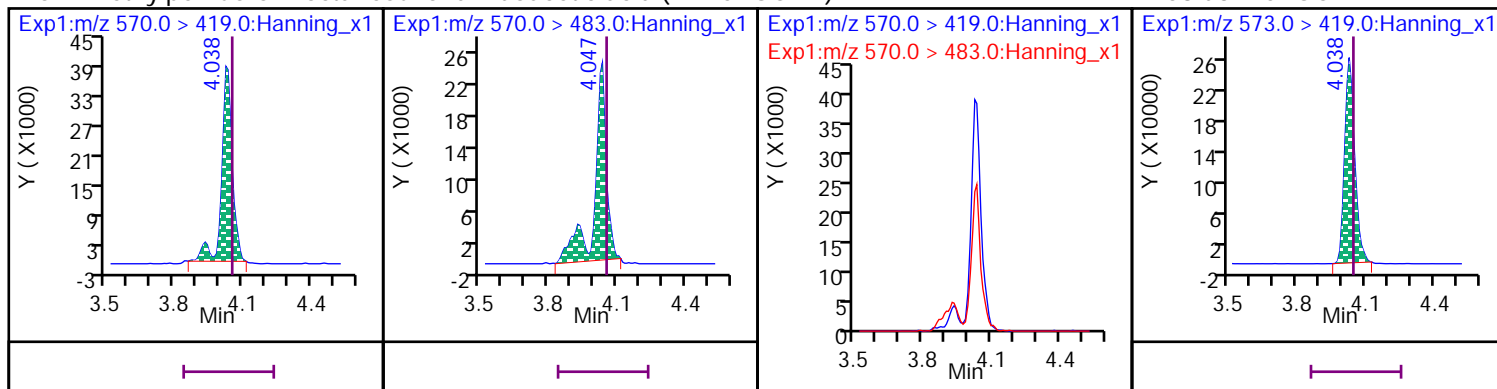
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



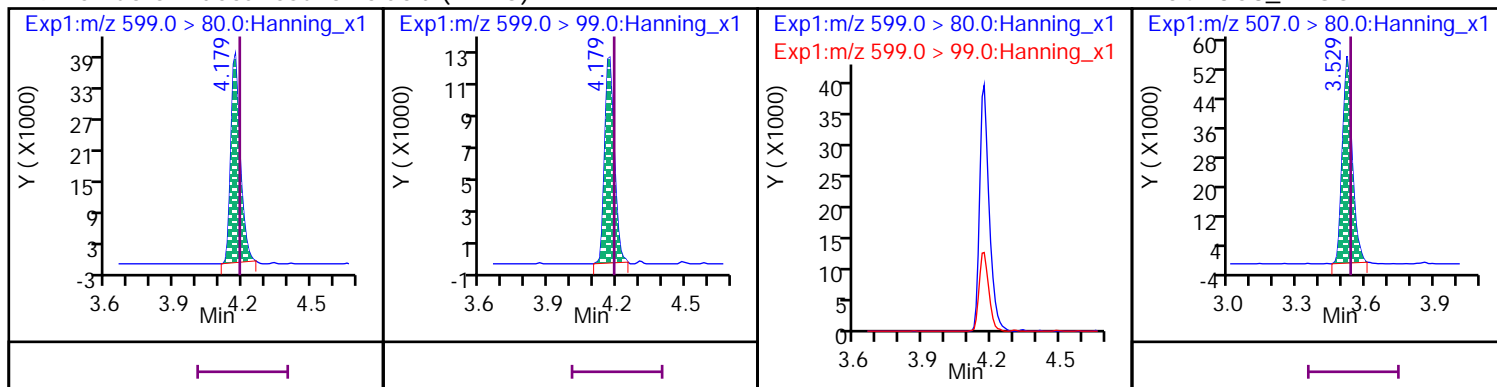
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



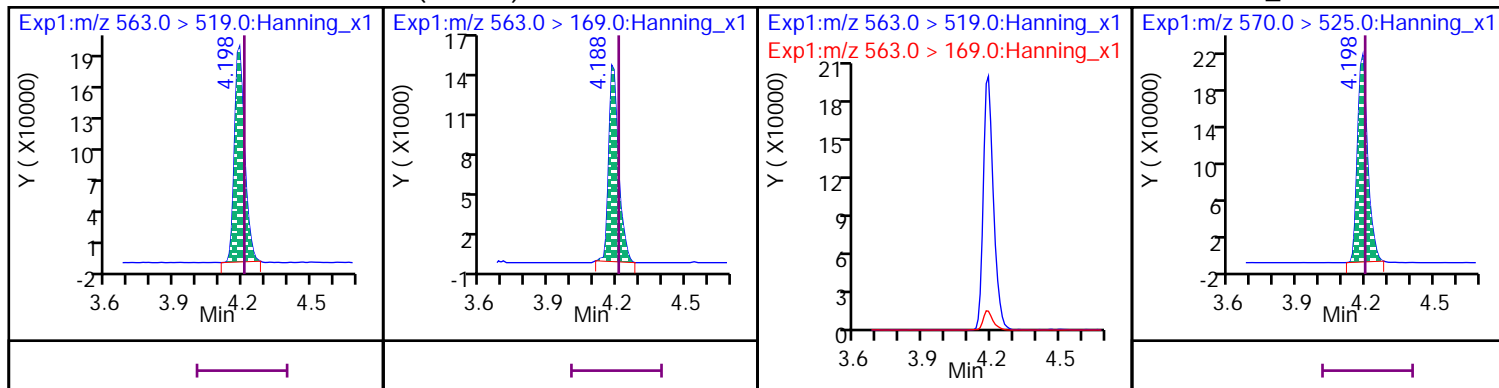
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



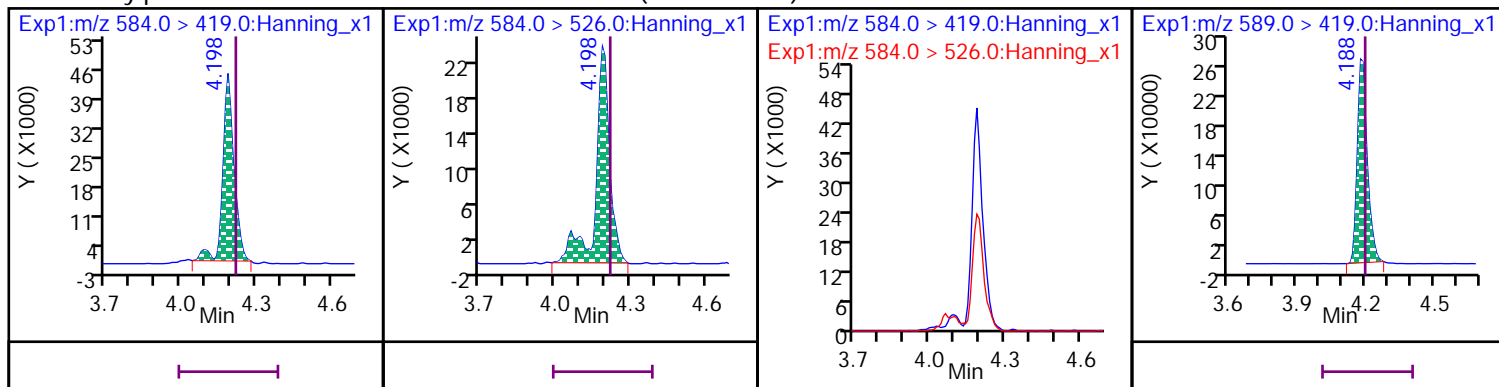
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



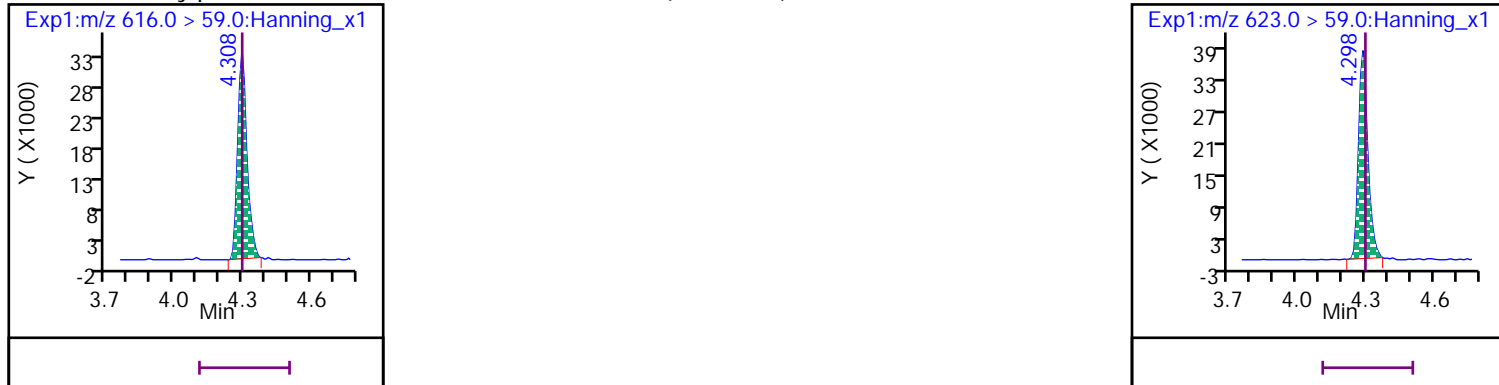
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



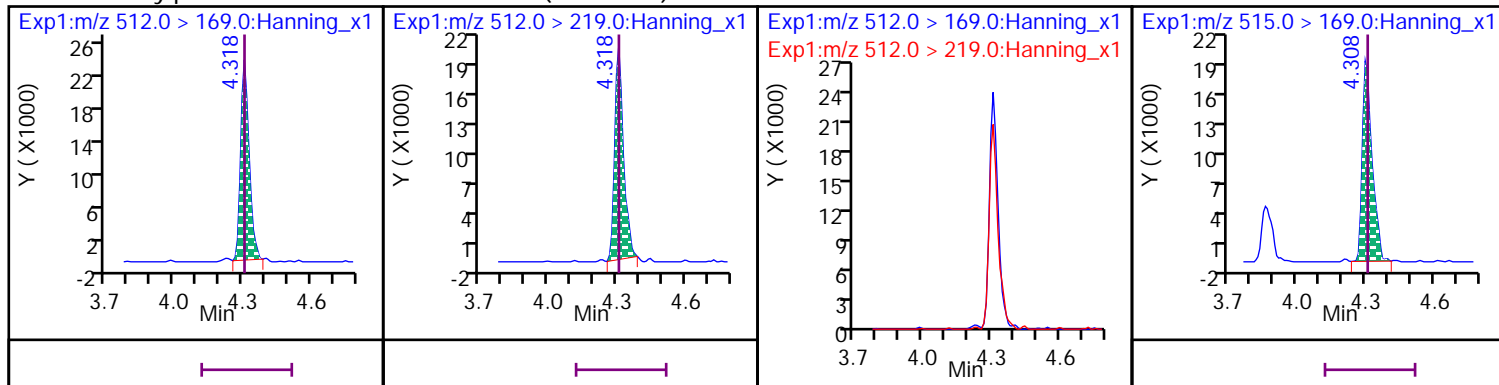
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



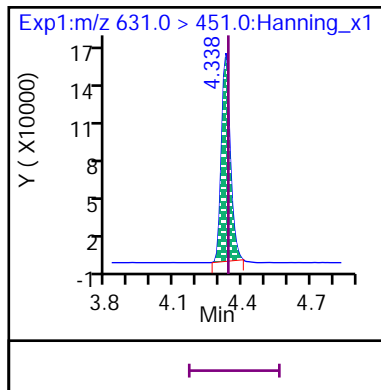
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

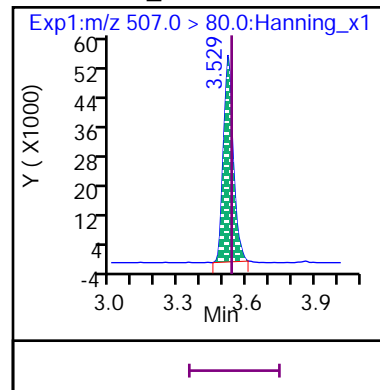




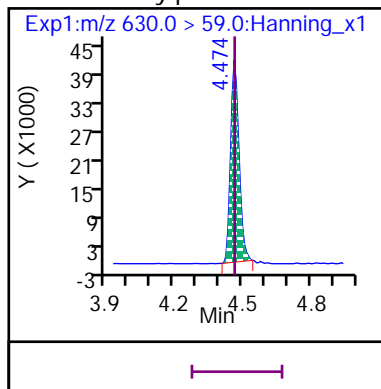
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



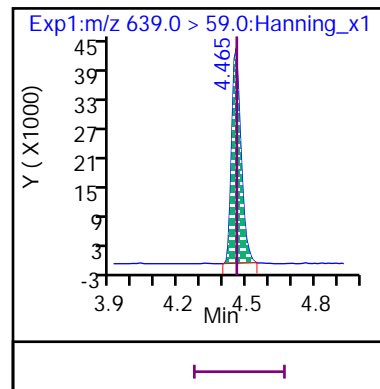
D 54 13C8\_PFOS



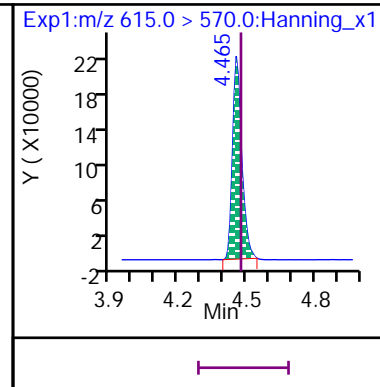
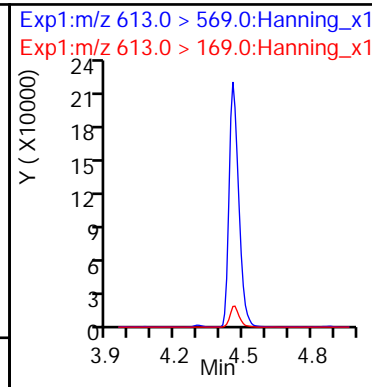
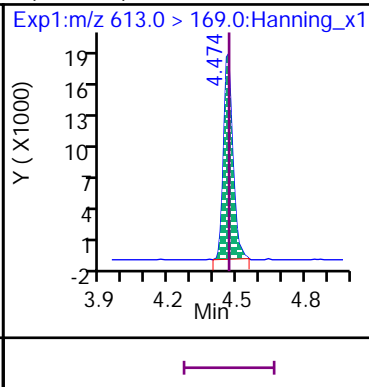
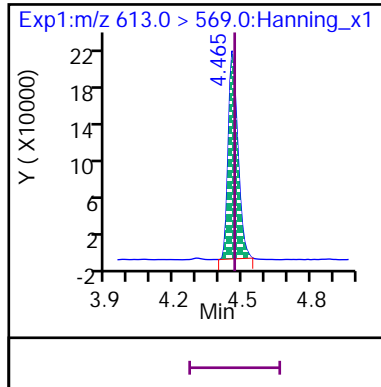
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



D 62 d9-EtFOSE

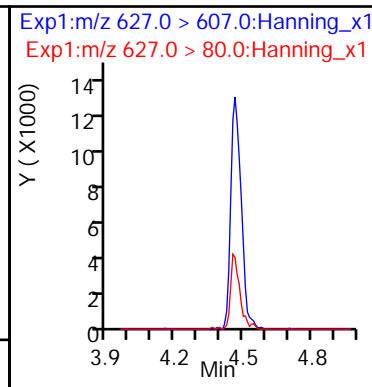
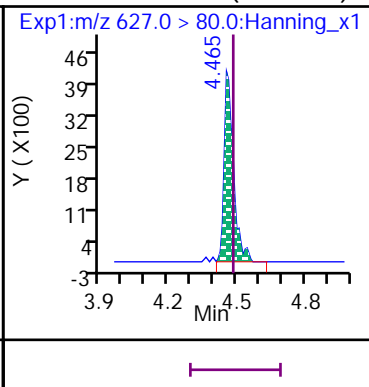
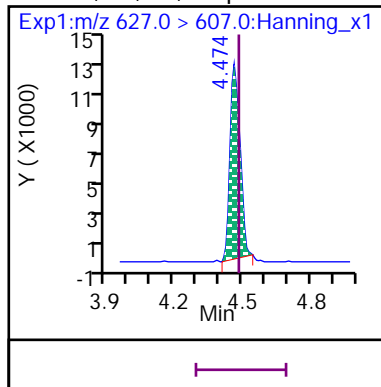


11 Perfluoro-n-dodecanoic acid (PFDaA)

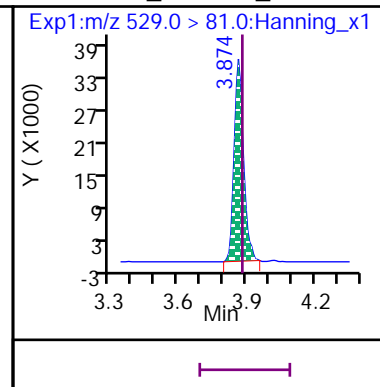


D 38 13C2\_PFDaA

4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

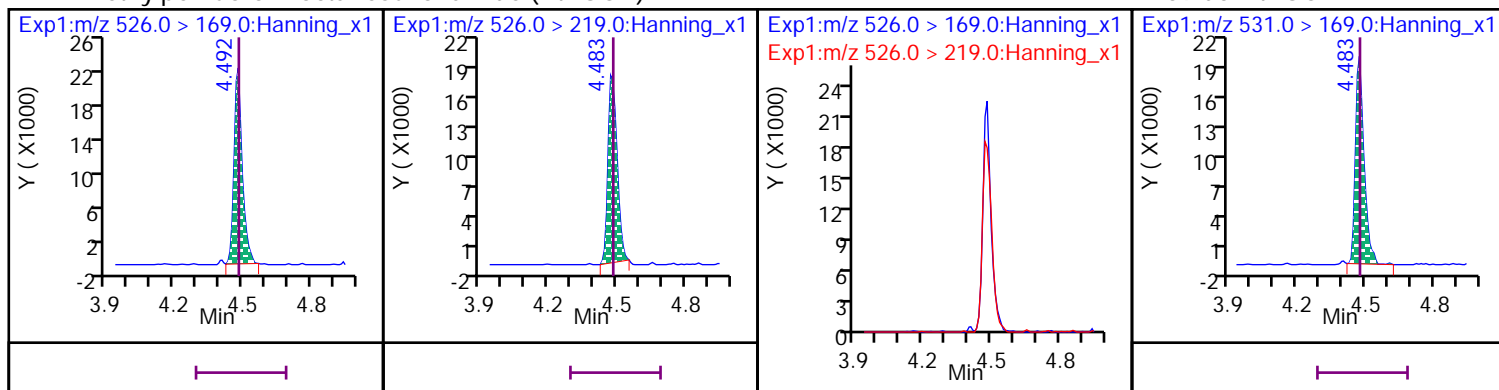


D 65 13C2\_8:2 FTS\_2



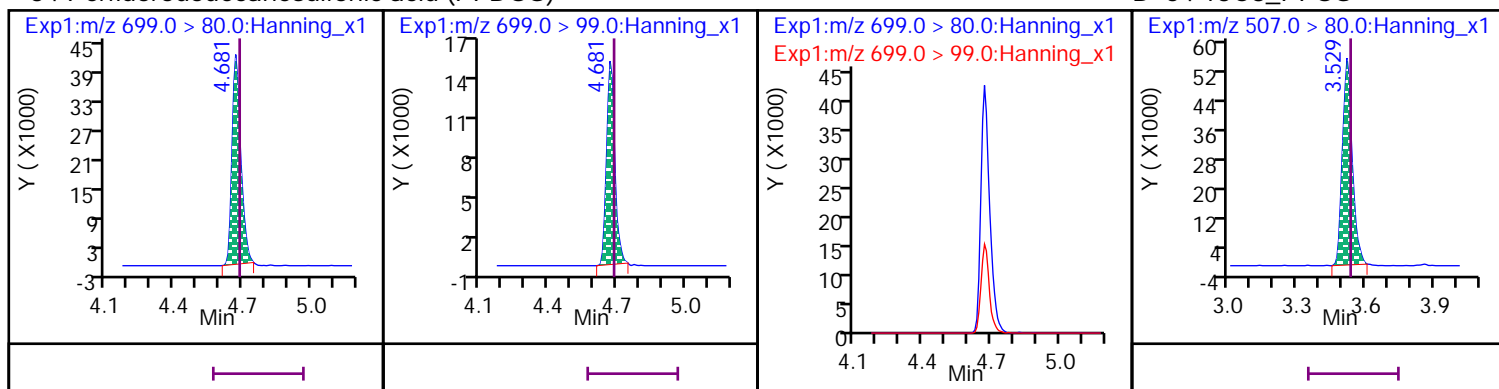
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



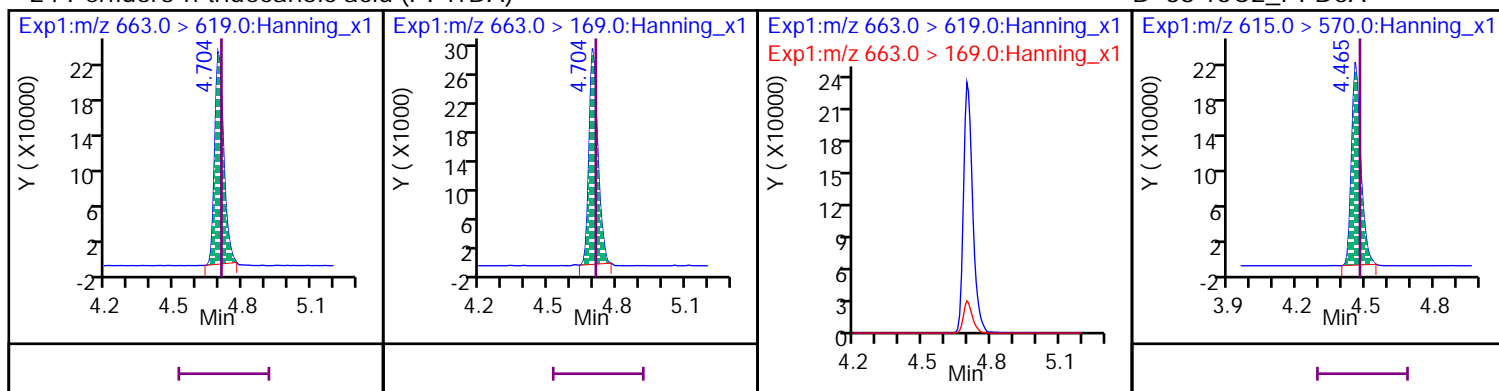
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



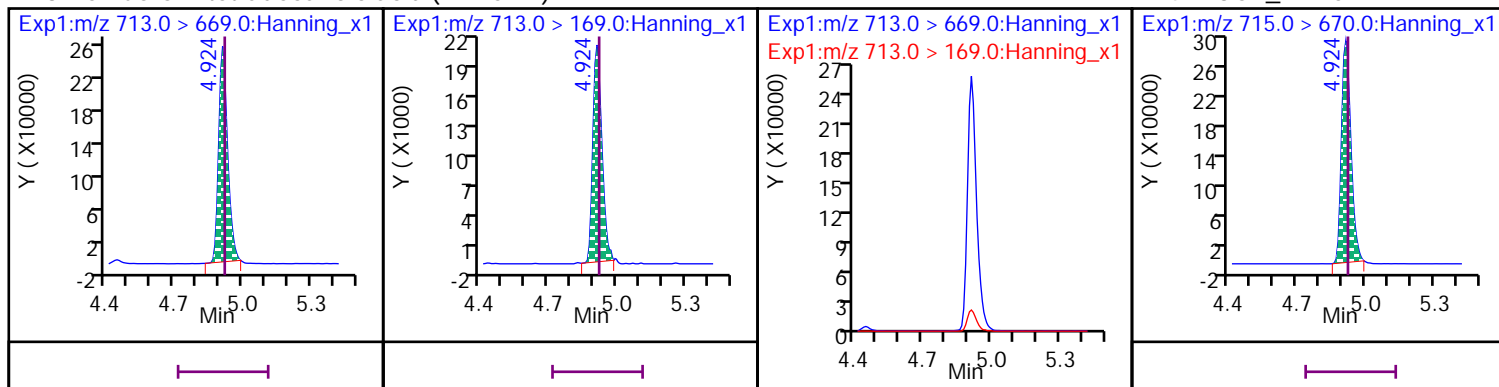
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



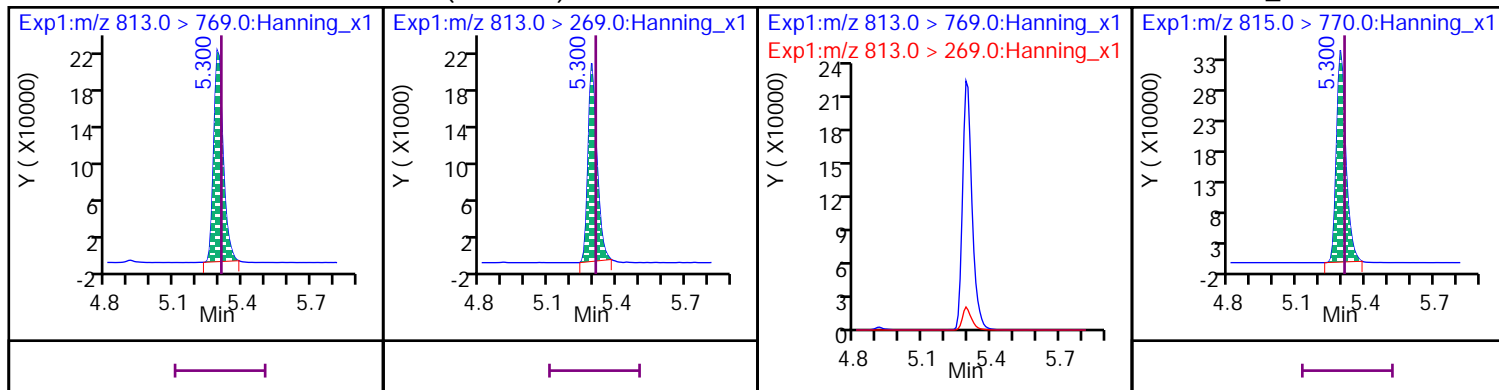
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



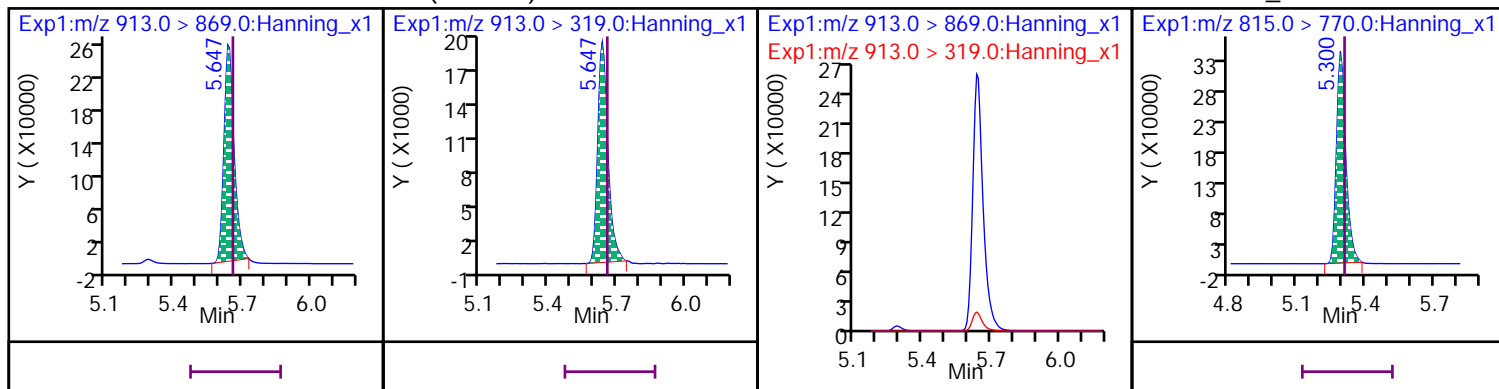
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

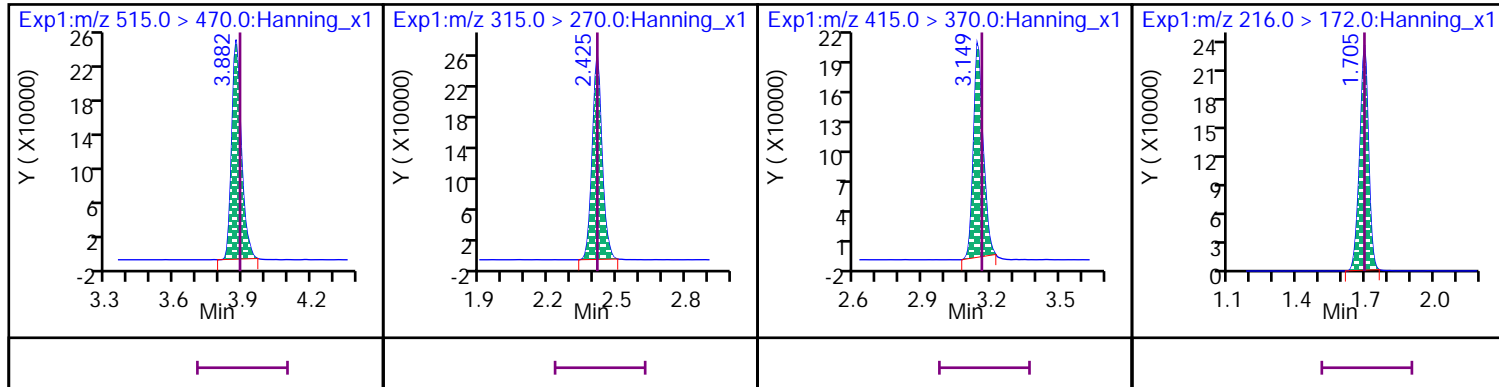


\* 37 13C2\_PFDA

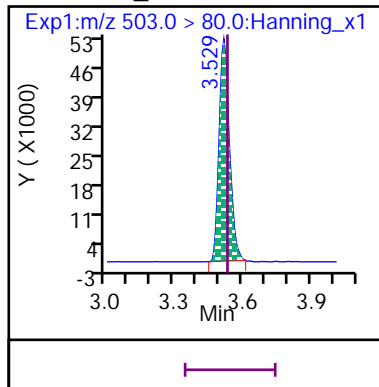
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320048.d  
Injection Date: 23-Dec-2020 19:01:55 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 38  
Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	902.31	90.2	70 - 130
D 46 13C4_PFBA	659896	662027			100	50 - 150
D 50 13C5_PFPeA	681912	676925			99.3	50 - 150
21 PFPeA			1000.00	928.84	92.9	70 - 130
7 PFBS			884.00	816.60	92.4	70 - 130
D 44 13C3_PFBS	234990	242119			103	50 - 150
1 4:2 FTS			934.00	948.02	102	70 - 130
D 63 13C2_4:2 FTS_2	145673	131565			90.3	50 - 150
D 49 13C5_PFHxA	739934	730245			98.7	50 - 150
15 PFHxA			1000.00	911.25	91.1	70 - 130
22 PFPeS			938.00	915.11	97.6	70 - 130
28 GenX			2000.00	1841.86	92.1	70 - 130
D 66 13C3_GenX	1382147	1338464			96.8	50 - 150
D 47 13C4_PFHpA	612609	595842			97.3	50 - 150
13 PFHpA			1000.00	975.77	97.6	70 - 130
D 45 13C3_PFHxS	185632	190494			103	50 - 150
14 PFHxS			910.00	819.35	90	70 - 130
29 ADONA			942.00	821.83	87.2	70 - 130
D 64 13C2_6:2 FTS_2	118188	109882			93	50 - 150
2 6:2 FTS			948.00	938.39	99	70 - 130
20 PFOA			1000.00	956.04	95.6	70 - 130
D 53 13C8_PFOA	612317	583490			95.3	50 - 150
12 PFHpS			952.00	871.22	91.5	70 - 130
18 PFOS			928.00	849.26	91.5	70 - 130
17 PFNA			1000.00	906.57	90.7	70 - 130
D 56 13C9_PFNA	732148	788209			108	50 - 150
D 54 13C8_PFOS	151103	162825			108	50 - 150
30 9Cl-PF3ONS			932.00	845.31	90.7	70 - 130
D 55 13C8_PFOSA	323224	315550			97.6	50 - 150
19 PFOSA			1000.00	967.77	96.8	70 - 130
16 PFNS			960.00	944.33	98.4	70 - 130
D 65 13C2_8:2 FTS_2	93513	96844			104	50 - 150
3 8:2 FTS			958.00	738.29	77.1	70 - 130
10 PFDA			1000.00	897.75	89.8	70 - 130
D 51 13C6_PFDA	641610	687686			107	50 - 150
D 58 d3-MeFOSAA	810340	817685			101	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	874.00	87.4	70 - 130
9 PFDS			964.00	894.43	92.8	70 - 130
5 N-EtFOSAA			1000.00	937.60	93.8	70 - 130
25 PFUdA			1000.00	897.24	89.7	70 - 130
D 60 d5-EtFOSAA	763091	793213			104	50 - 150
D 52 13C7_PFUdA	652802	627887			96.2	50 - 150
D 61 d7-MeFOSE	103832	103613			99.8	50 - 150
32 MeFOSE			1000.00	910.97	91.1	70 - 130
26 MeFOSA			1000.00	915.95	91.6	70 - 130
D 57 d3-MeFOSA	49874	57493			115	50 - 150
31 11Cl-PF3OUDS			942.00	872.27	92.6	70 - 130
D 62 d9-EtFOSE	117283	118470			101	50 - 150
33 EtFOSE			1000.00	1015.65	102	70 - 130
D 59 d5-EtFOSA	52571	54180			103	50 - 150
D 38 13C2_PFDoA	604828	587700			97.2	50 - 150
4 10:2 FTS			964.00	850.66	88.2	70 - 130
27 EtFOSA			1000.00	871.33	87.1	70 - 130
11 PFDoA			1000.00	939.63	94	70 - 130
34 PFDOS			968.00	882.37	91.2	70 - 130
24 PFTrDA			1000.00	1032.43	103	70 - 130
23 PFTeDA			1000.00	976.76	97.7	70 - 130
D 42 13C2_PFTeDA	781191	773930			99.1	50 - 150
35 PFHxDA			1000.00	991.23	99.1	70 - 130
D 40 13C2_PFHxDA	893092	934571			105	50 - 150
36 PFODA			1000.00	934.09	93.4	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320048.d  
 Injection Date: 23-Dec-2020 19:01:55 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 38  
 Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.705	0	662027	24	>100:1			1000.00	954.55	100	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/1	594960	23	>100:1			1000.00	902.31		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	0	676925	17	>100:1			1000.00	984.07	99.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	0/0	632163	18	>100:1			1000.00	928.84		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	0	242119	16	>100:1			1000.00	1051.64	103	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.141	0/0	233114	17	>100:1	Target = 3.50		884.00	816.60		
298.9 > 99	44	2.130	2.141		67849	18	>100:1	3.43 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.461	0/0	192196	20	>100:1	Target = 3.10		938.00	915.11		
349 > 99	44	2.451	2.461		59747	19	>100:1	3.21 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.389	0	131565	20	>100:1			5000.00	5434.70	90.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.398	-1/-1	49784	20	>100:1	Target = 1.80		934.00	948.02		
327 > 81	63	2.389	2.398		28299	21	>100:1	1.75 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.425	0	730245	19	>100:1			1000.00	990.74	98.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.425	0/0	656970	20	>100:1	Target = 18.34		1000.00	911.25		
313 > 119	49	2.425	2.425		37703	19	>100:1	17.42 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.532	0	1338464	21	>100:1			5000.00	5025.13	96.8	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.532	0/0	354239	20	>100:1	Target = 0.81		2000.00	1841.86		
285 > 185	66	2.532	2.532		444988	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.783	0	595842	19	>100:1			1000.00	982.19	97.3	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.783	0/0	603071	21	>100:1	Target = 3.70		1000.00	975.77		
363 > 169	47	2.773	2.783		157380	21	>100:1	3.83 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.801	0	190494	20	>100:1			1000.00	1112.51	103	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.810	-1/-1	165491	30	>100:1	Target = 3.21	0.14	910.00	819.35		
399 > 99	45	2.791	2.810		55634	25	>100:1	2.97 (1.60-4.81)	0.05				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.828	0/0	993936	20	>100:1	Target = 2.97		942.00	821.83		
377 > 85	45	2.819	2.828		322089	21	>100:1	3.08 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.156	3.169	0/0	150765	25	>100:1	Target = 3.08		952.00	871.22		
449 > 99	45	3.156	3.169		48647	21	>100:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.142	0	109882	25	>100:1			5000.00	5705.67	93	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.129	3.162	-2/-2	42756	25	>100:1	Target = 1.80		948.00	938.39		
427 > 81	64	3.129	3.162		20927	19	>100:1	2.04 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.169	-1	583490	24	>100:1			1000.00	985.85	95.3	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.169	-1/0	568689	24	>100:1	Target = 2.87		1000.00	956.04		
413 > 169	53	3.149	3.169		188289	24	>100:1	3.02 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.529	3.545	0	162825	23	>100:1			1000.00	1086.02	108	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.553	-1/-1	163860	45	>100:1	Target = 3.84	0.26	928.00	849.26		
499 > 99	54	3.529	3.553		46702	39	>100:1	3.50 (1.92-5.76)	0.11				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.751	0/0	463352	24	>100:1			932.00	845.31		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.882	3.883	0/0	117668	20	>100:1	Target = 3.07		960.00	944.33		
549 > 99	54	3.882	3.883		39207	20	>100:1	3.00 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.179	4.198	-1/-1	105692	17	>100:1	Target = 3.03		964.00	894.43		
599 > 99	54	4.179	4.198		38287	18	>100:1	2.76 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.338	4.349	0/0	403351	17	>100:1			942.00	872.27		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.681	4.698	-1/-1	115344	19	>100:1	Target = 3.33		968.00	882.37		
699 > 99	54	4.689	4.698		36646	25	>100:1	3.14 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.537	3.553	0	788209	22	>100:1			1000.00	1049.60	108	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.537	3.553	0/0	714584	21	>100:1	Target = 6.16		1000.00	906.57		
463 > 169	56	3.537	3.553		119317	22	>100:1	5.98 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.867	0	315550	21	>100:1			1000.00	1019.34	97.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.875	0/0	300938	21	>100:1			1000.00	967.77		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.891	-1	96844	18	>100:1			5000.00	5220.66	104	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.882	3.891	0/1	28908	15	>100:1	Target = 1.95		958.00	738.29		
527 > 81	65	3.882	3.891		18804	26	>100:1	1.53 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.494	-1/0	38075	19	>100:1	Target = 3.14		964.00	850.66		
627 > 80	65	4.483	4.494		12012	27	>100:1	3.16 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.882	3.899	-1	687686	19	>100:1			1000.00	1036.71	107	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.899	-1/0	606628	19	>100:1	Target = 15.94		1000.00	897.75		
513 > 169	51	3.882	3.899		42823	16	>100:1	14.16 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.057	-1	817685	18	>100:1			5000.00	5696.59	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.047	4.065	-1/0	109793	33	>100:1	Target = 1.33	0.11	1000.00	874.00		
570 > 483	58	4.056	4.065		91972	34	>100:1	1.19 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.198	4.208	0	793213	18	>100:1			5000.00	5972.33	104	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.207	4.228	-1/-1	148086	35	>100:1	Target = 1.58	0.08	1000.00	937.60		M
584 > 526	60	4.207	4.228		81122	32	>100:1	1.82 (0.79-2.37)	0.13				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.198	4.208	0	627887	17	>100:1			1000.00	993.37	96.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.218	-1/-1	529491	19	>100:1	Target = 15.50		1000.00	897.24		
563 > 169	52	4.198	4.218		38339	23	>100:1	13.81 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.309	0	103613	18	>100:1			1000.00	957.54	99.8	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.309	0/0	88687	16	>100:1			1000.00	910.97		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.319	0	57493	14	>100:1			1000.00	1086.48	115	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.319	0/0	59412	18	>100:1	Target = 1.12		1000.00	915.95		
512 > 219	57	4.318	4.319		58235	17	>100:1	1.02 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.467	0	118470	17	>100:1			1000.00	944.77	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.476	0/0	107050	16	>100:1			1000.00	1015.65		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.474	4.485	0	587700	18	>100:1			1000.00	970.90	97.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.474	4.476	0/0	559214	19	>100:1	Target = 10.85		1000.00	939.63		
613 > 169	38	4.474	4.476		54819	17	>100:1	10.20 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.711	4.719	0/0	597620	22	>100:1	Target = 8.37		1000.00	1032.43		
663 > 169	38	4.711	4.719		71901	21	>100:1	8.31 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.485	0	54180	15	>100:1			1000.00	1103.59	103	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.494	0/0	51576	19	>100:1	Target = 1.03		1000.00	871.33		
526 > 219	59	4.492	4.494		47417	16	>100:1	1.08 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.924	4.933	0	773930	18	>100:1			1000.00	918.67	99.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.924	4.933	0/0	654990	20	>100:1	Target = 12.11		1000.00	976.76		
713 > 169	42	4.924	4.933		54801	20	>100:1	11.95 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.300	5.318	-1	934571	19	>100:1			1000.00	1031.35	105	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.300	5.318	-1/0	605283	19	>100:1	Target = 11.48		1000.00	991.23		
813 > 269	40	5.300	5.318		55091	19	>100:1	10.98 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.647	5.668	-1/0	772774	25	92:1	Target = 13.88		1000.00	934.09		
913 > 319	40	5.647	5.668		55485	26	>100:1	13.92 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.891	3.899	0	665329	21	>100:1					91.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.425	0	690770	20	>100:1					94.7	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.156	3.169	0	582690	24	>100:1					94	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	602280	24	>100:1					99.2	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.529	3.545	0	173599	23	>100:1					109	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320048.d

Injection Date: 23-Dec-2020 19:01:55

Inst. ID: LCMSMS02

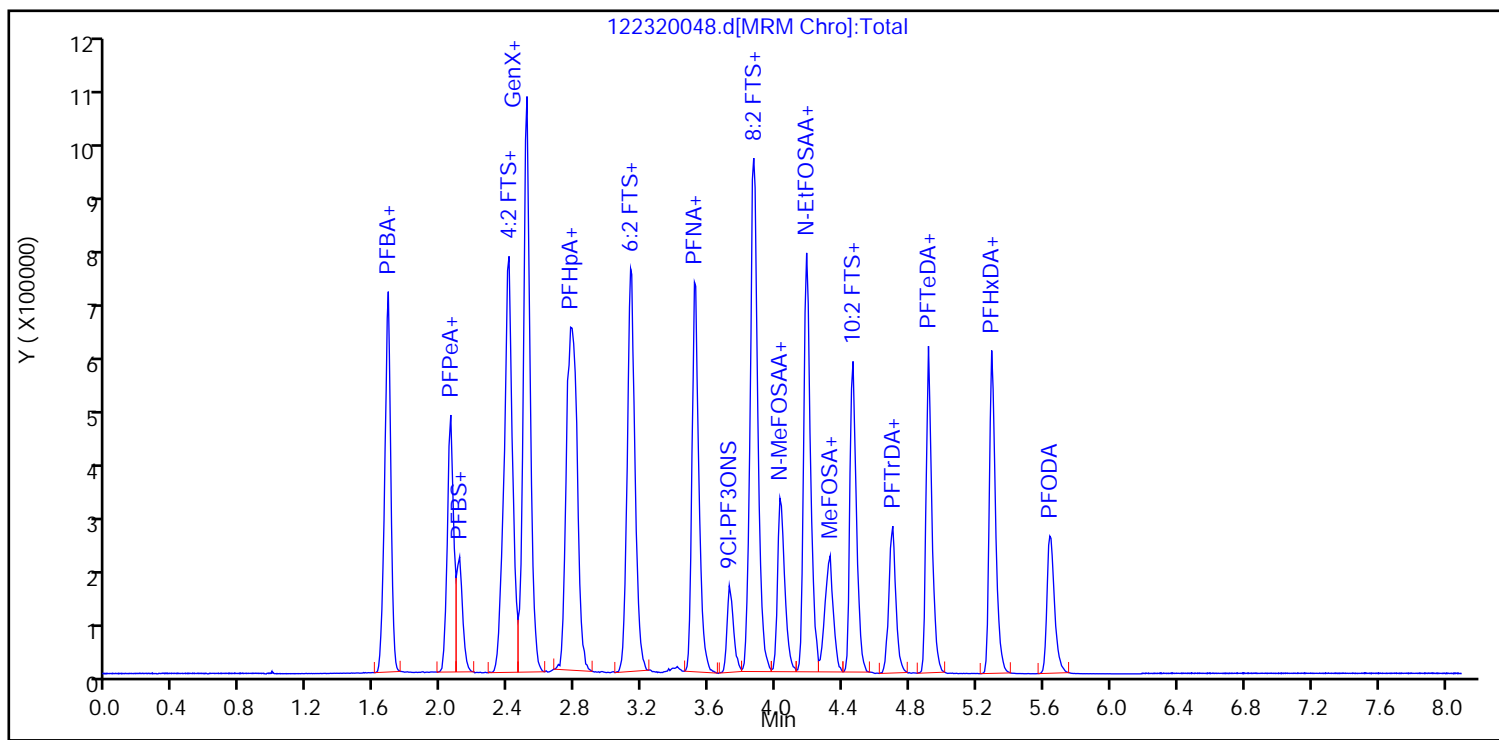
Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

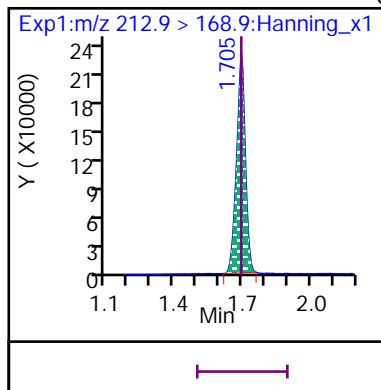
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Dil. Factor: 1

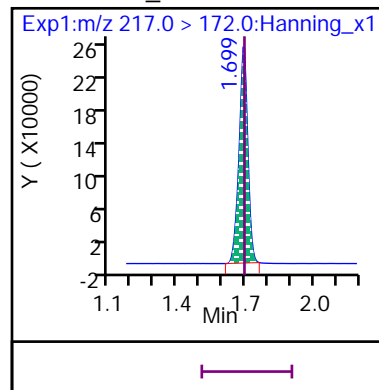
Operator: Stephen E. Somerville



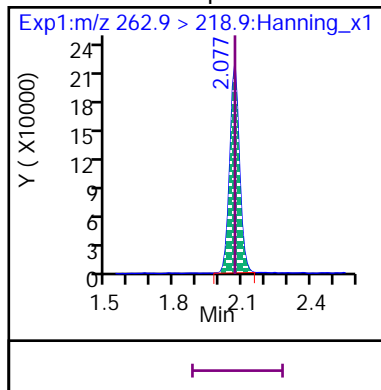
8 Perfluoro-n-butanoic acid (PFBA)



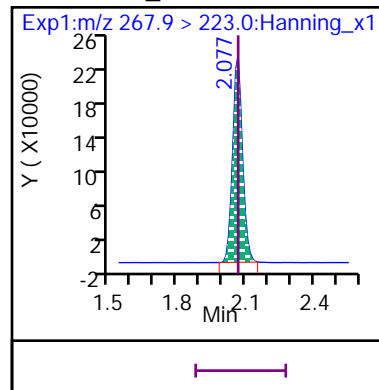
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

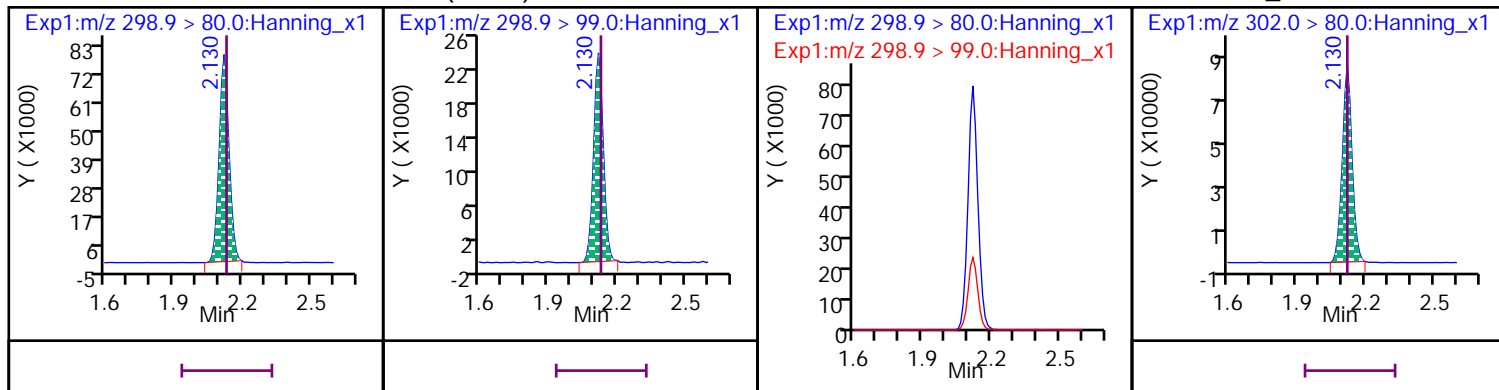


D 50 13C5\_PFPeA



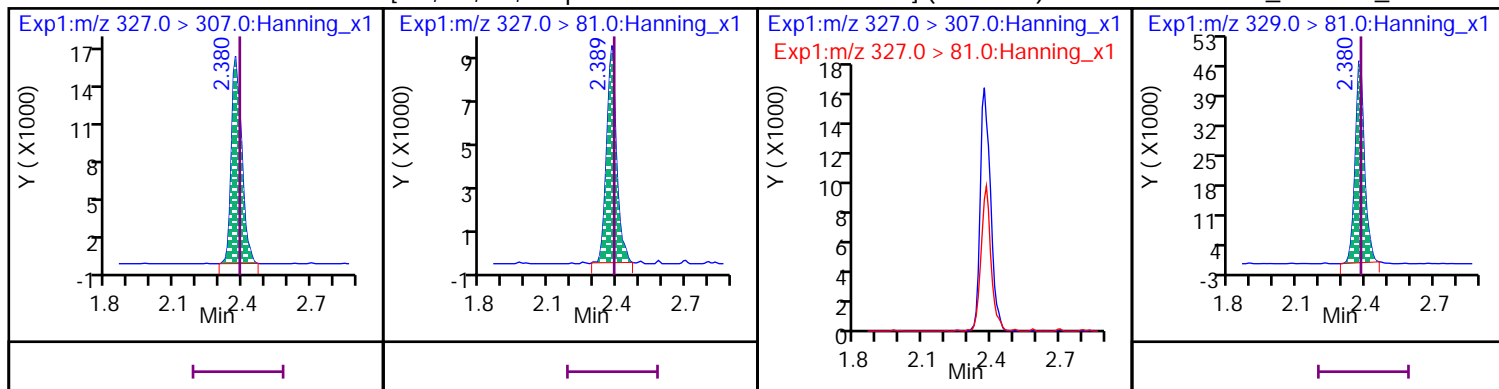
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



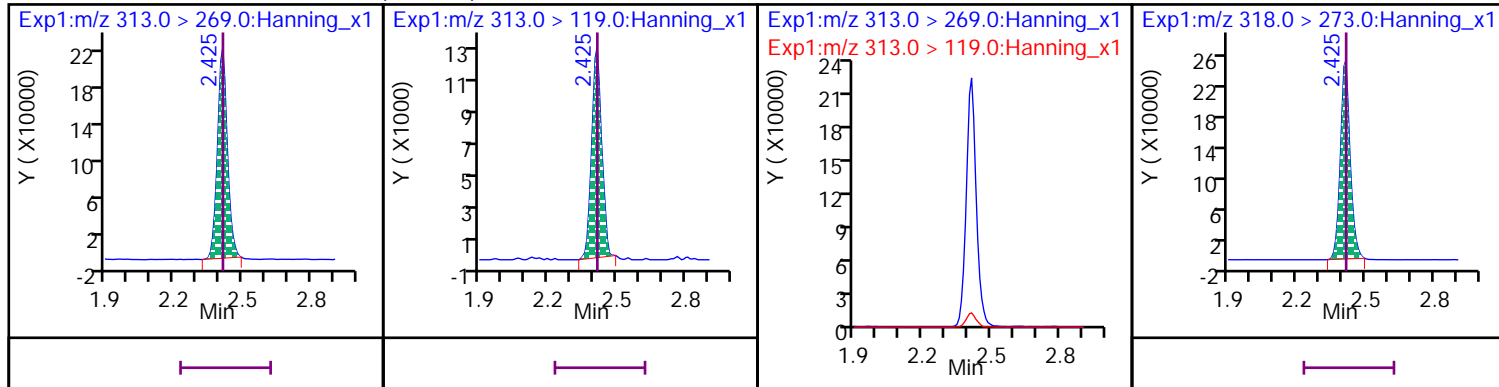
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



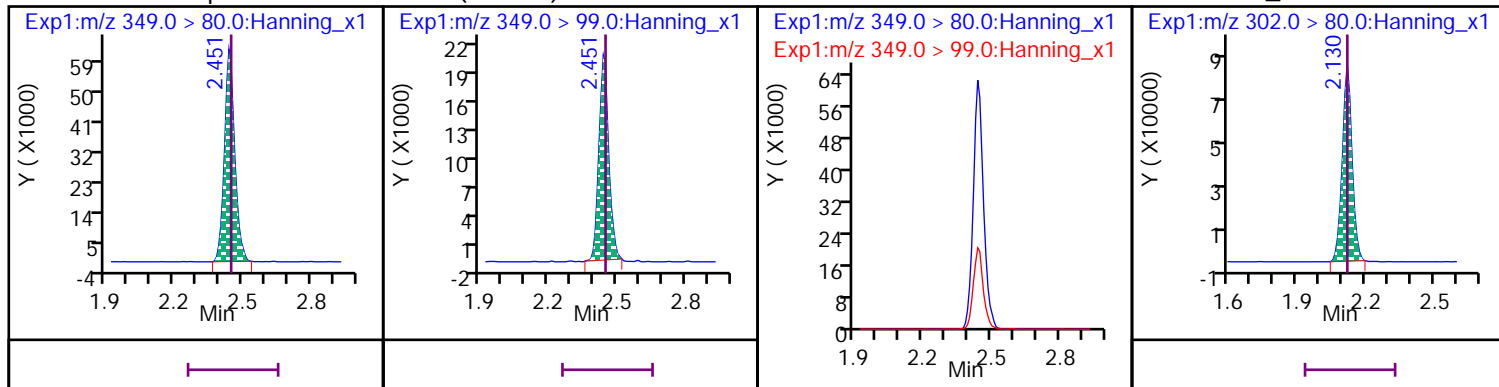
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



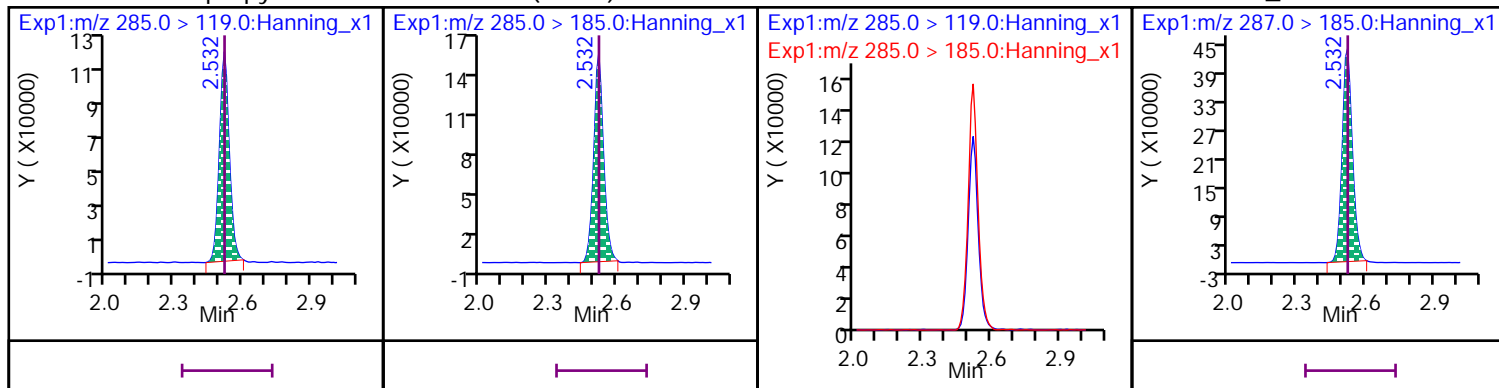
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



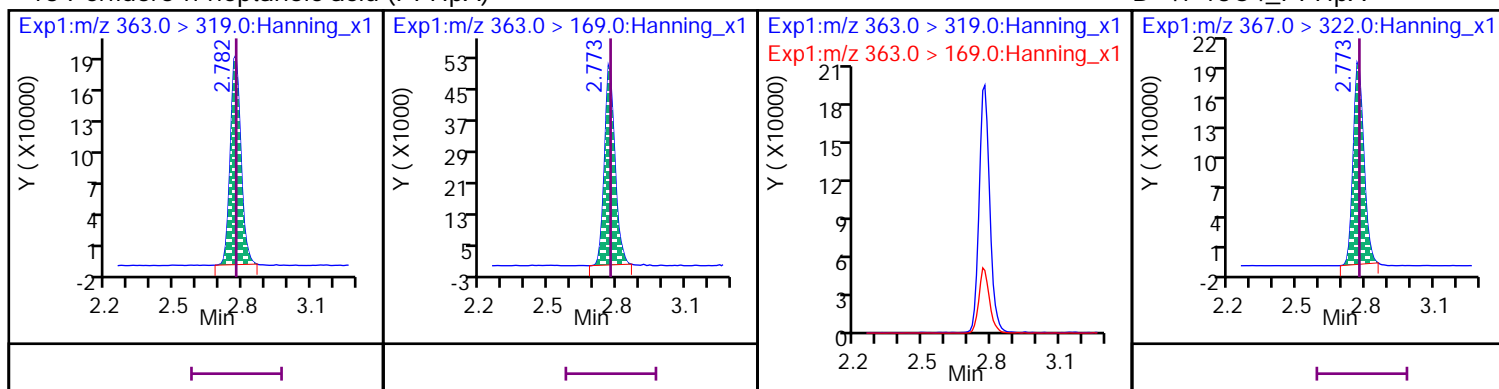
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



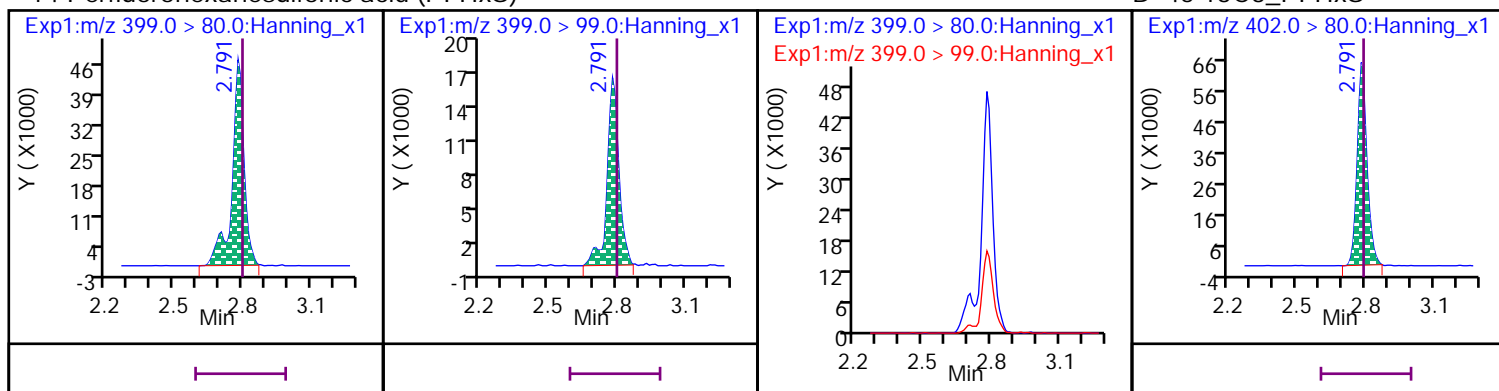
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



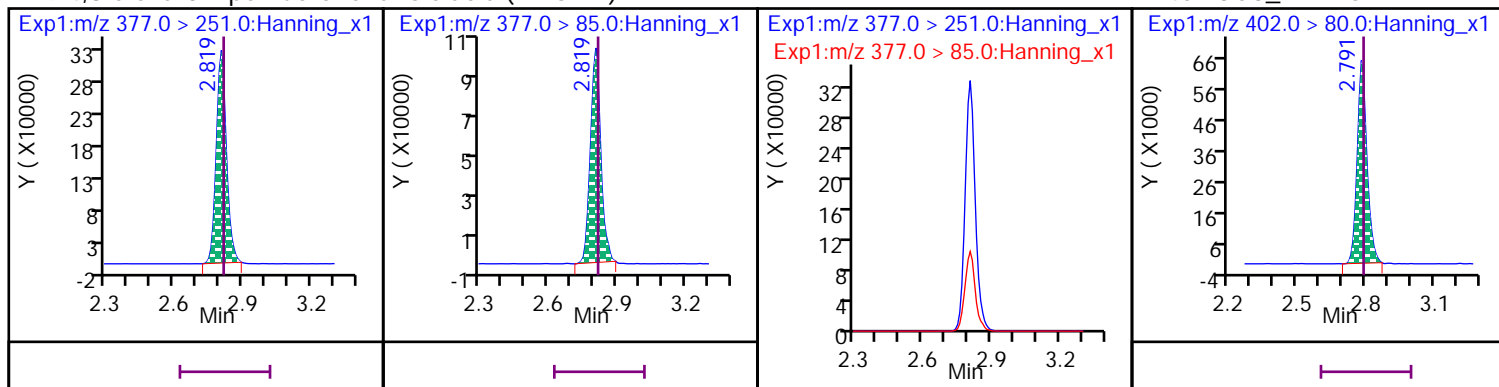
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



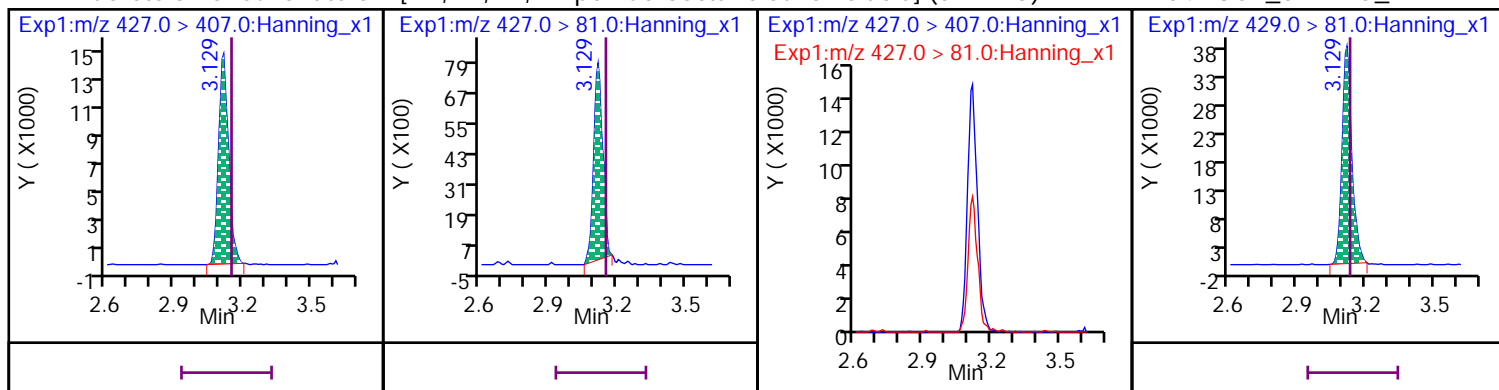
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



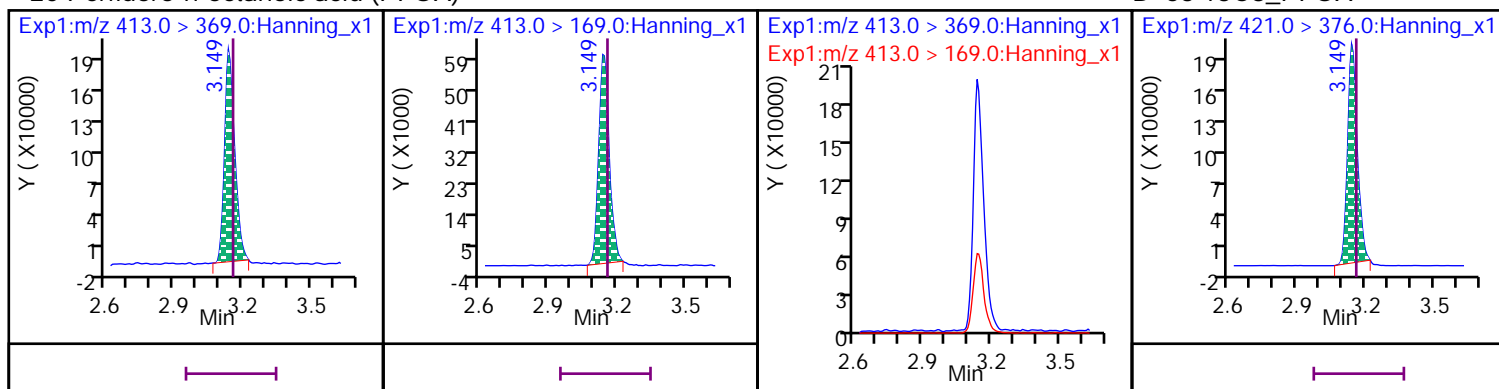
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



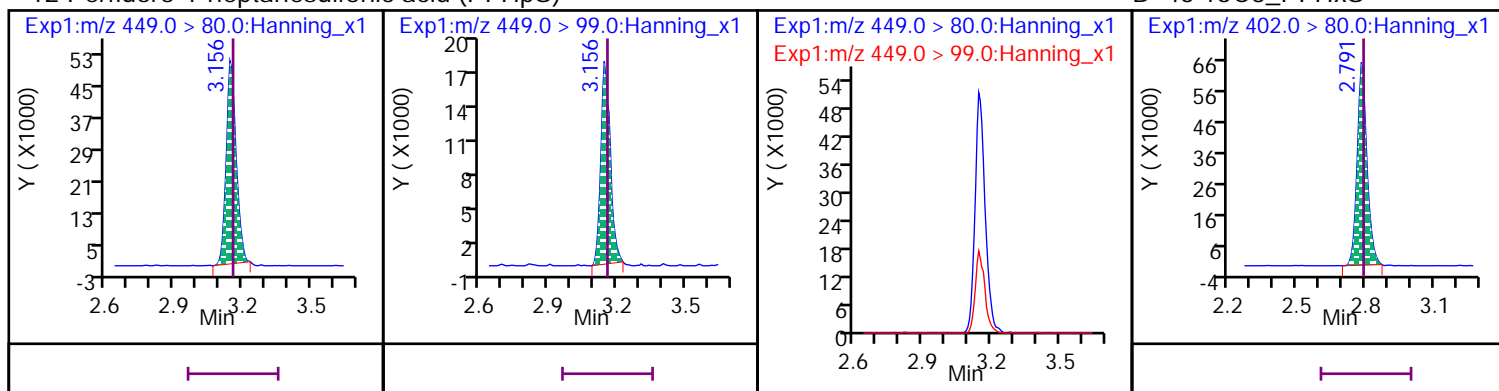
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



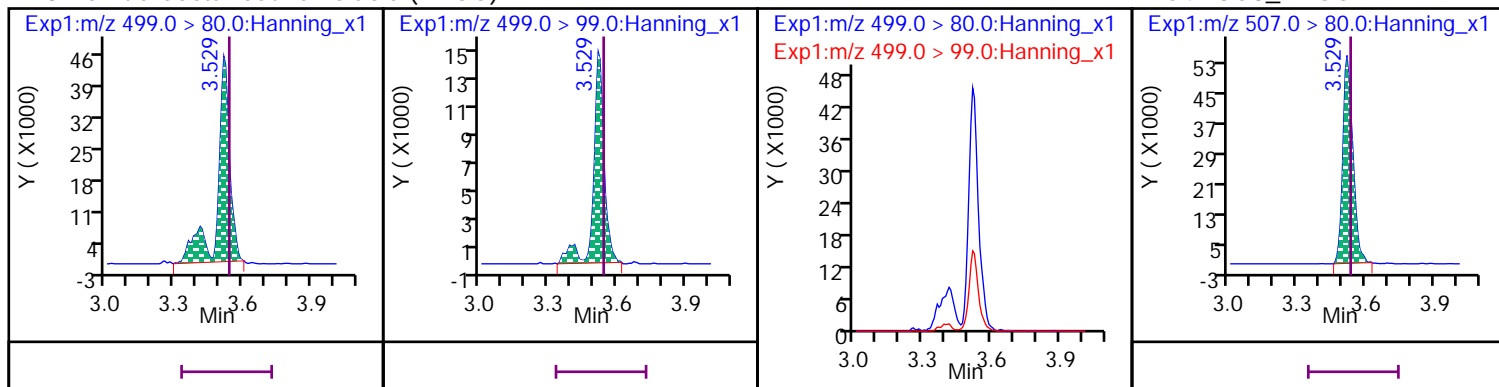
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



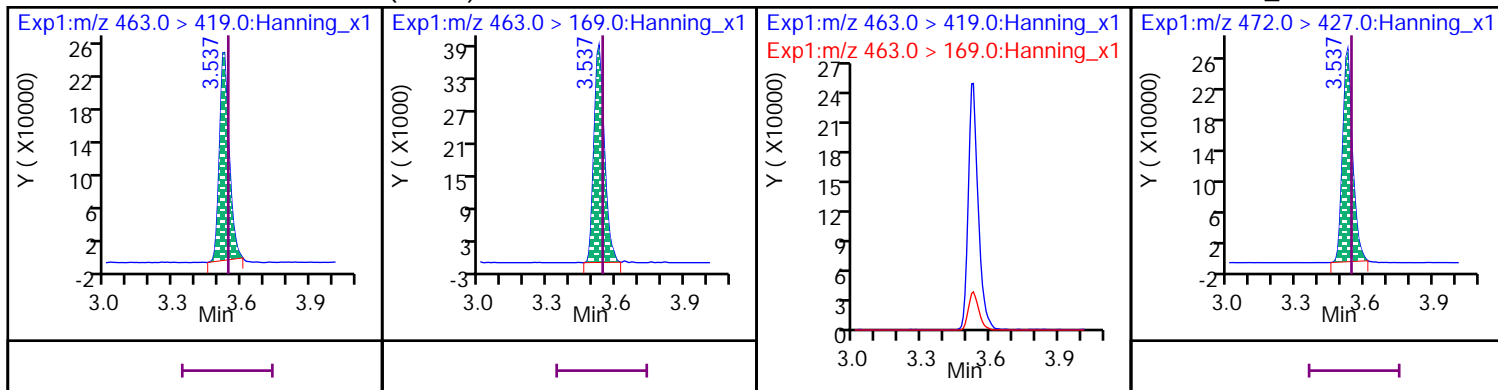
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



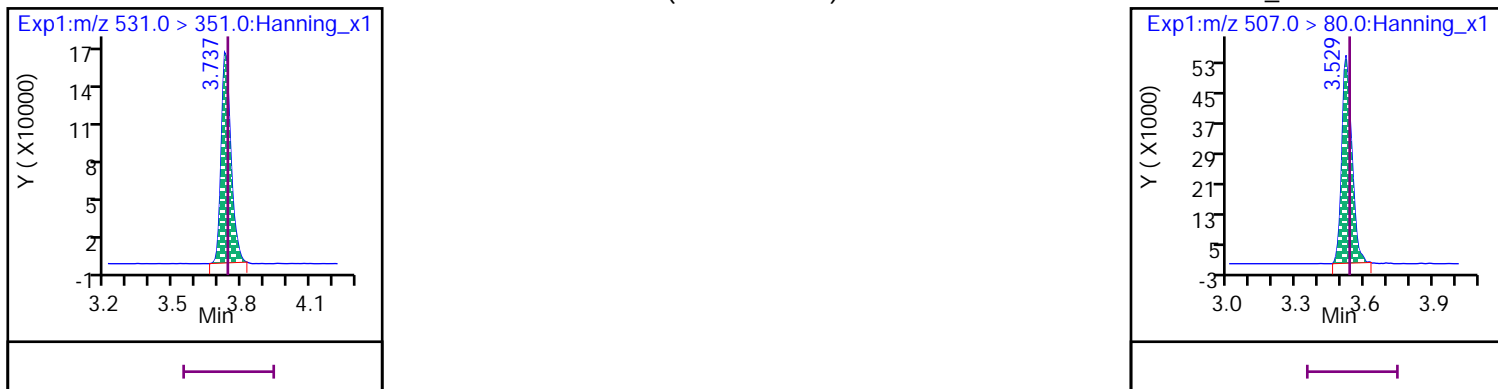
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



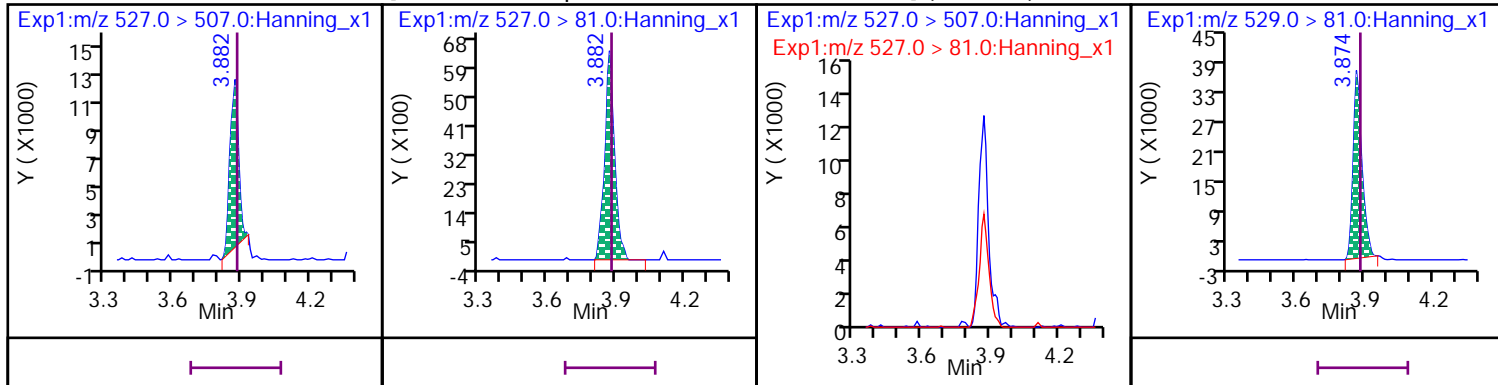
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



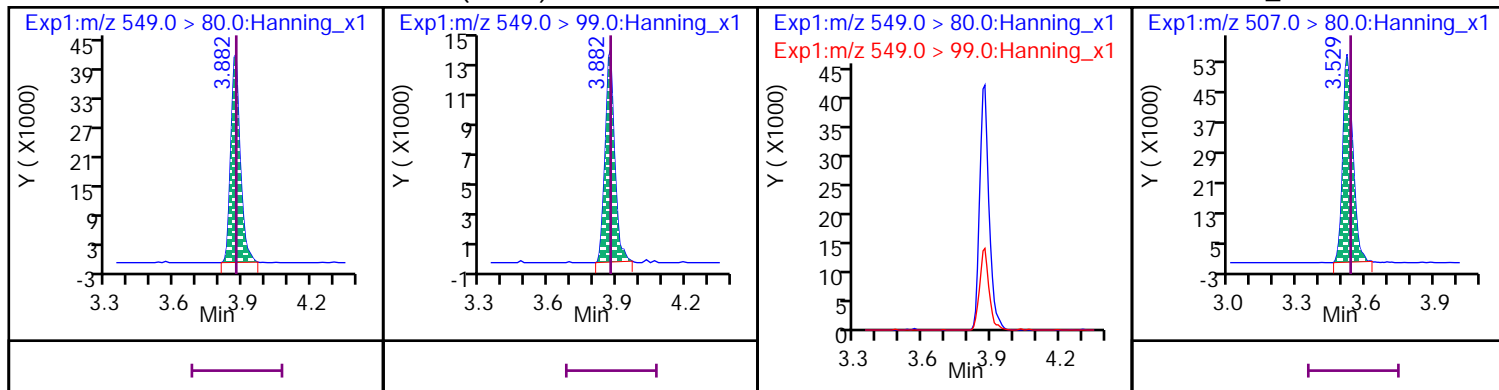
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



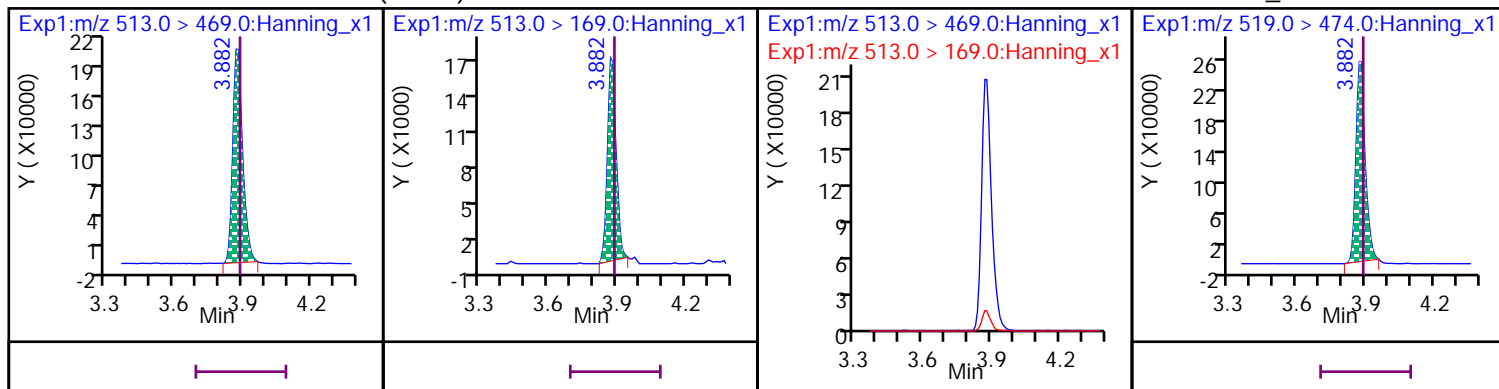
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



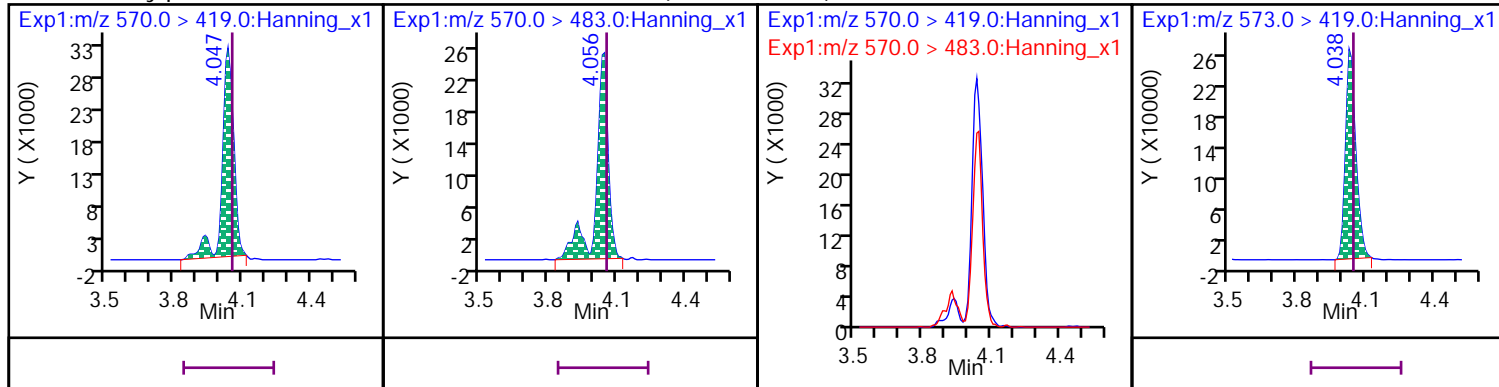
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



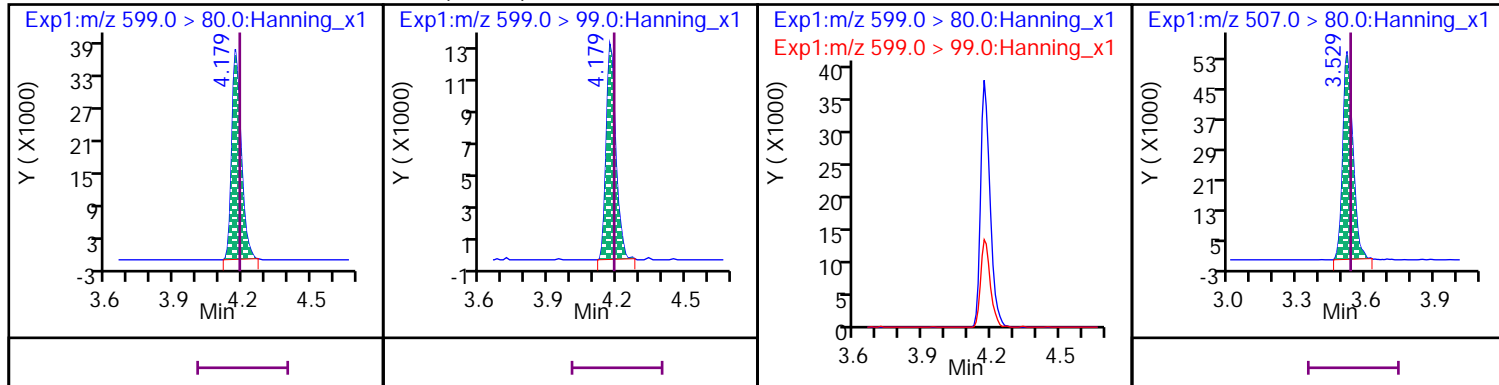
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



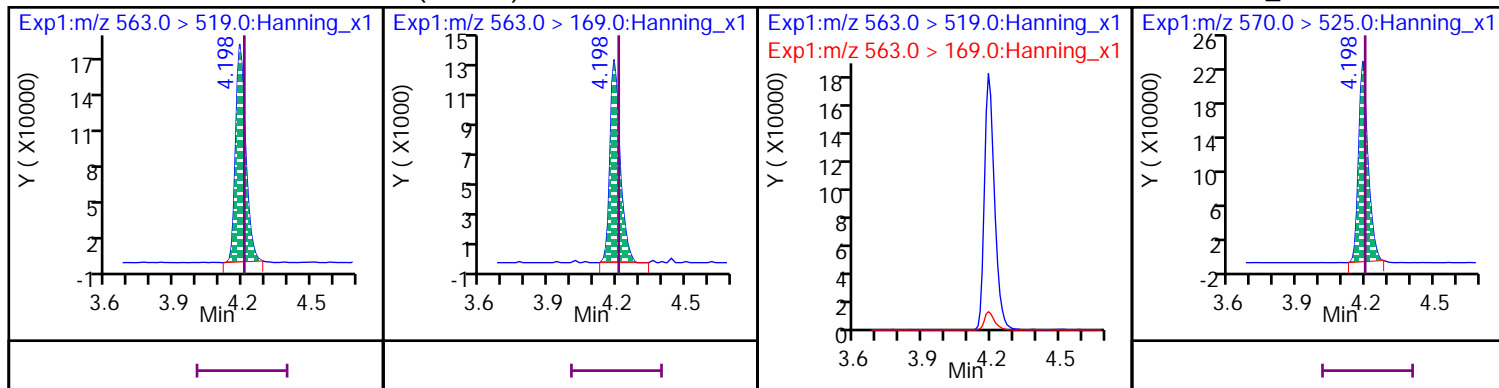
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



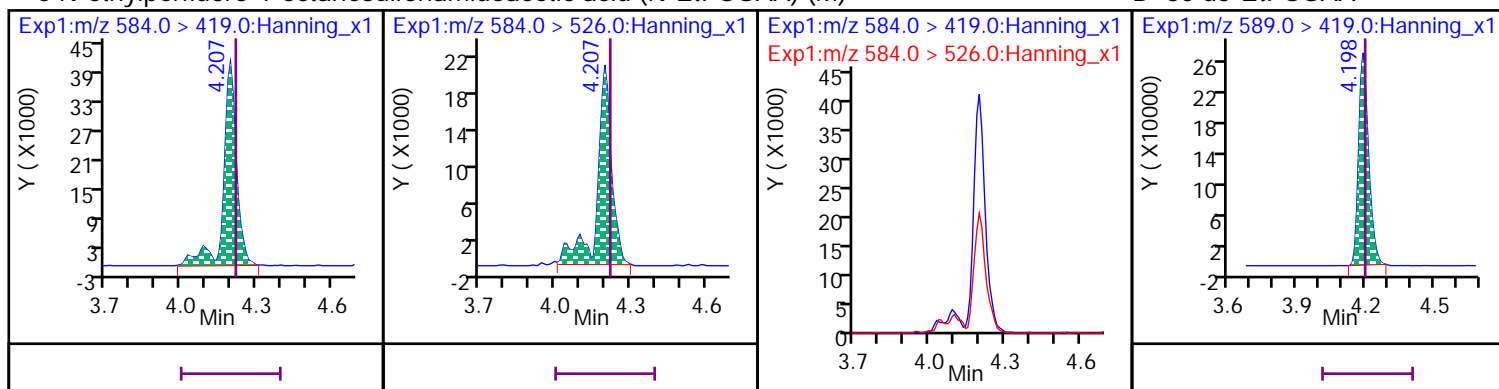
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



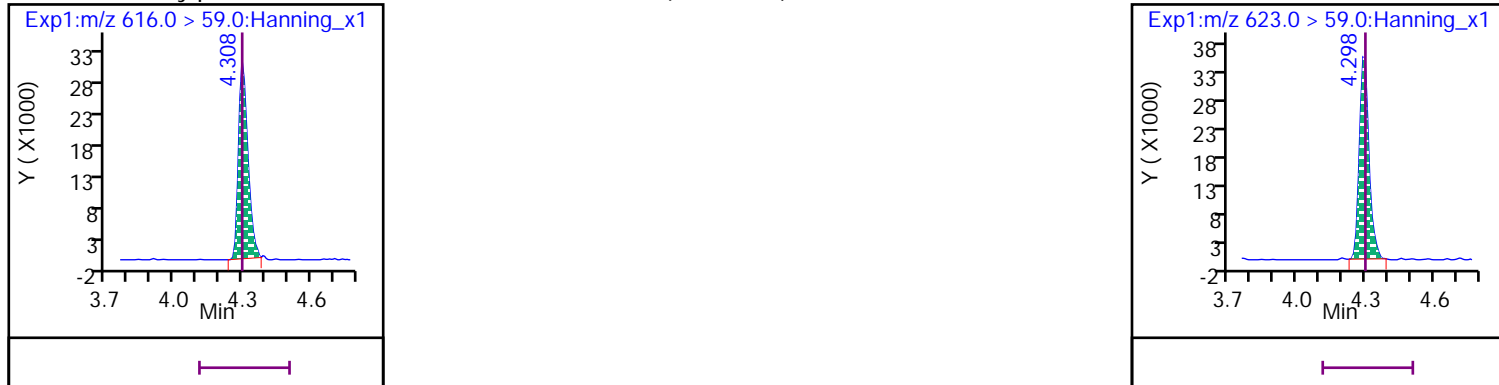
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



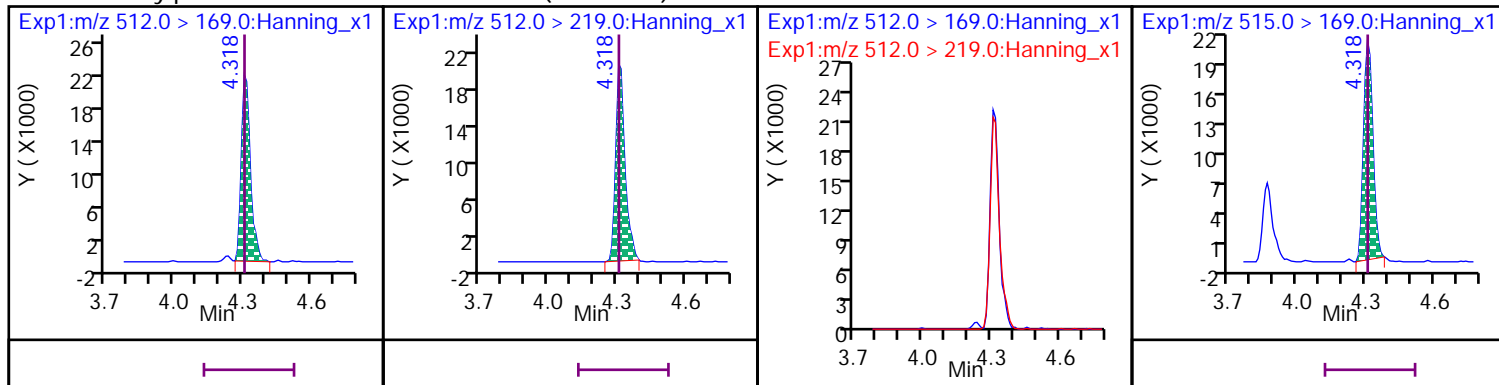
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



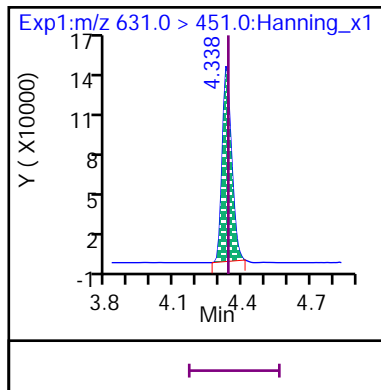
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

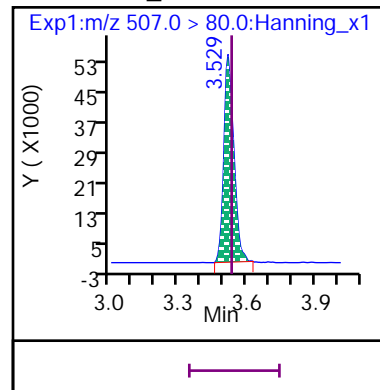




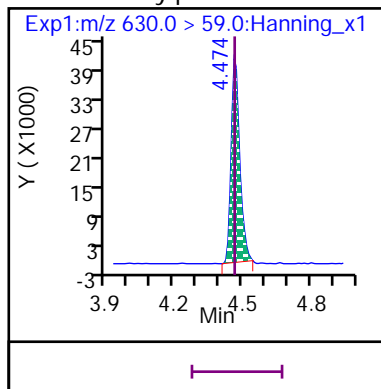
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



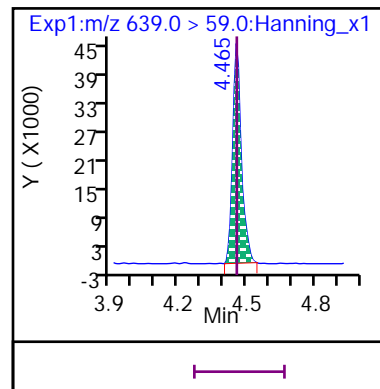
D 54 13C8\_PFOS



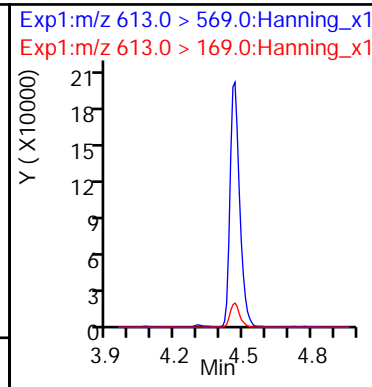
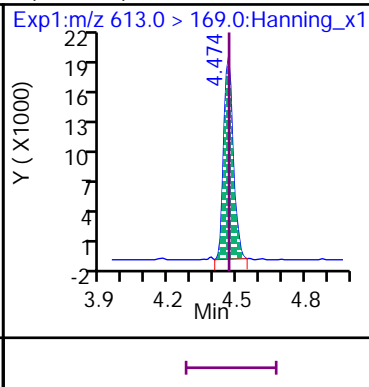
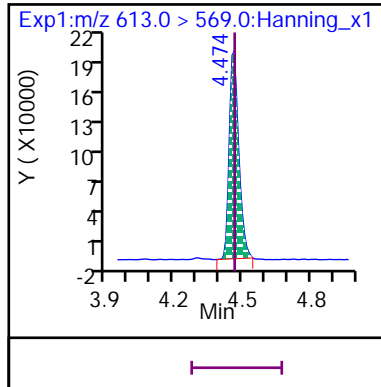
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



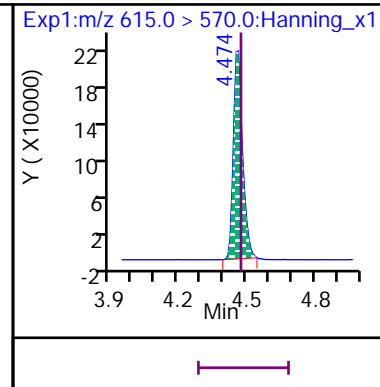
D 62 d9-EtFOSE



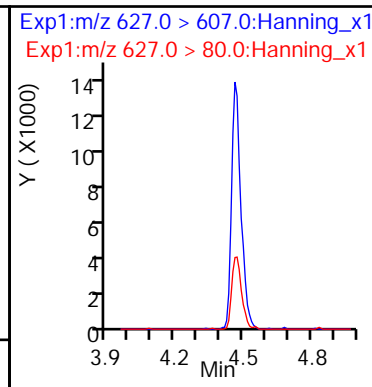
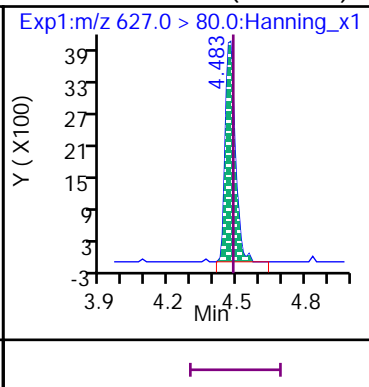
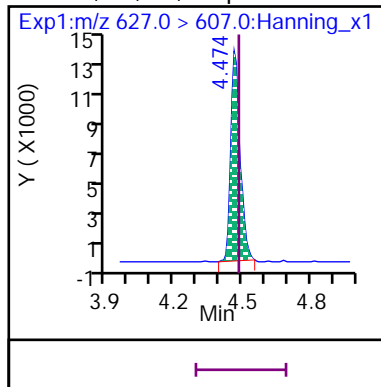
11 Perfluoro-n-dodecanoic acid (PFDaA)



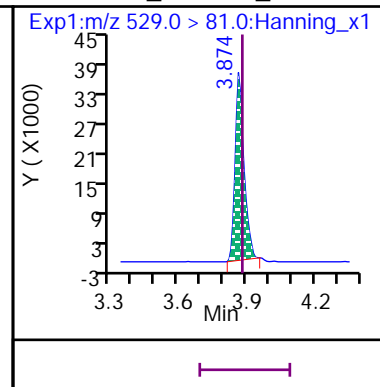
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

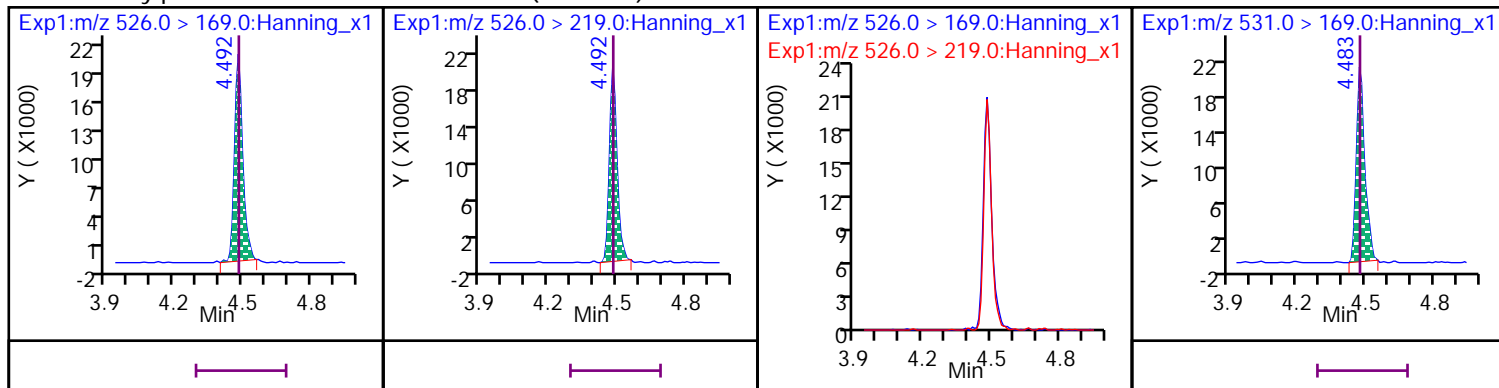


D 65 13C2\_8:2 FTS\_2



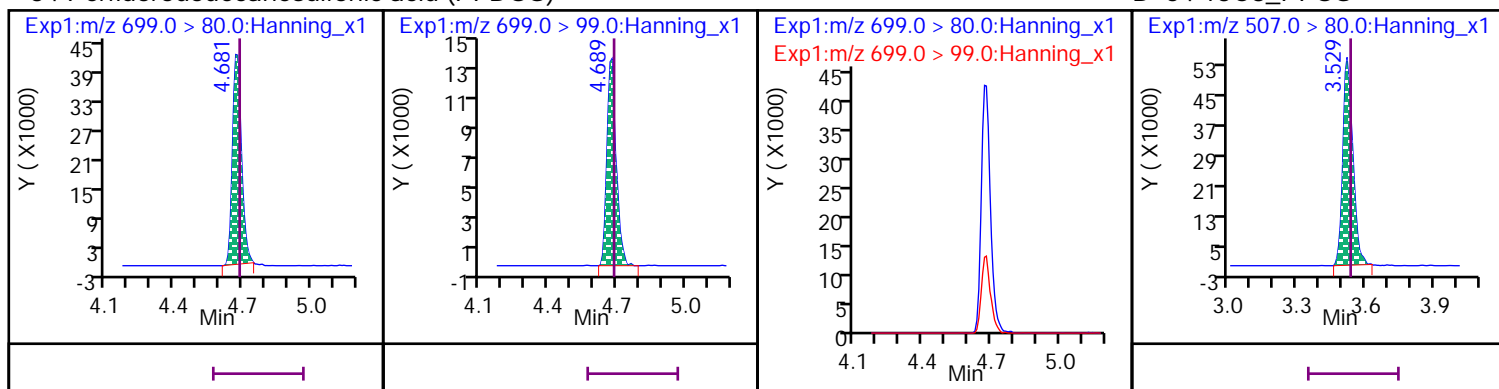
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



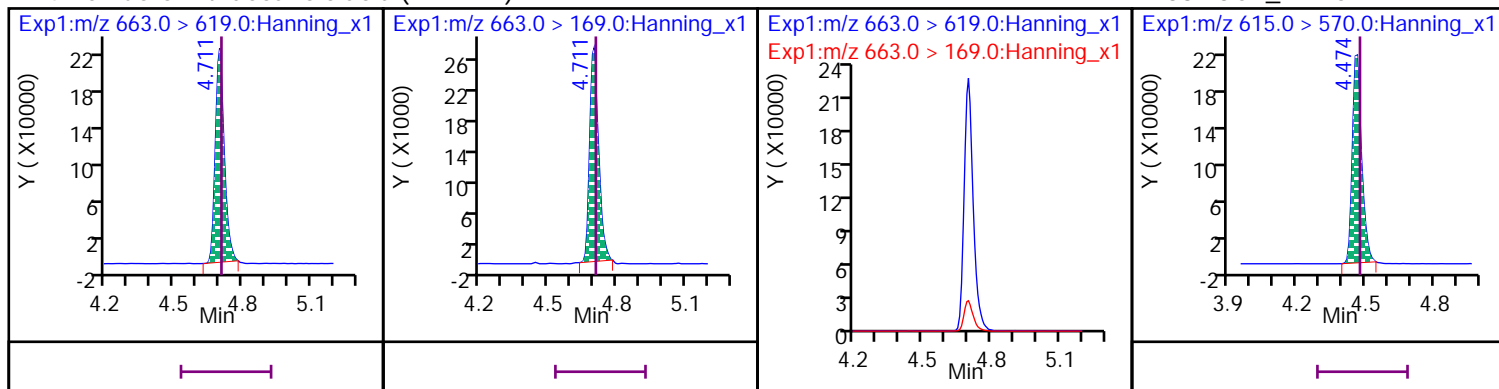
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



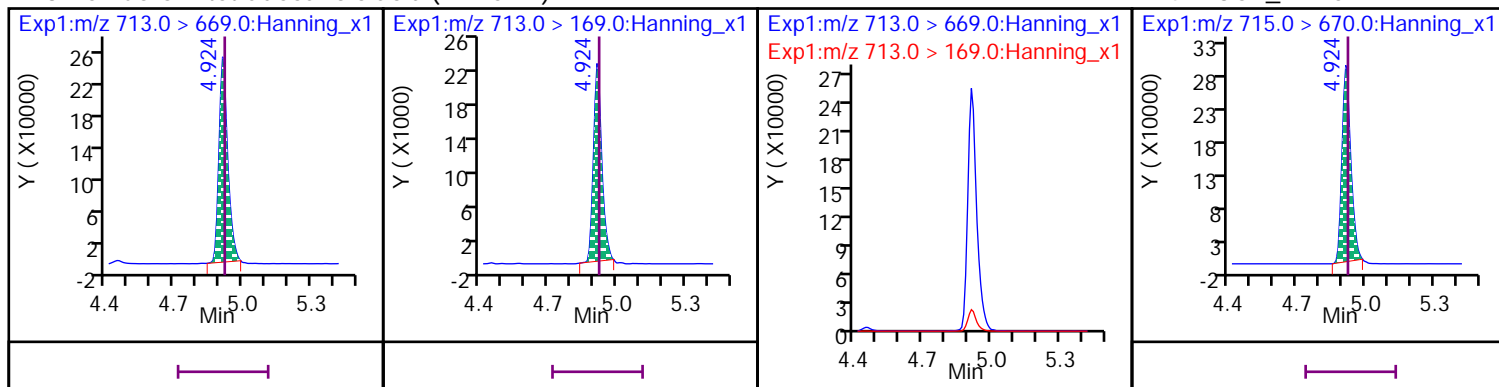
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



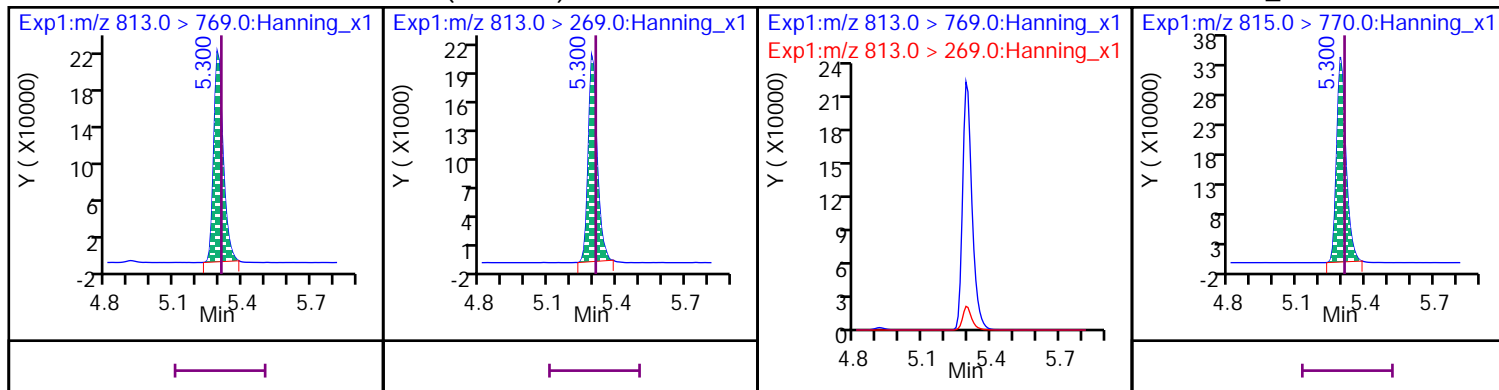
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



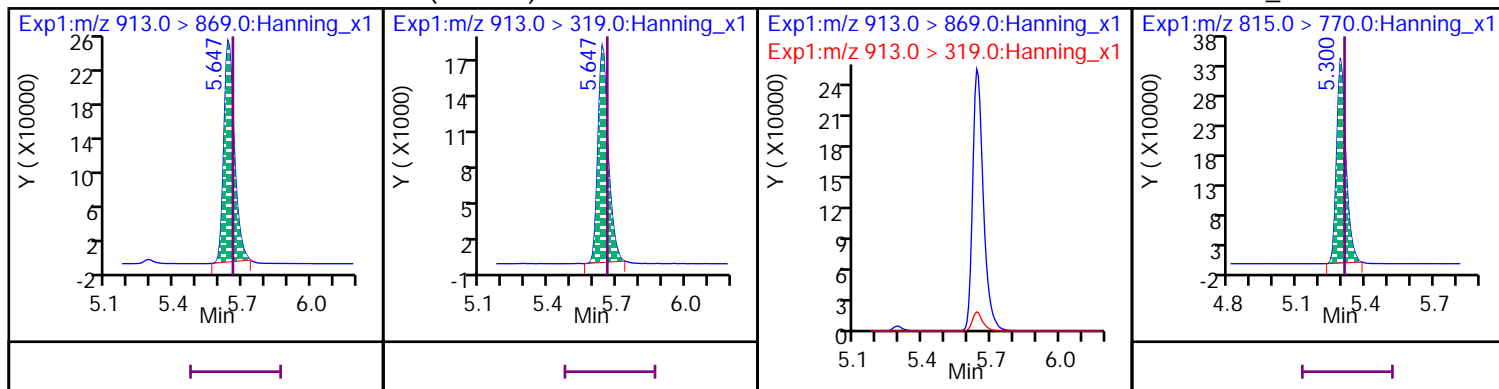
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

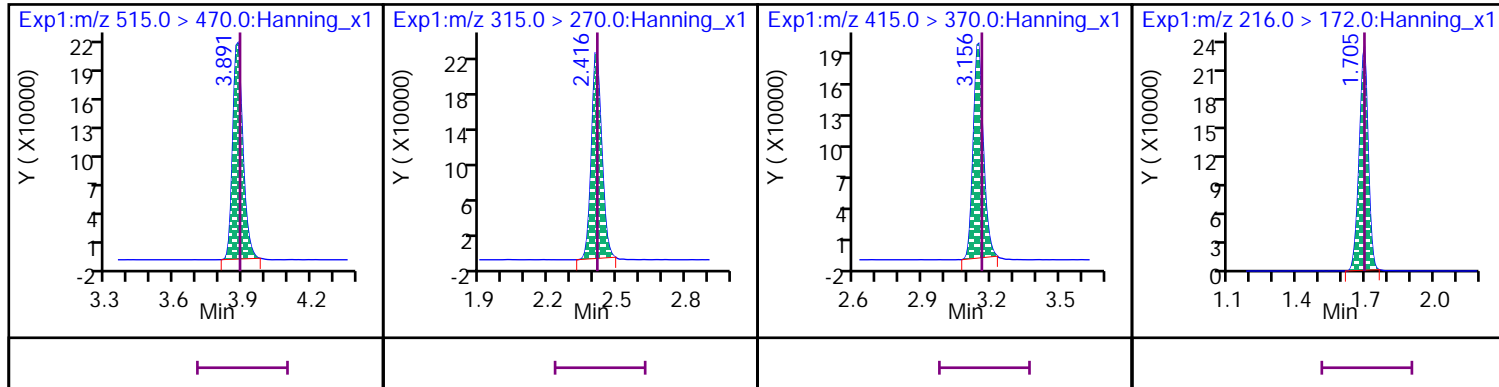


\* 37 13C2\_PFDA

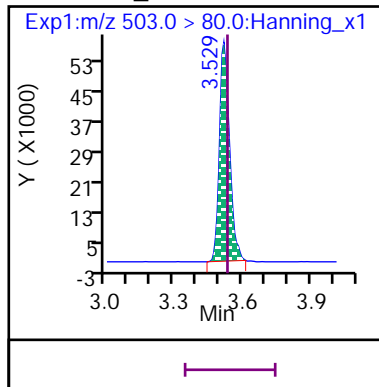
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320048.d

Injection Date: 23-Dec-2020 19:01:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

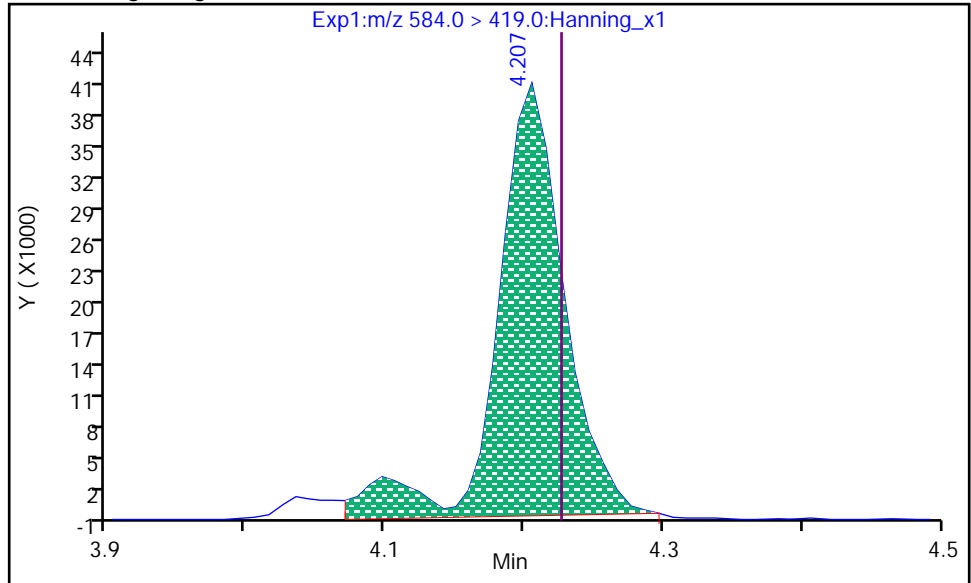
Dil. Factor: 1

Operator: Stephen E. Somerville

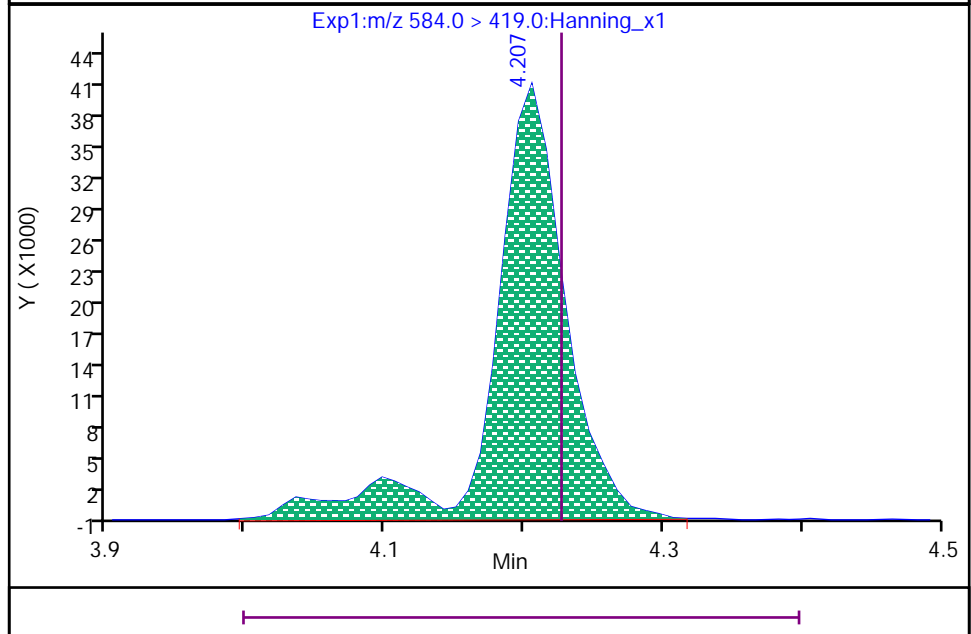
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.207  
Area: 137626  
Amount: 871.37  
Amount Units: ng/L



RT: 4.207  
Area: 148086  
Amount: 937.60  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 07:56:06

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320048.d

Injection Date: 23-Dec-2020 19:01:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

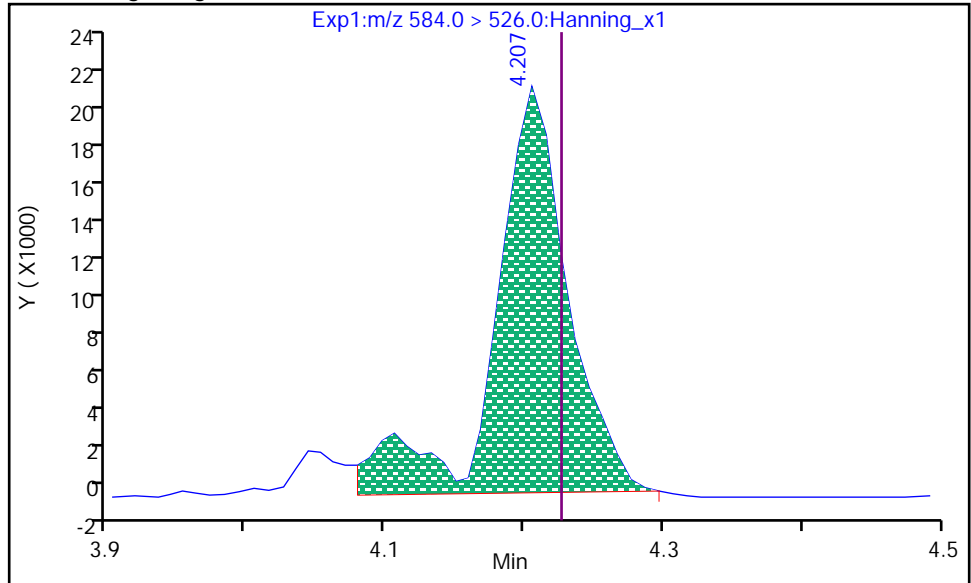
Dil. Factor: 1

Operator: Stephen E. Somerville

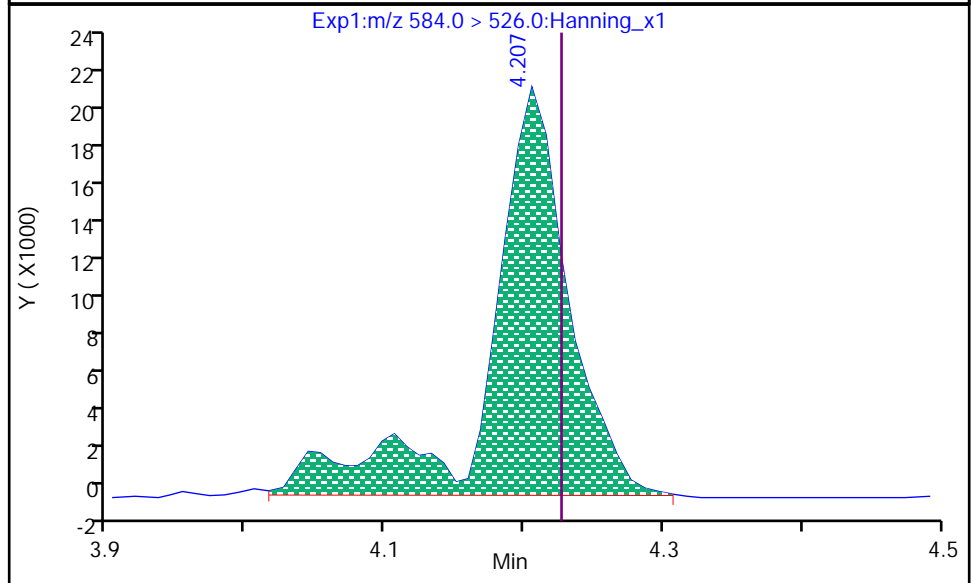
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.207  
Area: 74615  
Amount: 937.60  
Amount Units: ng/L



RT: 4.207  
Area: 81122  
Amount: 937.60  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 07:56:12

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d  
Injection Date: 23-Dec-2020 21:20:19 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 51  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	937.68	93.8	70 - 130
D 46 13C4_PFBA	659896	645850			97.9	50 - 150
D 50 13C5_PFPeA	681912	647074			94.9	50 - 150
21 PFPeA			1000.00	969.54	97	70 - 130
7 PFBS			884.00	767.67	86.8	70 - 130
D 44 13C3_PFBS	234990	249413			106	50 - 150
1 4:2 FTS			934.00	907.05	97.1	70 - 130
D 63 13C2_4:2 FTS_2	145673	133882			91.9	50 - 150
D 49 13C5_PFHxA	739934	708722			95.8	50 - 150
15 PFHxA			1000.00	944.46	94.4	70 - 130
22 PFPeS			938.00	864.67	92.2	70 - 130
28 GenX			2000.00	1822.50	91.1	70 - 130
D 66 13C3_GenX	1382147	1299758			94	50 - 150
D 47 13C4_PFHpA	612609	598952			97.8	50 - 150
13 PFHpA			1000.00	953.13	95.3	70 - 130
D 45 13C3_PFHxS	185632	185681			100	50 - 150
14 PFHxS			910.00	826.06	90.8	70 - 130
29 ADONA			942.00	824.59	87.5	70 - 130
D 64 13C2_6:2 FTS_2	118188	103325			87.4	50 - 150
2 6:2 FTS			948.00	899.17	94.8	70 - 130
20 PFOA			1000.00	944.76	94.5	70 - 130
D 53 13C8_PFOA	612317	599739			97.9	50 - 150
12 PFHpS			952.00	885.38	93	70 - 130
18 PFOS			928.00	848.45	91.4	70 - 130
17 PFNA			1000.00	979.11	97.9	70 - 130
D 56 13C9_PFNA	732148	730359			99.8	50 - 150
D 54 13C8_PFOS	151103	156055			103	50 - 150
30 9CI-PF3ONS			932.00	873.05	93.7	70 - 130
D 55 13C8_PFOSA	323224	310155			96	50 - 150
19 PFOSA			1000.00	938.38	93.8	70 - 130
16 PFNS			960.00	915.62	95.4	70 - 130
D 65 13C2_8:2 FTS_2	93513	96115			103	50 - 150
3 8:2 FTS			958.00	850.90	88.8	70 - 130
10 PFDA			1000.00	968.41	96.8	70 - 130
D 51 13C6_PFDA	641610	647186			101	50 - 150
D 58 d3-MeFOSAA	810340	779392			96.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1029.96	103	70 - 130
9 PFDS			964.00	903.42	93.7	70 - 130
5 N-EtFOSAA			1000.00	969.44	96.9	70 - 130
25 PFUdA			1000.00	935.24	93.5	70 - 130
D 60 d5-EtFOSAA	763091	721014			94.5	50 - 150
D 52 13C7_PFUdA	652802	638806			97.9	50 - 150
D 61 d7-MeFOSE	103832	99005			95.4	50 - 150
32 MeFOSE			1000.00	1009.65	101	70 - 130
26 MeFOSA			1000.00	970.23	97	70 - 130
D 57 d3-MeFOSA	49874	51491			103	50 - 150
31 11Cl-PF3OUDS			942.00	871.94	92.6	70 - 130
D 62 d9-EtFOSE	117283	113662			96.9	50 - 150
33 EtFOSE			1000.00	1023.52	102	70 - 130
D 59 d5-EtFOSA	52571	46833			89.1	50 - 150
D 38 13C2_PFDoA	604828	607852			100	50 - 150
4 10:2 FTS			964.00	823.28	85.4	70 - 130
27 EtFOSA			1000.00	974.38	97.4	70 - 130
11 PFDoA			1000.00	924.39	92.4	70 - 130
34 PFDOS			968.00	867.74	89.6	70 - 130
24 PFTrDA			1000.00	964.65	96.5	70 - 130
23 PFTeDA			1000.00	961.66	96.2	70 - 130
D 42 13C2_PFTeDA	781191	788078			101	50 - 150
35 PFHxDA			1000.00	974.90	97.5	70 - 130
D 40 13C2_PFHxDA	893092	917459			103	50 - 150
36 PFODA			1000.00	932.59	93.3	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d  
 Injection Date: 23-Dec-2020 21:20:19 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 51  
 Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.705	0	645850	24	>100:1			1000.00	931.22	97.9	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/1	603175	23	>100:1			1000.00	937.68		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	647074	19	>100:1			1000.00	940.67	94.9	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	630760	18	>100:1			1000.00	969.54		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.130	0	249413	18	>100:1			1000.00	1083.32	106	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.141	0/0	225748	17	>100:1	Target = 3.50		884.00	767.67		
298.9 > 99	44	2.120	2.141		65048	16	>100:1	3.47 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.442	2.461	-1/-1	187075	19	>100:1	Target = 3.10		938.00	864.67		
349 > 99	44	2.442	2.461		60880	19	>100:1	3.07 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.389	0	133882	19	>100:1			5000.00	5530.41	91.9	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.398	-1/-1	48471	18	>100:1	Target = 1.80		934.00	907.05		
327 > 81	63	2.380	2.398		23799	20	>100:1	2.03 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.425	0	708722	19	>100:1			1000.00	961.54	95.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.425	0/0	660841	20	>100:1	Target = 18.34		1000.00	944.46		
313 > 119	49	2.416	2.425		32441	19	>100:1	20.37 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.532	0	1299758	20	>100:1			5000.00	4879.81	94	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.532	0/0	340378	20	>100:1	Target = 0.81		2000.00	1822.50		
285 > 185	66	2.523	2.532		431615	20	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.783	0	598952	20	>100:1			1000.00	987.32	97.8	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.783	0/0	592151	20	>100:1	Target = 3.70		1000.00	953.13		
363 > 169	47	2.773	2.783		163291	21	>100:1	3.62 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.801	-1	185681	21				1000.00	1084.40	100	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.810	-1/0	162631	27	>100:1	Target = 3.21	0.17	910.00	826.06		
399 > 99	45	2.782	2.810		53027	26	>100:1	3.06 (1.60-4.81)					M
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.810	2.828	-1/0	972067	20	>100:1	Target = 2.97		942.00	824.59		
377 > 85	45	2.810	2.828		330081	20	>100:1	2.94 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.169	-1/0	149344	26	>100:1	Target = 3.08		952.00	885.38		
449 > 99	45	3.142	3.169		50417	24	>100:1	2.96 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.142	-1	103325	26				5000.00	5365.19	87.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.162	-2/-1	38575	20	>100:1	Target = 1.80		948.00	899.17		
427 > 81	64	3.109	3.162		24228	28	>100:1	1.59 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.169	-1	599739	26	>100:1			1000.00	1013.30	97.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.169	-1/0	577630	26	>100:1	Target = 2.87		1000.00	944.76		
413 > 169	53	3.142	3.169		194978	25	>100:1	2.96 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.515	3.545	-1	156055	21				1000.00	1040.86	103	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.553	-1/0	156898	41	>100:1	Target = 3.84	0.28	928.00	848.45		
499 > 99	54	3.515	3.553		46072	44	>100:1	3.40 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.730	3.751	-1/0	458660	24	>100:1			932.00	873.05		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.866	3.883	-1/0	109347	22	>100:1	Target = 3.07		960.00	915.62		
549 > 99	54	3.866	3.883		37502	19	>100:1	2.91 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.171	4.198	-1/0	102316	17		Target = 3.03		964.00	903.42		
599 > 99	54	4.171	4.198		38104	18	>100:1	2.68 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.329	4.349	-1/0	386432	17	>100:1			942.00	871.94		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.698	-1/0	108715	19	>100:1	Target = 3.33		968.00	867.74		
699 > 99	54	4.673	4.698		34864	18		3.11 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.553	-1	730359	22	>100:1			1000.00	972.56	99.8	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.553	-1/0	715125	23	>100:1	Target = 6.16		1000.00	979.11		
463 > 169	56	3.515	3.553		112511	22	>100:1	6.35 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.867	-1	310155	21	>100:1			1000.00	1001.91	96	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.875	-1/0	286810	21	>100:1			1000.00	938.38		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.891	-1	96115	19	>100:1			5000.00	5181.36	103	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.891	-1/0	32969	18	>100:1	Target = 1.95		958.00	850.90		
527 > 81	65	3.858	3.891		16273	28		2.02 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.494	-1/0	36572	22	>100:1	Target = 3.14		964.00	823.28		
627 > 80	65	4.465	4.494		11037	25		3.31 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.874	3.899	-1	647186	21	>100:1			1000.00	975.66	101	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.874	3.899	-1/0	615834	20	>100:1	Target = 15.94		1000.00	968.41		
513 > 169	51	3.874	3.899		44154	20	>100:1	13.94 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.057	-1	779392	18	>100:1			5000.00	5429.81	96.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.065	-2/-1	123326	32	>100:1	Target = 1.33	0.08	1000.00	1029.96		M
570 > 483	58	4.039	4.065		86650	39	>100:1	1.42 (0.66-1.99)	0.22				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.208	-1	721014	19	>100:1			5000.00	5428.72	94.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.228	-1/0	139179	36	>100:1	Target = 1.58	0.06	1000.00	969.44		M
584 > 526	60	4.198	4.228		82576	37	>100:1	1.68 (0.79-2.37)	0.14				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.208	-1	638806	19	>100:1			1000.00	1010.65	97.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.188	4.218	-1/0	561514	17	>100:1	Target = 15.50		1000.00	935.24		
563 > 169	52	4.188	4.218		36298	15	>100:1	15.46 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.309	-1	99005	16	>100:1			1000.00	914.95	95.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.309	0/1	93923	20	>100:1			1000.00	1009.65		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.319	0	51491	16	56:1			1000.00	973.05	103	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.319	0/0	56363	16	>100:1	Target = 1.12		1000.00	970.23		
512 > 219	57	4.319	4.319		47071	15	>100:1	1.19 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.467	0	113662	17	>100:1			1000.00	906.43	96.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.476	0/0	103501	20	>100:1			1000.00	1023.52		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.485	-1	607852	18	>100:1			1000.00	1004.19	100	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.476	-1/0	569013	19	>100:1	Target = 10.85		1000.00	924.39		
613 > 169	38	4.465	4.476		51457	18	>100:1	11.05 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.697	4.719	-1/0	577531	20	>100:1	Target = 8.37		1000.00	964.65		
663 > 169	38	4.704	4.719		67346	20	>100:1	8.57 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.485	0	46833	17	>100:1			1000.00	953.94	89.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.494	0/0	49855	18	>100:1	Target = 1.03		1000.00	974.38		
526 > 219	59	4.483	4.494		47679	17	>100:1	1.04 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.916	4.933	-1	788078	19	>100:1			1000.00	935.47	101	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.916	4.933	-1/0	656653	21	87:1	Target = 12.11		1000.00	961.66		
713 > 169	42	4.916	4.933		53925	21	>100:1	12.17 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.318	-1	917459	19	>100:1			1000.00	1012.46	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.318	-1/0	584409	20	>100:1	Target = 11.48		1000.00	974.90		
813 > 269	40	5.292	5.318		52640	19	>100:1	11.10 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.640	5.668	-1/0	757405	26	96:1	Target = 13.88		1000.00	932.59		
913 > 319	40	5.640	5.668		53727	23	>100:1	14.09 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.899	-1	670348	21	>100:1					92.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.425	0	662633	20	>100:1					90.8	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.169	-1	575956	24	>100:1					92.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	601725	23	>100:1					99.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80	3.515	3.545	-1	162393	22	>100:1						102	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

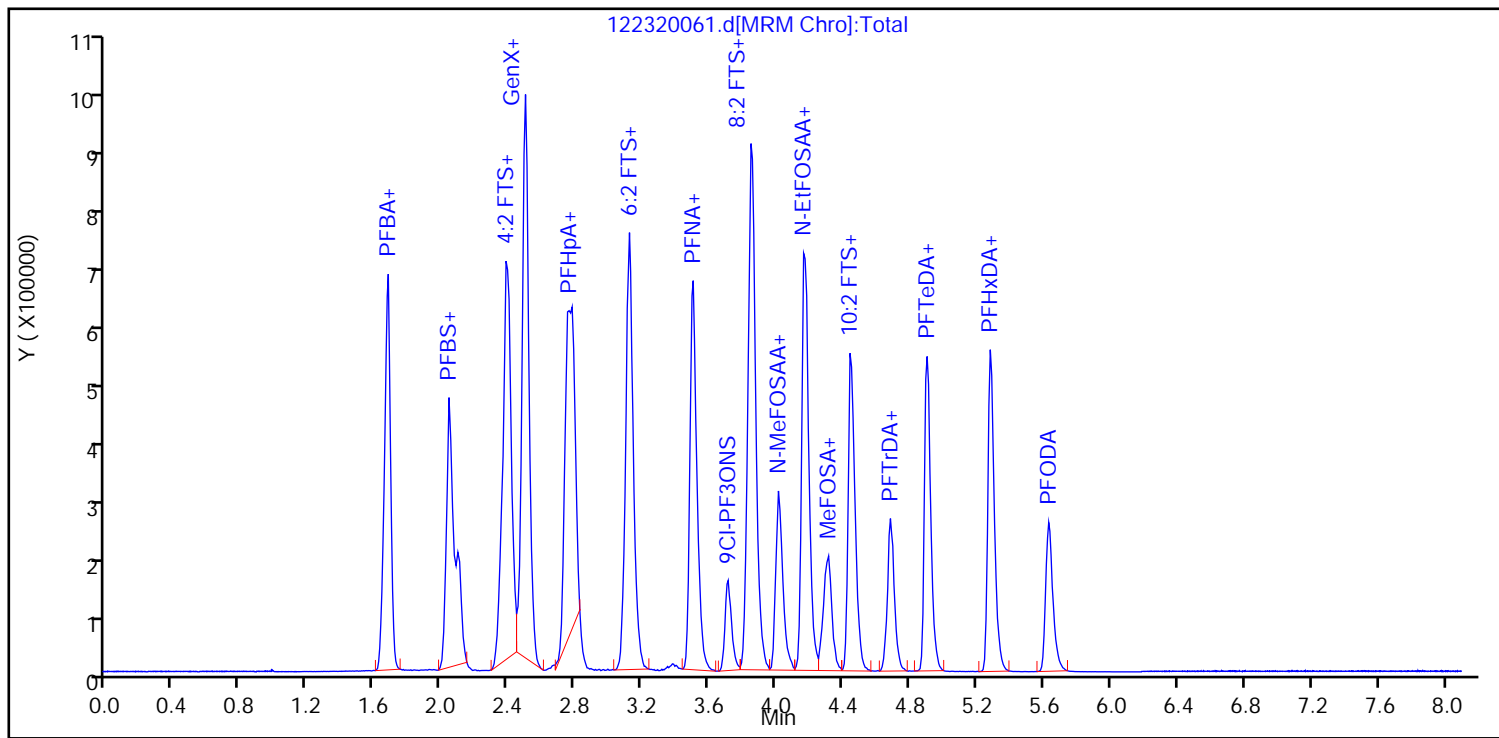
Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

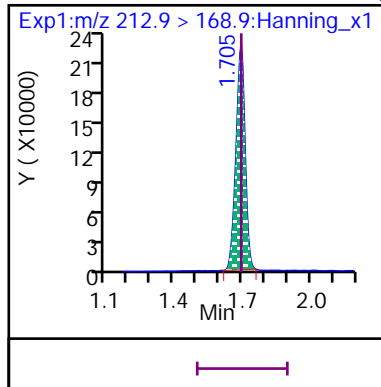
Sample Info: ID CCV 1000C\_SVLC-1248

Dil. Factor: 1

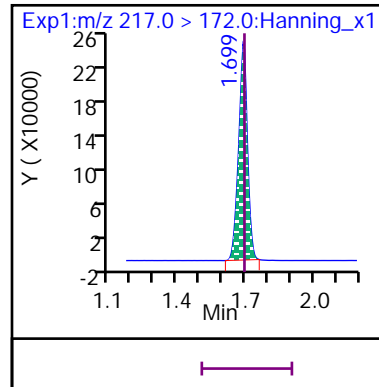
Operator: Stephen E. Somerville



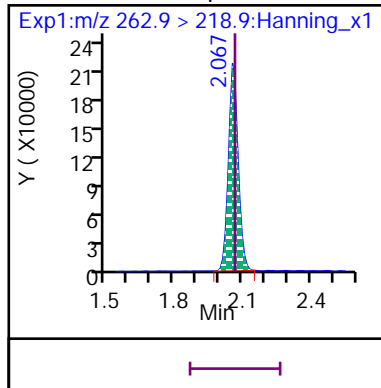
8 Perfluoro-n-butanoic acid (PFBA)



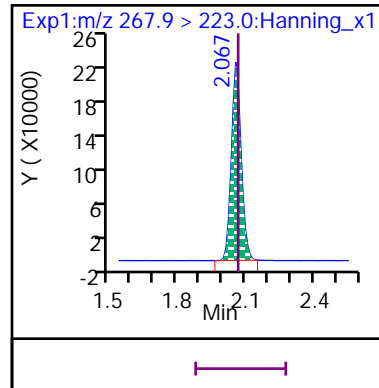
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

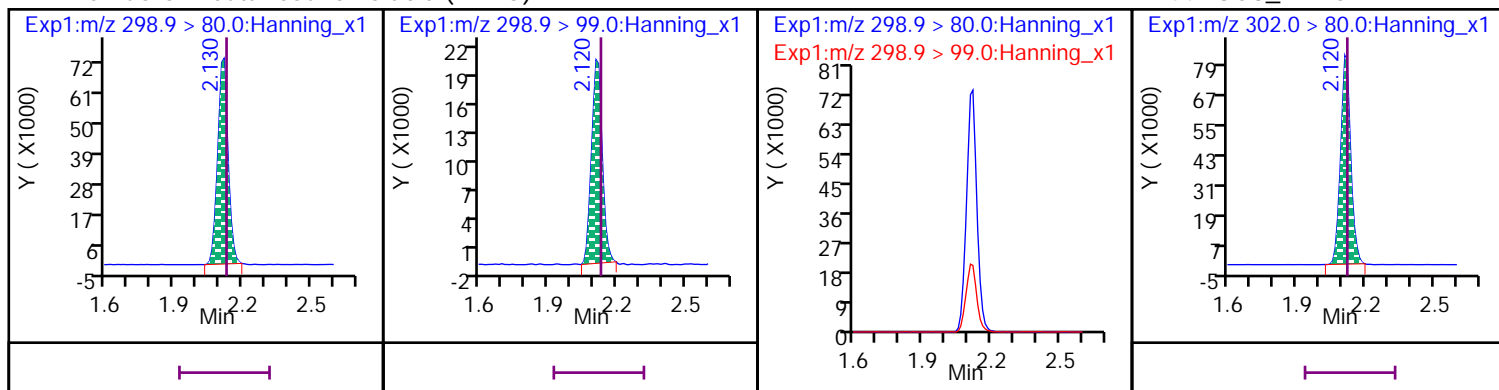


D 50 13C5\_PFPeA



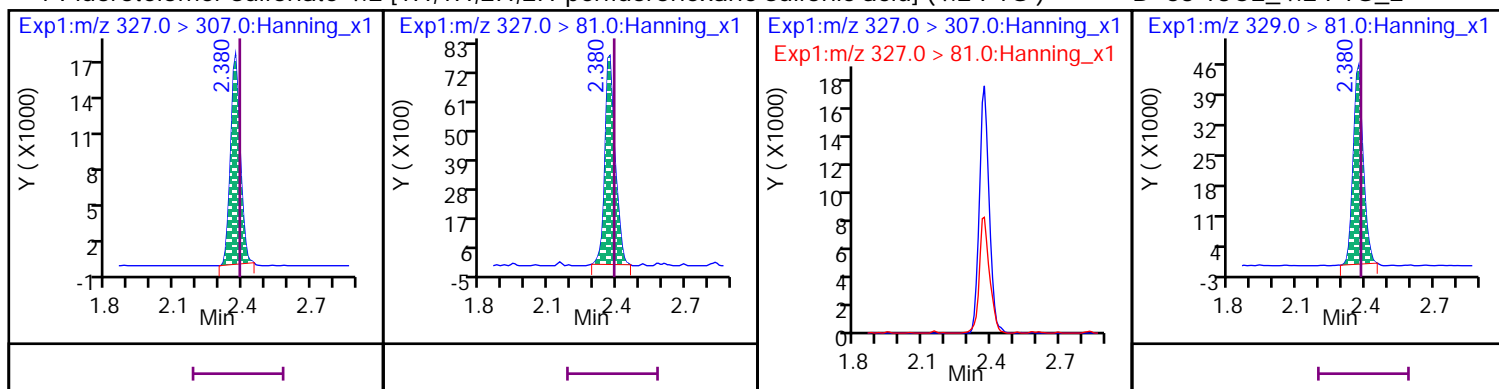
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



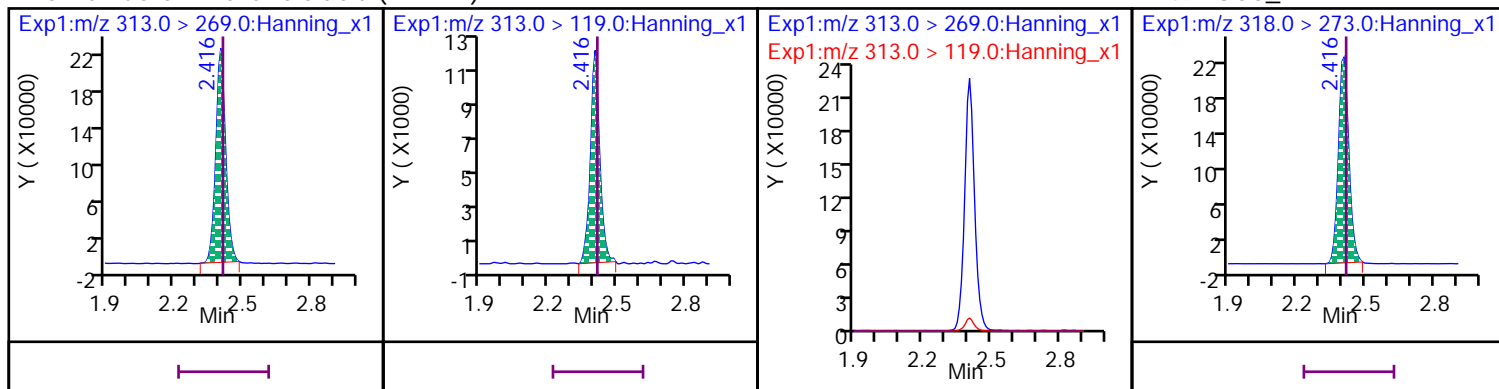
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



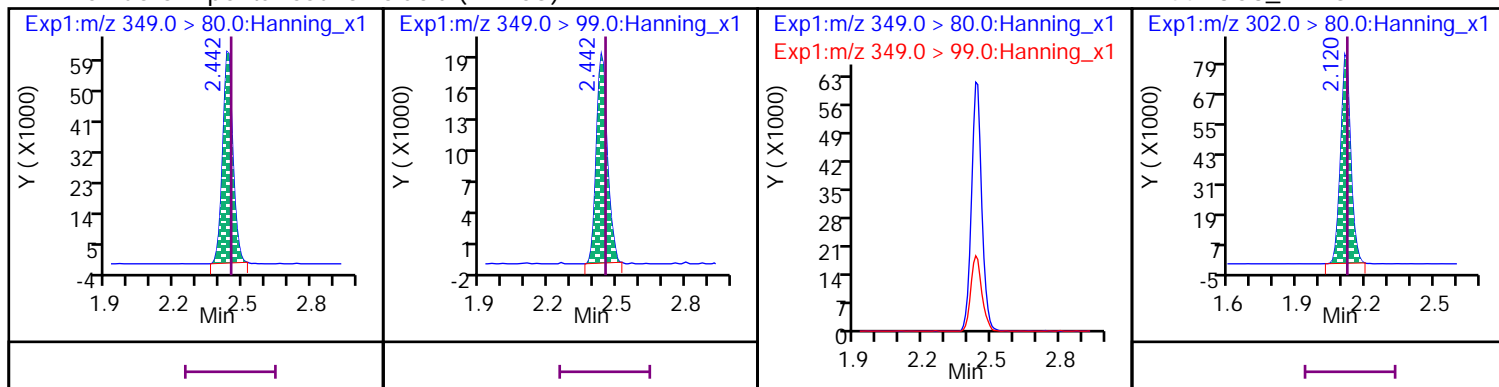
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



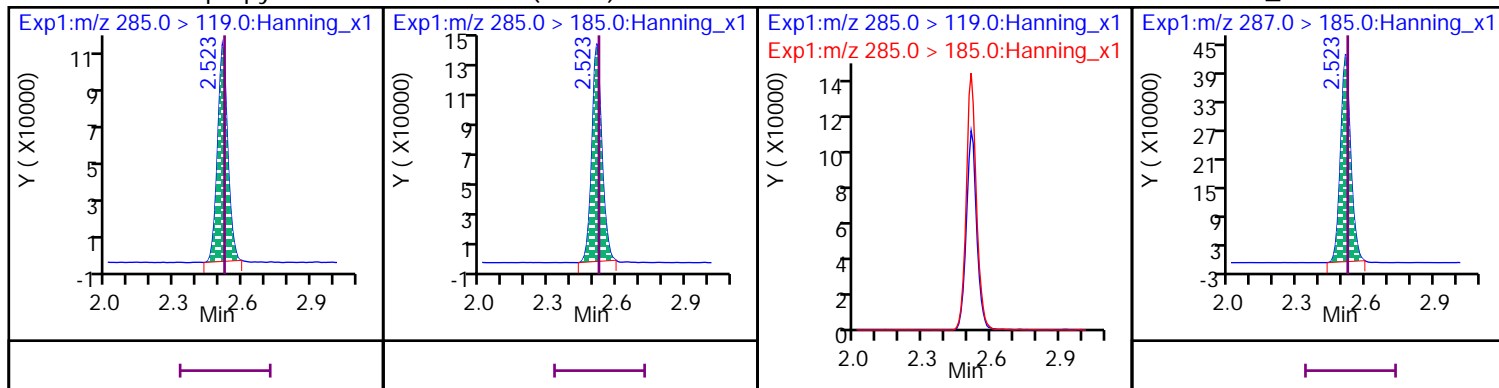
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



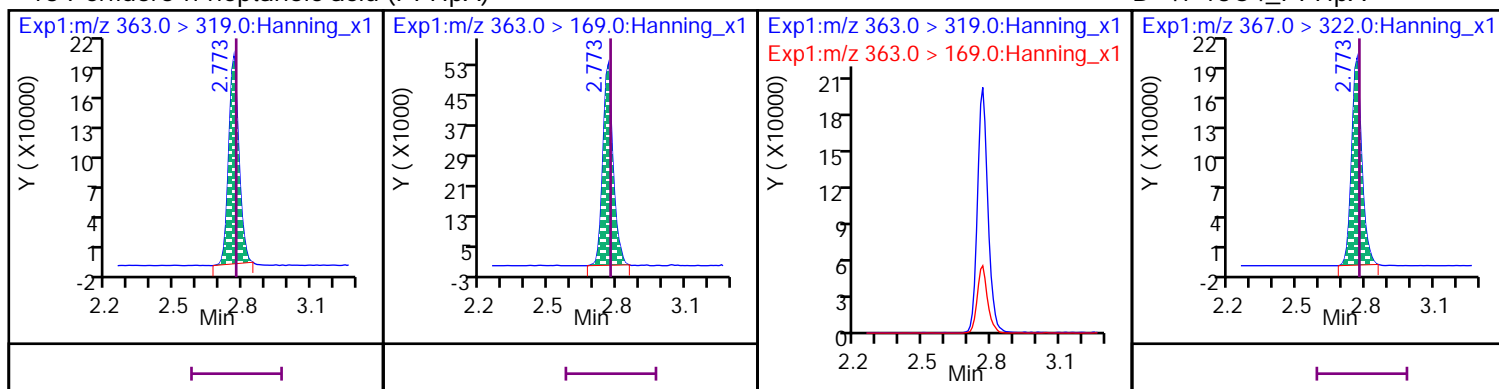
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



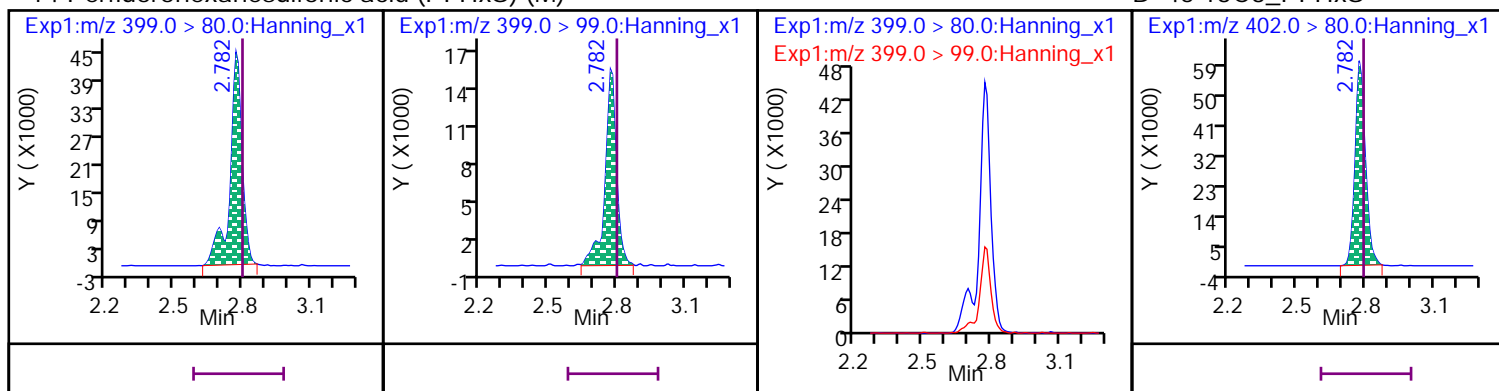
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



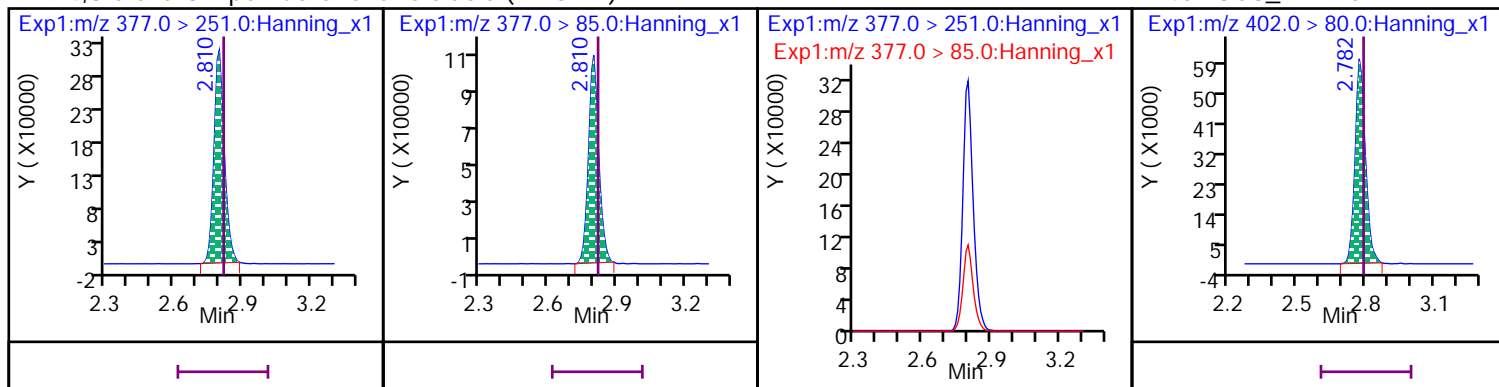
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



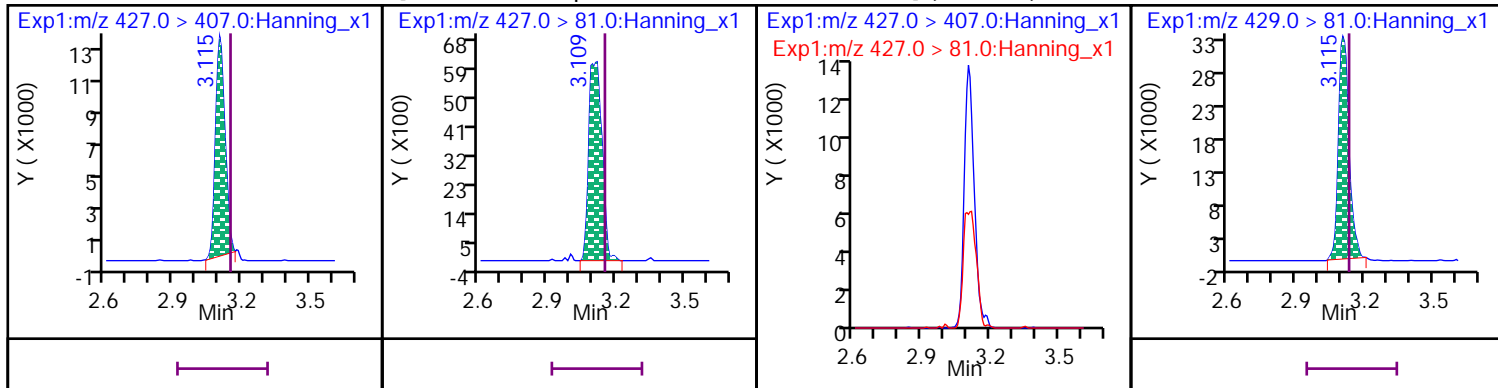
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



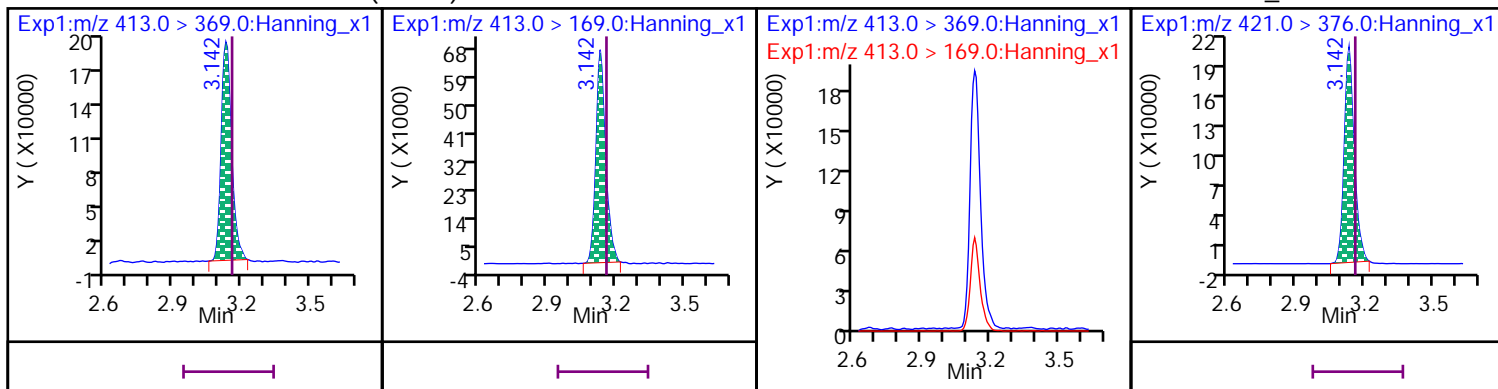
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



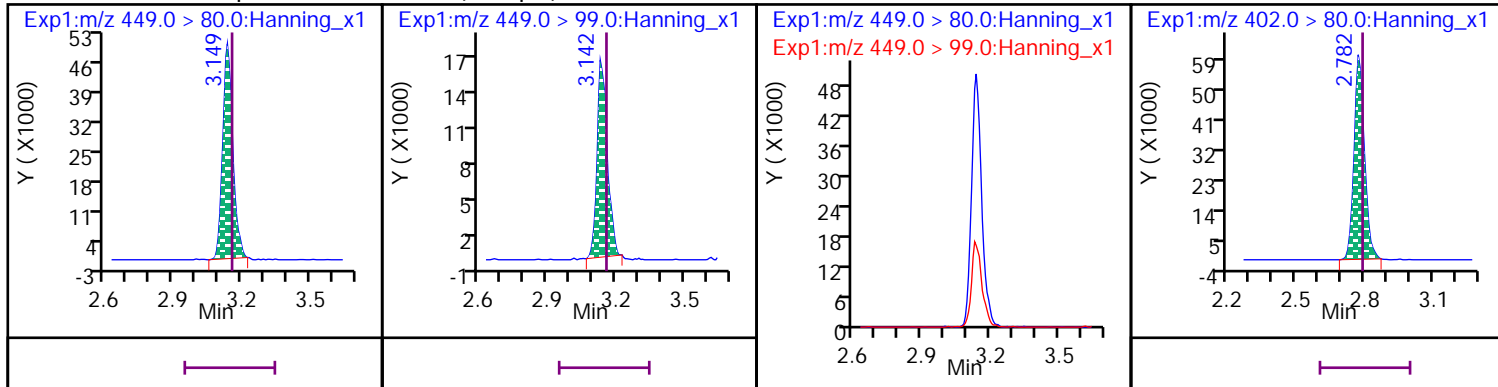
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



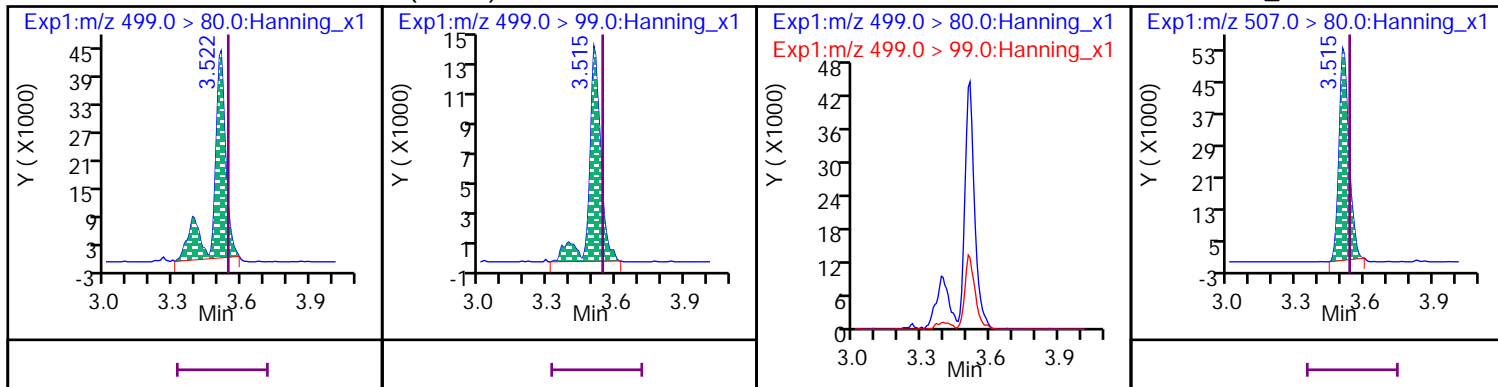
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



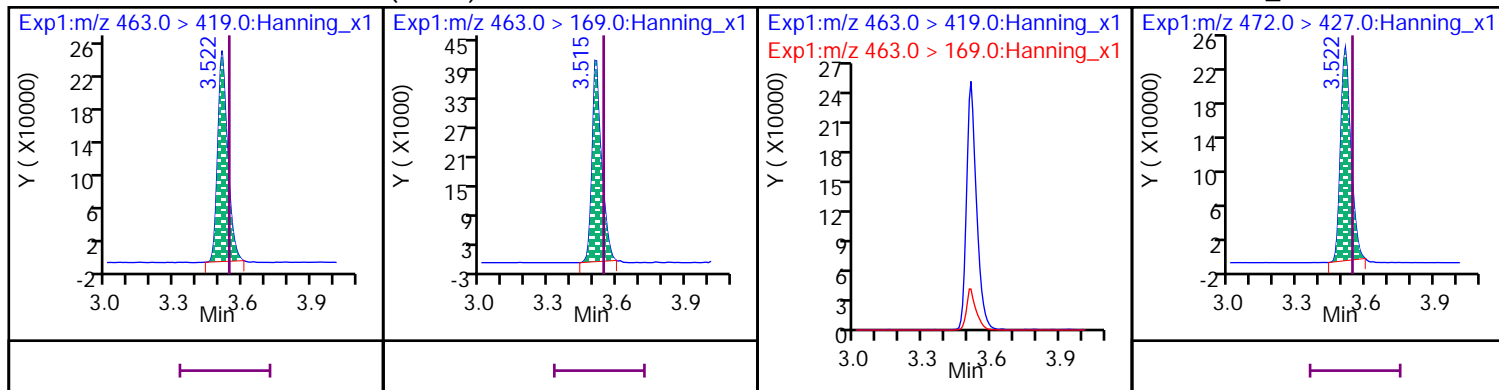
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



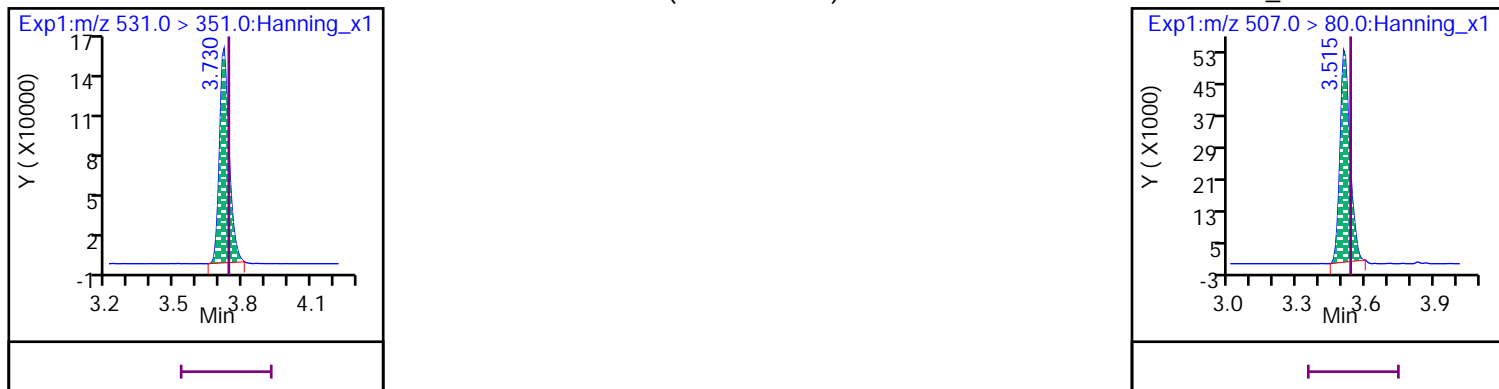
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



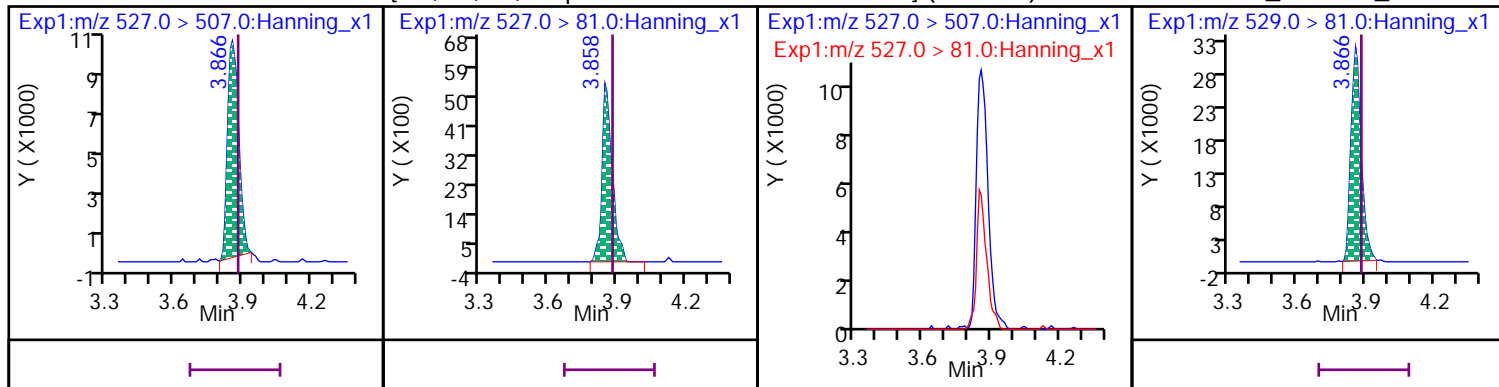
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

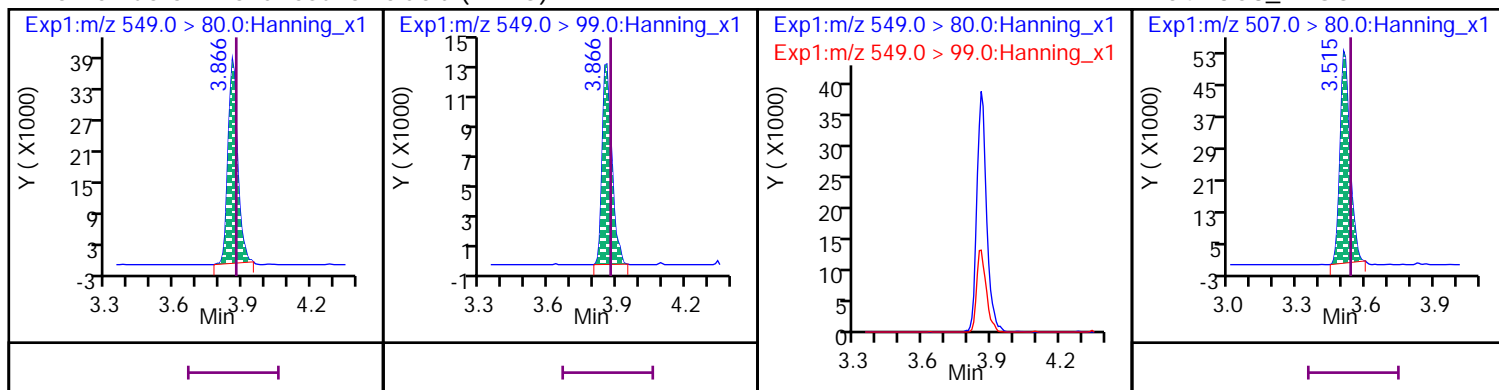
D 65 13C2\_8:2 FTS\_2





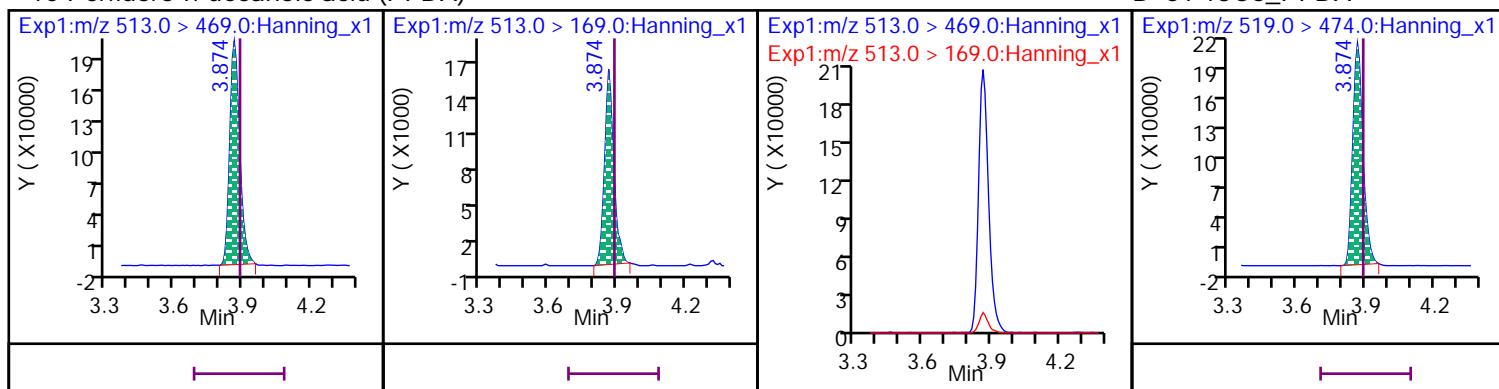
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



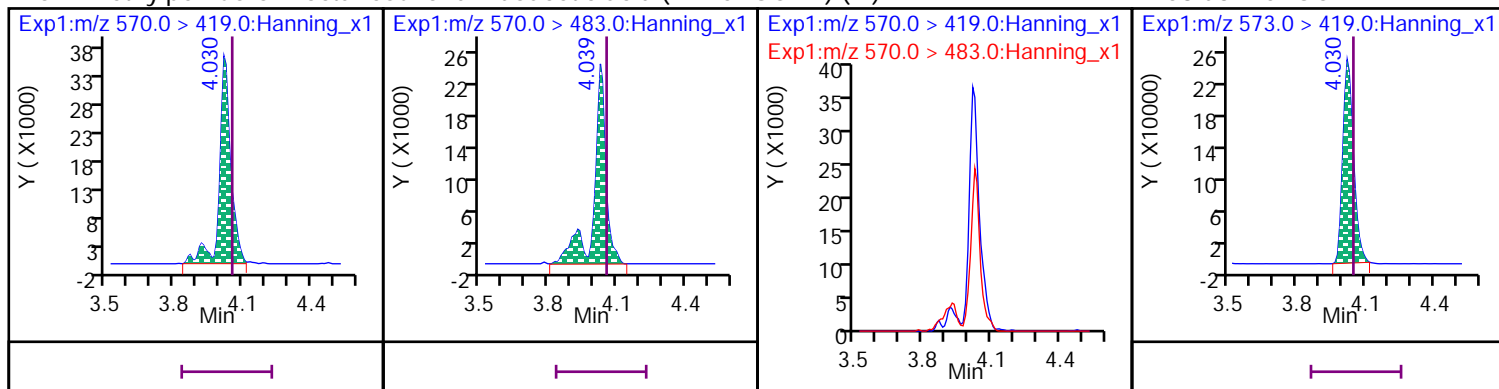
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



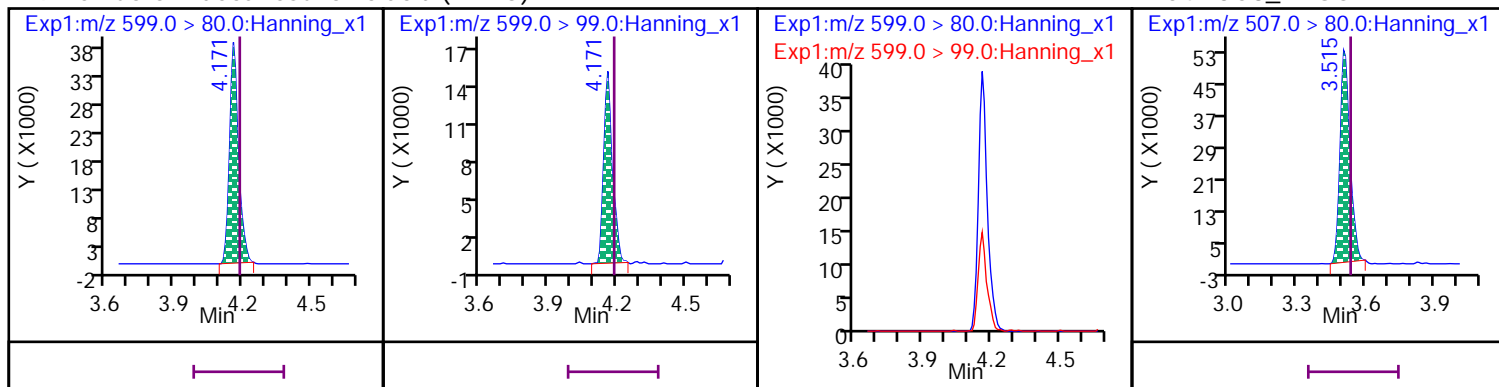
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



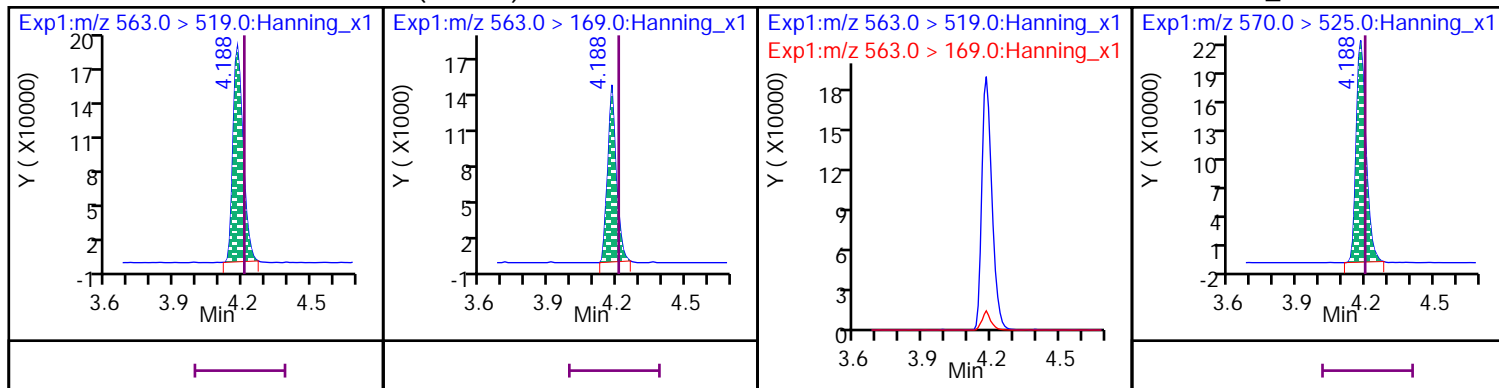
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



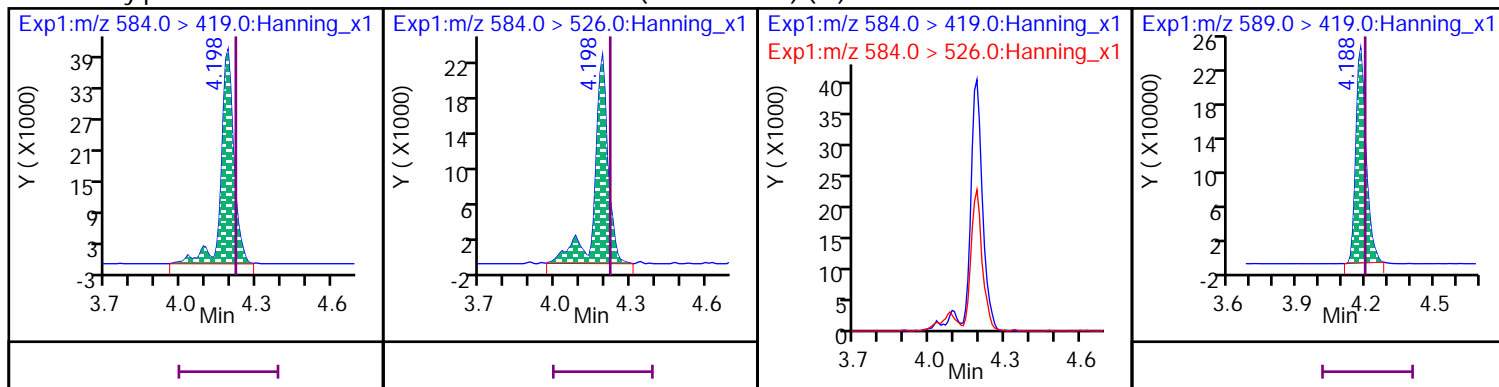
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



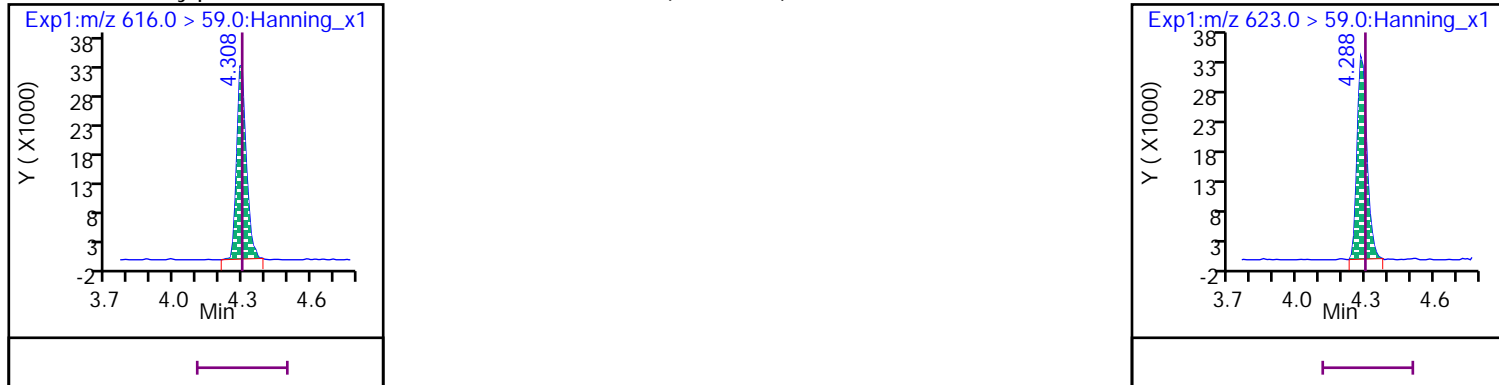
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



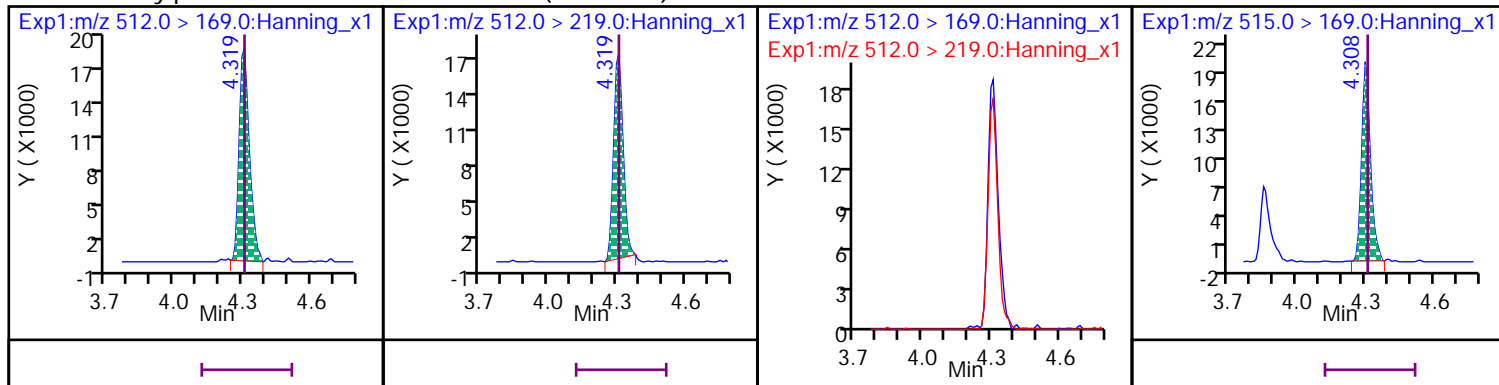
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

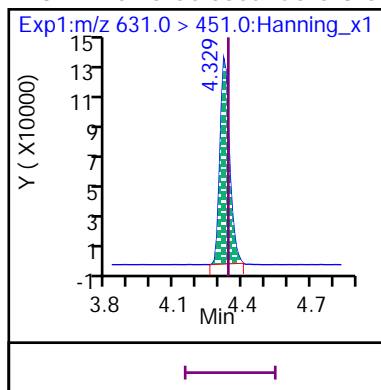


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

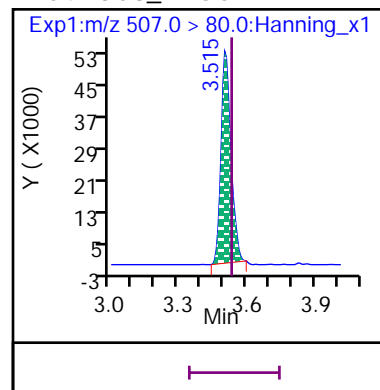
D 57 d3-MeFOSA



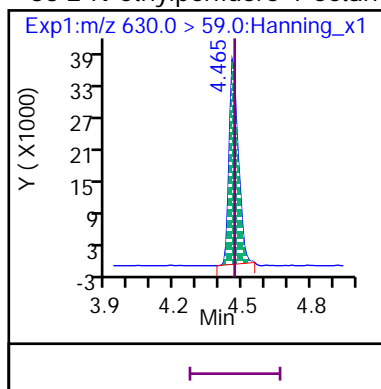
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



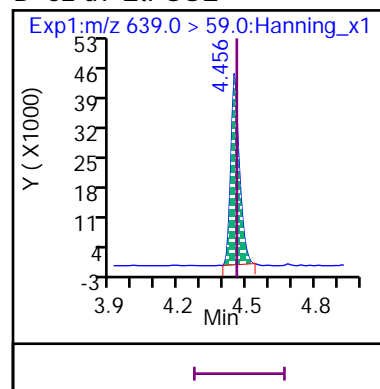
D 54 13C8\_PFOS



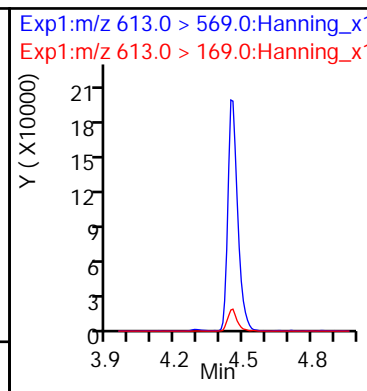
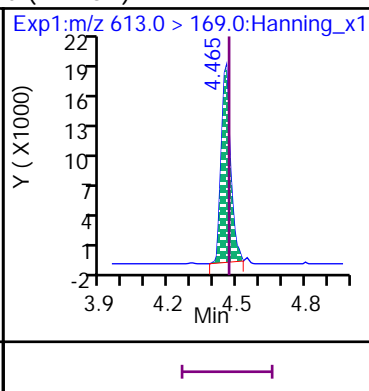
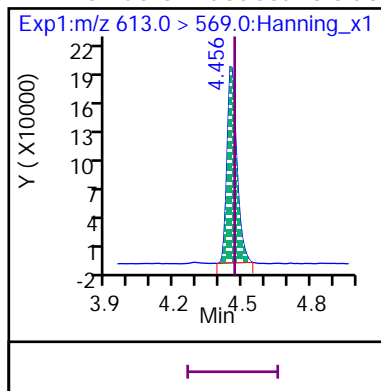
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



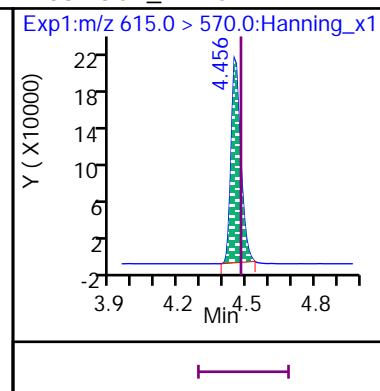
D 62 d9-EtFOSE



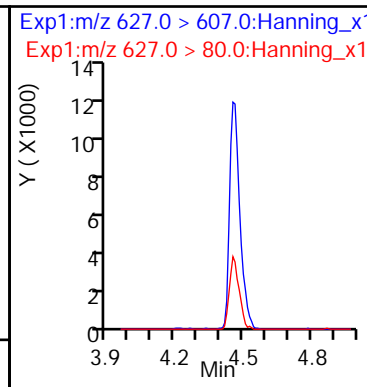
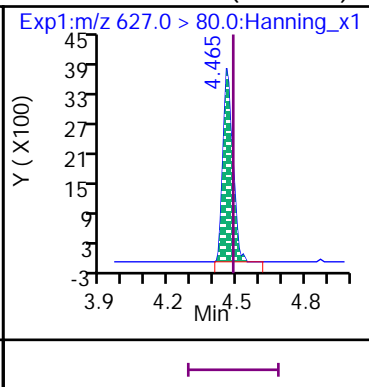
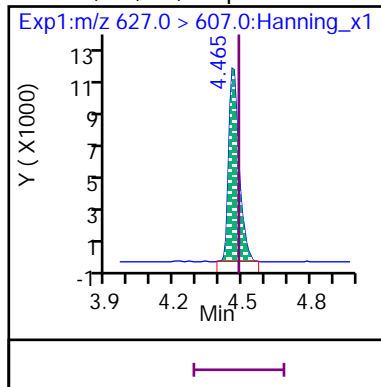
11 Perfluoro-n-dodecanoic acid (PFDoA)



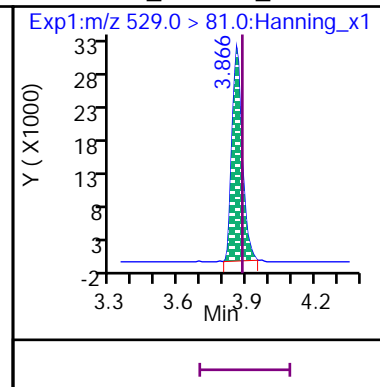
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

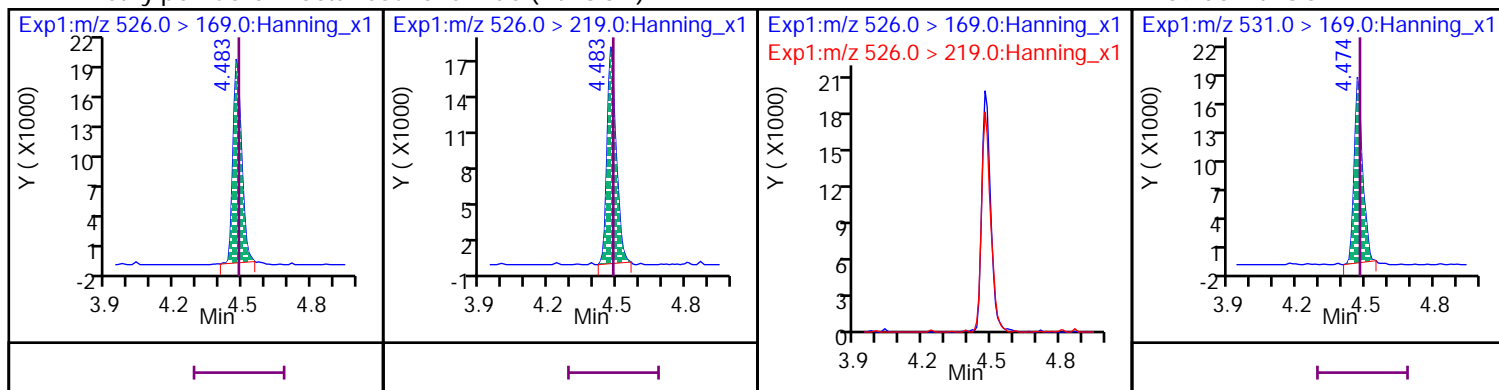


D 65 13C2\_8:2 FTS\_2



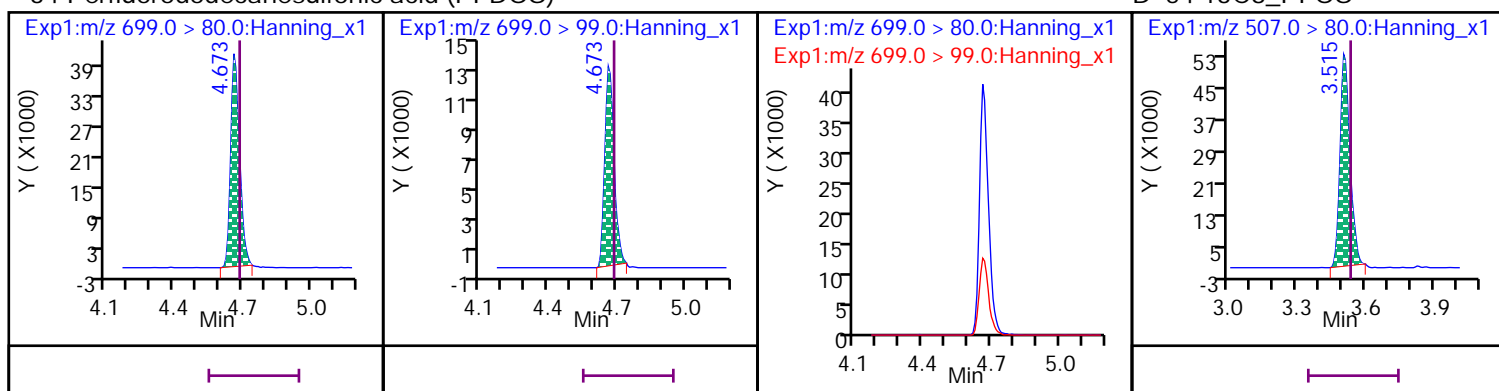
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



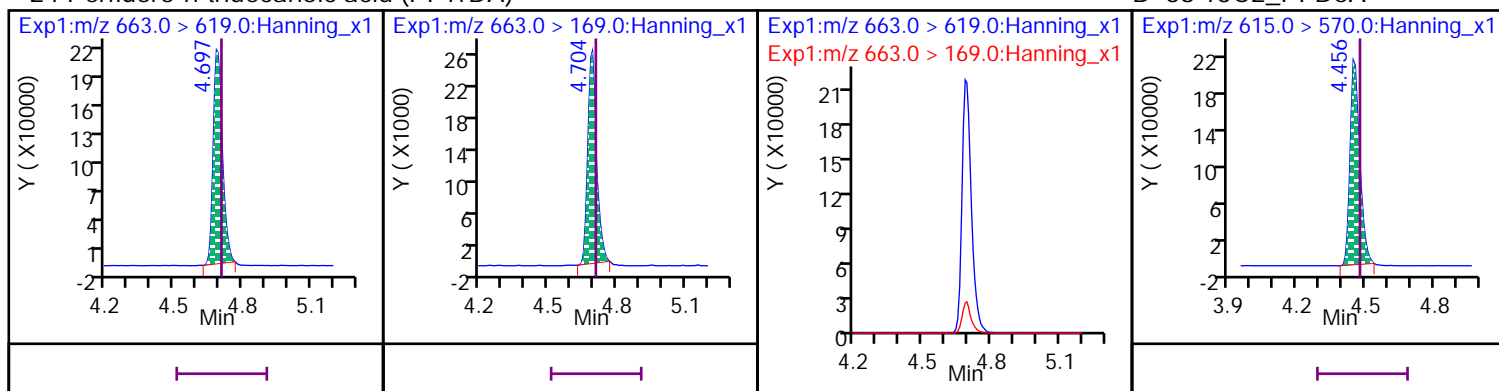
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



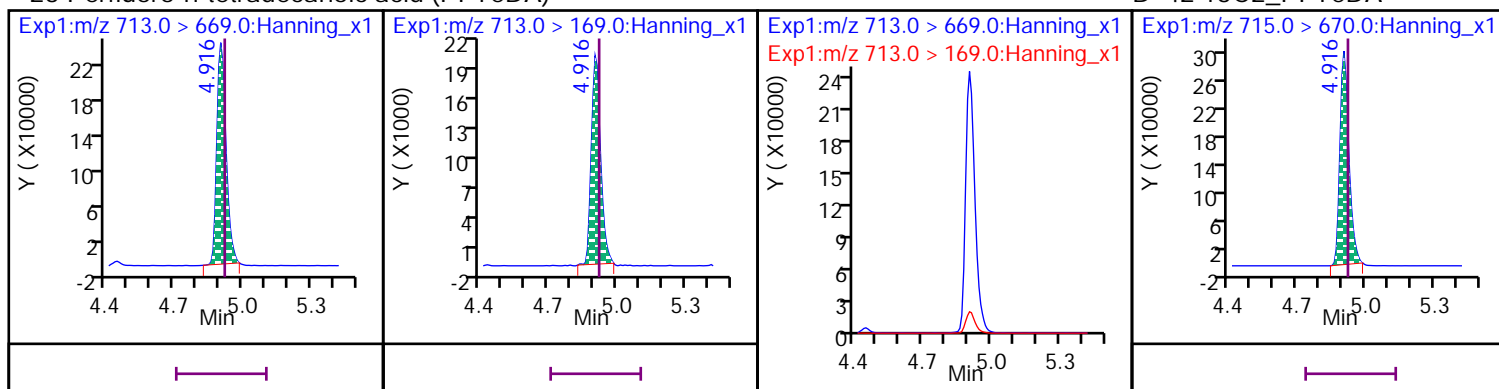
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



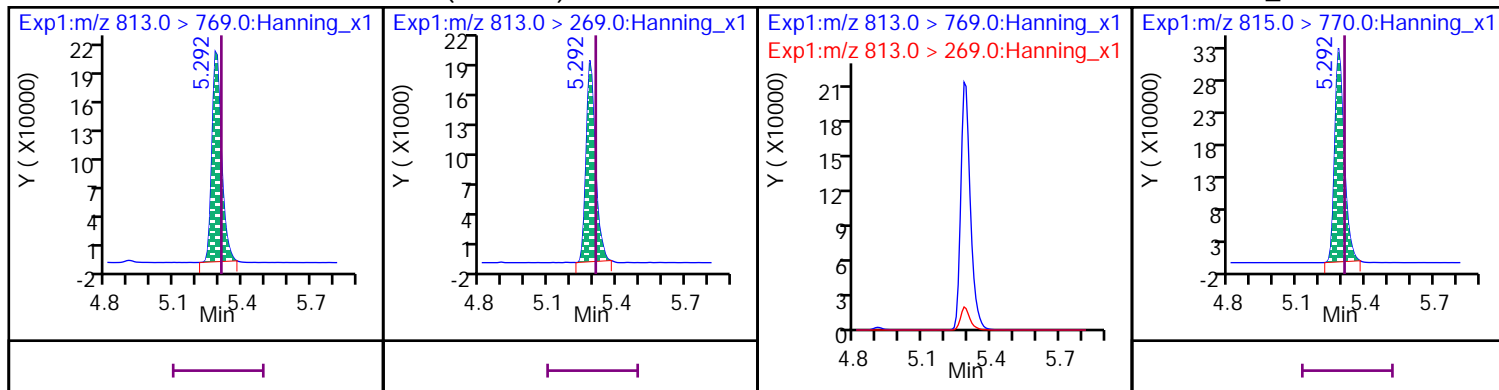
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



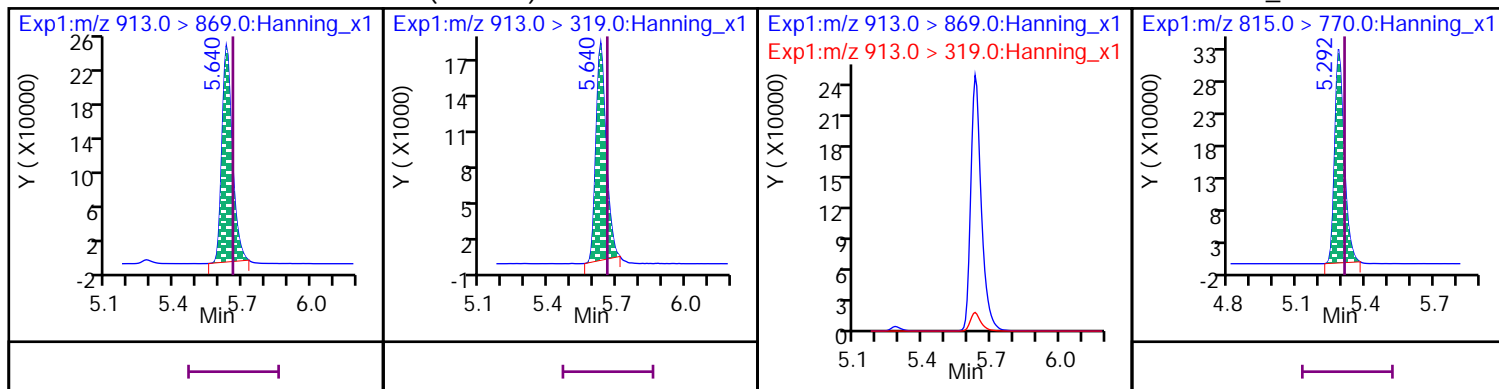
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

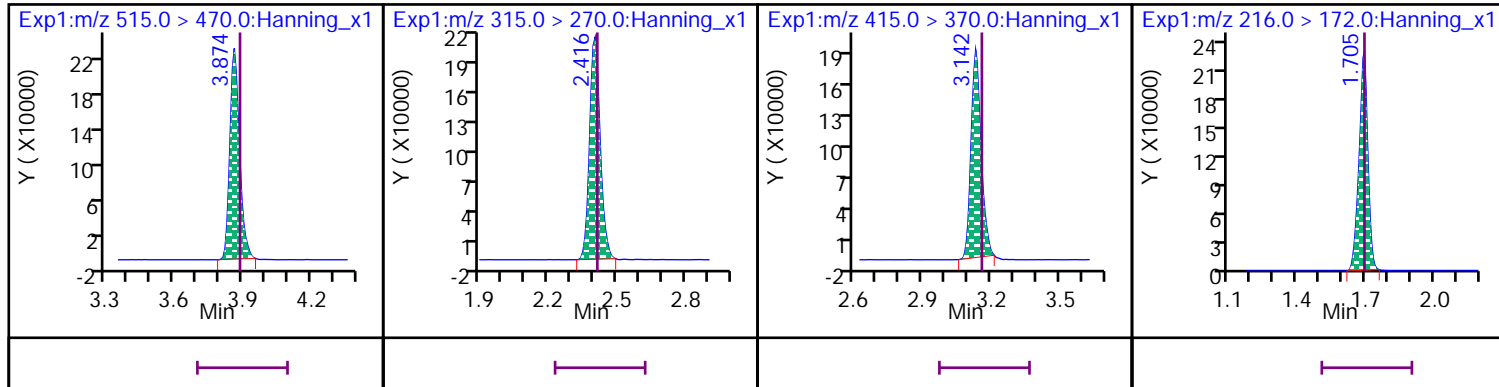


\* 37 13C2\_PFDA

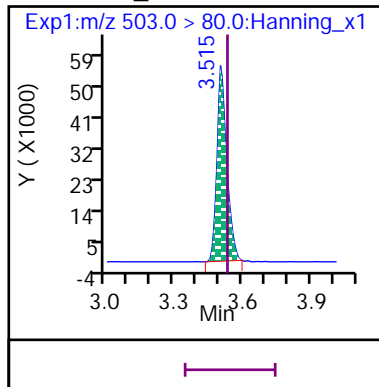
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

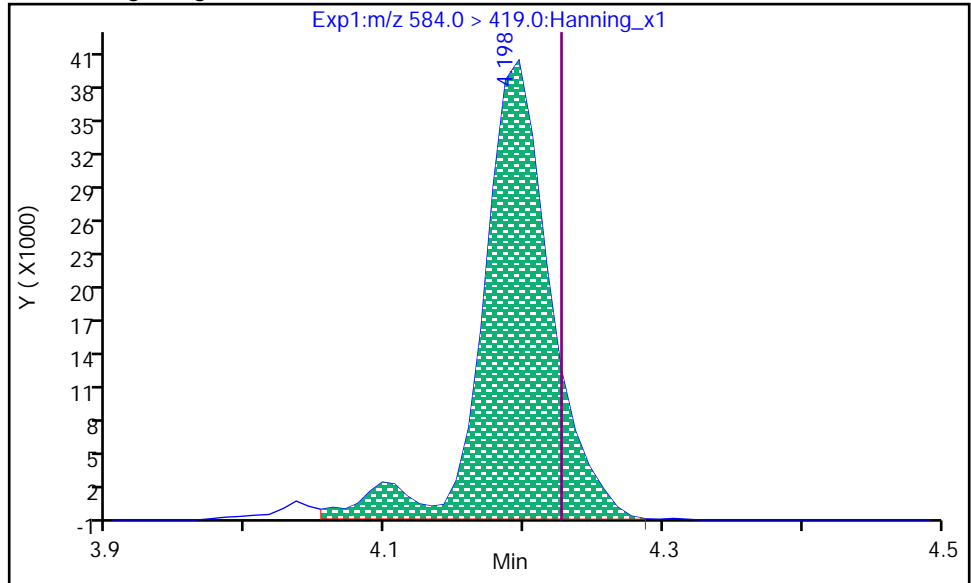
Dil. Factor: 1

Operator: Stephen E. Somerville

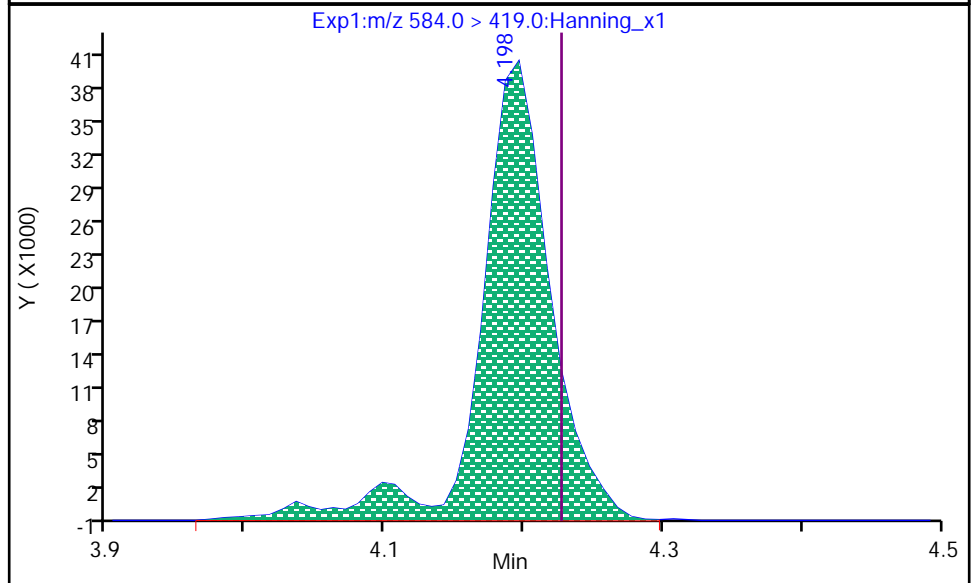
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.198  
Area: 134176  
Amount: 934.59  
Amount Units: ng/L



RT: 4.198  
Area: 139179  
Amount: 969.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 08:06:53

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

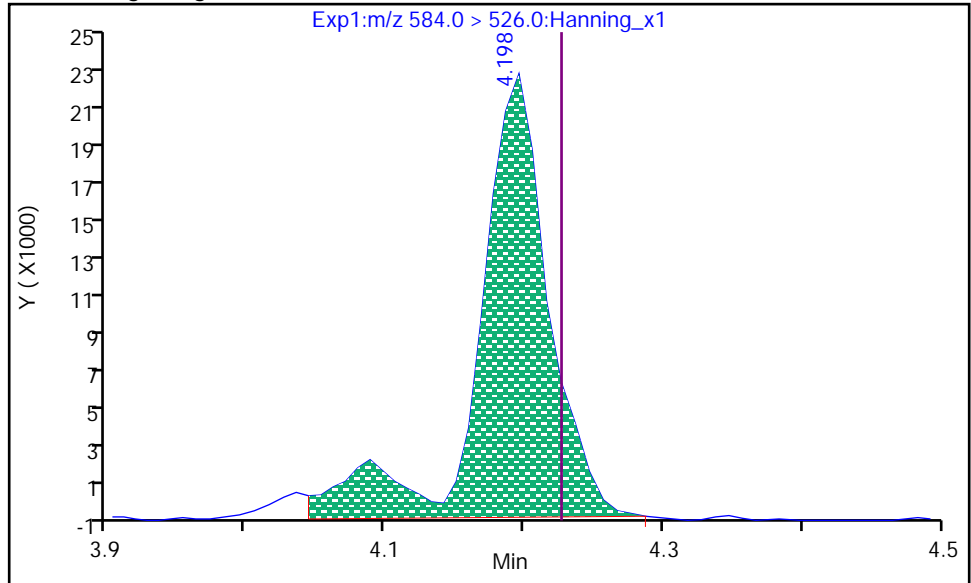
Dil. Factor: 1

Operator: Stephen E. Somerville

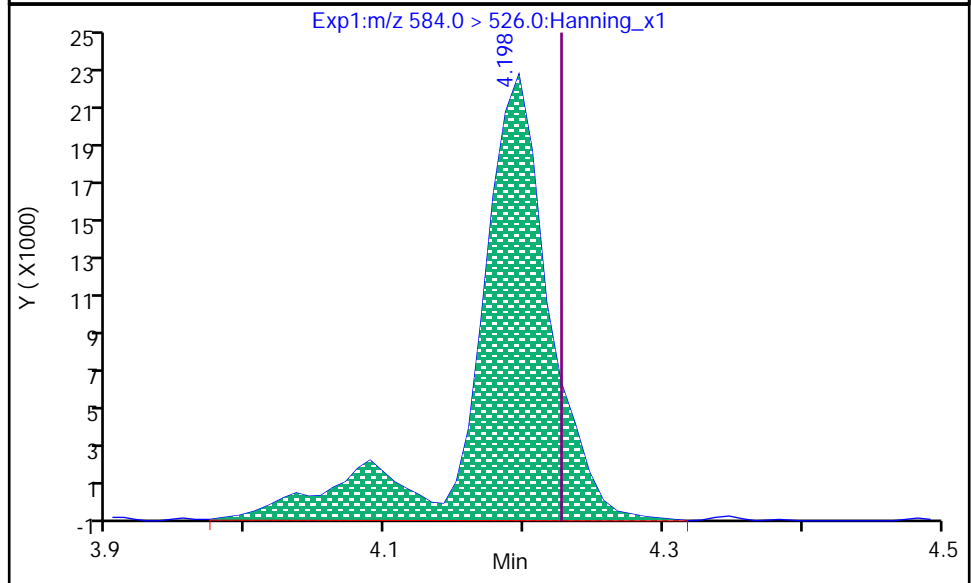
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.198  
Area: 77840  
Amount: 969.44  
Amount Units: ng/L



RT: 4.198  
Area: 82576  
Amount: 969.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 08:07:01

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

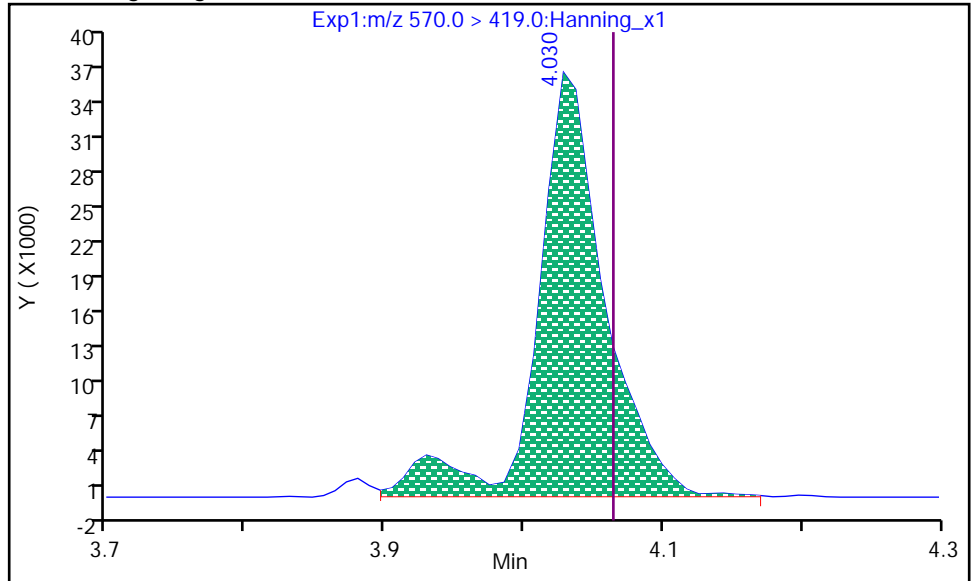
Dil. Factor: 1

Operator: Stephen E. Somerville

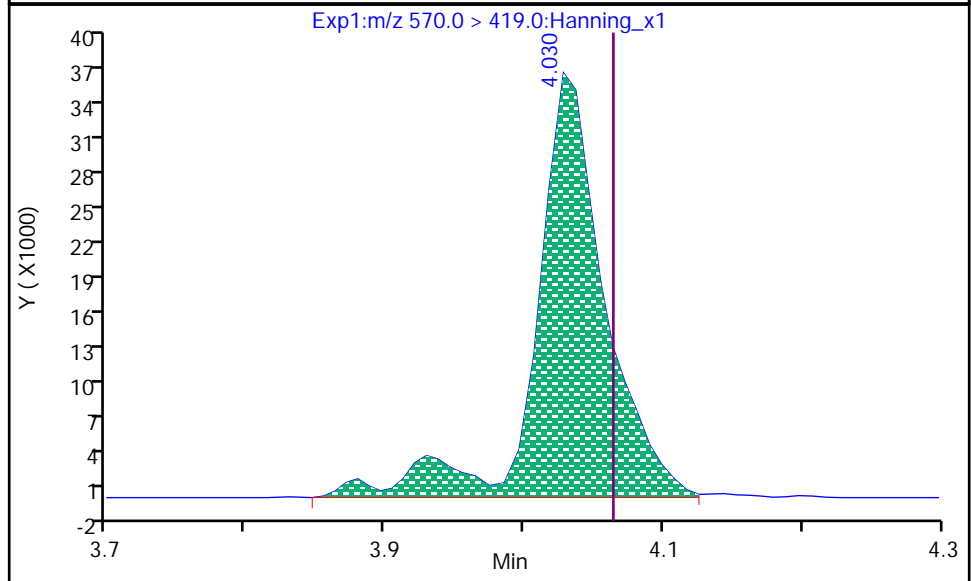
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.030  
Area: 121343  
Amount: 1013.40  
Amount Units: ng/L



RT: 4.030  
Area: 123326  
Amount: 1029.96  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 08:06:35

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

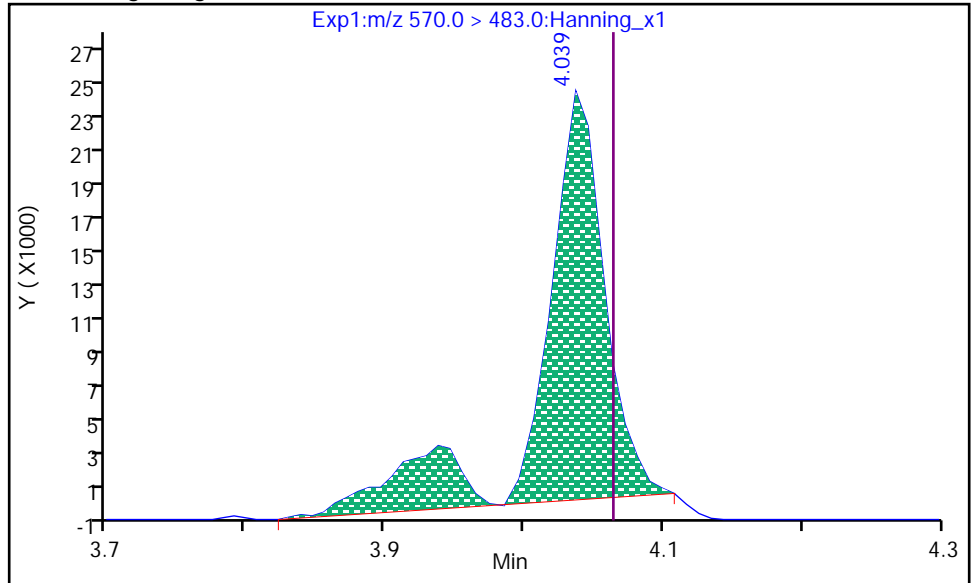
Dil. Factor: 1

Operator: Stephen E. Somerville

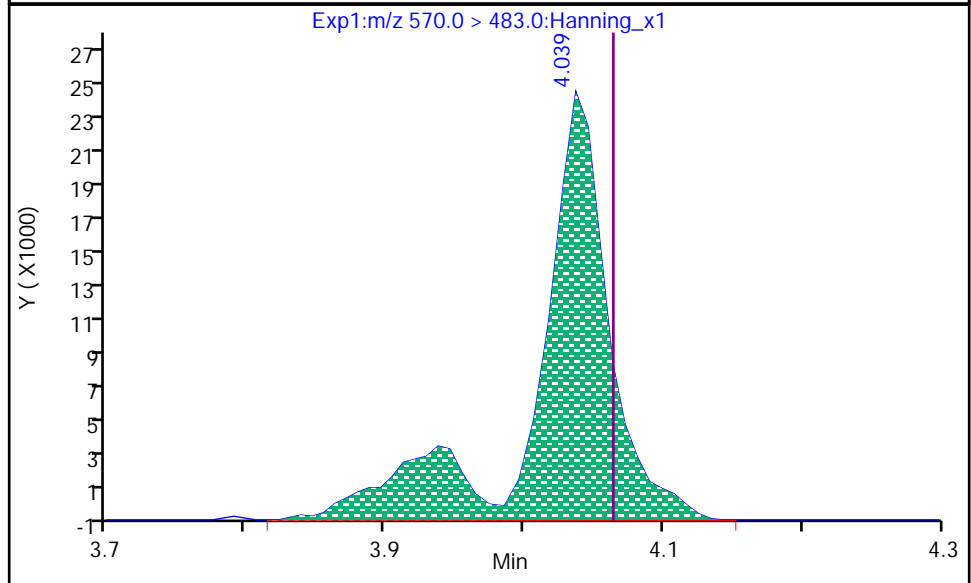
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.039  
Area: 72395  
Amount: 1029.96  
Amount Units: ng/L



RT: 4.039  
Area: 86650  
Amount: 1029.96  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 08:06:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320061.d

Injection Date: 23-Dec-2020 21:20:19

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

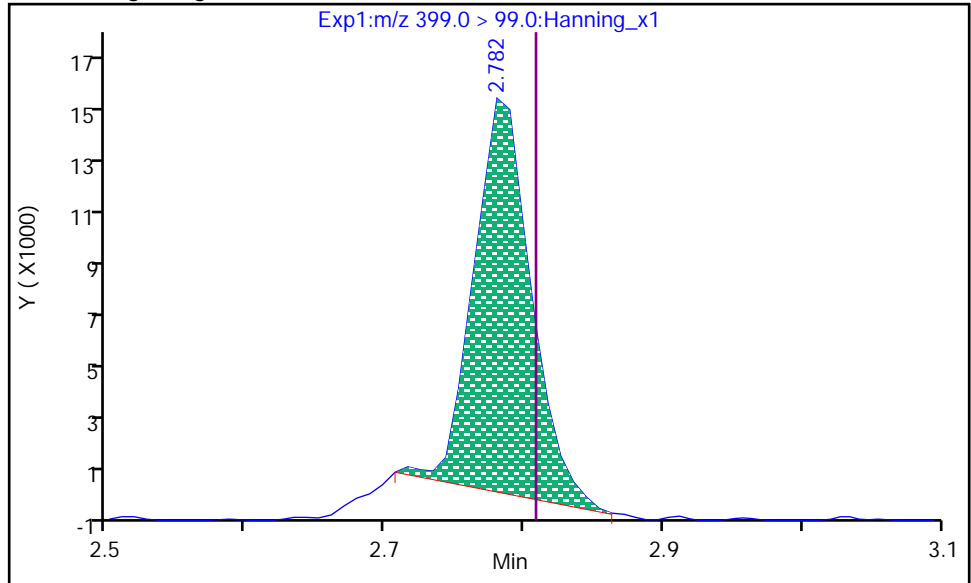
Dil. Factor: 1

Operator: Stephen E. Somerville

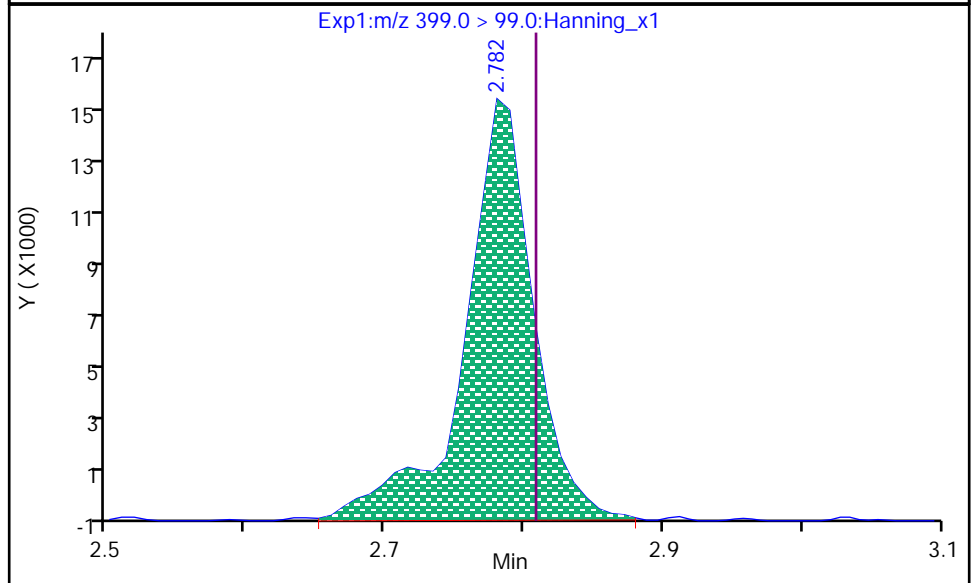
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.782  
Area: 41268  
Amount: 826.06  
Amount Units: ng/L



RT: 2.782  
Area: 53027  
Amount: 826.06  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 08:06:18

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320068.d  
Injection Date: 23-Dec-2020 22:34:46 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 58  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	925.11	92.5	70 - 130
D 46 13C4_PFBA	659896	684339			104	50 - 150
D 50 13C5_PFPeA	681912	708870			104	50 - 150
21 PFPeA			1000.00	931.45	93.1	70 - 130
7 PFBS			884.00	778.58	88.1	70 - 130
D 44 13C3_PFBS	234990	250029			106	50 - 150
1 4:2 FTS			934.00	855.59	91.6	70 - 130
D 63 13C2_4:2 FTS_2	145673	142649			97.9	50 - 150
D 49 13C5_PFHxA	739934	751780			102	50 - 150
15 PFHxA			1000.00	960.77	96.1	70 - 130
22 PFPeS			938.00	902.29	96.2	70 - 130
28 GenX			2000.00	1835.56	91.8	70 - 130
D 66 13C3_GenX	1382147	1399649			101	50 - 150
D 47 13C4_PFHpA	612609	625779			102	50 - 150
13 PFHpA			1000.00	982.03	98.2	70 - 130
D 45 13C3_PFHxS	185632	187314			101	50 - 150
14 PFHxS			910.00	855.07	94	70 - 130
29 ADONA			942.00	901.08	95.7	70 - 130
D 64 13C2_6:2 FTS_2	118188	107431			90.9	50 - 150
2 6:2 FTS			948.00	936.60	98.8	70 - 130
20 PFOA			1000.00	933.49	93.3	70 - 130
D 53 13C8_PFOA	612317	622792			102	50 - 150
12 PFHpS			952.00	881.07	92.5	70 - 130
18 PFOS			928.00	794.05	85.6	70 - 130
17 PFNA			1000.00	962.55	96.3	70 - 130
D 56 13C9_PFNA	732148	753555			103	50 - 150
D 54 13C8_PFOS	151103	167877			111	50 - 150
30 9CI-PF3ONS			932.00	845.50	90.7	70 - 130
D 55 13C8_PFOSA	323224	333713			103	50 - 150
19 PFOSA			1000.00	921.42	92.1	70 - 130
16 PFNS			960.00	823.70	85.8	70 - 130
D 65 13C2_8:2 FTS_2	93513	105741			113	50 - 150
3 8:2 FTS			958.00	921.41	96.2	70 - 130
10 PFDA			1000.00	949.67	95	70 - 130
D 51 13C6_PFDA	641610	678099			106	50 - 150
D 58 d3-MeFOSAA	810340	842914			104	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	916.60	91.7	70 - 130
9 PFDS			964.00	830.62	86.2	70 - 130
5 N-EtFOSAA			1000.00	912.69	91.3	70 - 130
25 PFUdA			1000.00	908.25	90.8	70 - 130
D 60 d5-EtFOSAA	763091	807312			106	50 - 150
D 52 13C7_PFUdA	652802	649076			99.4	50 - 150
D 61 d7-MeFOSE	103832	103521			99.7	50 - 150
32 MeFOSE			1000.00	947.01	94.7	70 - 130
26 MeFOSA			1000.00	976.95	97.7	70 - 130
D 57 d3-MeFOSA	49874	55037			110	50 - 150
31 11Cl-PF3OUDS			942.00	877.82	93.2	70 - 130
D 62 d9-EtFOSE	117283	122885			105	50 - 150
33 EtFOSE			1000.00	982.46	98.2	70 - 130
D 59 d5-EtFOSA	52571	54124			103	50 - 150
D 38 13C2_PFDoA	604828	637350			105	50 - 150
4 10:2 FTS			964.00	852.32	88.4	70 - 130
27 EtFOSA			1000.00	841.04	84.1	70 - 130
11 PFDoA			1000.00	943.99	94.4	70 - 130
34 PFDOS			968.00	860.02	88.8	70 - 130
24 PFTrDA			1000.00	941.59	94.2	70 - 130
23 PFTeDA			1000.00	937.97	93.8	70 - 130
D 42 13C2_PFTeDA	781191	853331			109	50 - 150
35 PFHxDA			1000.00	974.11	97.4	70 - 130
D 40 13C2_PFHxDA	893092	974131			109	50 - 150
36 PFODA			1000.00	939.20	93.9	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320068.d  
Injection Date: 23-Dec-2020 22:34:46 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 58  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.705	0	684339	24	>100:1			1000.00	986.72	104	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.705	1/1	630552	24	>100:1			1000.00	925.11		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	708870	17	>100:1			1000.00	1030.51	104	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	663852	18	>100:1			1000.00	931.45		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.119	2.130	0	250029	18	>100:1			1000.00	1085.99	106	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.119	2.141	-1/-1	229521	18	>100:1	Target = 3.50		884.00	778.58		
298.9 > 99	44	2.130	2.141		64527	19	>100:1	3.55 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.442	2.461	-1/-1	195696	20	>100:1	Target = 3.10		938.00	902.29		
349 > 99	44	2.442	2.461		67339	19		2.90 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.389	0	142649	21	>100:1			5000.00	5892.56	97.9	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.398	-1/-1	48715	20	>100:1	Target = 1.80		934.00	855.59		
327 > 81	63	2.380	2.398		29714	25	>100:1	1.63 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.425	0	751780	19	>100:1			1000.00	1019.96	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.415	2.425	0/0	713096	20	>100:1	Target = 18.34		1000.00	960.77		
313 > 119	49	2.415	2.425		36999	19	>100:1	19.27 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.532	0	1399649	20	>100:1			5000.00	5254.85	101	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.522	2.532	0/0	369164	20	>100:1	Target = 0.81		2000.00	1835.56		
285 > 185	66	2.522	2.532		451065	21	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.783	0	625779	20	>100:1			1000.00	1031.54	102	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.783	0/0	637431	20	>100:1	Target = 3.70		1000.00	982.03		
363 > 169	47	2.773	2.783		161630	20	>100:1	3.94 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.801	0	187314	20				1000.00	1093.94	101	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.810	-1/-1	169823	26	>100:1	Target = 3.21	0.14	910.00	855.07		
399 > 99	45	2.791	2.810		49670	26	>100:1	3.41 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.828	-1/-1	1071588	20	>100:1	Target = 2.97		942.00	901.08		
377 > 85	45	2.809	2.828		338141	20	>100:1	3.16 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.169	0/0	149924	24	>100:1	Target = 3.08		952.00	881.07		
449 > 99	45	3.155	3.169		52085	24	>100:1	2.87 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.142	-1	107431	24				5000.00	5578.40	90.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.162	-2/-1	41725	24	>100:1	Target = 1.80		948.00	936.60		
427 > 81	64	3.115	3.162		26199	26	>100:1	1.59 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.169	-1	622792	25	>100:1			1000.00	1052.25	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.169	-1/0	592677	23	>100:1	Target = 2.87		1000.00	933.49		
413 > 169	53	3.149	3.169		206071	26	>100:1	2.87 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.522	3.545	-1	167877	21				1000.00	1119.71	111	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.553	-1/0	157962	43	92:1	Target = 3.84	0.30	928.00	794.05		
499 > 99	54	3.529	3.553		51369	40	>100:1	3.07 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.730	3.751	-1/0	477840	24	>100:1			932.00	845.50		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.866	3.883	-1/0	105822	21	>100:1	Target = 3.07		960.00	823.70		
549 > 99	54	3.866	3.883		39166	20	>100:1	2.70 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.198	-1/0	101197	20	>100:1	Target = 3.03		964.00	830.62		
599 > 99	54	4.170	4.198		37748	19	>100:1	2.68 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.349	-1/0	418512	17	>100:1			942.00	877.82		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.698	-1/0	115911	20		Target = 3.33		968.00	860.02		
699 > 99	54	4.672	4.698		38610	20		3.00 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.553	-1	753555	23	>100:1			1000.00	1003.45	103	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.553	-1/0	725354	23	>100:1	Target = 6.16		1000.00	962.55		
463 > 169	56	3.529	3.553		118393	22	>100:1	6.12 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.867	-1	333713	20	>100:1			1000.00	1078.01	103	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.875	-1/0	303017	21	>100:1			1000.00	921.42		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.891	-1	105741	20				5000.00	5700.28	113	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.891	-1/0	39218	24	>100:1	Target = 1.95		958.00	921.41		
527 > 81	65	3.866	3.891		19951	17		1.96 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.494	-1/0	41654	20		Target = 3.14		964.00	852.32		
627 > 80	65	4.474	4.494		13801	24		3.01 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.874	3.899	-1	678099	20	>100:1			1000.00	1022.26	106	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.899	-1/0	632761	22	>100:1	Target = 15.94		1000.00	949.67		
513 > 169	51	3.874	3.899		42909	20	>100:1	14.74 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.029	4.057	-1	842914	18	>100:1			5000.00	5872.35	104	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.065	-1/0	118697	33	>100:1	Target = 1.33	0.11	1000.00	916.60		
570 > 483	58	4.038	4.065		84603	35	>100:1	1.40 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.208	-1	807312	19	>100:1			5000.00	6078.48	106	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.197	4.228	-1/0	146714	34	>100:1	Target = 1.58	0.13	1000.00	912.69		
584 > 526	60	4.197	4.228		87691	37	>100:1	1.67 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.208	-1	649076	19	>100:1			1000.00	1026.90	99.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.188	4.218	-1/0	554075	18	>100:1	Target = 15.50		1000.00	908.25		
563 > 169	52	4.188	4.218		37276	18	>100:1	14.86 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.309	0	103521	17	>100:1			1000.00	956.69	99.7	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.309	0/0	92114	17	>100:1			1000.00	947.01		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.319	0	55037	14	>100:1			1000.00	1040.06	110	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.319	0/0	60662	17	>100:1	Target = 1.12		1000.00	976.95		
512 > 219	57	4.318	4.319		52033	18	>100:1	1.16 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.467	0	122885	18	>100:1			1000.00	979.98	105	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.476	0/0	107411	20	>100:1			1000.00	982.46		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.485	-1	637350	19	>100:1			1000.00	1052.92	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.476	0/1	609276	19	>100:1	Target = 10.85		1000.00	943.99		
613 > 169	38	4.456	4.476		58609	19	>100:1	10.39 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.704	4.719	0/1	591082	19	>100:1	Target = 8.37		1000.00	941.59		
663 > 169	38	4.704	4.719		70329	18	>100:1	8.40 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.485	0	54124	18	>100:1			1000.00	1102.45	103	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.494	0/0	49732	17	>100:1	Target = 1.03		1000.00	841.04		
526 > 219	59	4.483	4.494		51749	17	>100:1	0.96 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.933	-1	853331	19	>100:1			1000.00	1012.92	109	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.933	-1/0	693502	18	96:1	Target = 12.11		1000.00	937.97		
713 > 169	42	4.915	4.933		59059	18	>100:1	11.74 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.318	-1	974131	19	>100:1			1000.00	1075.00	109	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.318	-1/0	620010	21	>100:1	Target = 11.48		1000.00	974.11		
813 > 269	40	5.292	5.318		56444	19	>100:1	10.98 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.639	5.668	-1/0	809886	25	95:1	Target = 13.88		1000.00	939.20		
913 > 319	40	5.639	5.668		57644	25	>100:1	14.04 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.899	-1	713904	22	>100:1					98.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.425	0	733722	19	>100:1					101	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.169	-1	601936	25	>100:1					97.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.705	0	623691	23	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80      3.522    3.545    -1      177044    24    >100:1      111

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**



Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320068.d

Injection Date: 23-Dec-2020 22:34:46

Inst. ID: LCMSMS02

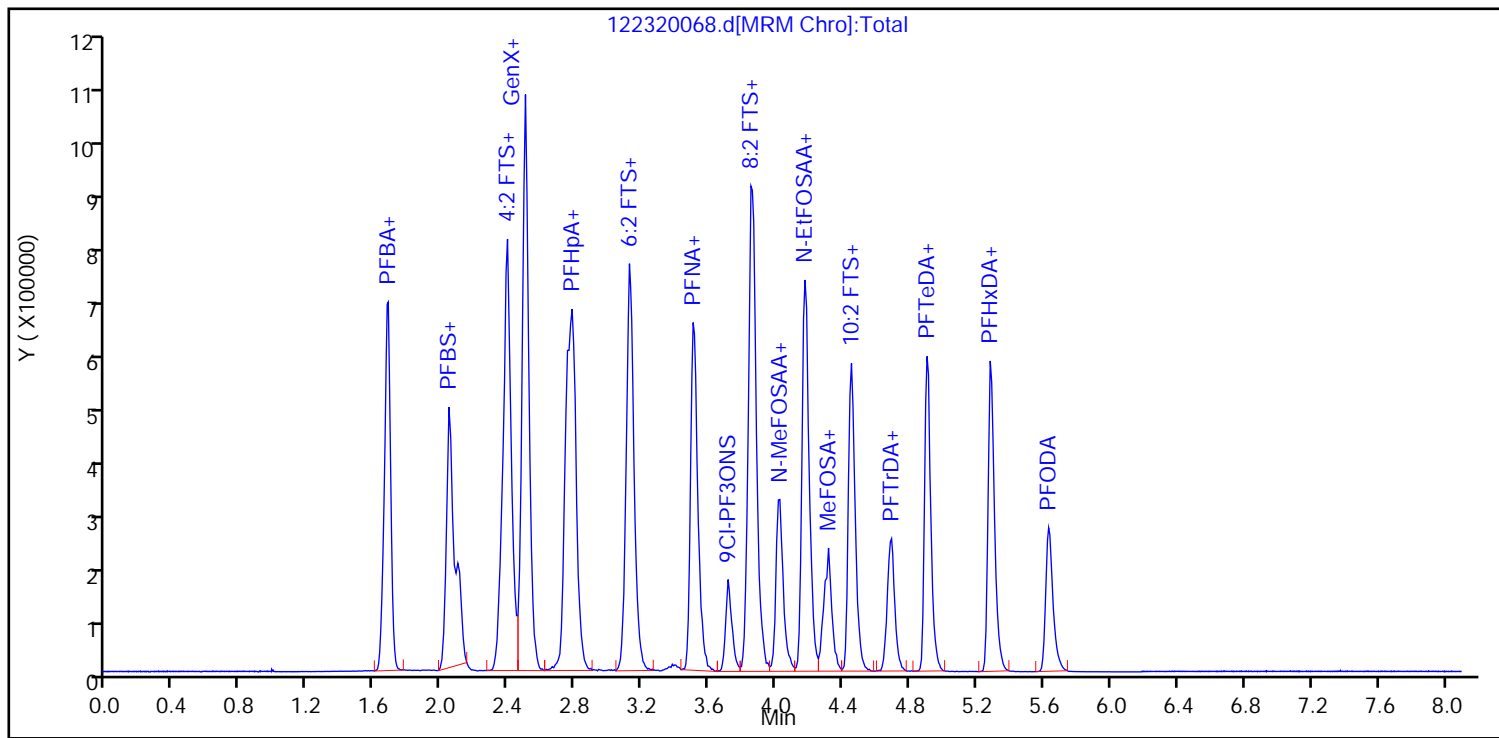
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Lab ID: ID CCV 1000D\_SVLC-1248

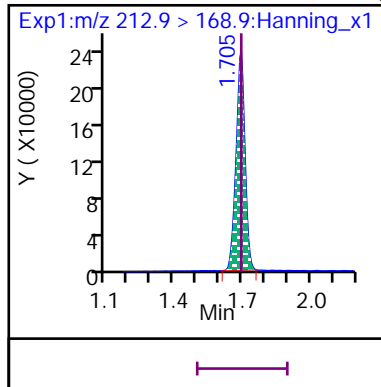
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Dil. Factor: 1

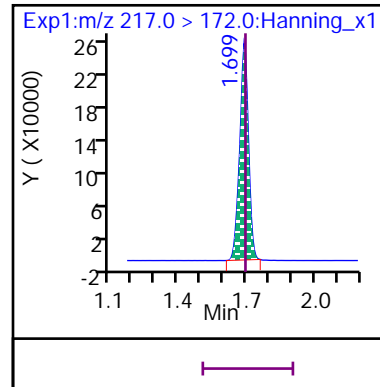
Operator: Stephen E. Somerville



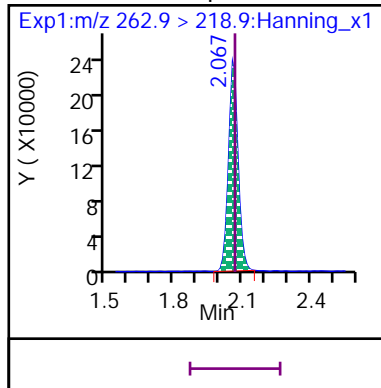
8 Perfluoro-n-butanoic acid (PFBA)



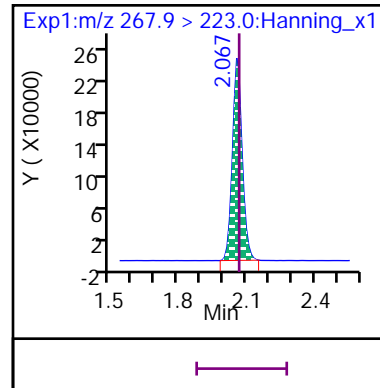
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

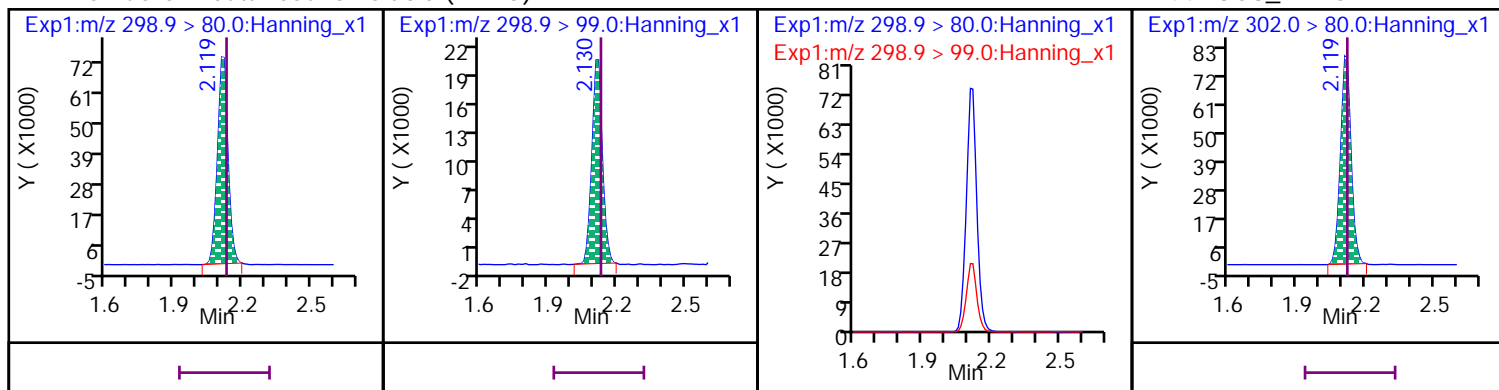


D 50 13C5\_PFPeA



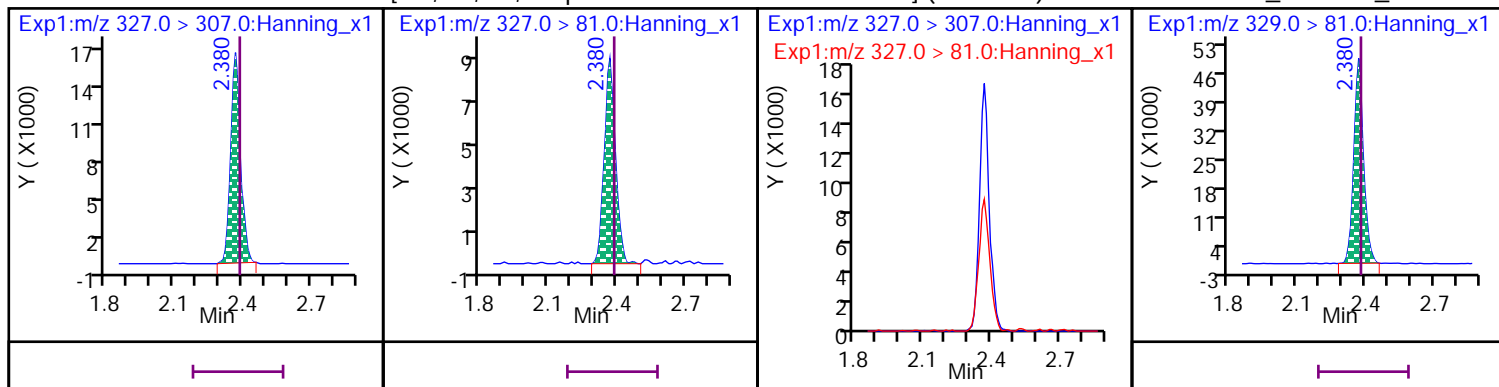
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



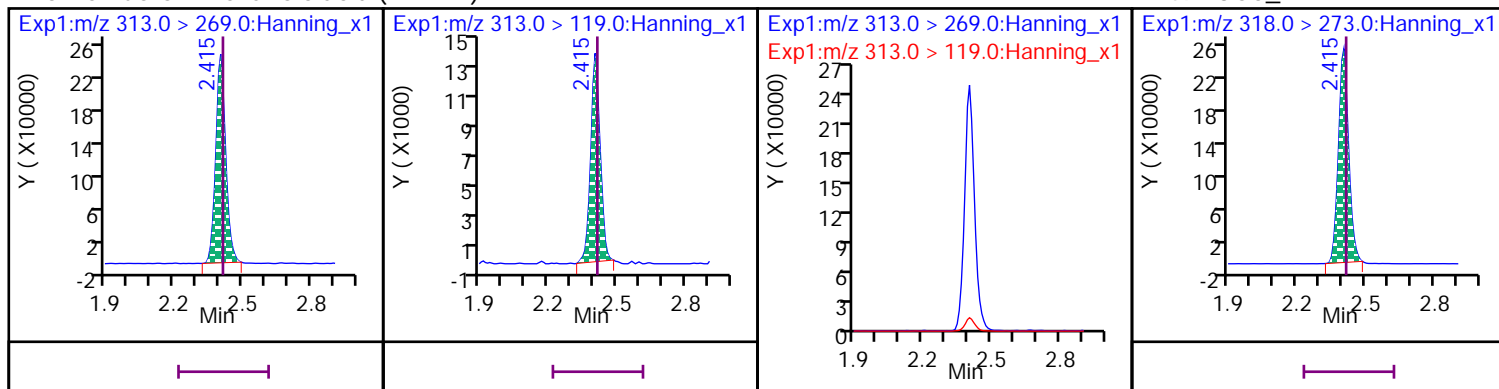
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



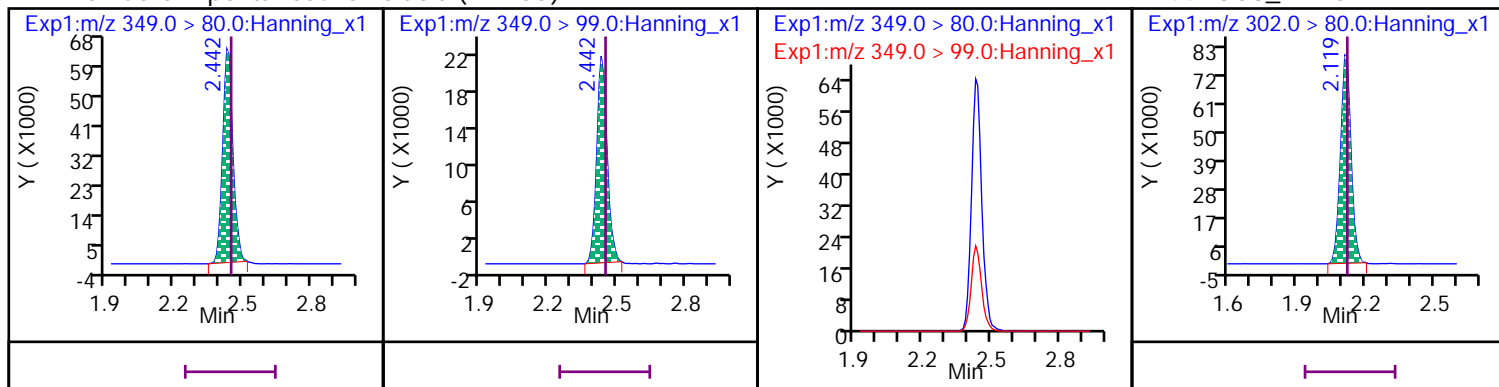
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



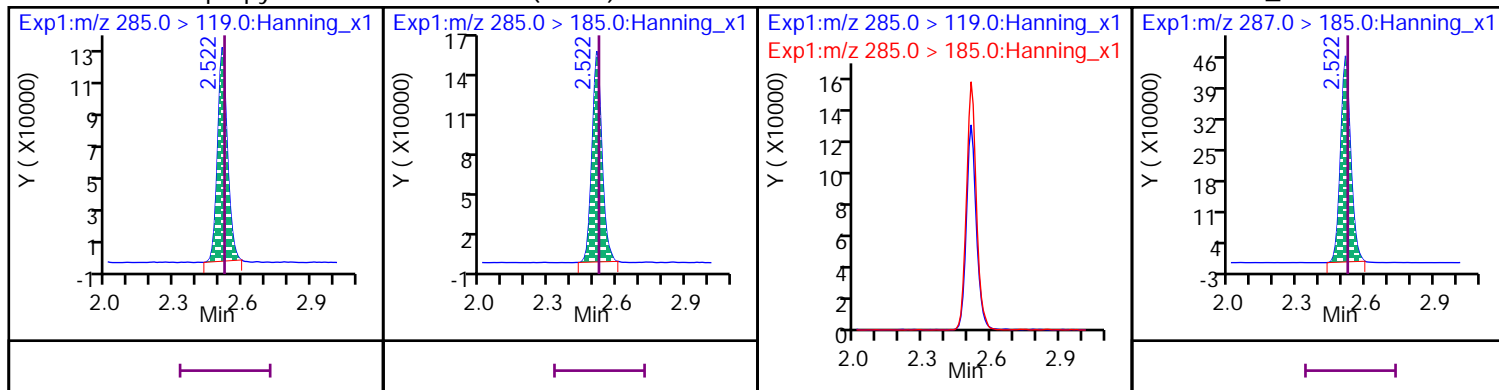
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



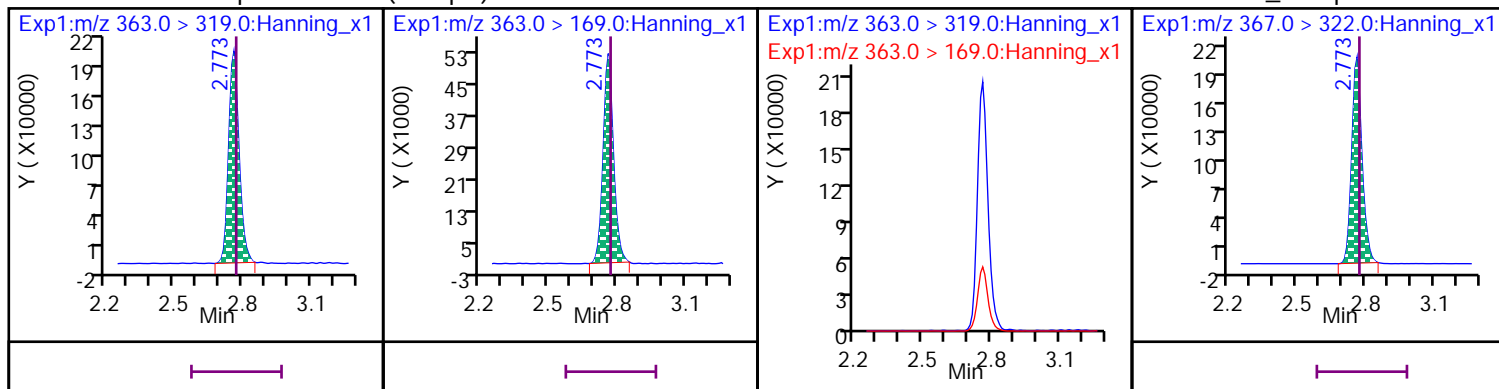
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



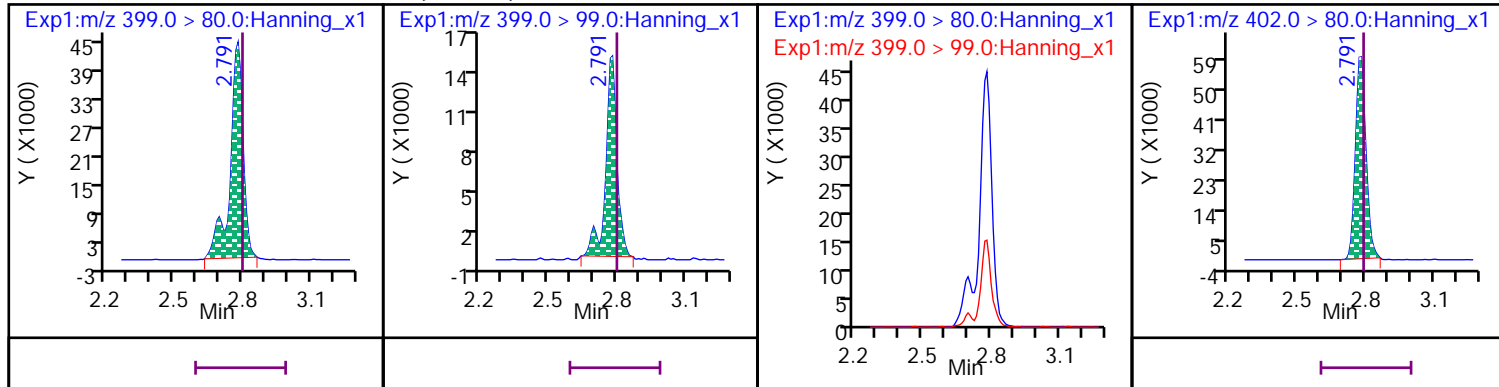
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



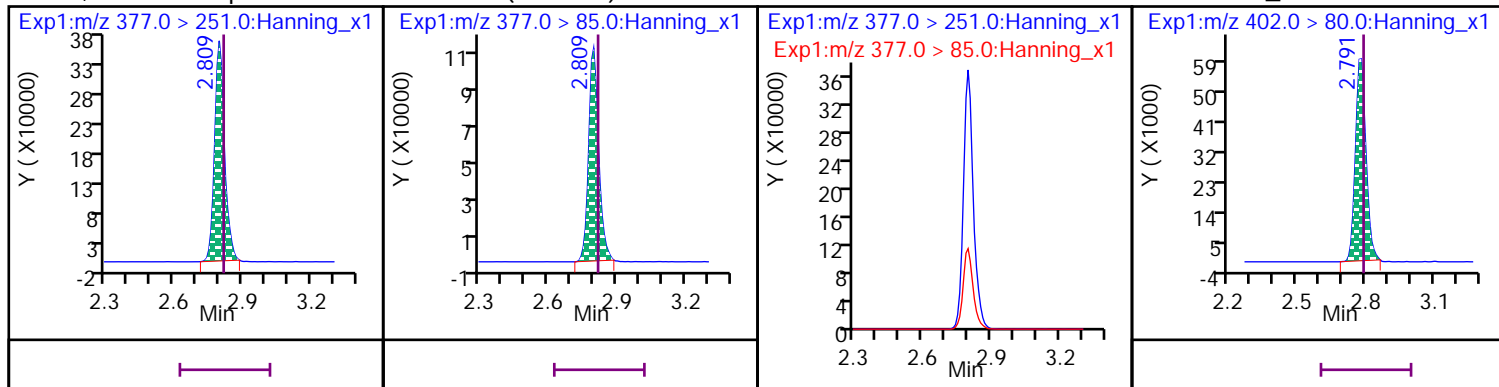
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



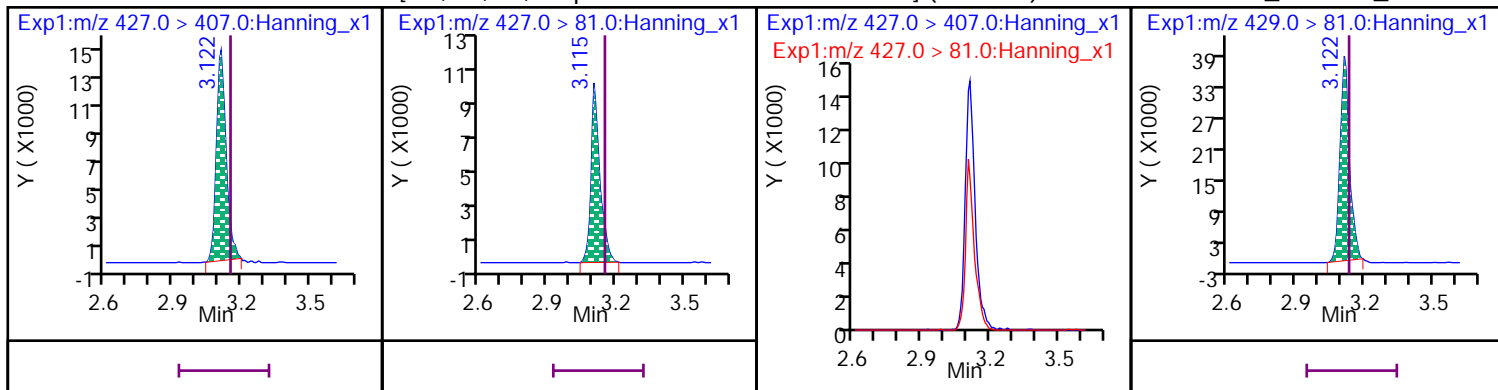
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



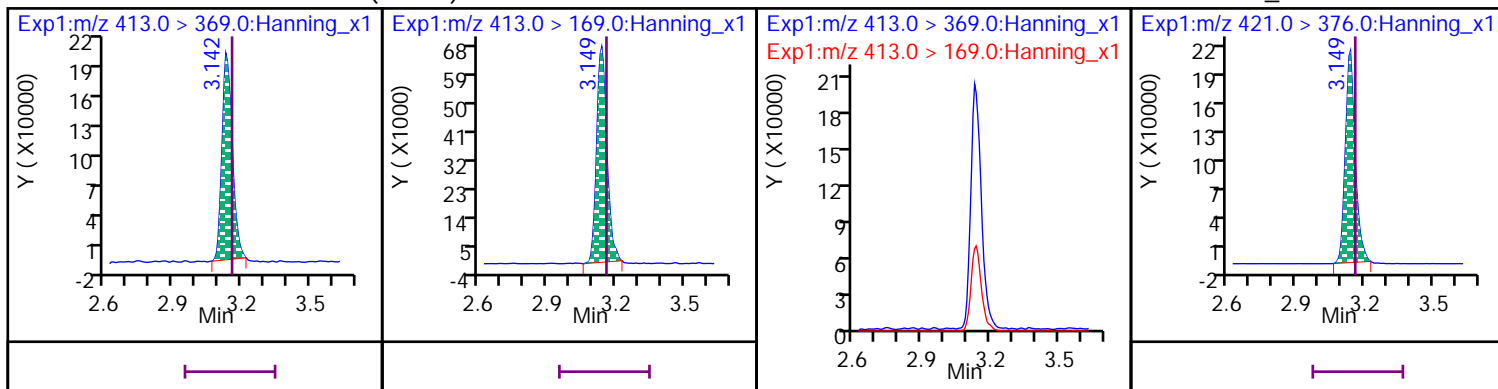
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



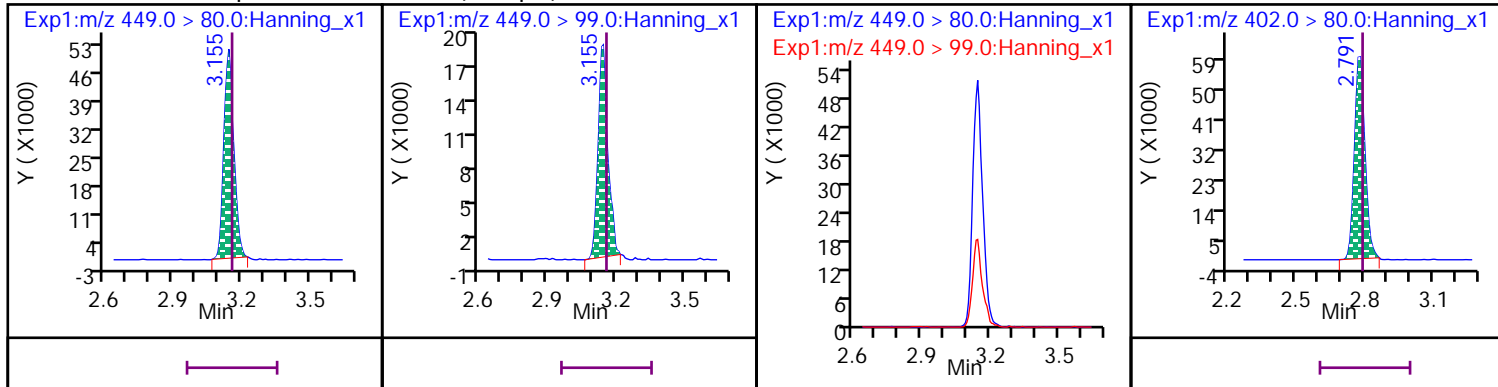
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



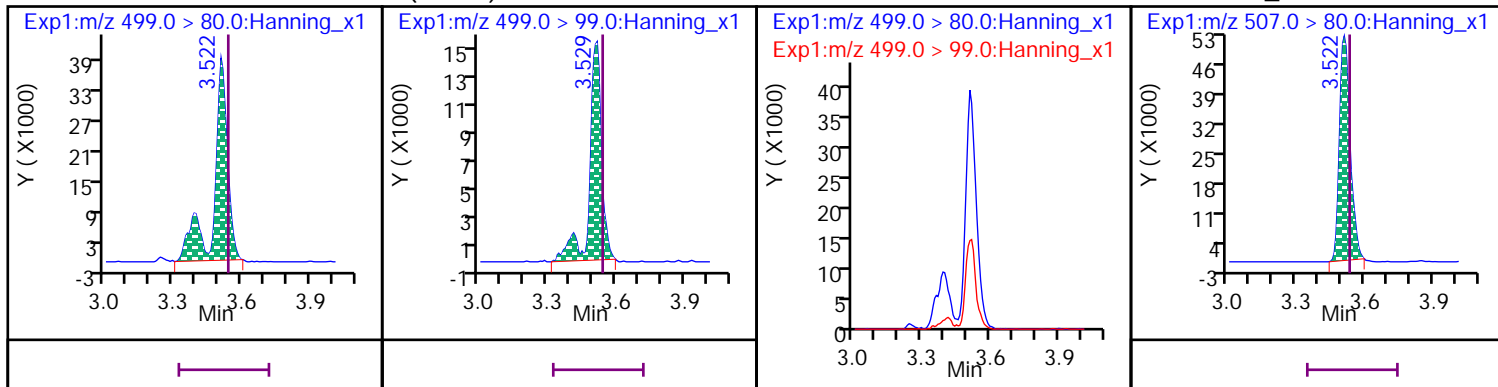
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



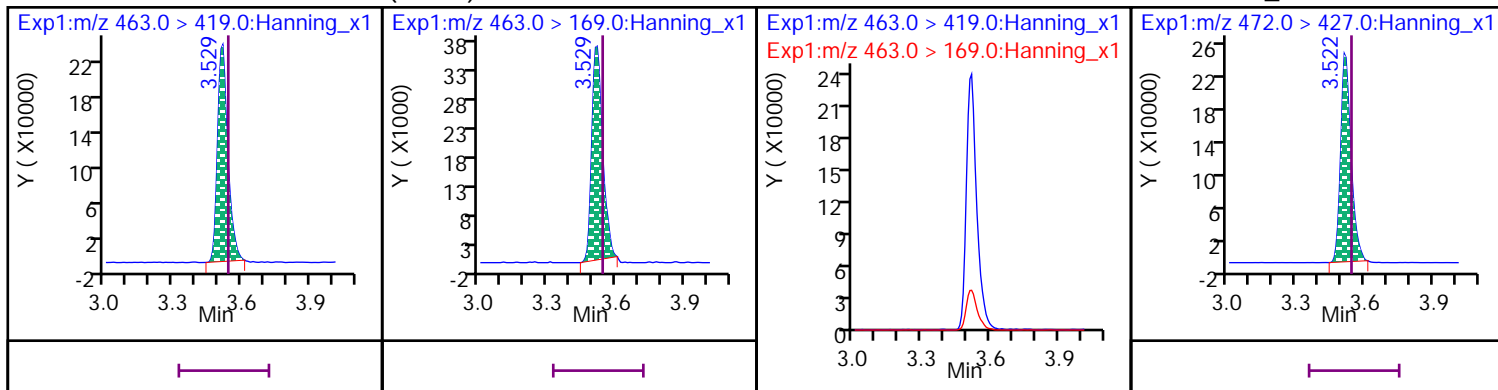
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



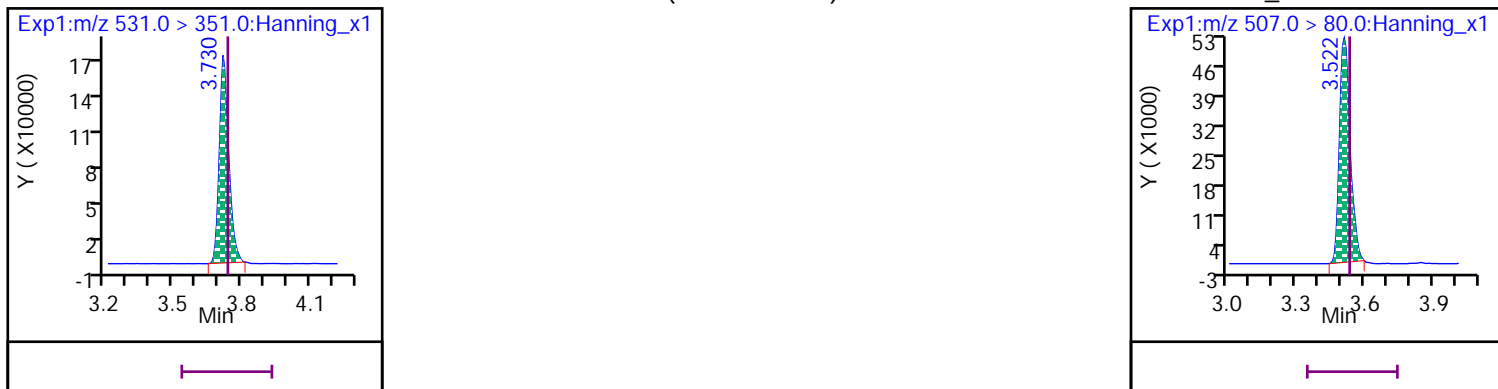
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



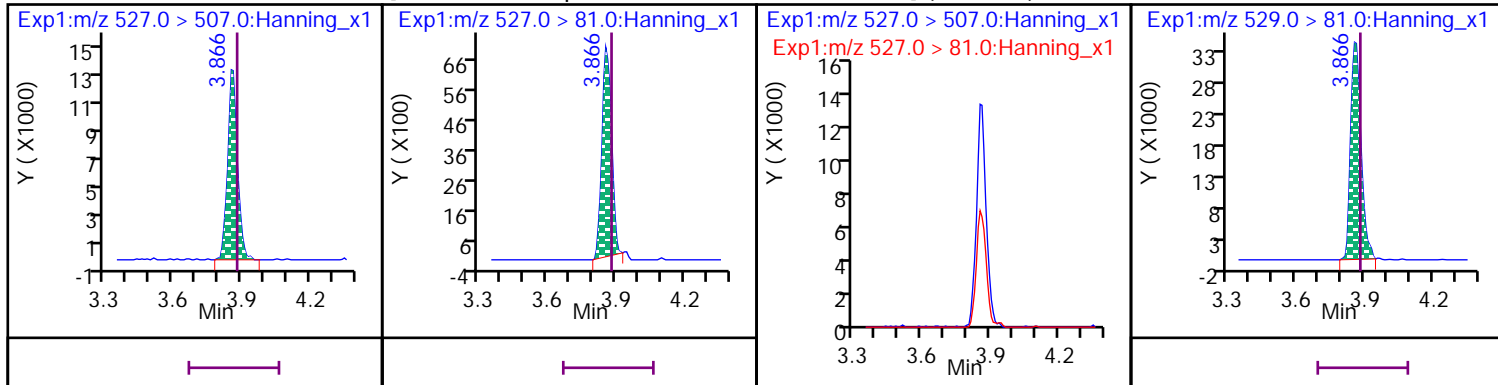
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



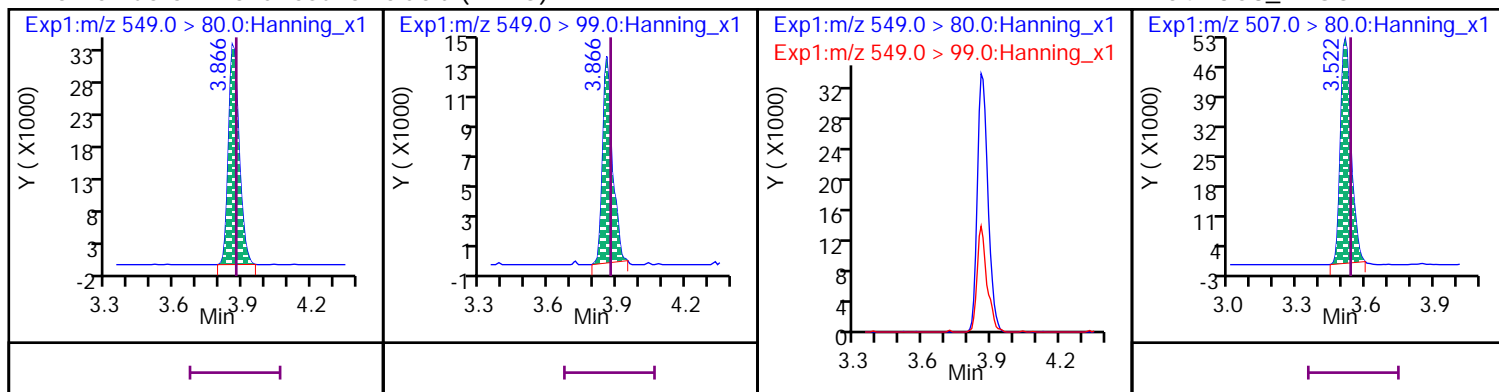
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



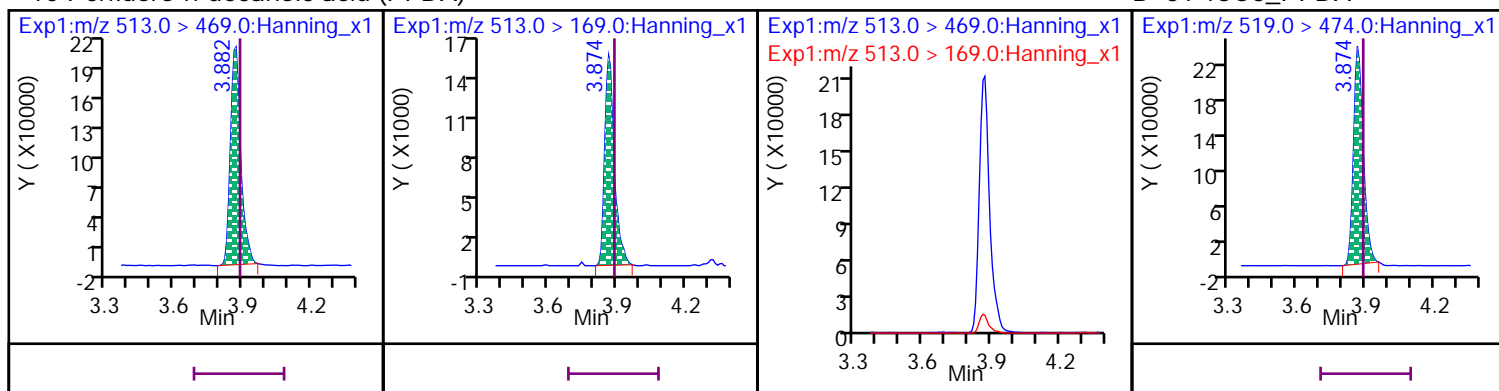
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



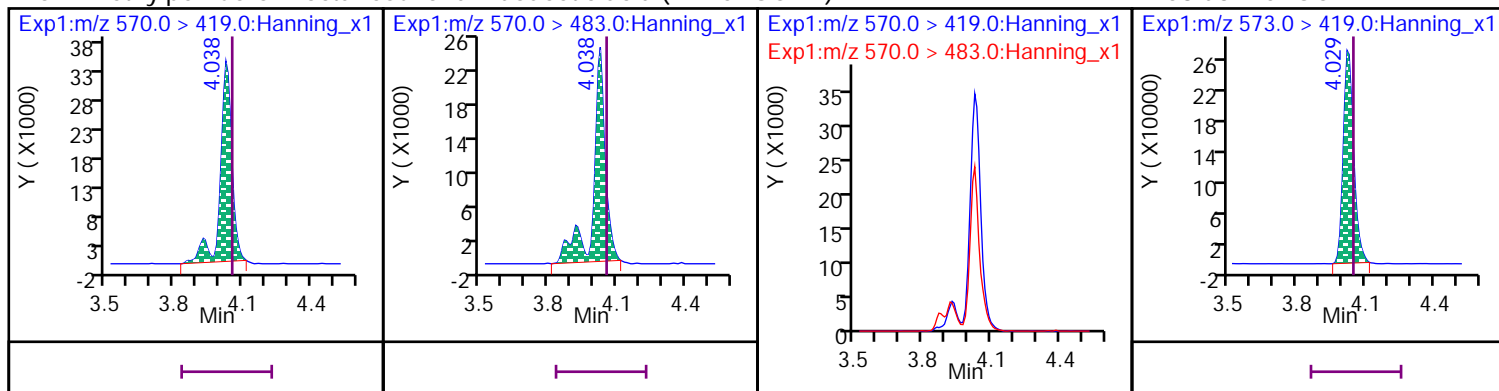
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



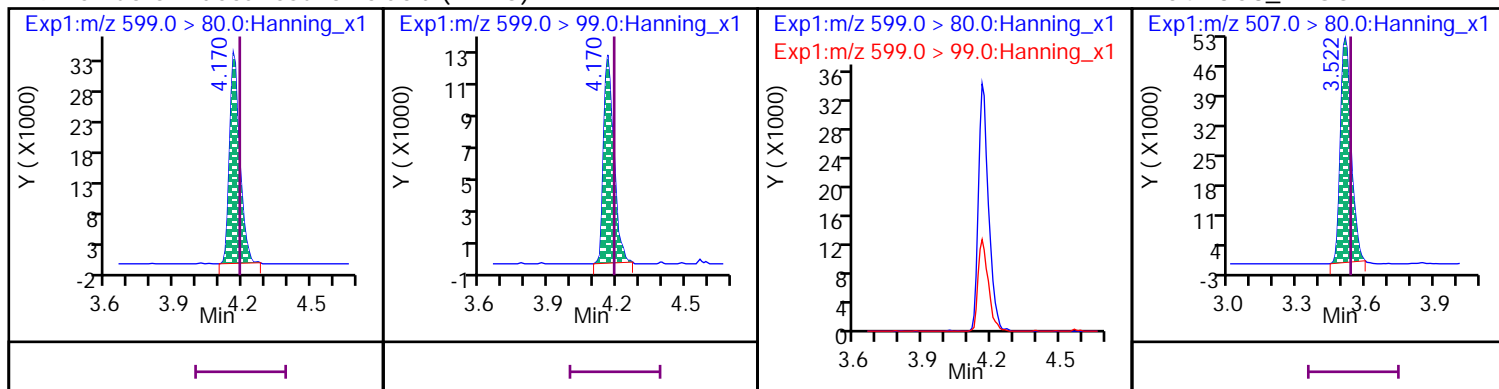
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



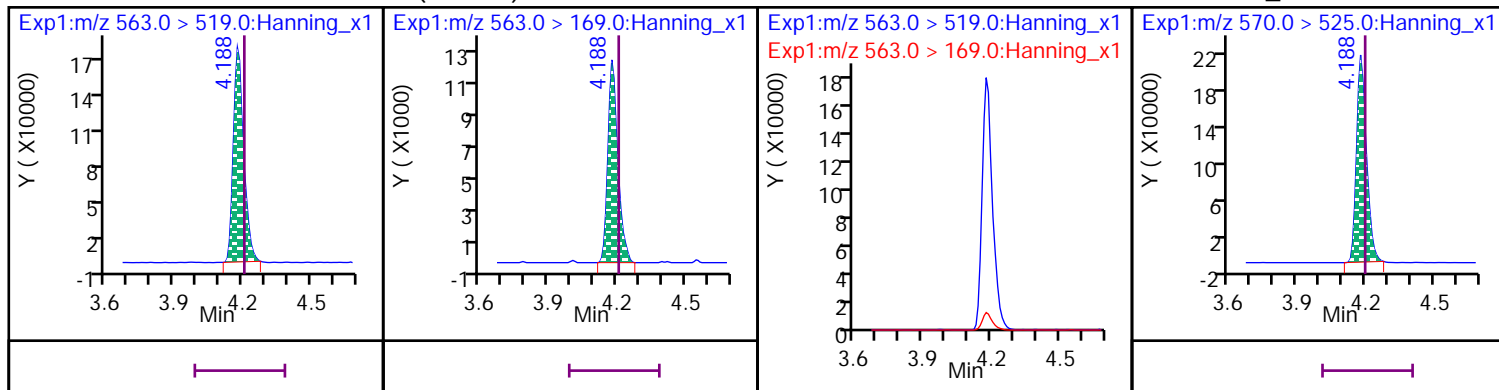
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



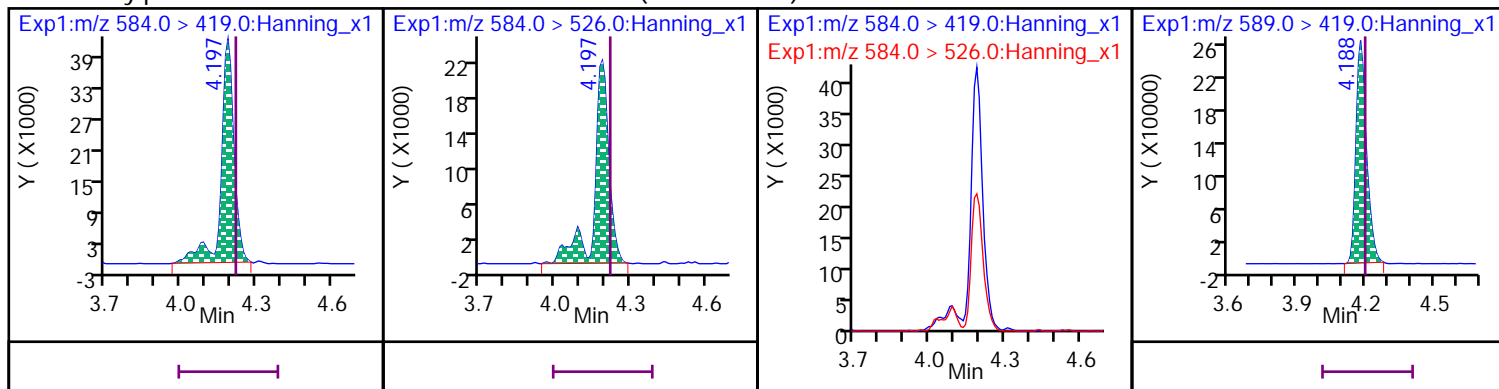
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



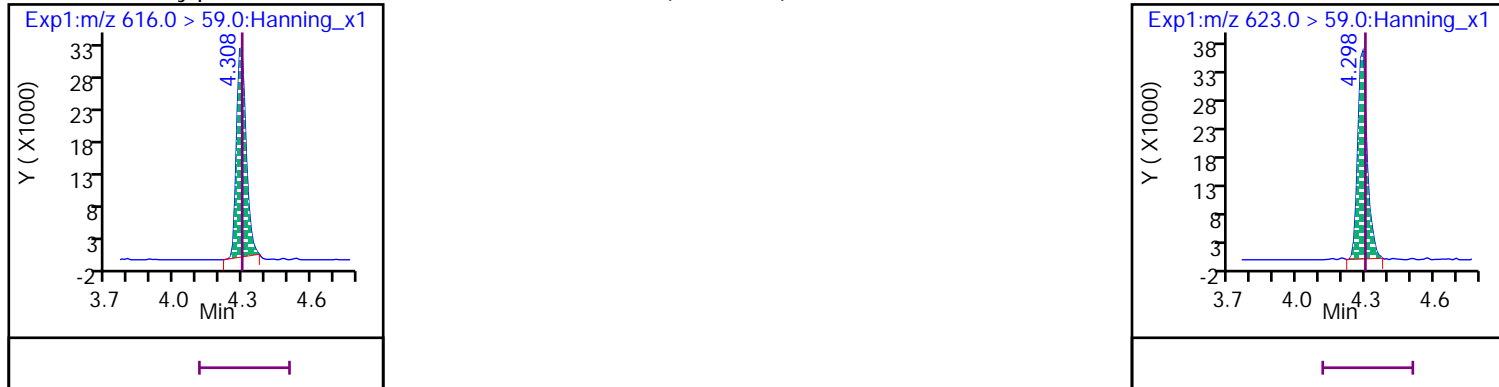
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



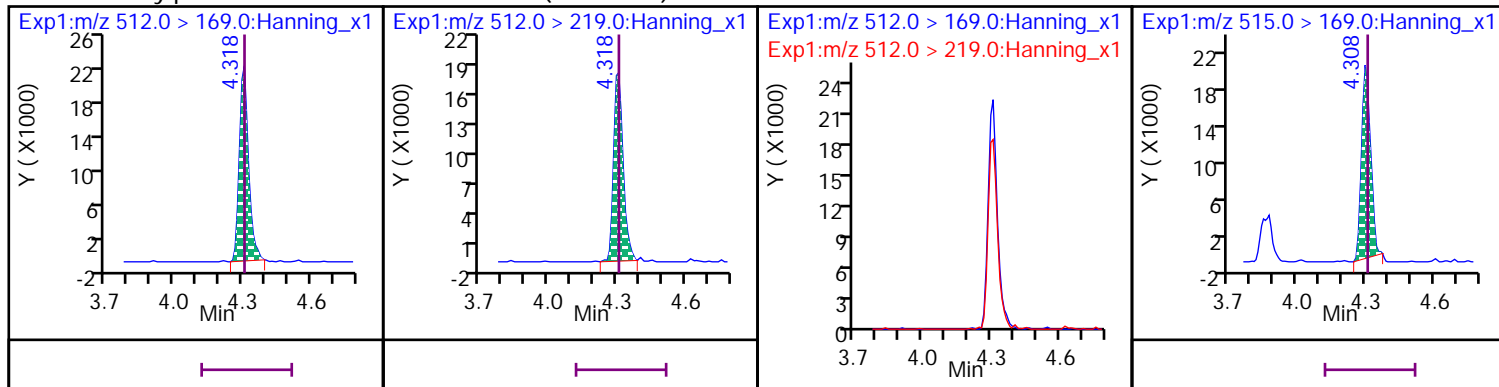
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

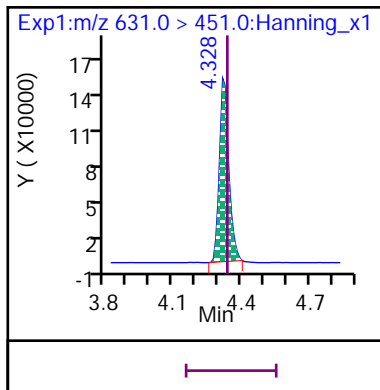


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

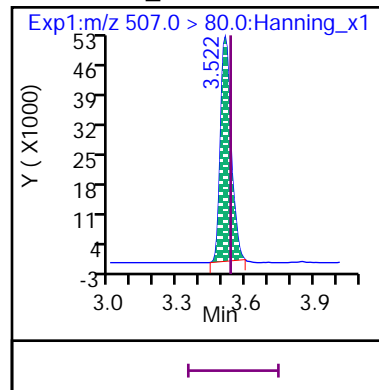
D 57 d3-MeFOSA



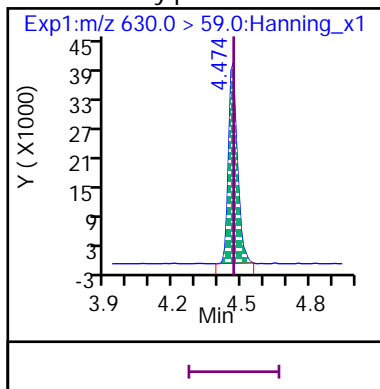
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



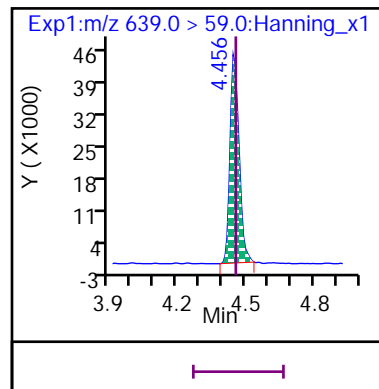
D 54 13C8\_PFOS



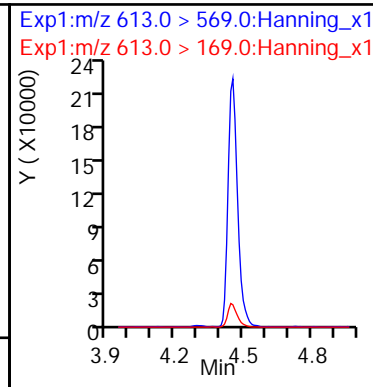
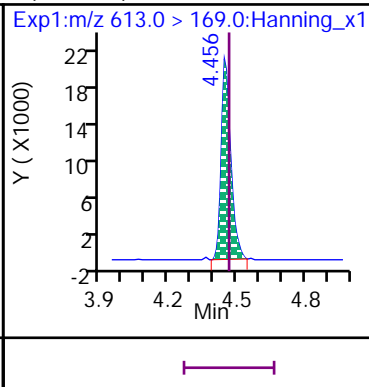
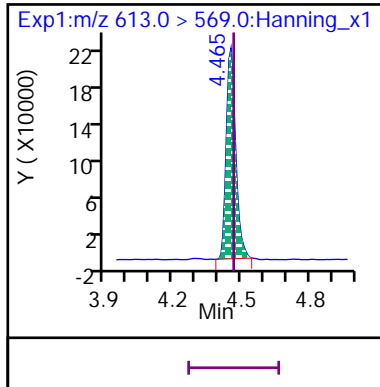
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



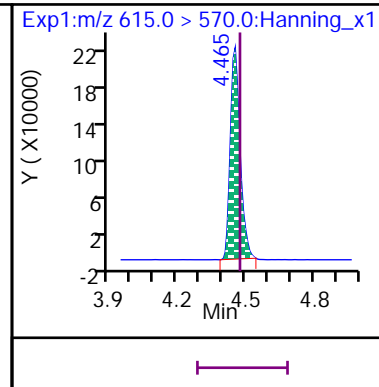
D 62 d9-EtFOSE



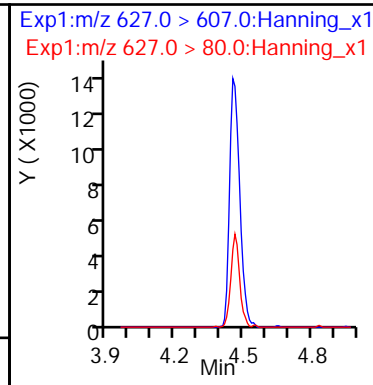
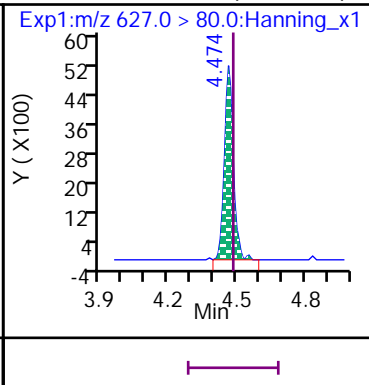
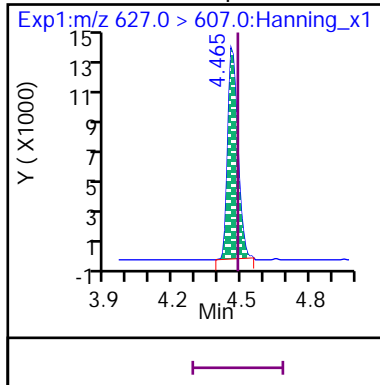
11 Perfluoro-n-dodecanoic acid (PFDaA)



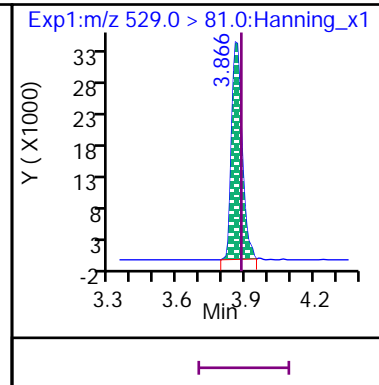
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



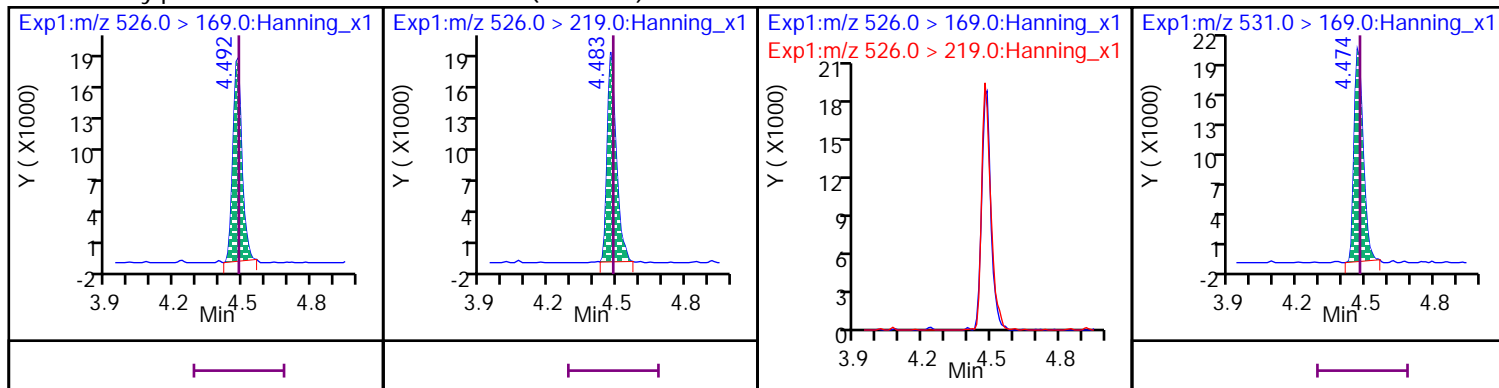
D 65 13C2\_8:2 FTS\_2





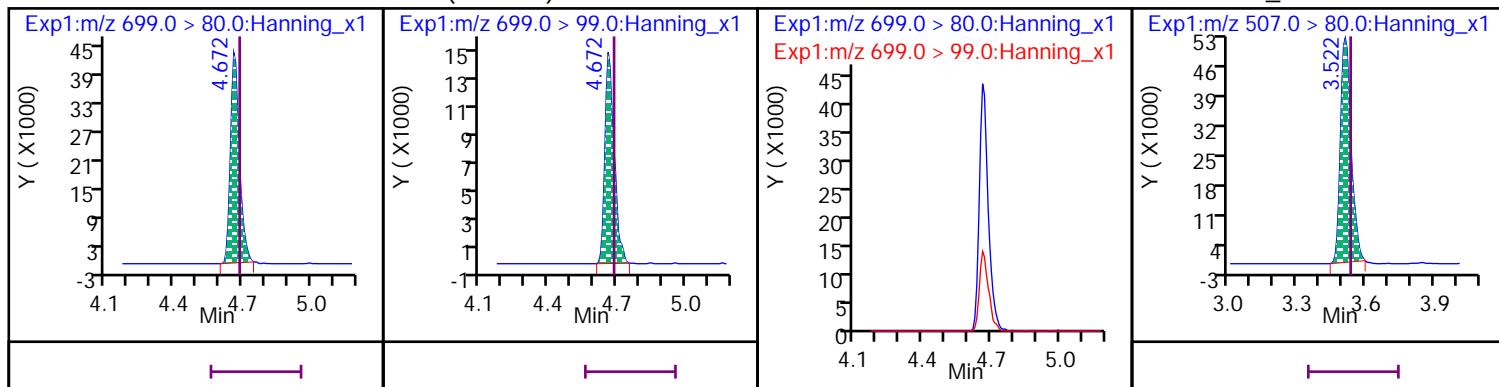
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



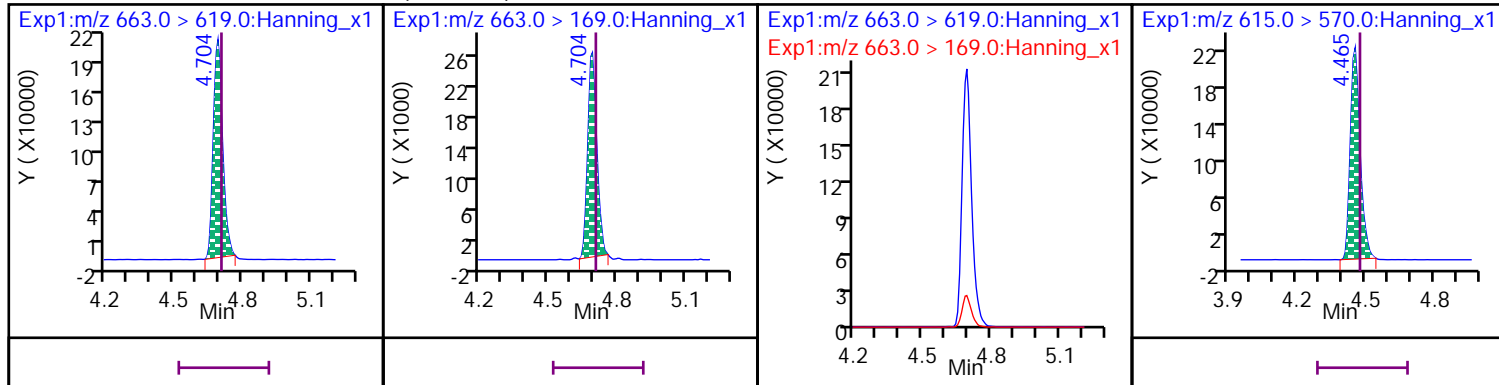
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



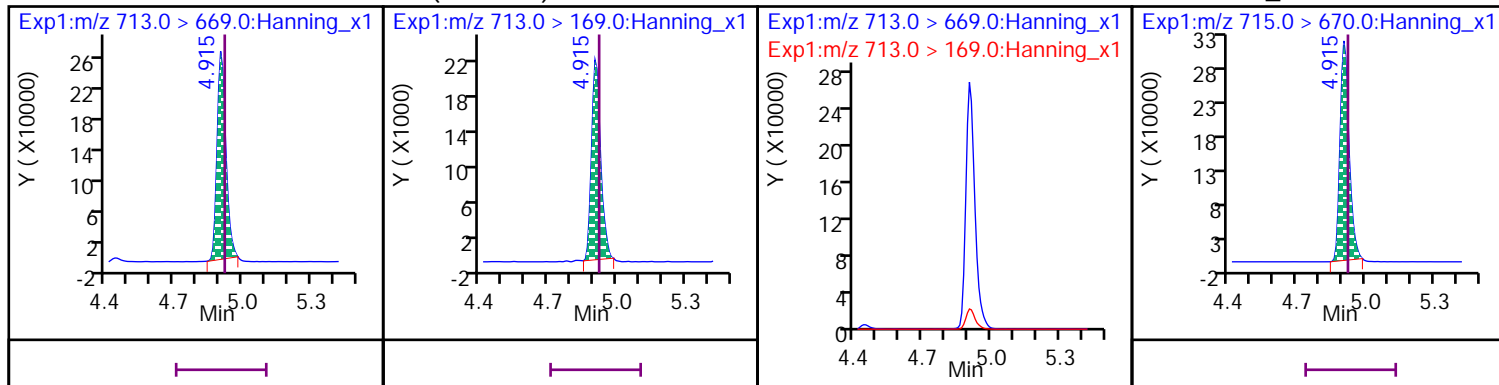
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



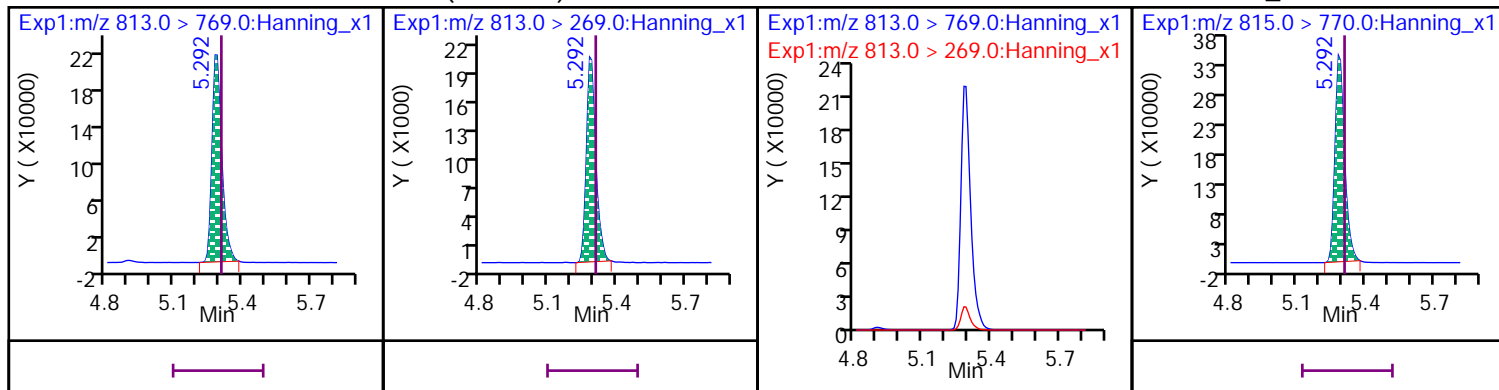
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



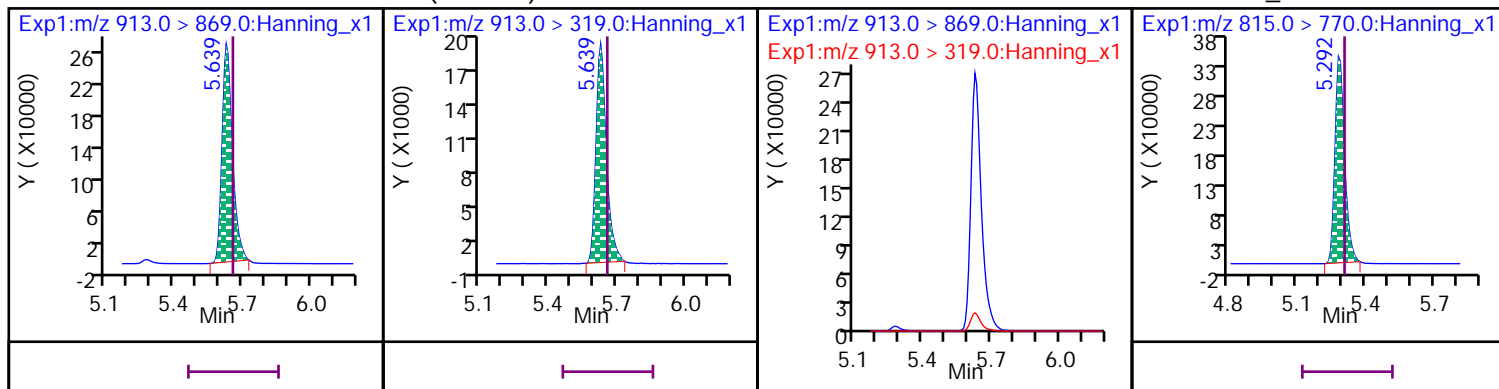
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

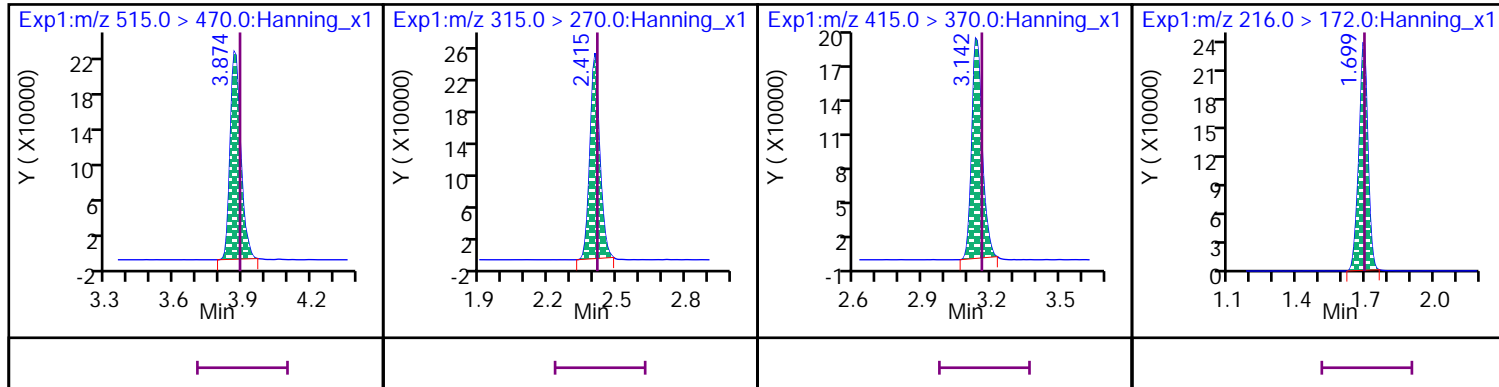


\* 37 13C2\_PFDA

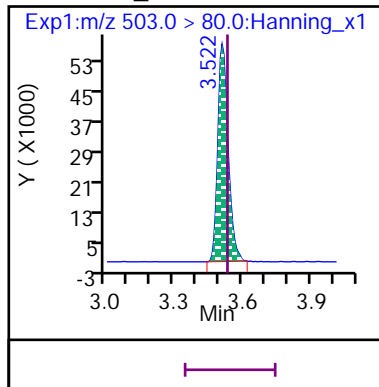
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOA



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d  
Injection Date: 27-Dec-2020 10:19:11 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	106.40	106	70 - 130
D 46 13C4_PFBFA	735341	637910			86.8	50 - 150
D 50 13C5_PFPeA	728206	658438			90.4	50 - 150
21 PFPeA			100.00	102.24	102	70 - 130
7 PFBS			88.400	93.649	106	70 - 130
D 44 13C3_PFBFS	247575	239776			96.8	50 - 150
1 4:2 FTS			93.400	82.440	88.3	70 - 130
D 63 13C2_4:2 FTS_2	126464	137423			109	50 - 150
D 49 13C5_PFHxA	774364	718926			92.8	50 - 150
15 PFHxA			100.00	104.12	104	70 - 130
22 PFPeS			93.800	99.710	106	70 - 130
28 GenX			200.00	196.30	98.1	70 - 130
D 66 13C3_GenX	1412202	1323365			93.7	50 - 150
D 47 13C4_PFHpA	616003	585778			95.1	50 - 150
13 PFHpA			100.00	102.46	102	70 - 130
D 45 13C3_PFHxS	179294	178402			99.5	50 - 150
14 PFHxS			91.000	86.637	95.2	70 - 130
29 ADONA			94.200	92.270	98	70 - 130
D 64 13C2_6:2 FTS_2	104623	111803			107	50 - 150
2 6:2 FTS			94.800	109.81	116	70 - 130
20 PFOA			100.00	105.45	105	70 - 130
D 53 13C8_PFOA	654941	592205			90.4	50 - 150
12 PFHpS			95.200	108.93	114	70 - 130
18 PFOS			92.800	96.303	104	70 - 130
17 PFNA			100.00	100.54	101	70 - 130
D 56 13C9_PFNA	792377	760907			96	50 - 150
D 54 13C8_PFOS	154357	157347			102	50 - 150
30 9CI-PF3ONS			93.200	93.949	101	70 - 130
D 55 13C8_PFOA	330552	311979			94.4	50 - 150
19 PFOSA			100.00	106.86	107	70 - 130
16 PFNS			96.000	97.498	102	70 - 130
D 65 13C2_8:2 FTS_2	93314	88356			94.7	50 - 150
3 8:2 FTS			95.800	71.798	74.9	70 - 130
10 PFDA			100.00	105.84	106	70 - 130
D 51 13C6_PFDA	698114	636706			91.2	50 - 150
D 58 d3-MeFOSAA	762102	725286			95.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	121.90	122	70 - 130
9 PFDS			96.400	102.69	107	70 - 130
5 N-EtFOSAA			100.00	81.458	81.5	70 - 130
25 PFUdA			100.00	99.506	99.5	70 - 130
D 60 d5-EtFOSAA	738335	690640			93.5	50 - 150
D 52 13C7_PFUdA	678701	625944			92.2	50 - 150
D 61 d7-MeFOSE	117292	114979			98	50 - 150
32 MeFOSE			100.00	108.30	108	70 - 130
26 MeFOSA			100.00	125.64	126	70 - 130
D 57 d3-MeFOSA	54969	47825			87	50 - 150
31 11Cl-PF3OUDS			94.200	101.14	107	70 - 130
D 62 d9-EtFOSE	121851	122508			101	50 - 150
33 EtFOSE			100.00	110.37	110	70 - 130
D 59 d5-EtFOSA	51517	47562			92.3	50 - 150
D 38 13C2_PFDoA	649290	571184			88	50 - 150
4 10:2 FTS			96.400	87.226	90.5	70 - 130
27 EtFOSA			100.00	117.59	118	70 - 130
11 PFDoA			100.00	108.84	109	70 - 130
34 PFDOS			96.800	84.229	87	70 - 130
24 PFTrDA			100.00	110.33	110	70 - 130
23 PFTeDA			100.00	107.00	107	70 - 130
D 42 13C2_PFTeDA	887372	828920			93.4	50 - 150
35 PFHxDA			100.00	114.05	114	70 - 130
D 40 13C2_PFHxDA	913664	865470			94.7	50 - 150
36 PFODA			100.00	106.48	106	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d  
Injection Date: 27-Dec-2020 10:19:11 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.698	1.698	1	637910	24	>100:1			1000.00	919.77	86.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.698	1/0	67603	21	40:1			100.00	106.40		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	1	658438	17	>100:1			1000.00	957.19	90.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	0/-1	67685	15	>100:1			100.00	102.24		M
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	239776	17	>100:1			1000.00	1041.46	96.8	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	1/0	26475	17	>100:1	Target = 3.50		88.400	93.649		
298.9 > 99	44	2.130	2.130		7171	16	76:1	3.69 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.451	0/-1	20739	18	>100:1	Target = 3.10		93.800	99.710		
349 > 99	44	2.442	2.451		7210	24	58:1	2.87 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.380	0	137423	21	>100:1			5000.00	5676.68	109	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.380	0/0	4522	14	65:1	Target = 1.80		93.400	82.440		
327 > 81	63	2.380	2.380		3178	17	7.5:1	1.42 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.415	0	718926	19	>100:1			1000.00	975.38	92.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.415	2.415	0/0	73900	20	>100:1	Target = 18.34		100.00	104.12		
313 > 119	49	2.424	2.415		4329	21	15:1	17.07 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.522	-1	1323365	20	>100:1			5000.00	4968.44	93.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.522	2.522	-1/0	37327	18	98:1	Target = 0.81		200.00	196.30		
285 > 185	66	2.522	2.522		47768	18	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.773	-1	585778	19	>100:1			1000.00	965.60	95.1	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.773	-1/0	62257	21	>100:1	Target = 3.70		100.00	102.46		
363 > 169	47	2.773	2.773		17053	20	71:1	3.65 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	-1	178402	20	>100:1			1000.00	1041.89	99.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	0/1	16388	25	87:1	Target = 3.21	0.16	91.000	86.637		
399 > 99	45	2.791	2.782		6257	28	30:1	2.61 (1.60-4.81)	0.09				M
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.809	-1/0	104509	20	>100:1	Target = 2.97		94.200	92.270		
377 > 85	45	2.800	2.809		35375	21	>100:1	2.95 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.142	3.142	0/1	17654	29	>100:1	Target = 3.08		95.200	108.93		
449 > 99	45	3.148	3.142		5421	21	28:1	3.25 (1.54-4.63)					M
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.108	3.108	-1	111803	25	>100:1			5000.00	5805.41	107	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.115	0/1	6244	25	66:1	Target = 1.80		94.800	109.81		M
427 > 81	64	3.115	3.115		2963	20	17:1	2.10 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	-2	592205	25	>100:1			1000.00	1000.58	90.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.135	-2/0	63664	22	33:1	Target = 2.87		100.00	105.45		
413 > 169	53	3.135	3.135		21104	24	98:1	3.01 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.507	3.507	-2	157347	21	>100:1			1000.00	1049.48	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.500	3.500	-2/0	17956	40	66:1	Target = 3.84	0.28	92.800	96.303		
499 > 99	54	3.515	3.500		5314	44	37:1	3.37 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.716	3.716	-2/0	49765	25	>100:1			93.200	93.949		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.858	-1/1	11740	25		Target = 3.07		96.000	97.498		
549 > 99	54	3.858	3.858		4133	16	28:1	2.84 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.153	4.153	-2/0	11726	15	56:1	Target = 3.03		96.400	102.69		
599 > 99	54	4.162	4.153		2522	21	20:1	4.64 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.318	-2/0	45194	17	>100:1			94.200	101.14		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.648	4.648	-3/1	10640	22	95:1	Target = 3.33		96.800	84.229		
699 > 99	54	4.656	4.648		4300	28		2.47 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.515	3.515	-1	760907	22	>100:1			1000.00	1013.24	96	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.515	3.515	-1/0	76507	29	>100:1	Target = 6.16		100.00	100.54		
463 > 169	56	3.507	3.515		13268	17	>100:1	5.76 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.850	0	311979	20	>100:1			1000.00	1007.80	94.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.858	0/0	32853	20	>100:1			100.00	106.86		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.850	3.850	-2	88356	18	>100:1			5000.00	4763.09	94.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.850	3.850	-2/0	3096	14	8.9:1	Target = 1.95		95.800	71.798		
527 > 81	65	3.842	3.850		2078	14	8.5:1	1.48 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.447	4.447	-2/0	3562	22	40:1	Target = 3.14		96.400	87.226		
627 > 80	65	4.438	4.447		1388	17	16:1	2.56 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	-2	636706	20	>100:1			1000.00	959.86	91.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.866	-1/1	66215	25	>100:1	Target = 15.94		100.00	105.84		
513 > 169	51	3.866	3.866		4440	27	36:1	14.91 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	-2	725286	19	>100:1			5000.00	5052.87	95.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.019	4.019	0/2	13583	35	81:1	Target = 1.33	0.16	100.00	121.90		M
570 > 483	58	4.019	4.019		9036	31	53:1	1.50 (0.66-1.99)	0.15				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	-2	690640	18	>100:1			5000.00	5200.03	93.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.180	4.180	0/2	11202	34		Target = 1.58	0.11	100.00	81.458		M
584 > 526	60	4.188	4.180		8723	37	30:1	1.28 (0.79-2.37)	0.17				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	-2	625944	20	>100:1			1000.00	990.30	92.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.171	4.171	-2/0	58540	20	>100:1	Target = 15.50		100.00	99.506		
563 > 169	52	4.171	4.171		3883	19		15.07 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	114979	17	>100:1			1000.00	1062.57	98	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	11700	18	54:1			100.00	108.30		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	47825	16	>100:1			1000.00	903.78	87	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	6779	21	58:1	Target = 1.12		100.00	125.64		
512 > 219	57	4.318	4.318		5767	11	30:1	1.17 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	122508	17	>100:1			1000.00	976.97	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	12030	16	63:1			100.00	110.37		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.438	4.438	-2	571184	19	>100:1			1000.00	943.61	88	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.438	4.438	-3/-1	62956	18	27:1	Target = 10.85		100.00	108.84		
613 > 169	38	4.447	4.438		5817	14		10.82 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.673	4.673	-3/-1	62067	18	>100:1	Target = 8.37		100.00	110.33		
663 > 169	38	4.673	4.673		9243	25	58:1	6.71 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	47562	19	>100:1			1000.00	968.78	92.3	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	6110	15	36:1	Target = 1.03		100.00	117.59		
526 > 219	59	4.492	4.492		5592	20	28:1	1.09 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.890	4.890	-3	828920	18	>100:1			1000.00	983.95	93.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.890	4.890	-3/0	76848	20	14:1	Target = 12.11		100.00	107.00		
713 > 169	42	4.890	4.890		6047	15	>100:1	12.70 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.258	5.258	-4	865470	19	>100:1			1000.00	955.09	94.7	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.266	5.266	-4/0	64495	20	18:1	Target = 11.48		100.00	114.05		
813 > 269	40	5.266	5.266		5670	13	>100:1	11.37 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.591	5.591	-5/-1	81574	25	11:1	Target = 13.88		100.00	106.48		
913 > 319	40	5.591	5.591		6200	31	>100:1	13.15 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.858	3.858	-2	677491	22	>100:1					93.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.415	0	721321	21	>100:1					95.8	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	-2	602564	25	>100:1					93.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.698	1	603451	24	>100:1					90.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.507	3.507	-2	163708	23	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID:

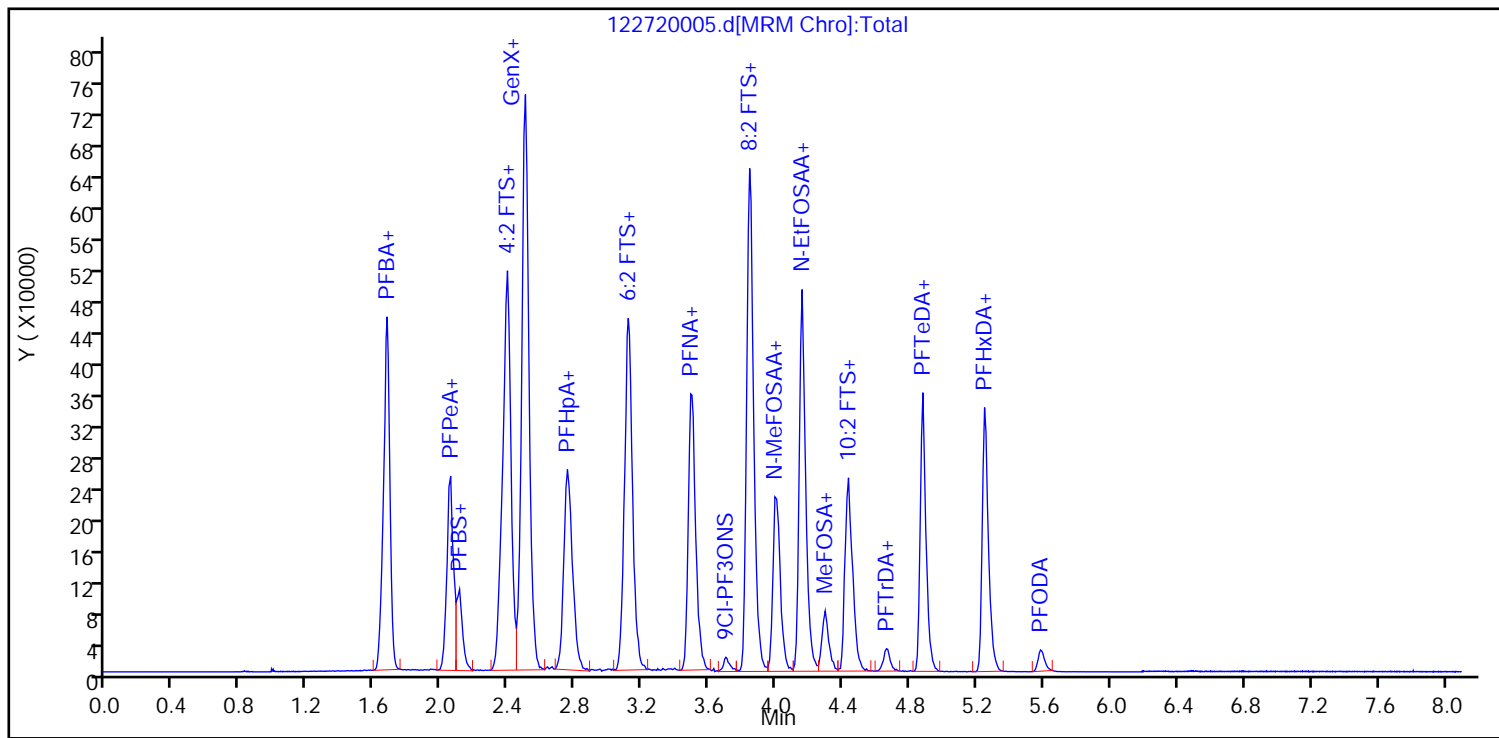
ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

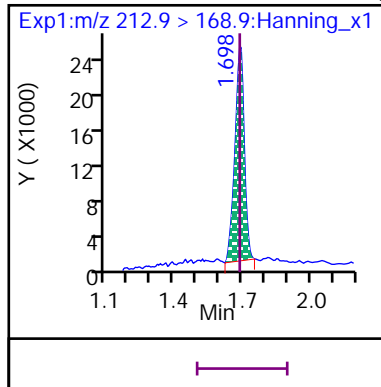
Dil. Factor: 1

Operator:

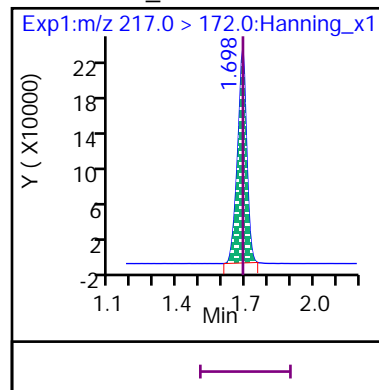
Matthew M. Miller



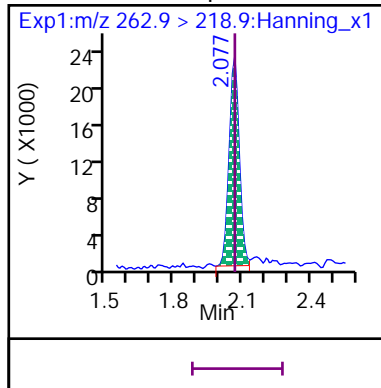
8 Perfluoro-n-butanoic acid (PFBA)



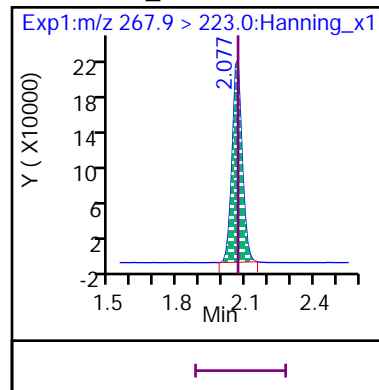
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

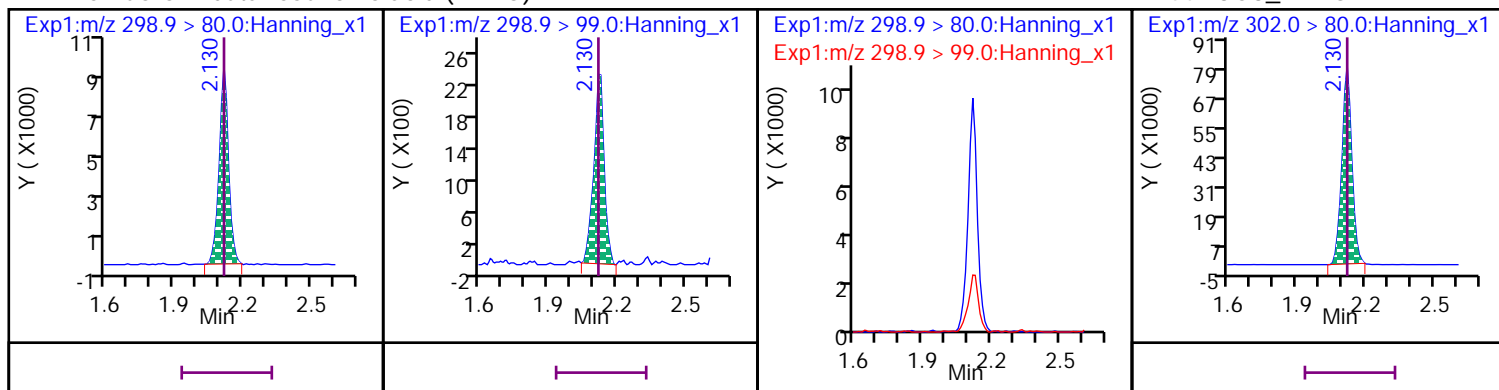


D 50 13C5\_PFPeA



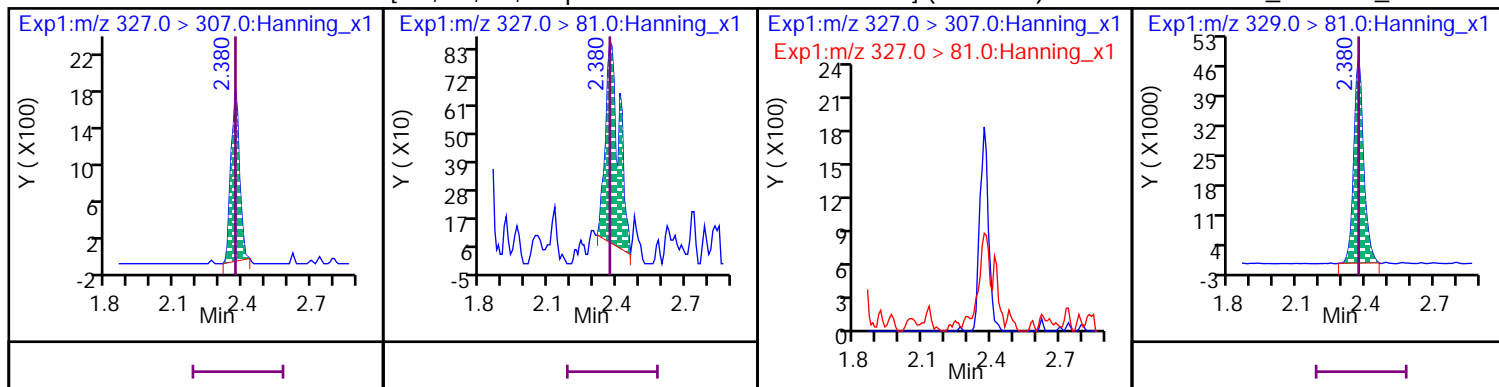
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



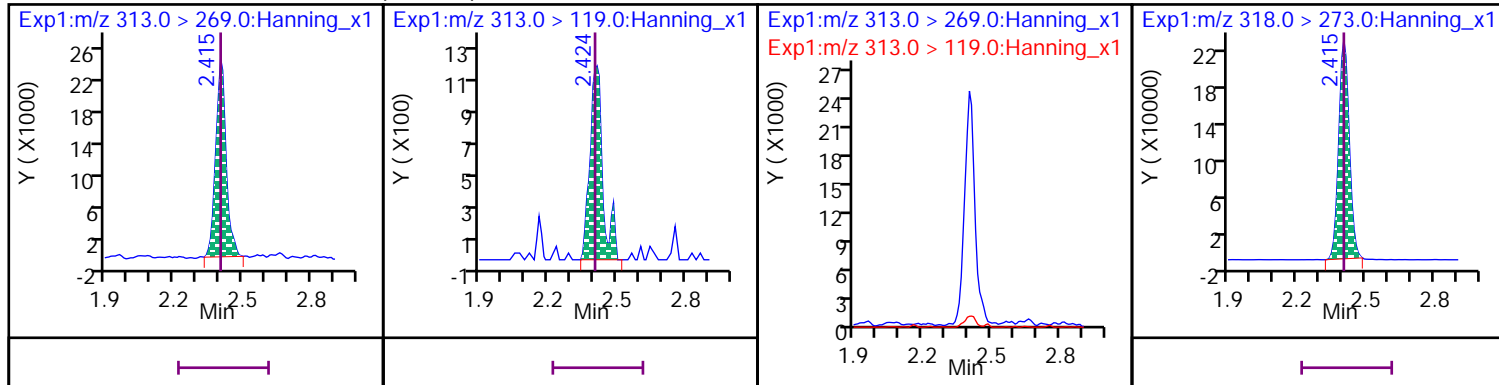
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



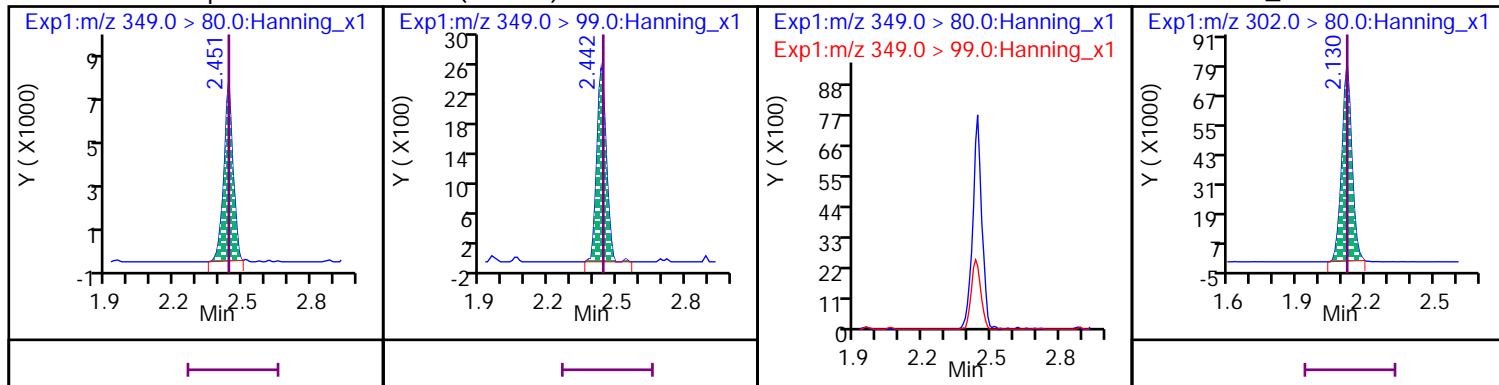
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



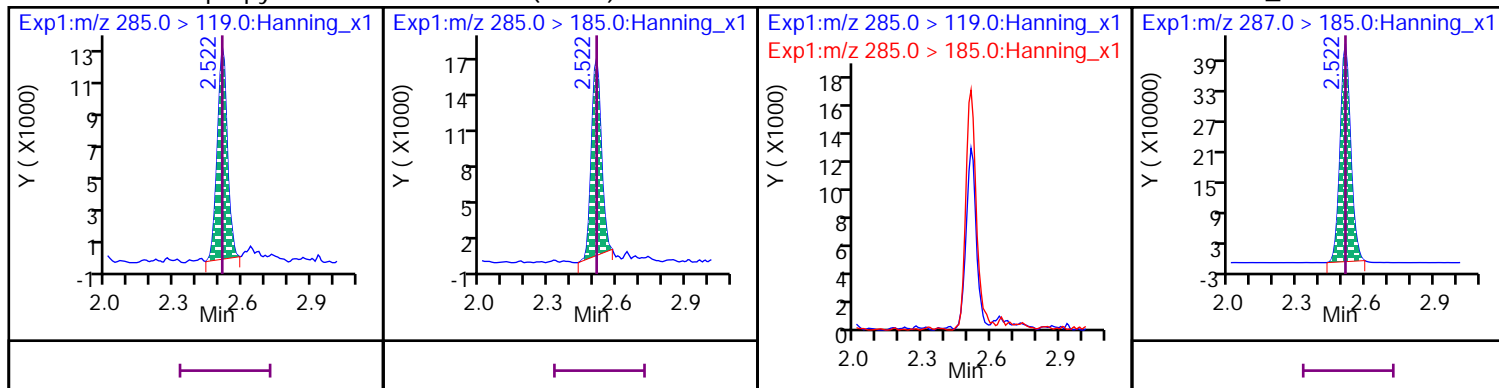
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



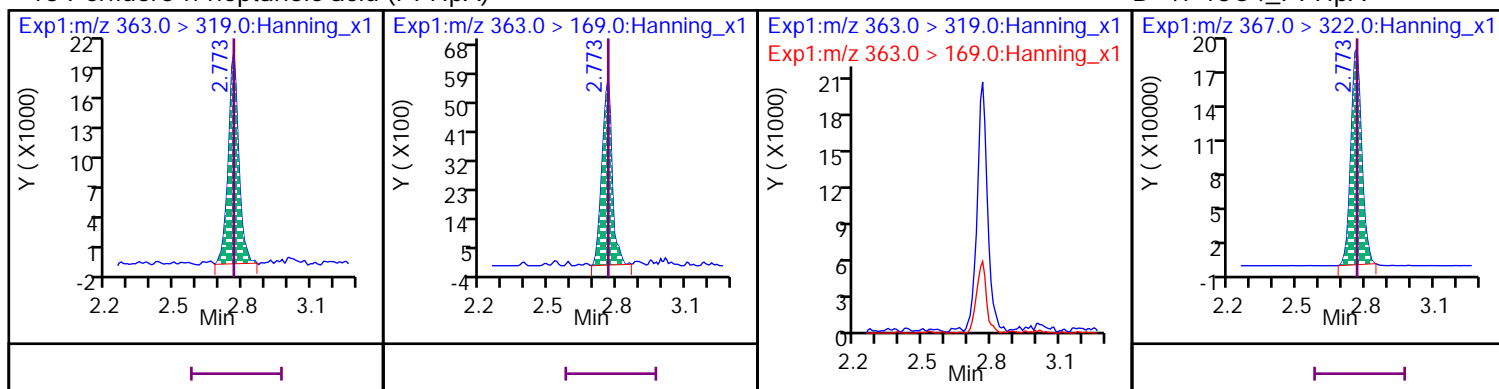
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



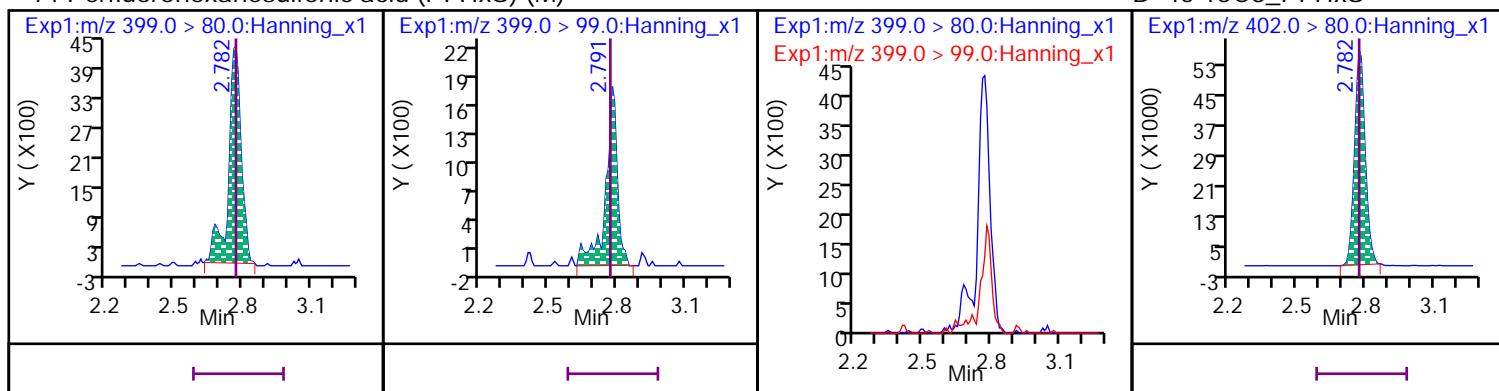
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



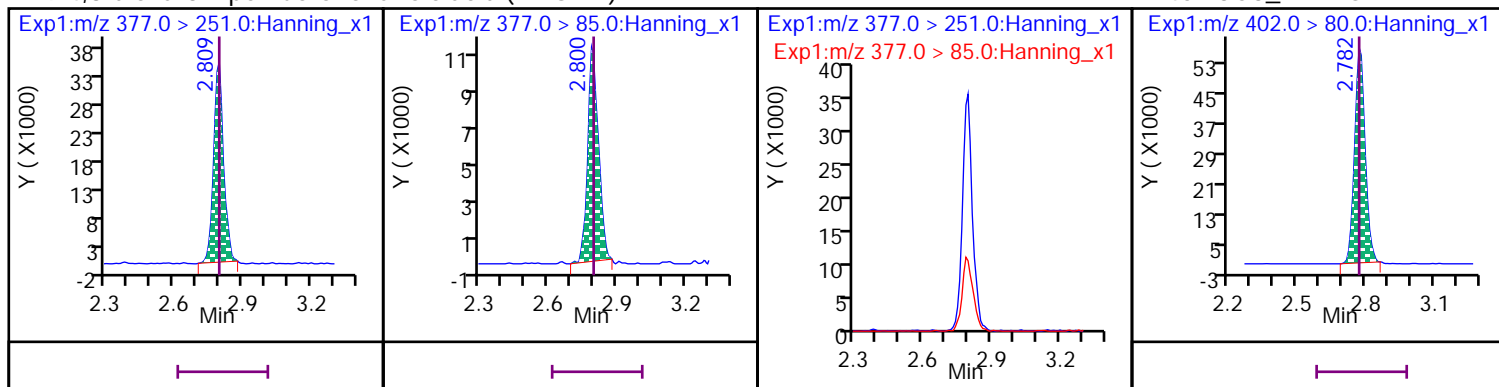
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS

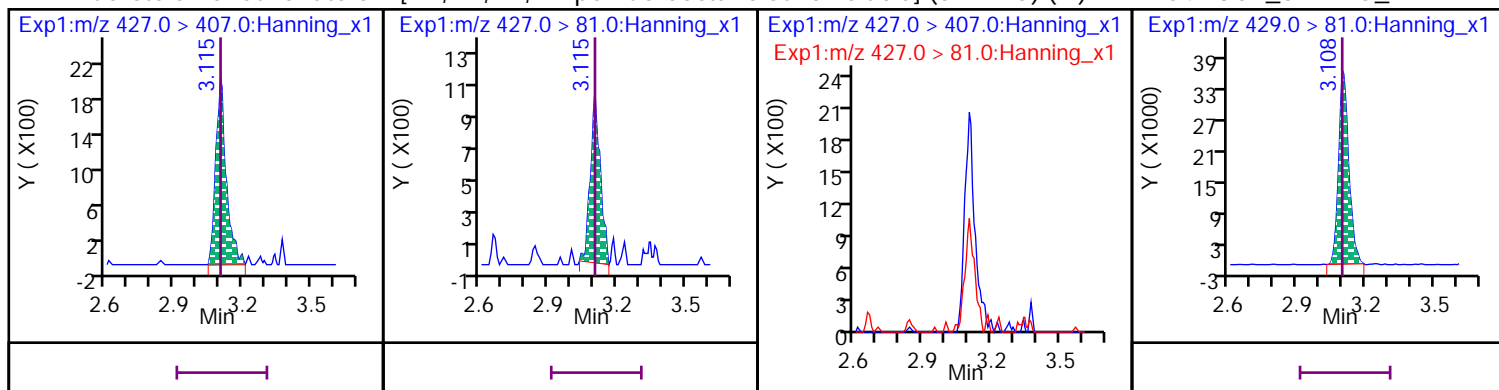


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS

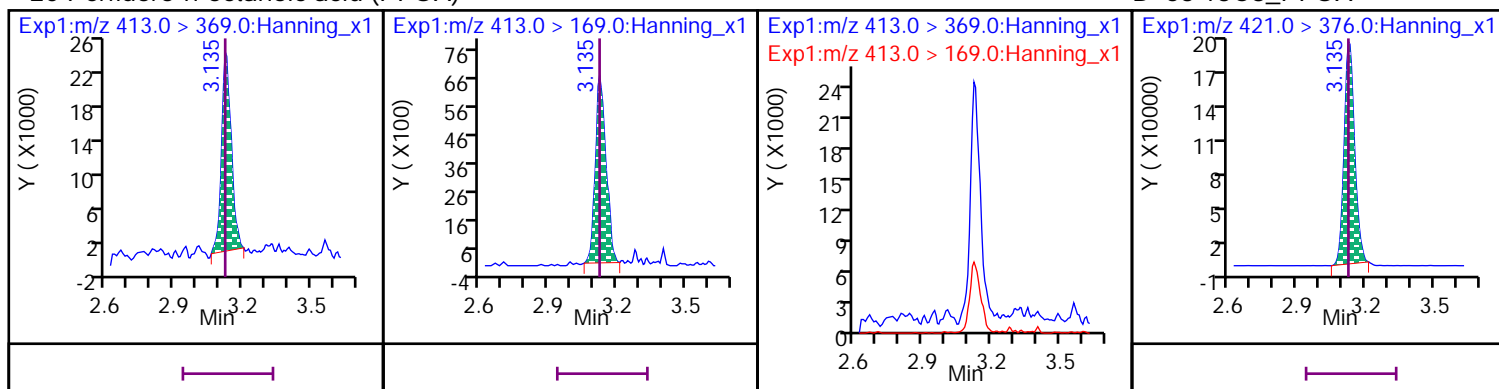


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M) D 64 13C2\_6:2 FTS\_2



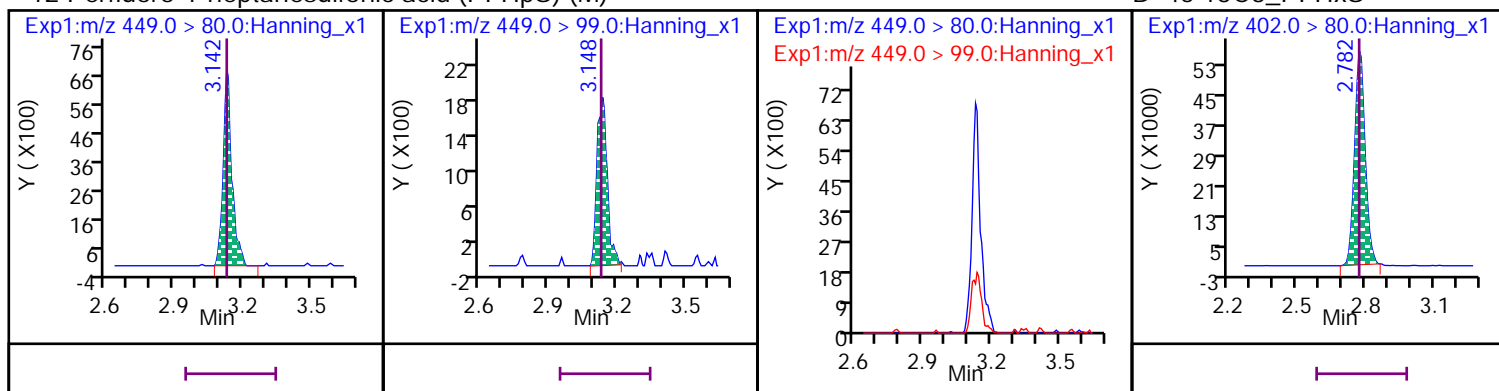
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



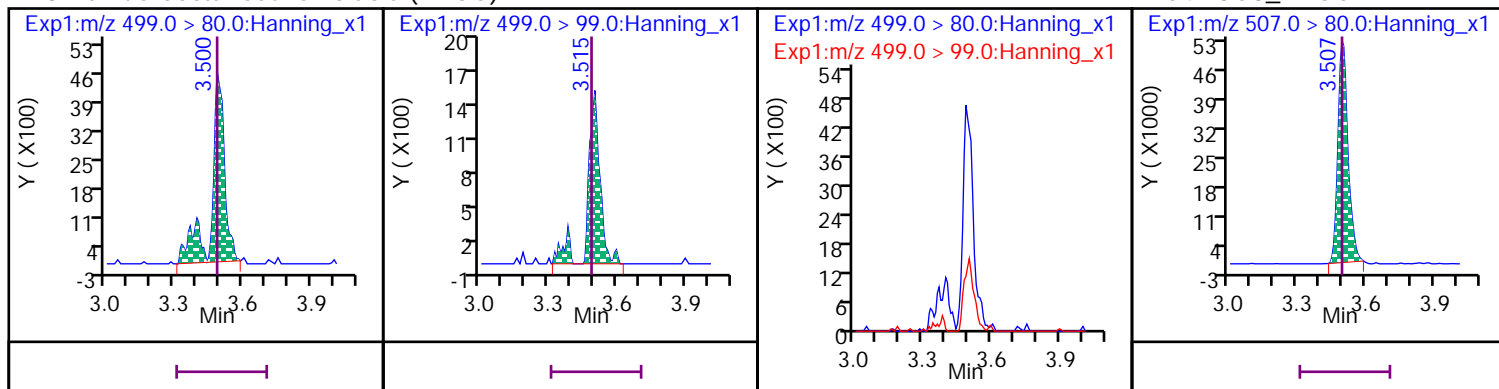
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (M)

D 45 13C3\_PFHxS



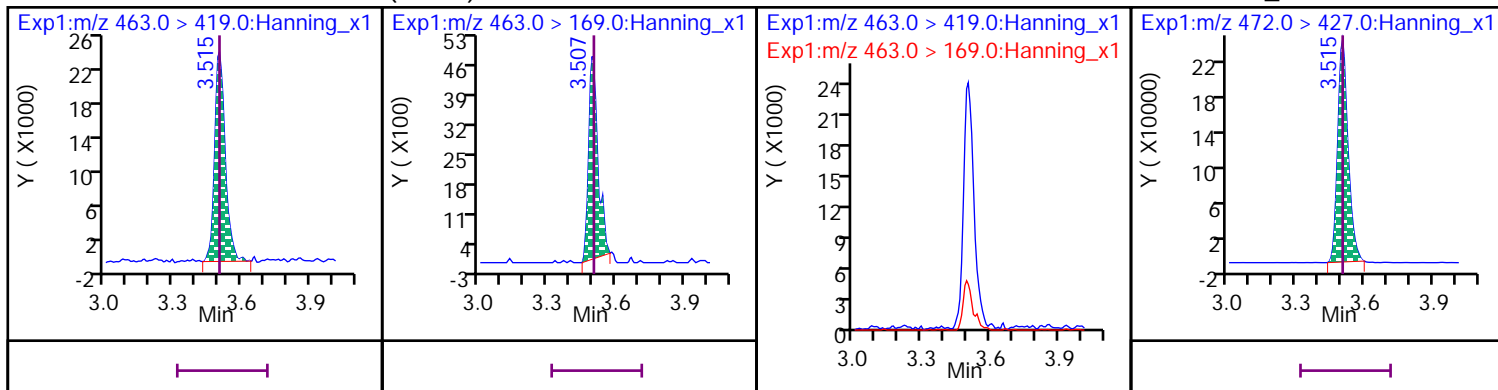
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



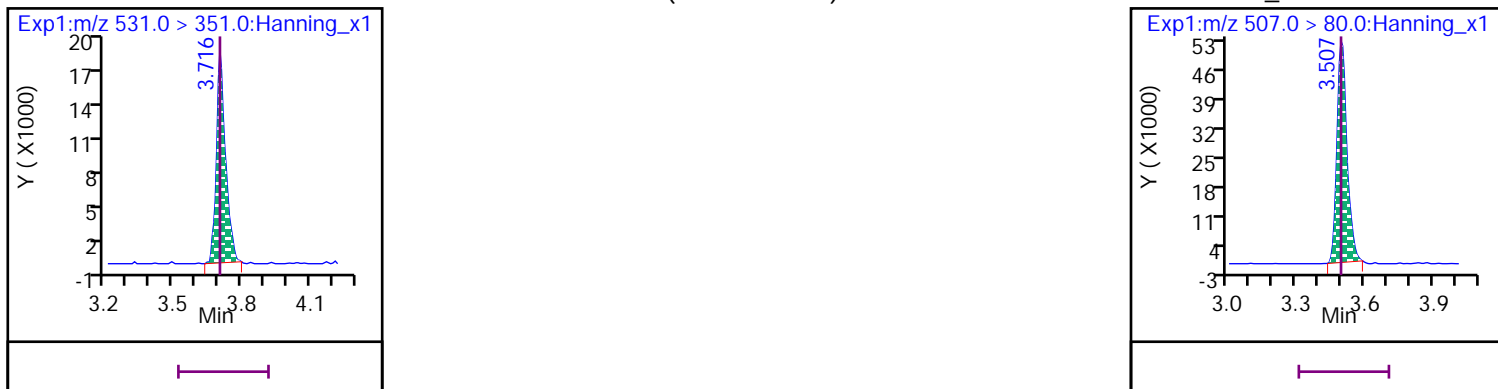
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



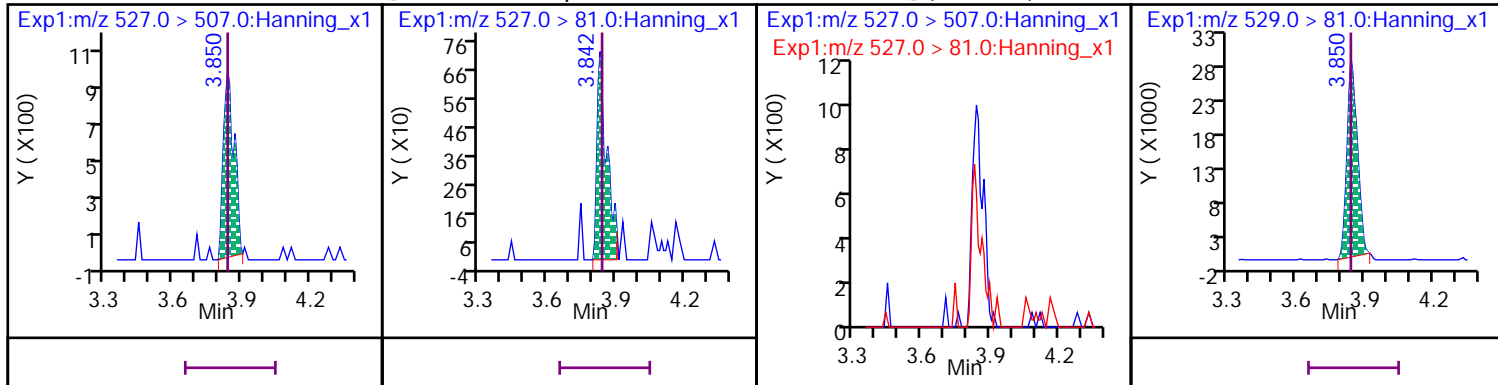
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



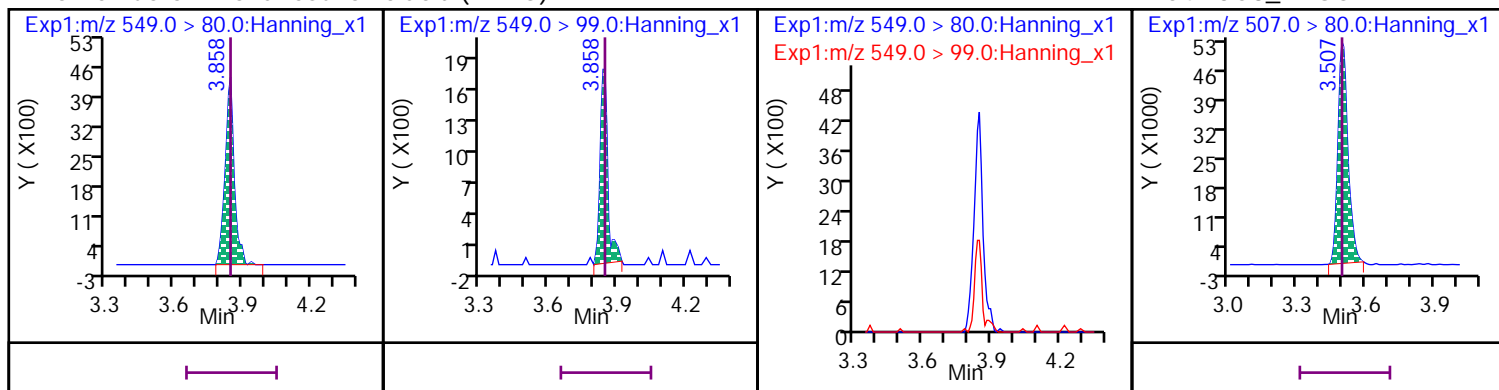
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



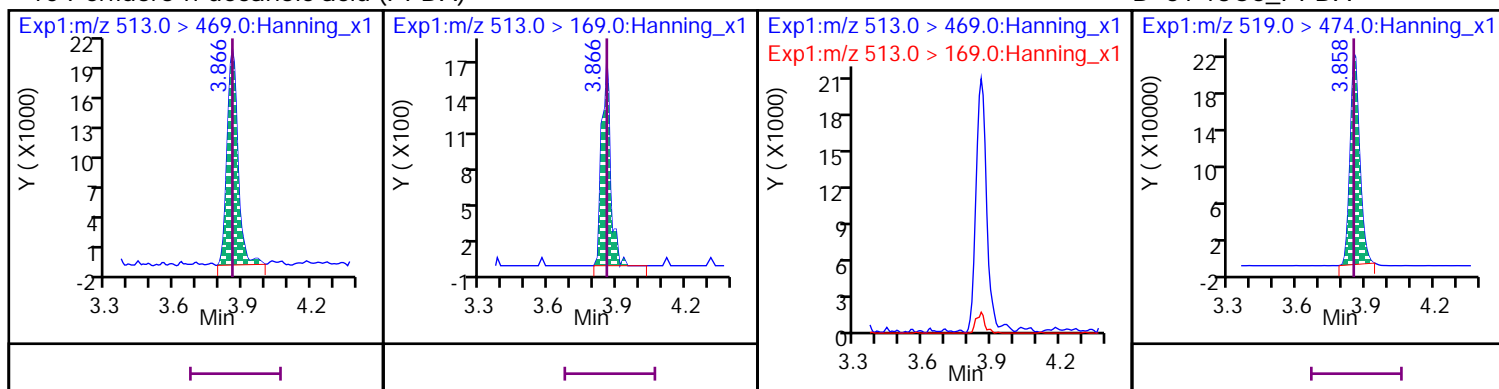
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



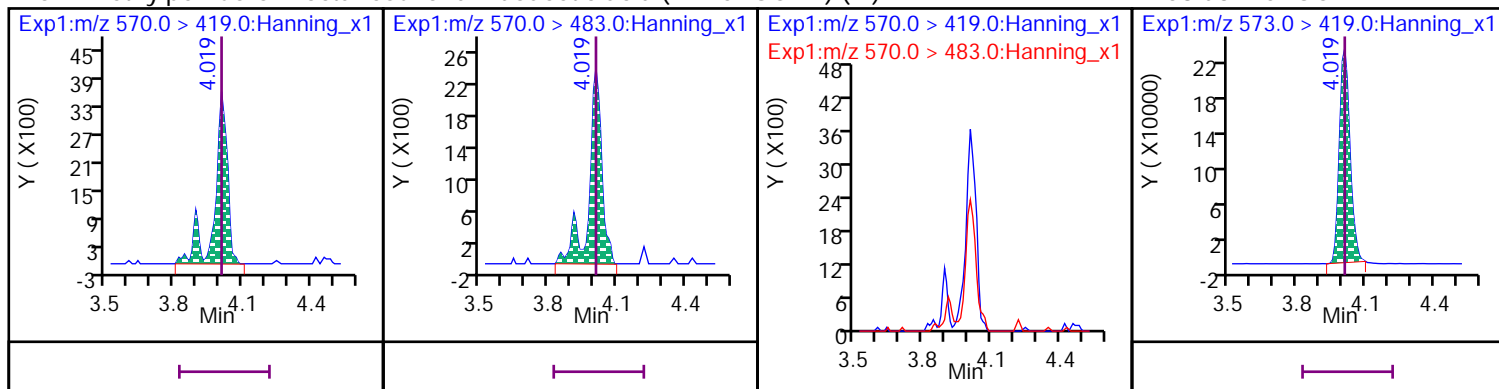
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



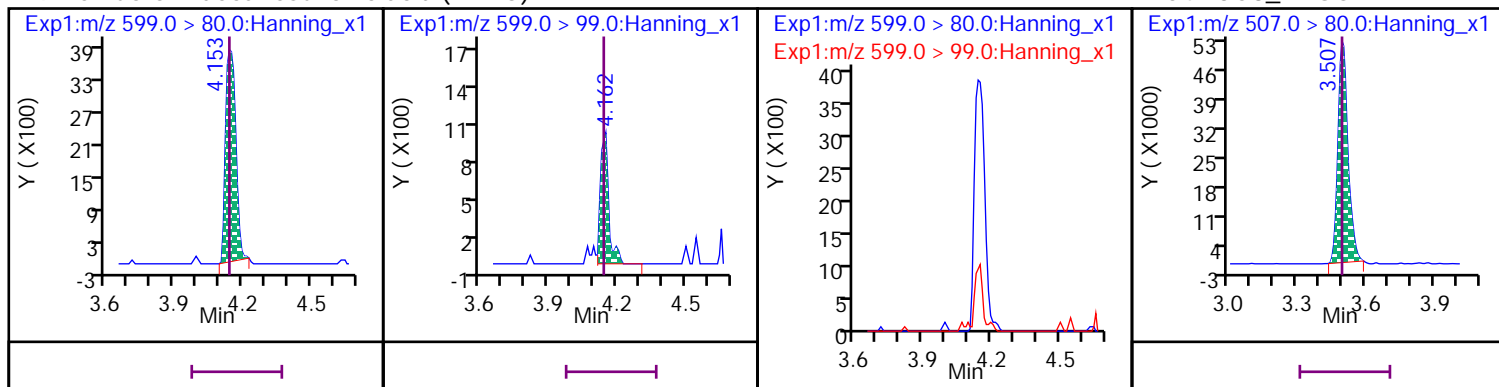
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



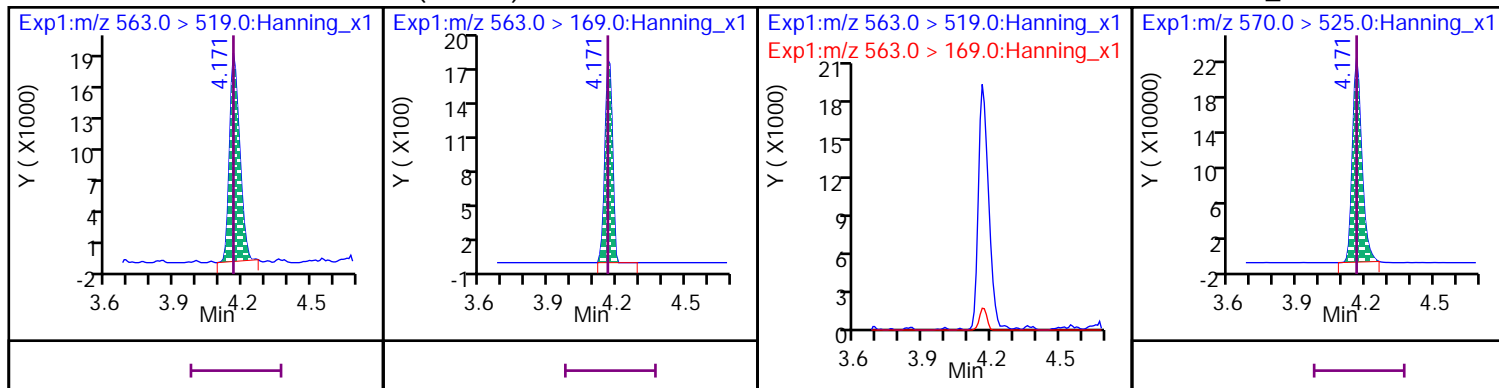
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



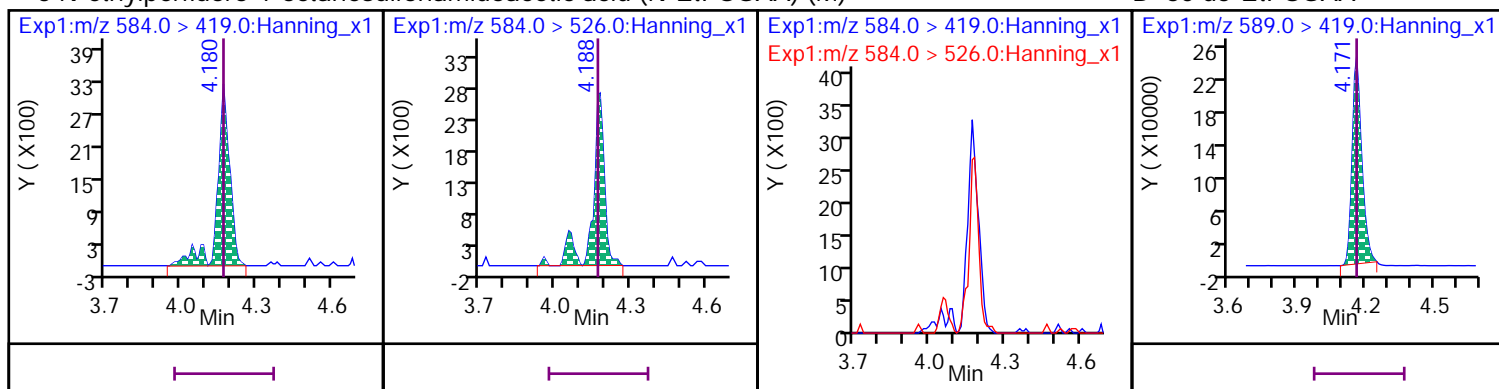
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



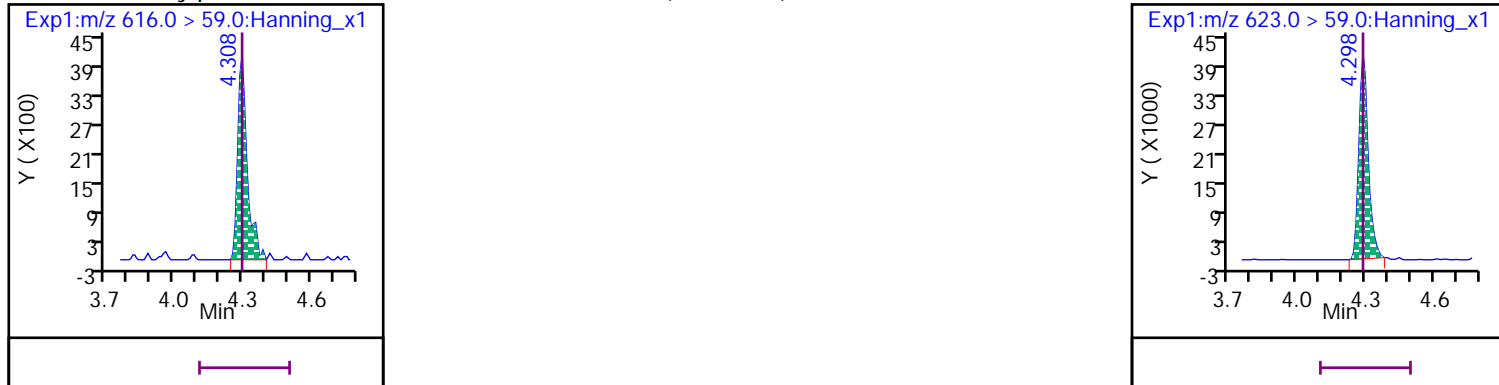
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



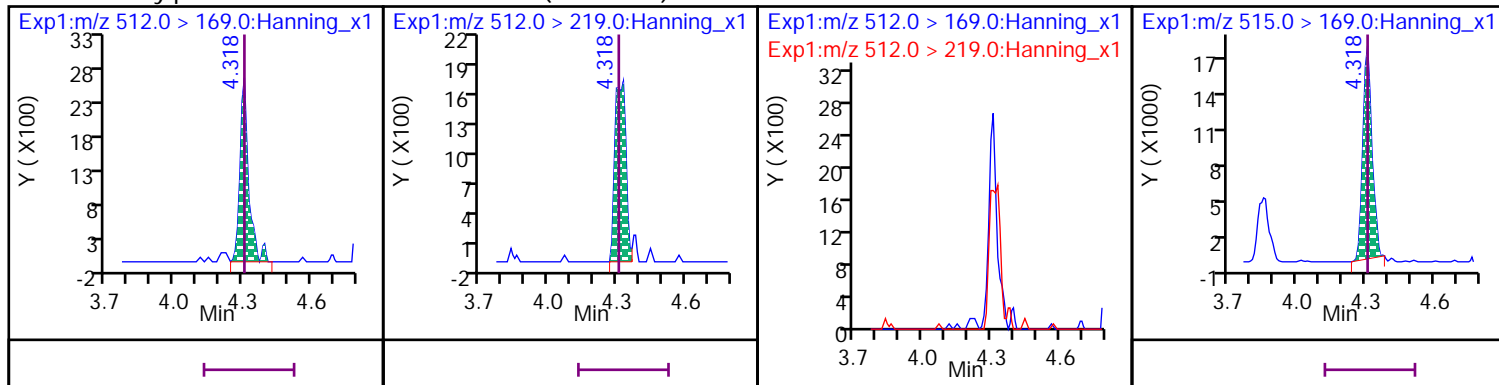
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

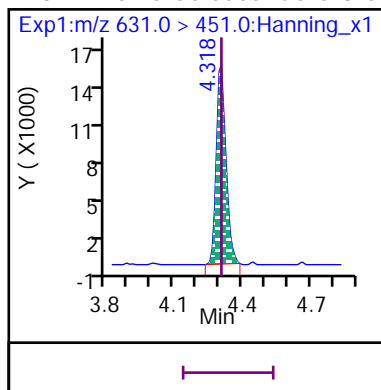


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

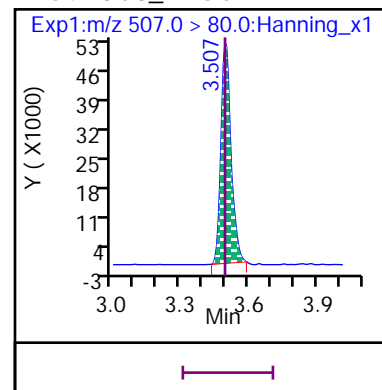
D 57 d3-MeFOSA



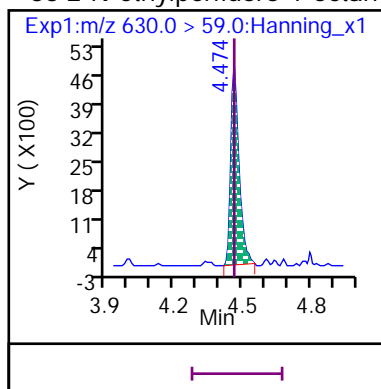
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



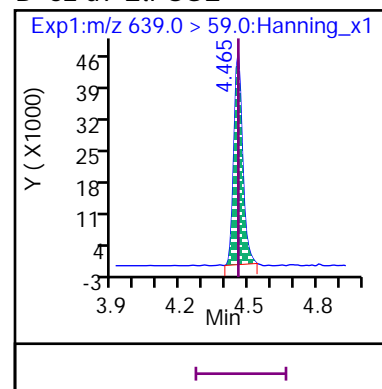
D 54 13C8\_PFOS



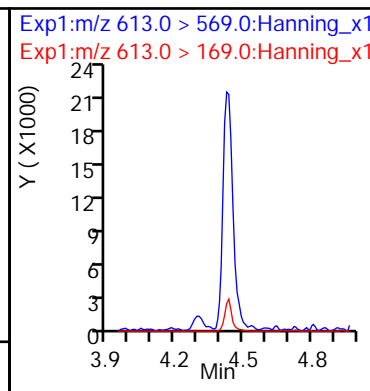
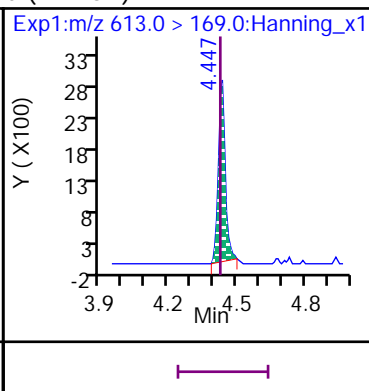
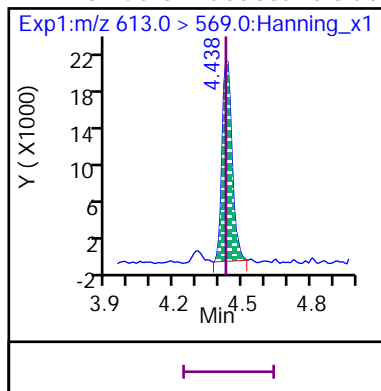
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



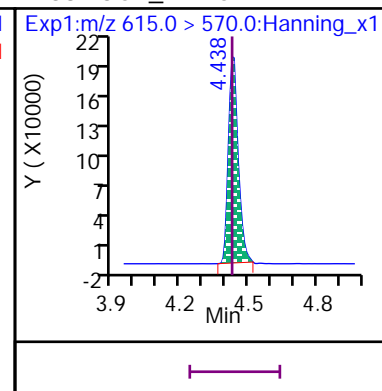
D 62 d9-EtFOSE



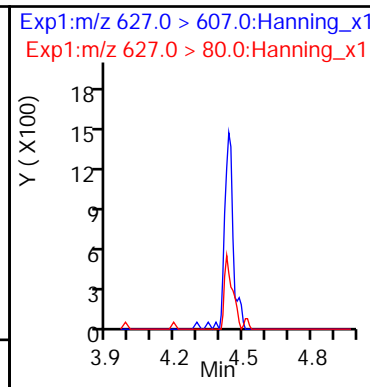
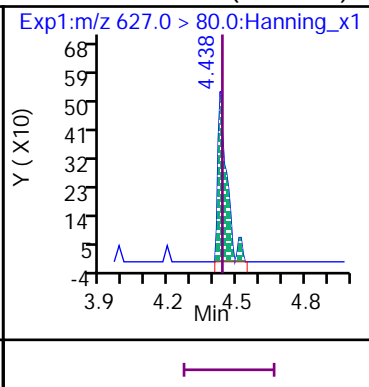
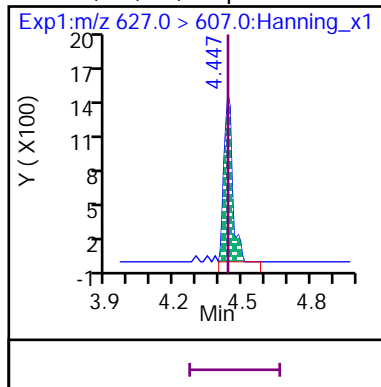
11 Perfluoro-n-dodecanoic acid (PFDoA)



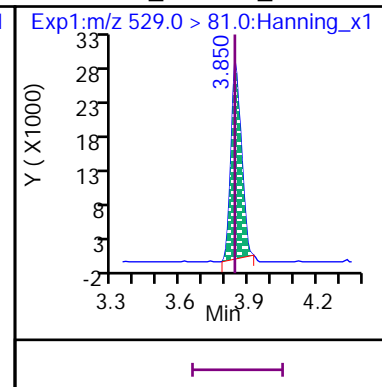
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



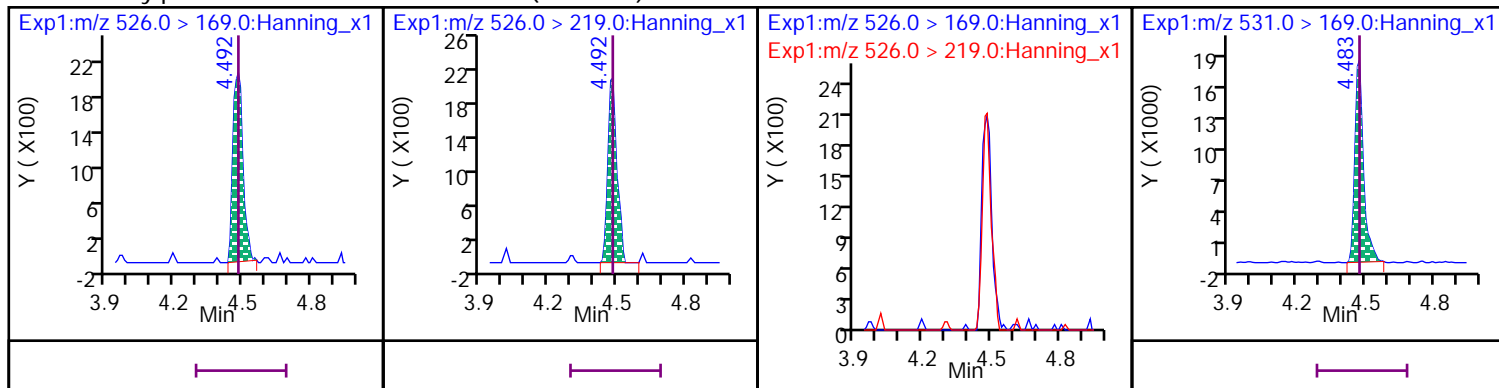
D 65 13C2\_8:2 FTS\_2





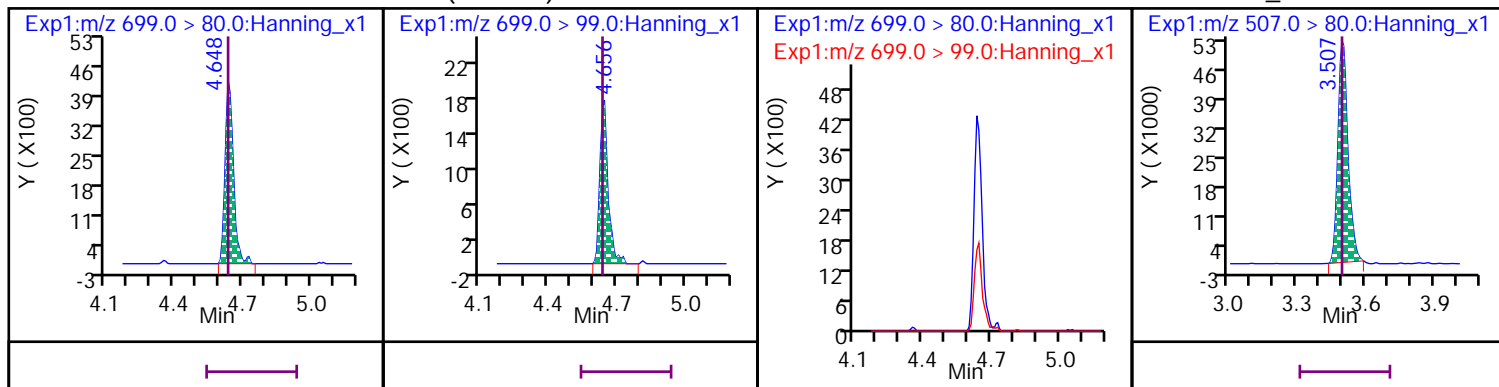
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



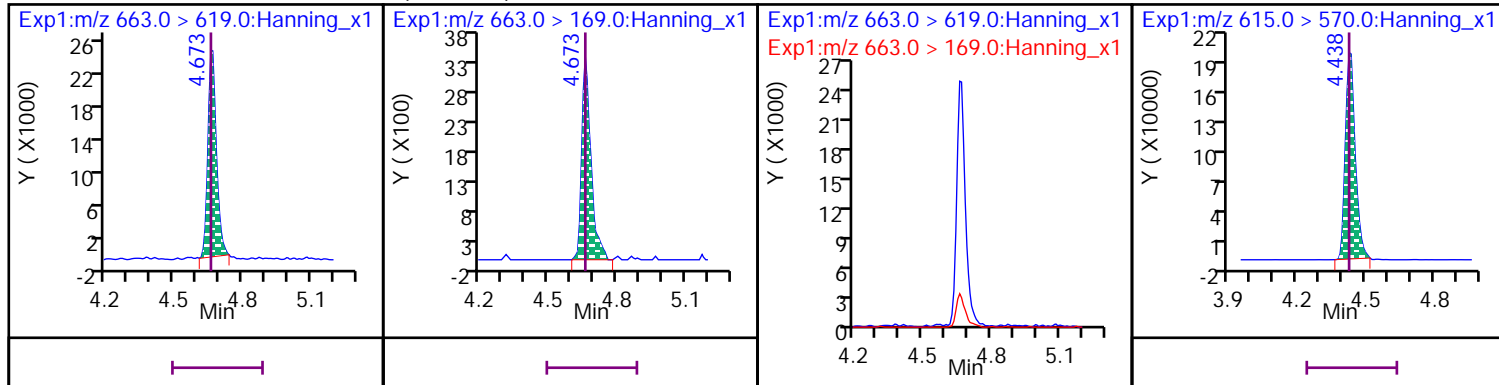
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



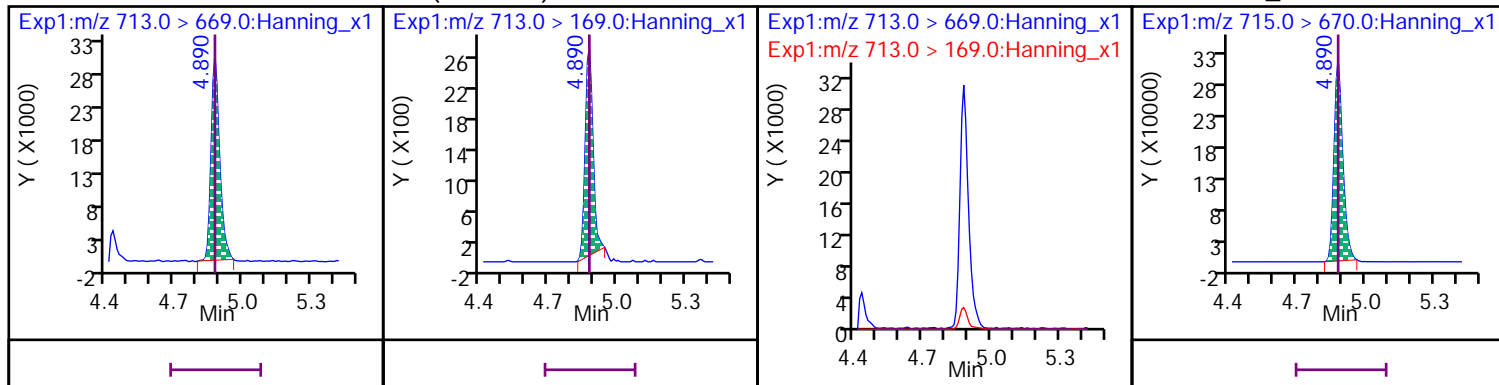
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



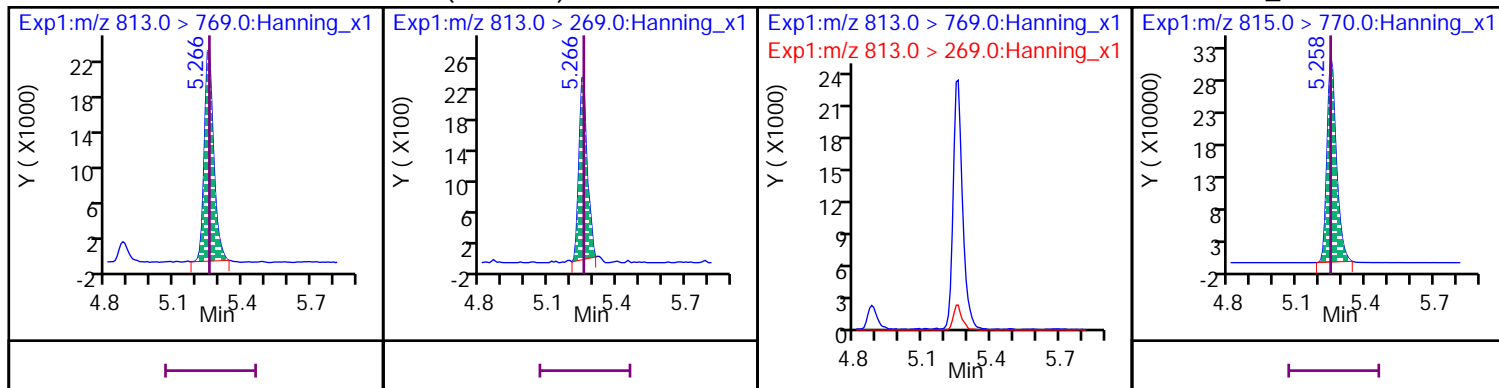
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



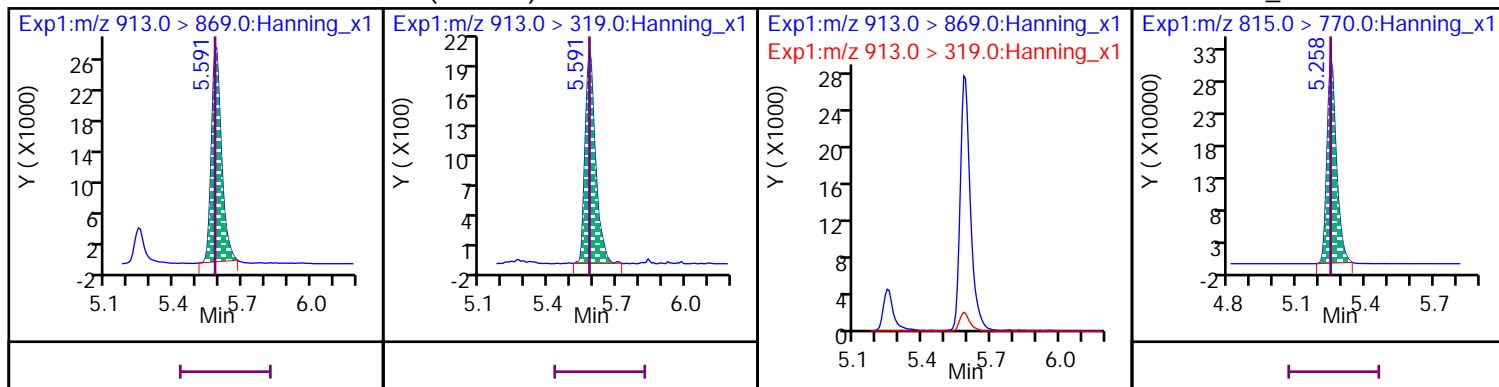
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

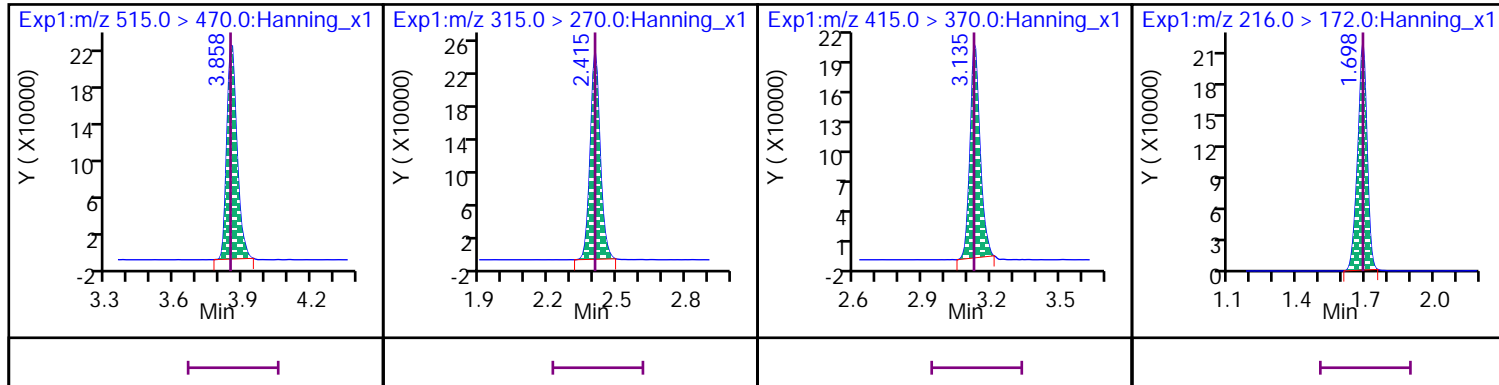


\* 37 13C2\_PFDA

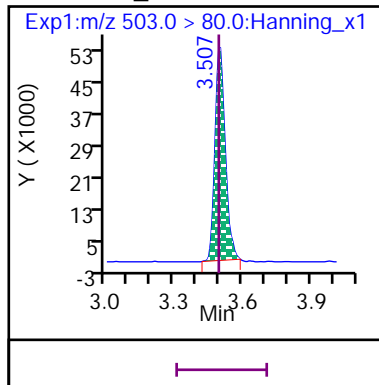
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

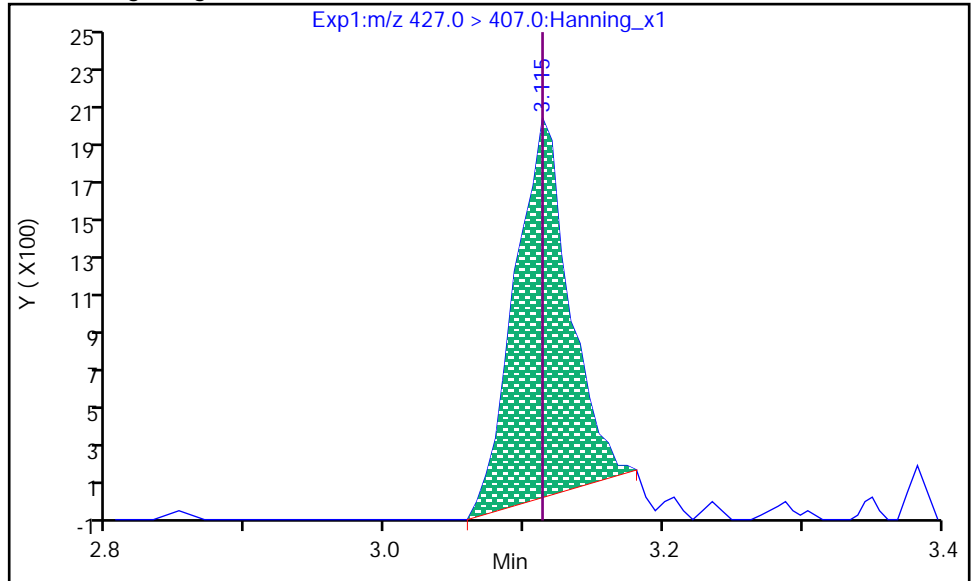
Dil. Factor: 1

Operator: Matthew M. Miller

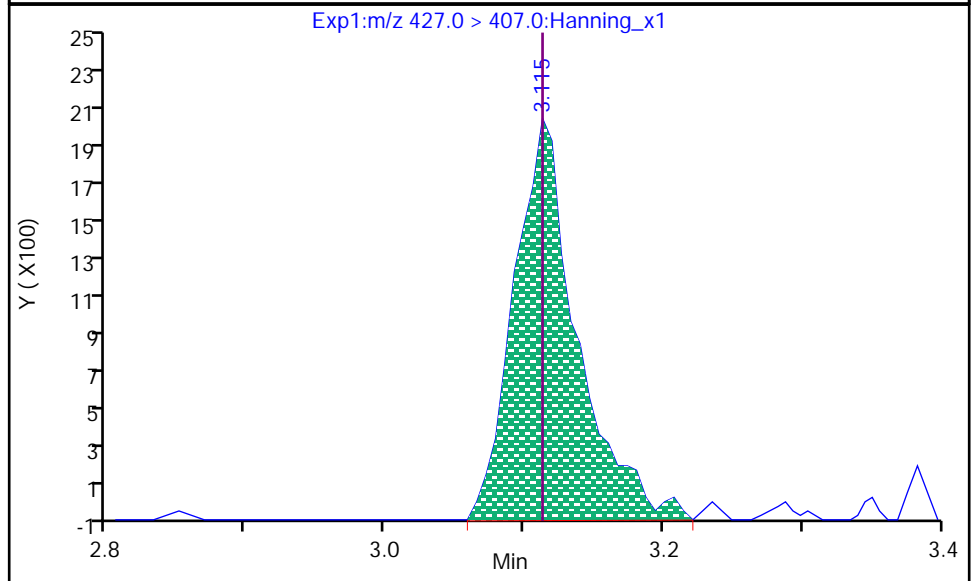
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

RT: 3.115  
Area: 5116  
Amount: 84.726  
Amount Units: ng/L



RT: 3.115  
Area: 6244  
Amount: 109.81  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:27:46

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

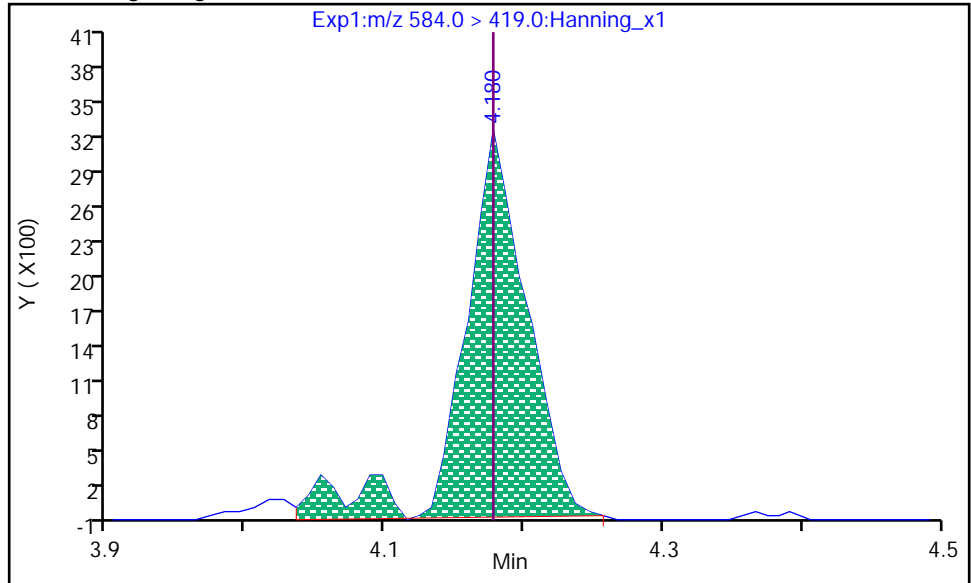
Dil. Factor: 1

Operator: Matthew M. Miller

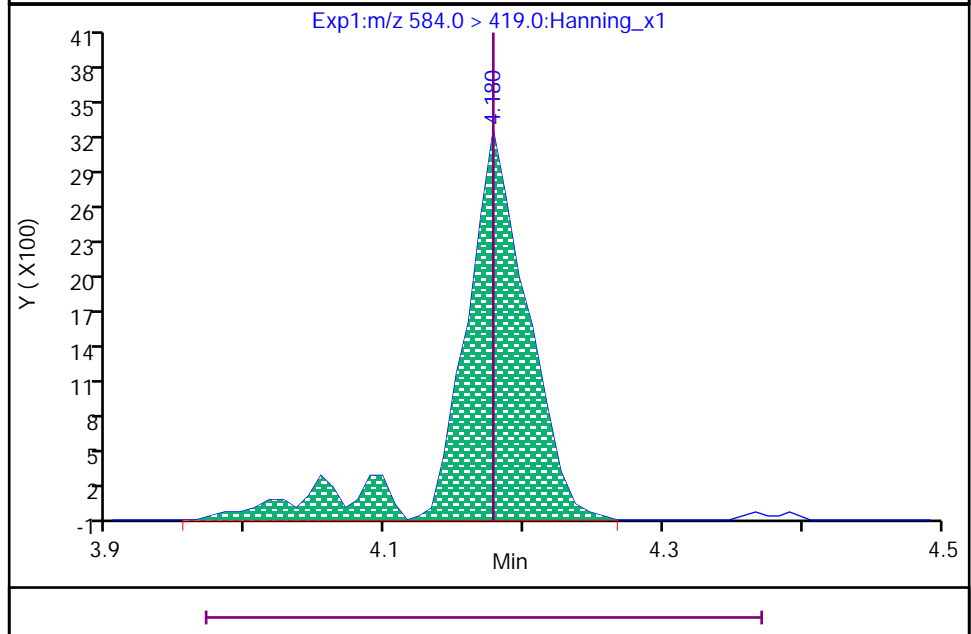
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.180  
Area: 10478  
Amount: 76.194  
Amount Units: ng/L



RT: 4.180  
Area: 11202  
Amount: 81.458  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:28:48

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

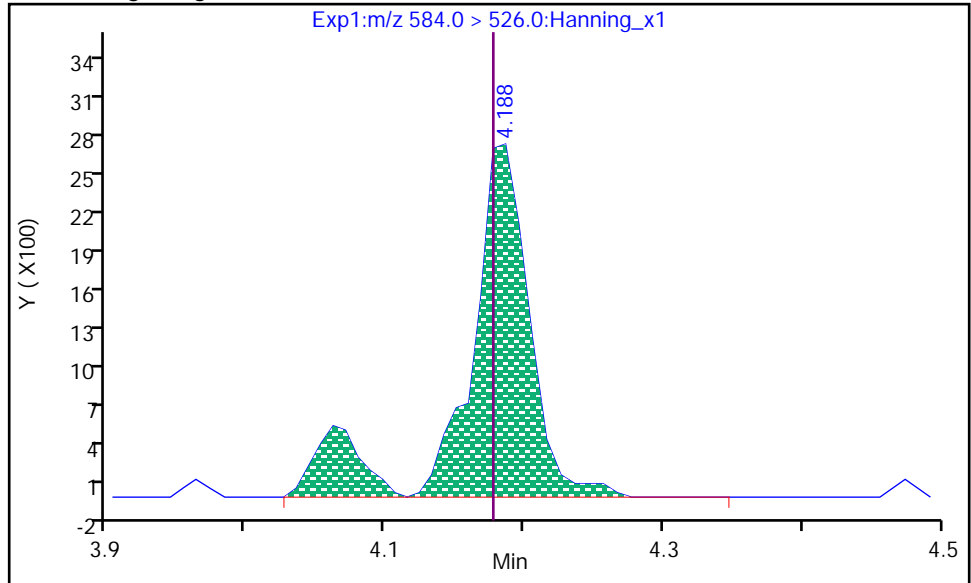
Dil. Factor: 1

Operator: Matthew M. Miller

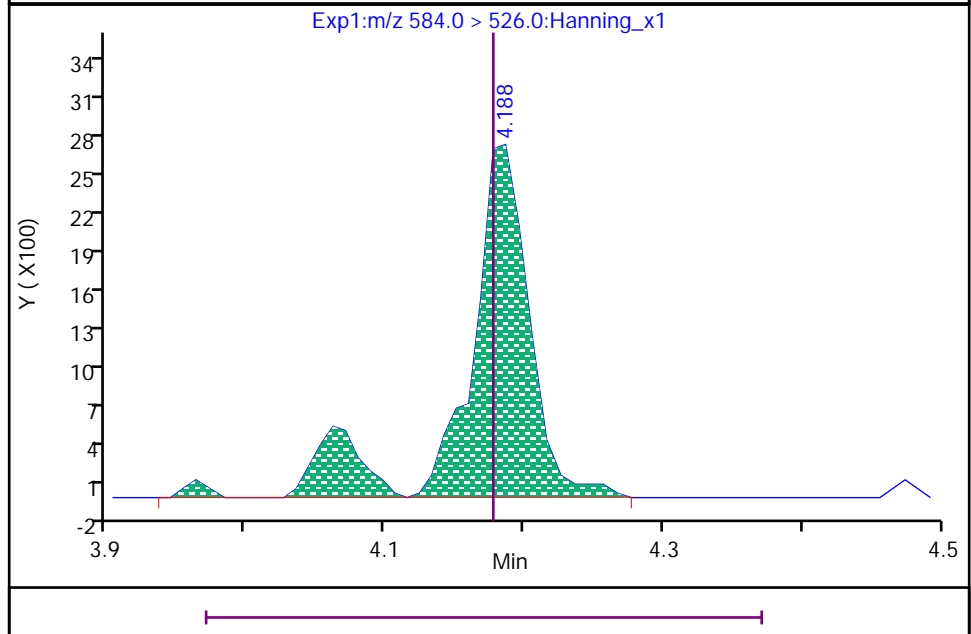
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.188  
Area: 8595  
Amount: 81.458  
Amount Units: ng/L



RT: 4.188  
Area: 8723  
Amount: 81.458  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:28:54

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

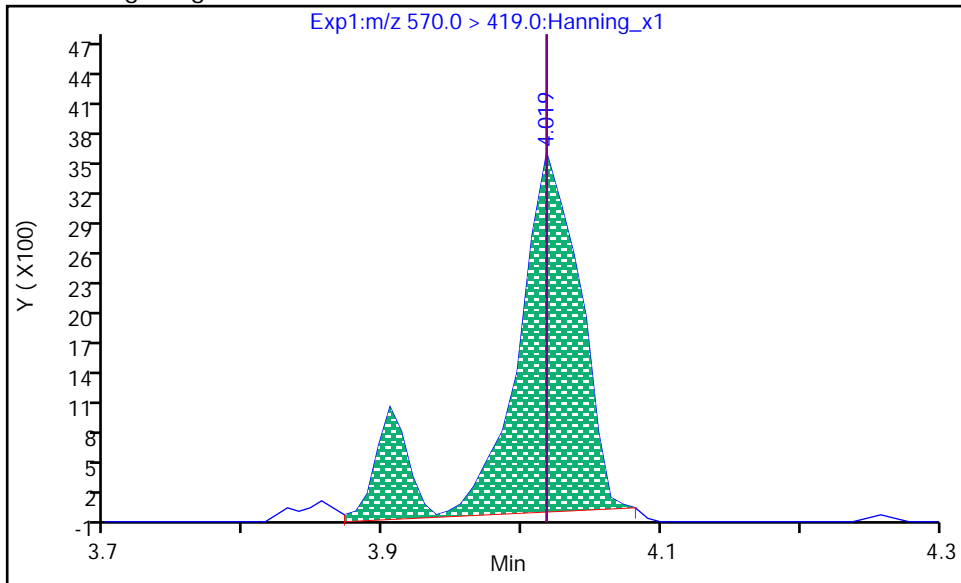
Dil. Factor: 1

Operator: Matthew M. Miller

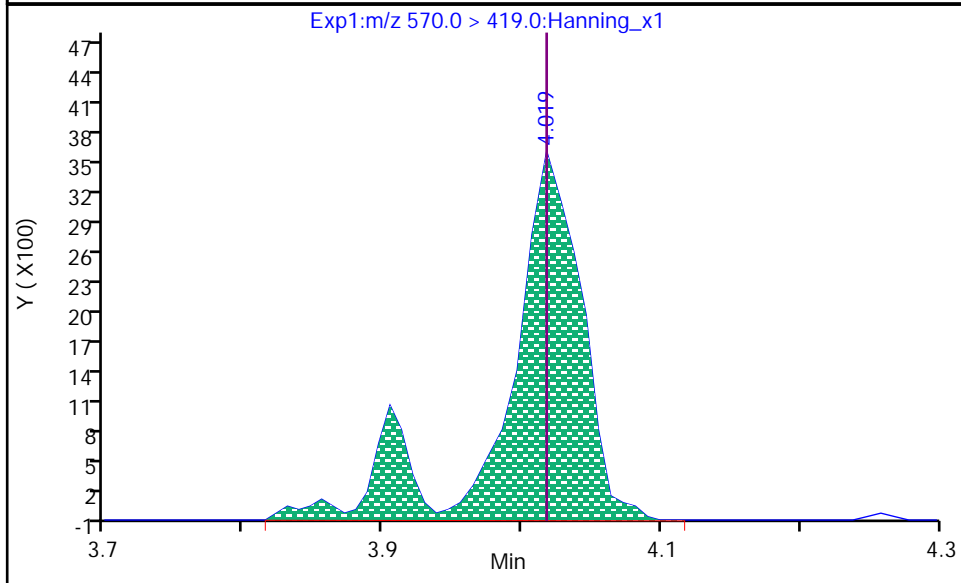
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.019  
Area: 12203  
Amount: 109.52  
Amount Units: ng/L

Processing Integration Results



RT: 4.019  
Area: 13583  
Amount: 121.90  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:28:37

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

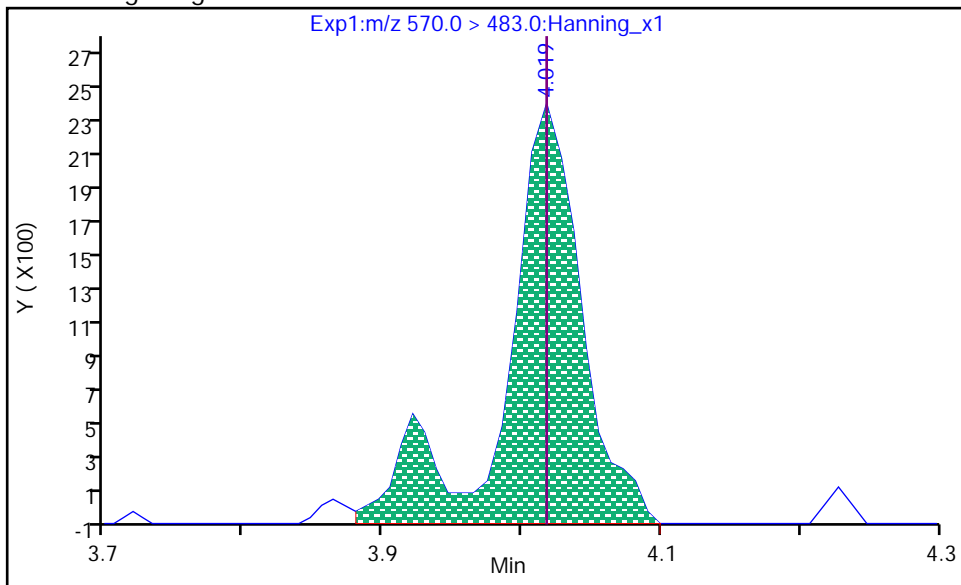
Dil. Factor: 1

Operator: Matthew M. Miller

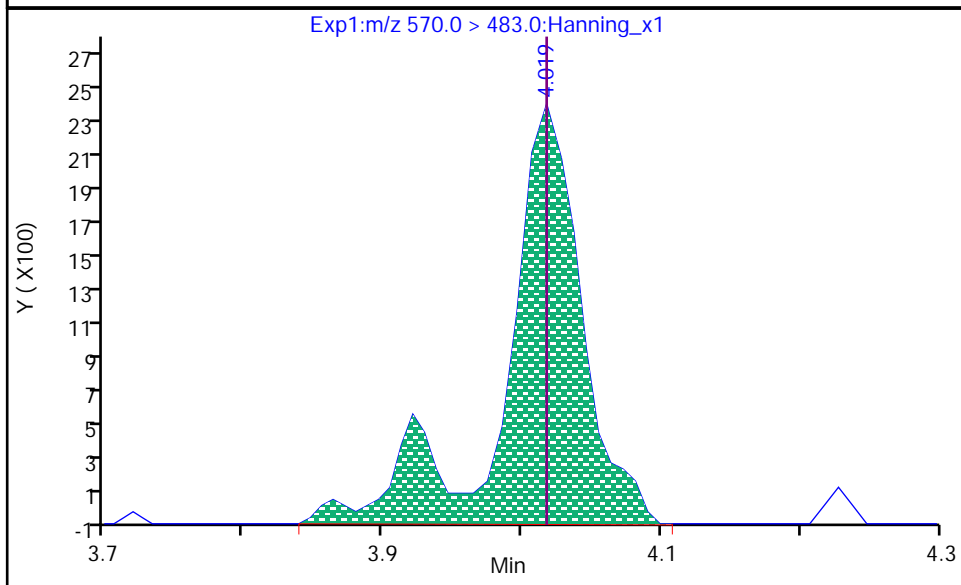
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.019  
Area: 8790  
Amount: 121.90  
Amount Units: ng/L



RT: 4.019  
Area: 9036  
Amount: 121.90  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:28:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

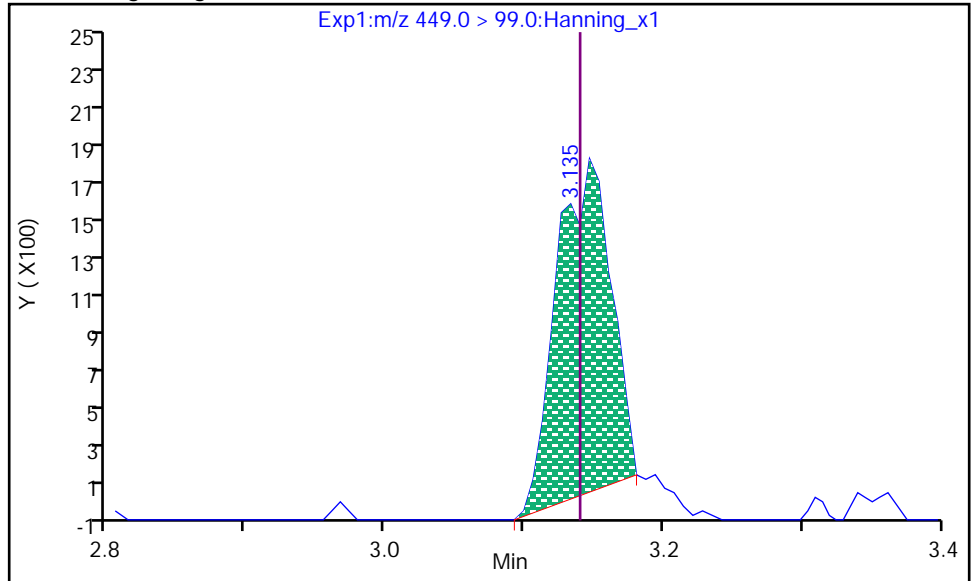
Dil. Factor: 1

Operator: Matthew M. Miller

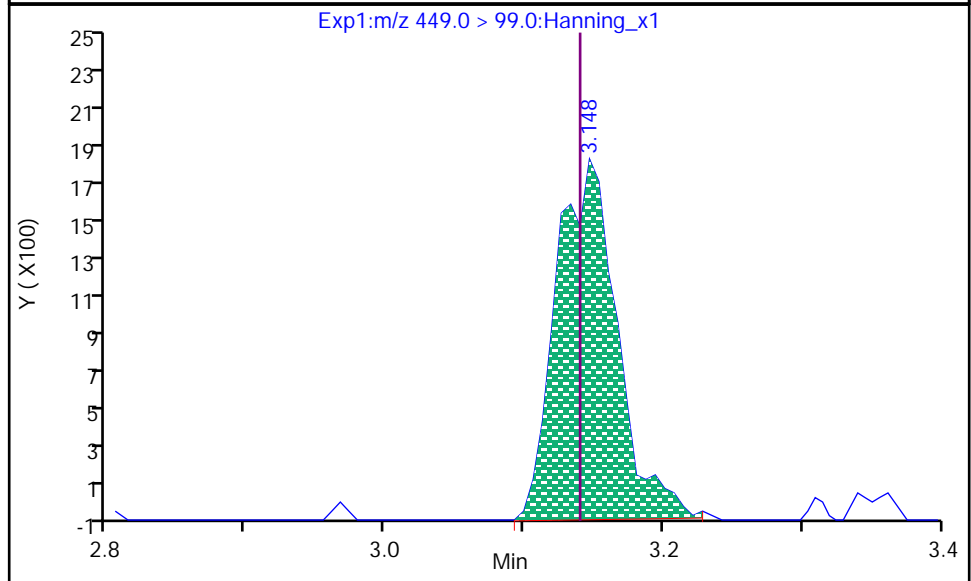
12 PFHpS, CAS: 375-92-8

Processing Integration Results

RT: 3.135  
Area: 4486  
Amount: 108.93  
Amount Units: ng/L



RT: 3.148  
Area: 5421  
Amount: 108.93  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:27:52

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

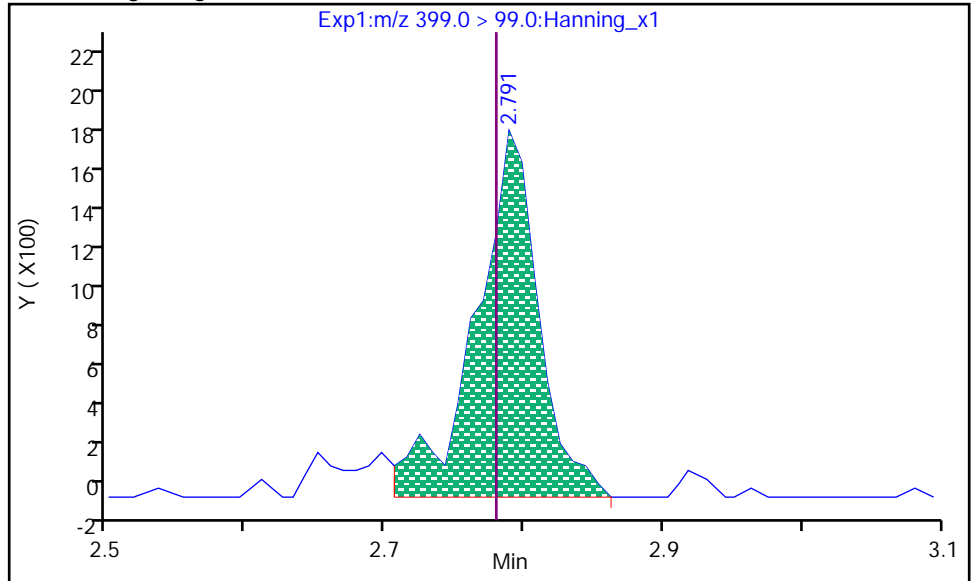
Dil. Factor: 1

Operator: Matthew M. Miller

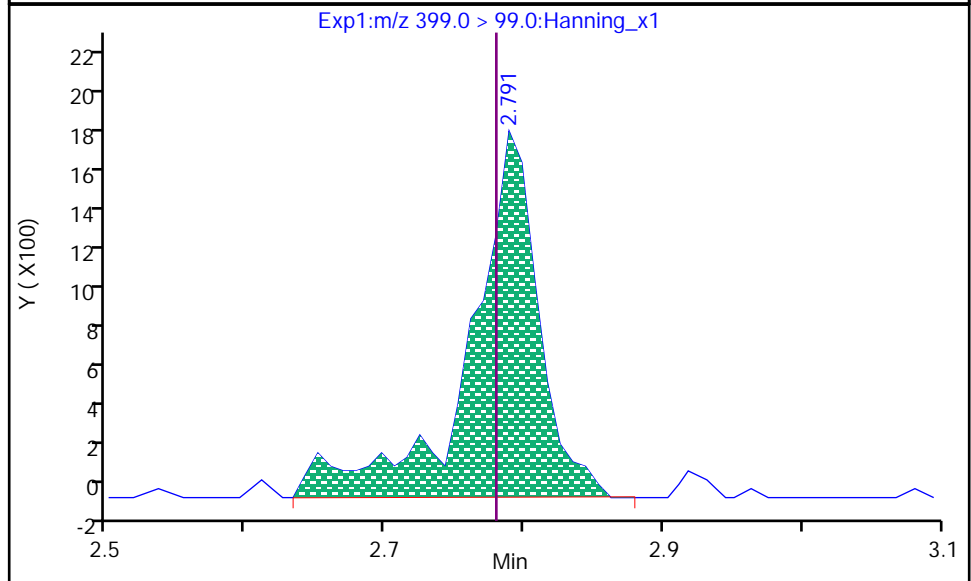
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.791  
Area: 5629  
Amount: 86.637  
Amount Units: ng/L



RT: 2.791  
Area: 6257  
Amount: 86.637  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:27:39

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720005.d

Injection Date: 27-Dec-2020 10:19:11

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

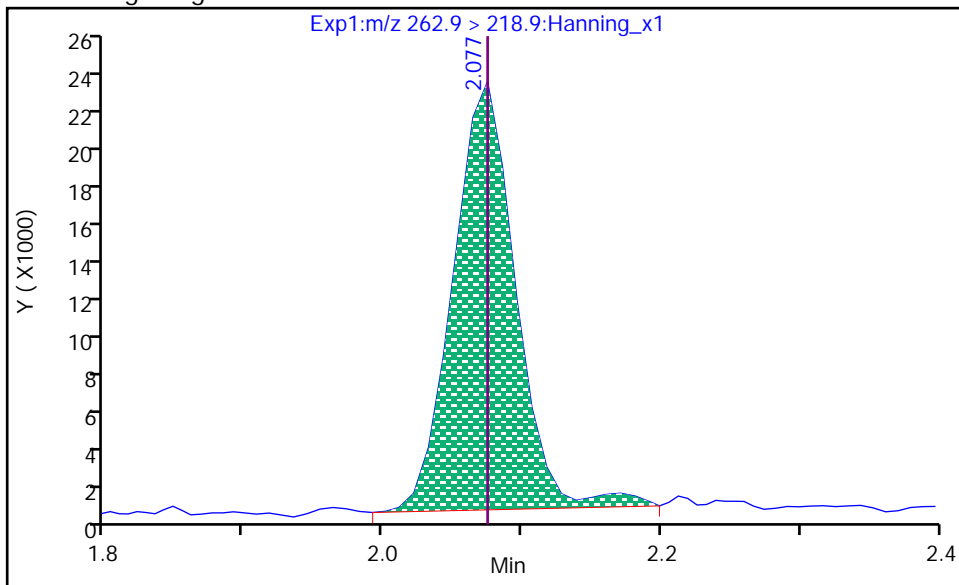
Dil. Factor: 1

Operator: Matthew M. Miller

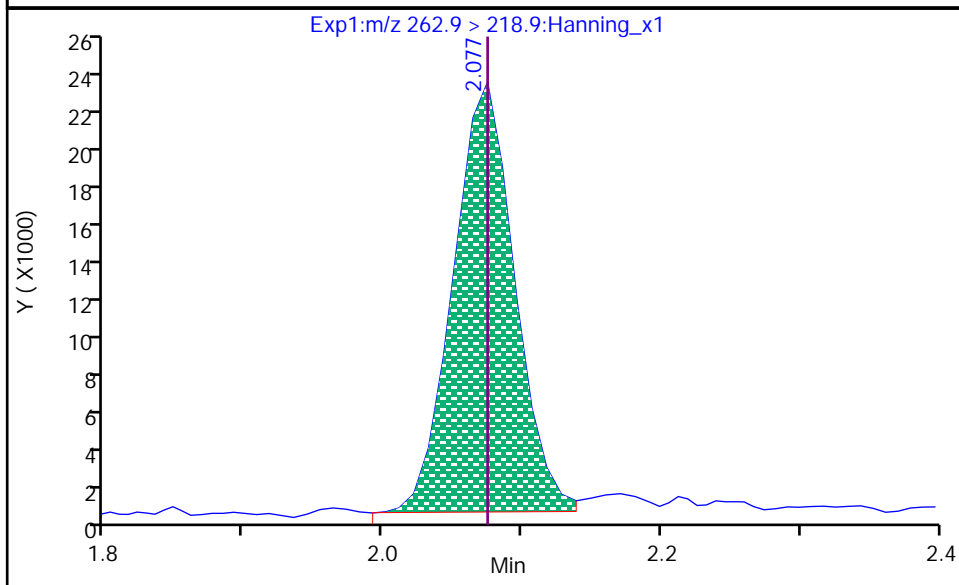
21 PFPeA, CAS: 2706-90-3

Processing Integration Results

RT: 2.077  
Area: 68790  
Amount: 103.91  
Amount Units: ng/L



RT: 2.077  
Area: 67685  
Amount: 102.24  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:27:28

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d  
Injection Date: 27-Dec-2020 10:29:45 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	205.16	103	70 - 130
D 46 13C4_PFBA	637910	645195			101	50 - 150
D 50 13C5_PFPeA	658438	670647			102	50 - 150
21 PFPeA			200.00	203.36	102	70 - 130
7 PFBS			176.80	179.90	102	70 - 130
D 44 13C3_PFBS	239776	241705			101	50 - 150
1 4:2 FTS			186.80	174.81	93.6	70 - 130
D 63 13C2_4:2 FTS_2	137423	139736			102	50 - 150
D 49 13C5_PFHxA	718926	731973			102	50 - 150
15 PFHxA			200.00	207.15	104	70 - 130
22 PFPeS			187.60	177.75	94.8	70 - 130
28 GenX			400.00	392.56	98.1	70 - 130
D 66 13C3_GenX	1323365	1387850			105	50 - 150
D 47 13C4_PFHpA	585778	605042			103	50 - 150
13 PFHpA			200.00	207.78	104	70 - 130
D 45 13C3_PFHxS	178402	173447			97.2	50 - 150
14 PFHxS			182.00	205.08	113	70 - 130
29 ADONA			188.40	187.61	99.6	70 - 130
D 64 13C2_6:2 FTS_2	111803	102966			92.1	50 - 150
2 6:2 FTS			189.60	172.56	91	70 - 130
20 PFOA			200.00	209.84	105	70 - 130
D 53 13C8_PFOA	592205	604903			102	50 - 150
12 PFHpS			190.40	204.98	108	70 - 130
18 PFOS			185.60	212.06	114	70 - 130
17 PFNA			200.00	208.51	104	70 - 130
D 56 13C9_PFNA	760907	721230			94.8	50 - 150
D 54 13C8_PFOS	157347	155853			99.1	50 - 150
30 9CI-PF3ONS			186.40	185.13	99.3	70 - 130
D 55 13C8_PFOSA	311979	316647			101	50 - 150
19 PFOSA			200.00	193.56	96.8	70 - 130
16 PFNS			192.00	183.35	95.5	70 - 130
D 65 13C2_8:2 FTS_2	88356	96166			109	50 - 150
3 8:2 FTS			191.60	218.73	114	70 - 130
10 PFDA			200.00	215.38	108	70 - 130
D 51 13C6_PFDA	636706	660526			104	50 - 150
D 58 d3-MeFOSAA	725286	749199			103	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	222.92	111	70 - 130
9 PFDS			192.80	191.59	99.4	70 - 130
5 N-EtFOSAA			200.00	205.40	103	70 - 130
25 PFUdA			200.00	206.64	103	70 - 130
D 60 d5-EtFOSAA	690640	693535			100	50 - 150
D 52 13C7_PFUdA	625944	603078			96.3	50 - 150
D 61 d7-MeFOSE	114979	109472			95.2	50 - 150
32 MeFOSE			200.00	176.96	88.5	70 - 130
26 MeFOSA			200.00	224.37	112	70 - 130
D 57 d3-MeFOSA	47825	52727			110	50 - 150
31 11Cl-PF3OUDS			188.40	185.11	98.3	70 - 130
D 62 d9-EtFOSE	122508	124052			101	50 - 150
33 EtFOSE			200.00	208.45	104	70 - 130
D 59 d5-EtFOSA	47562	47612			100	50 - 150
D 38 13C2_PFDoA	571184	633384			111	50 - 150
4 10:2 FTS			192.80	157.16	81.5	70 - 130
27 EtFOSA			200.00	208.82	104	70 - 130
11 PFDoA			200.00	208.64	104	70 - 130
34 PFDOS			193.60	199.28	103	70 - 130
24 PFTrDA			200.00	191.30	95.6	70 - 130
23 PFTeDA			200.00	203.04	102	70 - 130
D 42 13C2_PFTeDA	828920	832549			100	50 - 150
35 PFHxDA			200.00	215.26	108	70 - 130
D 40 13C2_PFHxDA	865470	863806			99.8	50 - 150
36 PFODA			200.00	212.24	106	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d  
Injection Date: 27-Dec-2020 10:29:45 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.698	1.698	0	645195	24	>100:1			1000.00	930.28	101	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.698	0/0	131838	23	83:1			200.00	205.16		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.077	0	670647	18	>100:1			1000.00	974.94	102	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.077	0/0	137122	18	>100:1			200.00	203.36		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	0	241705	17	>100:1			1000.00	1049.84	101	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	0/0	51268	16	>100:1	Target = 3.50		176.80	179.90		
298.9 > 99	44	2.130	2.130		14725	14	>100:1	3.48 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.451	0/0	37269	19	>100:1	Target = 3.10		187.60	177.75		
349 > 99	44	2.442	2.451		12940	25	>100:1	2.88 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.380	0	139736	21	>100:1			5000.00	5772.23	102	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.380	1/1	9750	16	>100:1	Target = 1.80		186.80	174.81		
327 > 81	63	2.379	2.380		5826	18	24:1	1.67 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.415	0	731973	19	>100:1			1000.00	993.08	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.415	2.415	0/0	149701	20	>100:1	Target = 18.34		200.00	207.15		
313 > 119	49	2.415	2.415		6716	14	45:1	22.29 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.522	0	1387850	21	>100:1			5000.00	5210.55	105	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.522	2.522	0/0	78286	19	>100:1	Target = 0.81		400.00	392.56		
285 > 185	66	2.522	2.522		97551	20	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.763	2.773	0	605042	20	>100:1			1000.00	997.35	103	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.763	2.773	0/0	130403	20	>100:1	Target = 3.70		200.00	207.78		
363 > 169	47	2.773	2.773		33113	14	>100:1	3.93 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	0	173447	21	>100:1			1000.00	1012.96	97.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	0/0	37715	26	>100:1	Target = 3.21	0.16	182.00	205.08		
399 > 99	45	2.782	2.782		10297	24	35:1	3.66 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.800	2.809	0/0	206591	21	>100:1	Target = 2.97		188.40	187.61		
377 > 85	45	2.800	2.809		73122	20	>100:1	2.82 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.148	3.142	1/1	32297	27	>100:1	Target = 3.08		190.40	204.98		
449 > 99	45	3.148	3.142		11939	31	53:1	2.70 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.108	3.108	0	102966	25	>100:1			5000.00	5346.55	92.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.108	3.115	0/0	8349	20		Target = 1.80		189.60	172.56		
427 > 81	64	3.108	3.115		4708	21	43:1	1.77 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	0	604903	23	>100:1			1000.00	1022.03	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.135	0/0	129404	22	89:1	Target = 2.87		200.00	209.84		
413 > 169	53	3.135	3.135		43758	24	>100:1	2.95 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	155853	22	>100:1			1000.00	1039.51	99.1	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.500	1/1	39164	50	75:1	Target = 3.84	0.31	185.60	212.06		
499 > 99	54	3.514	3.500		9927	44	38:1	3.94 (1.92-5.76)	0.12				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.716	3.716	0/0	97135	22	>100:1			186.40	185.13		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.850	3.858	0/0	21868	19	>100:1	Target = 3.07		192.00	183.35		
549 > 99	54	3.858	3.858		9325	24		2.34 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.153	4.153	0/0	21670	24	>100:1	Target = 3.03		192.80	191.59		
599 > 99	54	4.144	4.153		7881	16	33:1	2.74 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.308	4.318	0/0	81934	16				188.40	185.11		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.647	4.648	0/0	24935	15	>100:1	Target = 3.33		193.60	199.28		
699 > 99	54	4.656	4.648		7125	19	>100:1	3.49 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.507	3.515	0	721230	22	>100:1			1000.00	960.41	94.8	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.514	3.515	0/0	150388	21	>100:1	Target = 6.16		200.00	208.51		
463 > 169	56	3.514	3.515		26222	27	>100:1	5.73 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.850	0	316647	21	>100:1			1000.00	1022.88	101	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.858	0/0	60397	21	>100:1			200.00	193.56		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.850	3.850	0	96166	19	>100:1			5000.00	5184.11	109	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.858	3.850	1/1	8955	22	42:1	Target = 1.95		191.60	218.73		
527 > 81	65	3.842	3.850		3179	13		2.81 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.438	4.447	0/0	6985	23	31:1	Target = 3.14		192.80	157.16		
627 > 80	65	4.429	4.447		1408	14		4.96 (1.57-4.72)					M
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	0	660526	21	>100:1			1000.00	995.77	104	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.858	3.866	0/0	139790	19	>100:1	Target = 15.94		200.00	215.38		
513 > 169	51	3.858	3.866		10612	27	34:1	13.17 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	749199	20				5000.00	5219.47	103	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.019	1/1	25658	26	65:1	Target = 1.33	0.07	200.00	222.92		
570 > 483	58	4.030	4.019		18380	32	52:1	1.39 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	0	693535	19	>100:1			5000.00	5221.82	100	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.171	4.180	0/0	28364	34		Target = 1.58	0.08	200.00	205.40		M
584 > 526	60	4.179	4.180		15082	29	92:1	1.88 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	0	603078	20	>100:1			1000.00	954.12	96.3	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.171	4.171	0/0	117127	26	>100:1	Target = 15.50		200.00	206.64		
563 > 169	52	4.162	4.171		9479	25		12.35 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	0	109472	16	>100:1			1000.00	1011.68	95.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	0/0	18202	16	>100:1			200.00	176.96		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.318	0	52727	25	>100:1			1000.00	996.41	110	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	0/0	13347	20	77:1	Target = 1.12		200.00	224.37		
512 > 219	57	4.318	4.318		12041	15	80:1	1.10 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	124052	19	>100:1			1000.00	989.29	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	0/0	23006	25	80:1			200.00	208.45		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.438	4.438	0	633384	19				1000.00	1046.37	111	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.438	4.438	0/0	133822	19	62:1	Target = 10.85		200.00	208.64		
613 > 169	38	4.438	4.438		12038	18	92:1	11.11 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.673	4.673	0/0	119339	19	>100:1	Target = 8.37		200.00	191.30		
663 > 169	38	4.673	4.673		15040	20	>100:1	7.93 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.483	0	47612	15	>100:1			1000.00	969.80	100	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.492	0/0	10862	26	79:1	Target = 1.03		200.00	208.82		
526 > 219	59	4.483	4.492		9924	22	52:1	1.09 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.890	4.890	0	832549	18	>100:1			1000.00	988.26	100	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.890	4.890	0/0	146464	18	32:1	Target = 12.11		200.00	203.04		
713 > 169	42	4.890	4.890		13843	19	>100:1	10.58 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.258	5.258	0	863806	19	>100:1			1000.00	953.26	99.8	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.266	5.266	0/0	121495	19	41:1	Target = 11.48		200.00	215.26		
813 > 269	40	5.266	5.266		10565	17	>100:1	11.49 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.598	5.591	1/1	162289	23	21:1	Target = 13.88		200.00	212.24		
913 > 319	40	5.598	5.591		11544	24	>100:1	14.05 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.858	3.858	0	681150	20	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.415	0	740801	21	>100:1					103	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	0	581270	24	>100:1					96.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.698	0	605240	24	>100:1					100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.507	3.507	0	169990	23	>100:1					104	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d

Injection Date: 27-Dec-2020 10:29:45

Inst. ID: LCMSMS02

Client ID:

Lab ID:

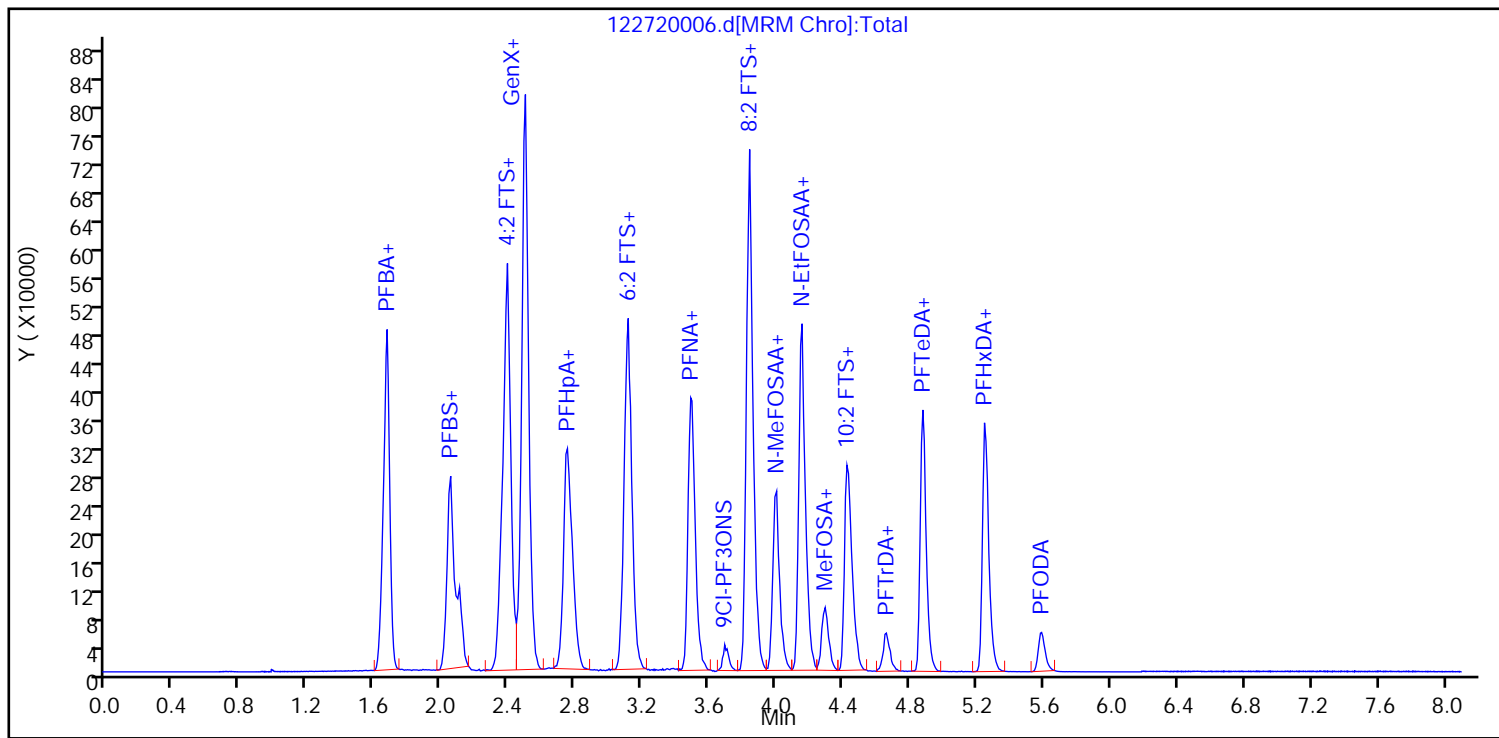
ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

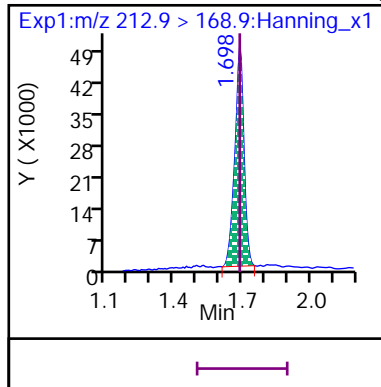
Dil. Factor: 1

Operator:

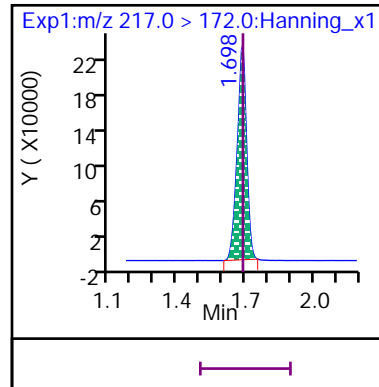
Matthew M. Miller



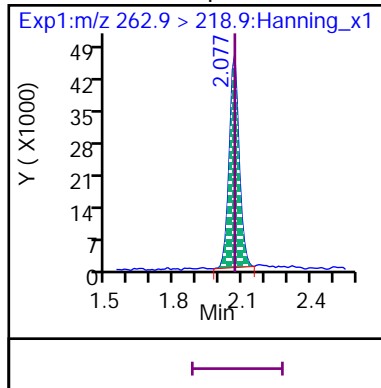
8 Perfluoro-n-butanoic acid (PFBA)



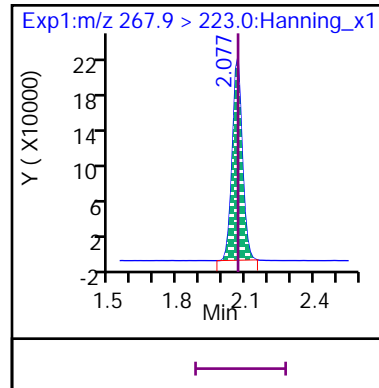
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

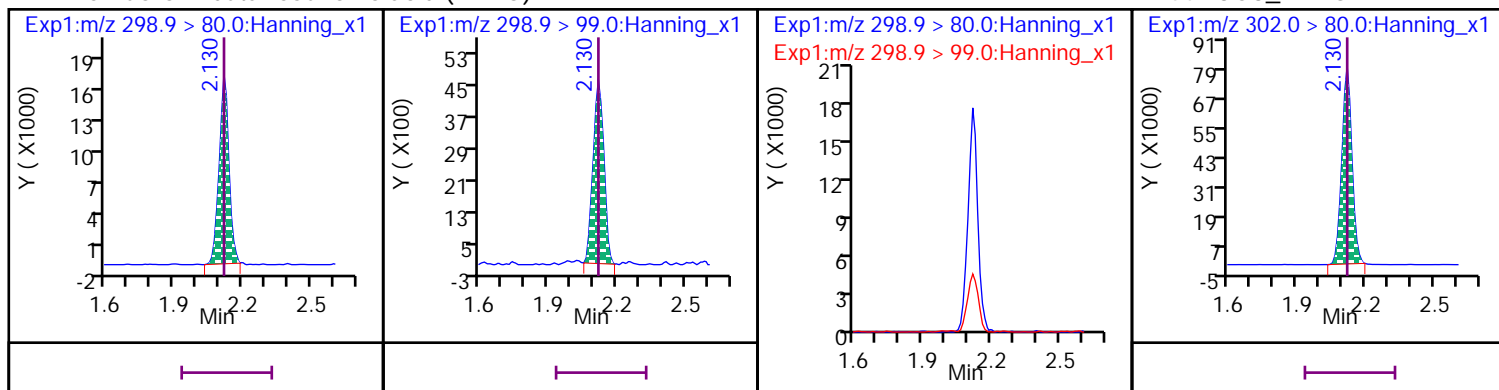


D 50 13C5\_PFPeA



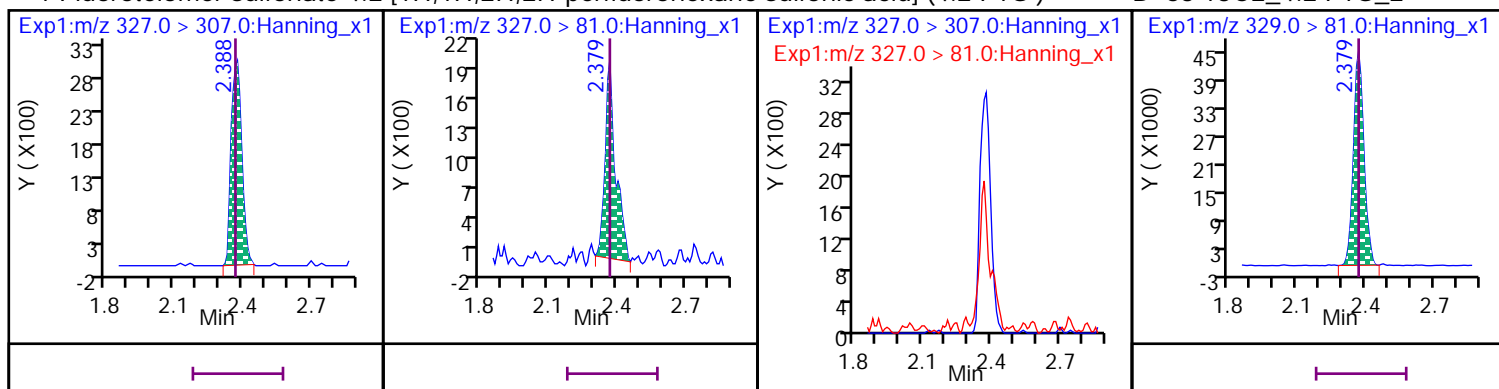
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



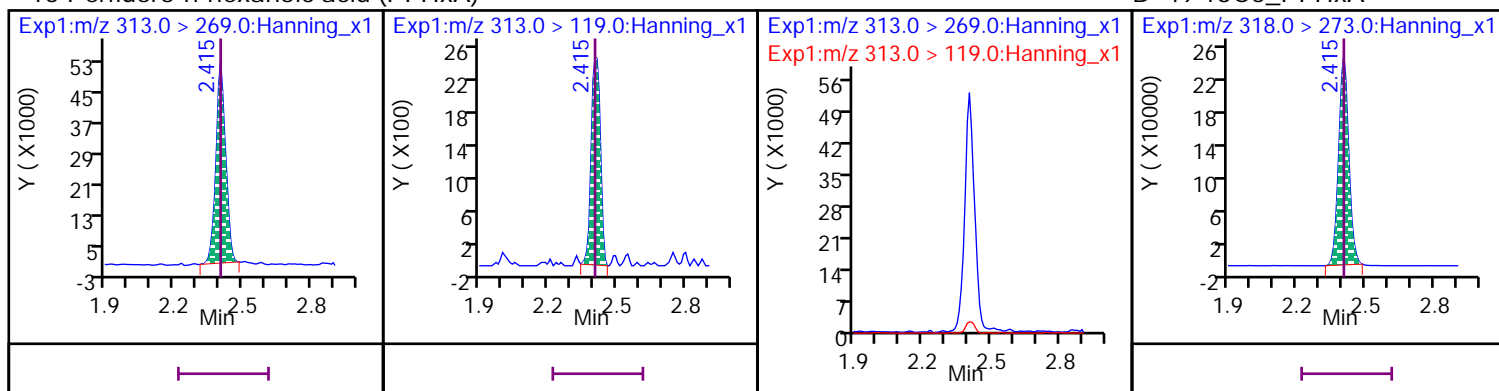
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



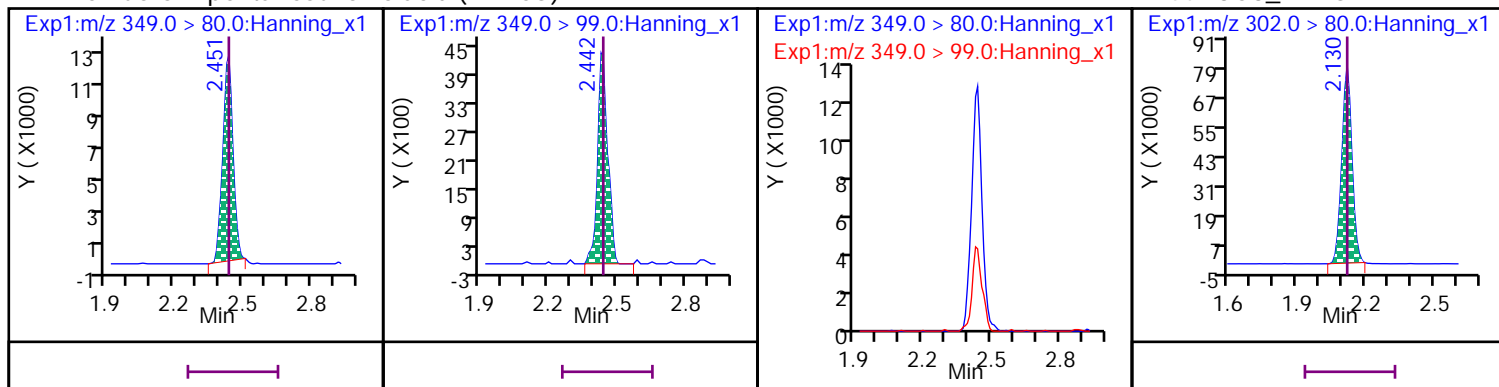
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



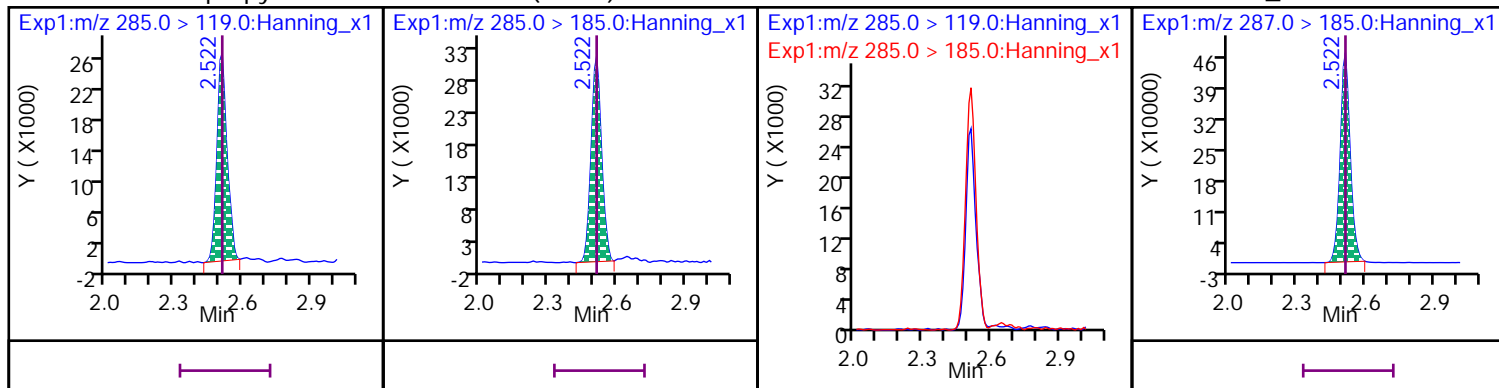
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



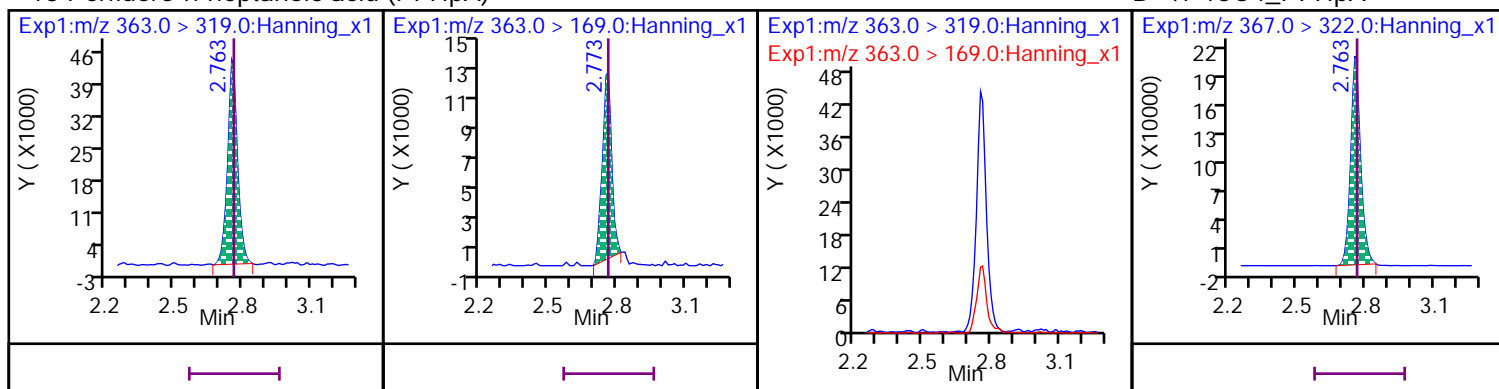
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



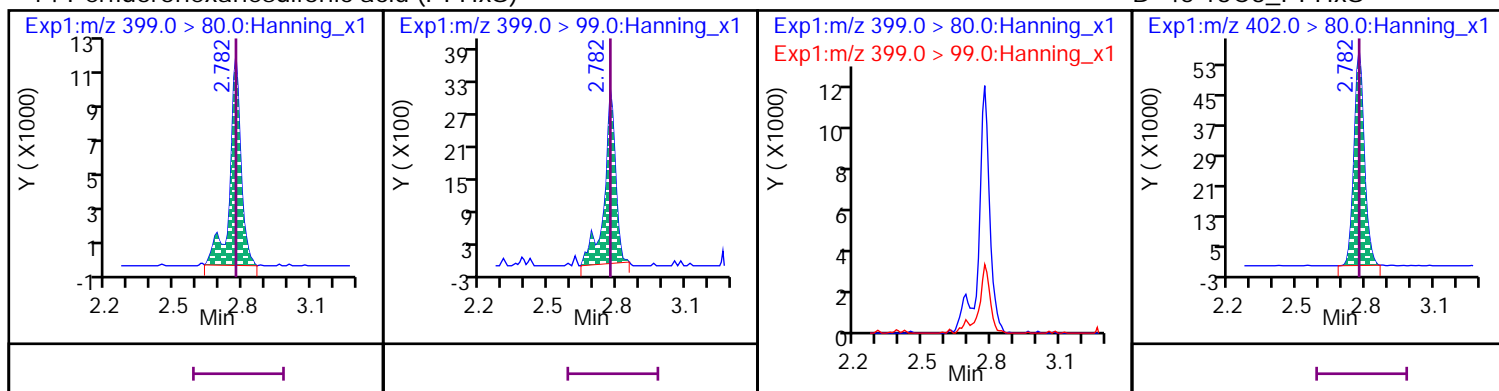
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



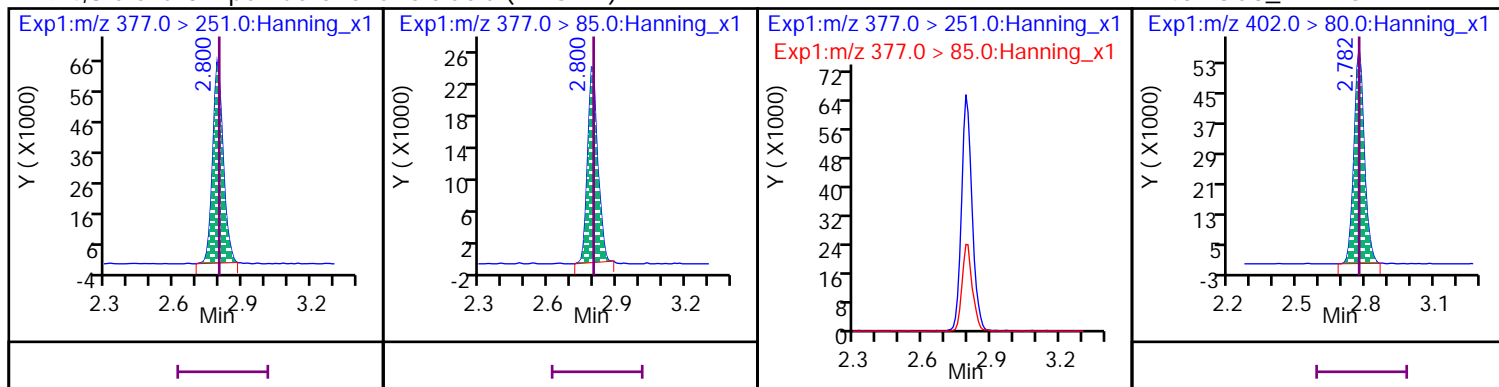
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



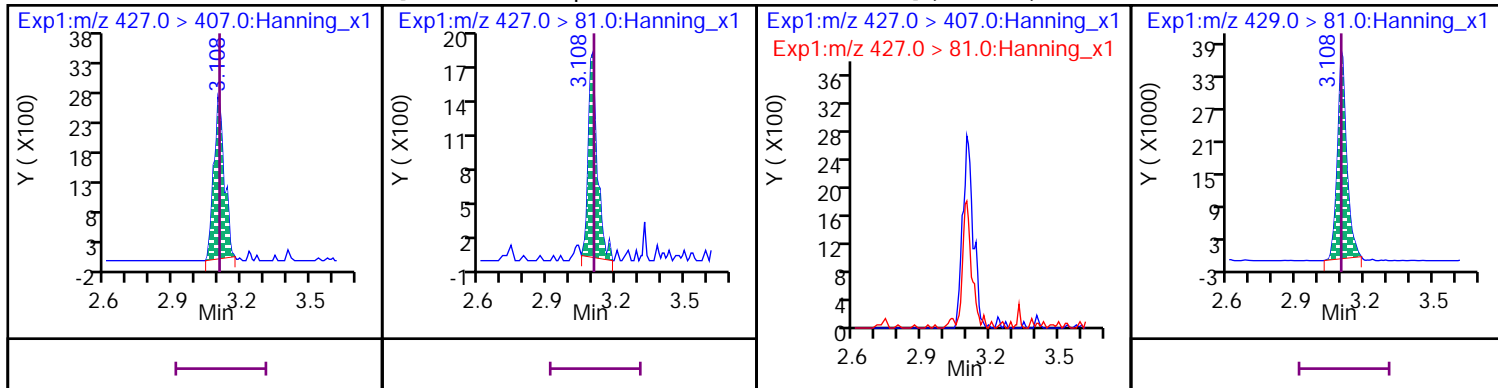
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



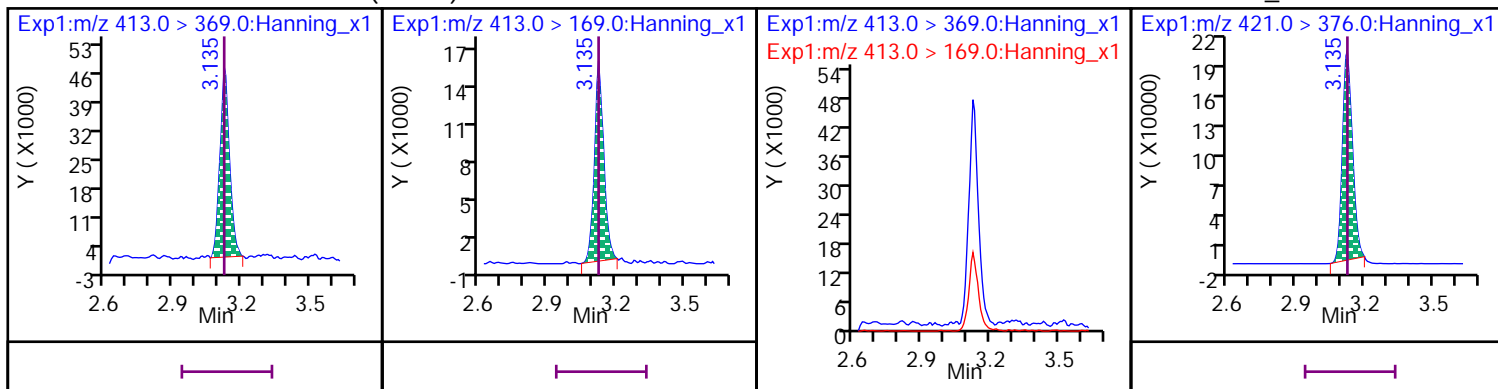
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



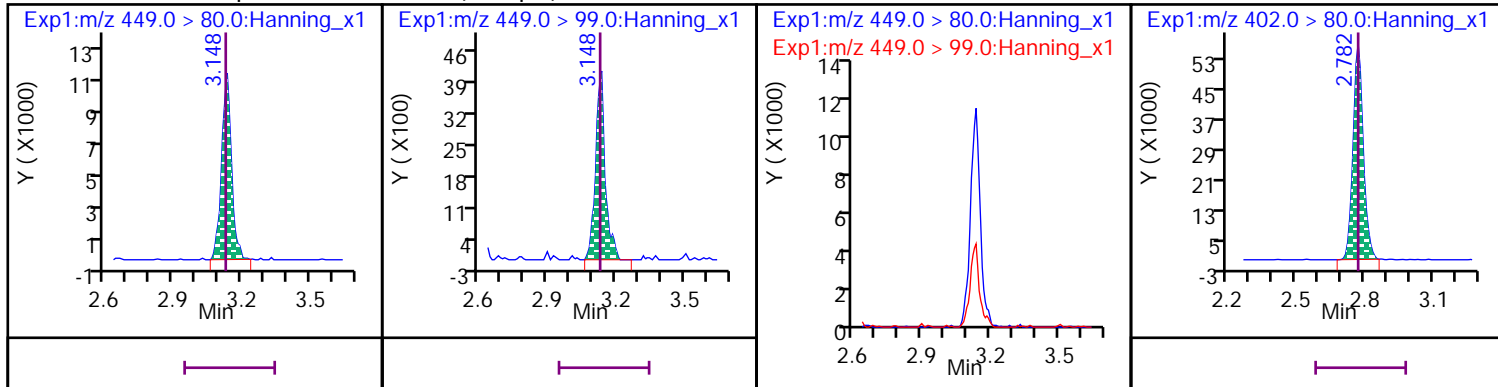
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



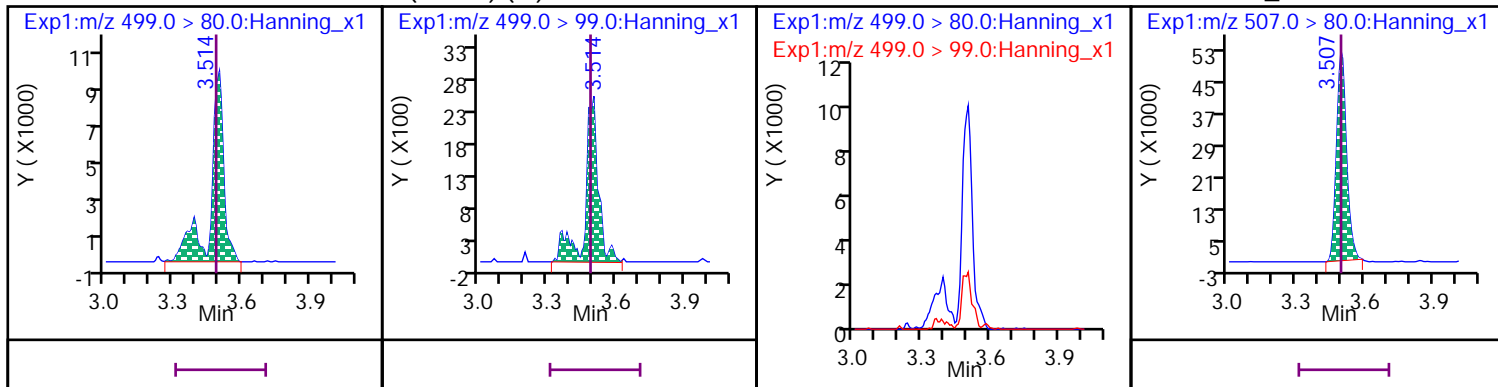
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



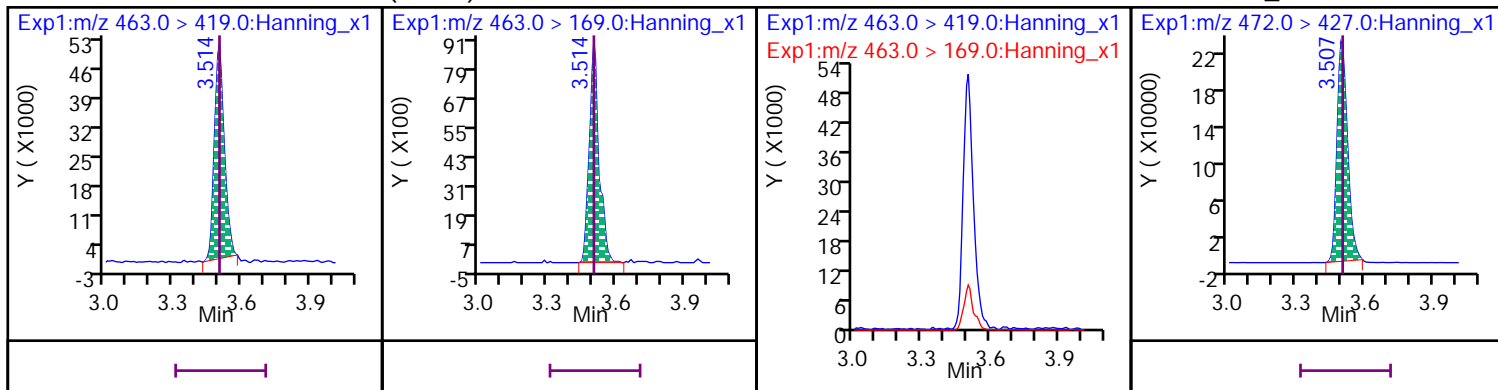
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



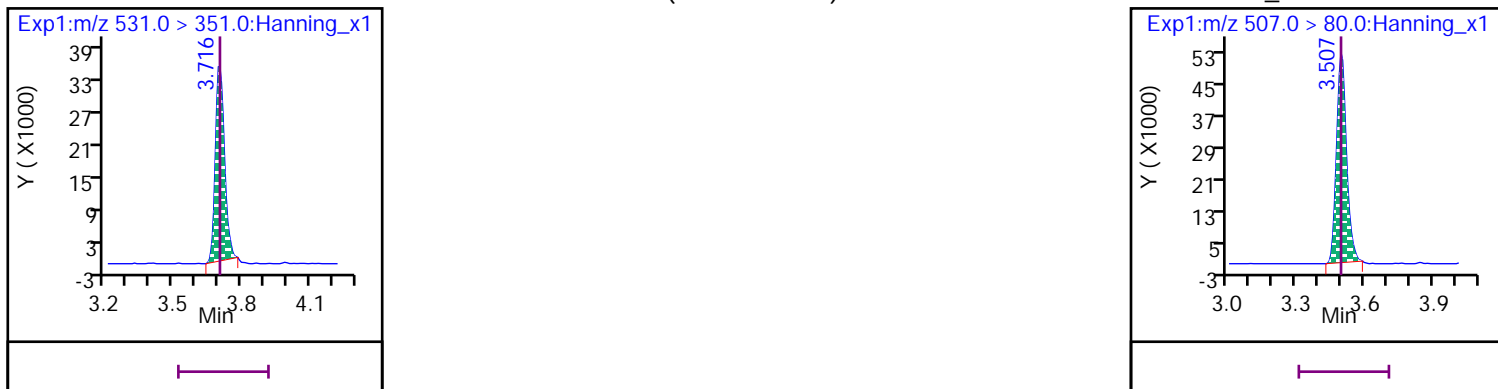
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



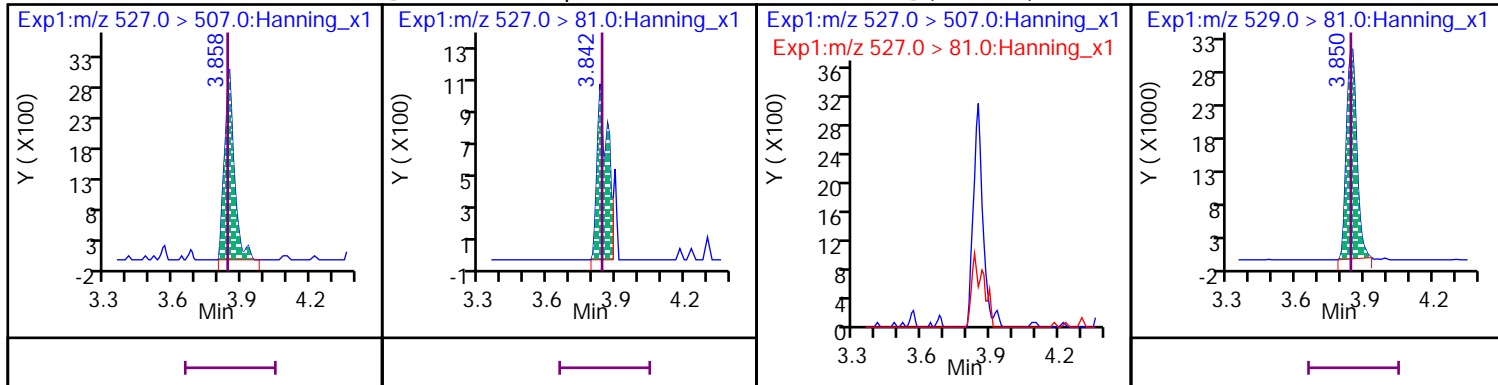
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



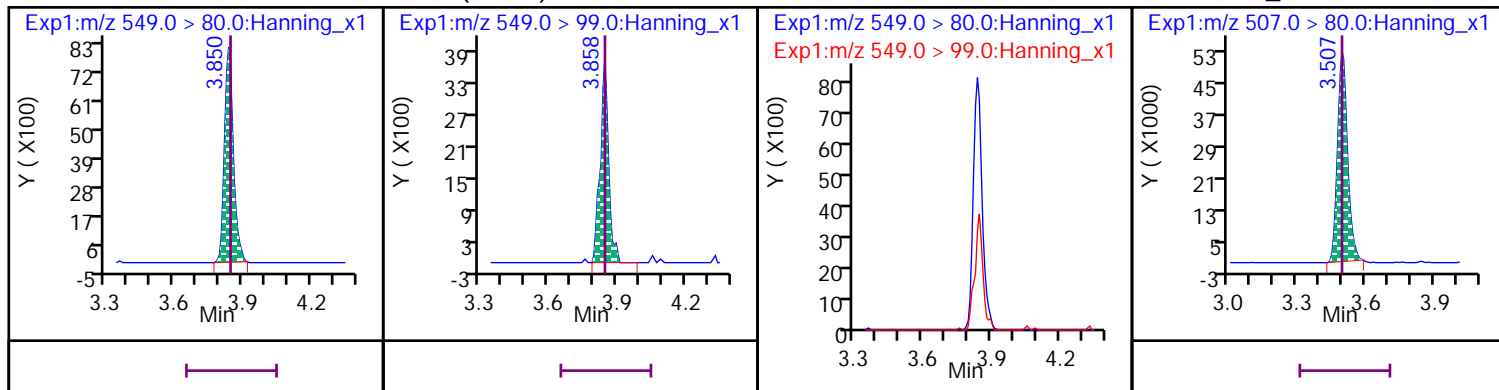
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



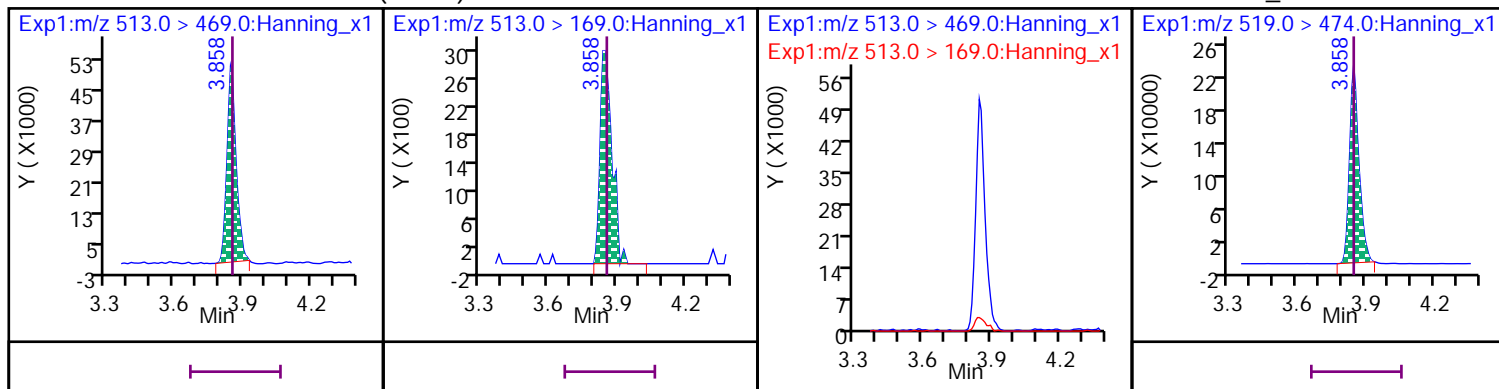
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



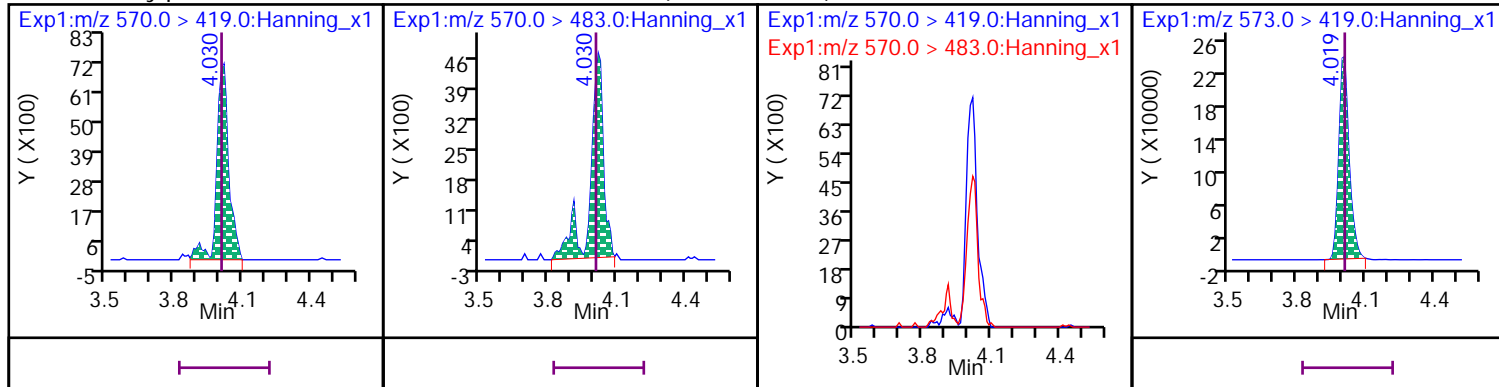
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



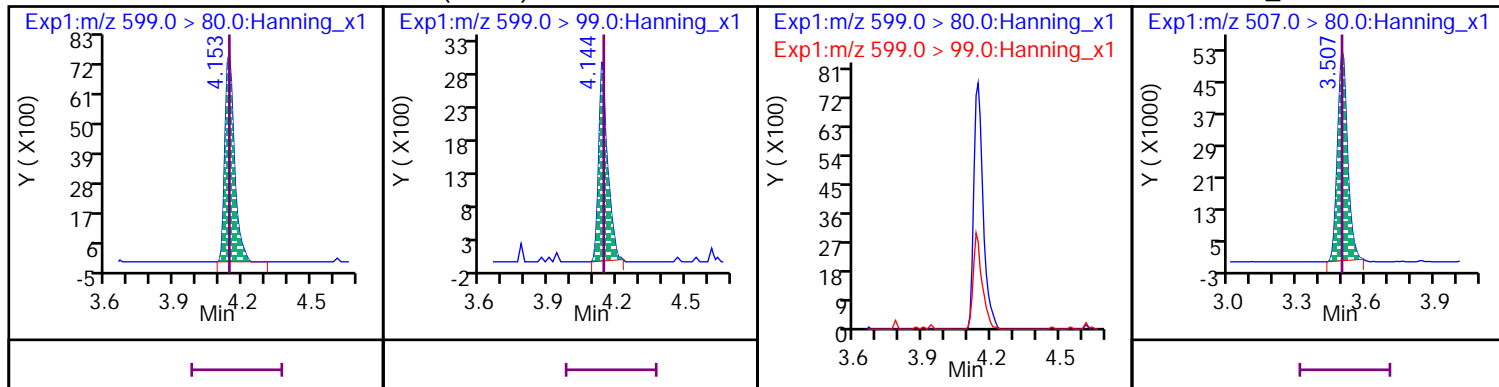
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



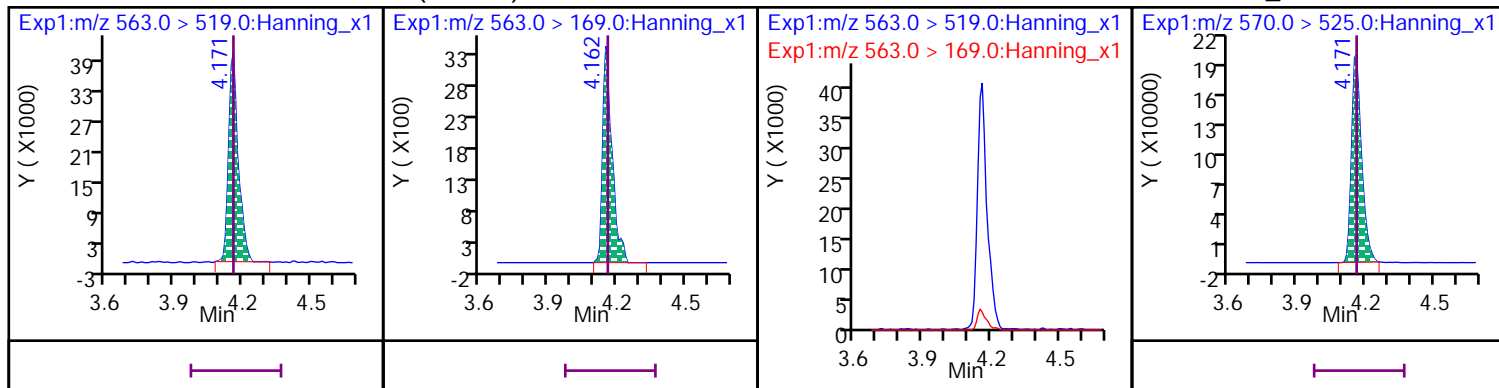
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



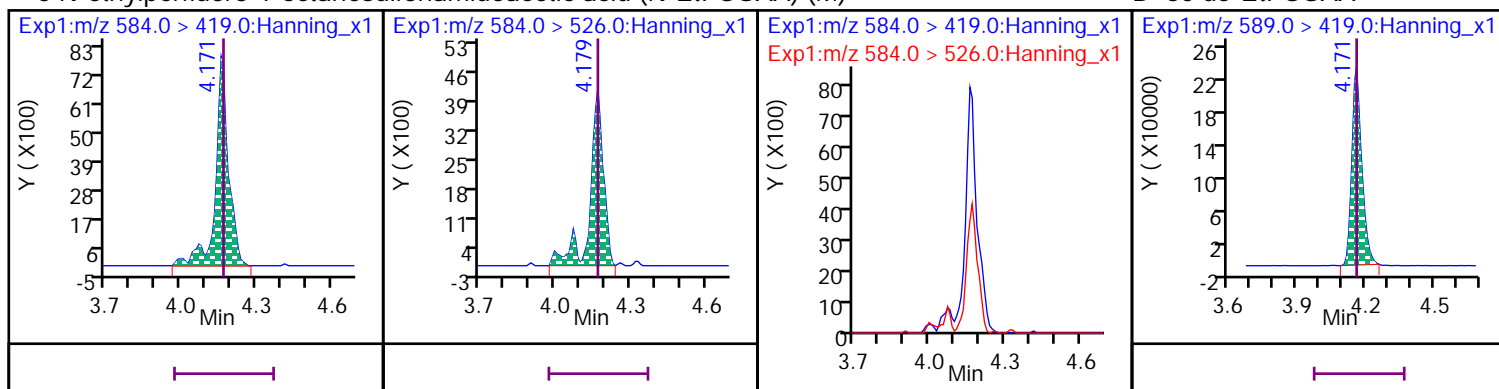
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



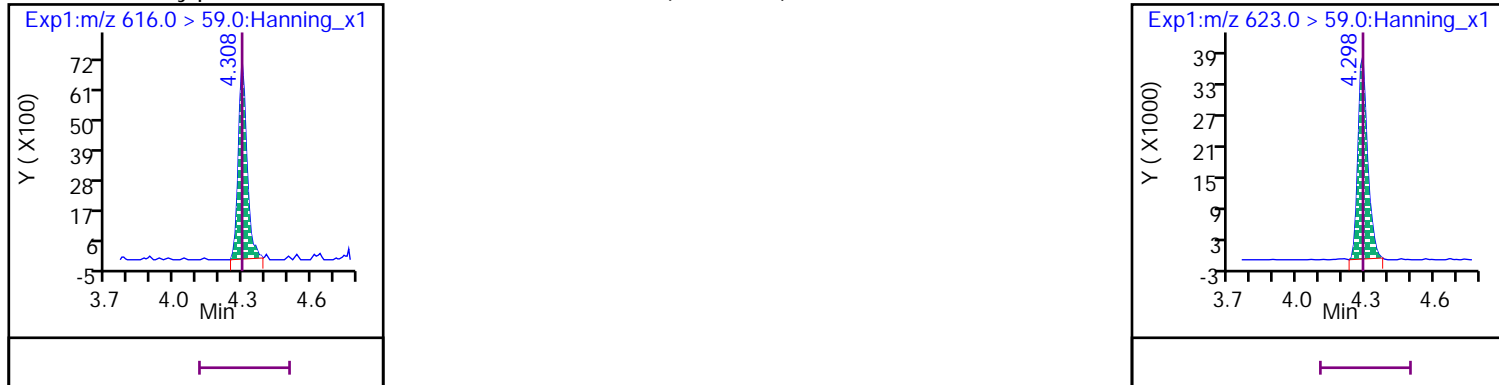
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



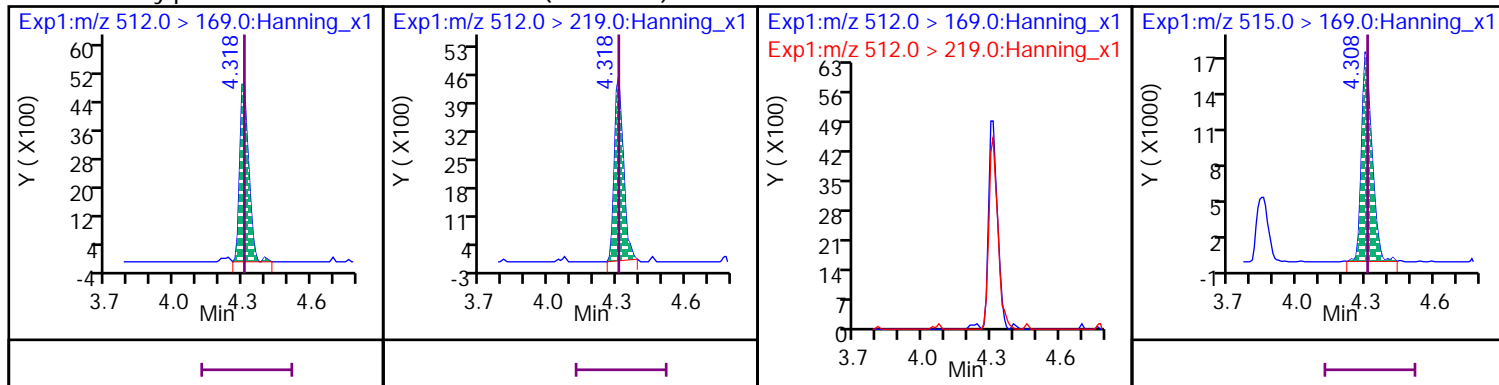
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

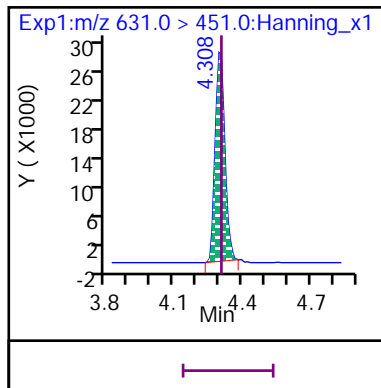


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

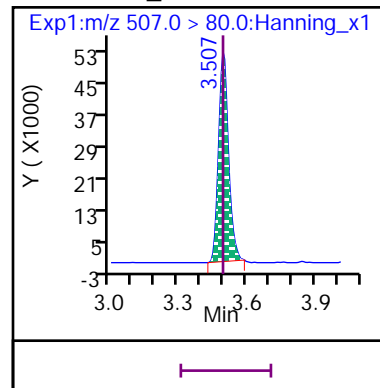
D 57 d3-MeFOSA



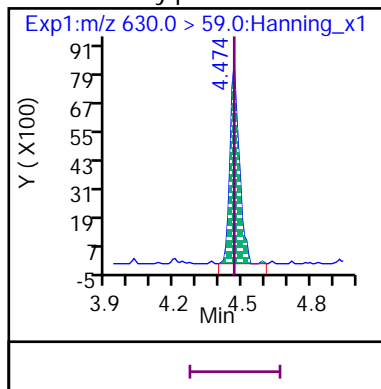
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



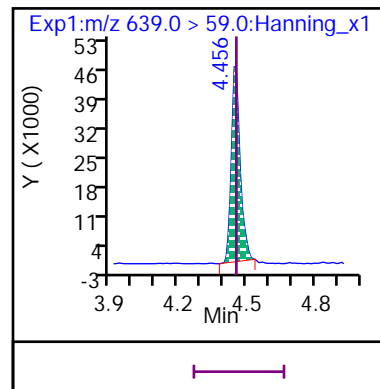
D 54 13C8\_PFOS



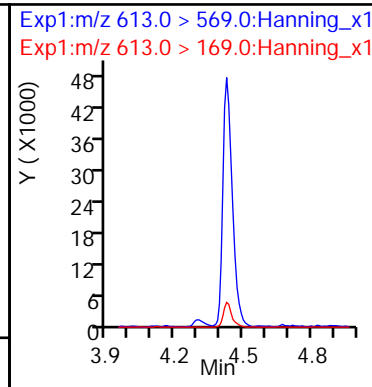
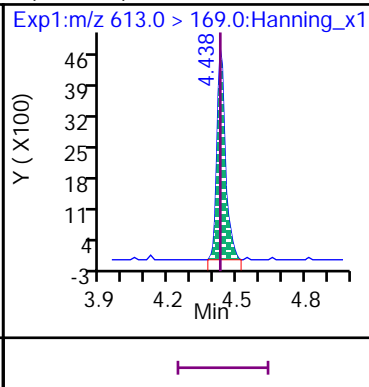
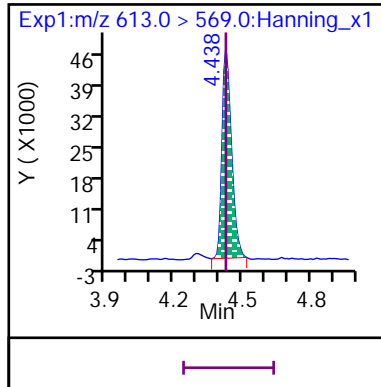
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



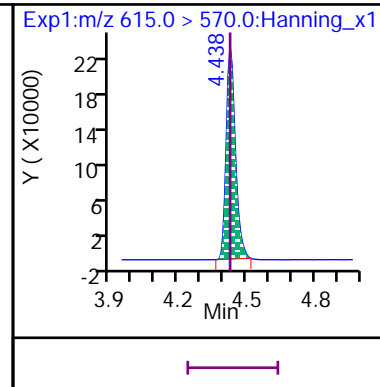
D 62 d9-EtFOSE



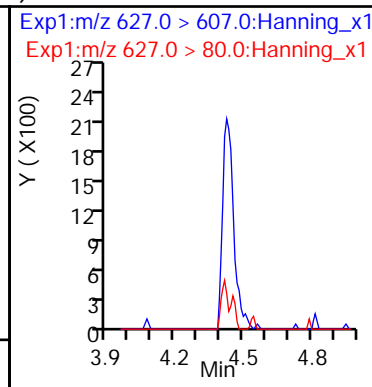
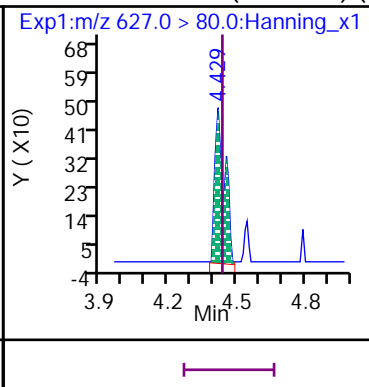
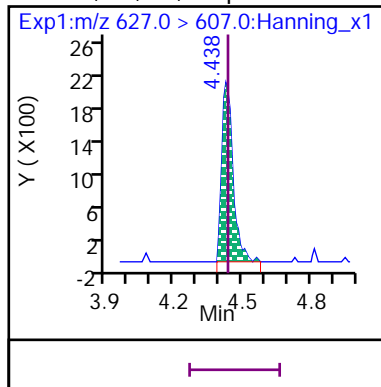
11 Perfluoro-n-dodecanoic acid (PFDaA)



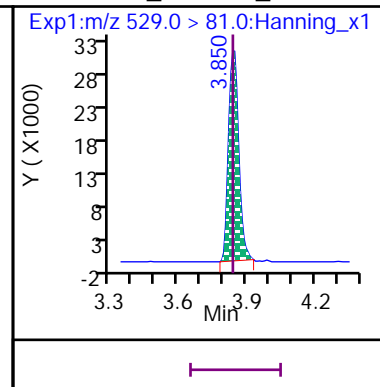
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (M)



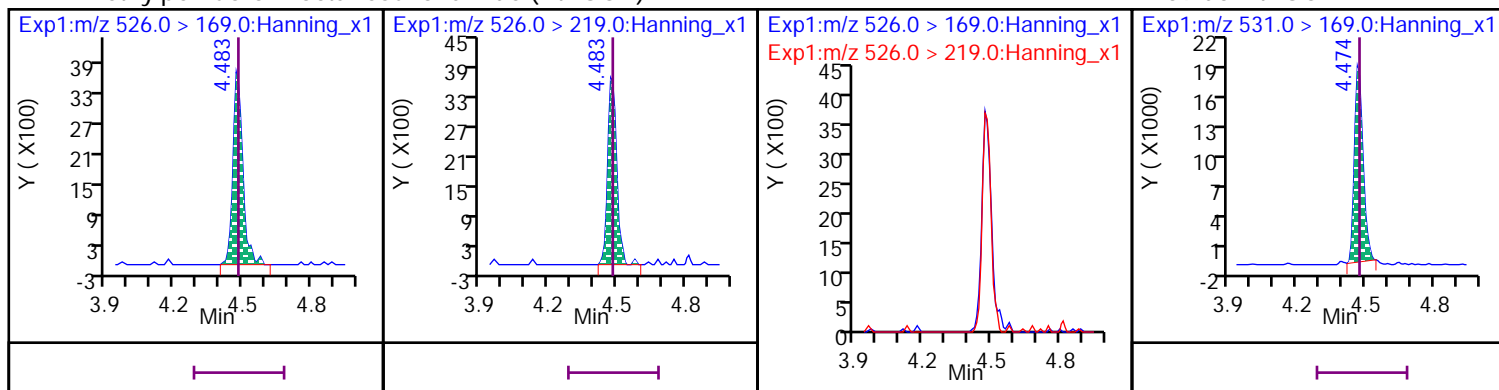
D 65 13C2\_8:2 FTS\_2





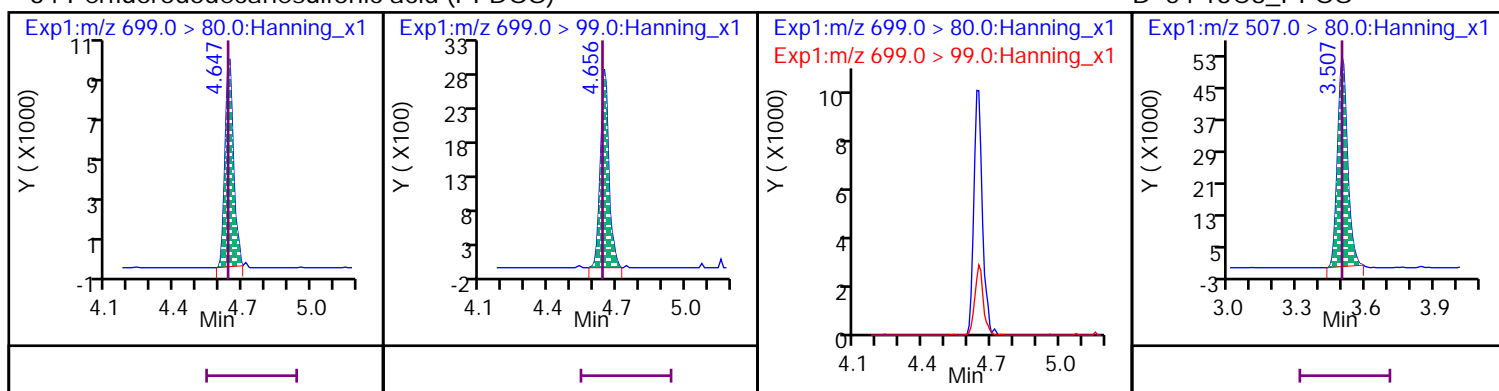
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



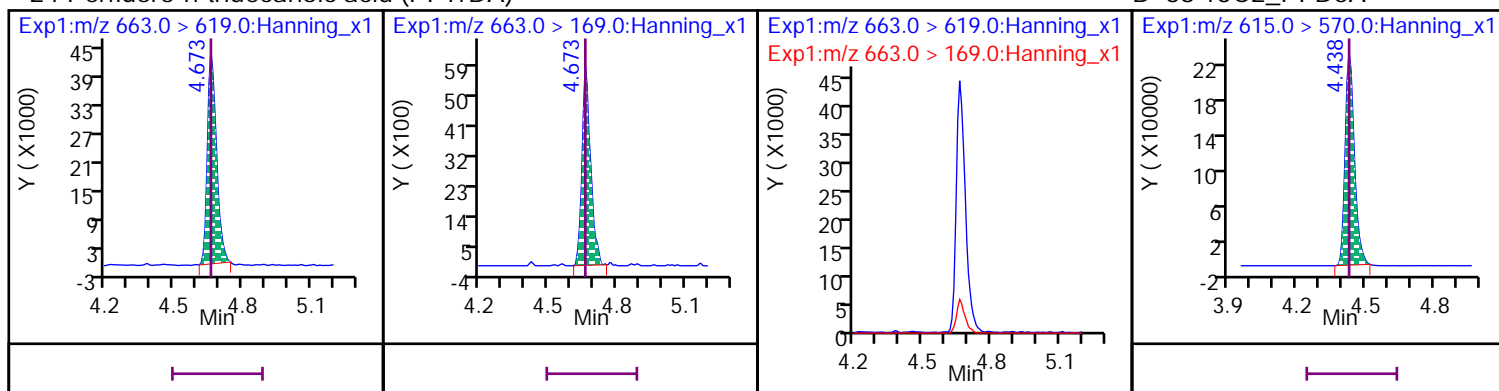
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



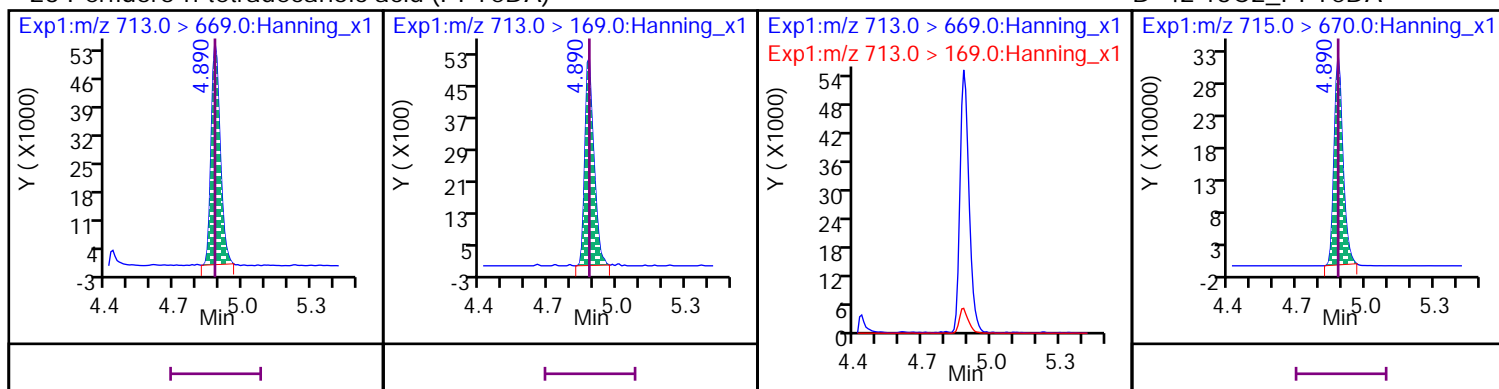
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



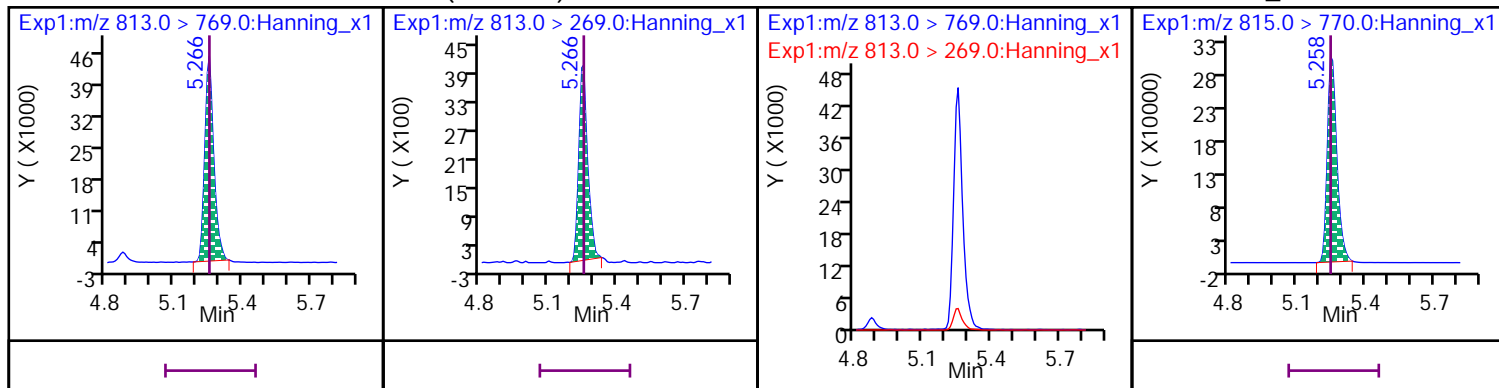
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



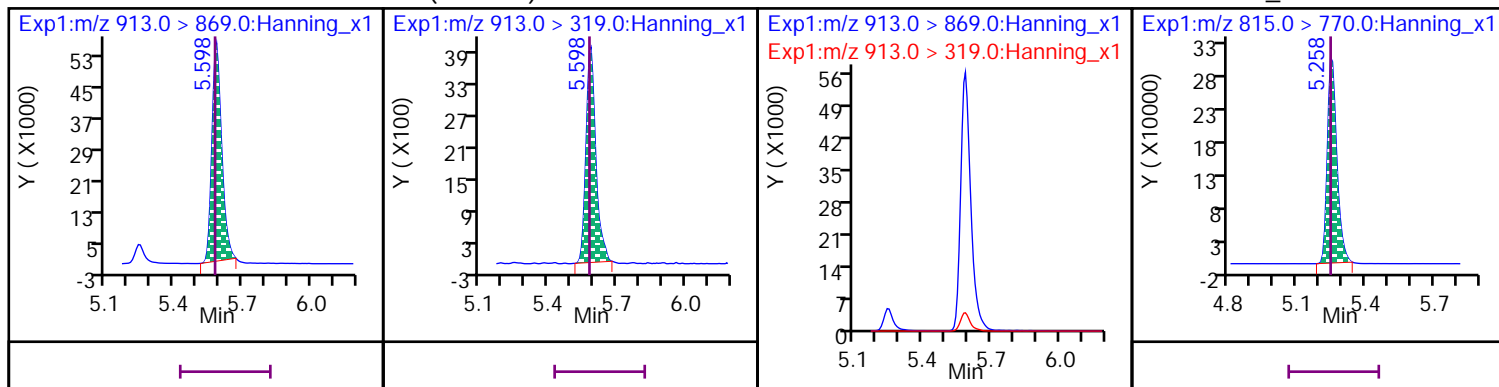
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

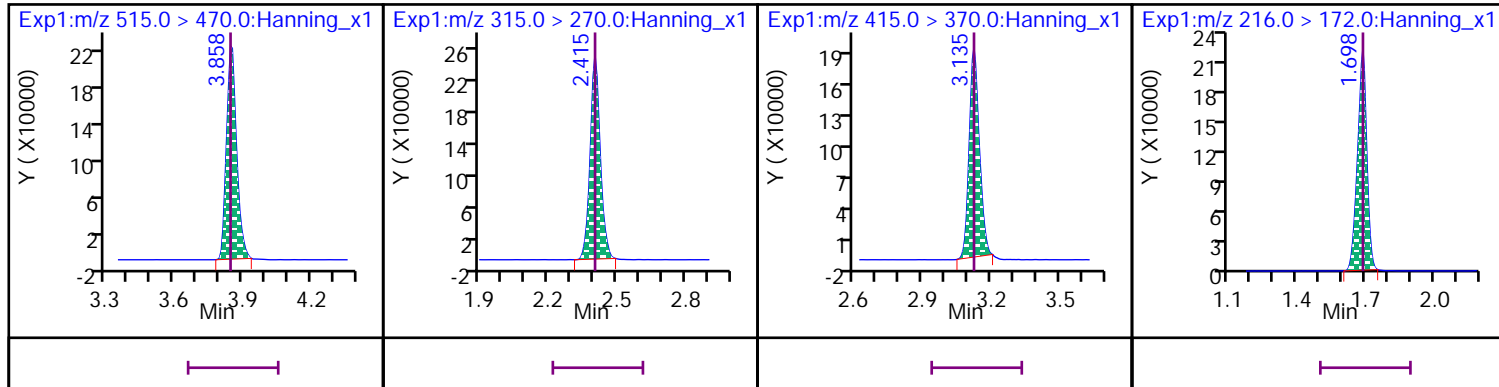


\* 37 13C2\_PFDA

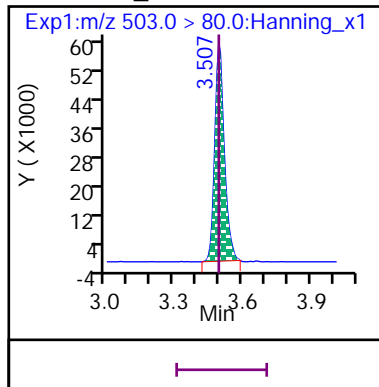
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d

Injection Date: 27-Dec-2020 10:29:45

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

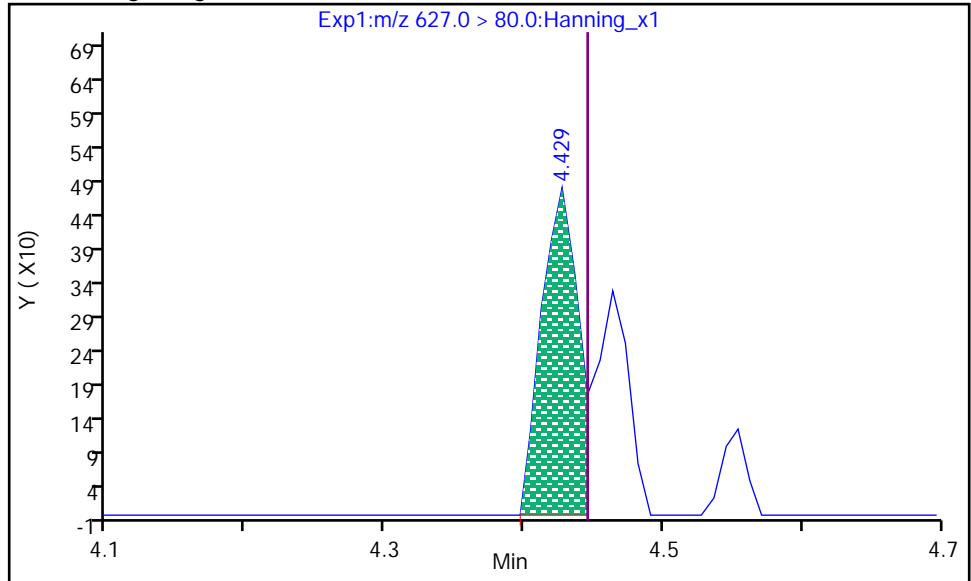
Dil. Factor: 1

Operator: Matthew M. Miller

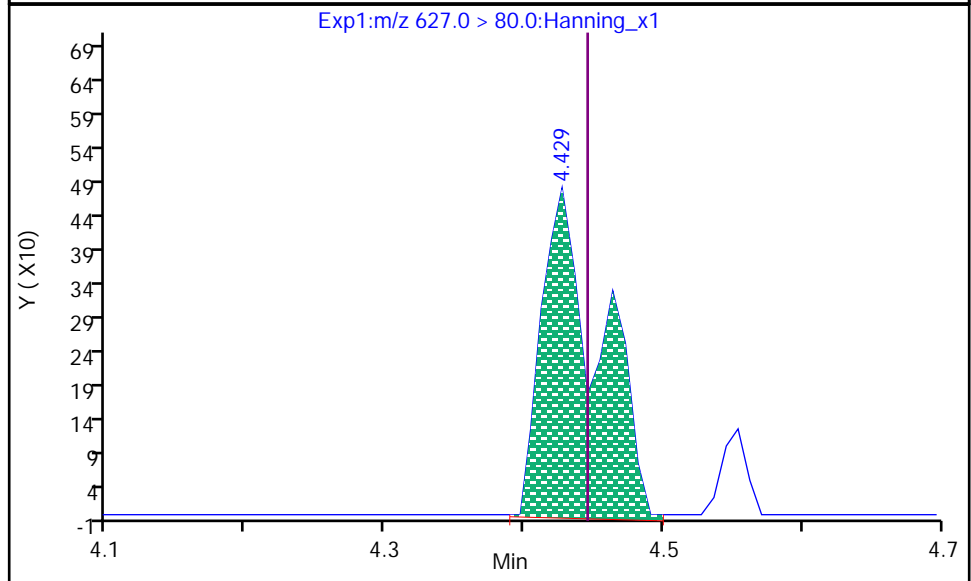
4 10:2 FTS, CAS: 120226-60-0

Processing Integration Results

RT: 4.429  
Area: 845  
Amount: 157.16  
Amount Units: ng/L



RT: 4.429  
Area: 1408  
Amount: 157.16  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:43:02

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d

Injection Date: 27-Dec-2020 10:29:45

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

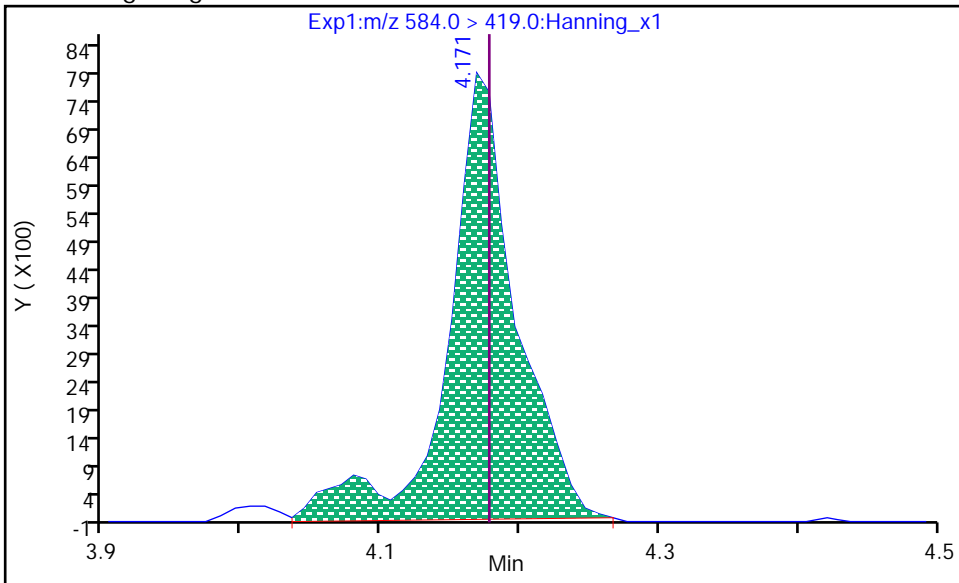
Dil. Factor: 1

Operator: Matthew M. Miller

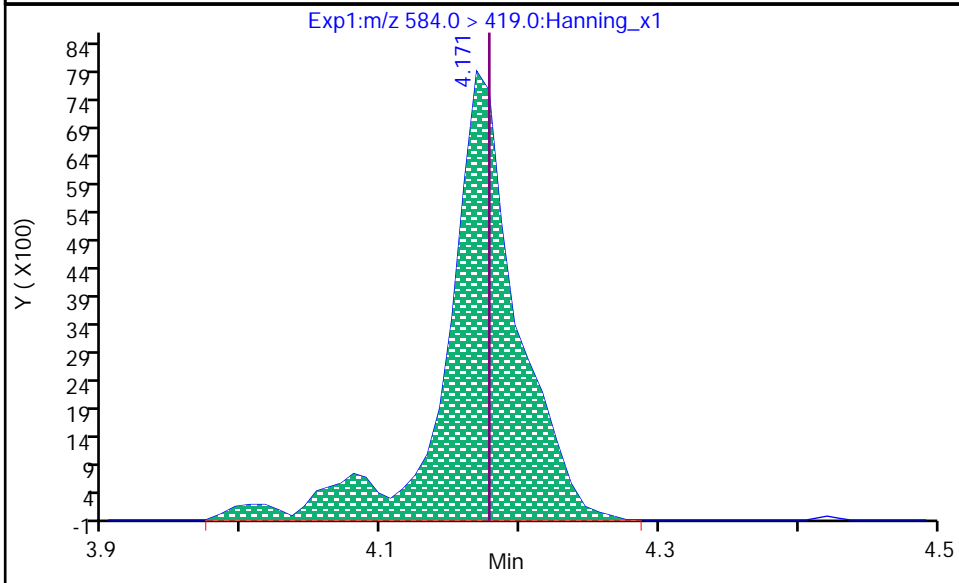
5 N-EtFOSAA, CAS: 2991-50-6

RT: 4.171  
Area: 26898  
Amount: 194.78  
Amount Units: ng/L

Processing Integration Results



RT: 4.171  
Area: 28364  
Amount: 205.40  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:42:54

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720006.d

Injection Date: 27-Dec-2020 10:29:45

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

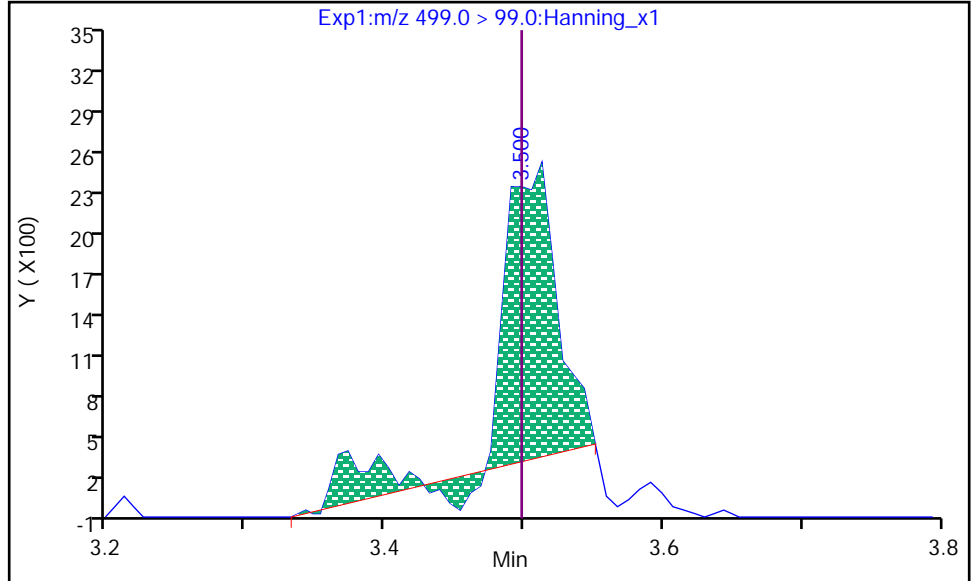
Dil. Factor: 1

Operator: Matthew M. Miller

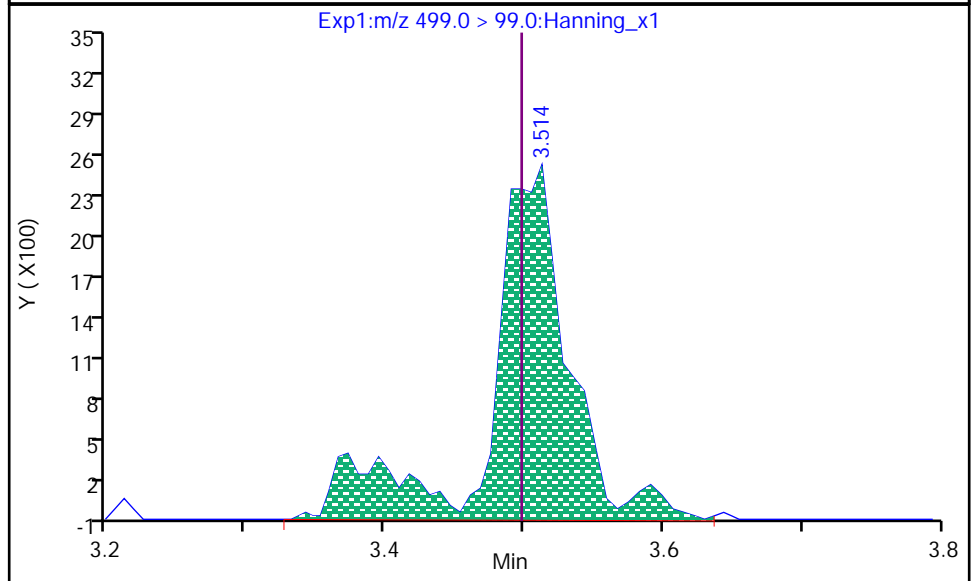
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.500  
Area: 5805  
Amount: 212.06  
Amount Units: ng/L



RT: 3.514  
Area: 9927  
Amount: 212.06  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:42:41

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720020.d  
Injection Date: 27-Dec-2020 12:58:11 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 13  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	933.44	93.3	70 - 130
D 46 13C4_PFBA	637910	651657			102	50 - 150
D 50 13C5_PFPeA	658438	671615			102	50 - 150
21 PFPeA			1000.00	924.36	92.4	70 - 130
7 PFBS			884.00	831.76	94.1	70 - 130
D 44 13C3_PFBS	239776	243248			101	50 - 150
1 4:2 FTS			934.00	915.42	98	70 - 130
D 63 13C2_4:2 FTS_2	137423	129255			94.1	50 - 150
D 49 13C5_PFHxA	718926	722934			101	50 - 150
15 PFHxA			1000.00	932.63	93.3	70 - 130
22 PFPeS			938.00	859.12	91.6	70 - 130
28 GenX			2000.00	1847.78	92.4	70 - 130
D 66 13C3_GenX	1323365	1305782			98.7	50 - 150
D 47 13C4_PFHpA	585778	584433			99.8	50 - 150
13 PFHpA			1000.00	957.05	95.7	70 - 130
D 45 13C3_PFHxS	178402	192692			108	50 - 150
14 PFHxS			910.00	726.83	79.9	70 - 130
29 ADONA			942.00	794.70	84.4	70 - 130
D 64 13C2_6:2 FTS_2	111803	102731			91.9	50 - 150
2 6:2 FTS			948.00	1047.38	110	70 - 130
20 PFOA			1000.00	919.36	91.9	70 - 130
D 53 13C8_PFOA	592205	613588			104	50 - 150
12 PFHpS			952.00	867.19	91.1	70 - 130
18 PFOS			928.00	776.26	83.6	70 - 130
17 PFNA			1000.00	908.27	90.8	70 - 130
D 56 13C9_PFNA	760907	762498			100	50 - 150
D 54 13C8_PFOS	157347	160639			102	50 - 150
30 9Cl-PF3ONS			932.00	850.82	91.3	70 - 130
D 55 13C8_PFOSA	311979	308681			98.9	50 - 150
19 PFOSA			1000.00	945.21	94.5	70 - 130
16 PFNS			960.00	889.34	92.6	70 - 130
D 65 13C2_8:2 FTS_2	88356	95198			108	50 - 150
3 8:2 FTS			958.00	1049.53	110	70 - 130
10 PFDA			1000.00	960.41	96	70 - 130
D 51 13C6_PFDA	636706	654177			103	50 - 150
D 58 d3-MeFOSAA	725286	755007			104	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	983.09	98.3	70 - 130
9 PFDS			964.00	864.54	89.7	70 - 130
5 N-EtFOSAA			1000.00	964.86	96.5	70 - 130
25 PFUdA			1000.00	927.75	92.8	70 - 130
D 60 d5-EtFOSAA	690640	701466			102	50 - 150
D 52 13C7_PFUdA	625944	639448			102	50 - 150
D 61 d7-MeFOSE	114979	106344			92.5	50 - 150
32 MeFOSE			1000.00	974.41	97.4	70 - 130
26 MeFOSA			1000.00	950.98	95.1	70 - 130
D 57 d3-MeFOSA	47825	55513			116	50 - 150
31 11Cl-PF3OUDS			942.00	809.59	85.9	70 - 130
D 62 d9-EtFOSE	122508	124133			101	50 - 150
33 EtFOSE			1000.00	1049.41	105	70 - 130
D 59 d5-EtFOSA	47562	50846			107	50 - 150
D 38 13C2_PFDoA	571184	609185			107	50 - 150
4 10:2 FTS			964.00	841.62	87.3	70 - 130
27 EtFOSA			1000.00	895.75	89.6	70 - 130
11 PFDoA			1000.00	962.00	96.2	70 - 130
34 PFDOS			968.00	887.06	91.6	70 - 130
24 PFTrDA			1000.00	901.80	90.2	70 - 130
23 PFTeDA			1000.00	910.10	91	70 - 130
D 42 13C2_PFTeDA	828920	817014			98.6	50 - 150
35 PFHxDA			1000.00	971.14	97.1	70 - 130
D 40 13C2_PFHxDA	865470	887245			103	50 - 150
36 PFODA			1000.00	984.64	98.5	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720020.d  
Injection Date: 27-Dec-2020 12:58:11 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 13  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.699	1.698	1	651657	24	>100:1			1000.00	939.59	102	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.698	1/0	605847	24	>100:1			1000.00	933.44		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	671615	18	>100:1			1000.00	976.35	102	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	624177	19	>100:1			1000.00	924.36		
<b>D 44 13C3_PFBs CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	243248	18	>100:1			1000.00	1056.54	101	
<b>7 Perfluoro-1-butanefulfonic acid (PFBs) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.130	0/-1	238547	17	>100:1	Target = 3.50		884.00	831.76		
298.9 > 99	44	2.120	2.130		65631	17	>100:1	3.63 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.442	2.451	0/-1	181279	20	>100:1	Target = 3.10		938.00	859.12		
349 > 99	44	2.442	2.451		63213	19	>100:1	2.86 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.380	1	129255	21	>100:1			5000.00	5339.28	94.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.371	2.380	0/-1	47228	19	>100:1	Target = 1.80		934.00	915.42		
327 > 81	63	2.380	2.380		26392	18	>100:1	1.78 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.407	2.415	0	722934	19	>100:1			1000.00	980.82	101	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.415	1/1	665651	20	>100:1	Target = 18.34		1000.00	932.63		
313 > 119	49	2.416	2.415		35395	19	>100:1	18.80 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.522	1	1305782	20	>100:1			5000.00	4902.43	98.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.522	1/0	346700	19	>100:1	Target = 0.81		2000.00	1847.78		
285 > 185	66	2.523	2.522		434213	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.764	2.773	0	584433	20	>100:1			1000.00	963.38	99.8	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.764	2.773	0/0	580171	19	>100:1	Target = 3.70		1000.00	957.05		
363 > 169	47	2.764	2.773		153756	22	>100:1	3.77 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	1	192692	21				1000.00	1125.35	108	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	1/0	148497	26	>100:1	Target = 3.21	0.16	910.00	726.83		
399 > 99	45	2.782	2.782		53519	29	>100:1	2.77 (1.60-4.81)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.800	2.809	0/-1	972215	20	>100:1	Target = 2.97		942.00	794.70		
377 > 85	45	2.800	2.809		323708	21	>100:1	3.00 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.142	3.142	1/0	151800	24	>100:1	Target = 3.08		952.00	867.19		
449 > 99	45	3.142	3.142		49749	26	>100:1	3.05 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.108	3.108	1	102731	27	>100:1			5000.00	5334.35	91.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.102	3.115	0/-1	44477	27	>100:1	Target = 1.80		948.00	1047.38		
427 > 81	64	3.108	3.115		23246	28	96:1	1.91 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.129	3.135	0	613588	26	>100:1			1000.00	1036.70	104	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.135	1/1	575080	26	>100:1	Target = 2.87		1000.00	919.36		
413 > 169	53	3.135	3.135		197524	22	>100:1	2.91 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	160639	28	>100:1			1000.00	1071.44	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.507	3.500	1/1	147764	48	>100:1	Target = 3.84	0.24	928.00	776.26		
499 > 99	54	3.507	3.500		43116	46	>100:1	3.42 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.716	3.716	0/0	460115	25	>100:1			932.00	850.82		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.850	3.858	0/0	109328	22	>100:1	Target = 3.07		960.00	889.34		
549 > 99	54	3.850	3.858		39895	21	>100:1	2.74 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.153	1/1	100789	19	>100:1	Target = 3.03		964.00	864.54		
599 > 99	54	4.162	4.153		39213	19	>100:1	2.57 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.318	0/0	369338	16	>100:1			942.00	809.59		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.656	4.648	1/1	114401	20	>100:1	Target = 3.33		968.00	887.06		
699 > 99	54	4.656	4.648		35837	20	>100:1	3.19 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.514	3.515	0	762498	24	>100:1			1000.00	1015.36	100	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.514	3.515	0/0	692576	22	>100:1	Target = 6.16		1000.00	908.27		
463 > 169	56	3.507	3.515		114746	25	>100:1	6.03 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.842	3.850	0	308681	21	>100:1			1000.00	997.15	98.9	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.842	3.858	0/0	287524	19	>100:1			1000.00	945.21		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.850	1	95198	22	>100:1			5000.00	5131.93	108	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.850	3.850	0/-1	40129	19	>100:1	Target = 1.95		958.00	1049.53		
527 > 81	65	3.858	3.850		19816	19		2.02 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.447	1/0	37030	26	>100:1	Target = 3.14		964.00	841.62		
627 > 80	65	4.456	4.447		13076	18		2.83 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	0	654177	21	>100:1			1000.00	986.20	103	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.858	3.866	0/0	617344	20	>100:1	Target = 15.94		1000.00	960.41		
513 > 169	51	3.858	3.866		44604	20	>100:1	13.84 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	755007	20	>100:1			5000.00	5259.93	104	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.019	4.019	0/0	114030	33	>100:1	Target = 1.33	0.13	1000.00	983.09		
570 > 483	58	4.019	4.019		74849	32	>100:1	1.52 (0.66-1.99)	0.18				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.170	4.171	0	701466	19	>100:1			5000.00	5281.54	102	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.179	4.180	0/0	134766	35	>100:1	Target = 1.58	0.13	1000.00	964.86		
584 > 526	60	4.179	4.180		76122	32	>100:1	1.77 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.170	4.171	0	639448	20	>100:1			1000.00	1011.67	102	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.170	4.171	0/0	557580	19	>100:1	Target = 15.50		1000.00	927.75		
563 > 169	52	4.170	4.171		39002	18	>100:1	14.29 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.298	0	106344	15	>100:1			1000.00	982.77	92.5	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.308	0/0	97364	17	>100:1			1000.00	974.41		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.318	0	55513	16	>100:1			1000.00	1049.06	116	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.318	0/0	59560	16	>100:1	Target = 1.12		1000.00	950.98		
512 > 219	57	4.308	4.318		61884	19	>100:1	0.96 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	124133	18	>100:1			1000.00	989.93	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.474	0/0	115895	17	>100:1			1000.00	1049.41		
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.447	4.438	1	609185	19				1000.00	1006.39	107	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													
613 > 569	38	4.447	4.438	1/0	593458	19	>100:1	Target = 10.85		1000.00	962.00		
613 > 169	38	4.447	4.438		52440	18	>100:1	11.31 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.681	4.673	1/0	541087	20	>100:1	Target = 8.37		1000.00	901.80		
663 > 169	38	4.681	4.673		66330	18	>100:1	8.15 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.483	0	50846	17	>100:1			1000.00	1035.68	107	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.492	0/0	49759	18	>100:1	Target = 1.03		1000.00	895.75		
526 > 219	59	4.483	4.492		47726	17	>100:1	1.04 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.899	4.890	1	817014	18	>100:1			1000.00	969.82	98.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.899	4.890	1/0	644261	21	89:1	Target = 12.11		1000.00	910.10		
713 > 169	42	4.899	4.890		52295	18	>100:1	12.31 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.275	5.258	2	887245	19	>100:1			1000.00	979.12	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.275	5.266	1/-1	562987	19	>100:1	Target = 11.48		1000.00	971.14		
813 > 269	40	5.275	5.266		50769	22	>100:1	11.08 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.612	5.591	2/0	773340	24	93:1	Target = 13.88		1000.00	984.64		
913 > 319	40	5.605	5.591		56590	25	>100:1	13.66 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.858	3.858	0	680563	20	>100:1					100	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.407	2.415	0	703919	20	>100:1					97.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	1	619147	24	>100:1					103	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	603378	24	>100:1					100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.507	3.507	0	164043	23	>100:1					100	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720020.d

Injection Date: 27-Dec-2020 12:58:11

Inst. ID: LCMSMS02

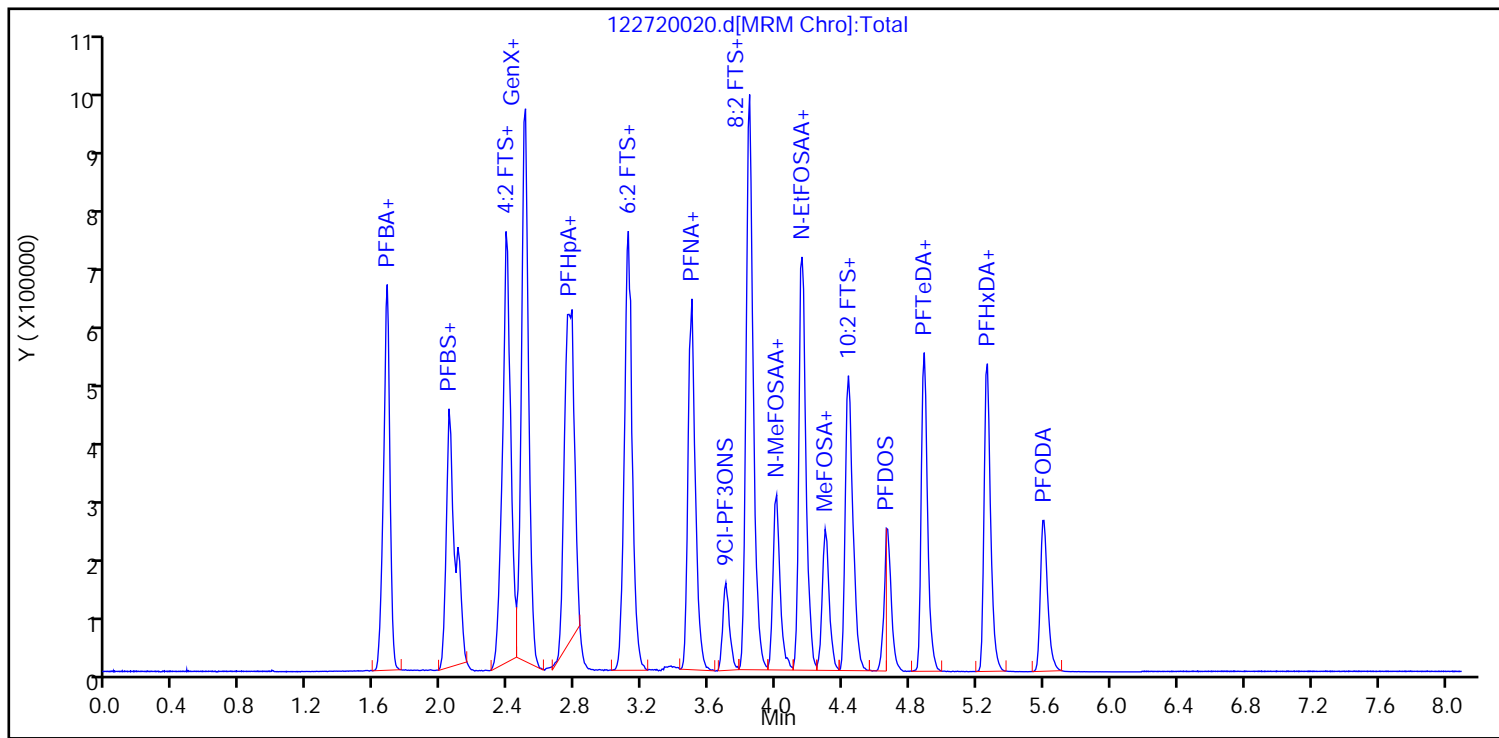
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

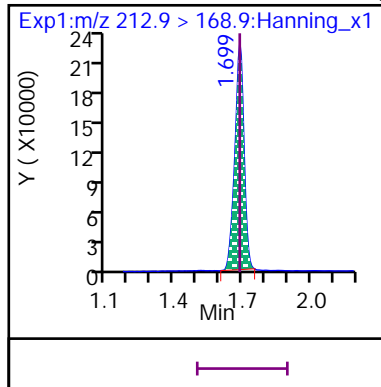
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

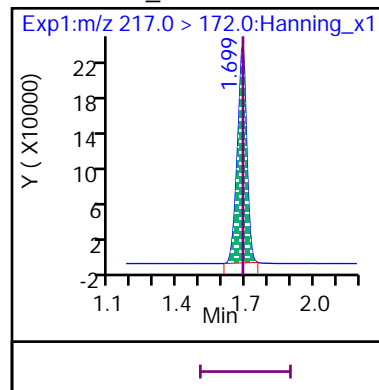
Operator: Matthew M. Miller



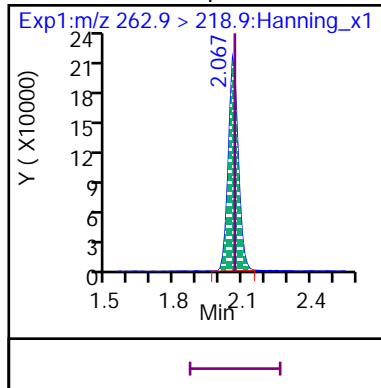
8 Perfluoro-n-butanoic acid (PFBA)



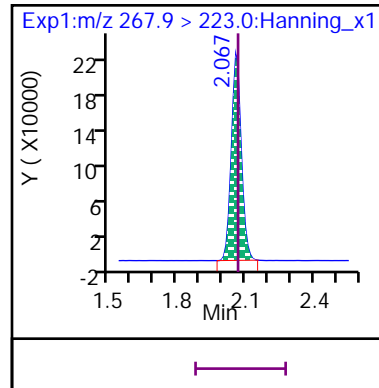
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

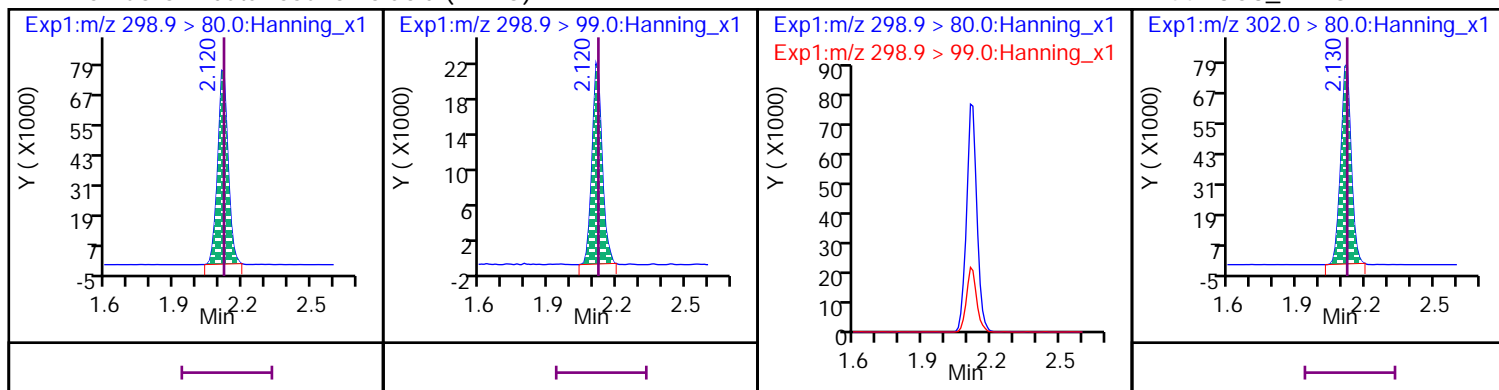


D 50 13C5\_PFPeA



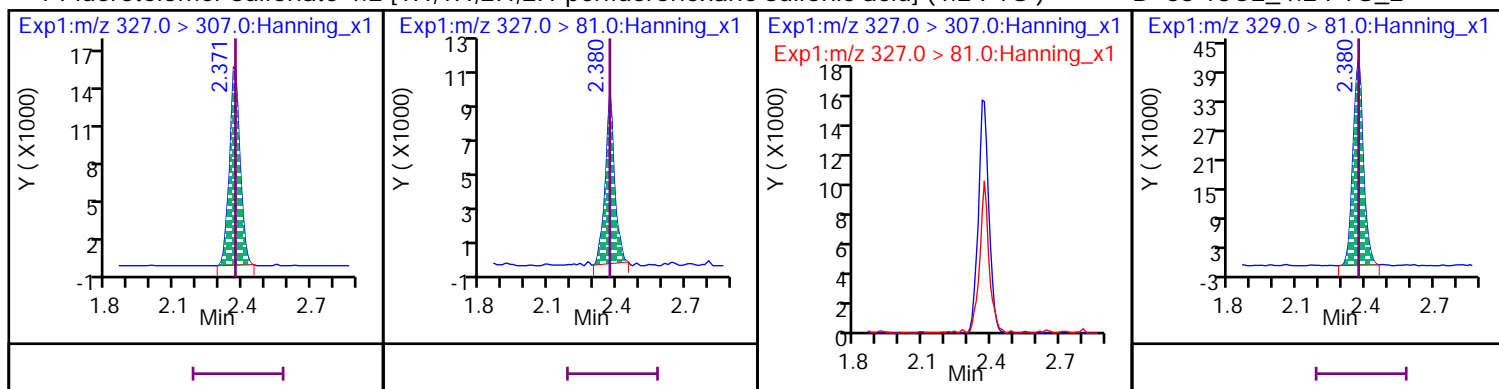
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



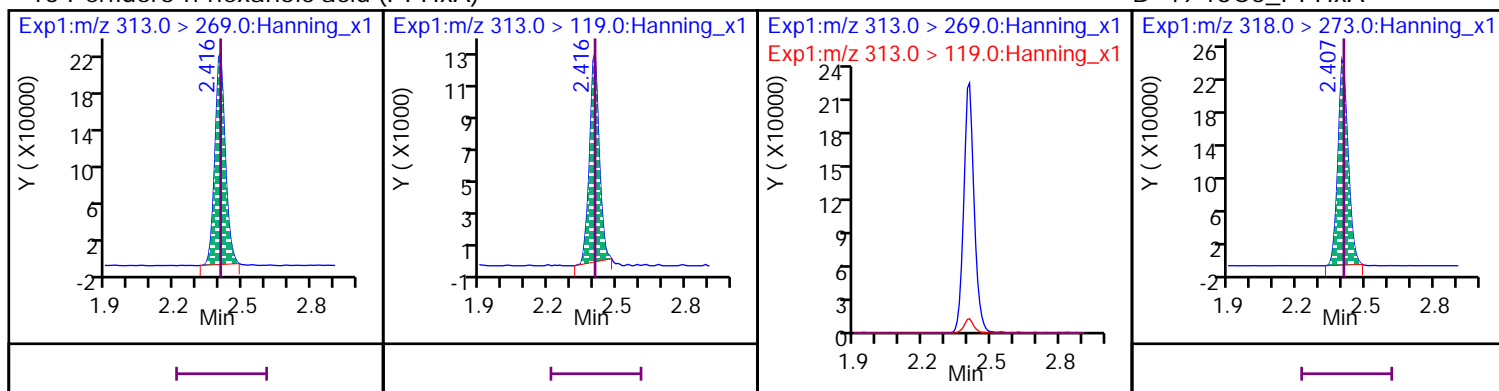
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



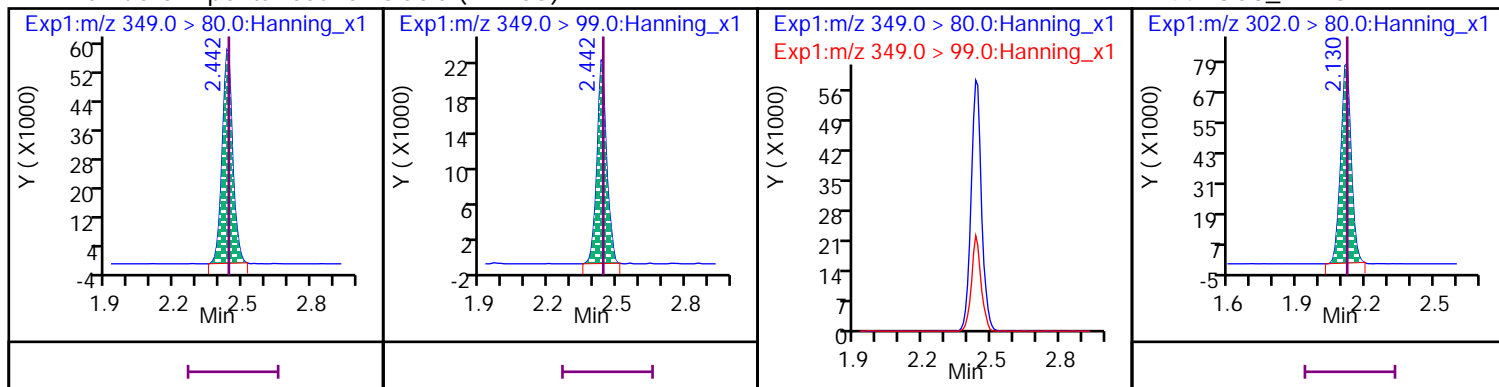
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



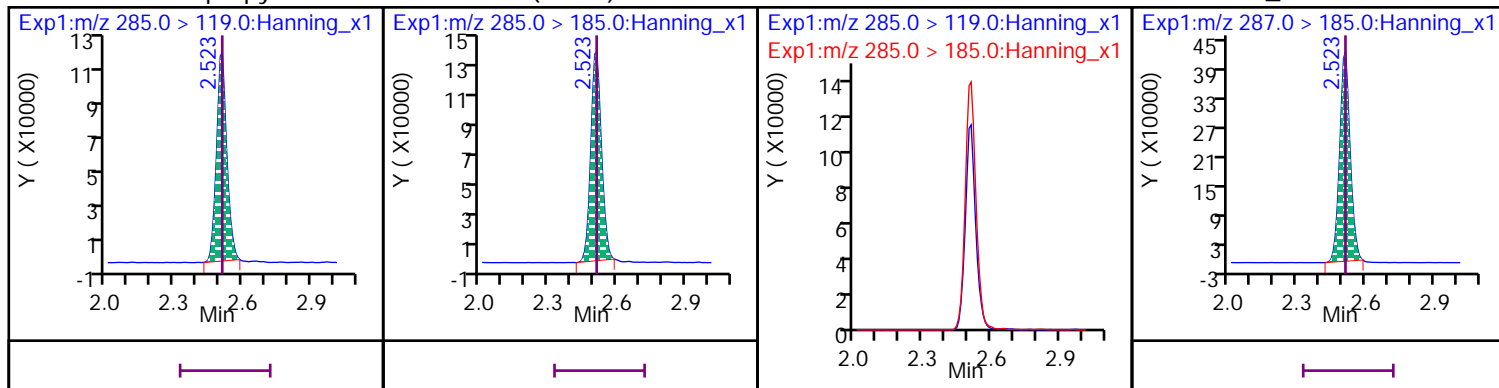
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



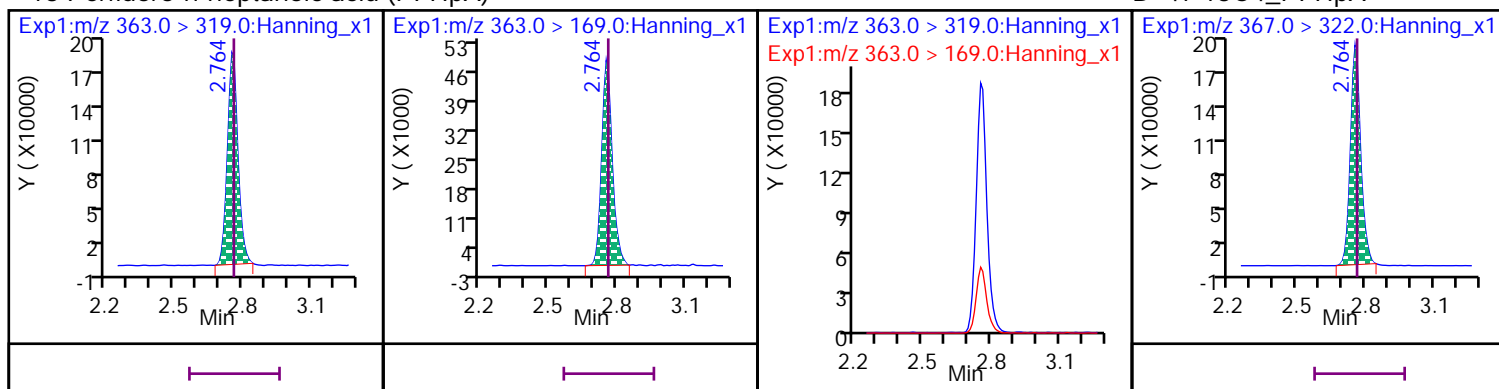
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



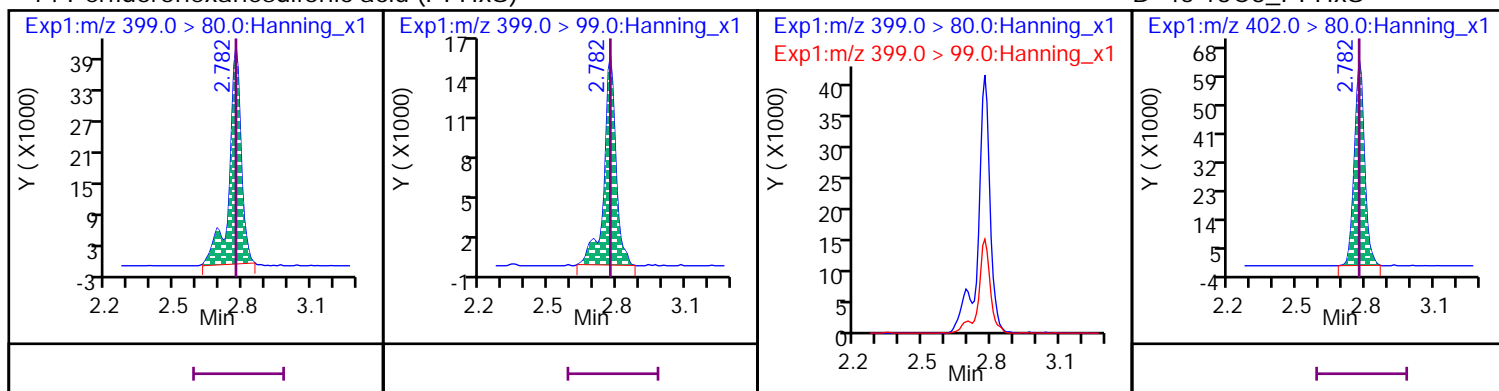
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



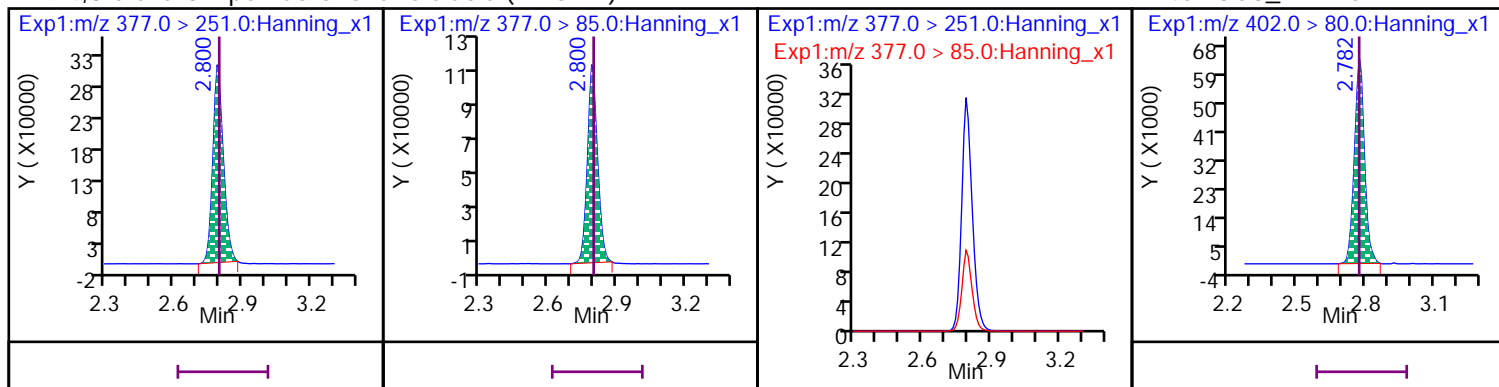
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



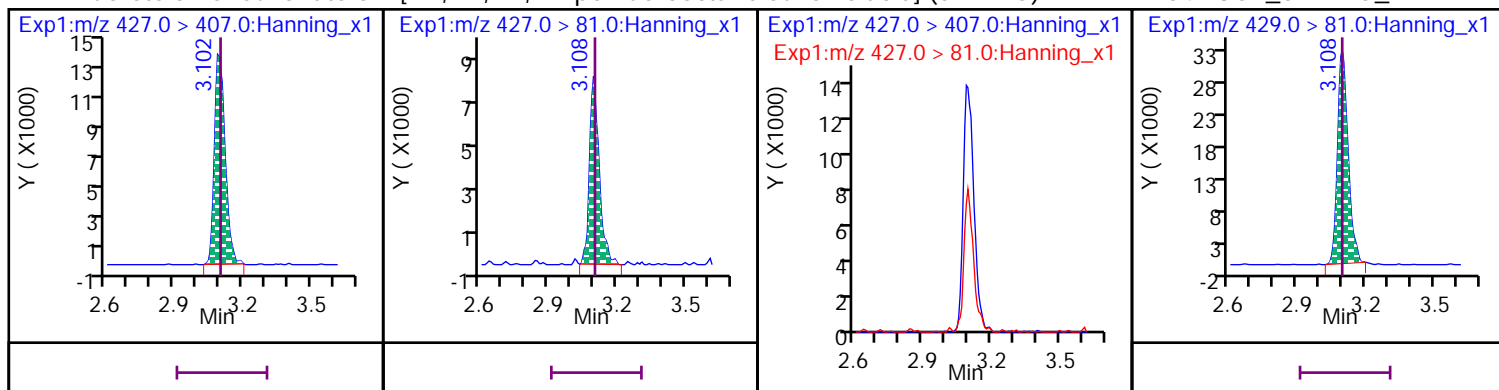
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



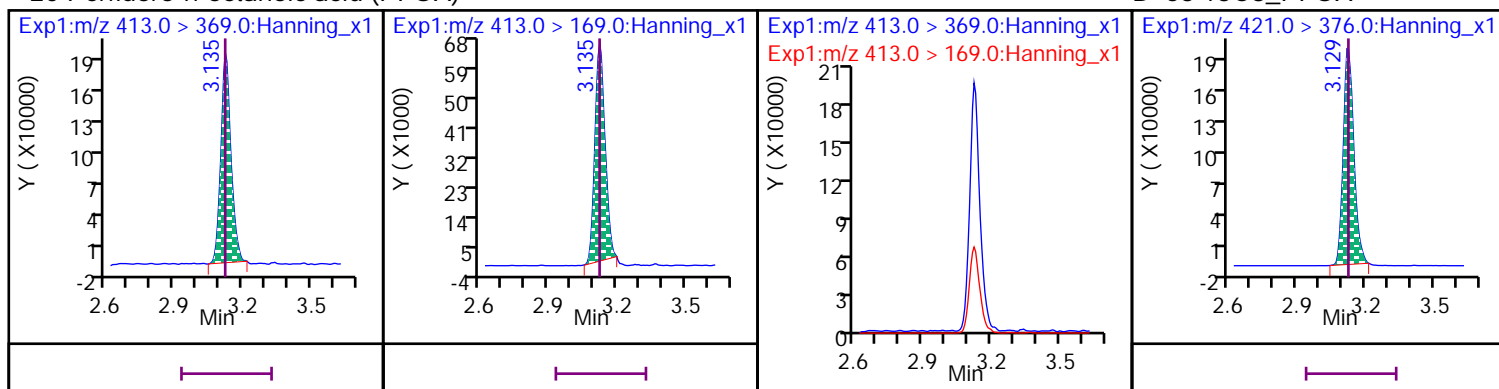
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



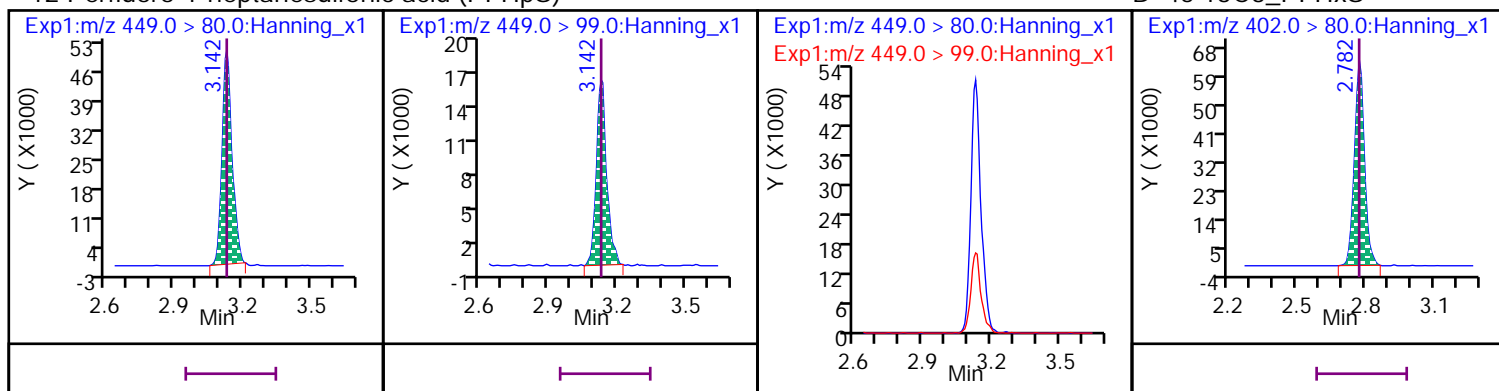
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



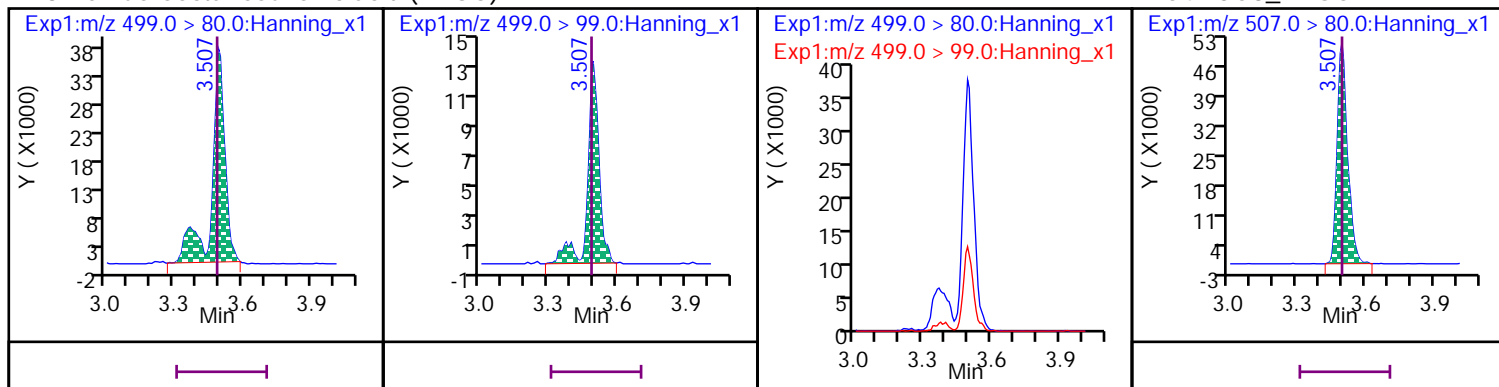
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



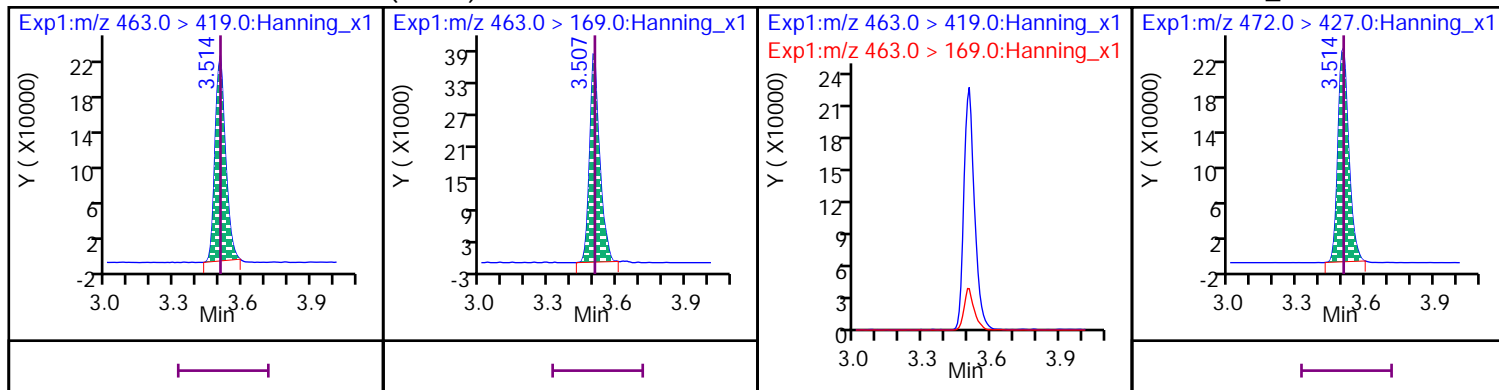
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



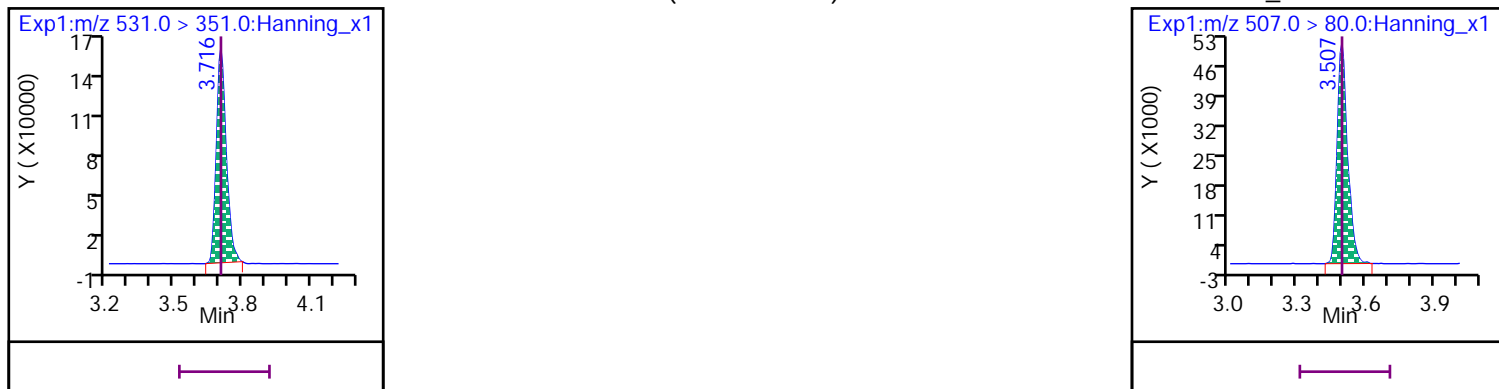
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



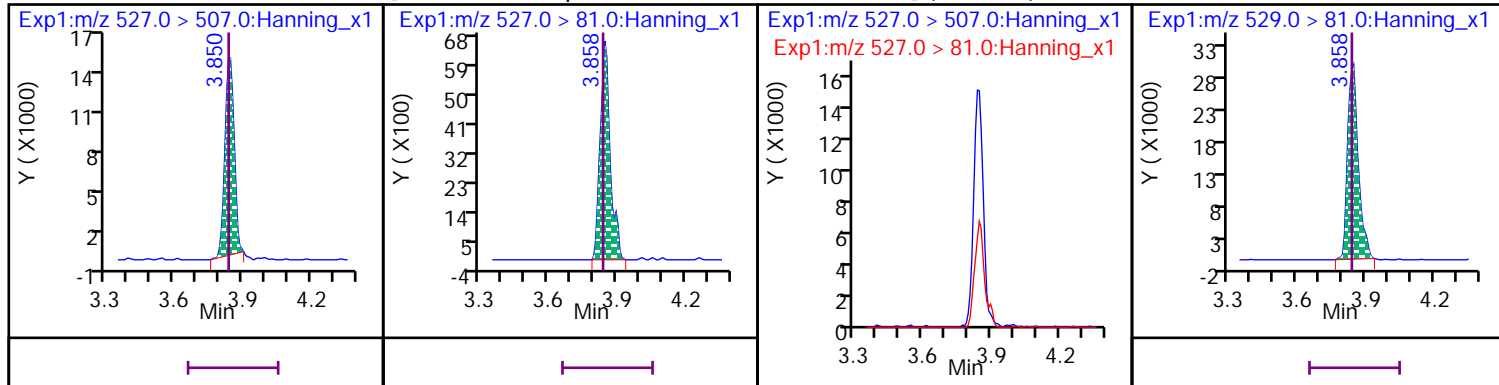
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

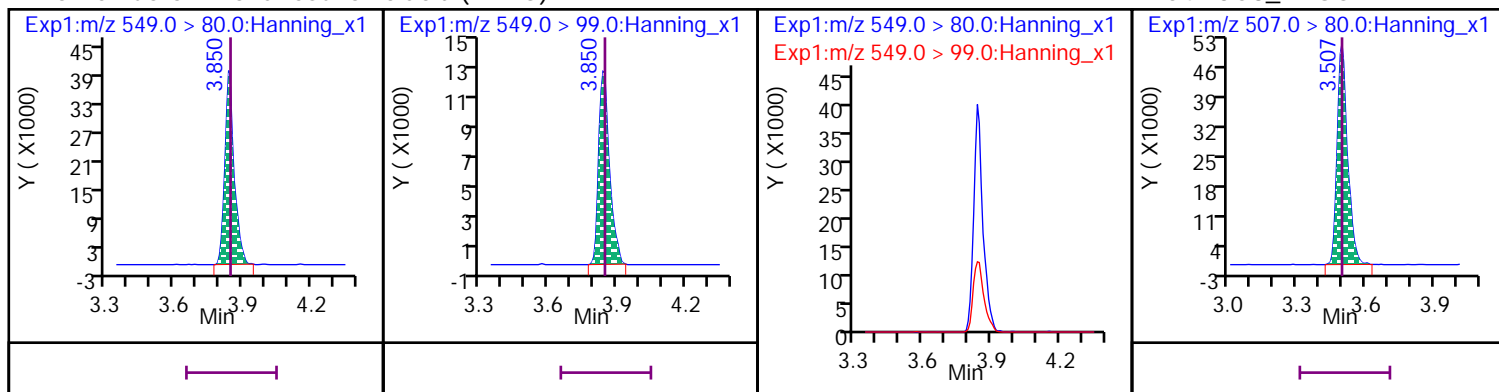
D 65 13C2\_8:2 FTS\_2





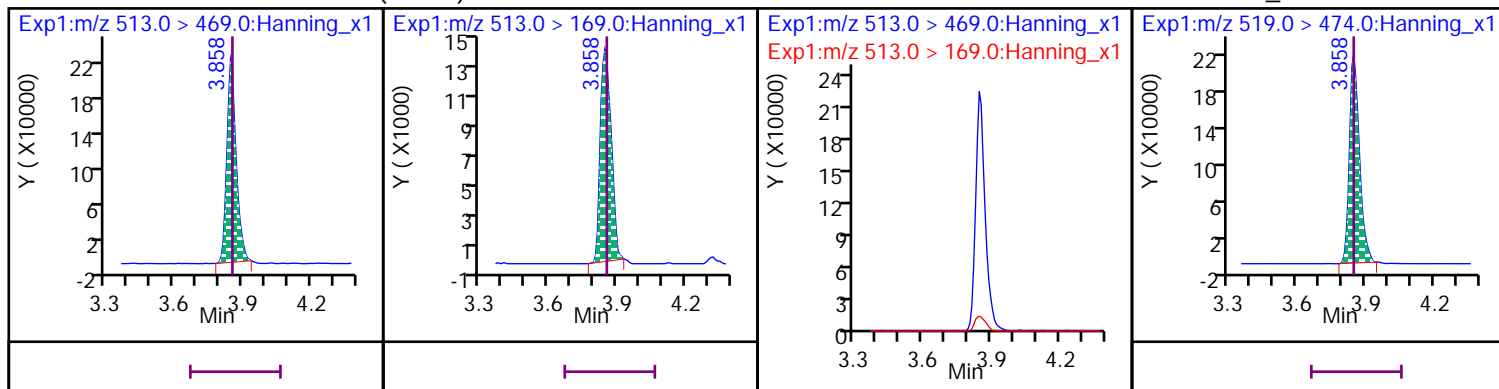
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



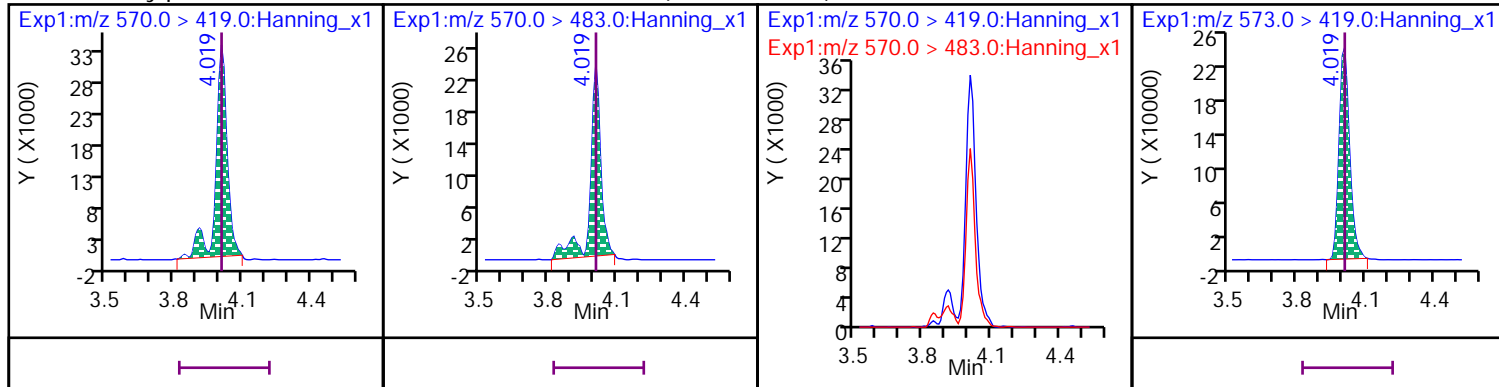
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



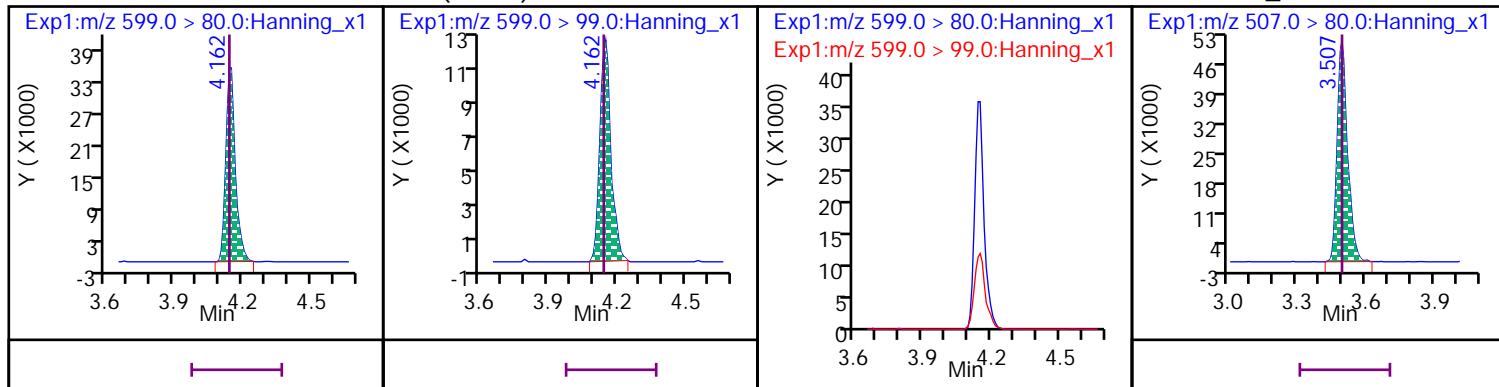
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



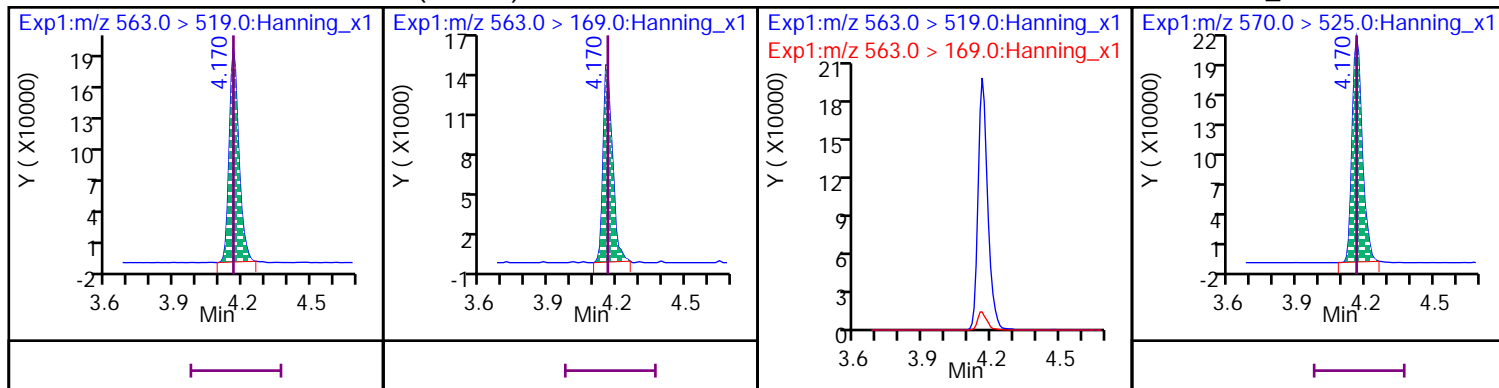
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



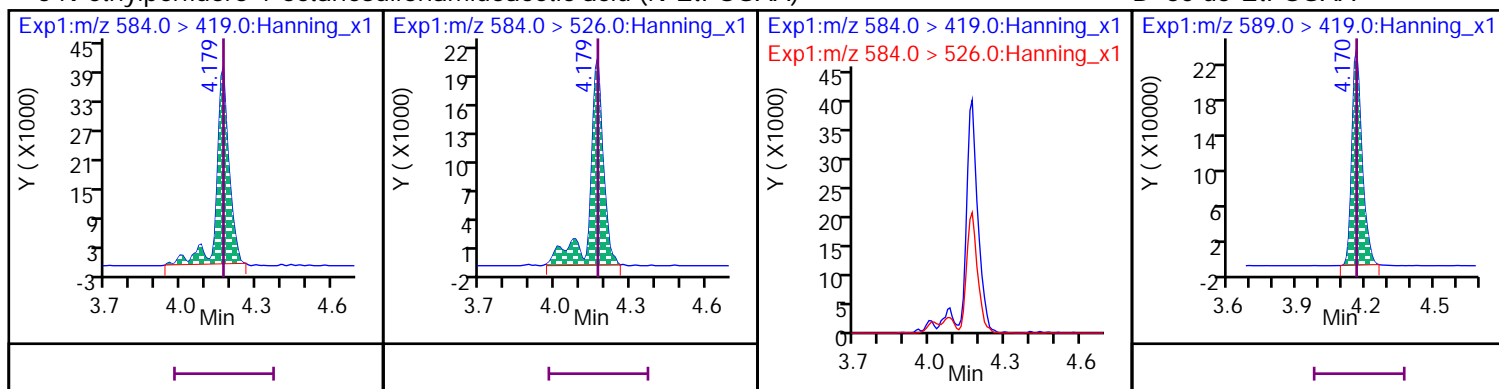
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



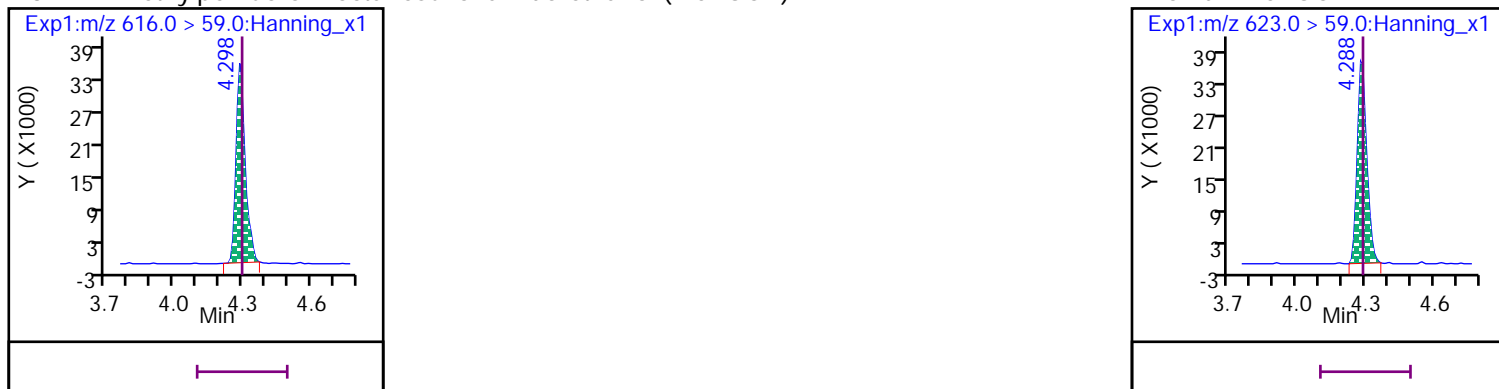
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



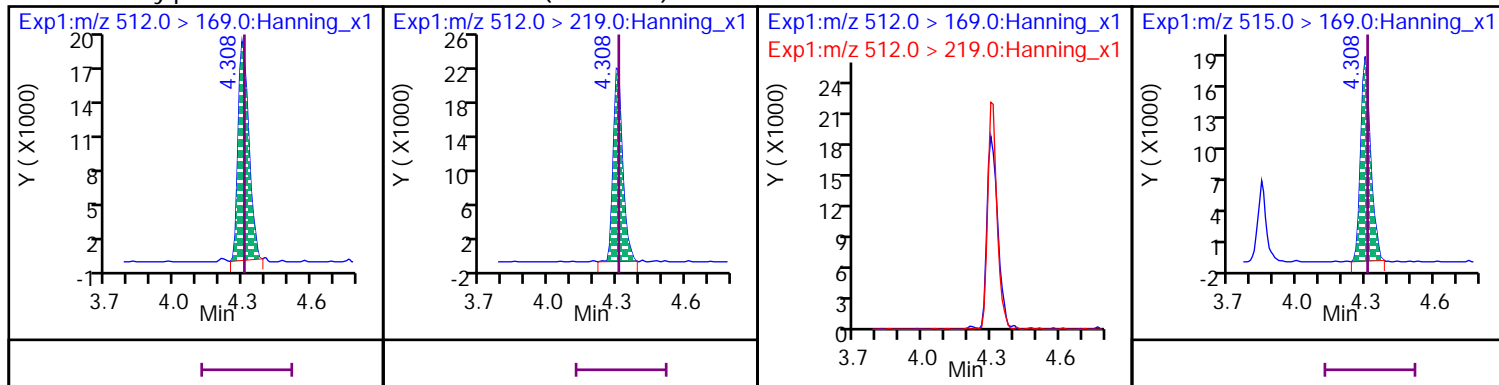
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

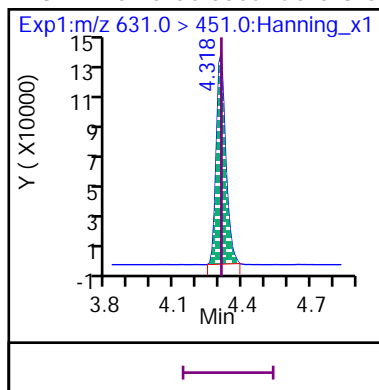


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

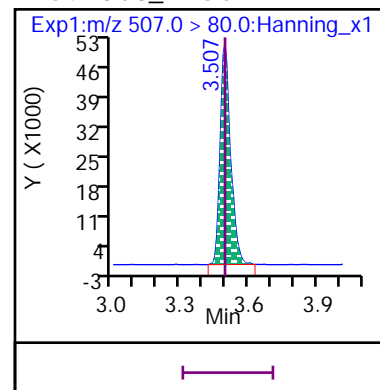
D 57 d3-MeFOSA



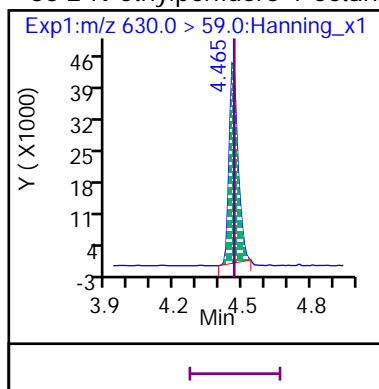
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



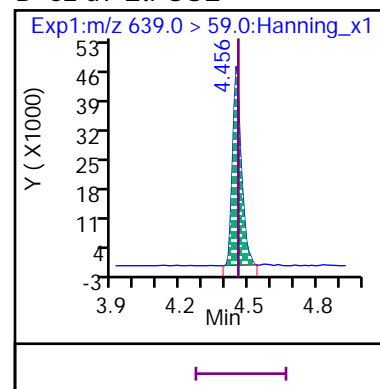
## D 54 13C8\_PFOS



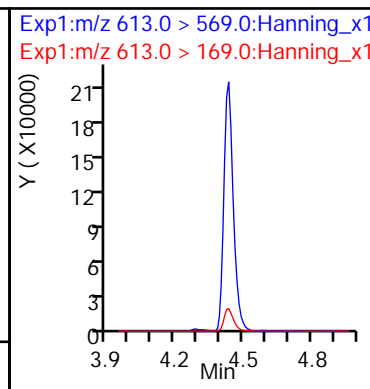
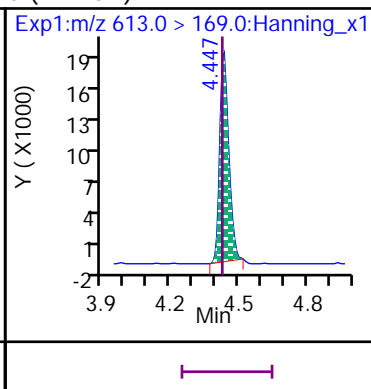
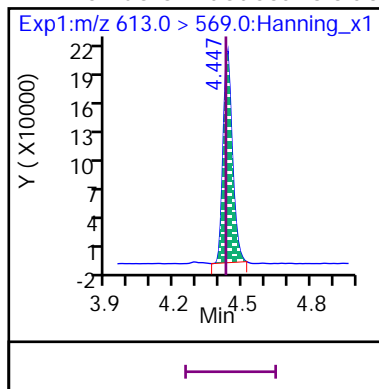
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



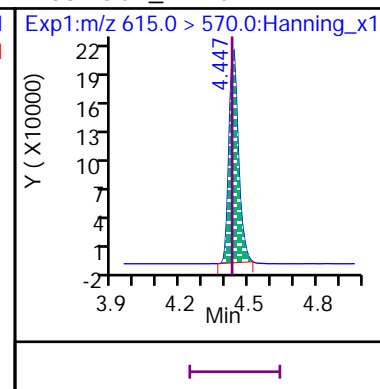
## D 62 d9-EtFOSE



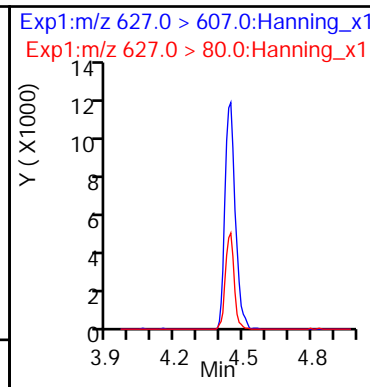
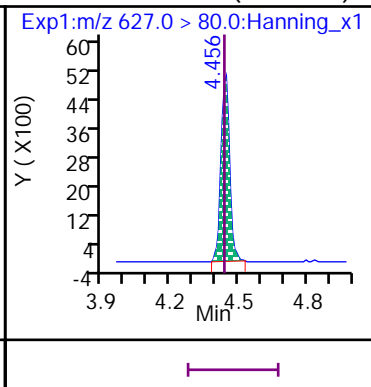
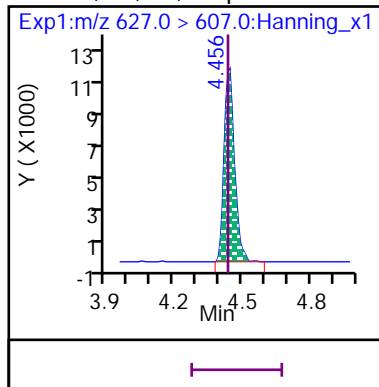
## 11 Perfluoro-n-dodecanoic acid (PFDaA)



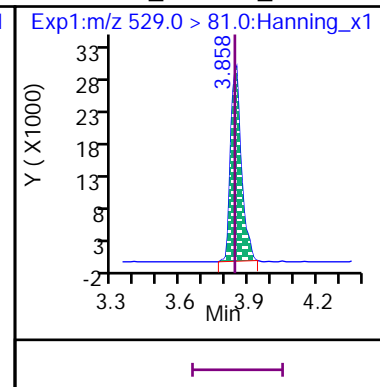
## D 38 13C2\_PFDaA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

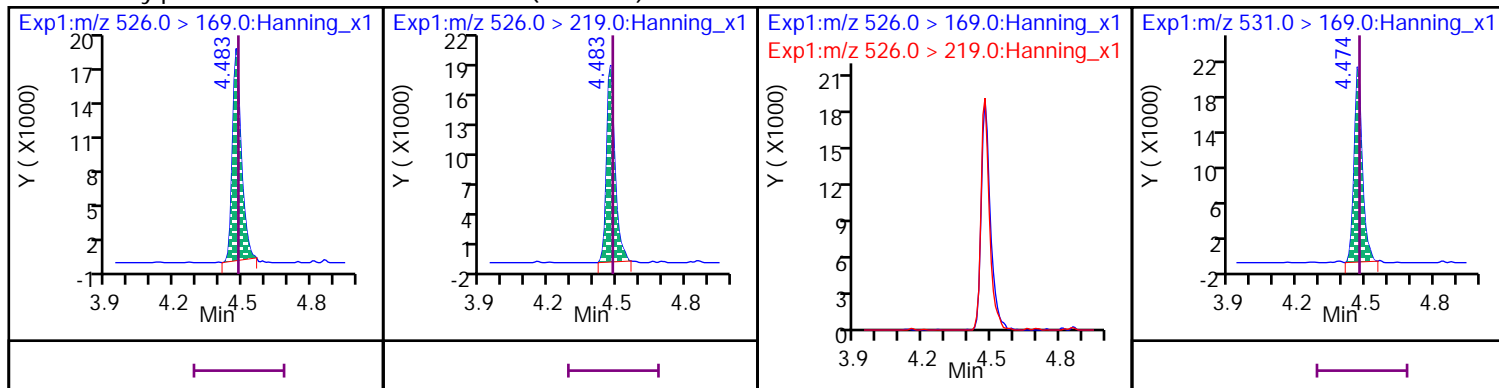


## D 65 13C2\_8:2 FTS\_2



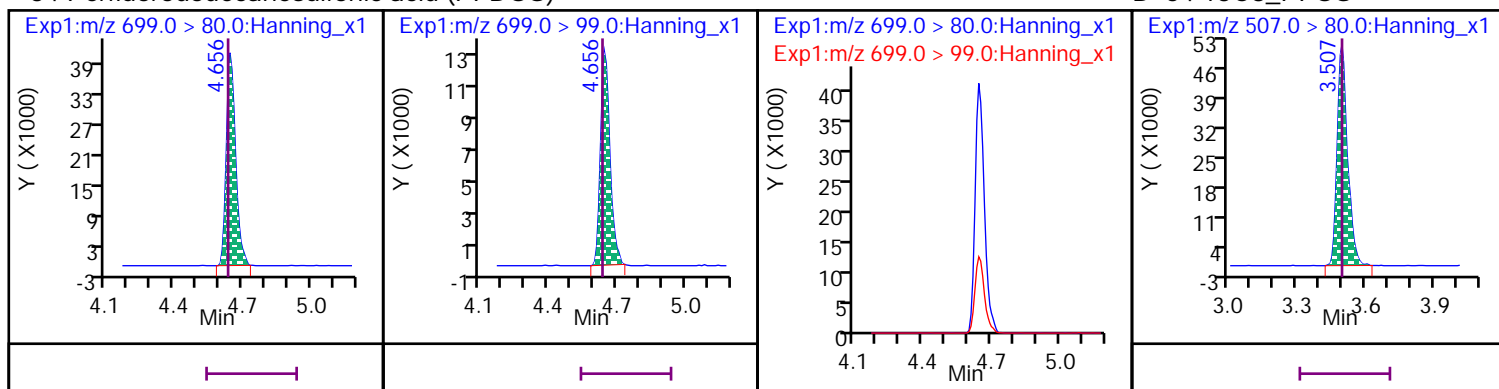
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

D 59 d5-EtFOSA



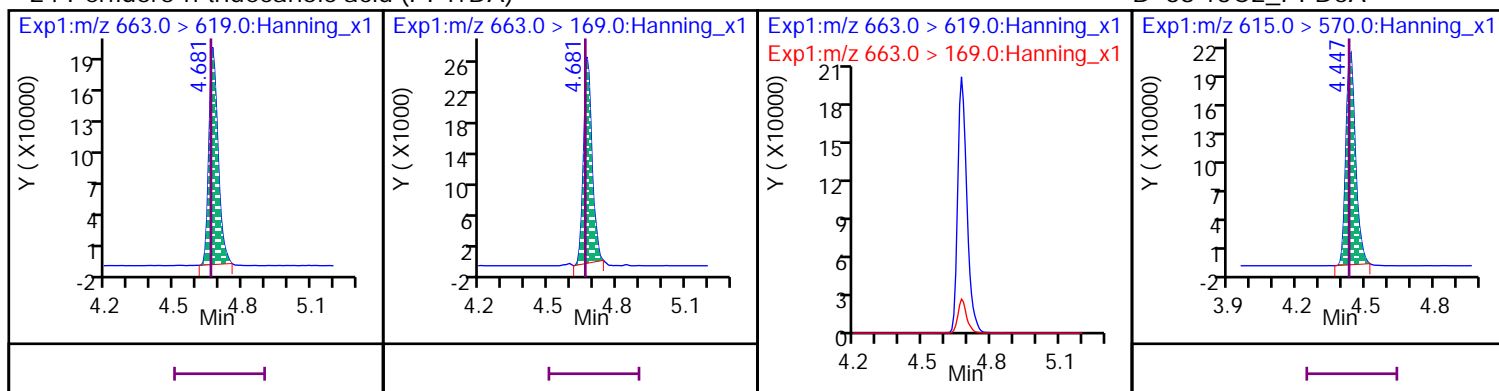
34 Perfluorododecanesulfonic acid (PFDOS)

D 54 13C8\_PFOS



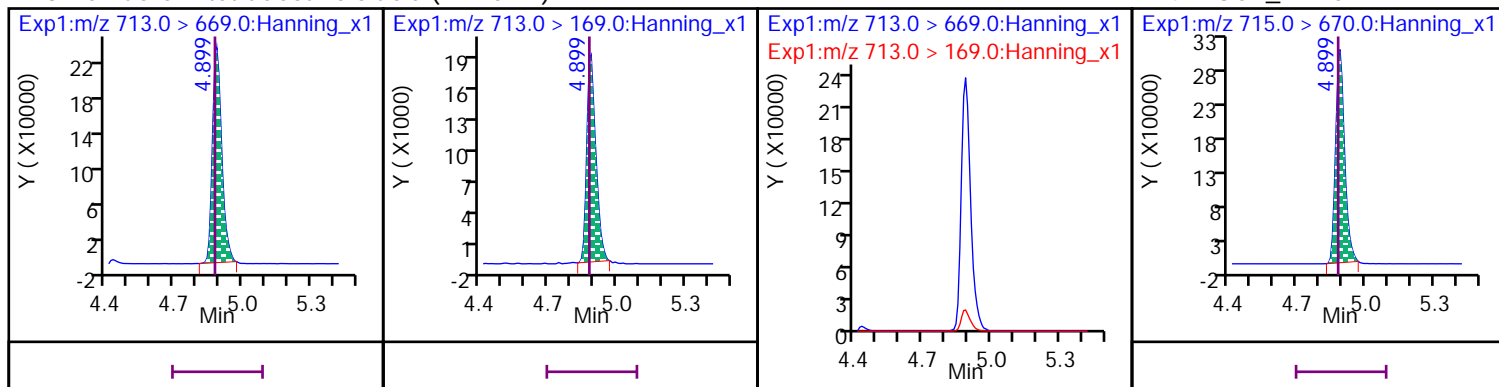
24 Perfluoro-n-tridecanoic acid (PFTrDA)

D 38 13C2\_PFDaA



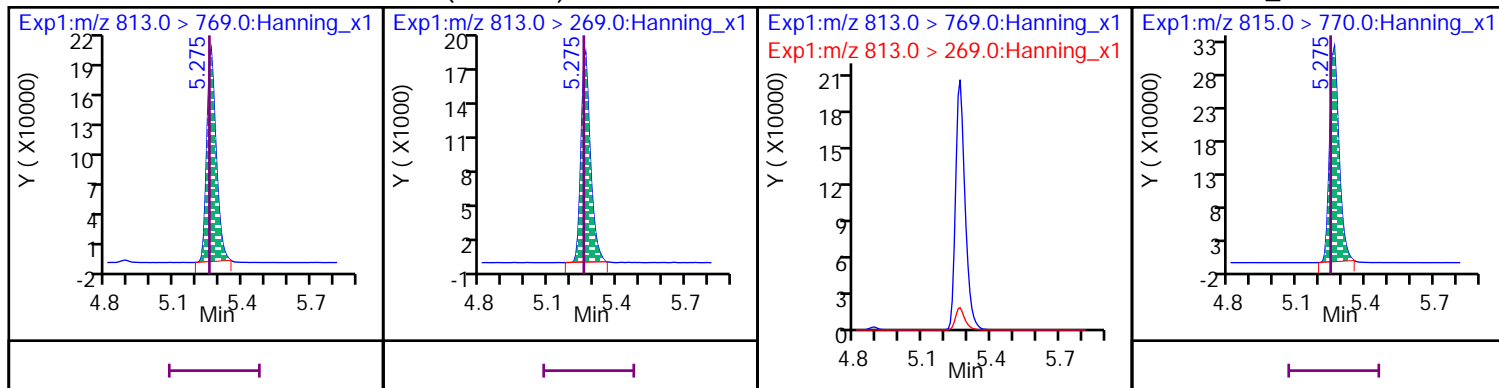
23 Perfluoro-n-tetradecanoic acid (PFTeDA)

D 42 13C2\_PFTeDA



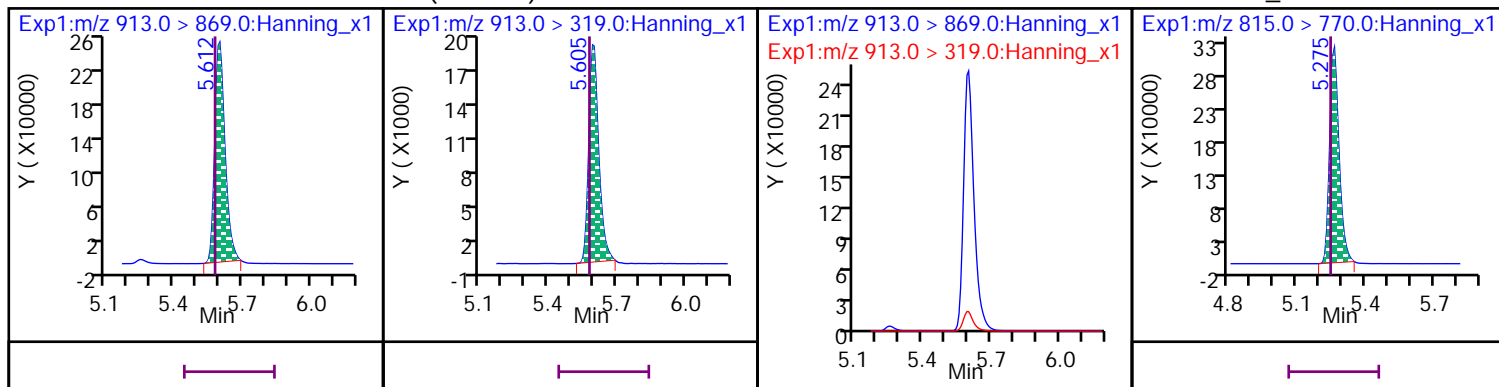
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

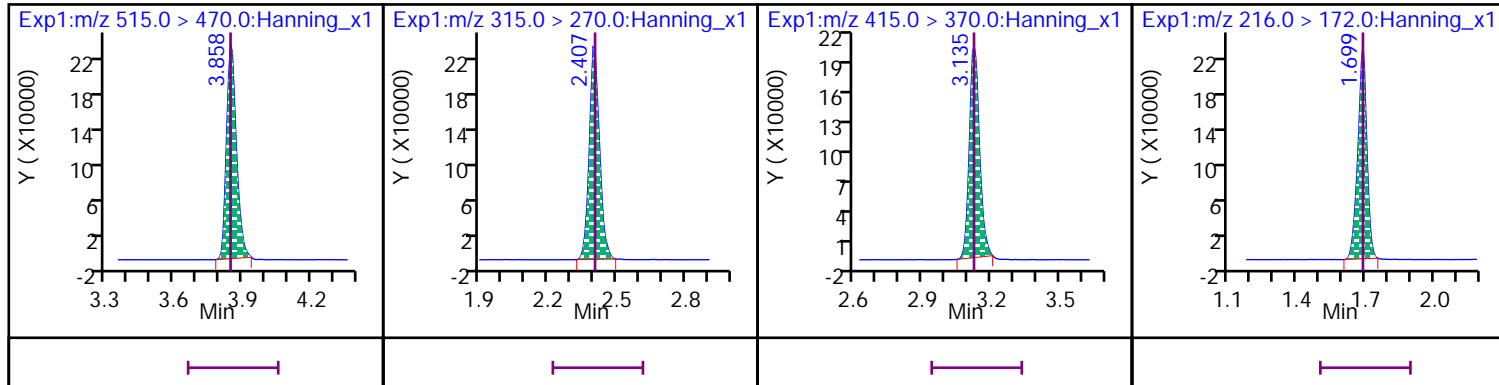


\* 37 13C2\_PFDA

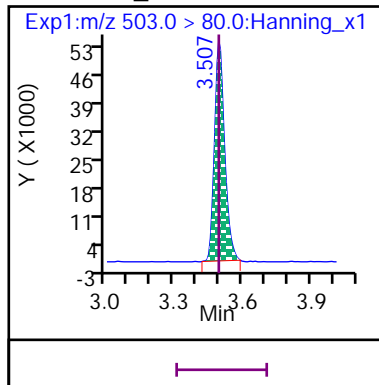
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720031.d  
Injection Date: 27-Dec-2020 14:55:00 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 24  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	929.01	92.9	70 - 130
D 46 13C4_PFBA	637910	650647			102	50 - 150
D 50 13C5_PFPeA	658438	648007			98.4	50 - 150
21 PFPeA			1000.00	964.12	96.4	70 - 130
7 PFBS			884.00	812.49	91.9	70 - 130
D 44 13C3_PFBS	239776	227036			94.7	50 - 150
1 4:2 FTS			934.00	868.95	93	70 - 130
D 63 13C2_4:2 FTS_2	137423	129145			94	50 - 150
D 49 13C5_PFHxA	718926	725985			101	50 - 150
15 PFHxA			1000.00	934.86	93.5	70 - 130
22 PFPeS			938.00	910.16	97	70 - 130
28 GenX			2000.00	1807.58	90.4	70 - 130
D 66 13C3_GenX	1323365	1336538			101	50 - 150
D 47 13C4_PFHpA	585778	586159			100	50 - 150
13 PFHpA			1000.00	979.65	98	70 - 130
D 45 13C3_PFHxS	178402	176668			99	50 - 150
14 PFHxS			910.00	829.33	91.1	70 - 130
29 ADONA			942.00	849.69	90.2	70 - 130
D 64 13C2_6:2 FTS_2	111803	104259			93.3	50 - 150
2 6:2 FTS			948.00	899.44	94.9	70 - 130
20 PFOA			1000.00	974.88	97.5	70 - 130
D 53 13C8_PFOA	592205	576266			97.3	50 - 150
12 PFHpS			952.00	931.03	97.8	70 - 130
18 PFOS			928.00	804.19	86.7	70 - 130
17 PFNA			1000.00	928.35	92.8	70 - 130
D 56 13C9_PFNA	760907	738038			97	50 - 150
D 54 13C8_PFOS	157347	162329			103	50 - 150
30 9CI-PF3ONS			932.00	806.15	86.5	70 - 130
D 55 13C8_PFOSA	311979	297697			95.4	50 - 150
19 PFOSA			1000.00	985.16	98.5	70 - 130
16 PFNS			960.00	778.74	81.1	70 - 130
D 65 13C2_8:2 FTS_2	88356	93317			106	50 - 150
3 8:2 FTS			958.00	855.67	89.3	70 - 130
10 PFDA			1000.00	966.13	96.6	70 - 130
D 51 13C6_PFDA	636706	629179			98.8	50 - 150
D 58 d3-MeFOSAA	725286	737189			102	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1027.46	103	70 - 130
9 PFDS			964.00	844.66	87.6	70 - 130
5 N-EtFOSAA			1000.00	862.05	86.2	70 - 130
25 PFUdA			1000.00	917.41	91.7	70 - 130
D 60 d5-EtFOSAA	690640	760502			110	50 - 150
D 52 13C7_PFUdA	625944	611981			97.8	50 - 150
D 61 d7-MeFOSE	114979	108581			94.4	50 - 150
32 MeFOSE			1000.00	883.54	88.4	70 - 130
26 MeFOSA			1000.00	937.76	93.8	70 - 130
D 57 d3-MeFOSA	47825	48533			101	50 - 150
31 11Cl-PF3OUDS			942.00	818.13	86.9	70 - 130
D 62 d9-EtFOSE	122508	122807			100	50 - 150
33 EtFOSE			1000.00	947.03	94.7	70 - 130
D 59 d5-EtFOSA	47562	47596			100	50 - 150
D 38 13C2_PFDoA	571184	601047			105	50 - 150
4 10:2 FTS			964.00	778.66	80.8	70 - 130
27 EtFOSA			1000.00	975.15	97.5	70 - 130
11 PFDoA			1000.00	907.35	90.7	70 - 130
34 PFDOS			968.00	838.56	86.6	70 - 130
24 PFTrDA			1000.00	887.54	88.8	70 - 130
23 PFTeDA			1000.00	925.39	92.5	70 - 130
D 42 13C2_PFTeDA	828920	807392			97.4	50 - 150
35 PFHxDA			1000.00	975.34	97.5	70 - 130
D 40 13C2_PFHxDA	865470	886733			102	50 - 150
36 PFODA			1000.00	953.68	95.4	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720031.d  
 Injection Date: 27-Dec-2020 14:55:00 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 24  
 Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.698	1	650647	24	>100:1			1000.00	938.14	102	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.698	1/0	602035	24	>100:1			1000.00	929.01		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	648007	18	>100:1			1000.00	942.03	98.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	628144	18	>100:1			1000.00	964.12		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	227036	18	>100:1			1000.00	986.12	94.7	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	1/0	217491	17	>100:1	Target = 3.50		884.00	812.49		
298.9 > 99	44	2.130	2.130		65083	19	>100:1	3.34 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.451	1/0	179248	21	>100:1	Target = 3.10		938.00	910.16		
349 > 99	44	2.442	2.451		57444	21	>100:1	3.12 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.380	1	129145	18	>100:1			5000.00	5334.74	94	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.380	1/0	44792	20	>100:1	Target = 1.80		934.00	868.95		
327 > 81	63	2.380	2.380		26424	22	>100:1	1.69 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.415	1	725985	21	>100:1			1000.00	984.96	101	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.415	1/0	670057	21	>100:1	Target = 18.34		1000.00	934.86		
313 > 119	49	2.416	2.415		34939	22	>100:1	19.17 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.522	1	1336538	21	>100:1			5000.00	5017.90	101	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.522	1/0	347146	20	>100:1	Target = 0.81		2000.00	1807.58		
285 > 185	66	2.523	2.522		415374	19	>100:1	0.83 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.764	2.773	0	586159	21	>100:1			1000.00	966.23	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.773	1/1	595628	19	>100:1	Target = 3.70		1000.00	979.65		
363 > 169	47	2.773	2.773		153431	24	>100:1	3.88 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	1	176668	23	>100:1			1000.00	1031.77	99	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	1/0	155350	27	>100:1	Target = 3.21	0.17	910.00	829.33		
399 > 99	45	2.782	2.782		51613	27	>100:1	3.00 (1.60-4.81)	0.15				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.809	1/0	953036	21	>100:1	Target = 2.97		942.00	849.69		
377 > 85	45	2.800	2.809		324056	21	>100:1	2.94 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.142	1/0	149422	25	>100:1	Target = 3.08		952.00	931.03		
449 > 99	45	3.142	3.142		50754	24	>100:1	2.94 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	104259	26	>100:1			5000.00	5413.69	93.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.115	1/0	38935	22	>100:1	Target = 1.80		948.00	899.44		
427 > 81	64	3.115	3.115		23115	28		1.68 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	1	576266	25	>100:1			1000.00	973.65	97.3	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.135	1/0	572719	26	>100:1	Target = 2.87		1000.00	974.88		
413 > 169	53	3.142	3.135		185812	22	>100:1	3.08 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.514	3.507	1	162329	22	>100:1			1000.00	1082.71	103	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.500	1/0	154692	43	81:1	Target = 3.84	0.27	928.00	804.19		
499 > 99	54	3.514	3.500		46491	46	>100:1	3.32 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.716	1/0	440544	23	>100:1			932.00	806.15		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.858	0/-1	96739	19	>100:1	Target = 3.07		960.00	778.74		
549 > 99	54	3.858	3.858		38150	22	>100:1	2.53 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.153	1/0	99507	17		Target = 3.03		964.00	844.66		
599 > 99	54	4.162	4.153		33350	22	>100:1	2.98 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.318	0/-1	377161	16	>100:1			942.00	818.13		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.648	2/1	109284	20	>100:1	Target = 3.33		968.00	838.56		
699 > 99	54	4.664	4.648		32778	19		3.33 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.514	3.515	0	738038	23	>100:1			1000.00	982.79	97	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.514	3.515	0/0	685180	22	>100:1	Target = 6.16		1000.00	928.35		
463 > 169	56	3.514	3.515		114805	23	>100:1	5.96 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.850	0	297697	20	>100:1			1000.00	961.67	95.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.858	0/0	289012	21	>100:1			1000.00	985.16		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.850	1	93317	27	>100:1			5000.00	5030.53	106	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.850	1/0	32185	21	>100:1	Target = 1.95		958.00	855.67		
527 > 81	65	3.858	3.850		17342	29		1.85 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.447	1/0	33583	19	>100:1	Target = 3.14		964.00	778.66		
627 > 80	65	4.456	4.447		11014	28		3.04 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.866	3.858	1	629179	21	>100:1			1000.00	948.51	98.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.866	0/-1	597292	20	>100:1	Target = 15.94		1000.00	966.13		
513 > 169	51	3.858	3.866		43129	18	>100:1	13.84 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	737189	19	>100:1			5000.00	5135.80	102	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.019	1/1	116365	36		Target = 1.33	0.11	1000.00	1027.46		
570 > 483	58	4.030	4.019		85433	35	>100:1	1.36 (0.66-1.99)	0.19				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.171	1	760502	19	>100:1			5000.00	5726.04	110	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.179	4.180	0/-1	130539	33	>100:1	Target = 1.58	0.11	1000.00	862.05		
584 > 526	60	4.179	4.180		84515	37	>100:1	1.54 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.171	1	611981	19	>100:1			1000.00	968.21	97.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.171	1/0	527679	20	>100:1	Target = 15.50		1000.00	917.41		
563 > 169	52	4.179	4.171		42582	17	>100:1	12.39 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.298	0	108581	18	>100:1			1000.00	1003.45	94.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.308	0/0	90141	24	>100:1			1000.00	883.54		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.318	0	48533	15	75:1			1000.00	917.16	101	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	0/0	51347	21	>100:1	Target = 1.12		1000.00	937.76		
512 > 219	57	4.318	4.318		54002	17		0.95 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	122807	18	>100:1			1000.00	979.36	100	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.474	0/0	103471	16	>100:1			1000.00	947.03		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.447	4.438	1	601047	19	>100:1			1000.00	992.95	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.447	4.438	1/0	552268	21	>100:1	Target = 10.85		1000.00	907.35		
613 > 169	38	4.447	4.438		51645	17		10.69 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.673	1/0	525421	21	>100:1	Target = 8.37		1000.00	887.54		
663 > 169	38	4.689	4.673		63993	20	>100:1	8.21 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.483	0	47596	16	>100:1			1000.00	969.48	100	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.492	0/0	50707	15	>100:1	Target = 1.03		1000.00	975.15		
526 > 219	59	4.483	4.492		47878	16	>100:1	1.05 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.899	4.890	1	807392	19	>100:1			1000.00	958.39	97.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.890	1/0	647373	19	77:1	Target = 12.11		1000.00	925.39		
713 > 169	42	4.899	4.890		56474	20	>100:1	11.46 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.275	5.258	2	886733	20	>100:1			1000.00	978.56	102	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.275	5.266	1/-1	565094	19	>100:1	Target = 11.48		1000.00	975.34		
813 > 269	40	5.283	5.266		52681	19	>100:1	10.72 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.619	5.591	2/0	748591	24	91:1	Target = 13.88		1000.00	953.68		
913 > 319	40	5.612	5.591		55615	26	>100:1	13.46 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.858	1	658198	21	>100:1					97.2	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	681244	21	>100:1					94.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.135	1	592447	24	>100:1					98.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	595473	23	>100:1					98.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80      3.514    3.507      1      163861    22    >100:1      100

### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720031.d

Injection Date: 27-Dec-2020 14:55:00

Inst. ID: LCMSMS02

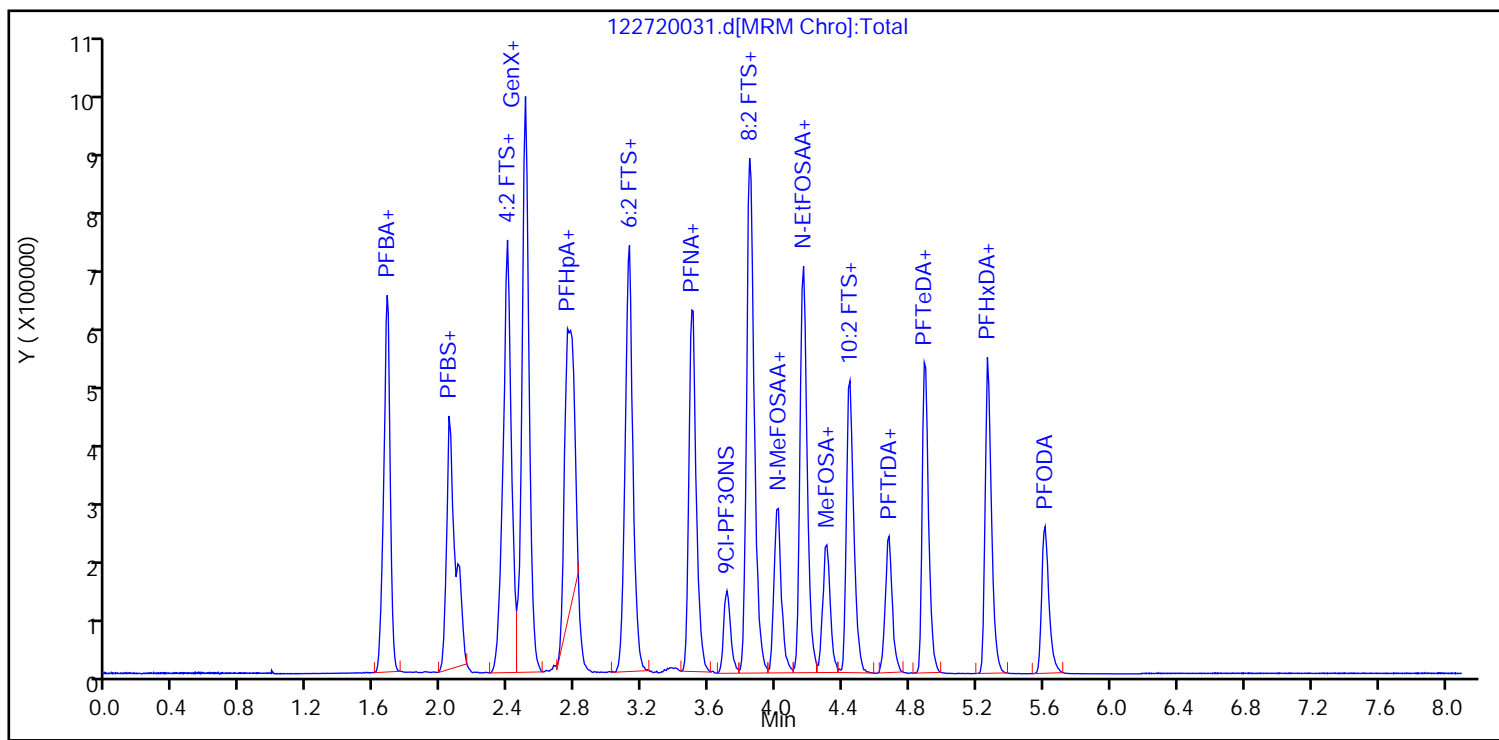
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Lab ID: ID CCV 1000A\_SVLC-1248

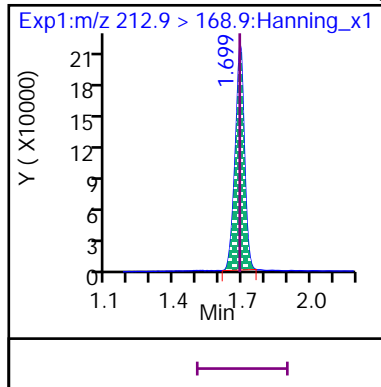
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Dil. Factor: 1

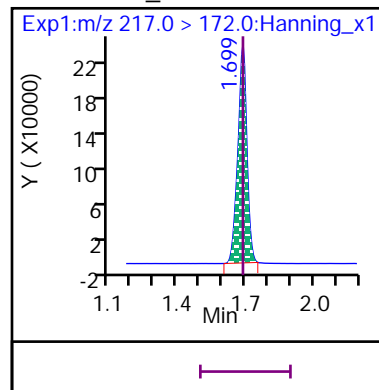
Operator: Matthew M. Miller



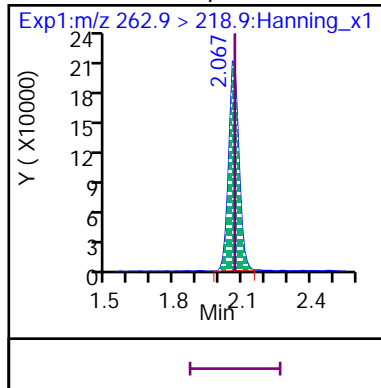
8 Perfluoro-n-butanoic acid (PFBA)



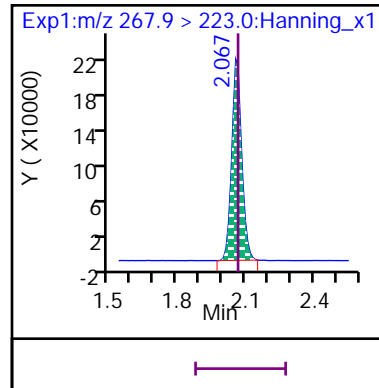
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

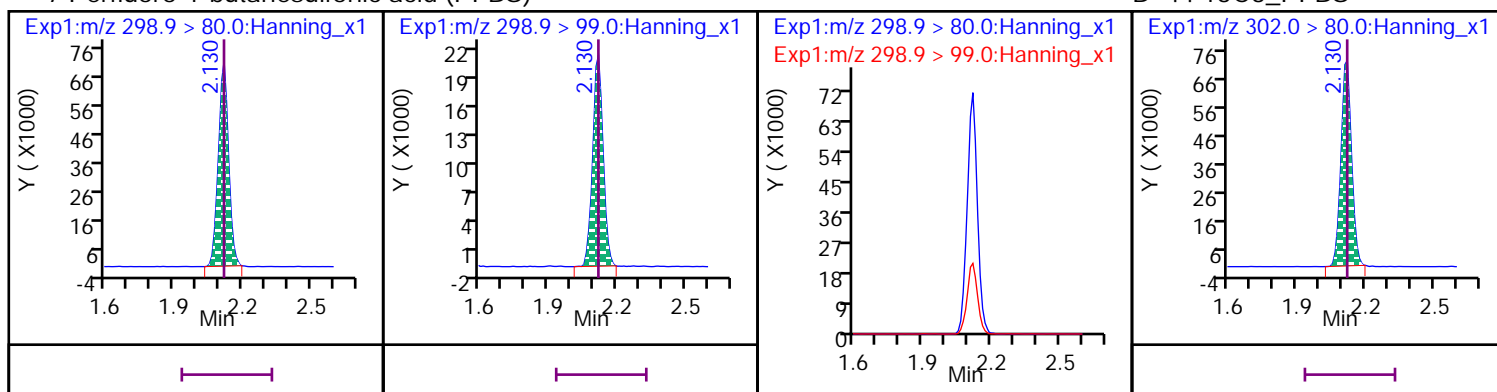


D 50 13C5\_PFPeA



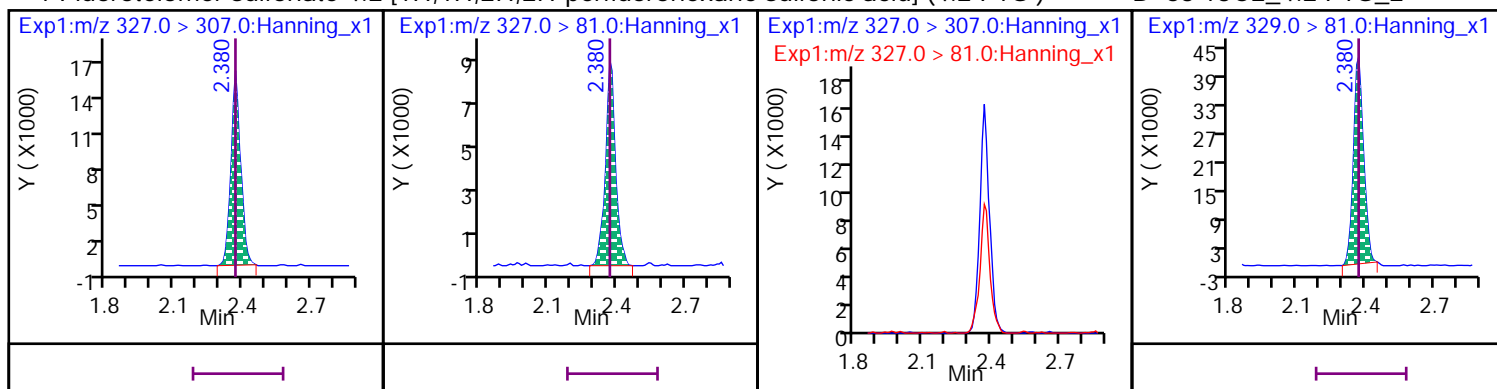
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



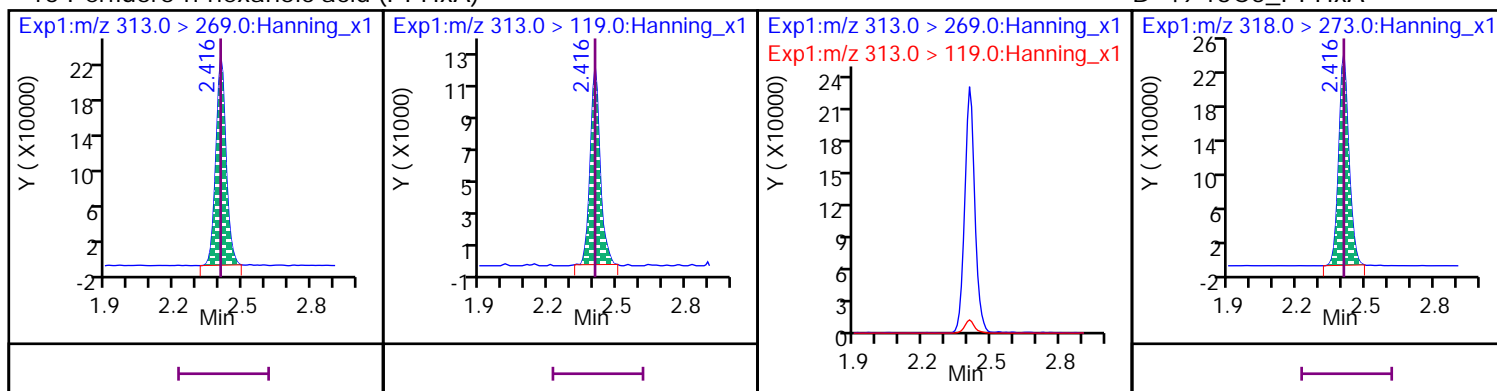
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



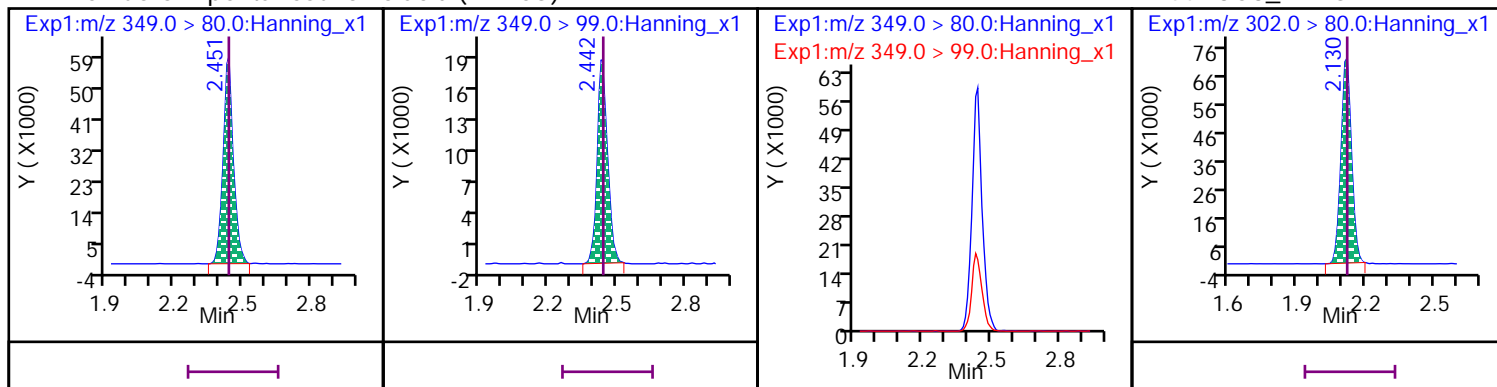
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



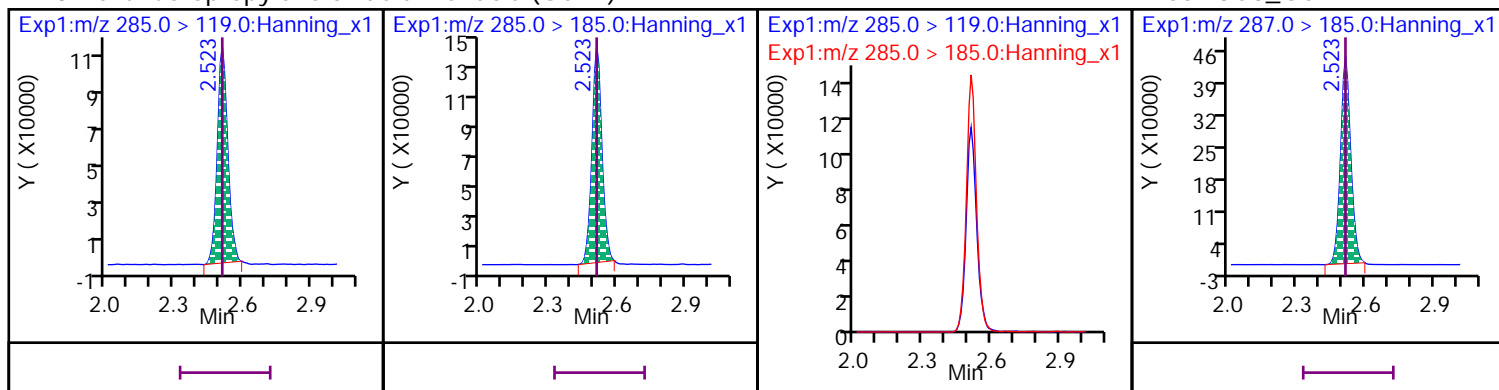
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



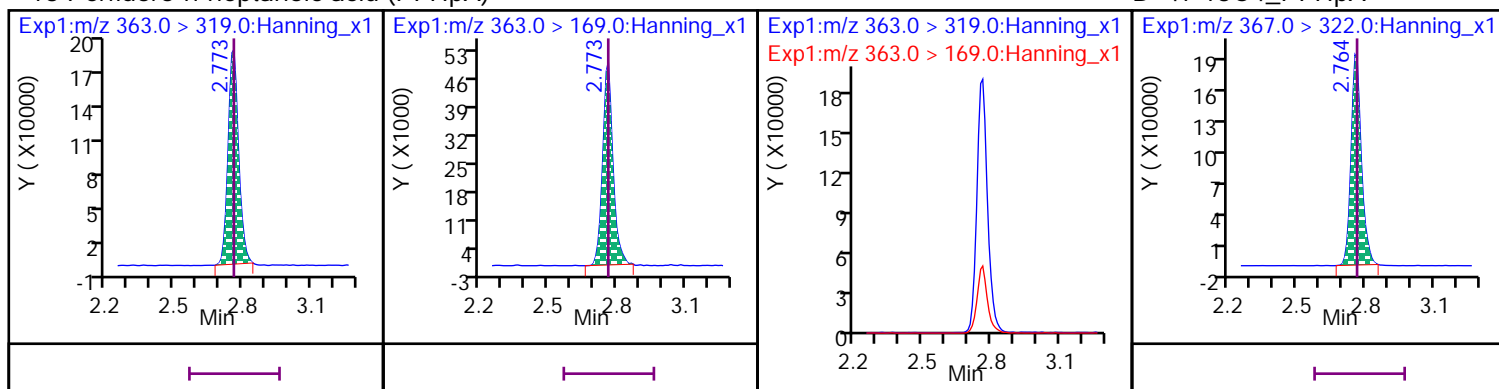
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



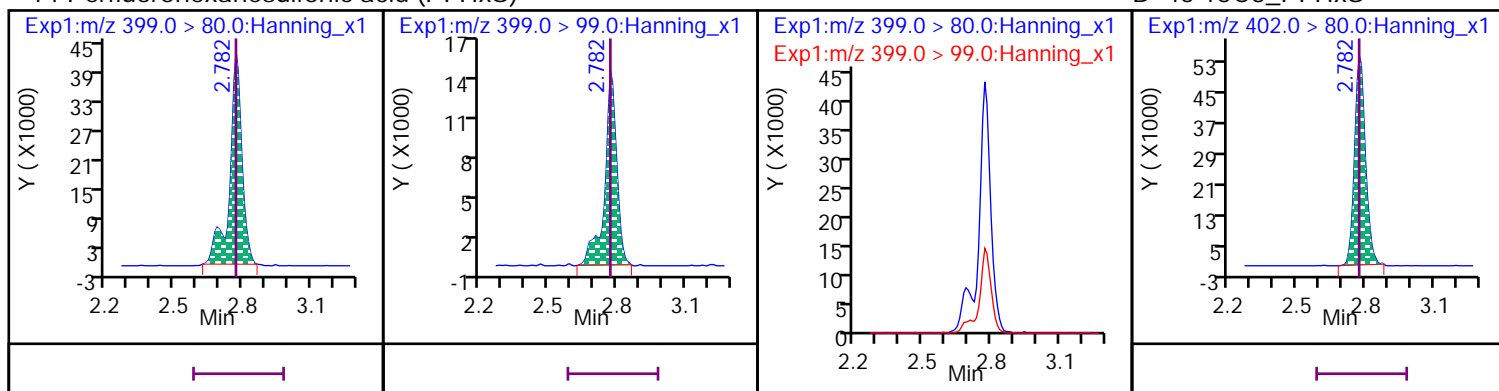
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



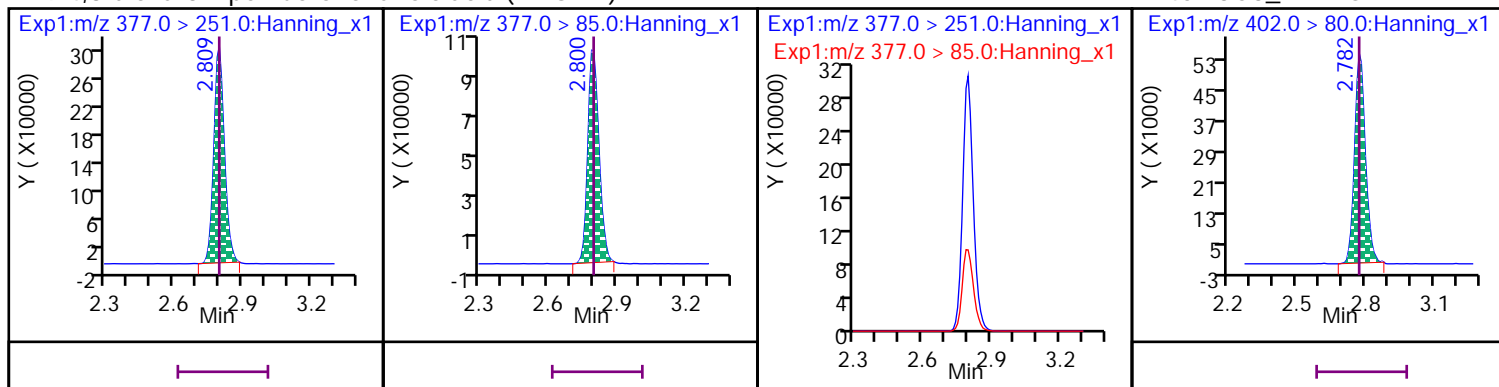
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



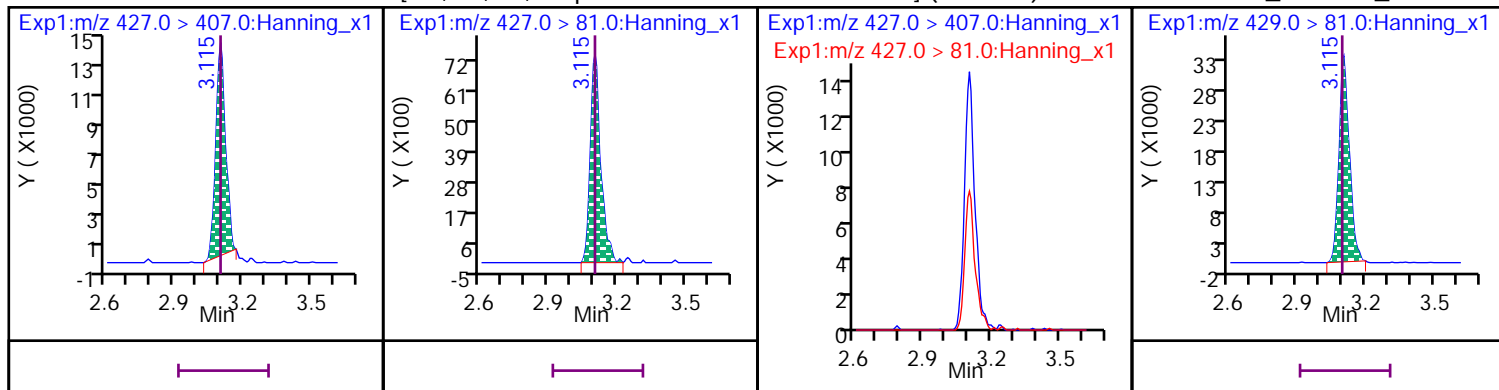
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



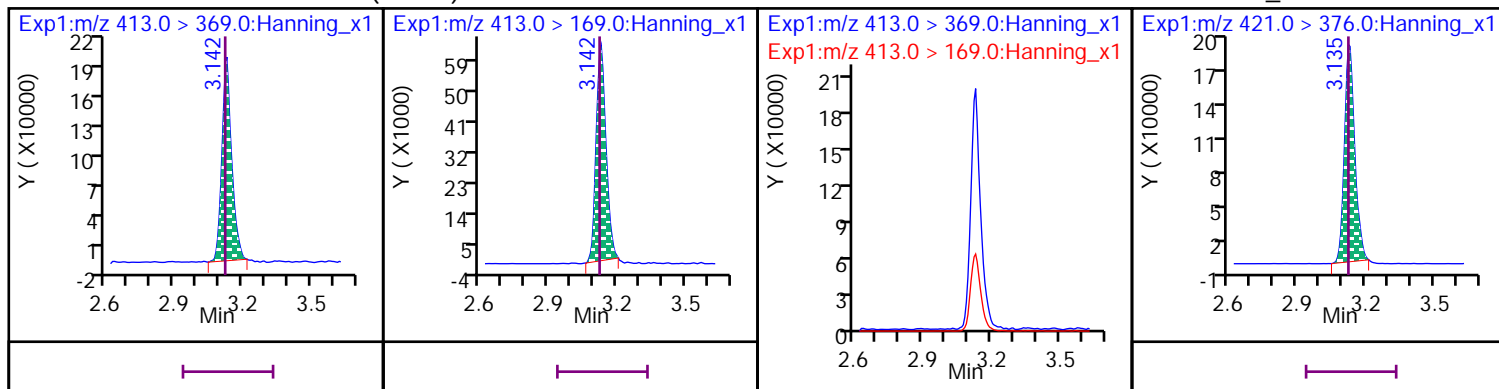
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



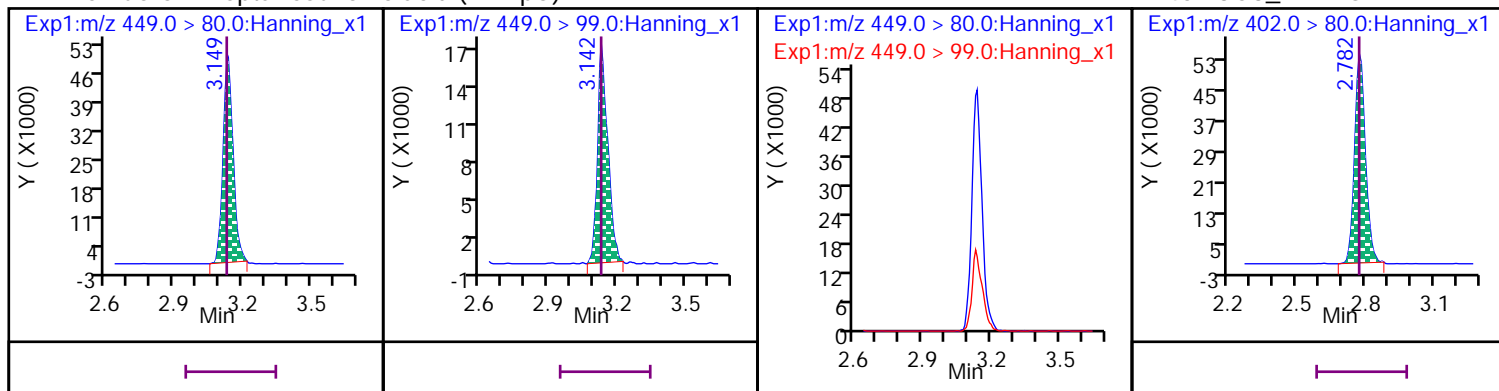
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



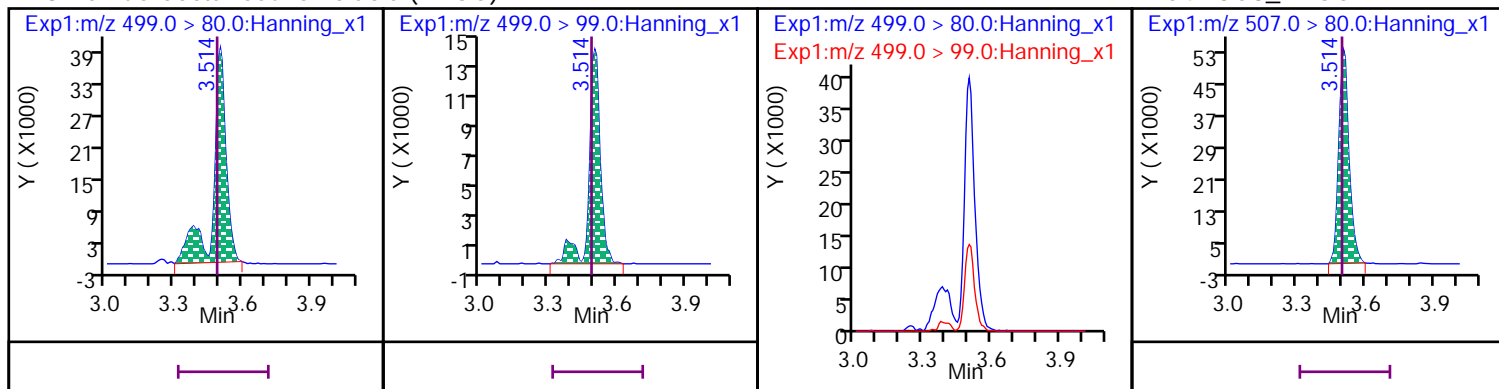
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



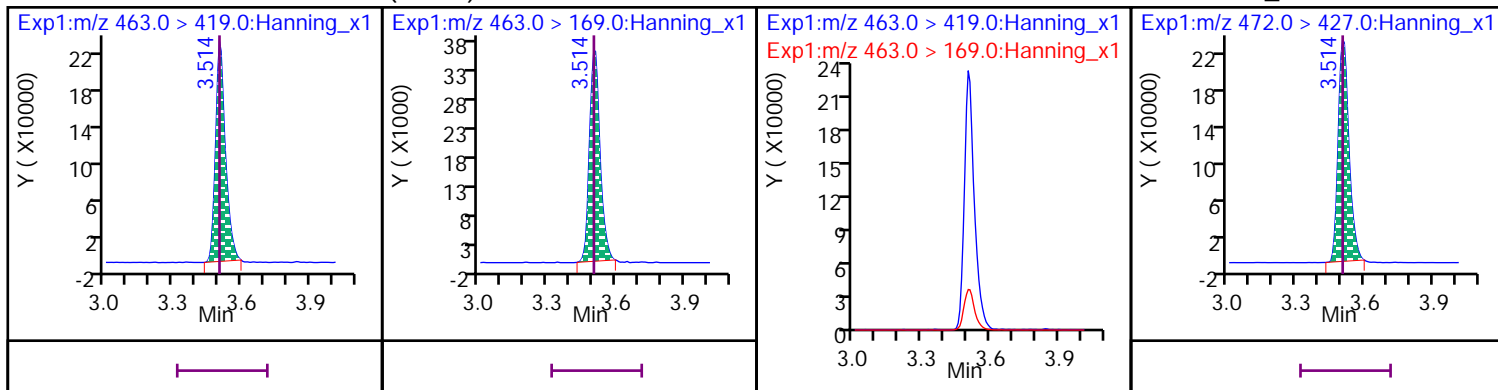
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



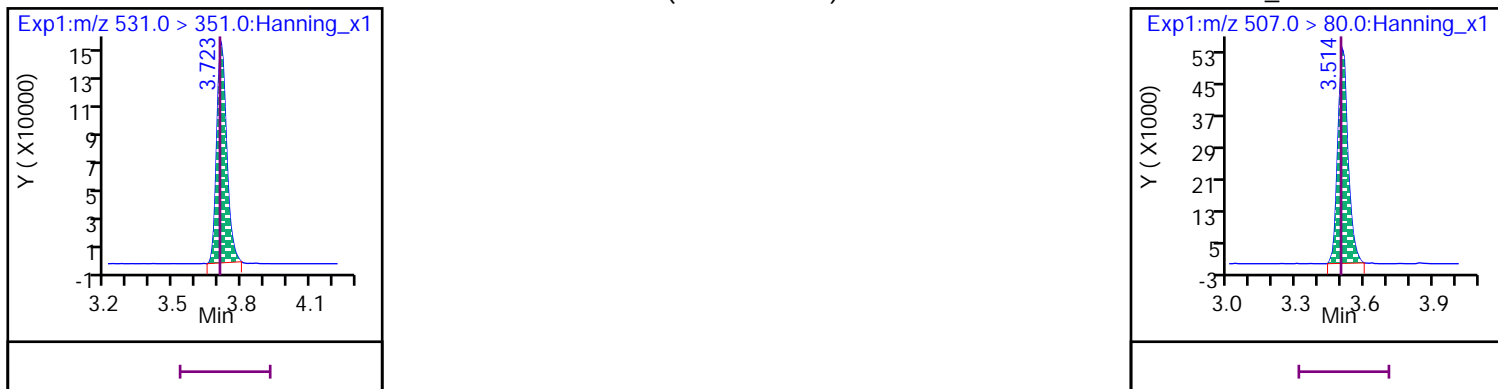
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



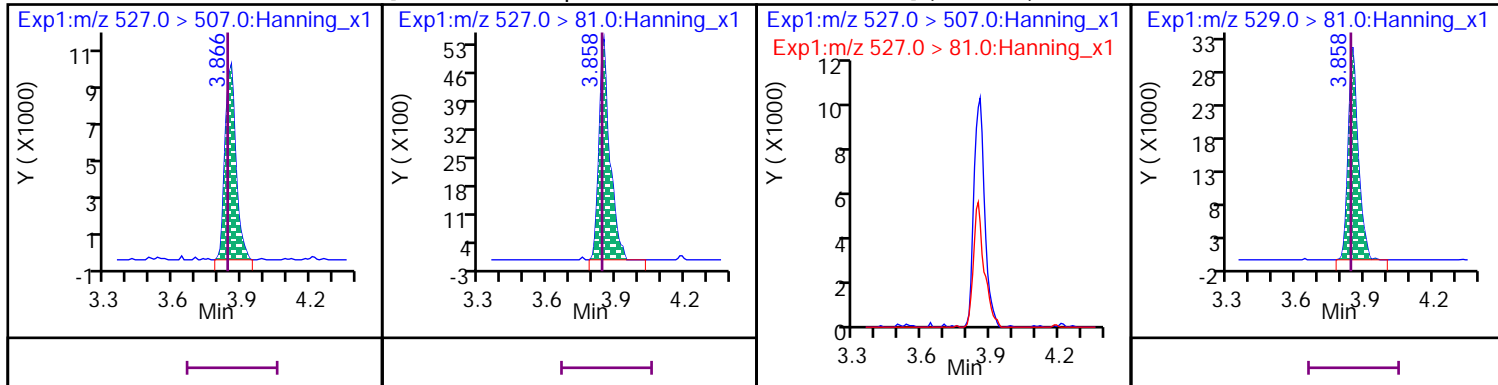
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

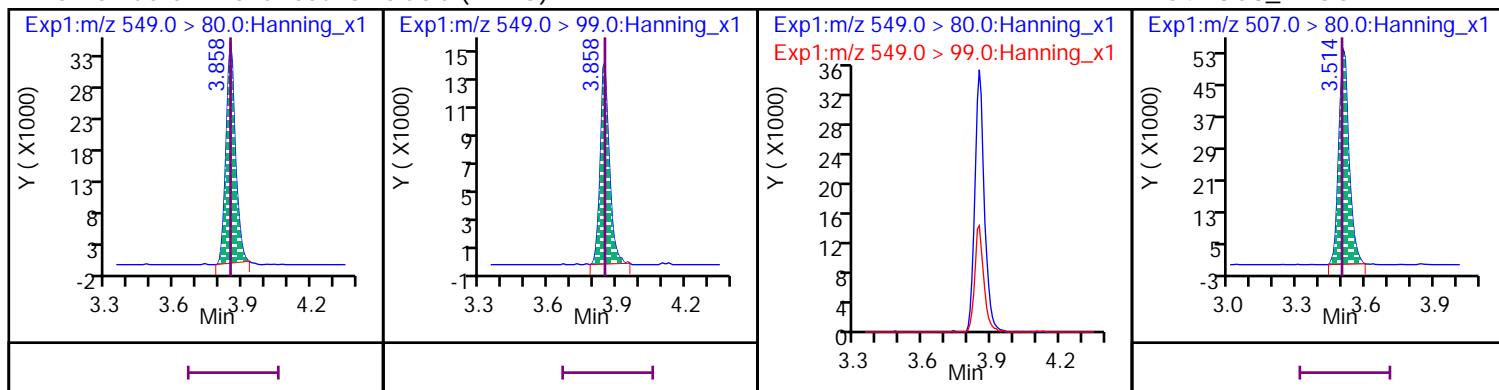
D 65 13C2\_8:2 FTS\_2





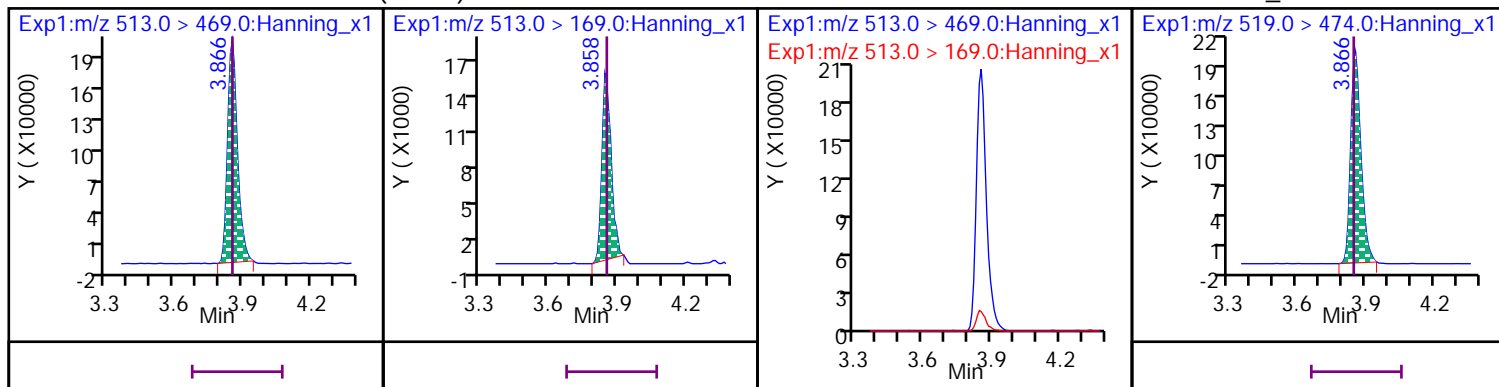
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



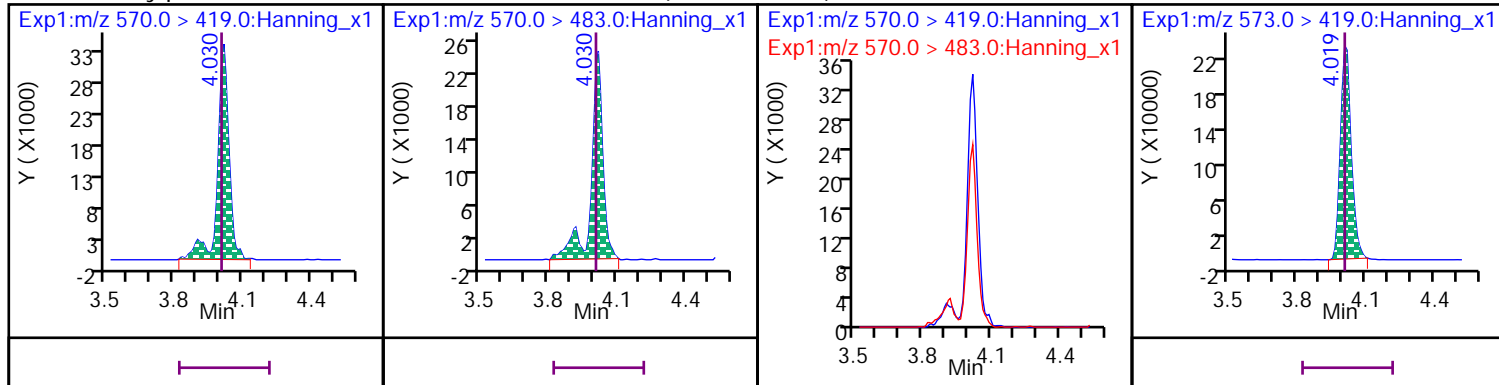
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



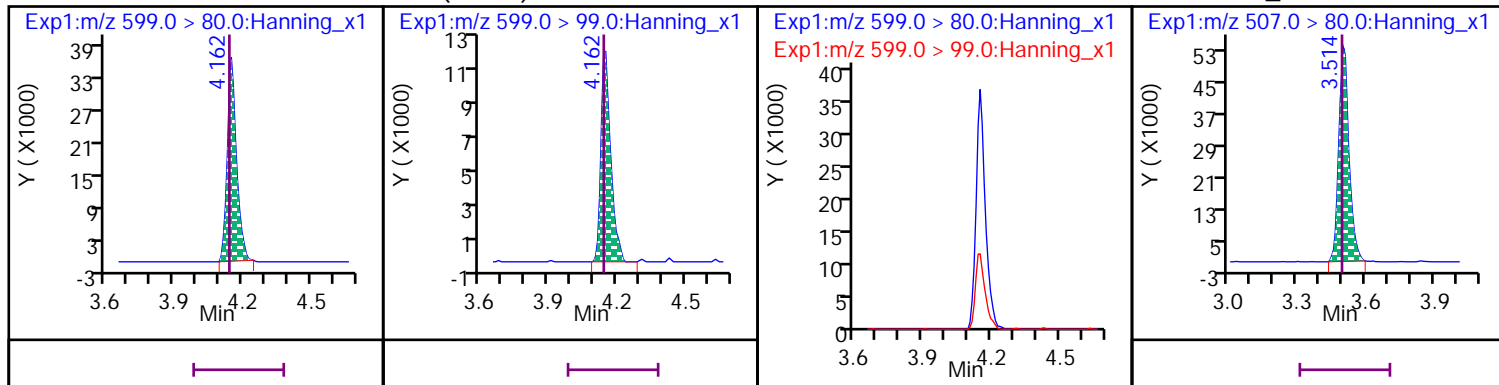
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



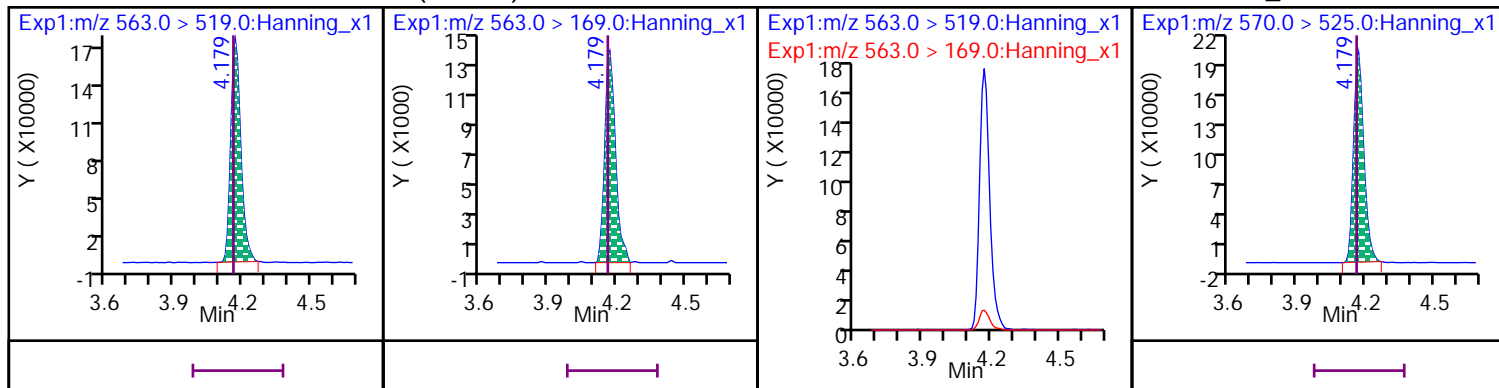
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



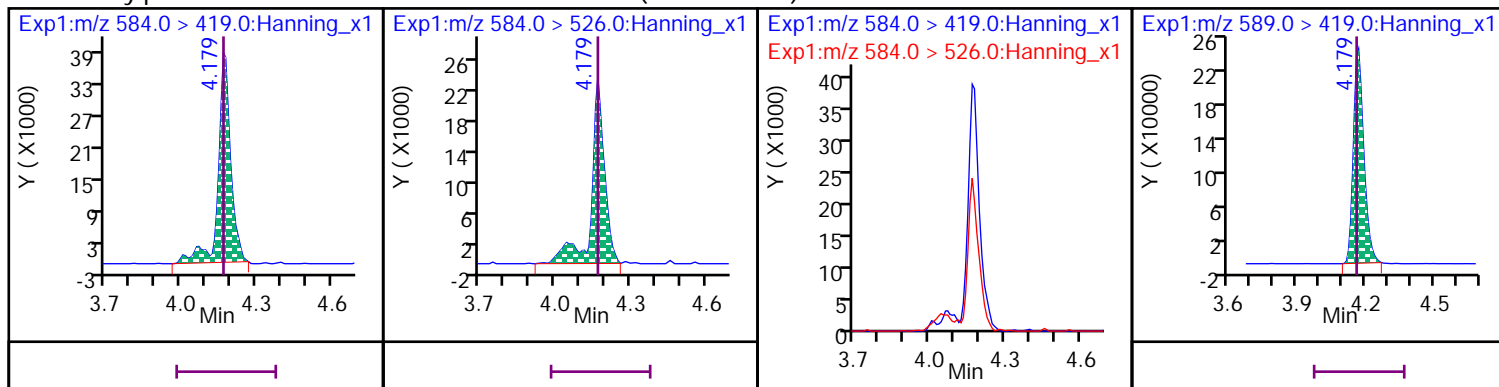
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



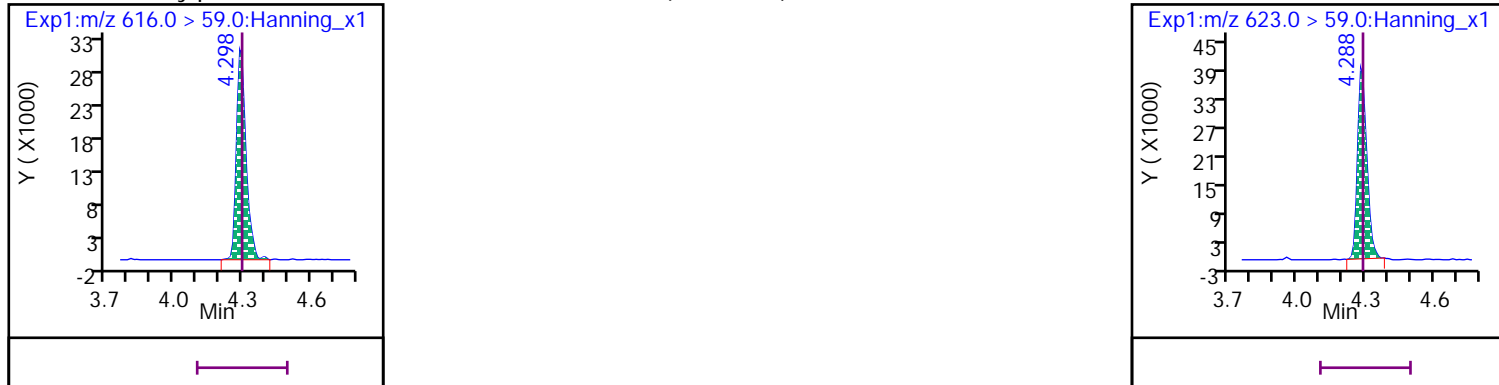
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



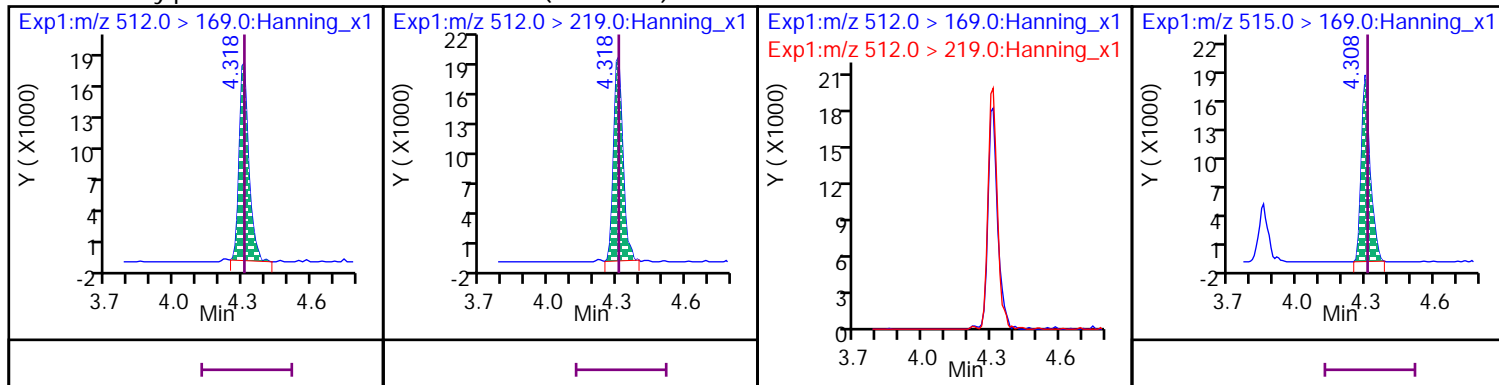
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

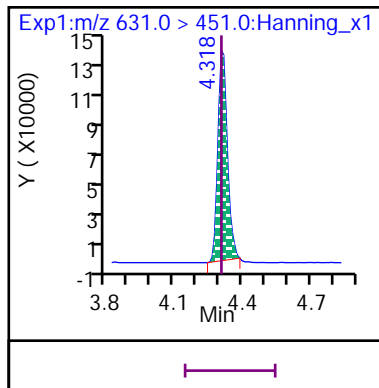


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

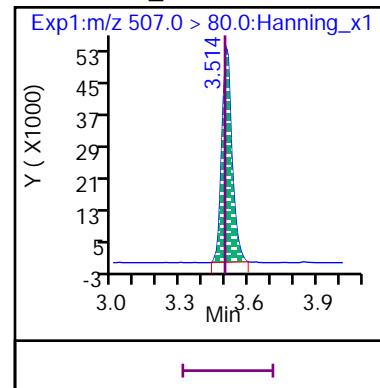
D 57 d3-MeFOSA



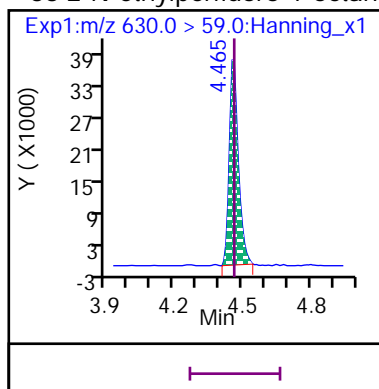
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



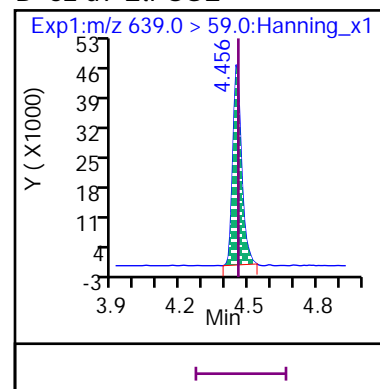
## D 54 13C8\_PFOS



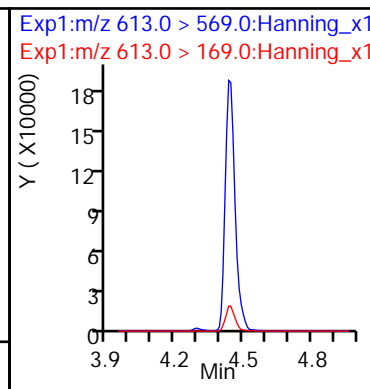
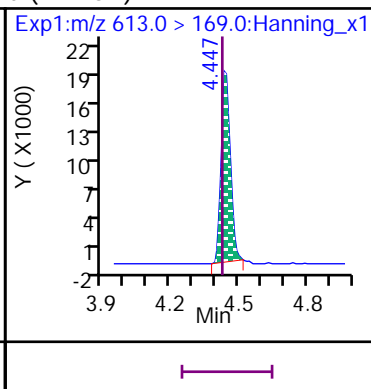
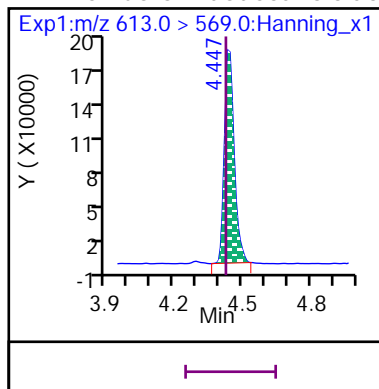
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



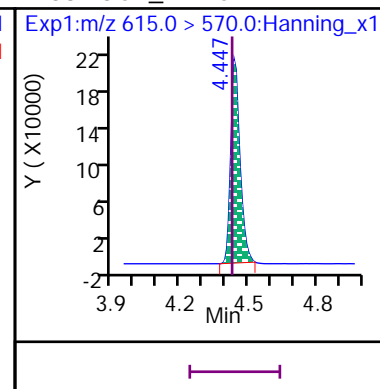
## D 62 d9-EtFOSE



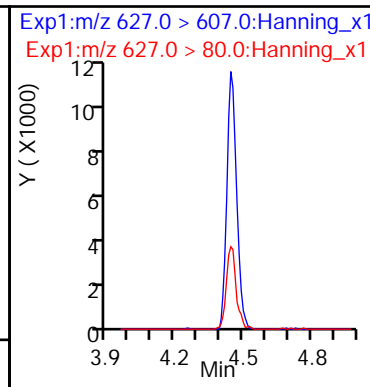
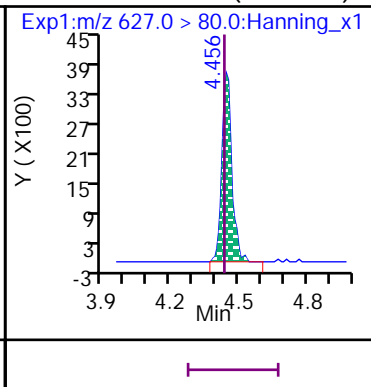
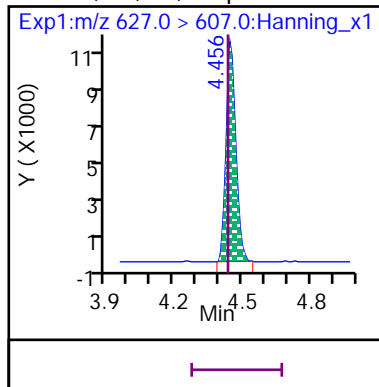
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



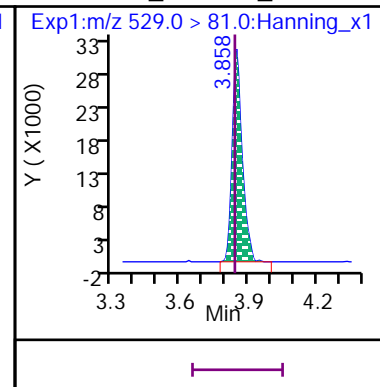
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

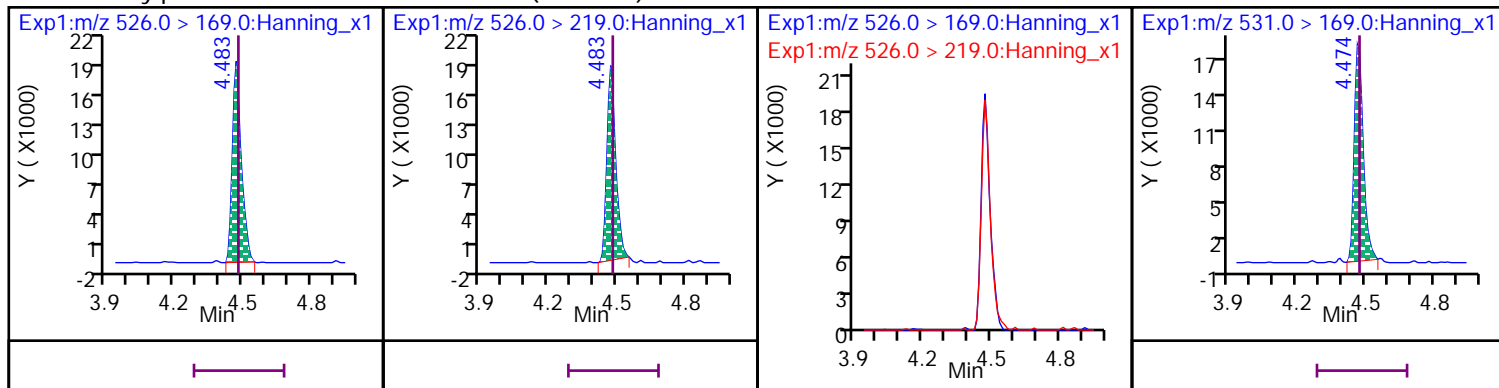


## D 65 13C2\_8:2 FTS\_2



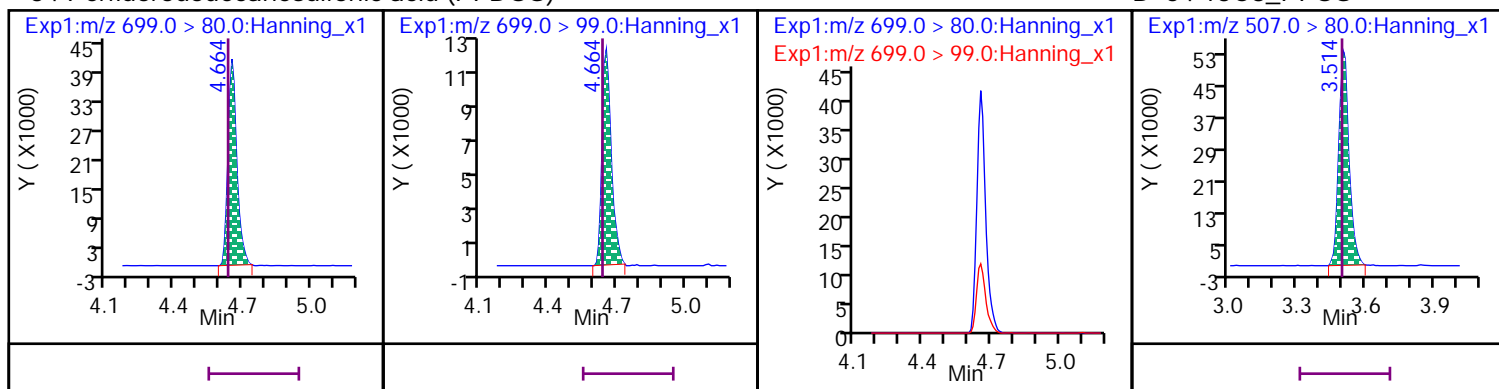
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



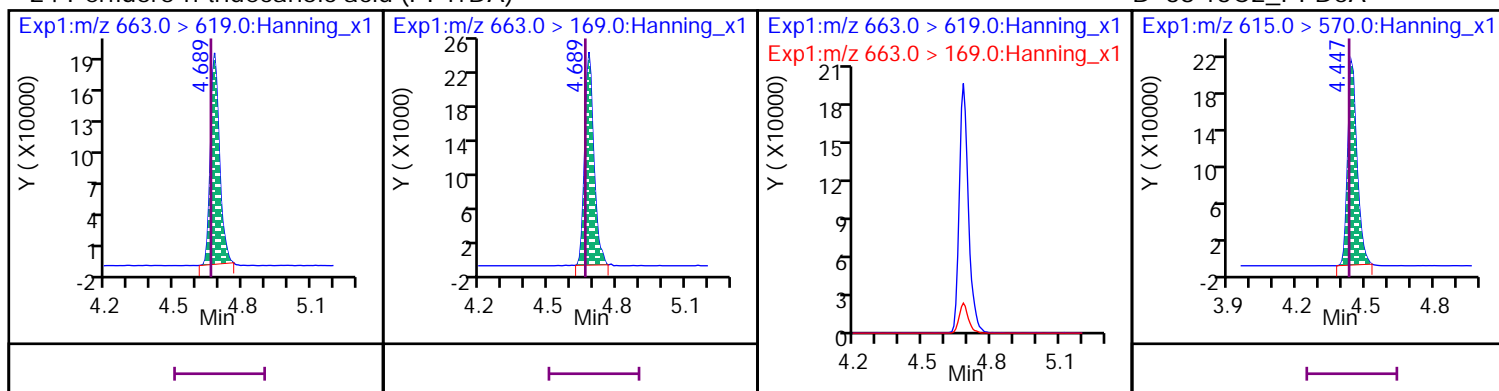
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



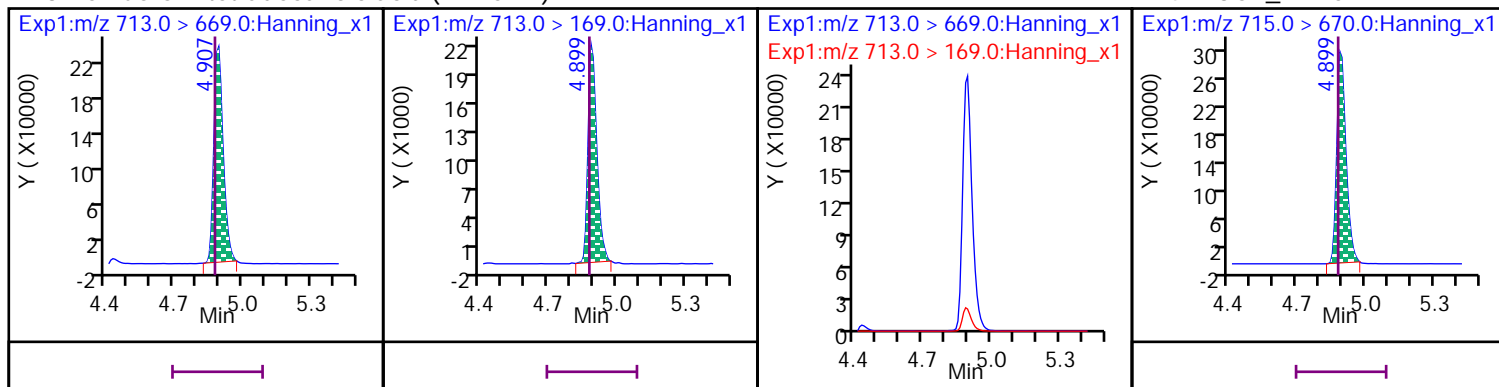
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



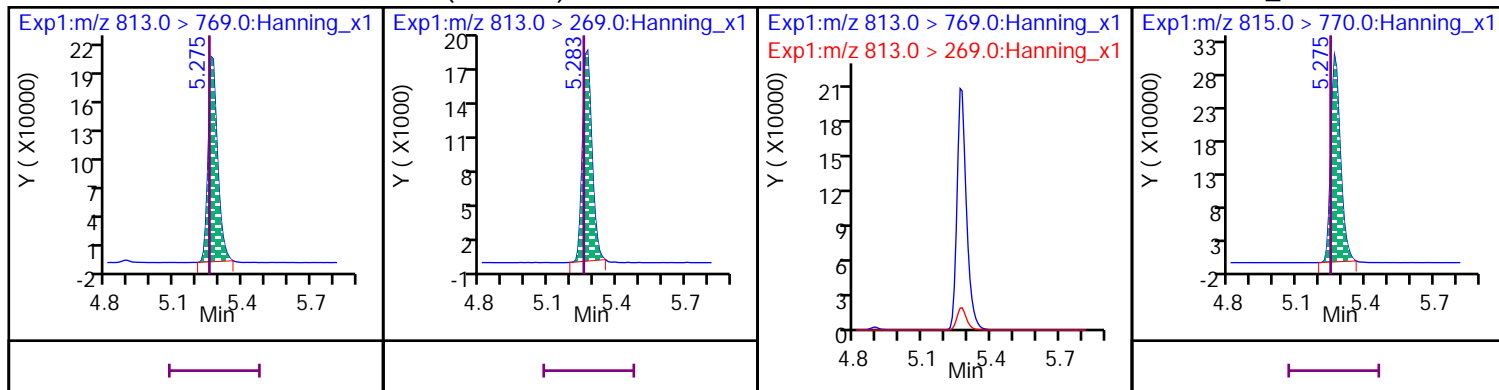
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



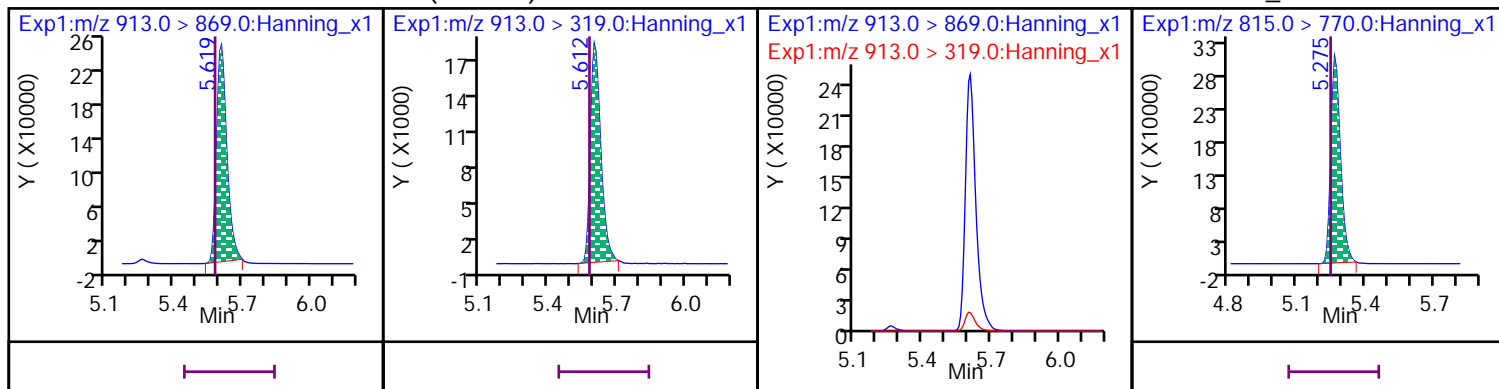
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

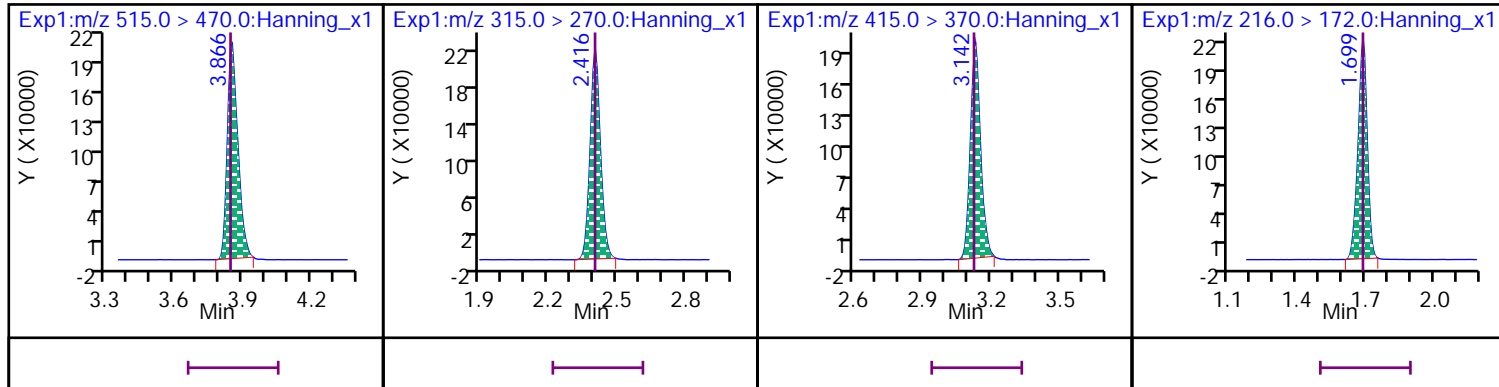


\* 37 13C2\_PFDA

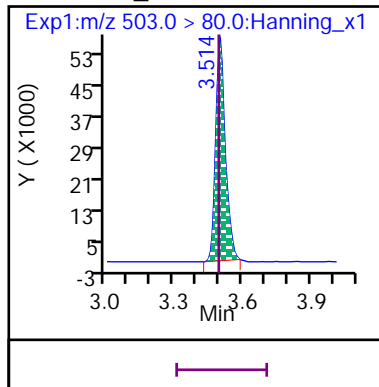
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720042.d  
Injection Date: 27-Dec-2020 16:51:56 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 35  
Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	918.15	91.8	70 - 130
D 46 13C4_PFBA	637910	668252			105	50 - 150
D 50 13C5_PFPeA	658438	681675			104	50 - 150
21 PFPeA			1000.00	919.03	91.9	70 - 130
7 PFBS			884.00	792.59	89.7	70 - 130
D 44 13C3_PFBS	239776	245268			102	50 - 150
1 4:2 FTS			934.00	882.64	94.5	70 - 130
D 63 13C2_4:2 FTS_2	137423	135393			98.5	50 - 150
D 49 13C5_PFHxA	718926	735714			102	50 - 150
15 PFHxA			1000.00	939.03	93.9	70 - 130
22 PFPeS			938.00	869.44	92.7	70 - 130
28 GenX			2000.00	1819.54	91	70 - 130
D 66 13C3_GenX	1323365	1369913			104	50 - 150
D 47 13C4_PFHpA	585778	622885			106	50 - 150
13 PFHpA			1000.00	976.74	97.7	70 - 130
D 45 13C3_PFHxS	178402	180269			101	50 - 150
14 PFHxS			910.00	841.44	92.5	70 - 130
29 ADONA			942.00	834.11	88.5	70 - 130
D 64 13C2_6:2 FTS_2	111803	106975			95.7	50 - 150
2 6:2 FTS			948.00	888.28	93.7	70 - 130
20 PFOA			1000.00	929.71	93	70 - 130
D 53 13C8_PFOA	592205	616348			104	50 - 150
12 PFHpS			952.00	890.57	93.5	70 - 130
18 PFOS			928.00	896.77	96.6	70 - 130
17 PFNA			1000.00	925.95	92.6	70 - 130
D 56 13C9_PFNA	760907	778150			102	50 - 150
D 54 13C8_PFOS	157347	156496			99.5	50 - 150
30 9CI-PF3ONS			932.00	855.29	91.8	70 - 130
D 55 13C8_PFOSA	311979	327423			105	50 - 150
19 PFOSA			1000.00	957.05	95.7	70 - 130
16 PFNS			960.00	944.09	98.3	70 - 130
D 65 13C2_8:2 FTS_2	88356	88965			101	50 - 150
3 8:2 FTS			958.00	1153.76	120	70 - 130
10 PFDA			1000.00	963.17	96.3	70 - 130
D 51 13C6_PFDA	636706	661591			104	50 - 150
D 58 d3-MeFOSAA	725286	736766			102	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1038.61	104	70 - 130
9 PFDS			964.00	920.03	95.4	70 - 130
5 N-EtFOSAA			1000.00	893.15	89.3	70 - 130
25 PFUdA			1000.00	989.17	98.9	70 - 130
D 60 d5-EtFOSAA	690640	728016			105	50 - 150
D 52 13C7_PFUdA	625944	611886			97.8	50 - 150
D 61 d7-MeFOSE	114979	104778			91.1	50 - 150
32 MeFOSE			1000.00	944.64	94.5	70 - 130
26 MeFOSA			1000.00	883.70	88.4	70 - 130
D 57 d3-MeFOSA	47825	53261			111	50 - 150
31 11Cl-PF3OUDS			942.00	860.31	91.3	70 - 130
D 62 d9-EtFOSE	122508	124199			101	50 - 150
33 EtFOSE			1000.00	1019.76	102	70 - 130
D 59 d5-EtFOSA	47562	51905			109	50 - 150
D 38 13C2_PFDoA	571184	613881			107	50 - 150
4 10:2 FTS			964.00	961.90	99.8	70 - 130
27 EtFOSA			1000.00	839.99	84	70 - 130
11 PFDoA			1000.00	953.40	95.3	70 - 130
34 PFDOS			968.00	903.60	93.3	70 - 130
24 PFTrDA			1000.00	954.80	95.5	70 - 130
23 PFTeDA			1000.00	930.81	93.1	70 - 130
D 42 13C2_PFTeDA	828920	849934			103	50 - 150
35 PFHxDA			1000.00	951.26	95.1	70 - 130
D 40 13C2_PFHxDA	865470	942805			109	50 - 150
36 PFODA			1000.00	948.12	94.8	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720042.d  
 Injection Date: 27-Dec-2020 16:51:56 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 35  
 Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.698	1	668252	24	>100:1			1000.00	963.52	105	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.698	1/0	611096	25	>100:1			1000.00	918.15		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	681675	18	>100:1			1000.00	990.97	104	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.077	0/0	629873	18	>100:1			1000.00	919.03		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.130	0	245268	17	>100:1			1000.00	1065.31	102	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	1/1	229203	17	>100:1	Target = 3.50		884.00	792.59		
298.9 > 99	44	2.130	2.130		65980	19	>100:1	3.47 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.451	1/1	184979	20		Target = 3.10		938.00	869.44		
349 > 99	44	2.451	2.451		65448	19	>100:1	2.82 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.371	2.380	0	135393	19	>100:1			5000.00	5592.83	98.5	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.380	1/1	47699	18	>100:1	Target = 1.80		934.00	882.64		
327 > 81	63	2.380	2.380		25952	19	>100:1	1.83 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.415	1	735714	19	>100:1			1000.00	998.16	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.415	1/0	682067	21	>100:1	Target = 18.34		1000.00	939.03		
313 > 119	49	2.416	2.415		34892	19	94:1	19.54 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.522	1	1369913	20	>100:1			5000.00	5143.20	104	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.522	1/0	358168	20	>100:1	Target = 0.81		2000.00	1819.54		
285 > 185	66	2.523	2.522		453493	20	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.764	2.773	0	622885	19	>100:1			1000.00	1026.77	106	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.764	2.773	0/0	631064	20	>100:1	Target = 3.70		1000.00	976.74		
363 > 169	47	2.773	2.773		157666	20	>100:1	4.00 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	1	180269	21	>100:1			1000.00	1052.80	101	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.782	2.782	1/0	160830	27	>100:1	Target = 3.21	0.14	910.00	841.44		
399 > 99	45	2.782	2.782		50269	28	>100:1	3.19 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.809	1/0	954635	21	>100:1	Target = 2.97		942.00	834.11		
377 > 85	45	2.800	2.809		328870	20	>100:1	2.90 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.142	3.142	1/0	145841	23	>100:1	Target = 3.08		952.00	890.57		
449 > 99	45	3.149	3.142		49870	30	>100:1	2.92 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	106975	25	>100:1			5000.00	5554.72	95.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.115	1/0	39469	25	>100:1	Target = 1.80		948.00	888.28		
427 > 81	64	3.122	3.115		21531	26	>100:1	1.83 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	1	616348	23	>100:1			1000.00	1041.37	104	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.135	3.135	1/0	584168	24	>100:1	Target = 2.87		1000.00	929.71		
413 > 169	53	3.135	3.135		199551	26	>100:1	2.92 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	156496	20	>100:1			1000.00	1043.80	99.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.500	1/1	166302	43	>100:1	Target = 3.84	0.26	928.00	896.77		
499 > 99	54	3.514	3.500		47281	44	>100:1	3.51 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.716	1/1	450601	23	>100:1			932.00	855.29		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.858	0/0	113065	22		Target = 3.07		960.00	944.09		
549 > 99	54	3.858	3.858		38503	19	>100:1	2.93 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.153	1/1	104492	18		Target = 3.03		964.00	920.03		
599 > 99	54	4.162	4.153		38097	18		2.74 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.318	0/0	382357	19	>100:1			942.00	860.31		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.648	1/1	113528	19		Target = 3.33		968.00	903.60		
699 > 99	54	4.664	4.648		36303	20		3.12 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.514	3.515	0	778150	23	>100:1			1000.00	1036.20	102	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.514	3.515	0/0	720549	22	>100:1	Target = 6.16		1000.00	925.95		
463 > 169	56	3.514	3.515		115928	22	>100:1	6.21 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.842	3.850	0	327423	22	>100:1			1000.00	1057.69	105	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.842	3.858	0/0	308801	21	>100:1			1000.00	957.05		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.850	1	88965	22	>100:1			5000.00	4795.92	101	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.858	3.850	1/0	41167	23	>100:1	Target = 1.95		958.00	1153.76		
527 > 81	65	3.858	3.850		20873	21	>100:1	1.97 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.447	1/0	39551	19		Target = 3.14		964.00	961.90		
627 > 80	65	4.456	4.447		12221	20		3.23 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.866	3.858	1	661591	21	>100:1			1000.00	997.38	104	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.866	0/1	626135	21	>100:1	Target = 15.94		1000.00	963.17		
513 > 169	51	3.866	3.866		48931	27	>100:1	12.79 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	0	736766	20	>100:1			5000.00	5132.85	102	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.029	4.019	1/1	117560	37	>100:1	Target = 1.33	0.08	1000.00	1038.61		M
570 > 483	58	4.029	4.019		83365	34	>100:1	1.41 (0.66-1.99)	0.17				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.170	4.171	0	728016	19	>100:1			5000.00	5481.44	105	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.179	4.180	0/0	129471	34	>100:1	Target = 1.58	0.09	1000.00	893.15		
584 > 526	60	4.179	4.180		83749	33	>100:1	1.54 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.170	4.171	0	611886	19	>100:1			1000.00	968.06	97.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.171	1/1	568866	18	>100:1	Target = 15.50		1000.00	989.17		
563 > 169	52	4.179	4.171		36514	17	>100:1	15.57 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.298	0	104778	17	>100:1			1000.00	968.30	91.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.308	0/0	92999	16	>100:1			1000.00	944.64		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.318	0	53261	16	78:1			1000.00	1006.50	111	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.318	0/0	53101	18		Target = 1.12		1000.00	883.70		
512 > 219	57	4.308	4.318		56981	17	>100:1	0.93 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	124199	18	>100:1			1000.00	990.46	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.474	0/0	112681	16	>100:1			1000.00	1019.76		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.438	2	613881	18	>100:1			1000.00	1014.15	107	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.438	2/0	592690	20	>100:1	Target = 10.85		1000.00	953.40		
613 > 169	38	4.456	4.438		57521	19	>100:1	10.30 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.673	1/-1	577303	21	>100:1	Target = 8.37		1000.00	954.80		
663 > 169	38	4.689	4.673		71946	19	>100:1	8.02 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.483	0	51905	17	>100:1			1000.00	1057.25	109	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.492	0/0	47633	18	>100:1	Target = 1.03		1000.00	839.99		
526 > 219	59	4.483	4.492		52843	18	>100:1	0.90 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.890	1	849934	18	>100:1			1000.00	1008.89	103	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.890	1/0	685470	21	93:1	Target = 12.11		1000.00	930.81		
713 > 169	42	4.907	4.890		57023	17	>100:1	12.02 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.258	2	942805	19	>100:1			1000.00	1040.43	109	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.266	2/0	585996	21	>100:1	Target = 11.48		1000.00	951.26		
813 > 269	40	5.283	5.266		51242	19	>100:1	11.43 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.626	5.591	3/1	791289	24	87:1	Target = 13.88		1000.00	948.12		
913 > 319	40	5.619	5.591		55795	23	>100:1	14.18 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.858	1	683594	22	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	719761	20	>100:1					99.8	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	1	588869	25	>100:1					97.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	619473	23	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.514	3.507	1	170047	26	>100:1					104	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720042.d

Injection Date: 27-Dec-2020 16:51:56

Inst. ID: LCMSMS02

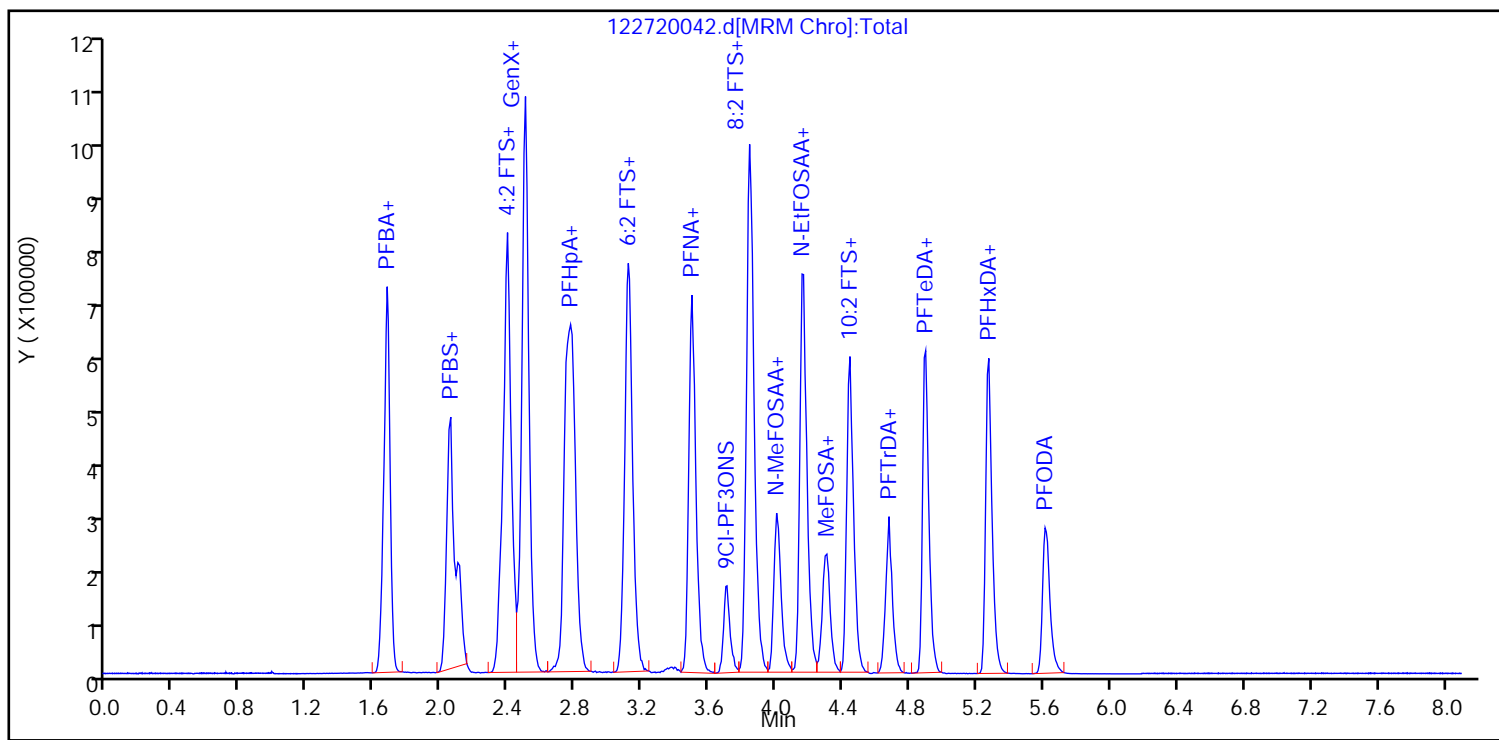
Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

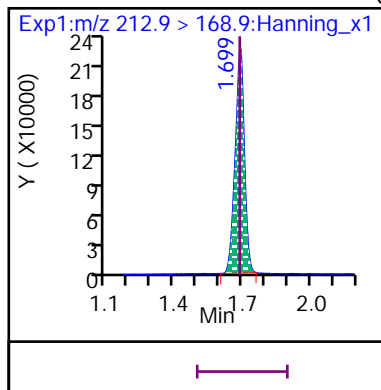
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Dil. Factor: 1

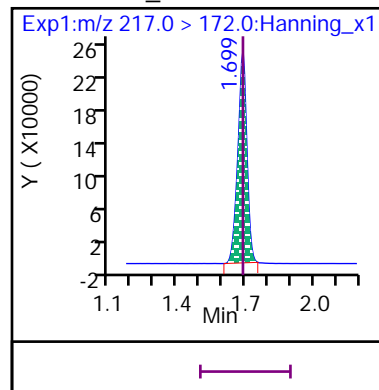
Operator: Matthew M. Miller



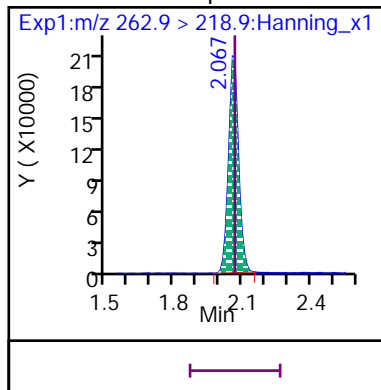
8 Perfluoro-n-butanoic acid (PFBA)



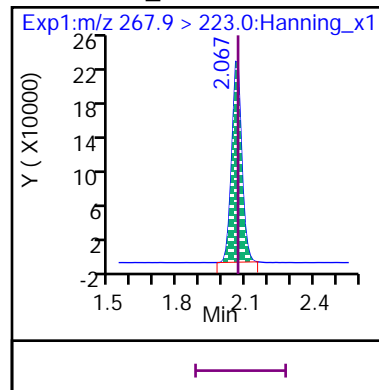
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

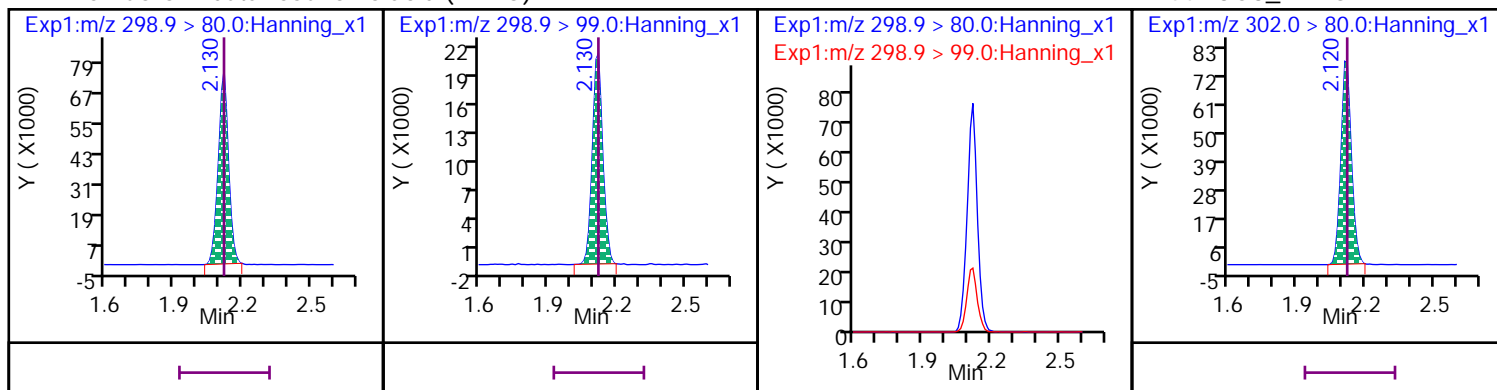


D 50 13C5\_PFPeA



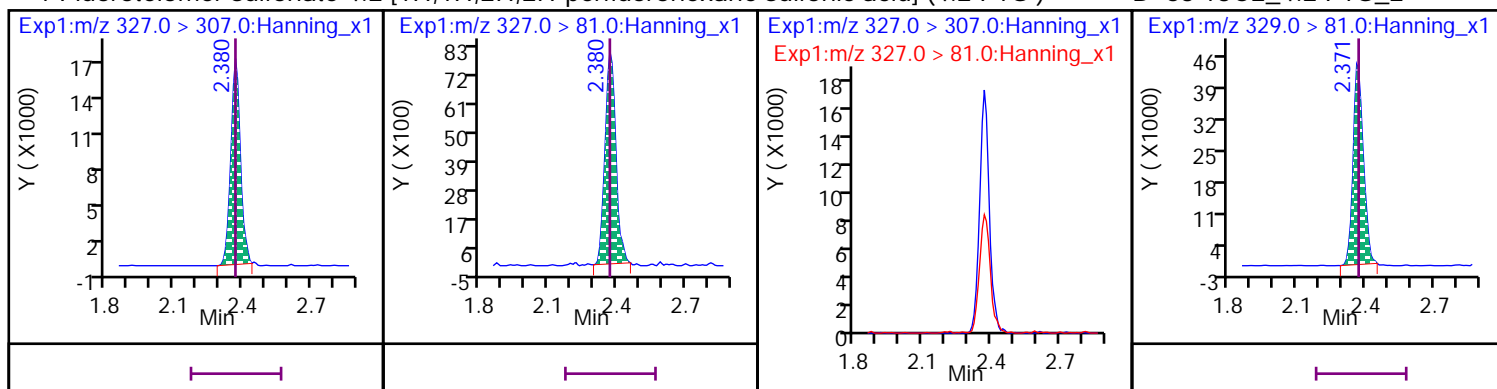
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



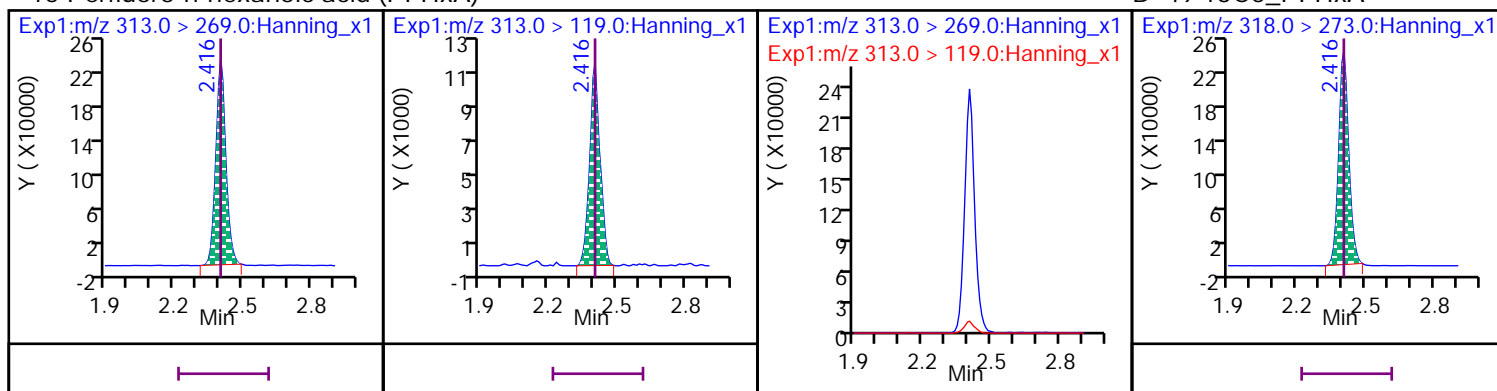
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



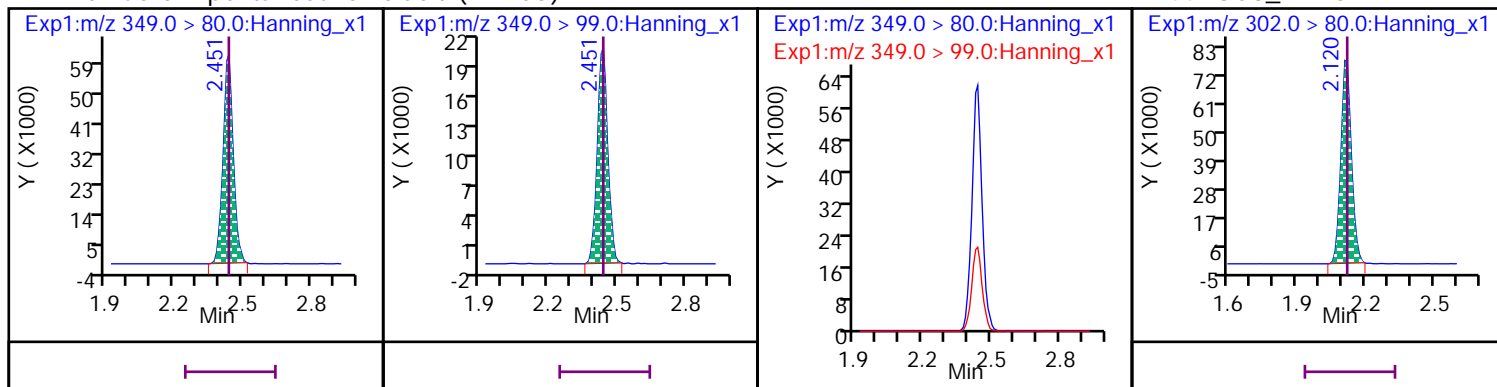
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



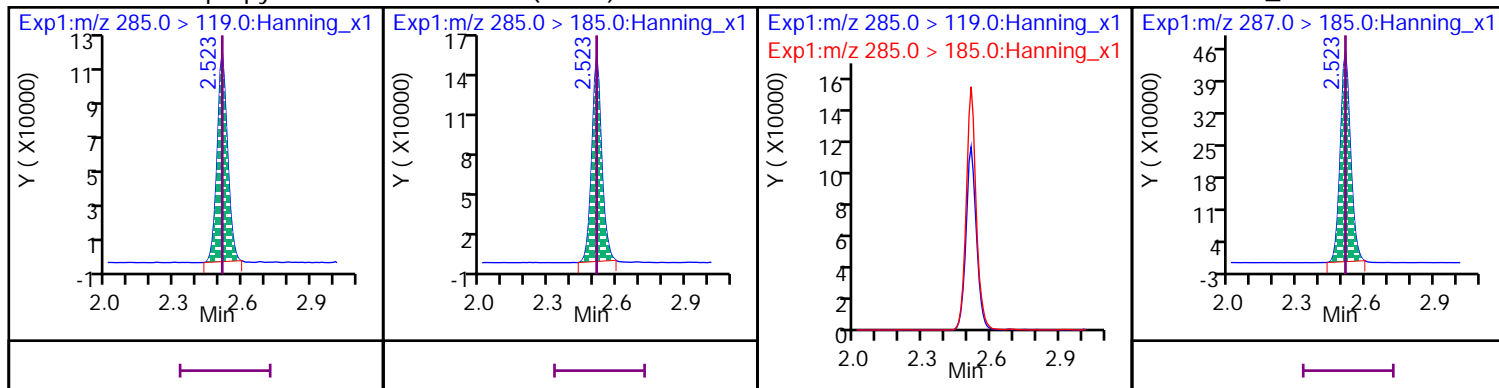
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



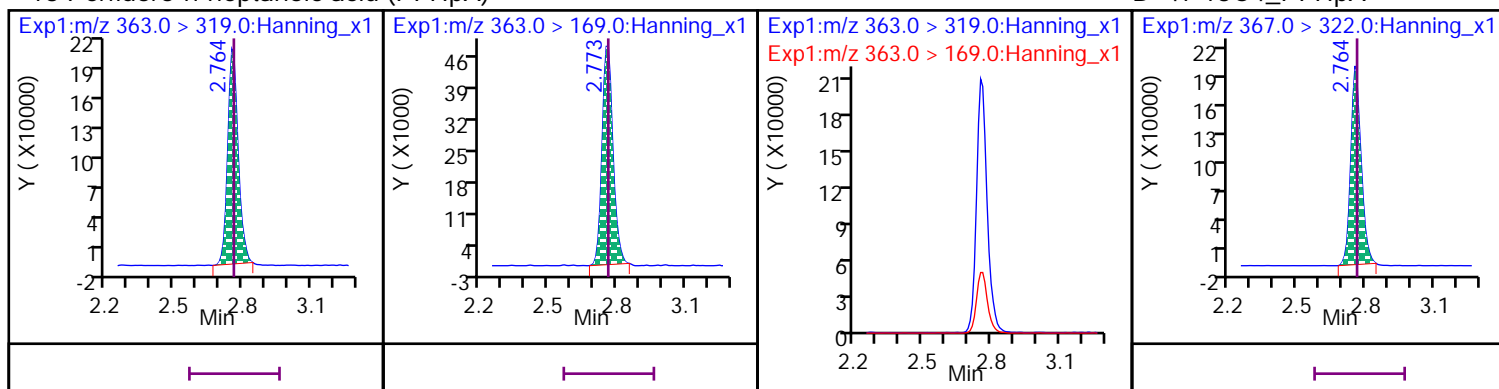
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



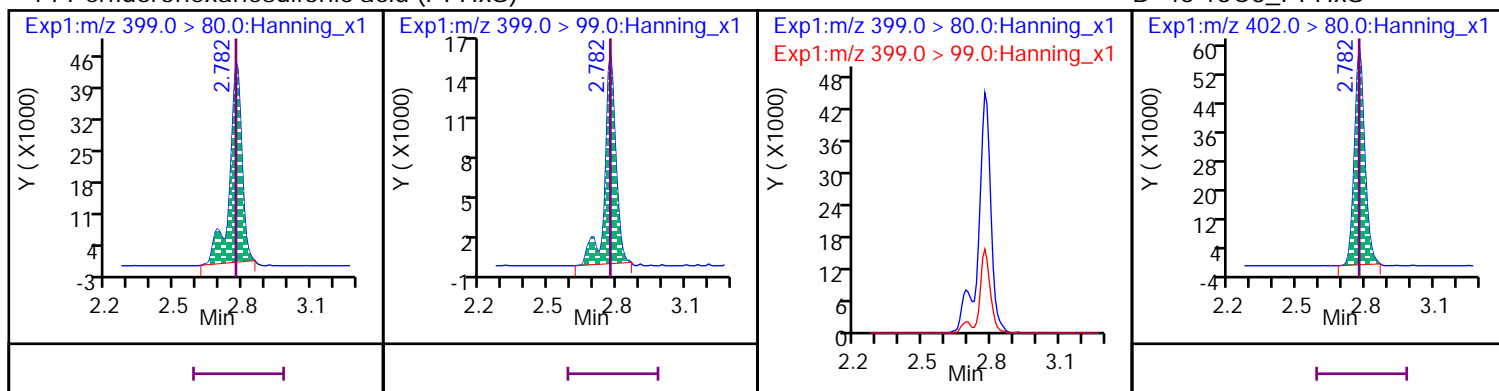
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



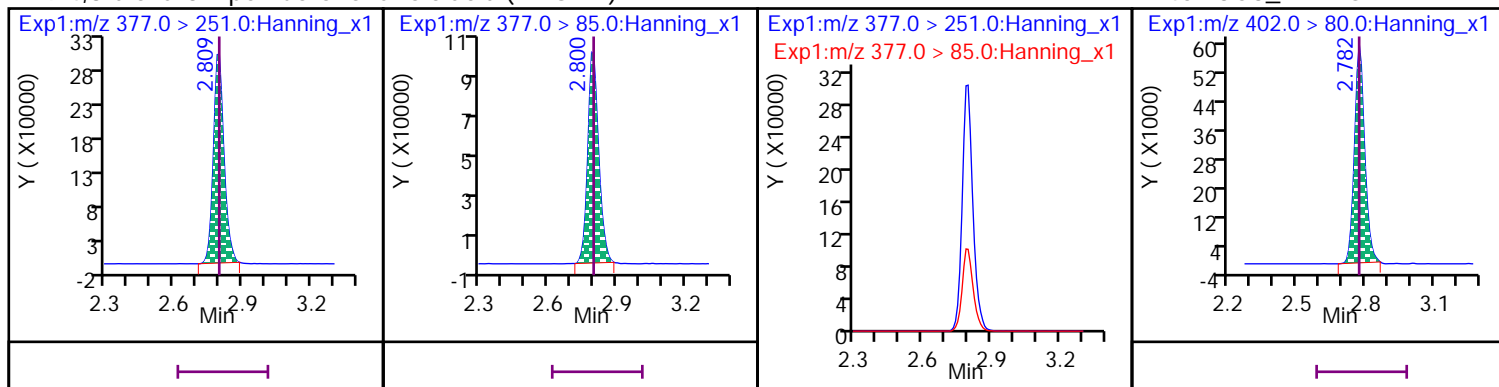
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



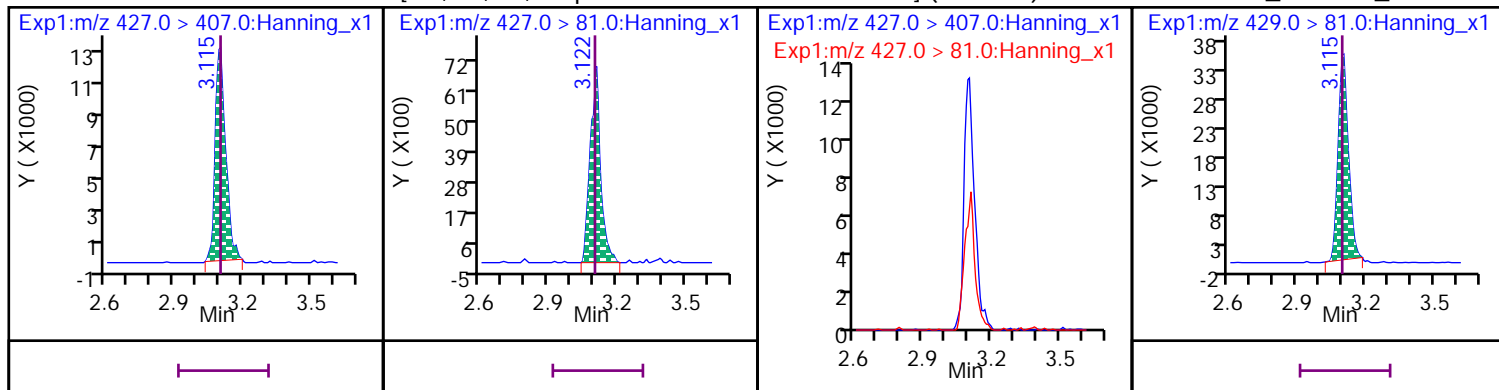
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



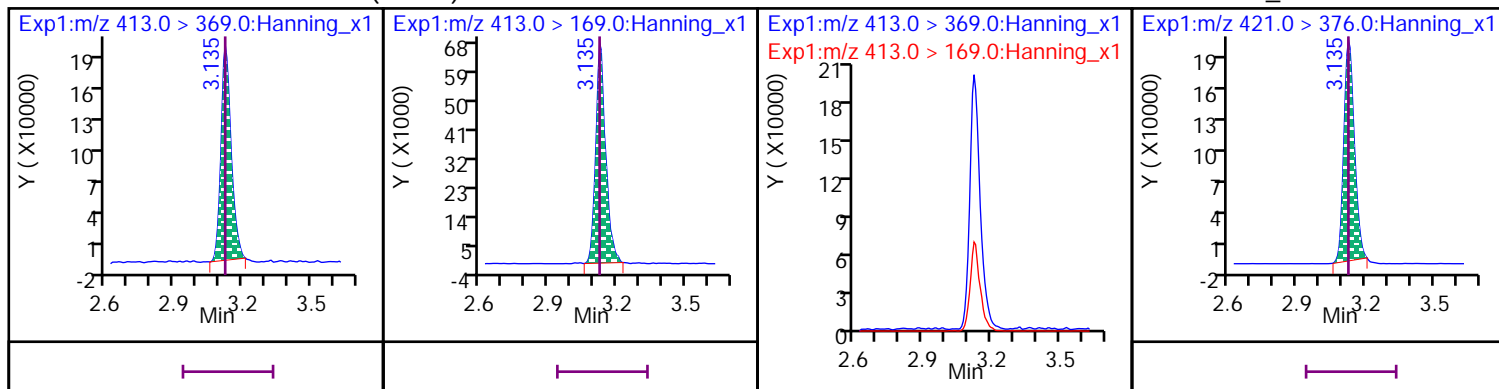
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



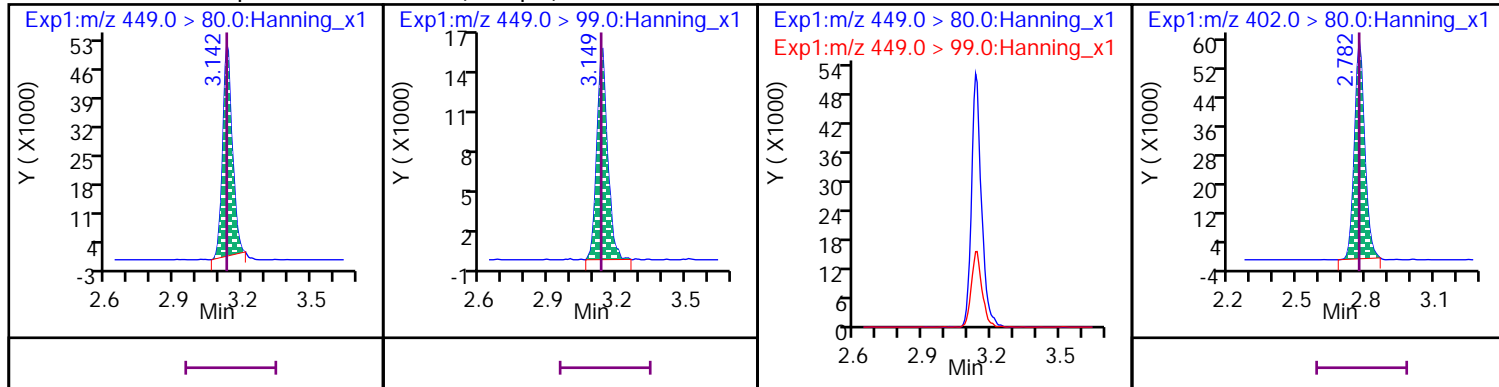
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



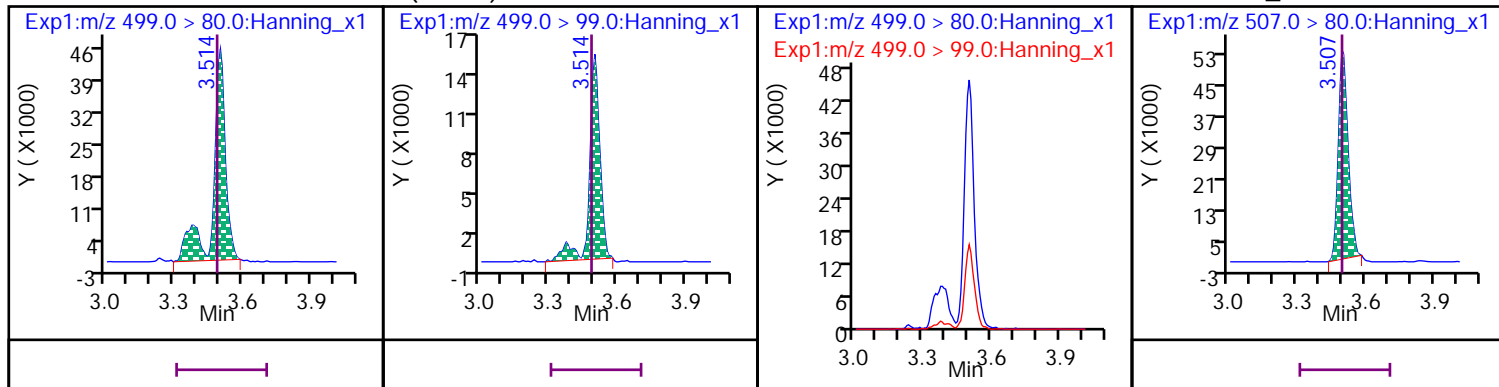
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



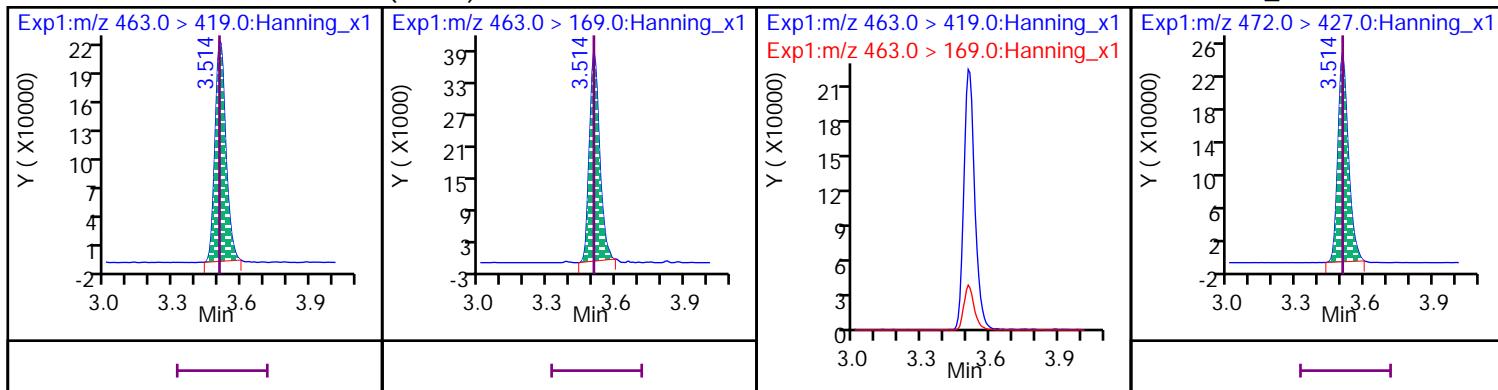
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



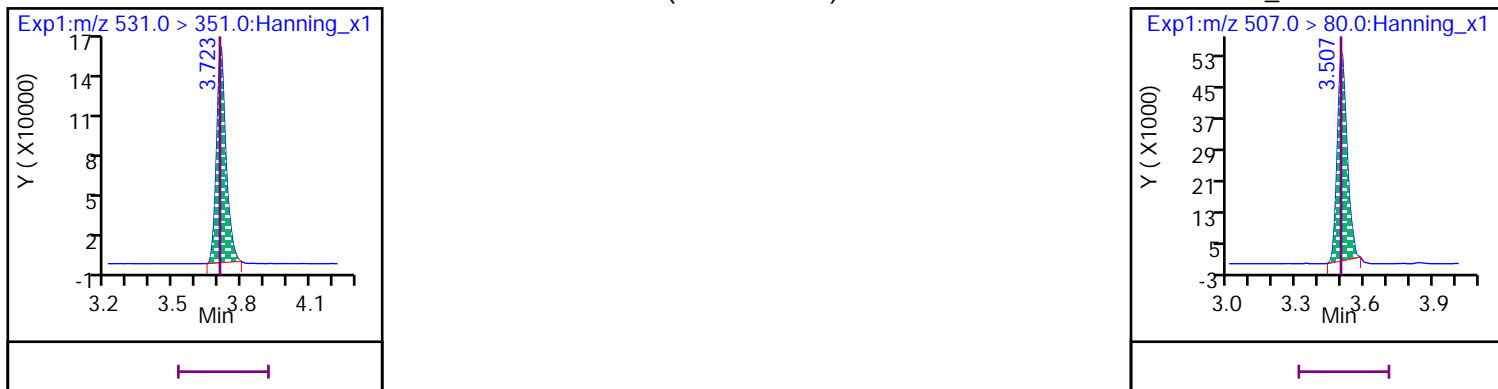
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



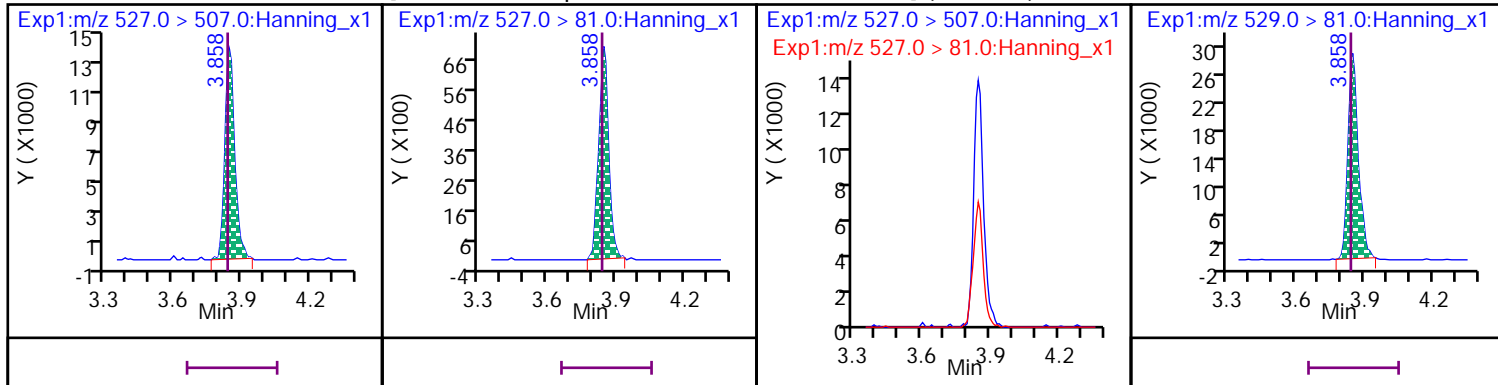
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

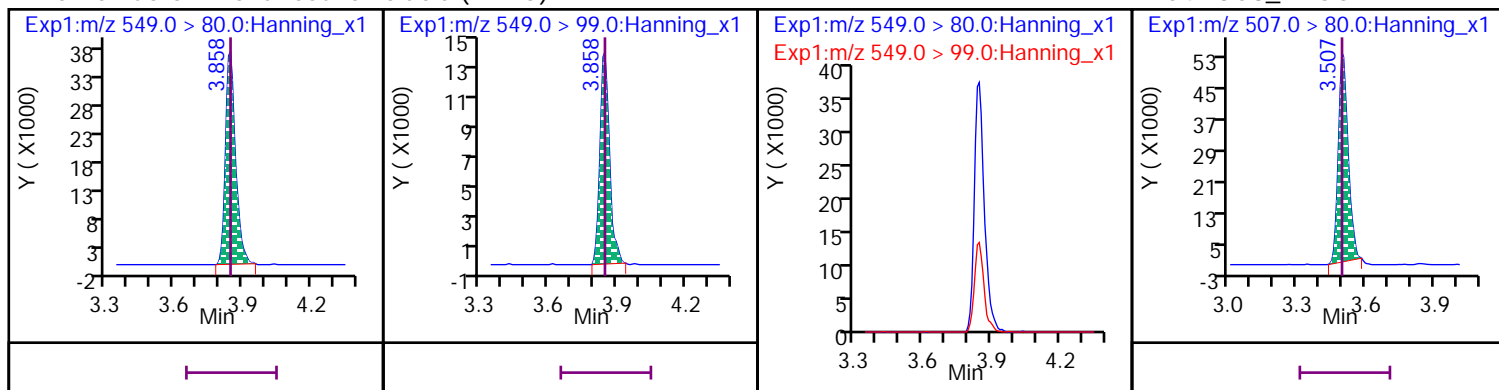
D 65 13C2\_8:2 FTS\_2





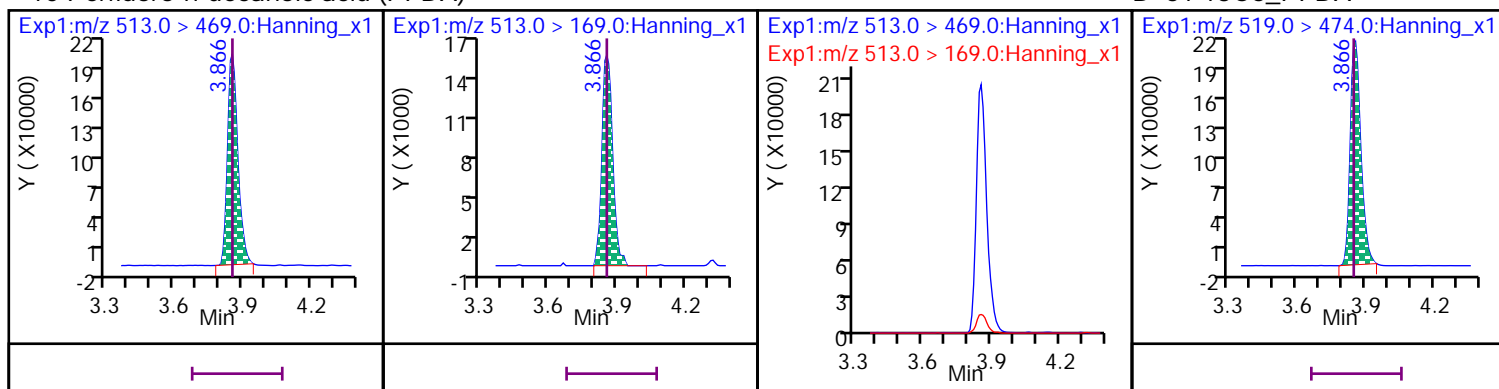
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



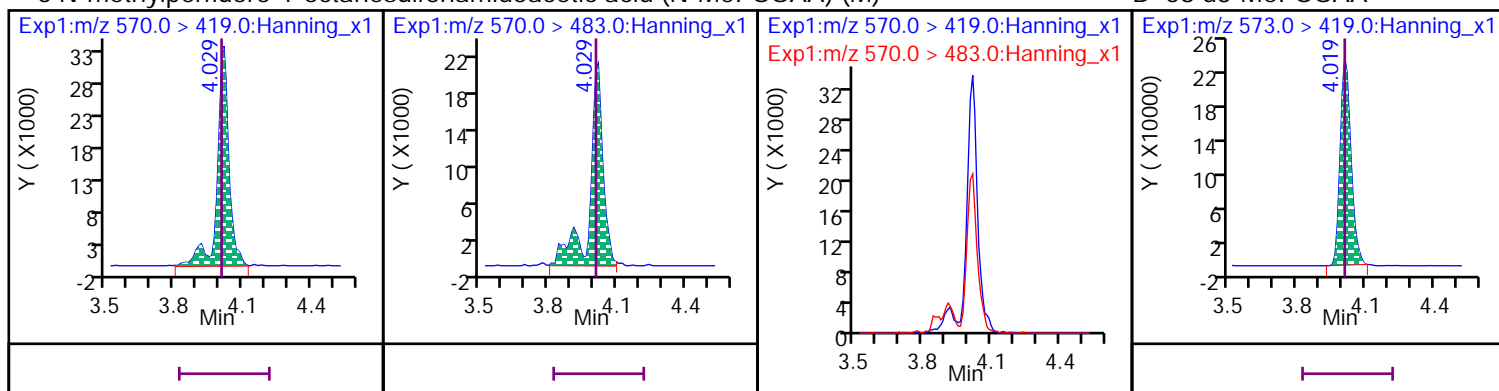
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



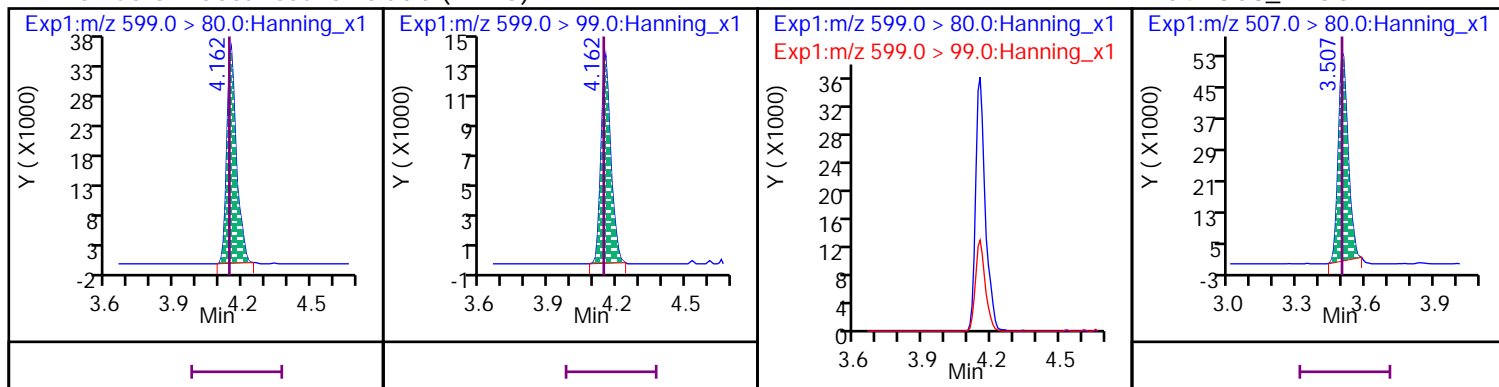
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



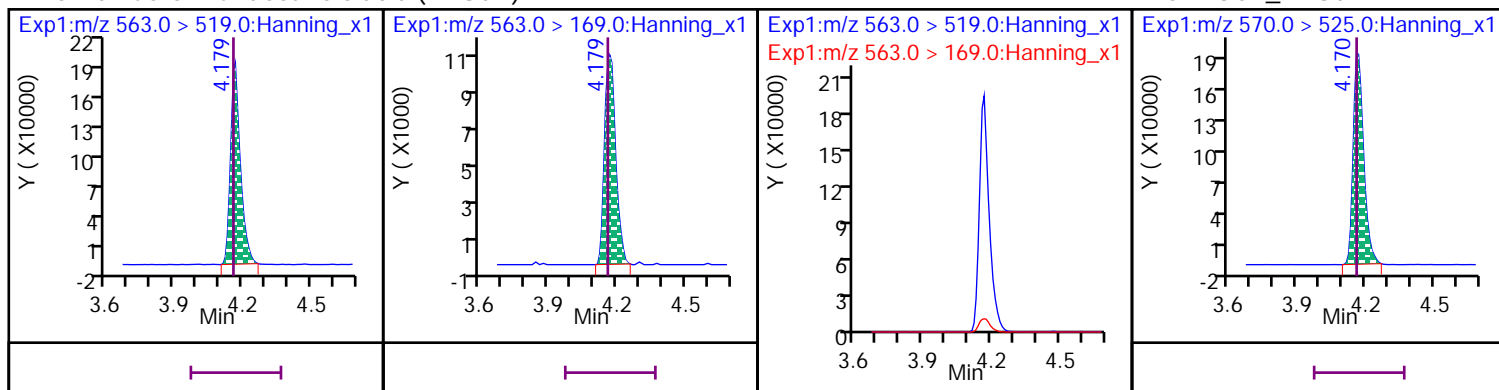
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



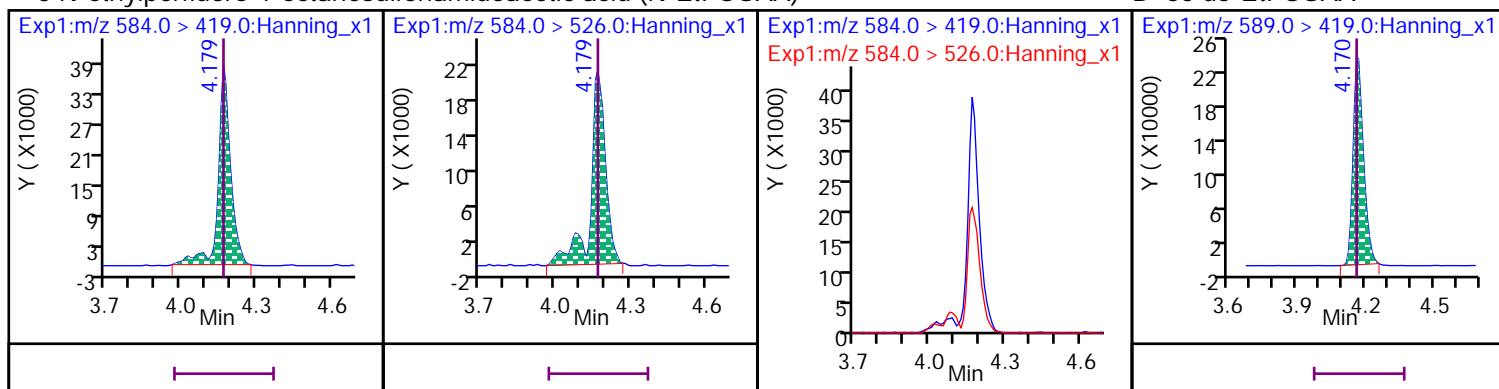
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



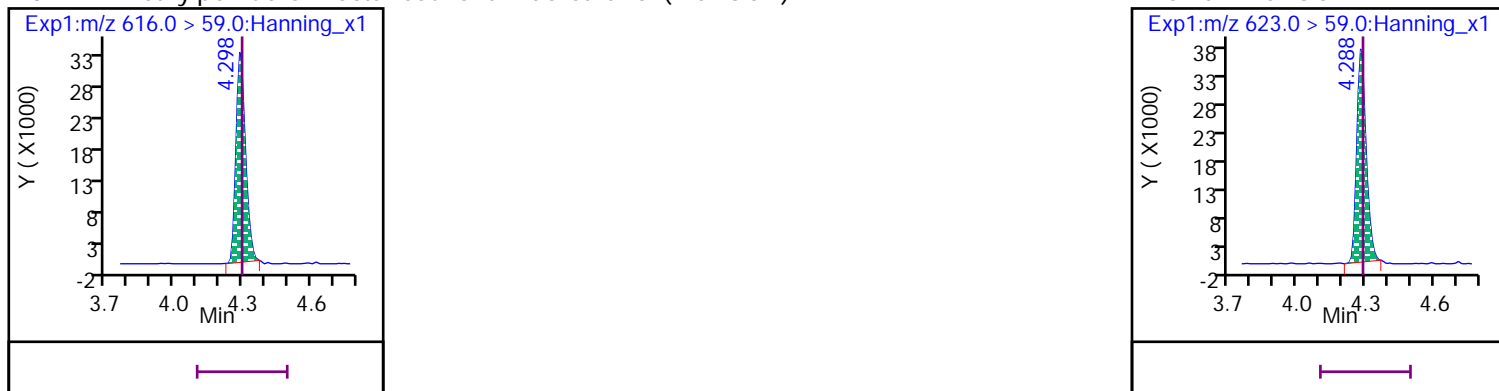
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



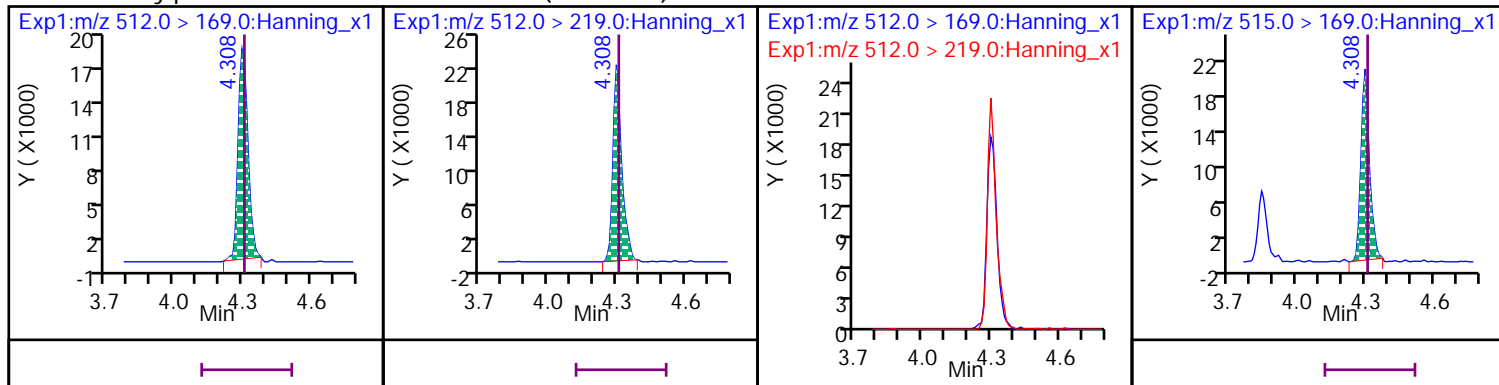
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

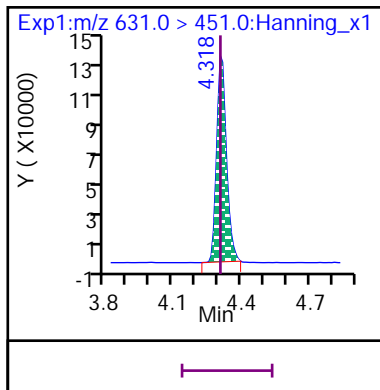


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

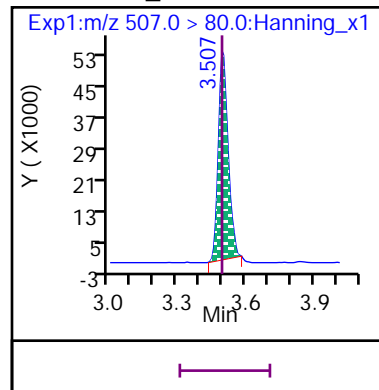
D 57 d3-MeFOSA



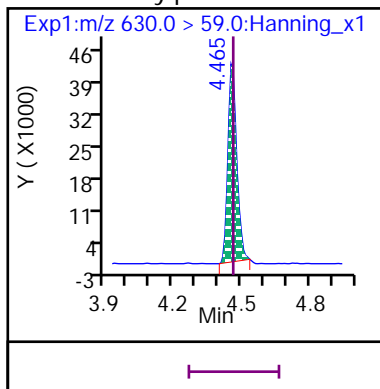
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



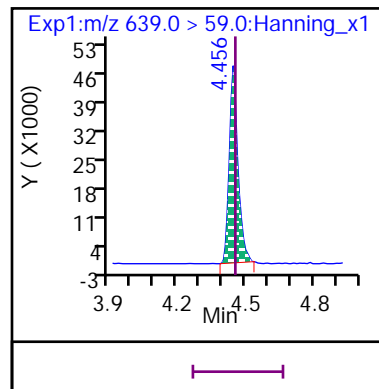
D 54 13C8\_PFOS



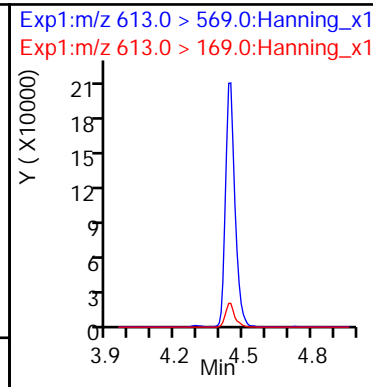
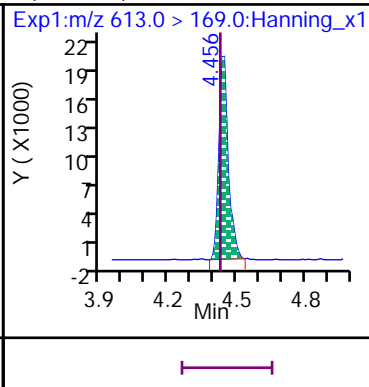
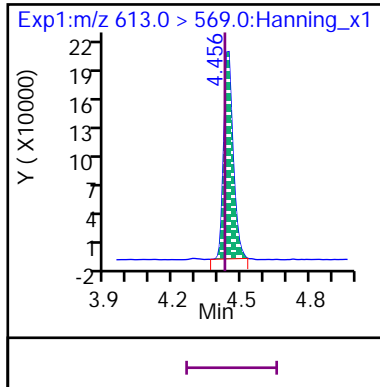
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



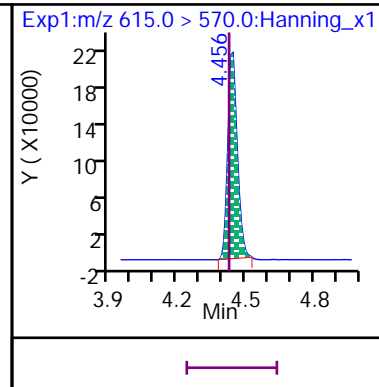
D 62 d9-EtFOSE



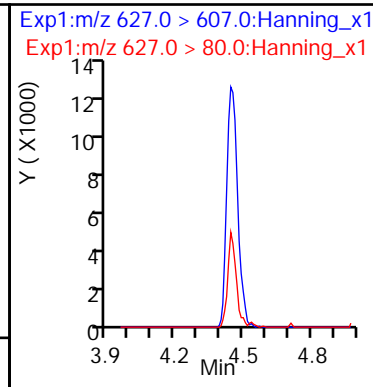
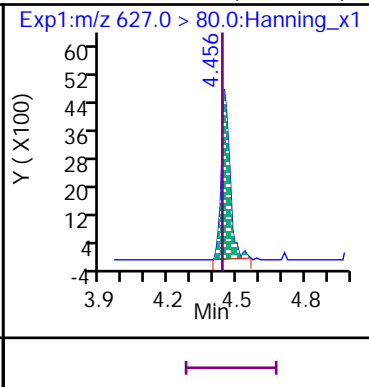
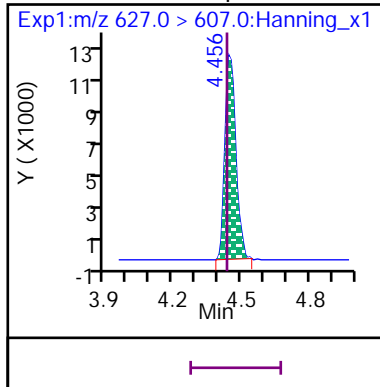
11 Perfluoro-n-dodecanoic acid (PFDoA)



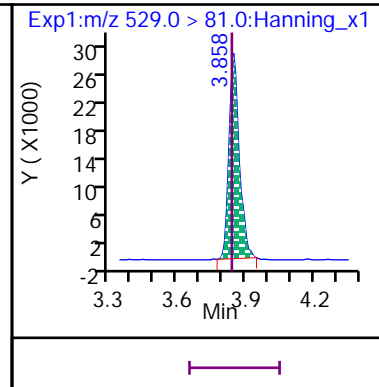
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

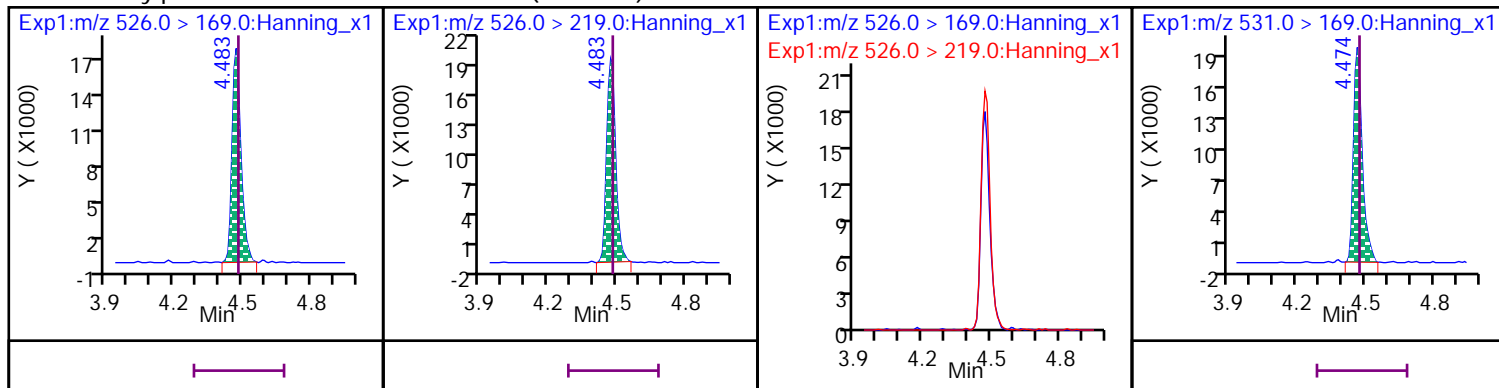


D 65 13C2\_8:2 FTS\_2



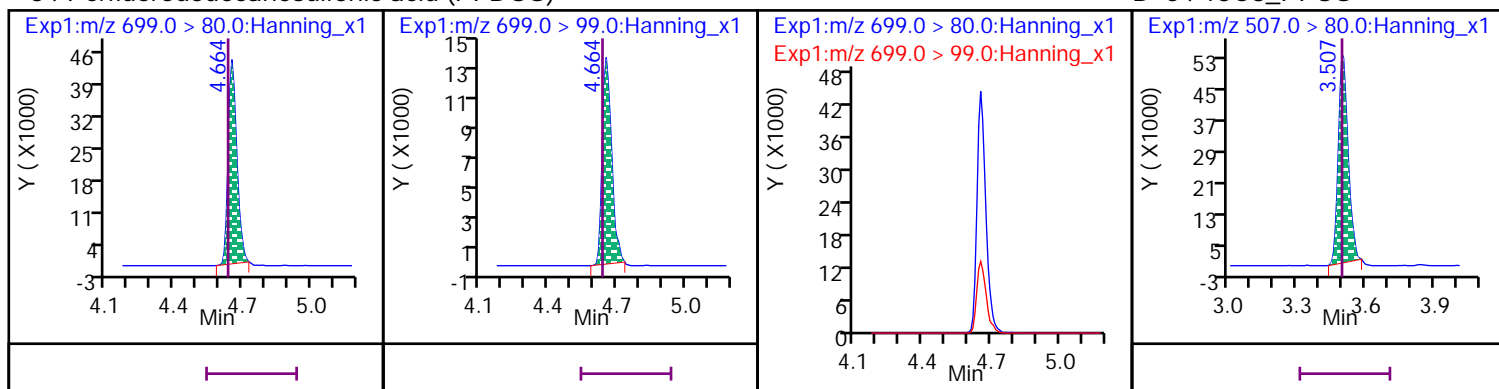
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



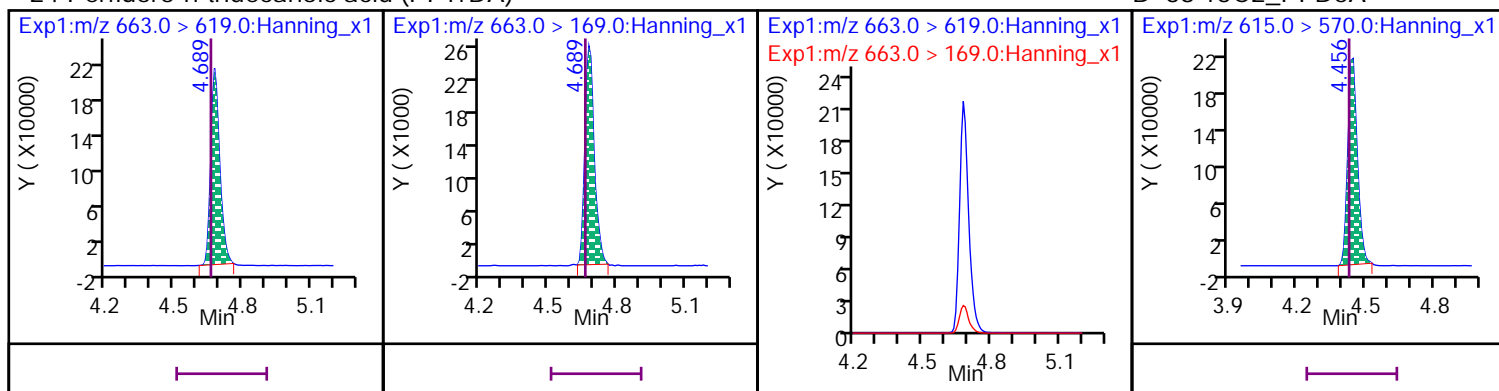
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



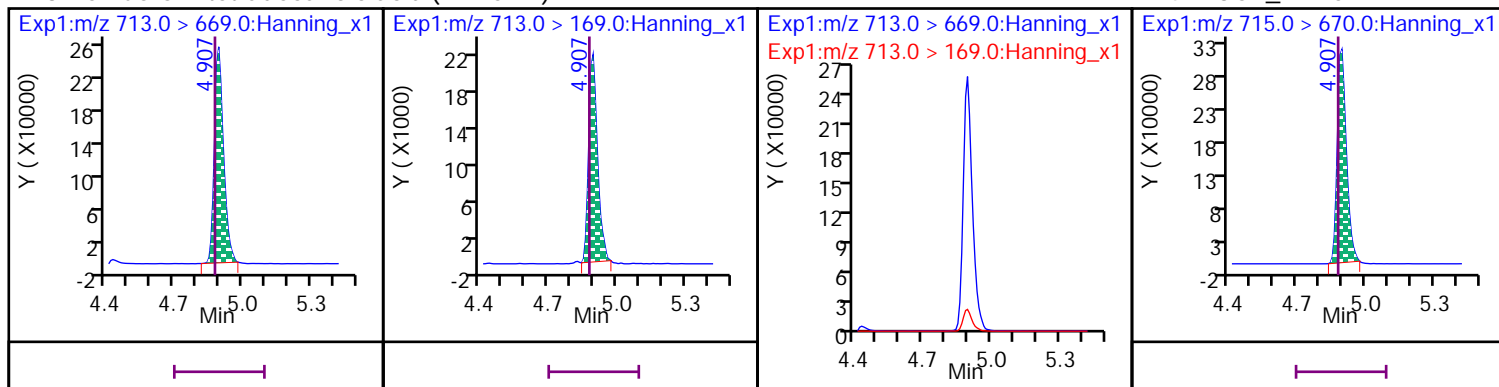
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



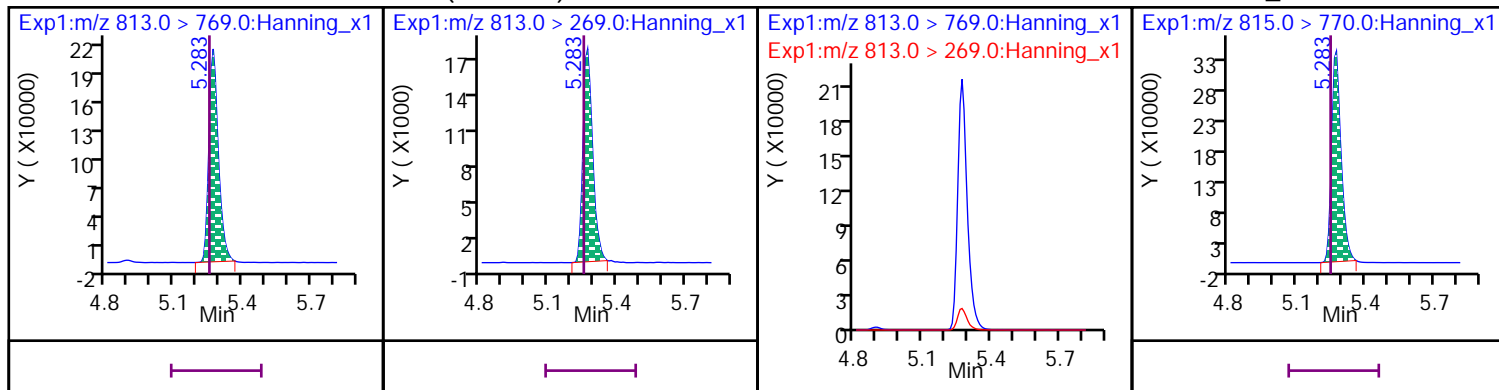
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



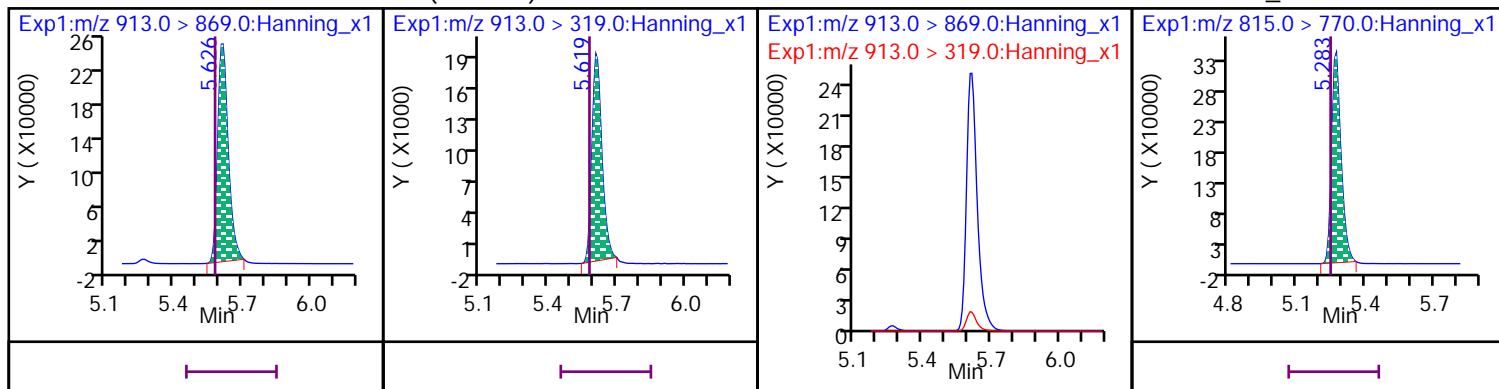
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

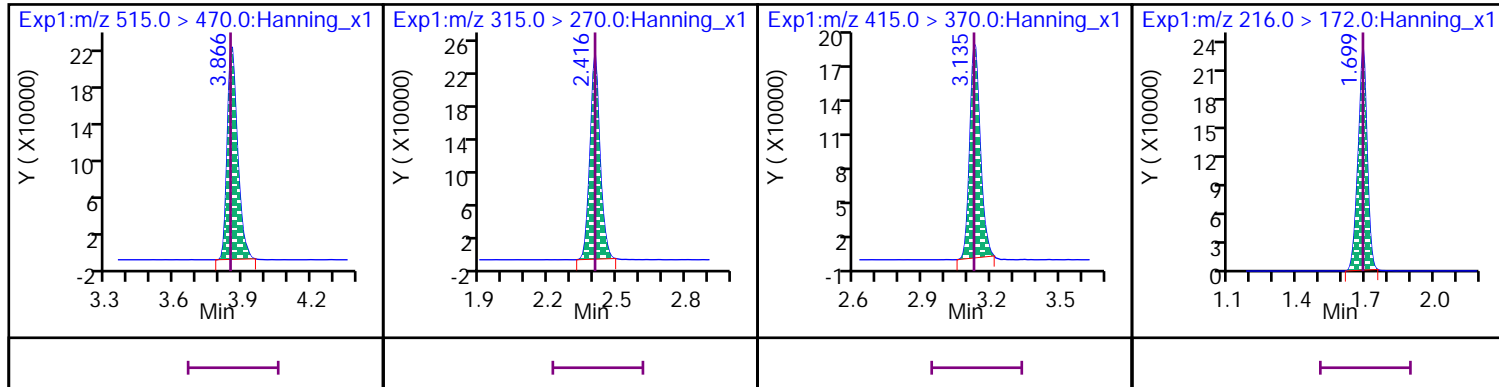


\* 37 13C2\_PFDA

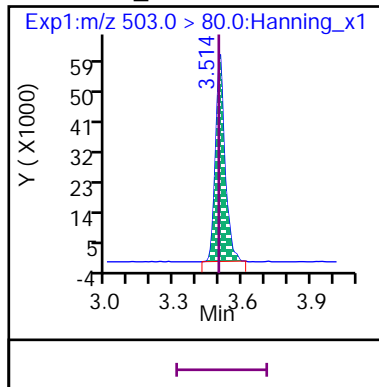
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720042.d

Injection Date: 27-Dec-2020 16:51:56

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

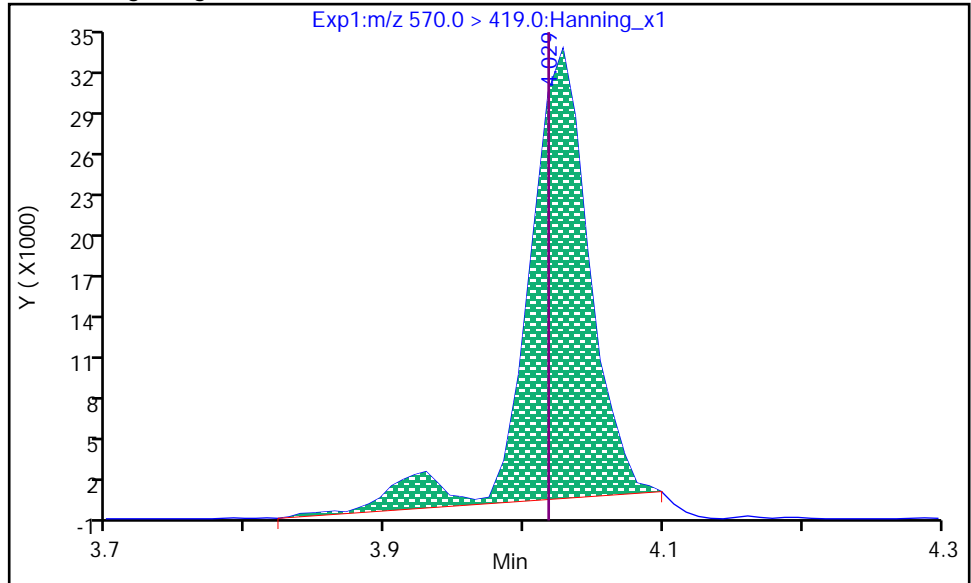
Dil. Factor: 1

Operator: Matthew M. Miller

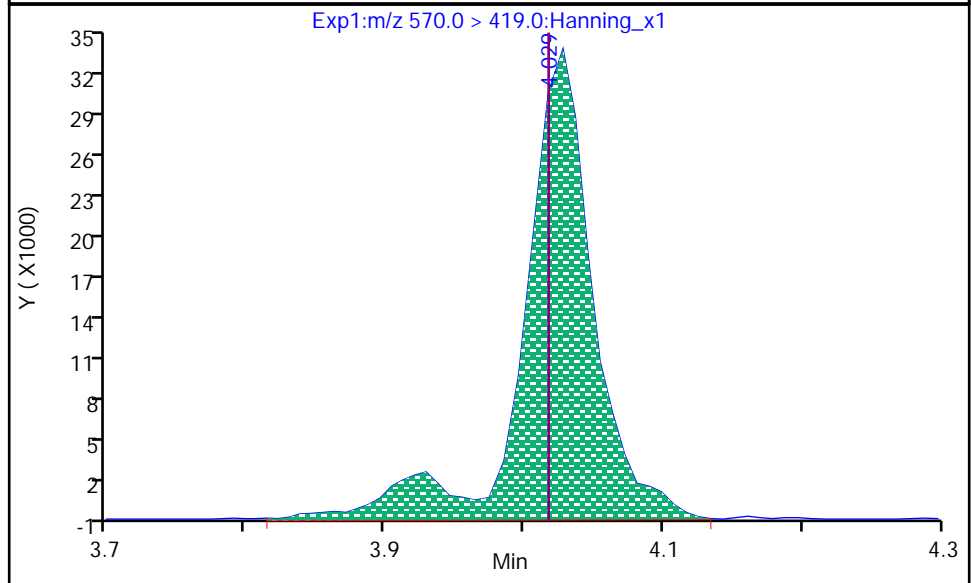
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.029  
Area: 98368  
Amount: 869.06  
Amount Units: ng/L



RT: 4.029  
Area: 117560  
Amount: 1038.61  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 13:07:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720042.d

Injection Date: 27-Dec-2020 16:51:56

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

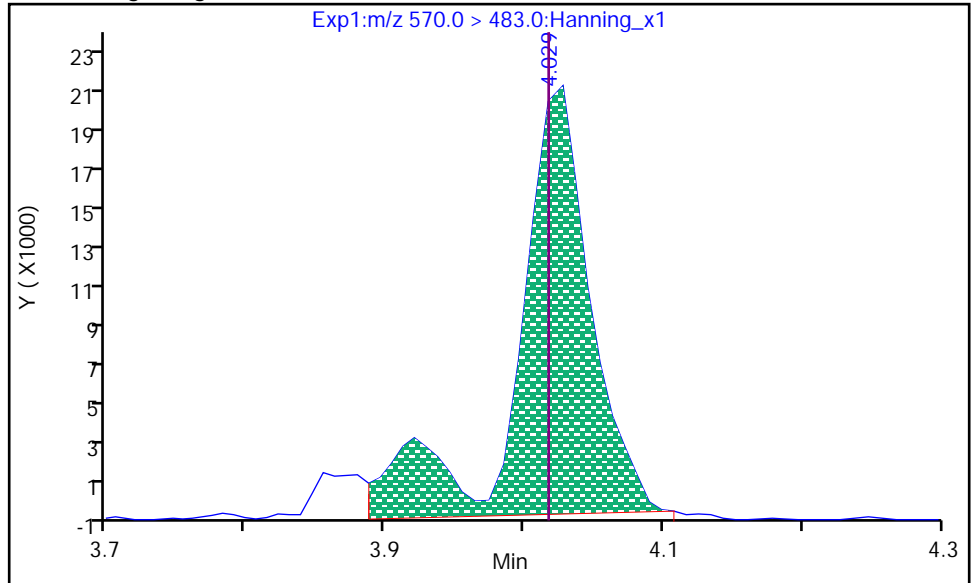
Dil. Factor: 1

Operator: Matthew M. Miller

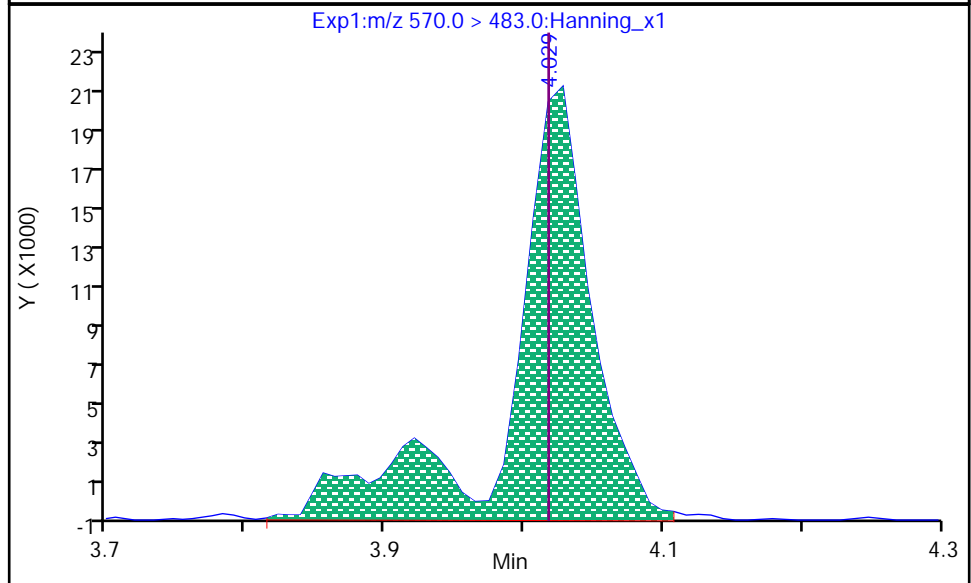
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.029  
Area: 74705  
Amount: 1038.61  
Amount Units: ng/L



RT: 4.029  
Area: 83365  
Amount: 1038.61  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 13:07:45

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720053.d  
Injection Date: 27-Dec-2020 18:49:02 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 46  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	949.49	94.9	70 - 130
D 46 13C4_PFBFA	637910	619533			97.1	50 - 150
D 50 13C5_PFPeA	658438	620016			94.2	50 - 150
21 PFPeA			1000.00	964.21	96.4	70 - 130
7 PFBS			884.00	814.71	92.2	70 - 130
D 44 13C3_PFBFS	239776	228959			95.5	50 - 150
1 4:2 FTS			934.00	924.69	99	70 - 130
D 63 13C2_4:2 FTS_2	137423	122032			88.8	50 - 150
D 49 13C5_PFHxA	718926	716929			99.7	50 - 150
15 PFHxA			1000.00	910.63	91.1	70 - 130
22 PFPeS			938.00	903.82	96.4	70 - 130
28 GenX			2000.00	1762.09	88.1	70 - 130
D 66 13C3_GenX	1323365	1302893			98.5	50 - 150
D 47 13C4_PFHpA	585778	599192			102	50 - 150
13 PFHpA			1000.00	910.67	91.1	70 - 130
D 45 13C3_PFHxS	178402	172849			96.9	50 - 150
14 PFHxS			910.00	820.19	90.1	70 - 130
29 ADONA			942.00	859.08	91.2	70 - 130
D 64 13C2_6:2 FTS_2	111803	105502			94.4	50 - 150
2 6:2 FTS			948.00	897.18	94.6	70 - 130
20 PFOA			1000.00	969.51	97	70 - 130
D 53 13C8_PFOA	592205	560719			94.7	50 - 150
12 PFHpS			952.00	900.86	94.6	70 - 130
18 PFOS			928.00	770.55	83	70 - 130
17 PFNA			1000.00	917.21	91.7	70 - 130
D 56 13C9_PFNA	760907	737154			96.9	50 - 150
D 54 13C8_PFOS	157347	159769			102	50 - 150
30 9CI-PF3ONS			932.00	786.92	84.4	70 - 130
D 55 13C8_PFOA	311979	296063			94.9	50 - 150
19 PFOSA			1000.00	987.78	98.8	70 - 130
16 PFNS			960.00	866.18	90.2	70 - 130
D 65 13C2_8:2 FTS_2	88356	84519			95.7	50 - 150
3 8:2 FTS			958.00	991.78	104	70 - 130
10 PFDA			1000.00	923.15	92.3	70 - 130
D 51 13C6_PFDA	636706	627372			98.5	50 - 150
D 58 d3-MeFOSAA	725286	712995			98.3	50 - 150



Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1008.66	101	70 - 130
9 PFDS			964.00	831.33	86.2	70 - 130
5 N-EtFOSAA			1000.00	901.23	90.1	70 - 130
25 PFUdA			1000.00	1022.39	102	70 - 130
D 60 d5-EtFOSAA	690640	695271			101	50 - 150
D 52 13C7_PFUdA	625944	560022			89.5	50 - 150
D 61 d7-MeFOSE	114979	103410			89.9	50 - 150
32 MeFOSE			1000.00	997.18	99.7	70 - 130
26 MeFOSA			1000.00	1131.96	113	70 - 130
D 57 d3-MeFOSA	47825	46817			97.9	50 - 150
31 11Cl-PF3OUDS			942.00	813.68	86.4	70 - 130
D 62 d9-EtFOSE	122508	123714			101	50 - 150
33 EtFOSE			1000.00	902.70	90.3	70 - 130
D 59 d5-EtFOSA	47562	46942			98.7	50 - 150
D 38 13C2_PFDoA	571184	585683			103	50 - 150
4 10:2 FTS			964.00	860.84	89.3	70 - 130
27 EtFOSA			1000.00	893.83	89.4	70 - 130
11 PFDoA			1000.00	916.97	91.7	70 - 130
34 PFDOS			968.00	859.18	88.8	70 - 130
24 PFTrDA			1000.00	979.99	98	70 - 130
23 PFTeDA			1000.00	920.30	92	70 - 130
D 42 13C2_PFTeDA	828920	784802			94.7	50 - 150
35 PFHxDA			1000.00	979.66	98	70 - 130
D 40 13C2_PFHxDA	865470	878983			102	50 - 150
36 PFODA			1000.00	960.75	96.1	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720053.d  
Injection Date: 27-Dec-2020 18:49:02 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 46  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.699	1.698	1	619533	23	>100:1			1000.00	893.28	97.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.698	1/0	585886	23	>100:1			1000.00	949.49		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.077	0	620016	17	>100:1			1000.00	901.34	94.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.078	2.077	1/1	601065	19	>100:1			1000.00	964.21		
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.130	2.130	1	228959	18	>100:1			1000.00	994.48	95.5	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.130	1/0	219933	18	>100:1	Target = 3.50		884.00	814.71		
298.9 > 99	44	2.130	2.130		61657	18	>100:1	3.56 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.451	1/0	179508	20		Target = 3.10		938.00	903.82		
349 > 99	44	2.451	2.451		58231	19	>100:1	3.08 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.380	1	122032	20	>100:1			5000.00	5040.91	88.8	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.380	1/0	45040	18	>100:1	Target = 1.80		934.00	924.69		
327 > 81	63	2.380	2.380		23654	21	89:1	1.90 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.415	1	716929	20	>100:1			1000.00	972.67	99.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.415	1/0	644553	20	>100:1	Target = 18.34		1000.00	910.63		
313 > 119	49	2.416	2.415		32542	19	>100:1	19.80 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.522	1	1302893	20	>100:1			5000.00	4891.58	98.5	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.522	1/0	329891	20	>100:1	Target = 0.81		2000.00	1762.09		
285 > 185	66	2.523	2.522		425036	21	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.773	1	599192	21	>100:1			1000.00	987.71	102	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.773	1/0	565997	20	>100:1	Target = 3.70		1000.00	910.67		
363 > 169	47	2.773	2.773		159894	20	>100:1	3.53 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.792	2.782	1	172849	20	>100:1			1000.00	1009.46	96.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.792	2.782	1/0	150316	27	>100:1	Target = 3.21	0.13	910.00	820.19		
399 > 99	45	2.782	2.782		47827	26	>100:1	3.14 (1.60-4.81)	0.09				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.810	2.809	1/0	942739	20	>100:1	Target = 2.97		942.00	859.08		
377 > 85	45	2.810	2.809		299845	20	>100:1	3.14 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.142	1/0	141454	23	>100:1	Target = 3.08		952.00	900.86		
449 > 99	45	3.149	3.142		49385	29	>100:1	2.86 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	105502	31	>100:1			5000.00	5478.23	94.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.115	1/0	39303	24	>100:1	Target = 1.80		948.00	897.18		
427 > 81	64	3.115	3.115		22627	28	>100:1	1.73 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.135	1	560719	25	>100:1			1000.00	947.38	94.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.135	1/0	554194	24	>100:1	Target = 2.87		1000.00	969.51		
413 > 169	53	3.142	3.135		193203	36	>100:1	2.86 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.522	3.507	1	159769	24	>100:1			1000.00	1065.63	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.500	2/1	145884	44	>100:1	Target = 3.84	0.25	928.00	770.55		
499 > 99	54	3.515	3.500		44143	44	>100:1	3.30 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.716	1/0	423249	25	>100:1			932.00	786.92		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.867	3.858	1/0	105904	21	>100:1	Target = 3.07		960.00	866.18		M
549 > 99	54	3.867	3.858		37514	25	>100:1	2.82 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.153	1/0	96392	17	>100:1	Target = 3.03		964.00	831.33		
599 > 99	54	4.162	4.153		36434	19	>100:1	2.64 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.319	4.318	1/0	369194	16	>100:1			942.00	813.68		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.666	4.648	2/1	110205	19	>100:1	Target = 3.33		968.00	859.18		
699 > 99	54	4.666	4.648		33910	26	>100:1	3.24 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.515	1	737154	24	>100:1			1000.00	981.61	96.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.515	1/0	676148	24	>100:1	Target = 6.16		1000.00	917.21		
463 > 169	56	3.522	3.515		114335	23	>100:1	5.91 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.851	3.850	1	296063	20	>100:1			1000.00	956.39	94.9	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.851	3.858	0/-1	288190	20	>100:1			1000.00	987.78		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.859	3.850	1	84519	20	>100:1			5000.00	4556.25	95.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.875	3.850	2/1	33698	20	>100:1	Target = 1.95		958.00	991.78		
527 > 81	65	3.867	3.850		17765	18	>100:1	1.89 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.458	4.447	1/0	33627	26	>100:1	Target = 3.14		964.00	860.84		
627 > 80	65	4.458	4.447		12776	24	>100:1	2.63 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.867	3.858	1	627372	21	>100:1			1000.00	945.79	98.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.867	3.866	1/0	569078	19	>100:1	Target = 15.94		1000.00	923.15		
513 > 169	51	3.867	3.866		43750	19	>100:1	13.00 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.019	1	712995	18	>100:1			5000.00	4967.24	98.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.019	1/0	110486	37	>100:1	Target = 1.33	0.07	1000.00	1008.66		
570 > 483	58	4.030	4.019		81936	36	>100:1	1.34 (0.66-1.99)	0.20				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.171	1	695271	19	>100:1			5000.00	5234.90	101	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.189	4.180	1/0	124766	36		Target = 1.58	0.09	1000.00	901.23		M
584 > 526	60	4.189	4.180		78079	32	>100:1	1.59 (0.79-2.37)	0.16				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.171	1	560022	18	>100:1			1000.00	886.01	89.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.180	4.171	1/0	538137	18	>100:1	Target = 15.50		1000.00	1022.39		
563 > 169	52	4.180	4.171		38064	19	>100:1	14.13 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.298	0	103410	16	>100:1			1000.00	955.66	89.9	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.299	4.308	0/0	96890	15	>100:1			1000.00	997.18		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.309	4.318	0	46817	16	>100:1			1000.00	884.73	97.9	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.309	4.318	0/0	59789	16	>100:1	Target = 1.12		1000.00	1131.96		
512 > 219	57	4.309	4.318		51158	17	>100:1	1.16 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.458	4.465	0	123714	18	>100:1			1000.00	986.59	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.467	4.474	0/0	99356	17	>100:1			1000.00	902.70		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.458	4.438	2	585683	21	>100:1			1000.00	967.56	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.458	4.438	2/0	543860	20	>100:1	Target = 10.85		1000.00	916.97		
613 > 169	38	4.449	4.438		50018	18	>100:1	10.87 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.691	4.673	2/0	565317	22	>100:1	Target = 8.37		1000.00	979.99		
663 > 169	38	4.691	4.673		65235	20	>100:1	8.66 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.476	4.483	0	46942	16	>100:1			1000.00	956.16	98.7	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.476	4.492	0/0	45840	18	>100:1	Target = 1.03		1000.00	893.83		
526 > 219	59	4.485	4.492		47192	16	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.908	4.890	2	784802	18	>100:1			1000.00	931.58	94.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.908	4.890	2/0	625795	18	87:1	Target = 12.11		1000.00	920.30		
713 > 169	42	4.908	4.890		54227	17	>100:1	11.54 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.284	5.258	2	878983	20	>100:1			1000.00	970.00	102	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.284	5.266	2/0	562639	20	>100:1	Target = 11.48		1000.00	979.66		
813 > 269	40	5.284	5.266		50544	18	>100:1	11.13 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.627	5.591	3/1	747550	25	82:1	Target = 13.88		1000.00	960.75		
913 > 319	40	5.627	5.591		54154	26	>100:1	13.80 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.867	3.858	1	634413	19	>100:1					93.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	660196	20	>100:1					91.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.135	1	558715	26	>100:1					92.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.698	1	566697	25	>100:1					93.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.515	3.507	1	155034	22	>100:1					94.7	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720053.d

Injection Date: 27-Dec-2020 18:49:02

Inst. ID: LCMSMS02

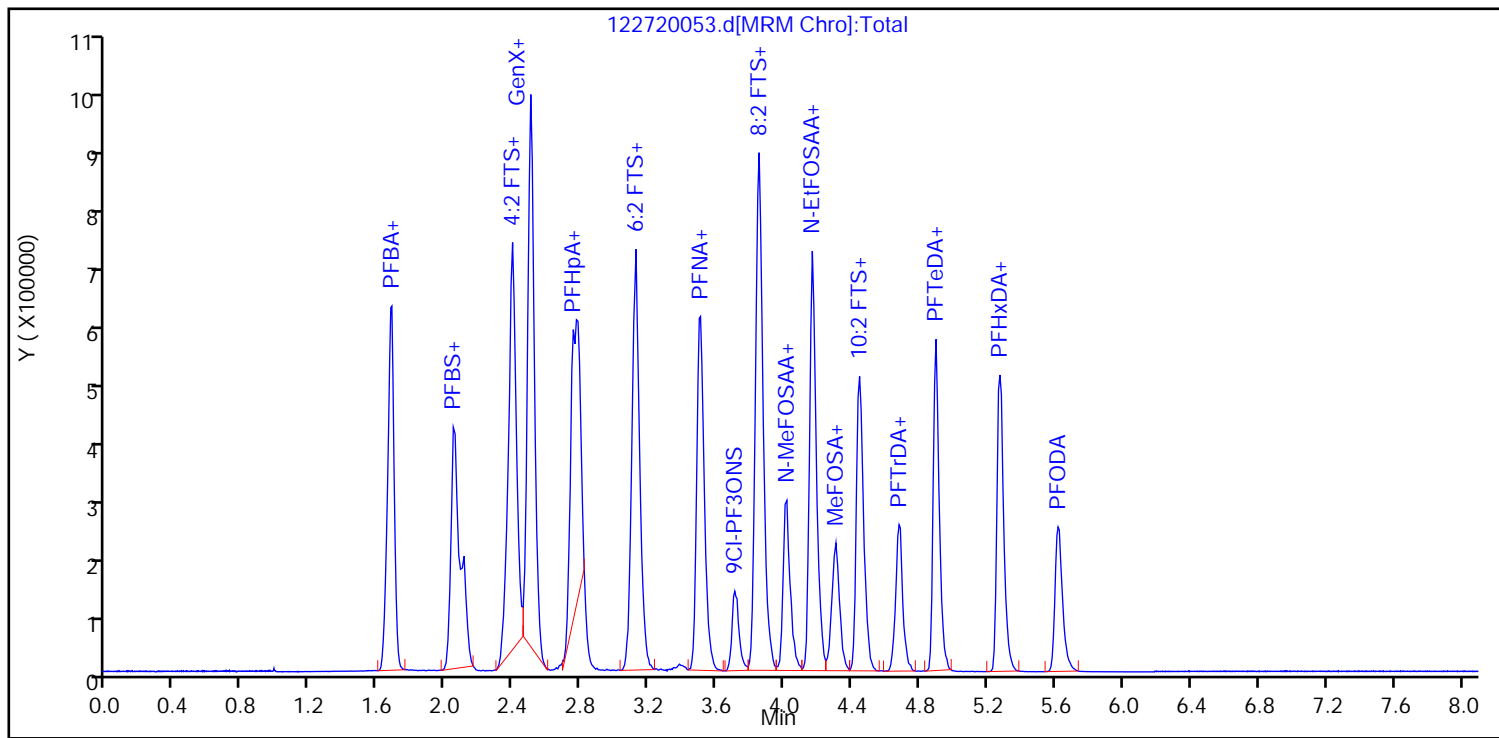
Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

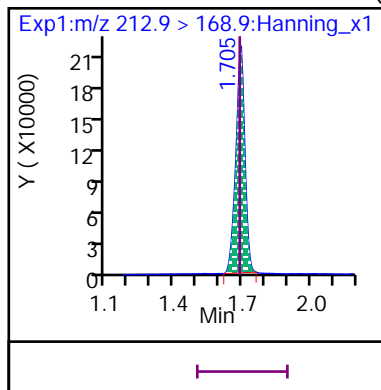
Sample Info: ID CCV 1000C\_SVLC-1248

Dil. Factor: 1

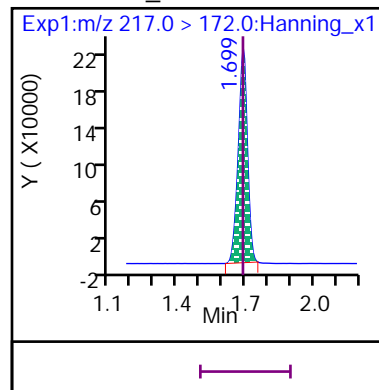
Operator: Matthew M. Miller



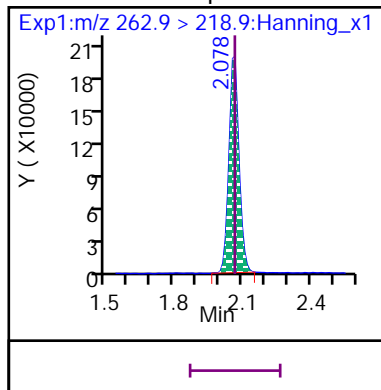
8 Perfluoro-n-butanoic acid (PFBA)



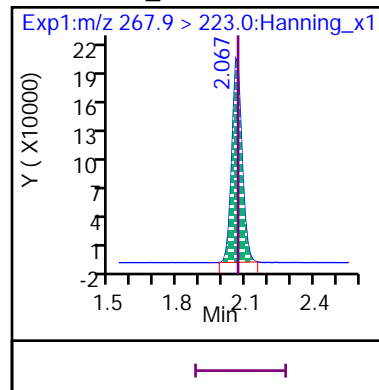
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

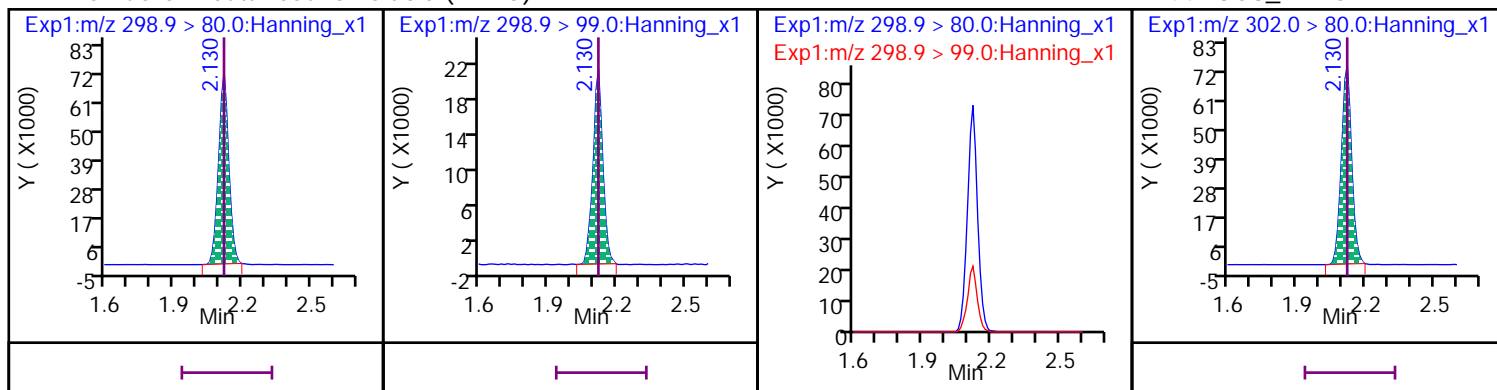


D 50 13C5\_PFPeA



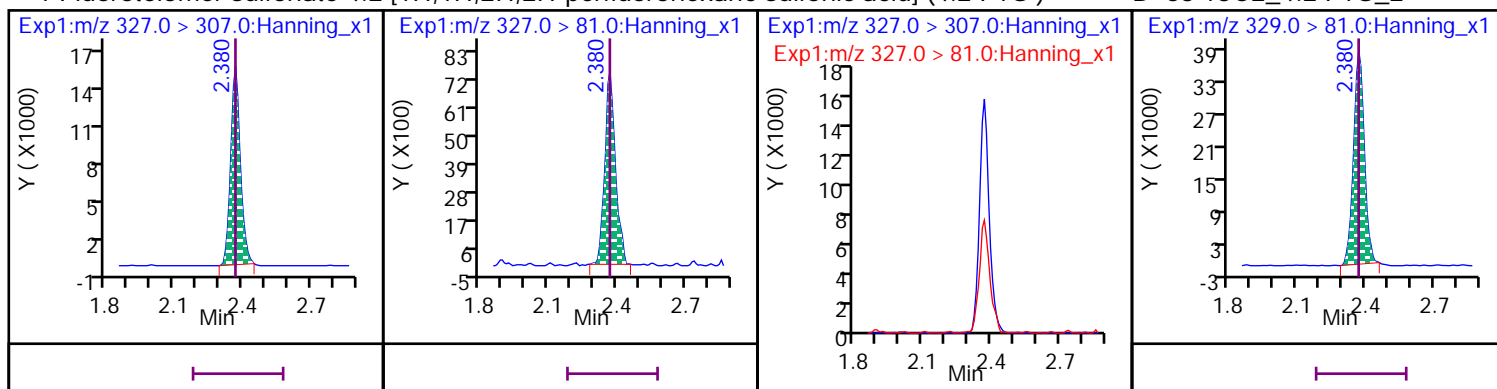
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



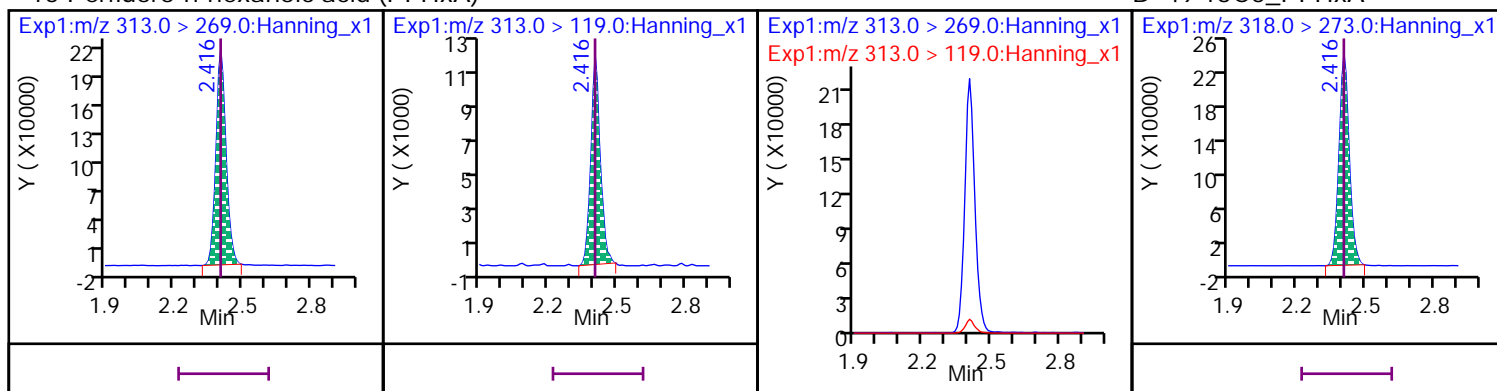
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



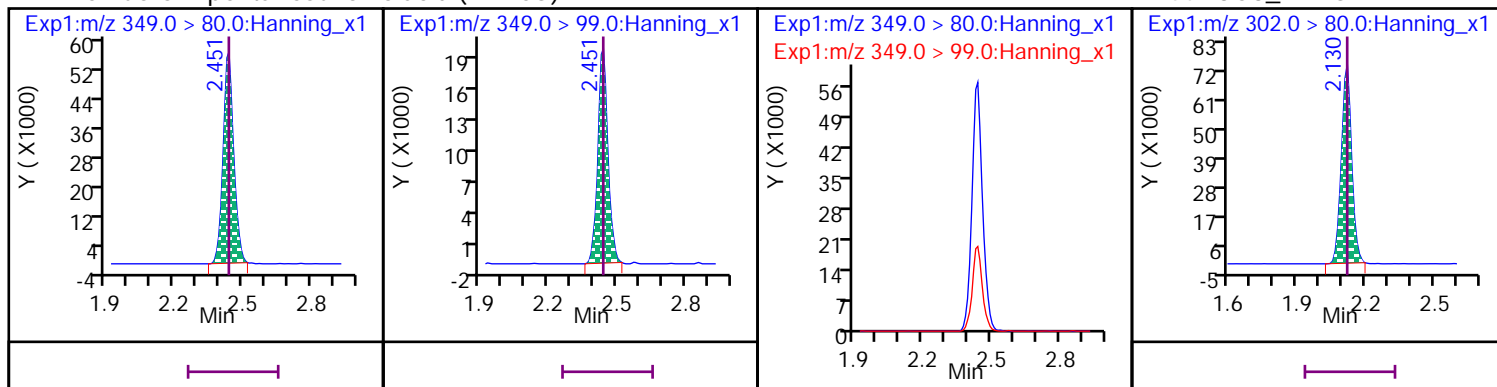
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



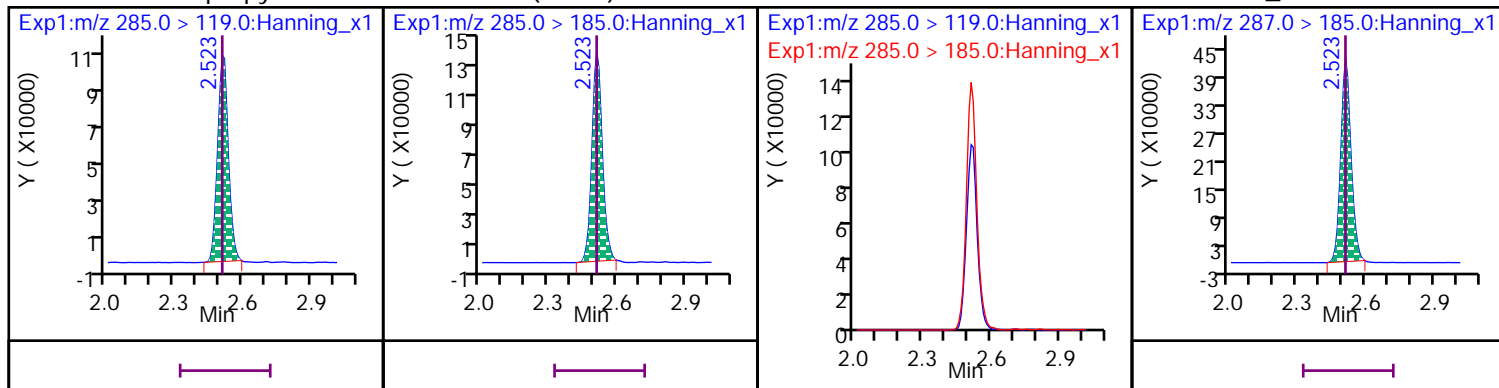
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



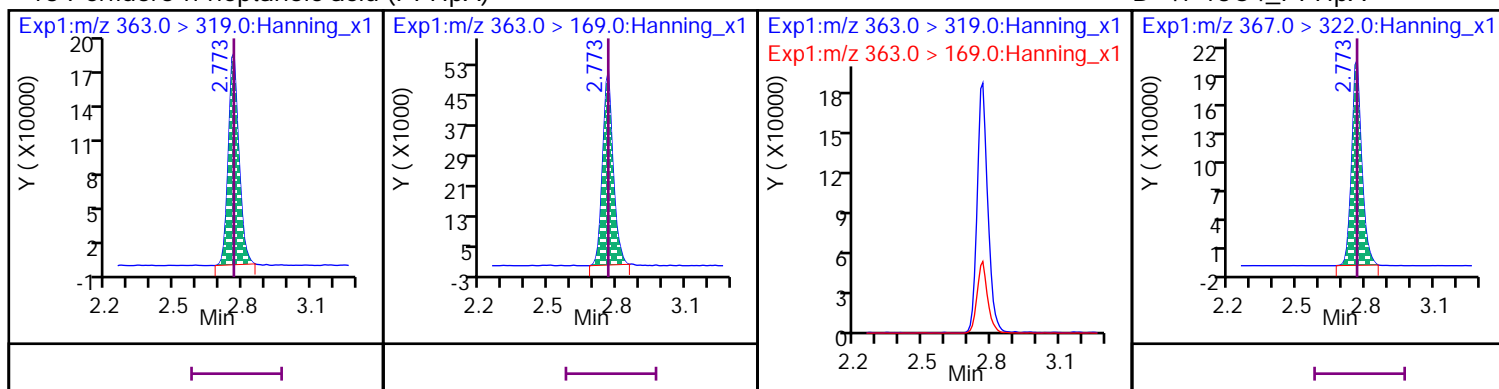
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



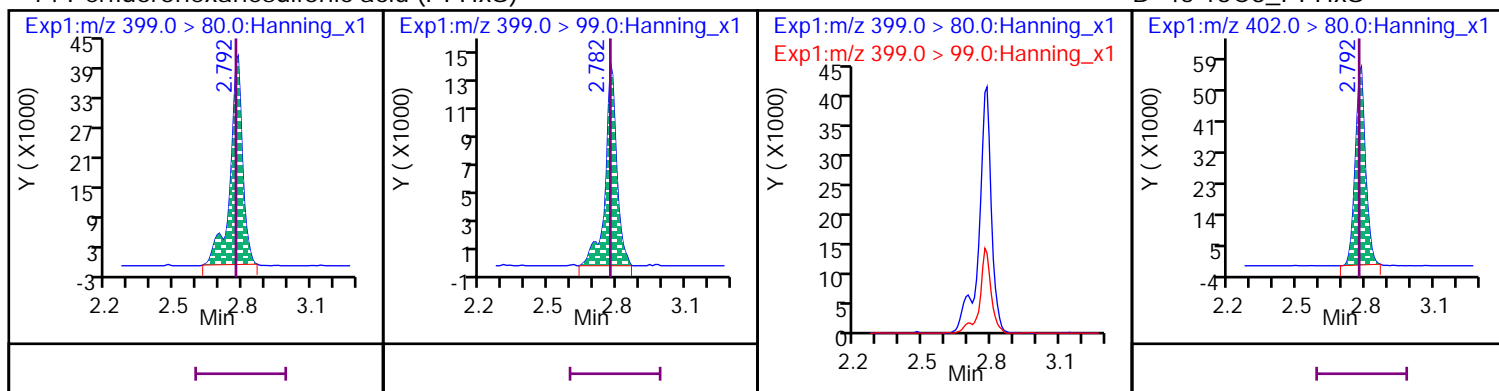
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



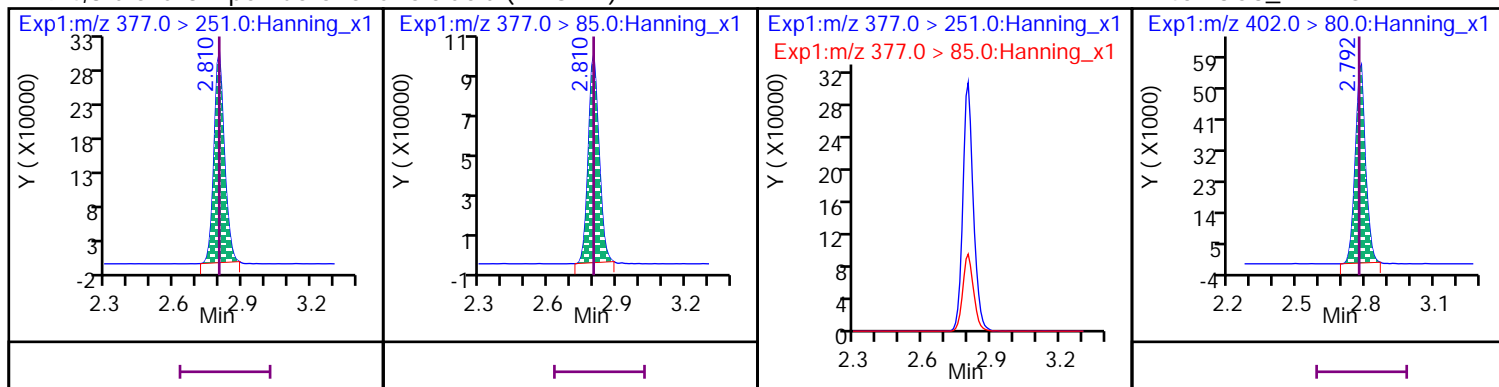
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

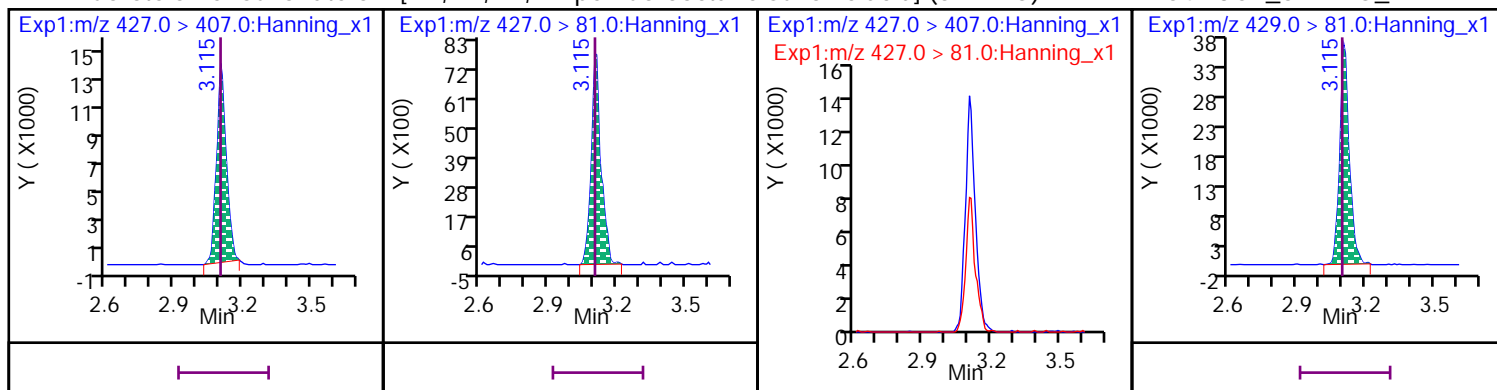
D 45 13C3\_PFHxS





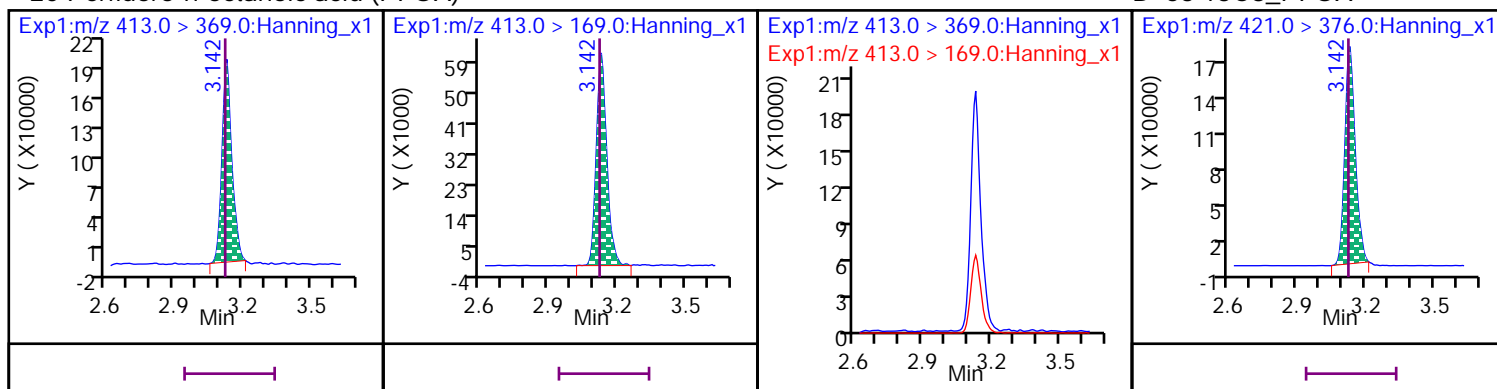
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



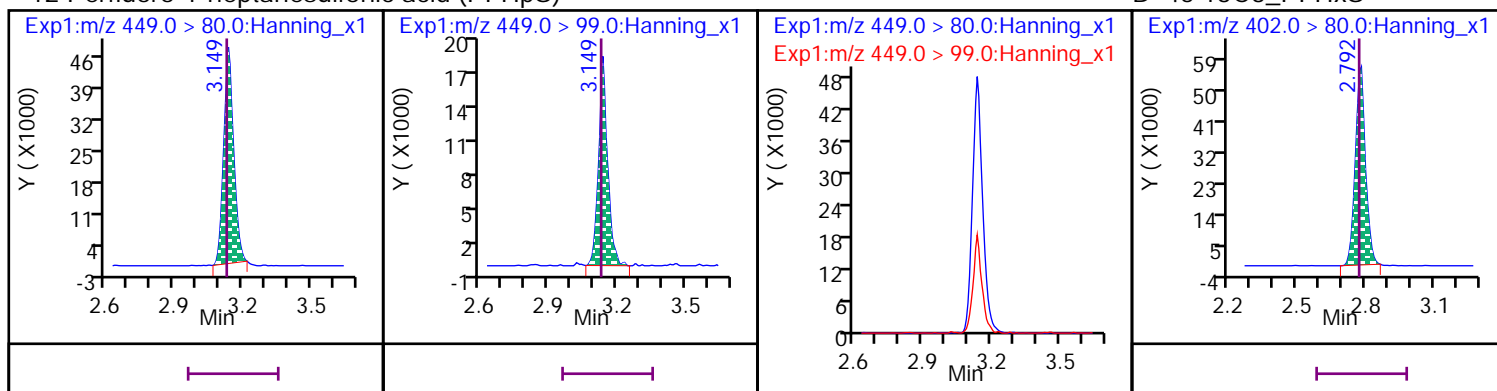
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



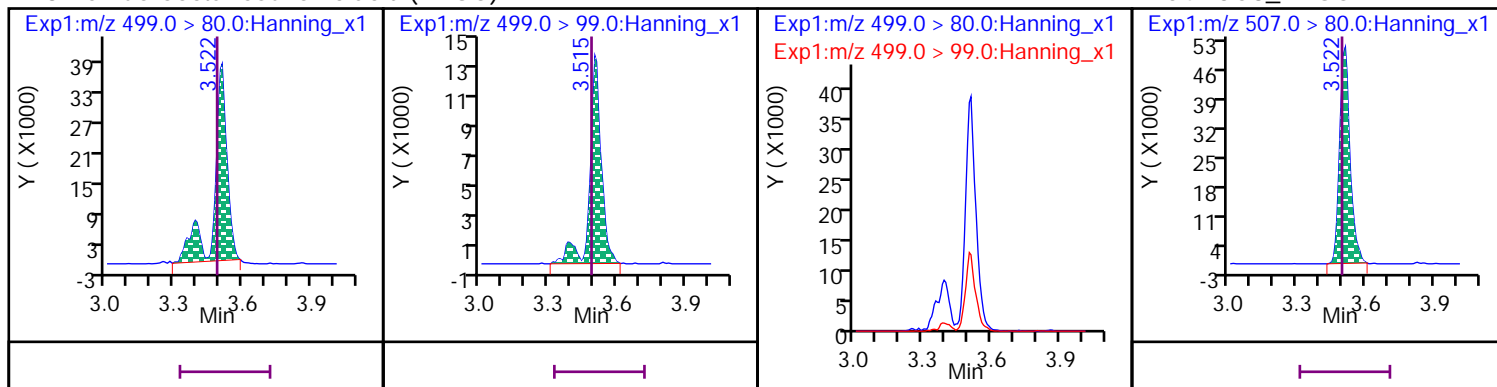
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



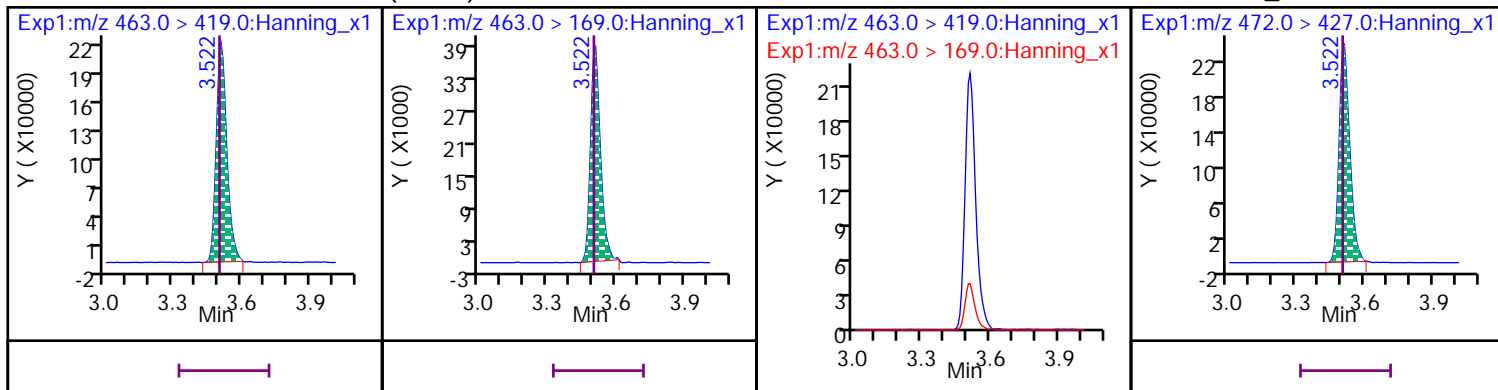
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



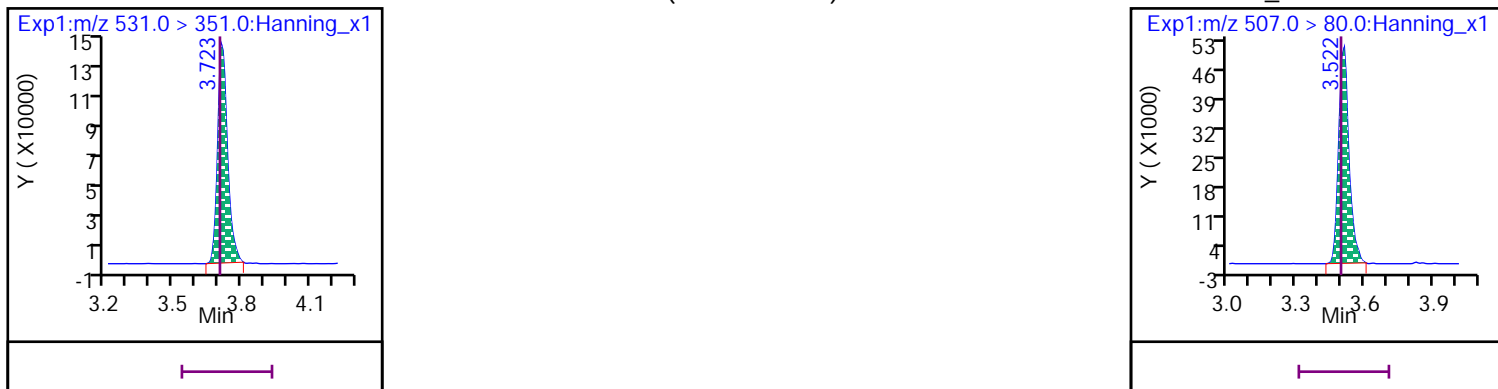
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



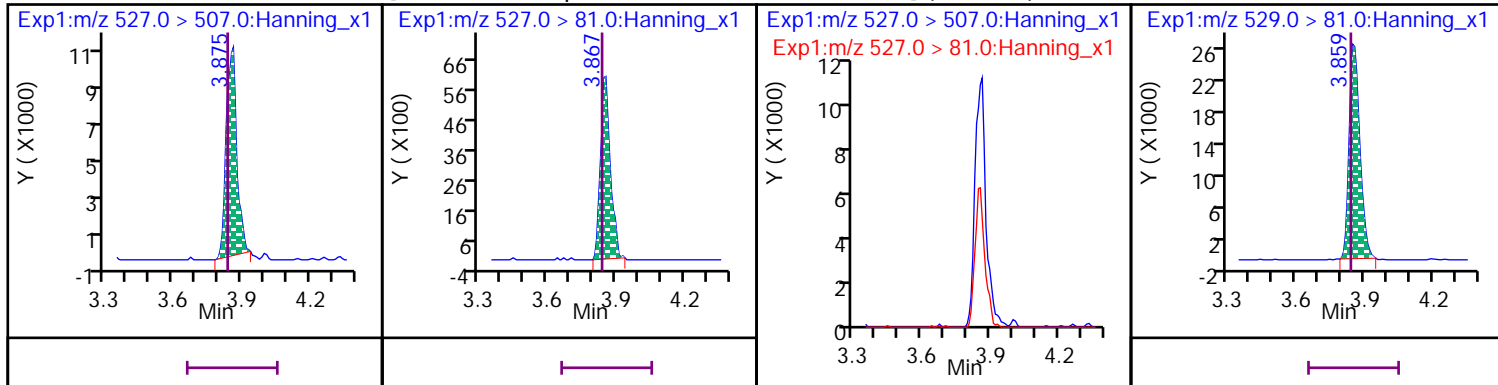
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



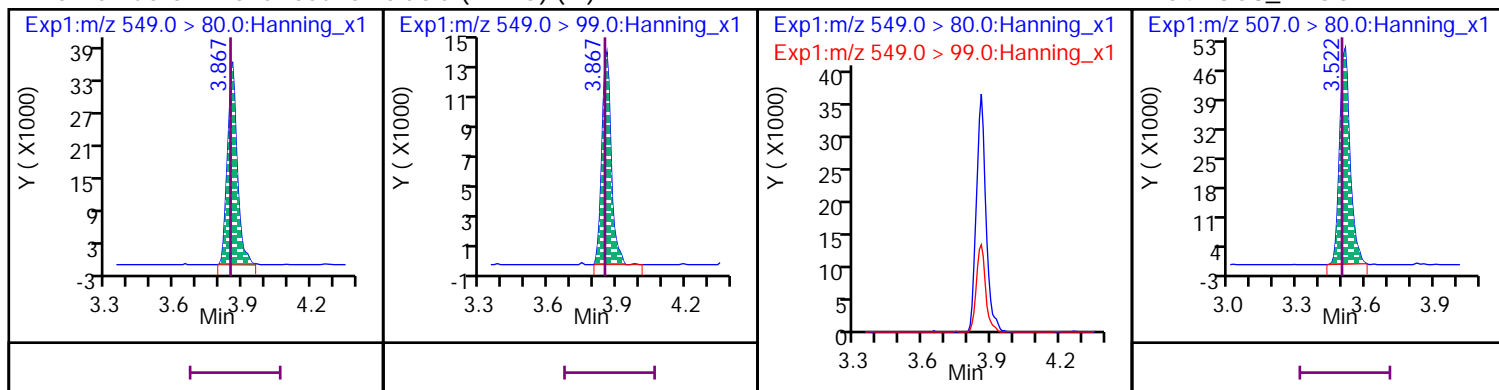
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



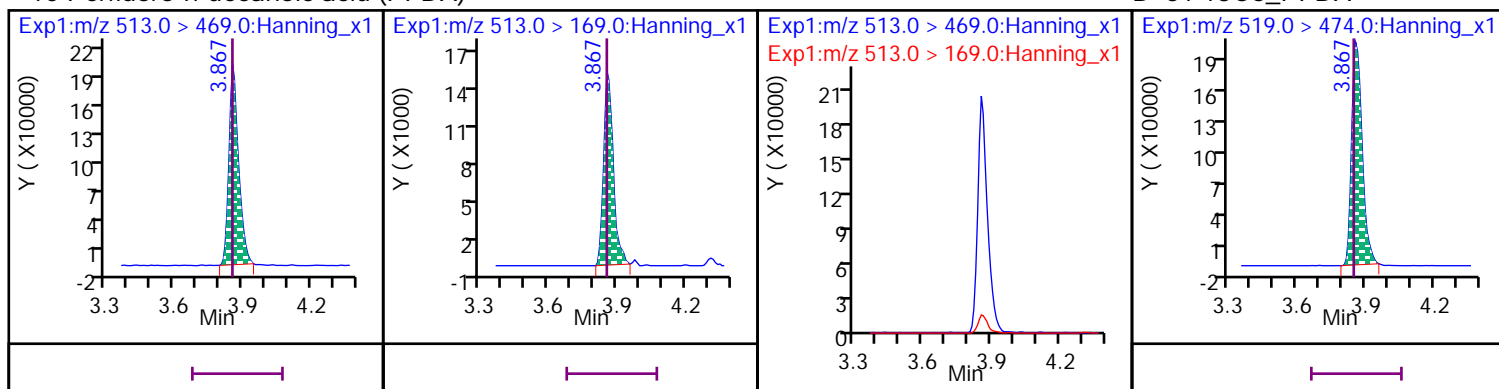
16 Perfluoro-1-nonanesulfonic acid (PFNS) (M)

D 54 13C8\_PFOS



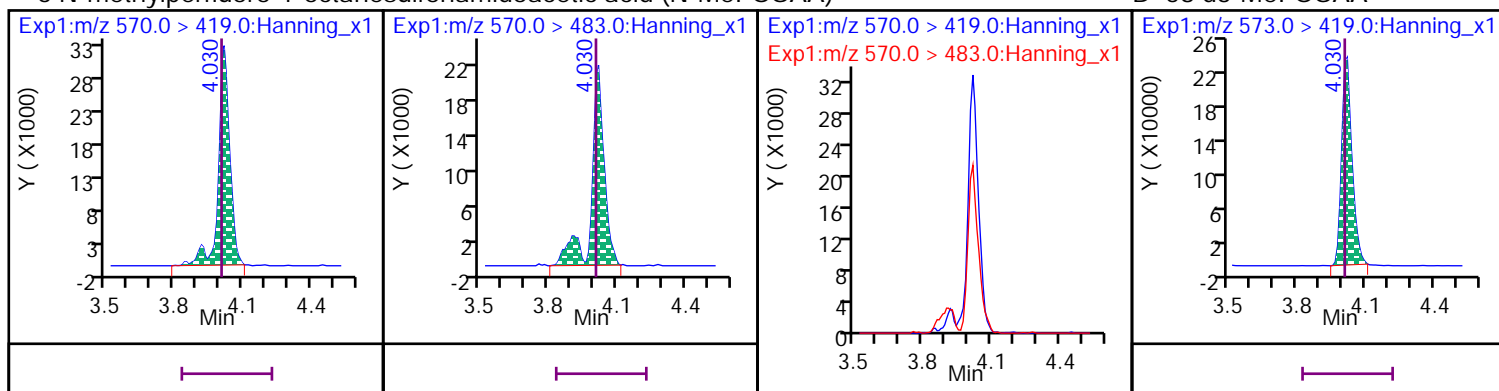
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



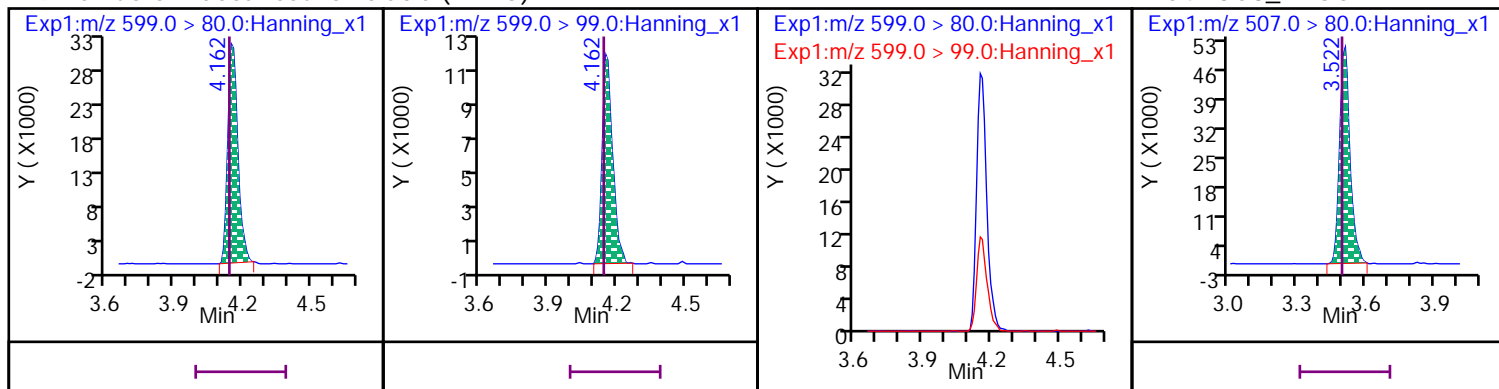
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



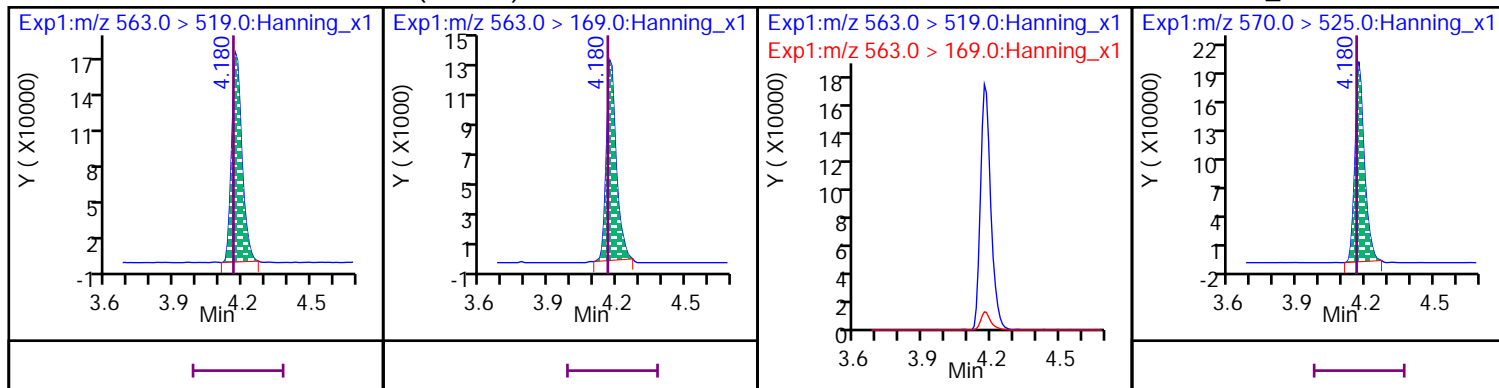
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



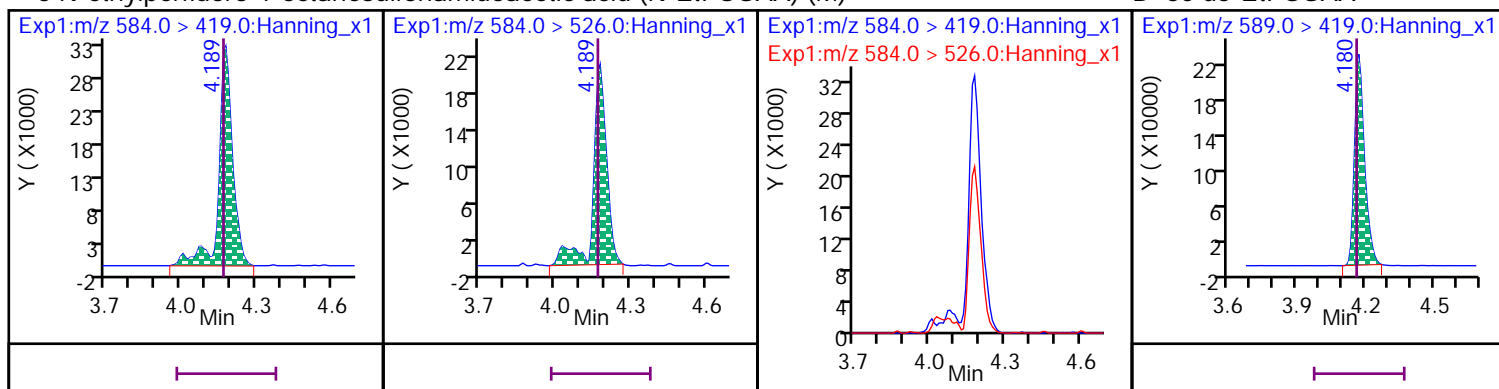
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



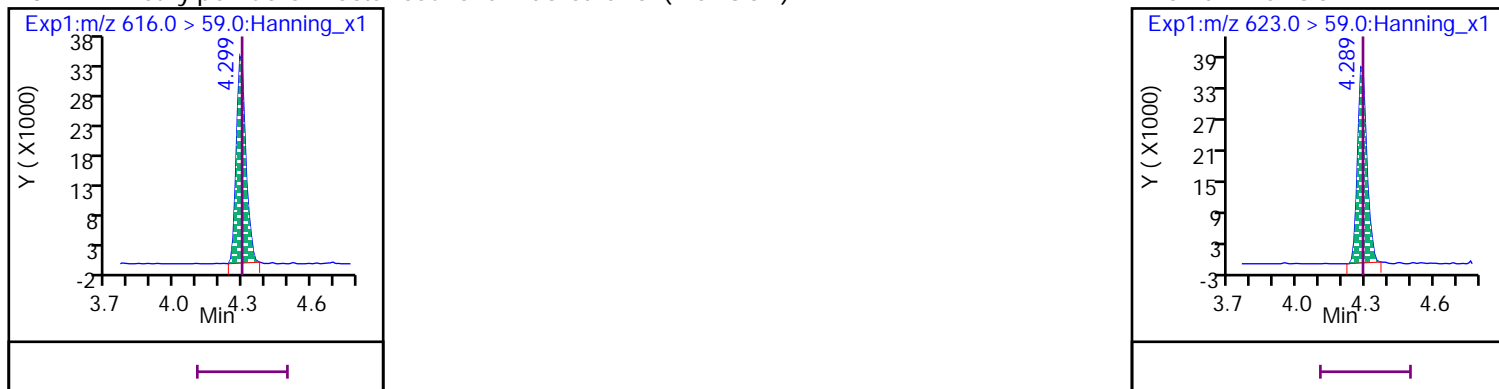
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



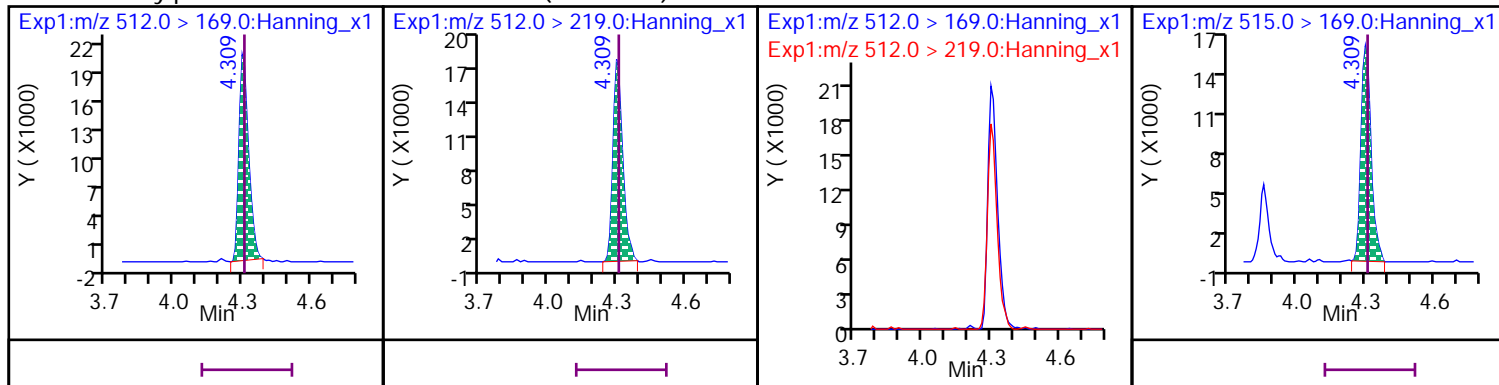
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

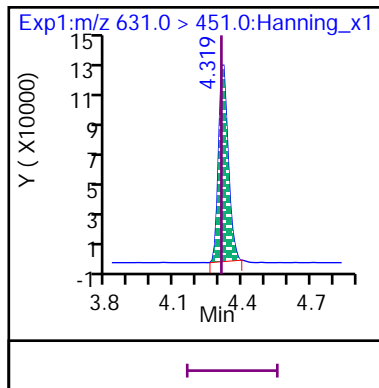


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

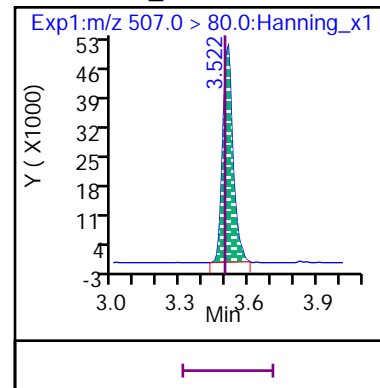
D 57 d3-MeFOSA



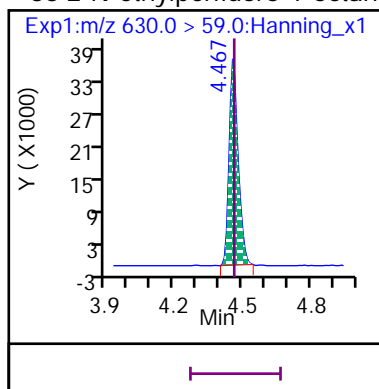
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



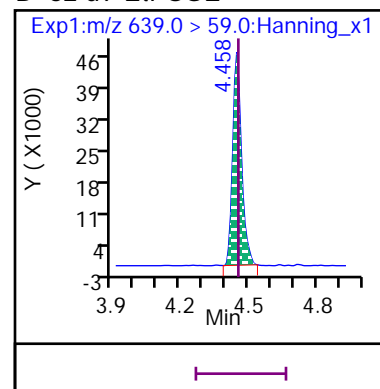
## D 54 13C8\_PFOS



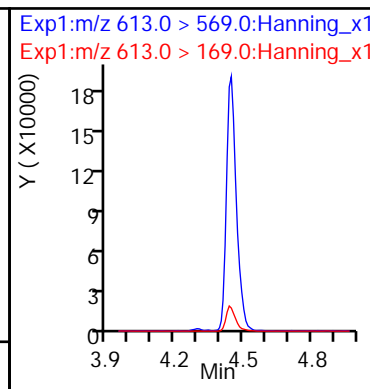
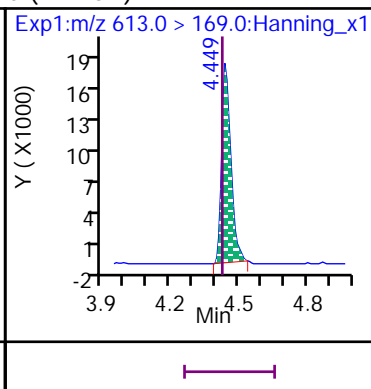
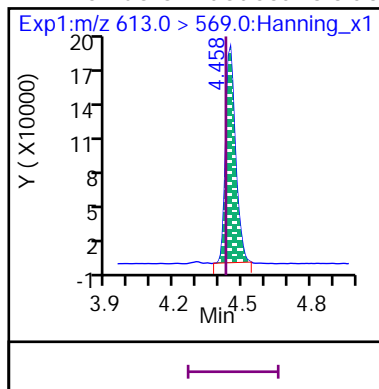
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



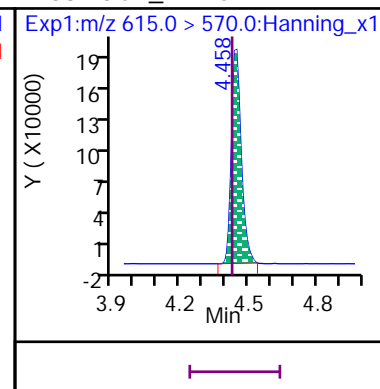
## D 62 d9-EtFOSE



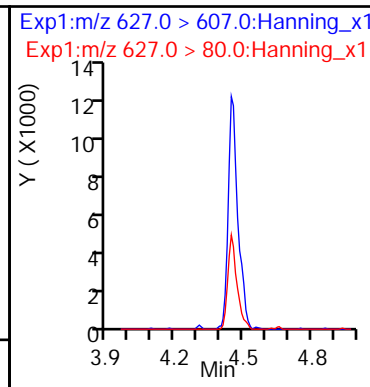
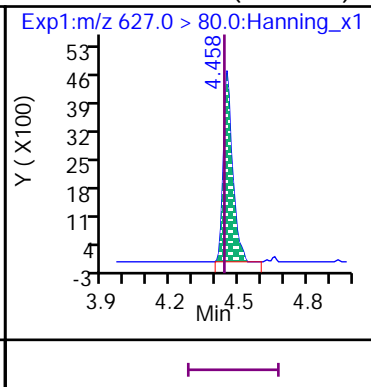
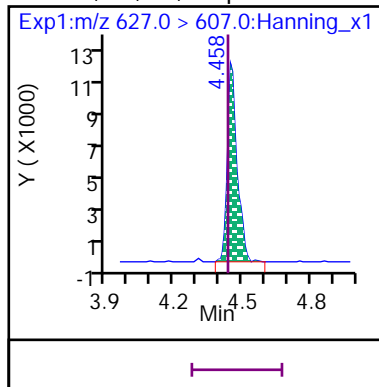
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



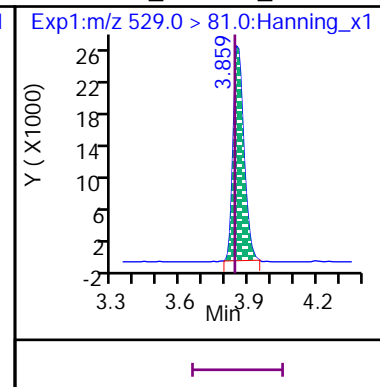
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

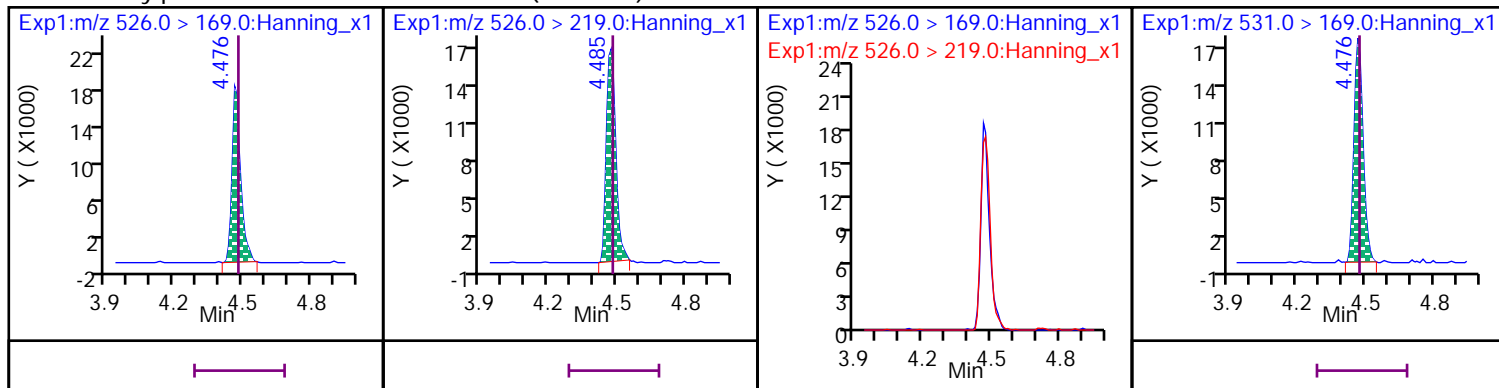


## D 65 13C2\_8:2 FTS\_2



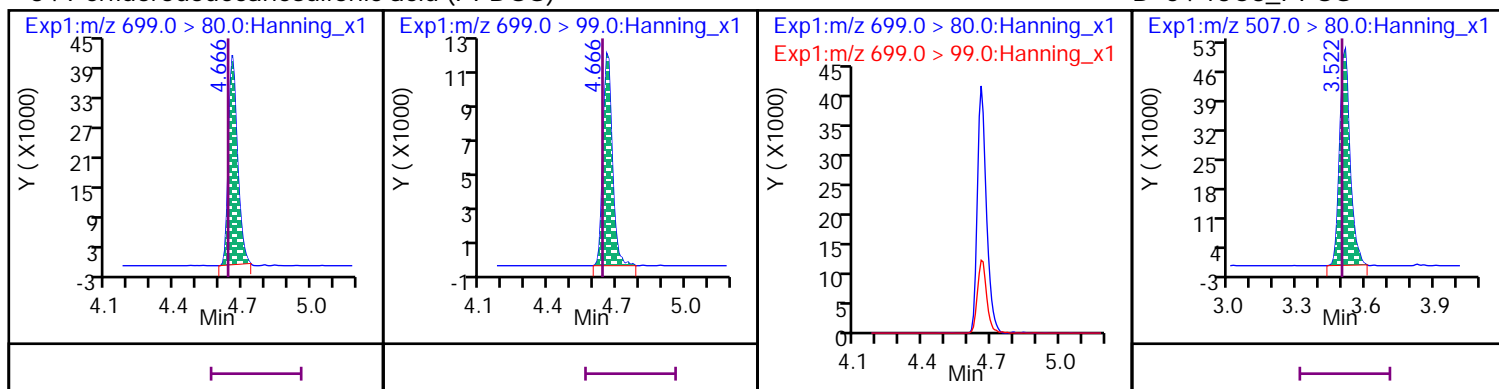
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



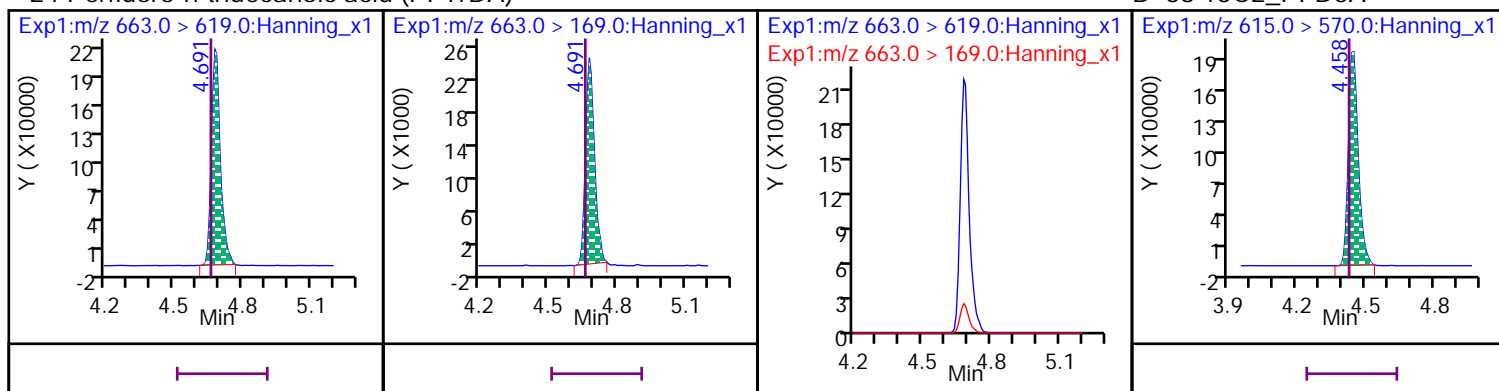
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



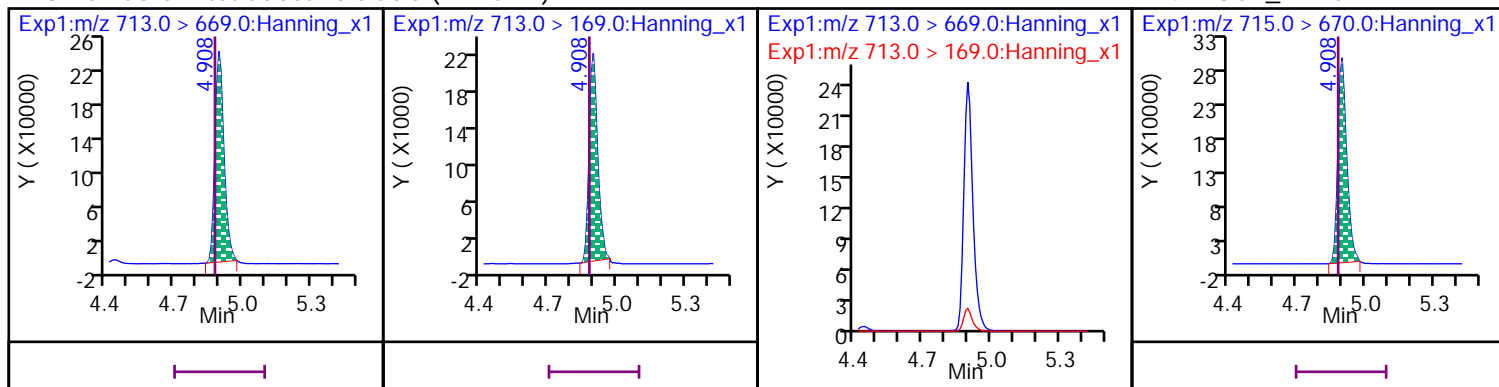
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



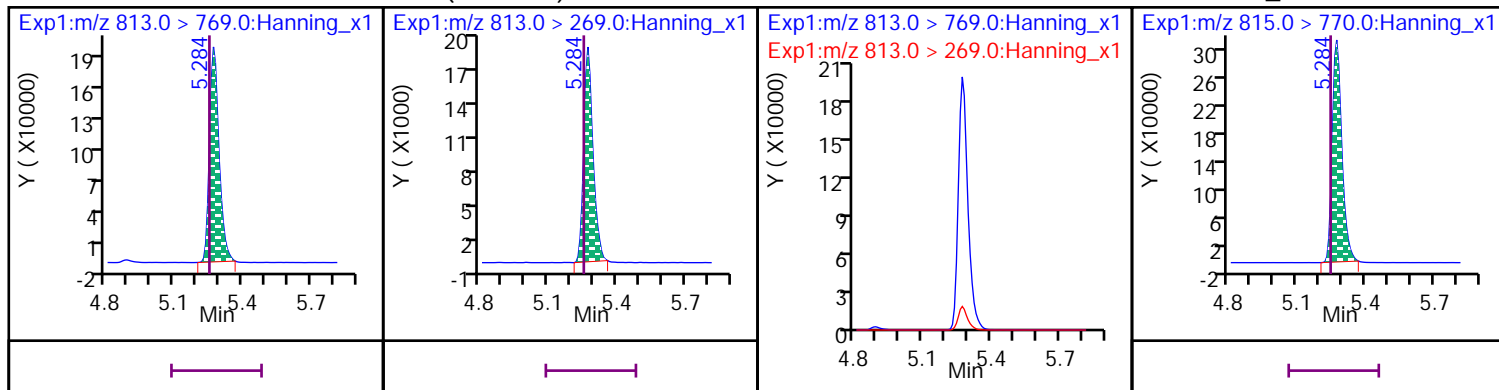
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



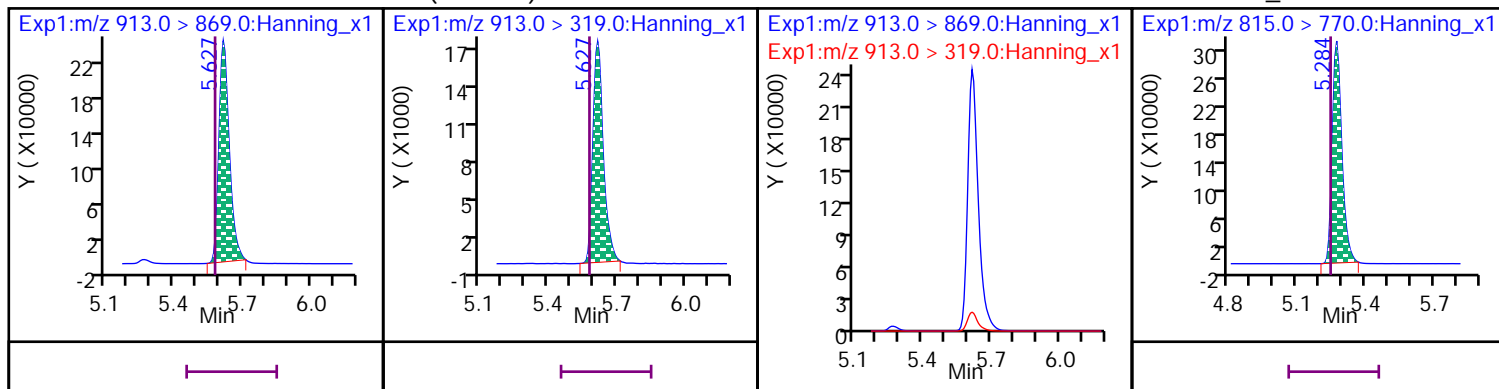
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

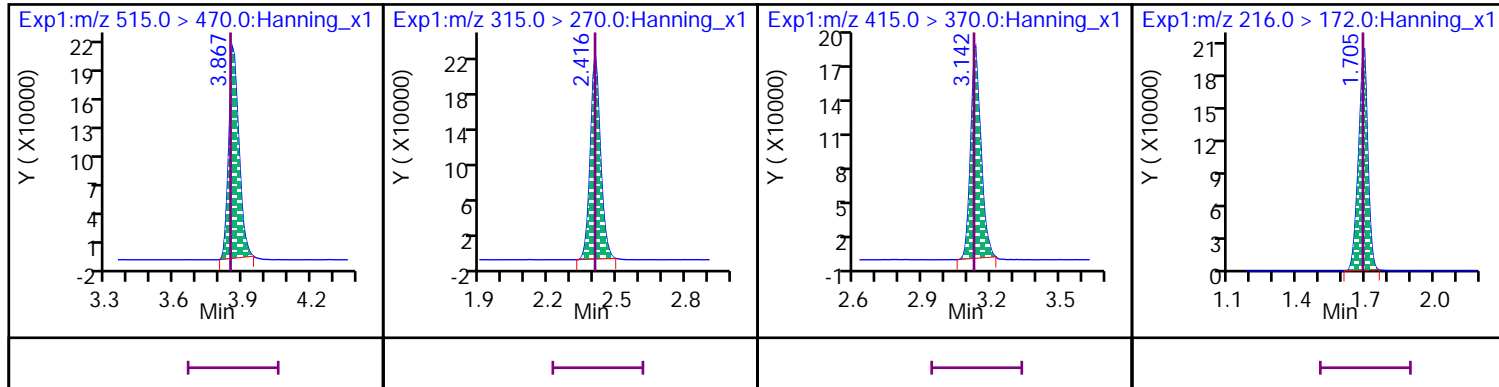


\* 37 13C2\_PFDA

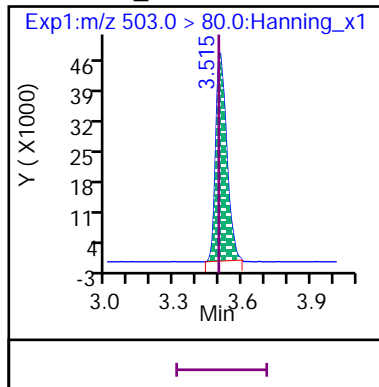
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

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Injection Date: 27-Dec-2020 18:49:02

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

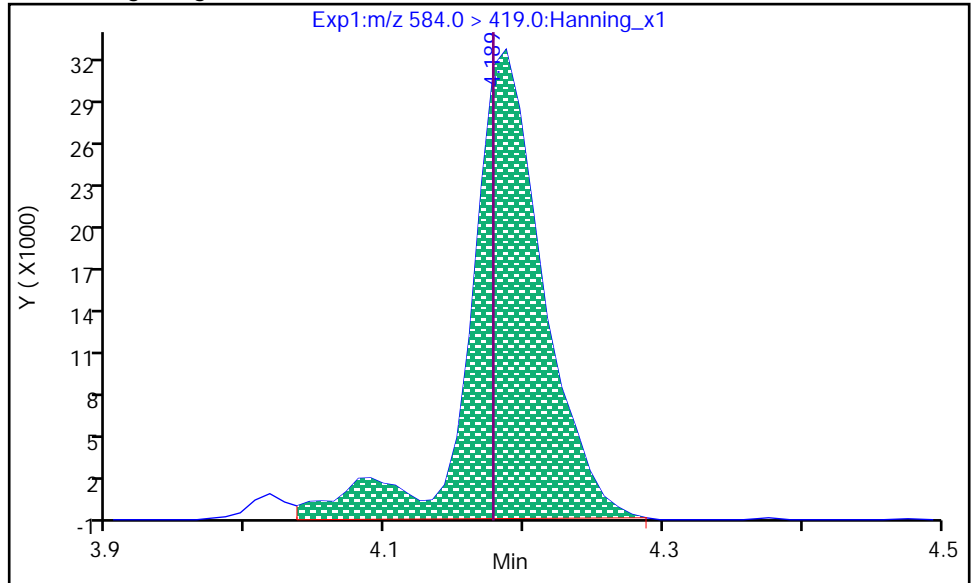
Dil. Factor: 1

Operator: Matthew M. Miller

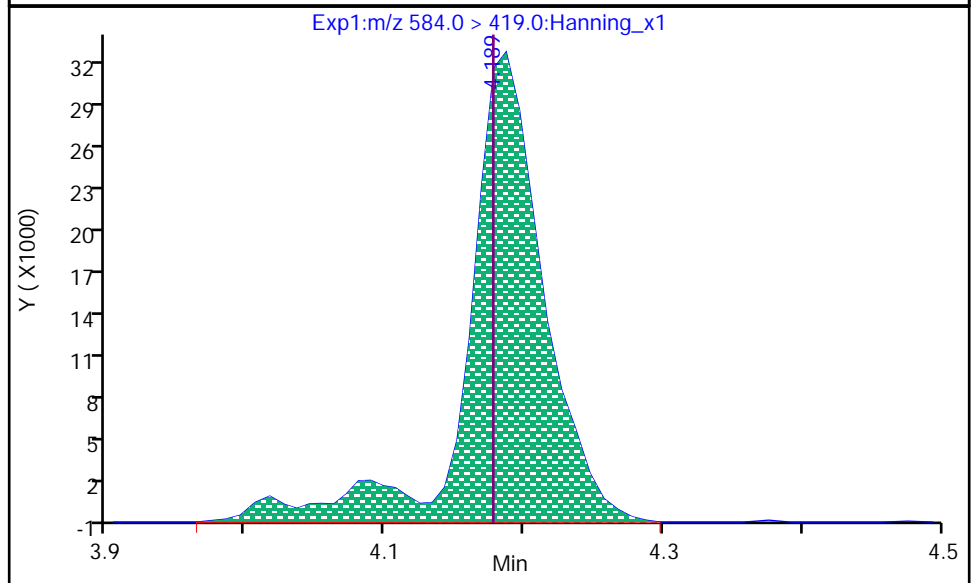
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.189  
Area: 119523  
Amount: 863.36  
Amount Units: ng/L



RT: 4.189  
Area: 124766  
Amount: 901.23  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 13:14:22

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720053.d

Injection Date: 27-Dec-2020 18:49:02

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

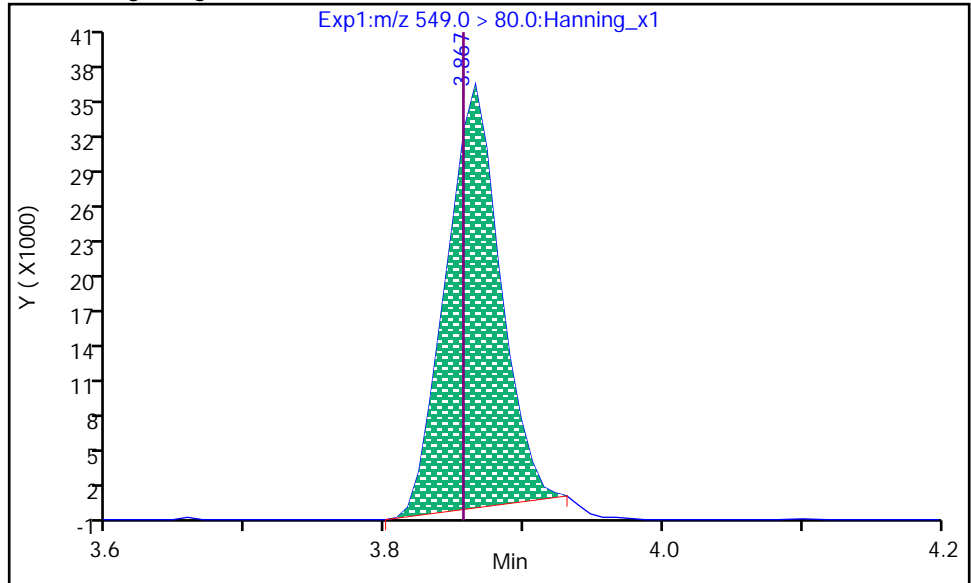
Dil. Factor: 1

Operator: Matthew M. Miller

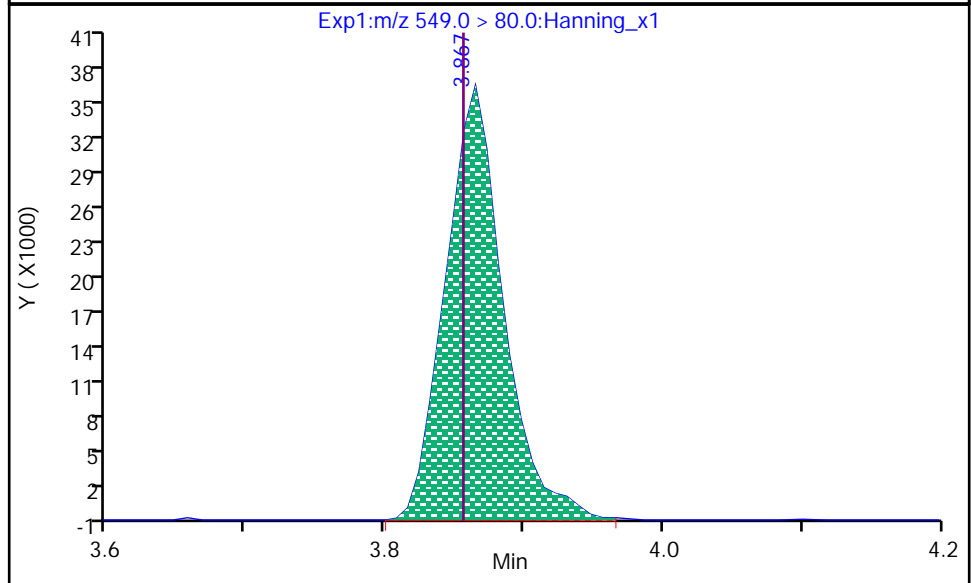
16 PFNS, CAS: 68259-12-1

Processing Integration Results

RT: 3.867  
Area: 96171  
Amount: 786.57  
Amount Units: ng/L



RT: 3.867  
Area: 105904  
Amount: 866.18  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 13:14:12

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d  
Injection Date: 28-Dec-2020 09:55:50 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	100.55	101	70 - 130
D 46 13C4_PFBA	735341	649747			88.4	50 - 150
D 50 13C5_PFPeA	728206	665996			91.5	50 - 150
21 PFPeA			100.00	104.97	105	70 - 130
7 PFBS			88.400	93.422	106	70 - 130
D 44 13C3_PFBS	247575	238207			96.2	50 - 150
1 4:2 FTS			93.400	95.316	102	70 - 130
D 63 13C2_4:2 FTS_2	126464	144067			114	50 - 150
D 49 13C5_PFHxA	774364	743582			96	50 - 150
15 PFHxA			100.00	99.817	99.8	70 - 130
22 PFPeS			93.800	92.565	98.7	70 - 130
28 GenX			200.00	193.32	96.7	70 - 130
D 66 13C3_GenX	1412202	1401050			99.2	50 - 150
D 47 13C4_PFHpA	616003	633684			103	50 - 150
13 PFHpA			100.00	100.59	101	70 - 130
D 45 13C3_PFHxS	179294	174146			97.1	50 - 150
14 PFHxS			91.000	107.33	118	70 - 130
29 ADONA			94.200	97.542	104	70 - 130
D 64 13C2_6:2 FTS_2	104623	104346			99.7	50 - 150
2 6:2 FTS			94.800	87.996	92.8	70 - 130
20 PFOA			100.00	95.965	96	70 - 130
D 53 13C8_PFOA	654941	628007			95.9	50 - 150
12 PFHpS			95.200	105.08	110	70 - 130
18 PFOS			92.800	96.831	104	70 - 130
17 PFNA			100.00	108.15	108	70 - 130
D 56 13C9_PFNA	792377	767623			96.9	50 - 150
D 54 13C8_PFOS	154357	152445			98.8	50 - 150
30 9CI-PF3ONS			93.200	92.655	99.4	70 - 130
D 55 13C8_PFOSA	330552	308857			93.4	50 - 150
19 PFOSA			100.00	106.85	107	70 - 130
16 PFNS			96.000	101.76	106	70 - 130
D 65 13C2_8:2 FTS_2	93314	100453			108	50 - 150
3 8:2 FTS			95.800	89.303	93.2	70 - 130
10 PFDA			100.00	110.16	110	70 - 130
D 51 13C6_PFDA	698114	672868			96.4	50 - 150
D 58 d3-MeFOSAA	762102	791564			104	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	94.755	94.8	70 - 130
9 PFDS			96.400	112.71	117	70 - 130
5 N-EtFOSAA			100.00	117.38	117	70 - 130
25 PFUdA			100.00	89.560	89.6	70 - 130
D 60 d5-EtFOSAA	738335	731651			99.1	50 - 150
D 52 13C7_PFUdA	678701	643525			94.8	50 - 150
D 61 d7-MeFOSE	117292	105402			89.9	50 - 150
32 MeFOSE			100.00	93.380	93.4	70 - 130
26 MeFOSA			100.00	84.122	84.1	70 - 130
D 57 d3-MeFOSA	54969	51840			94.3	50 - 150
31 11Cl-PF3OUDS			94.200	102.70	109	70 - 130
D 62 d9-EtFOSE	121851	137116			113	50 - 150
33 EtFOSE			100.00	98.410	98.4	70 - 130
D 59 d5-EtFOSA	51517	50284			97.6	50 - 150
D 38 13C2_PFDoA	649290	611364			94.2	50 - 150
4 10:2 FTS			96.400	97.637	101	70 - 130
27 EtFOSA			100.00	110.11	110	70 - 130
11 PFDoA			100.00	100.68	101	70 - 130
34 PFDOS			96.800	102.62	106	70 - 130
24 PFTrDA			100.00	97.339	97.3	70 - 130
23 PFTeDA			100.00	105.62	106	70 - 130
D 42 13C2_PFTeDA	887372	813074			91.6	50 - 150
35 PFHxDA			100.00	114.46	114	70 - 130
D 40 13C2_PFHxDA	913664	935525			102	50 - 150
36 PFODA			100.00	99.302	99.3	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d  
 Injection Date: 28-Dec-2020 09:55:50 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 95  
 Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	649747	24	>100:1			1000.00	936.84	88.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	65071	24	35:1			100.00	100.55		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	665996	17	>100:1			1000.00	968.18	91.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	70291	16	81:1			100.00	104.97		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	238207	16	>100:1			1000.00	1034.64	96.2	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	26238	16	>100:1	Target = 3.50		88.400	93.422		
298.9 > 99	44	2.115	2.125		6952	15	41:1	3.77 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	19127	18	>100:1	Target = 3.10		93.800	92.565		
349 > 99	44	2.450	2.450		6359	19	73:1	3.00 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.379	0	144067	19	>100:1			5000.00	5951.14	114	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	5481	16	61:1	Target = 1.80		93.400	95.316		
327 > 81	63	2.397	2.388		3709	19	15:1	1.47 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	743582	20	>100:1			1000.00	1008.83	96	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	73278	17	>100:1	Target = 18.34		100.00	99.817		
313 > 119	49	2.415	2.423		3952	17	39:1	18.54 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1401050	21	>100:1			5000.00	5260.11	99.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	38920	22	>100:1	Target = 0.81		200.00	193.32		
285 > 185	66	2.530	2.530		45121	18	>100:1	0.86 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	-1	633684	20	>100:1			1000.00	1044.57	103	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.772	-1/0	66119	20	>100:1	Target = 3.70		100.00	100.59		
363 > 169	47	2.772	2.772		17345	17	89:1	3.81 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	174146	20	>100:1			1000.00	1017.04	97.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	19817	26	>100:1	Target = 3.21	0.10	91.000	107.33		M
399 > 99	45	2.790	2.790		4757	23	19:1	4.16 (1.60-4.81)	0.23				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.808	2.808	-1/-1	107845	27	>100:1	Target = 2.97		94.200	97.542		
377 > 85	45	2.818	2.808		36338	17	>100:1	2.96 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	16624	22	80:1	Target = 3.08		95.200	105.08		
449 > 99	45	3.154	3.154		4746	23	21:1	3.50 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.114	-1	104346	23	>100:1			5000.00	5418.21	99.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.128	0/1	4912	23	55:1	Target = 1.80		94.800	87.996		M
427 > 81	64	3.128	3.128		3590	25	37:1	1.36 (0.90-2.71)					M
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.141	-1	628007	24	>100:1			1000.00	1061.07	95.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	-1/0	61439	21	34:1	Target = 2.87		100.00	95.965		
413 > 169	53	3.148	3.148		25407	27	>100:1	2.41 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.520	3.520	-1	152445	21	>100:1			1000.00	1016.78	98.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.520	-1/0	17492	42	>100:1	Target = 3.84	0.31	92.800	96.831		
499 > 99	54	3.520	3.520		3807	34	16:1	4.59 (1.92-5.76)	0.20				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.722	3.722	-1/0	47551	27	>100:1			93.200	92.655		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	-1/0	11872	19	64:1	Target = 3.07		96.000	101.76		
549 > 99	54	3.857	3.865		5222	11		2.27 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.169	4.169	-1/0	12470	16	65:1	Target = 3.03		96.400	112.71		
599 > 99	54	4.161	4.169		4183	16	12:1	2.98 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.317	4.317	-2/-1	44462	18	>100:1			94.200	102.70		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.663	4.663	-2/-1	12560	17	>100:1	Target = 3.33		96.800	102.62		
699 > 99	54	4.672	4.663		3450	15		3.64 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.520	3.520	-1	767623	23	>100:1			1000.00	1022.18	96.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.520	3.520	-1/0	83020	23	>100:1	Target = 6.16		100.00	108.15		
463 > 169	56	3.520	3.520		12678	25	70:1	6.54 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.849	3.849	-1	308857	21	>100:1			1000.00	997.72	93.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.841	3.841	-1/0	32521	18	>100:1			100.00	106.85		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.857	3.857	-2	100453	22	>100:1			5000.00	5415.22	108	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.873	0/2	4215	17		Target = 1.95		95.800	89.303		M
527 > 81	65	3.849	3.873		2042	18	17:1	2.06 (0.97-2.93)					M
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.455	4.455	-2/0	4533	26		Target = 3.14		96.400	97.637		
627 > 80	65	4.455	4.455		1943	18	14:1	2.33 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.865	3.865	-2	672868	22	>100:1			1000.00	1014.38	96.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	-1/1	72834	20	>100:1	Target = 15.94		100.00	110.16		
513 > 169	51	3.873	3.873		5337	17	44:1	13.64 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.029	4.029	-1	791564	19	>100:1			5000.00	5514.61	104	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.029	4.029	-2/-1	11523	33	44:1	Target = 1.33	0.07	100.00	94.755		
570 > 483	58	4.018	4.029		10473	29		1.10 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.178	4.178	-2	731651	18	>100:1			5000.00	5508.81	99.1	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.187	4.187	0/2	17100	39	55:1	Target = 1.58	0.09	100.00	117.38		M
584 > 526	60	4.187	4.187		8220	27	24:1	2.08 (0.79-2.37)	0.14				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.178	4.178	-2	643525	17	>100:1			1000.00	1018.12	94.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.178	4.178	-2/0	54169	15	>100:1	Target = 15.50		100.00	89.560		
563 > 169	52	4.178	4.178		3514	20	34:1	15.41 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.287	4.287	0	105402	16	>100:1			1000.00	974.07	89.9	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.297	4.297	0/0	9248	11	37:1			100.00	93.380		M
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.307	4.307	0	51840	17	>100:1			1000.00	979.65	94.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	0/0	4920	15	43:1	Target = 1.12		100.00	84.122		
512 > 219	57	4.307	4.317		4157	12	35:1	1.18 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.455	0	137116	17	>100:1			1000.00	1093.47	113	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.464	4.464	0/0	12005	25	64:1			100.00	98.410		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	-1	611364	19				1000.00	1009.99	94.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.446	4.446	-2/-1	62330	19	35:1	Target = 10.85		100.00	100.68		
613 > 169	38	4.446	4.446		5732	21	64:1	10.87 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.688	4.688	-2/-1	58613	21	>100:1	Target = 8.37		100.00	97.339		
663 > 169	38	4.688	4.688		7478	25	>100:1	7.83 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.473	4.473	0	50284	16	>100:1			1000.00	1024.23	97.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	0/0	6049	22	68:1	Target = 1.03		100.00	110.11		
526 > 219	59	4.482	4.482		4966	21	43:1	1.21 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.906	-2	813074	19	>100:1			1000.00	965.14	91.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.906	4.906	-2/0	74407	19	10:1	Target = 12.11		100.00	105.62		
713 > 169	42	4.906	4.906		6442	17	>100:1	11.55 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.282	5.282	-3	935525	18	>100:1			1000.00	1032.40	102	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.282	5.282	-3/0	69963	21	21:1	Target = 11.48		100.00	114.46		
813 > 269	40	5.282	5.282		5976	17	>100:1	11.70 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.625	5.625	-3/0	82236	25	9.6:1	Target = 13.88		100.00	99.302		
913 > 319	40	5.625	5.625		5894	33	>100:1	13.95 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.873	-1	732310	21	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	731022	19	>100:1					97.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	-1	599453	24	>100:1					93.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	609619	24	>100:1					91.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	-1	163036	21	>100:1					100	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID:

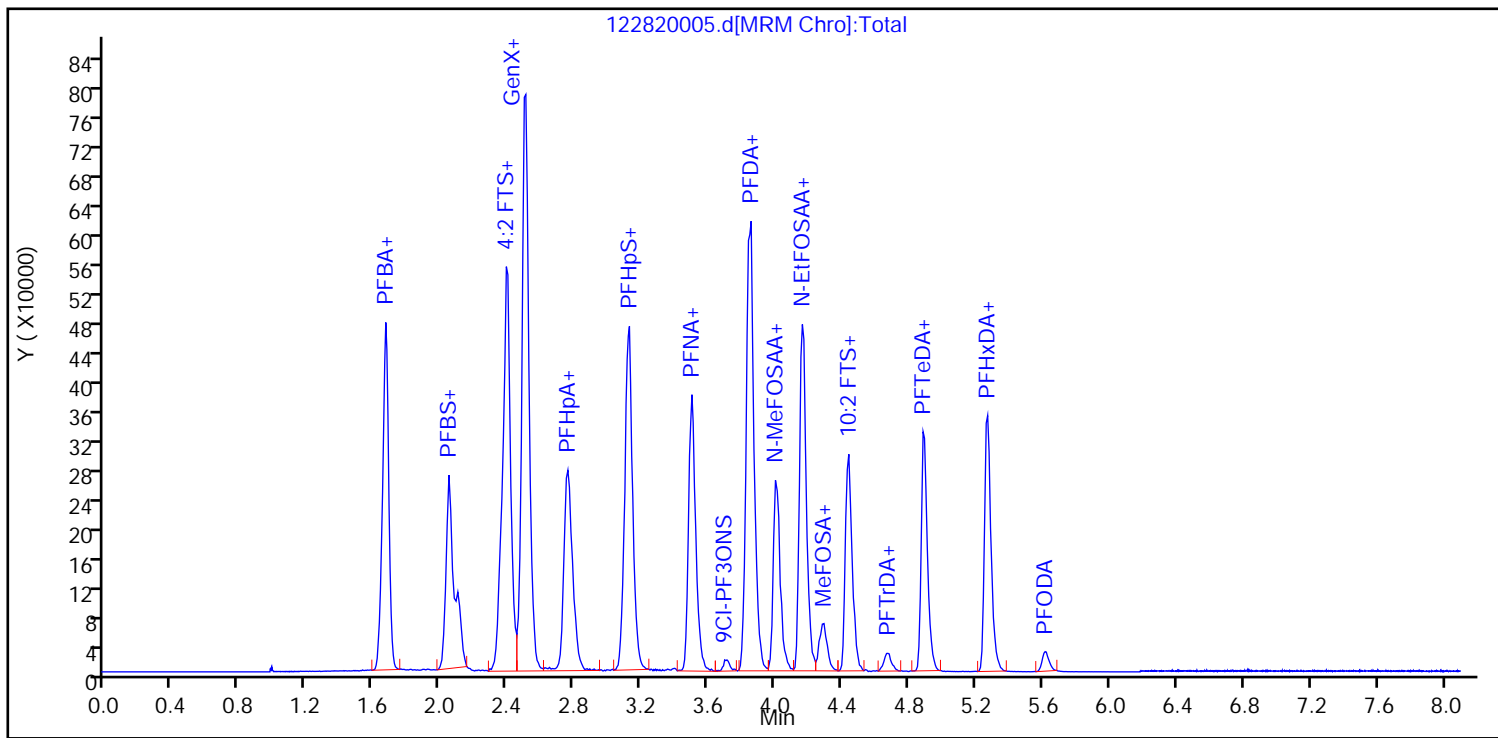
ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

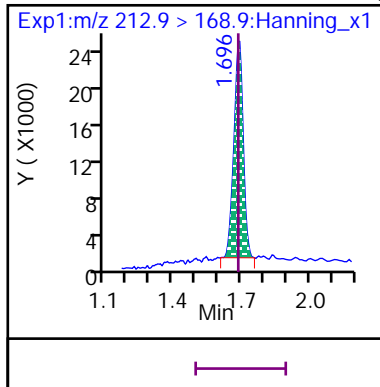
Dil. Factor: 1

Operator:

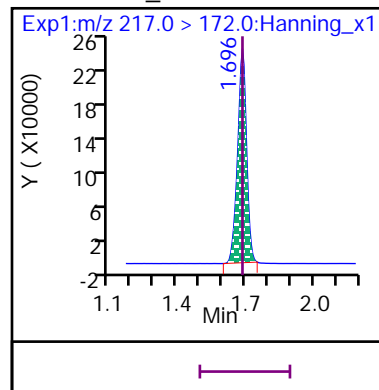
Matthew M. Miller



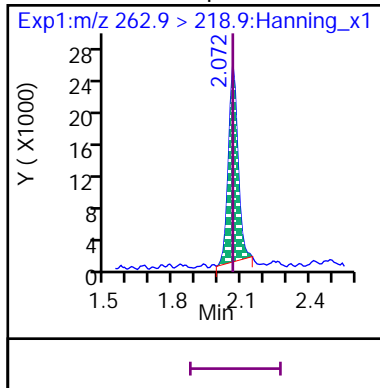
8 Perfluoro-n-butanoic acid (PFBA)



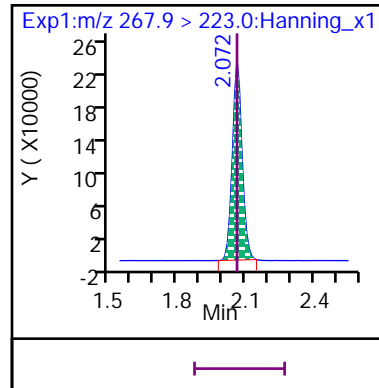
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



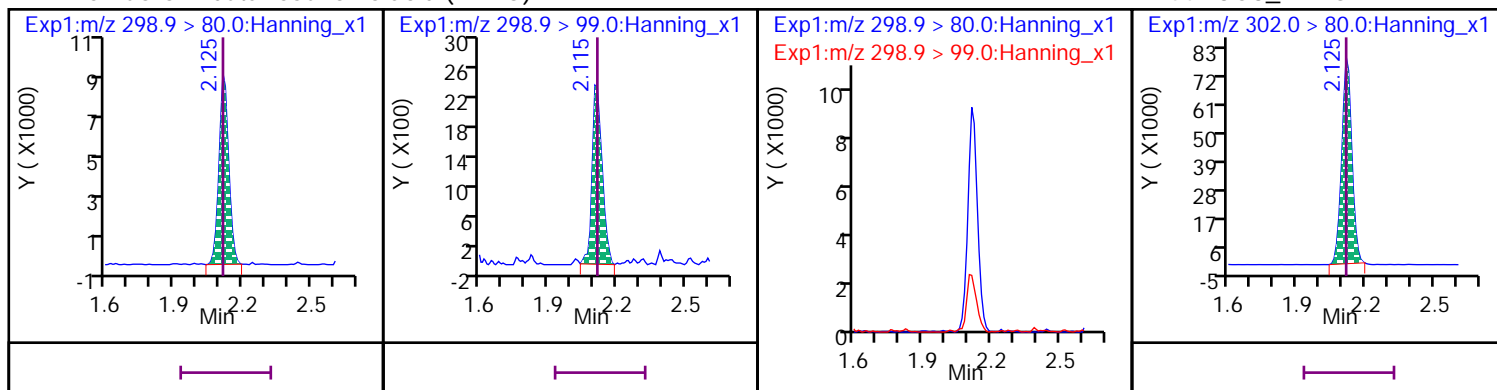
D 50 13C5\_PFPeA





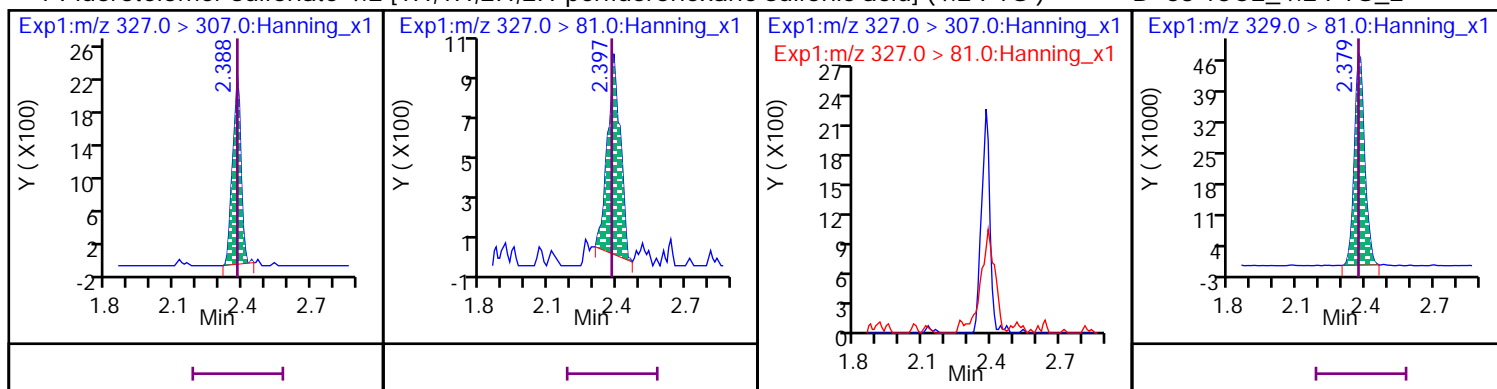
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



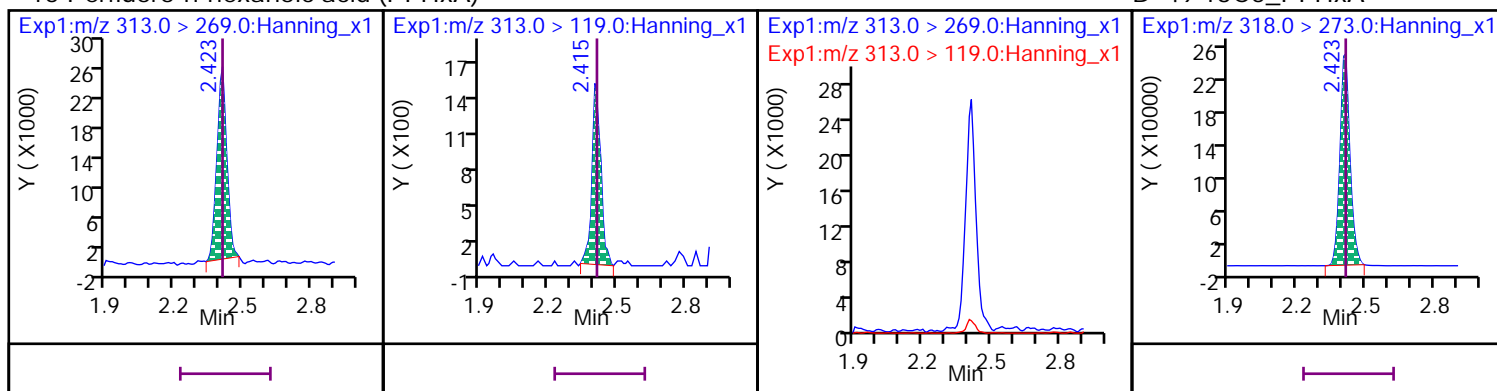
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



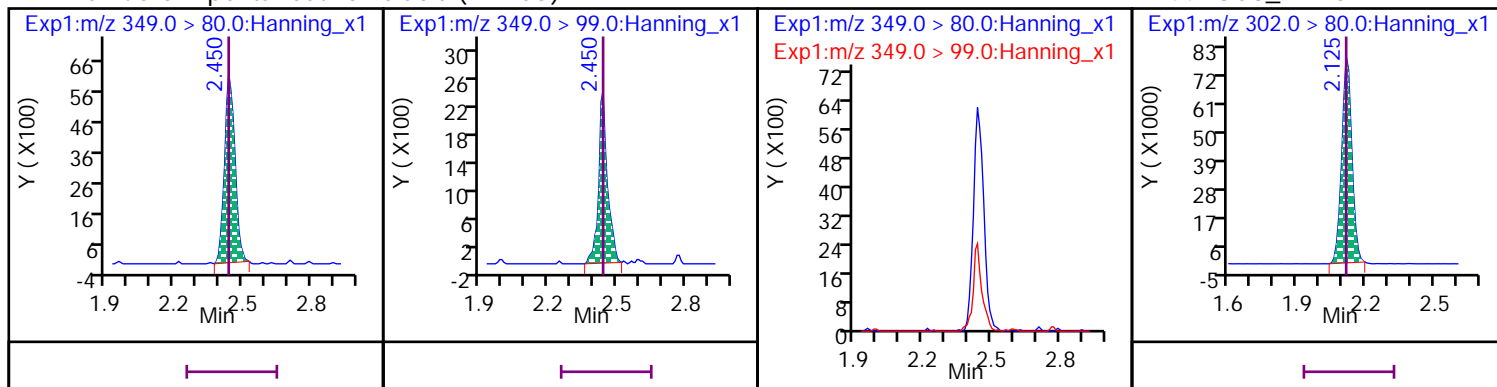
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



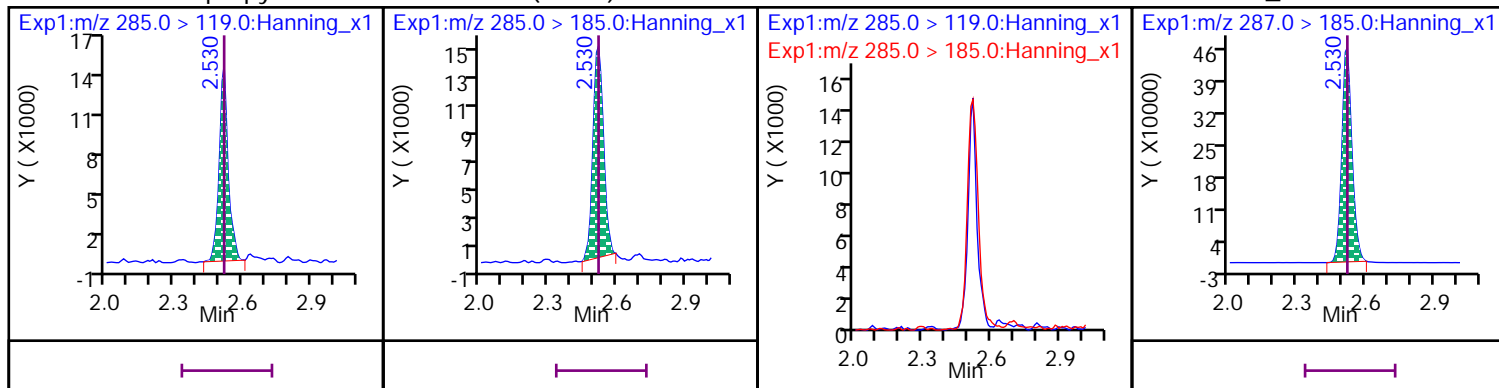
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



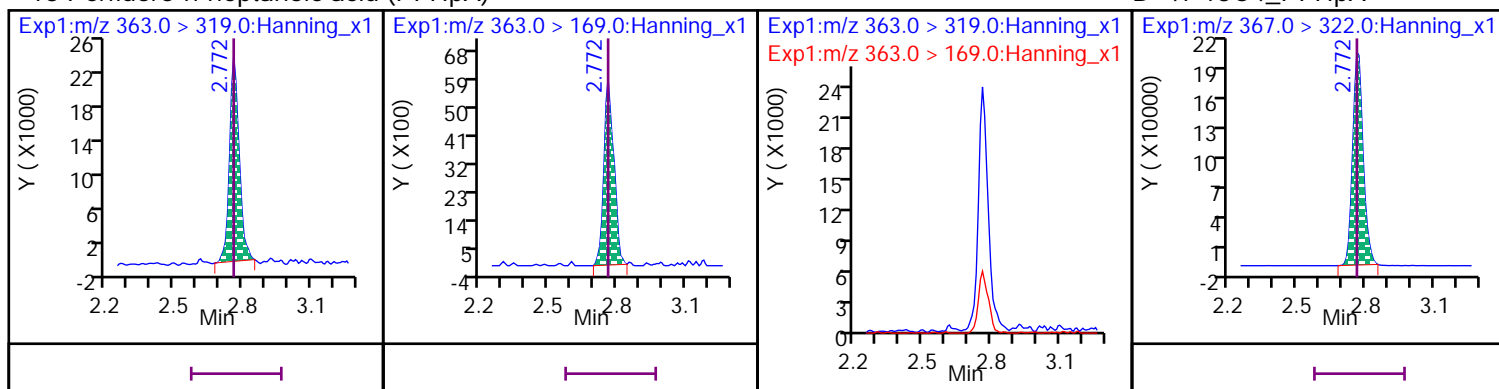
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



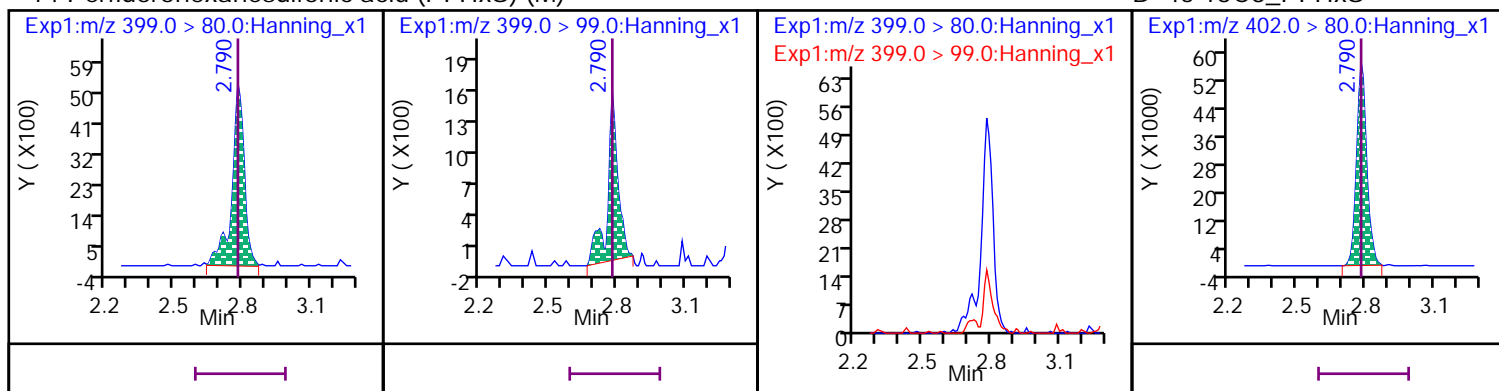
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



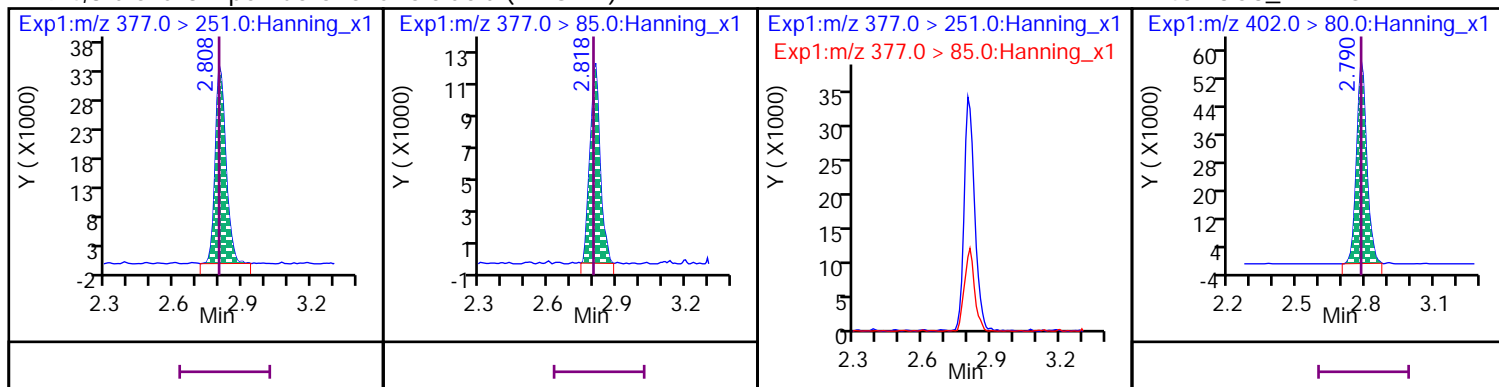
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS

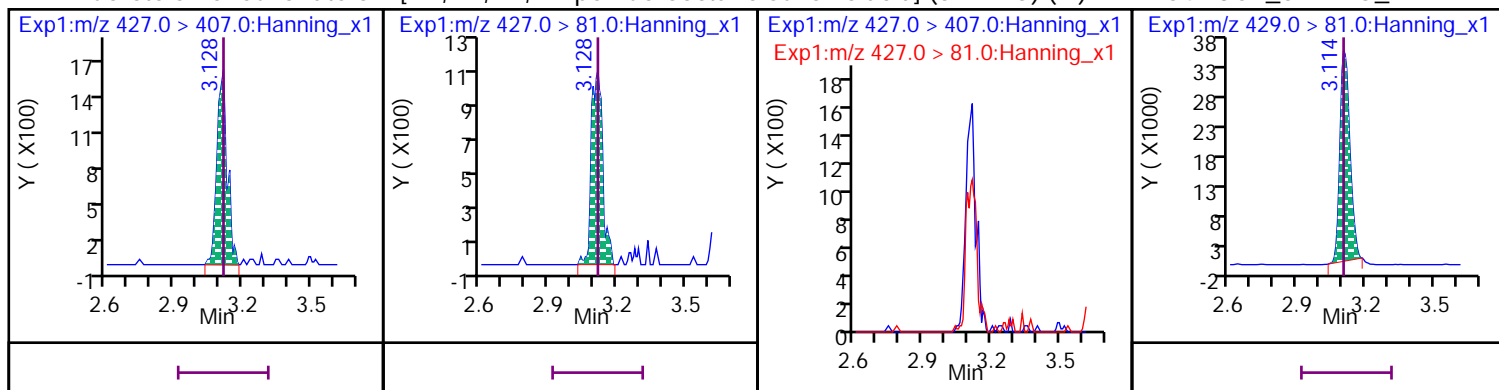


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS

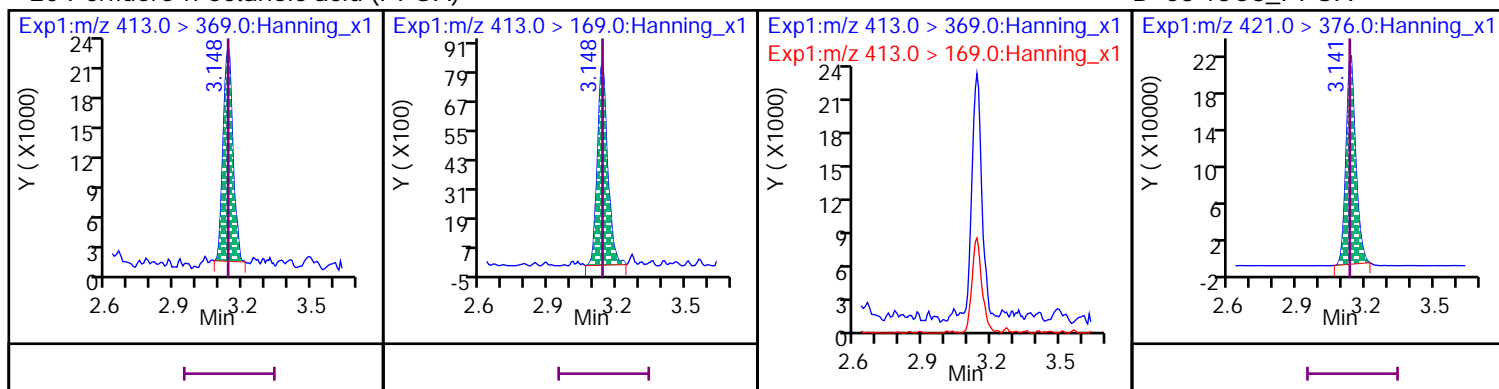


## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M) D 64 13C2\_6:2 FTS\_2



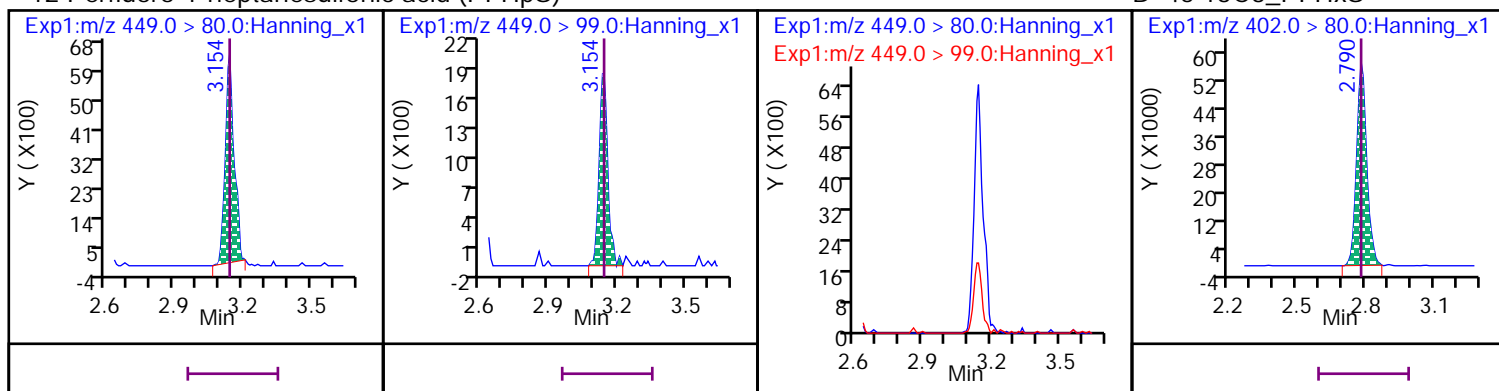
## 20 Perfluoro-n-octanoic acid (PFOA)

## D 53 13C8\_PFOA



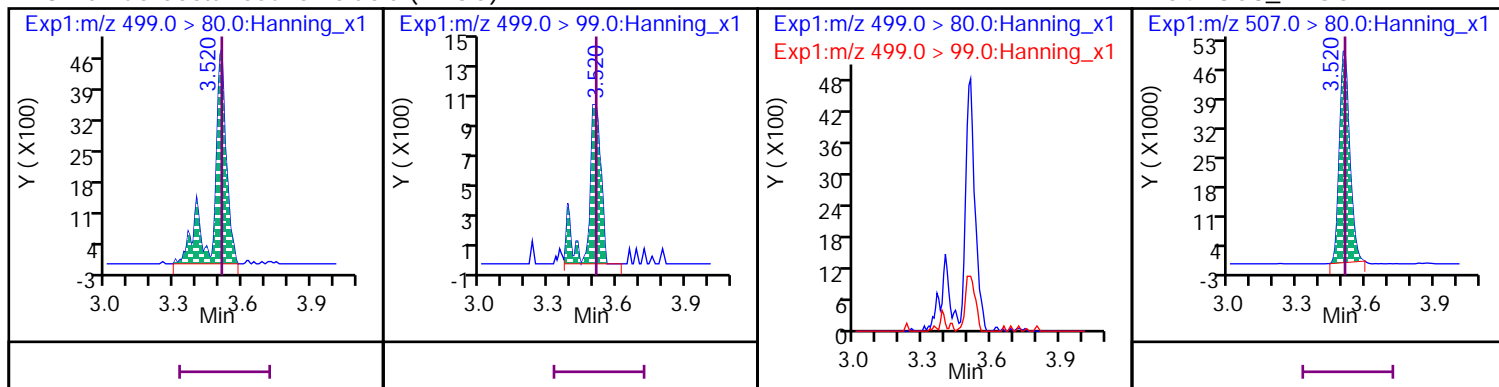
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

## D 45 13C3\_PFHxS



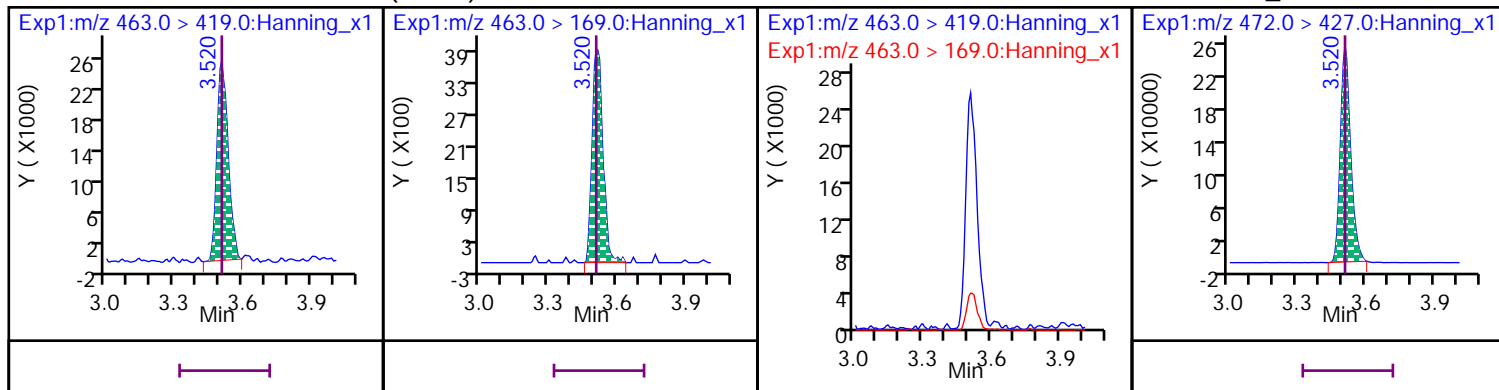
## 18 Perfluorooctanesulfonic acid (PFOS)

## D 54 13C8\_PFOS



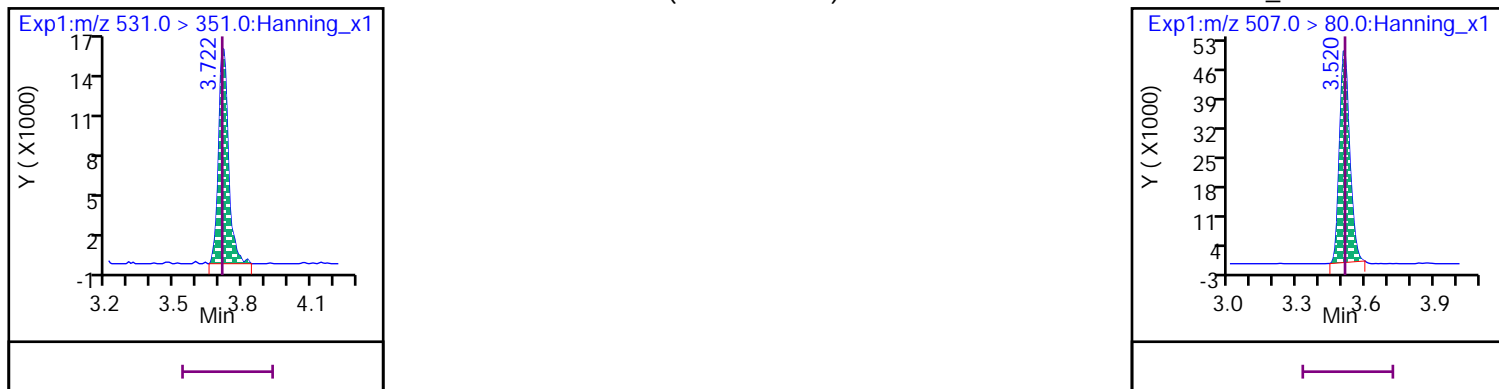
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



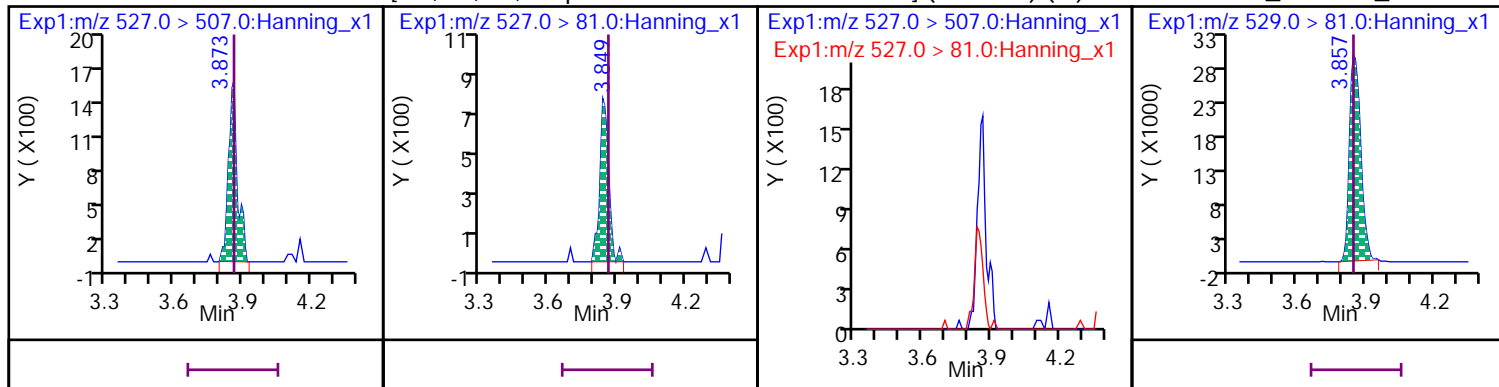
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



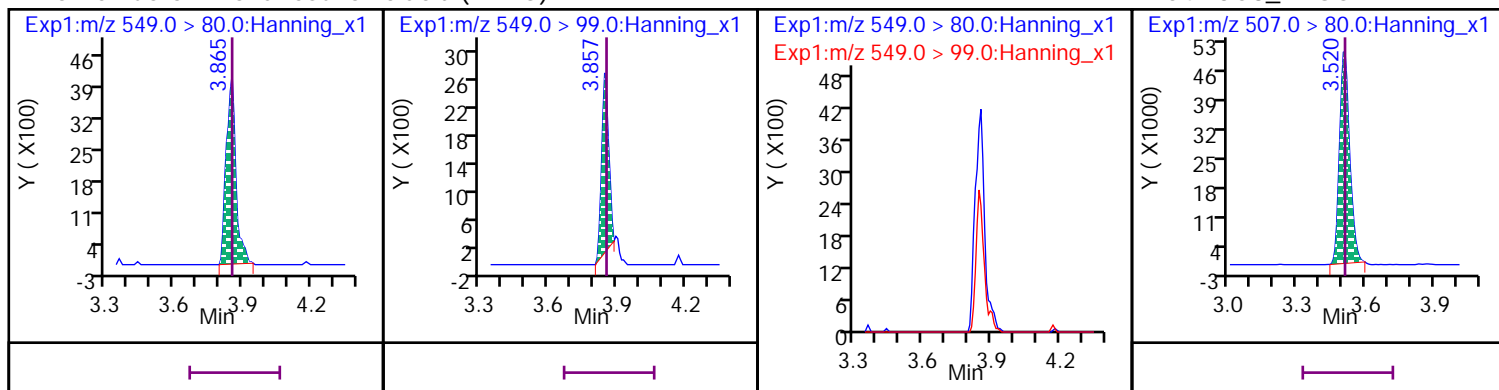
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



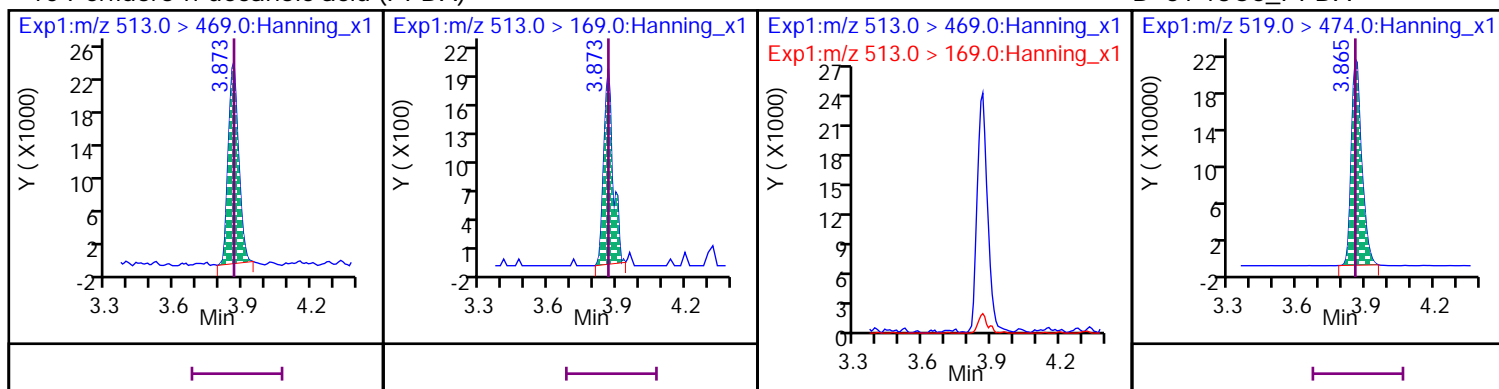
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



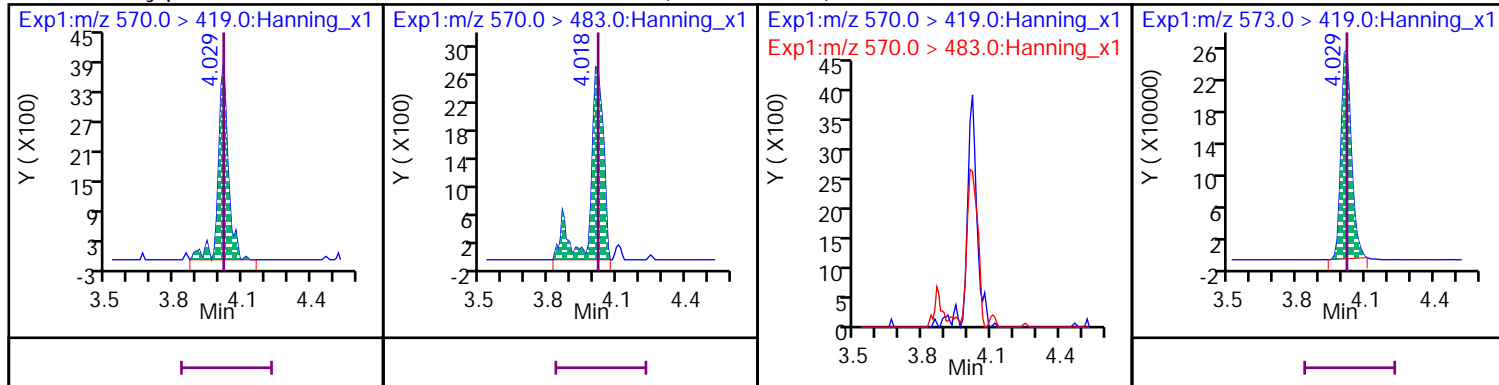
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



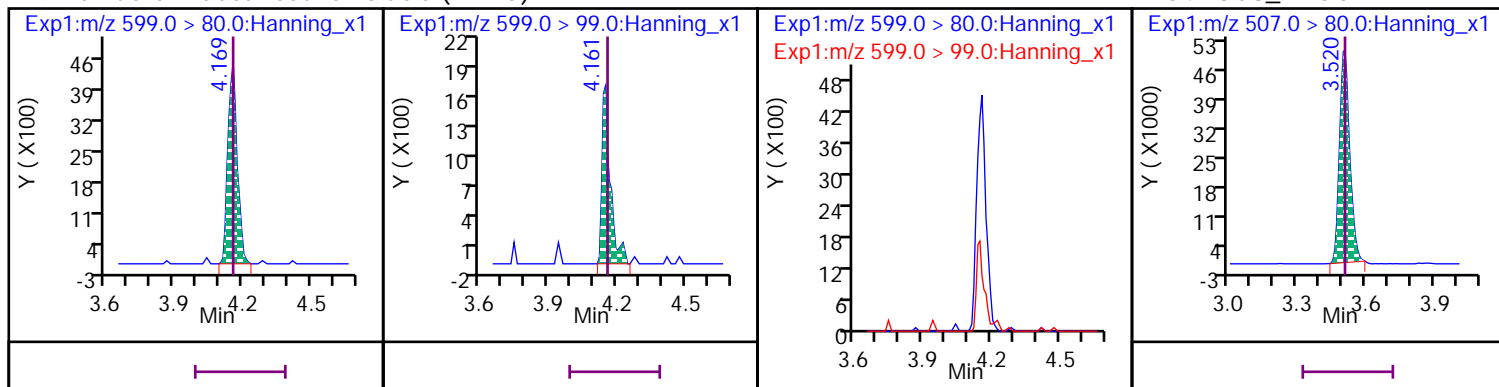
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



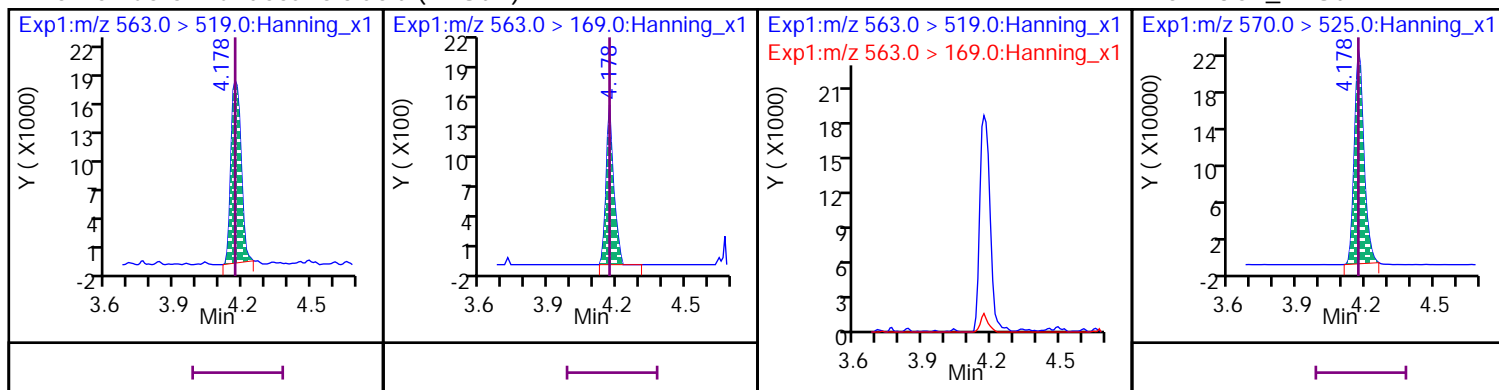
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



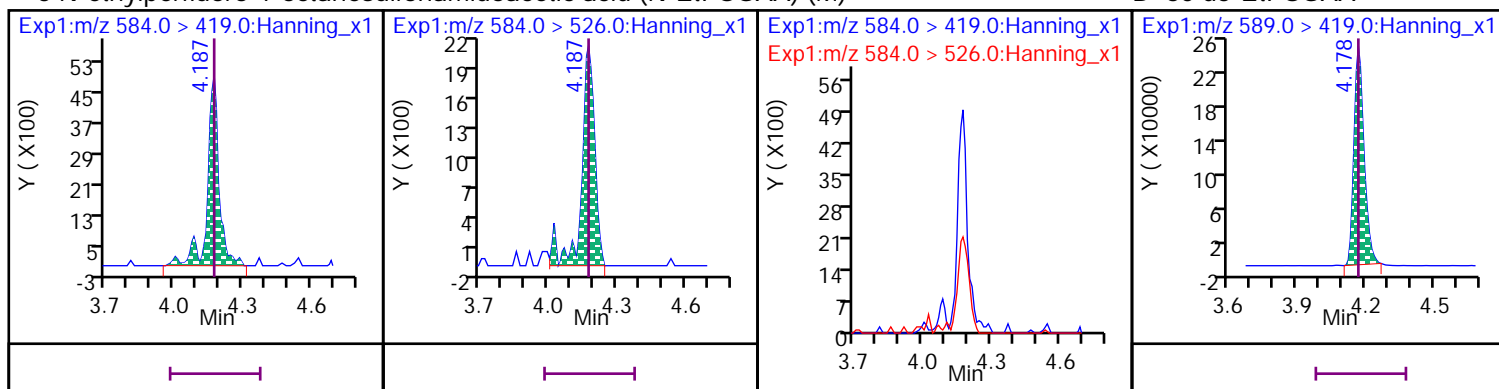
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



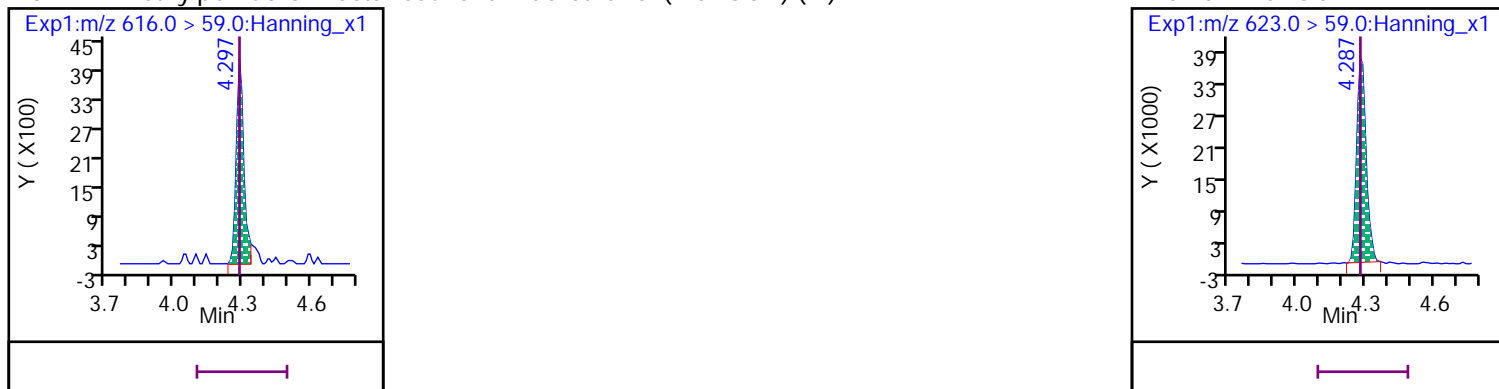
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



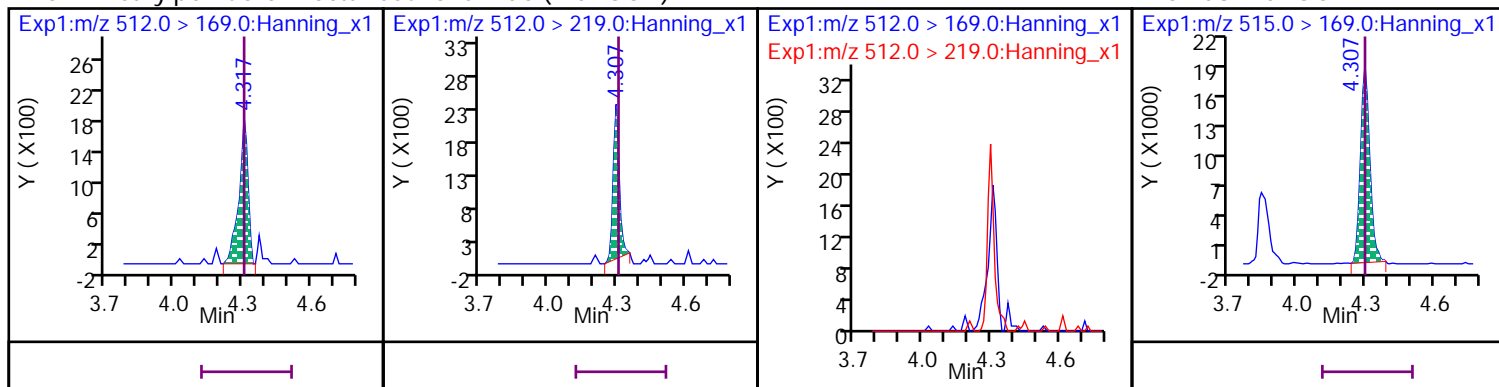
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (M)

D 61 d7-MeFOSE

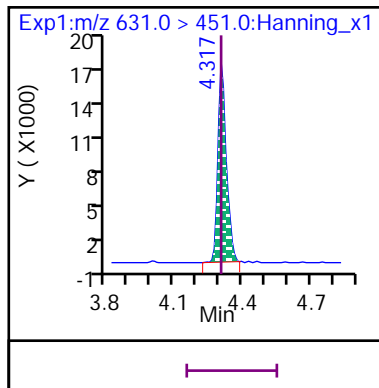


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

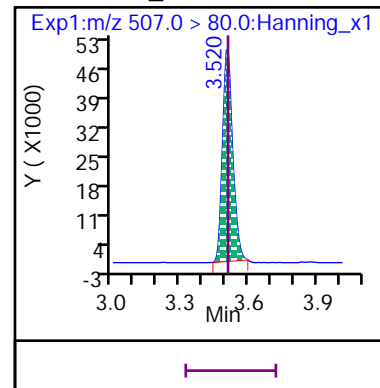
D 57 d3-MeFOSA



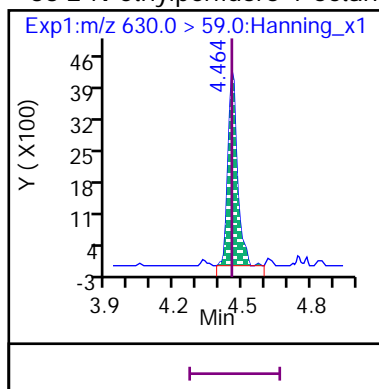
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



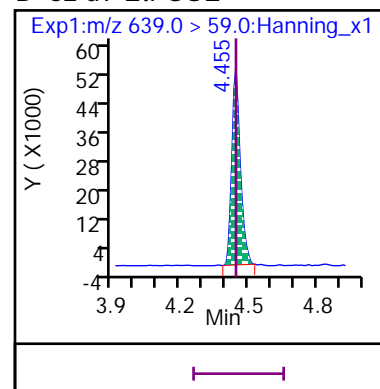
## D 54 13C8\_PFOS



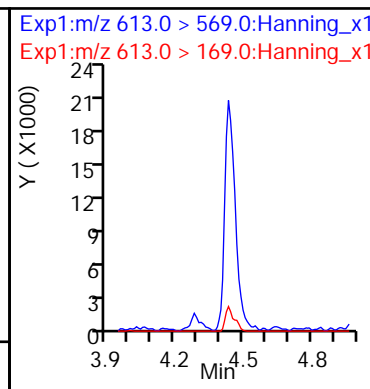
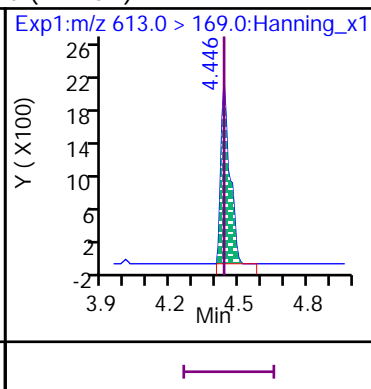
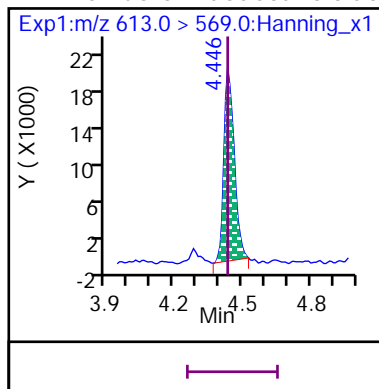
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



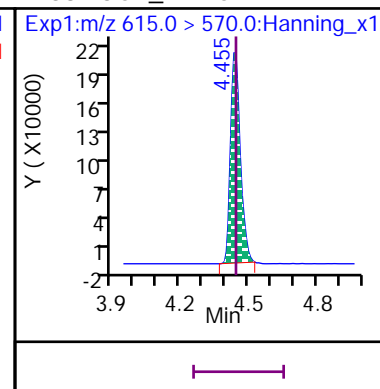
## D 62 d9-EtFOSE



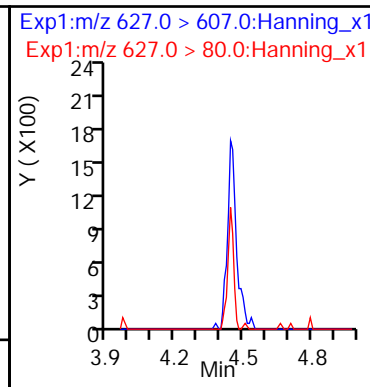
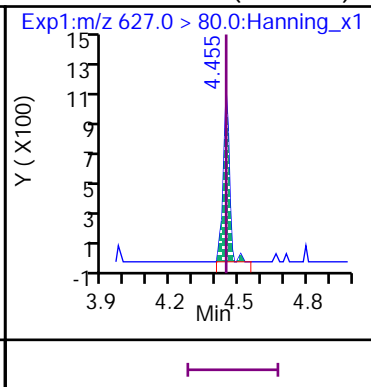
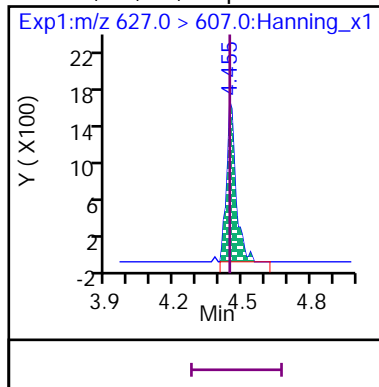
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



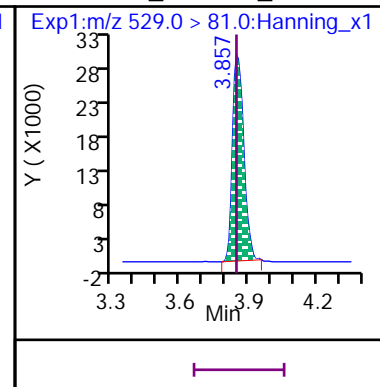
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

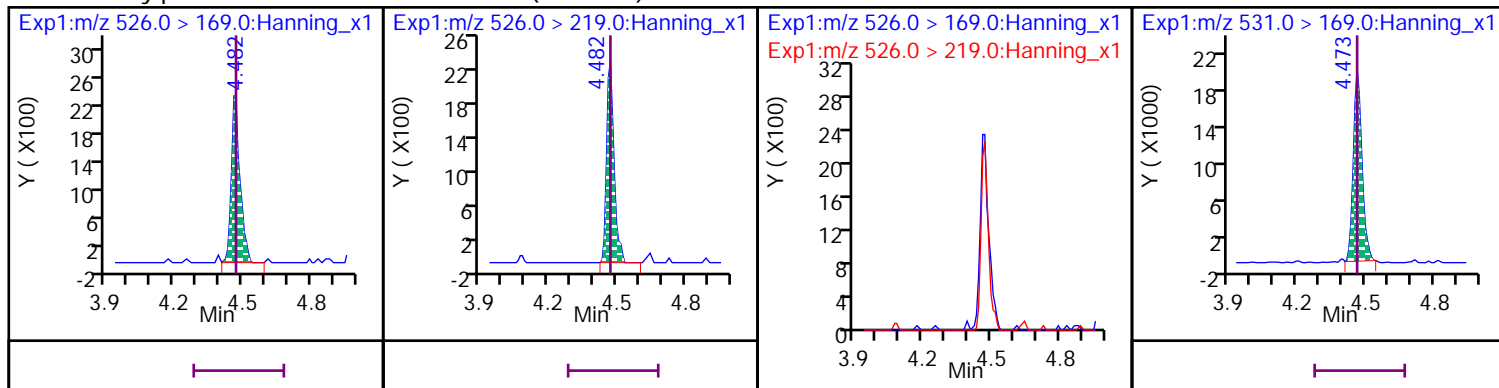


## D 65 13C2\_8:2 FTS\_2



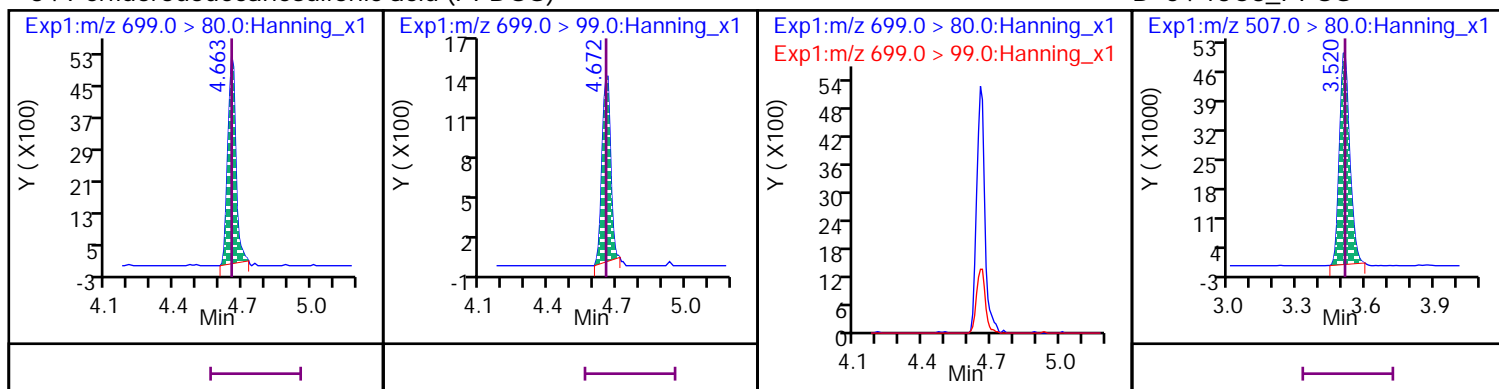
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



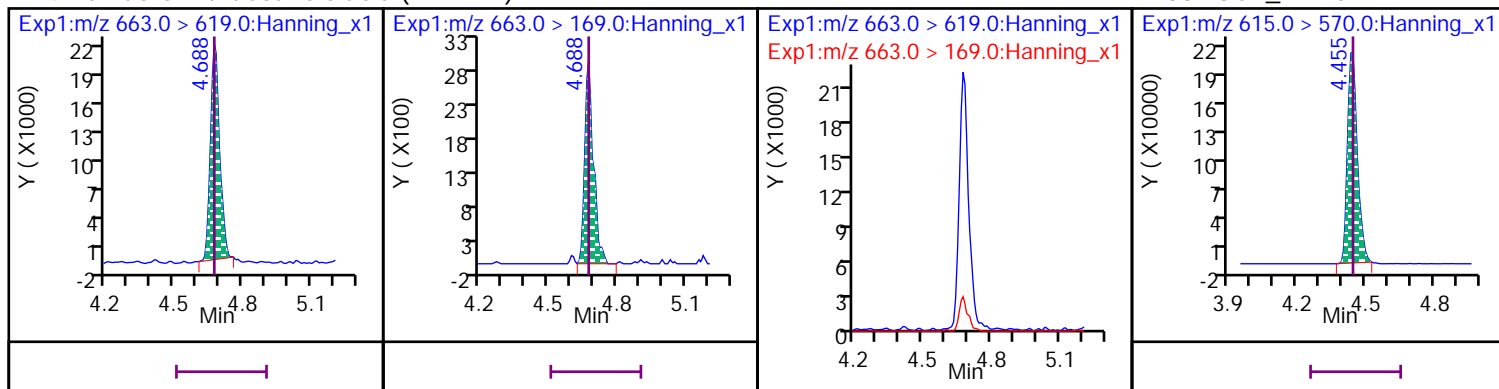
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



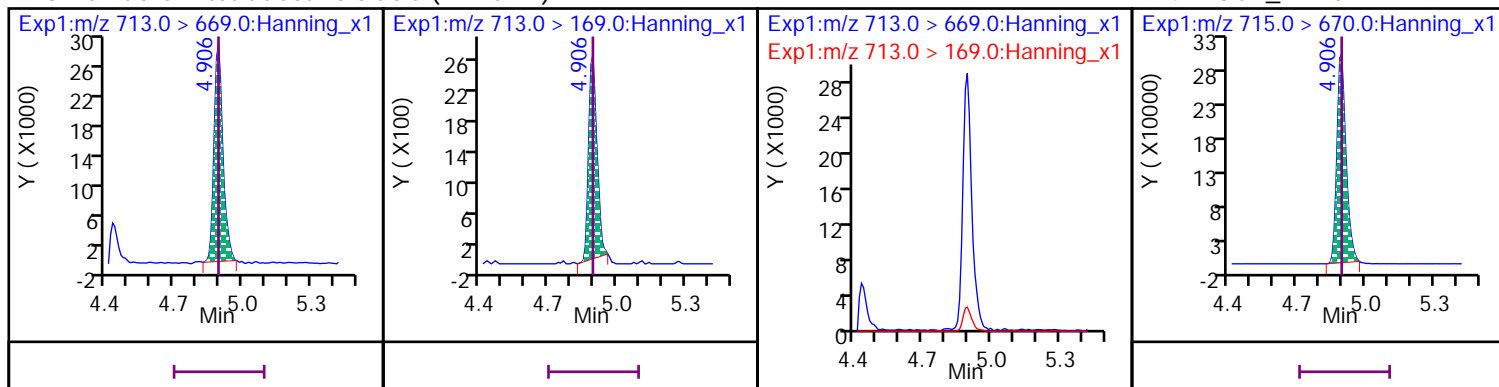
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

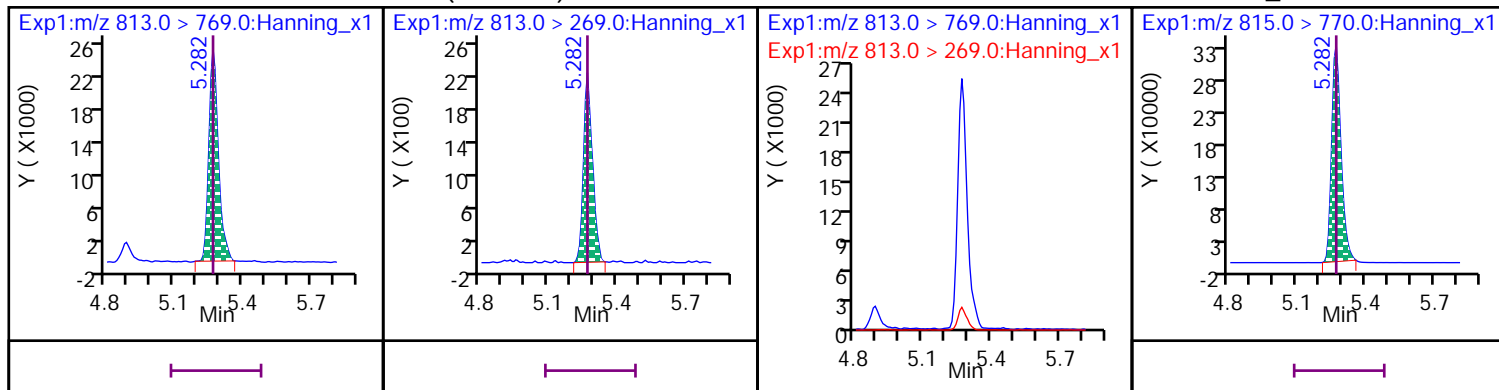
## D 42 13C2\_PFTeDA





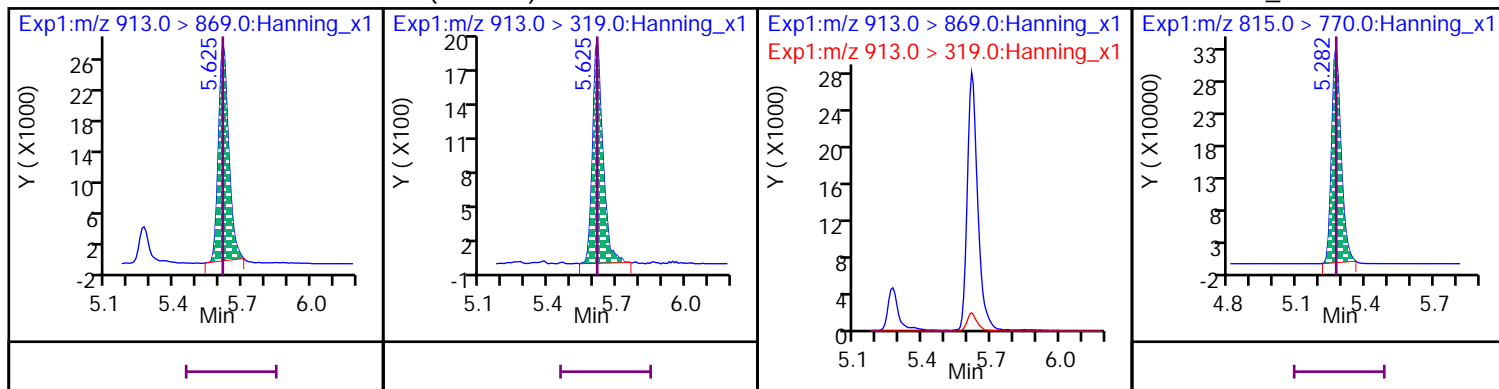
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

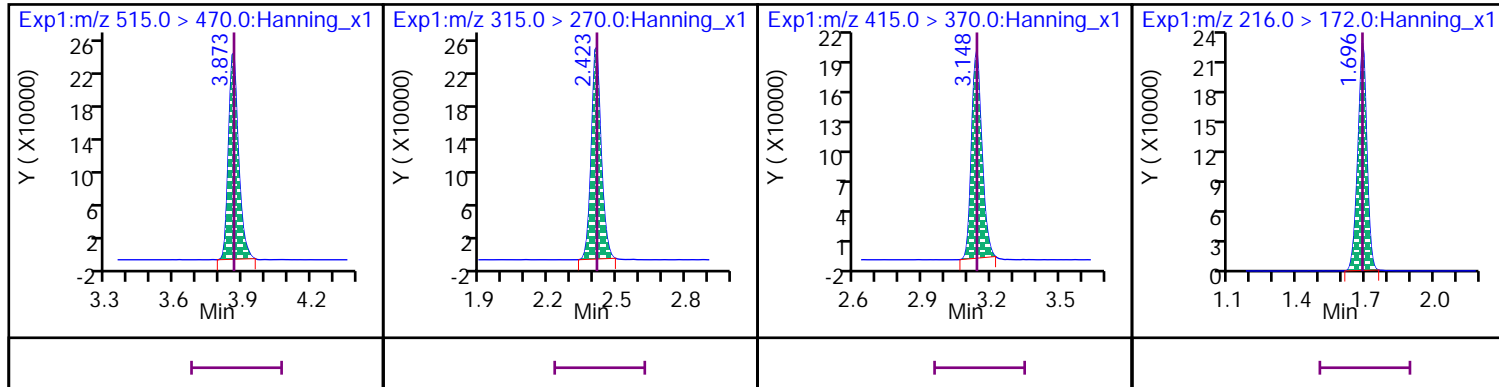


\* 37 13C2\_PFDA

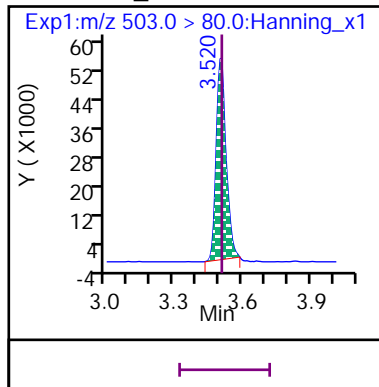
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

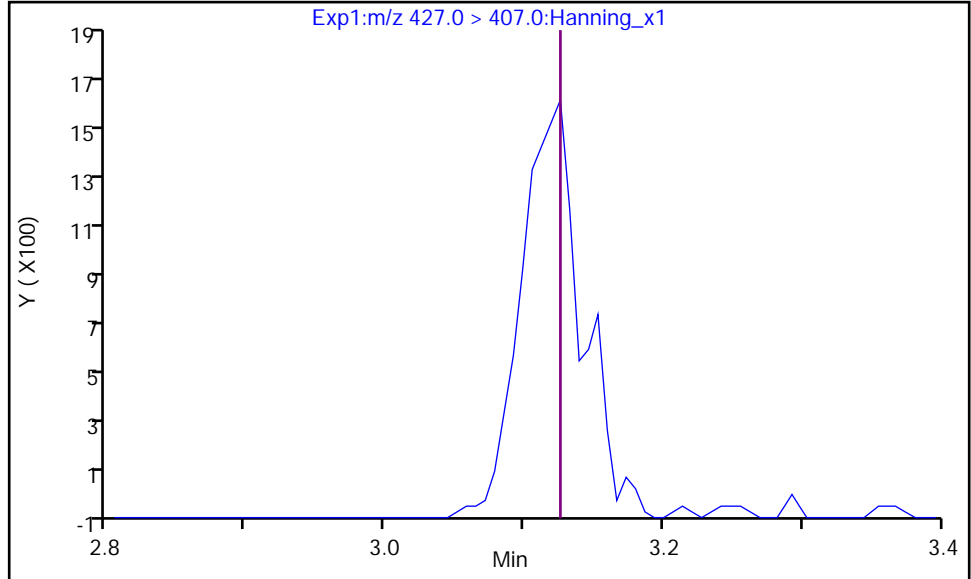
Dil. Factor: 1

Operator: Matthew M. Miller

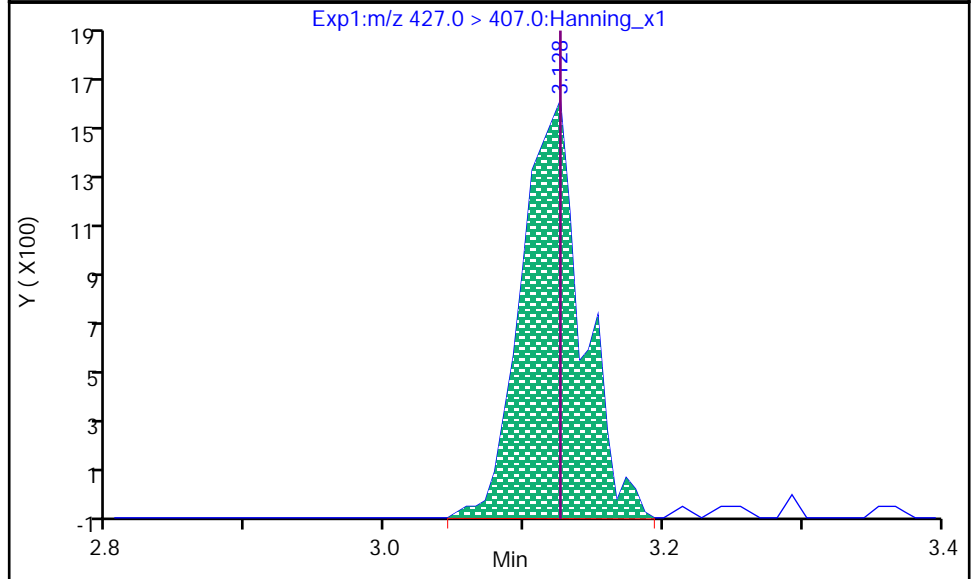
2 6:2 FTS, CAS: 27619-97-2

Not Detected  
Expected RT: 3.128  
RT Window: 2.914-3.314

Processing Integration Results



RT: 3.128  
Area: 4912  
Amount: 87.996  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:11  
Audit Action: Mint  
Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

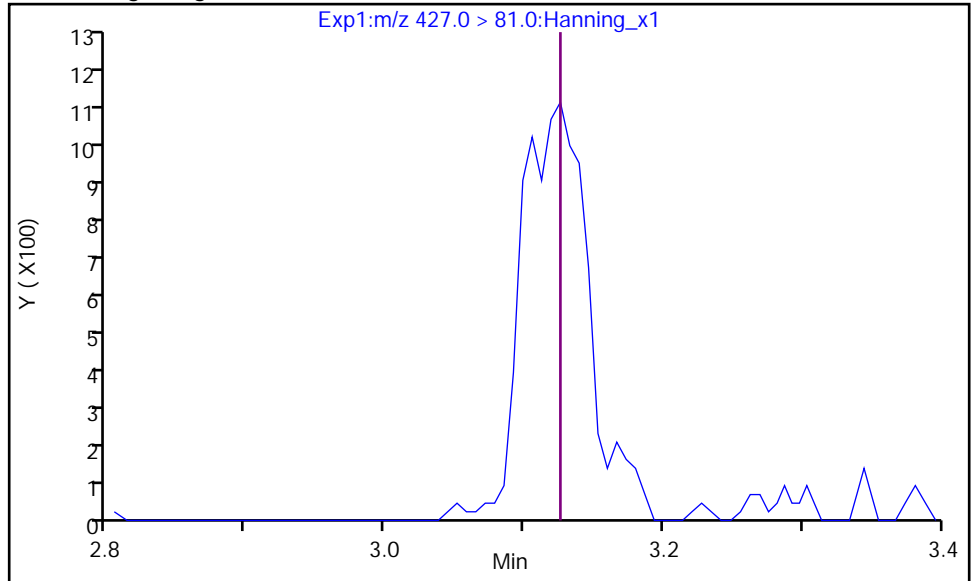
Dil. Factor: 1

Operator: Matthew M. Miller

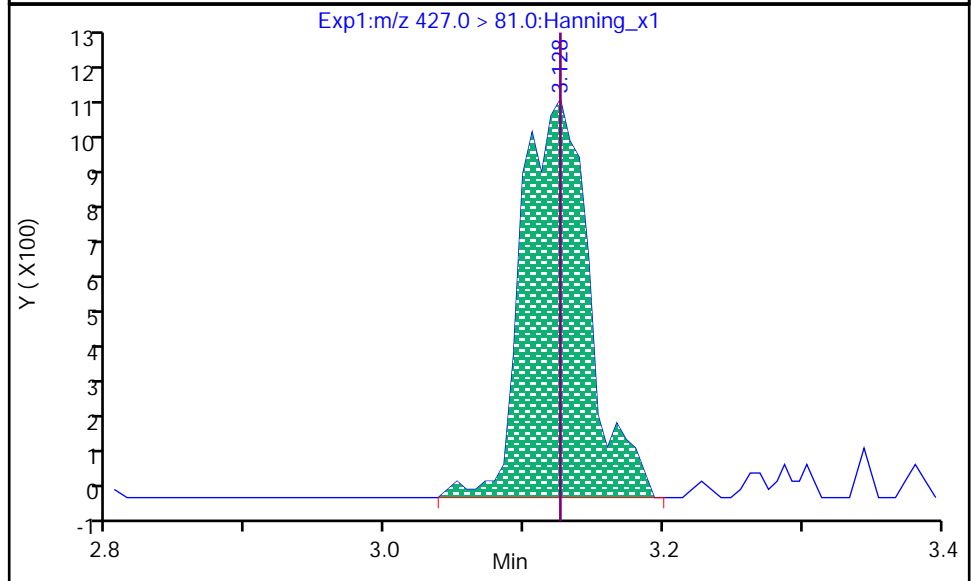
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

Not Detected  
Expected RT: 3.128  
RT Window: 2.914-3.314



RT: 3.128  
Area: 3590  
Amount: 87.996  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:15

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

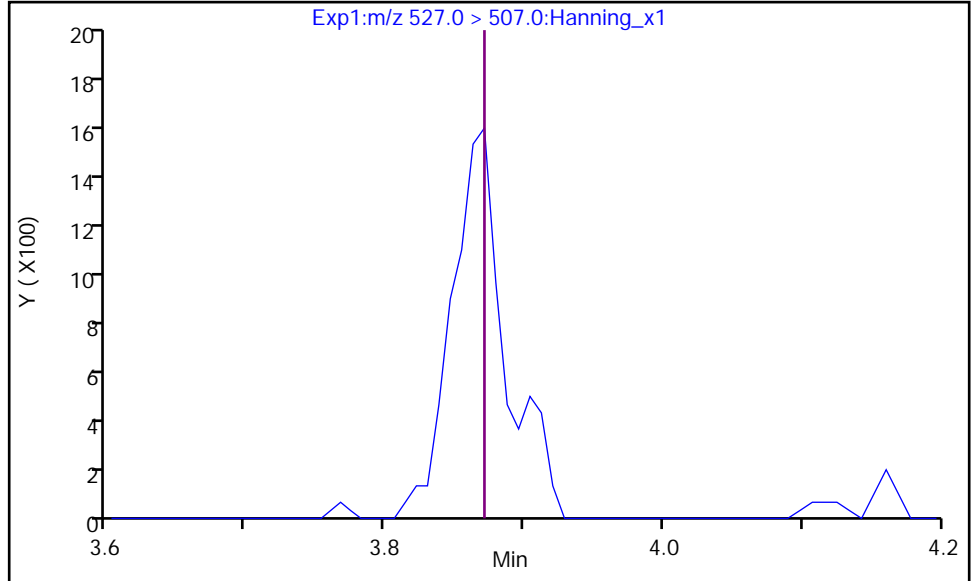
Dil. Factor: 1

Operator: Matthew M. Miller

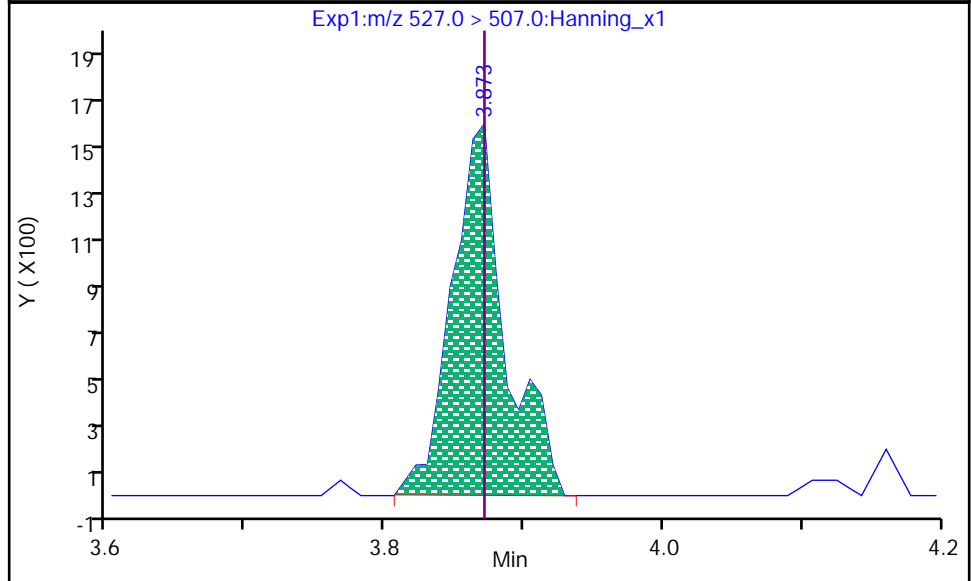
3 8:2 FTS, CAS: 39108-34-4

Not Detected  
Expected RT: 3.873  
RT Window: 3.657-4.057

Processing Integration Results



RT: 3.873  
Area: 4215  
Amount: 89.303  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:19  
Audit Action: Mint  
Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

Dil. Factor: 1

Operator: Matthew M. Miller

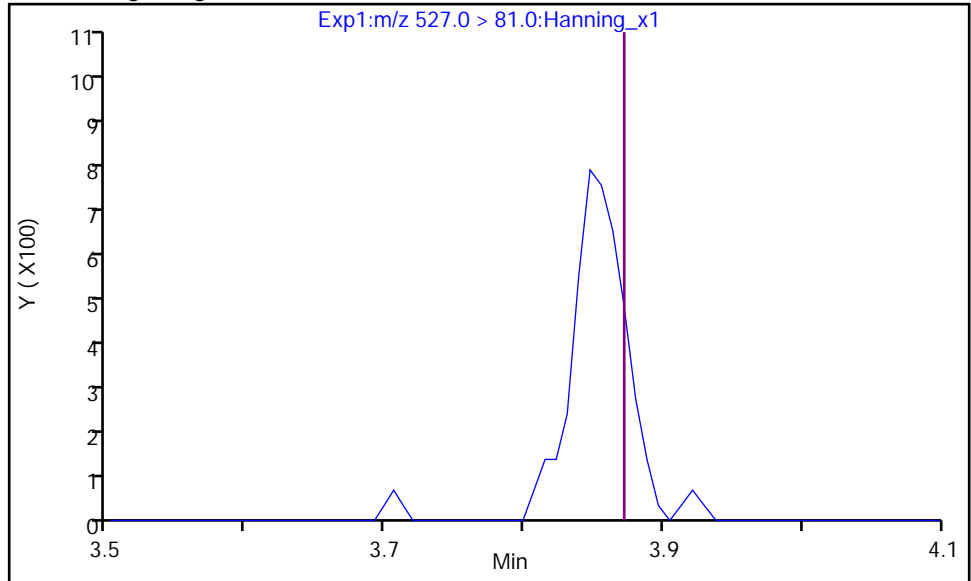
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

Not Detected

Expected RT: 3.873

RT Window: 3.657-4.057

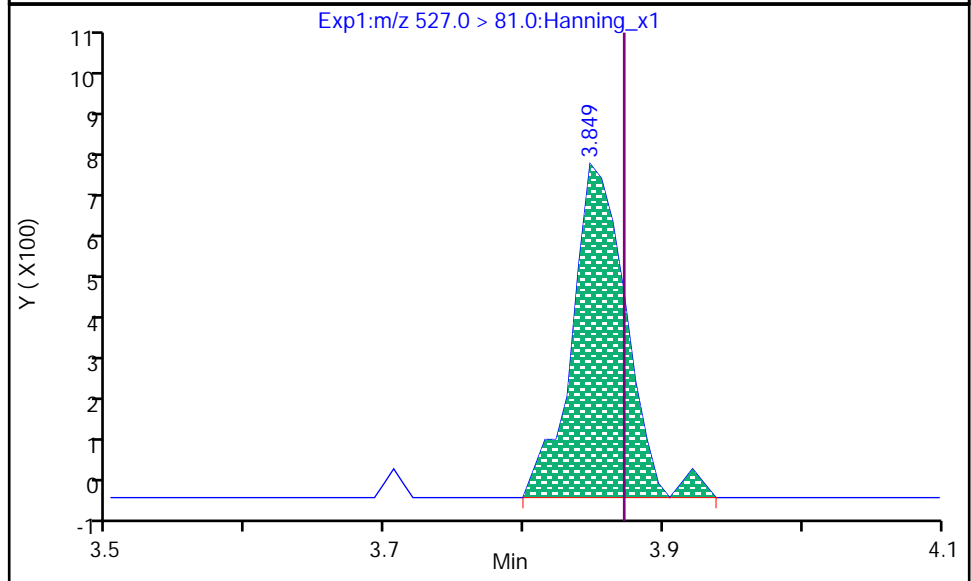


RT: 3.849

Area: 2042

Amount: 89.303

Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:22

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

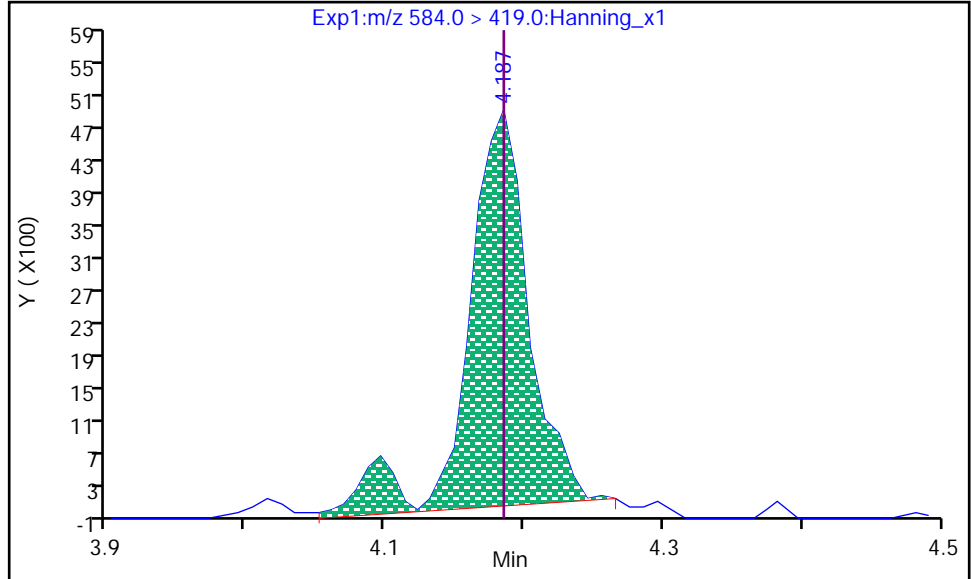
Dil. Factor: 1

Operator: Matthew M. Miller

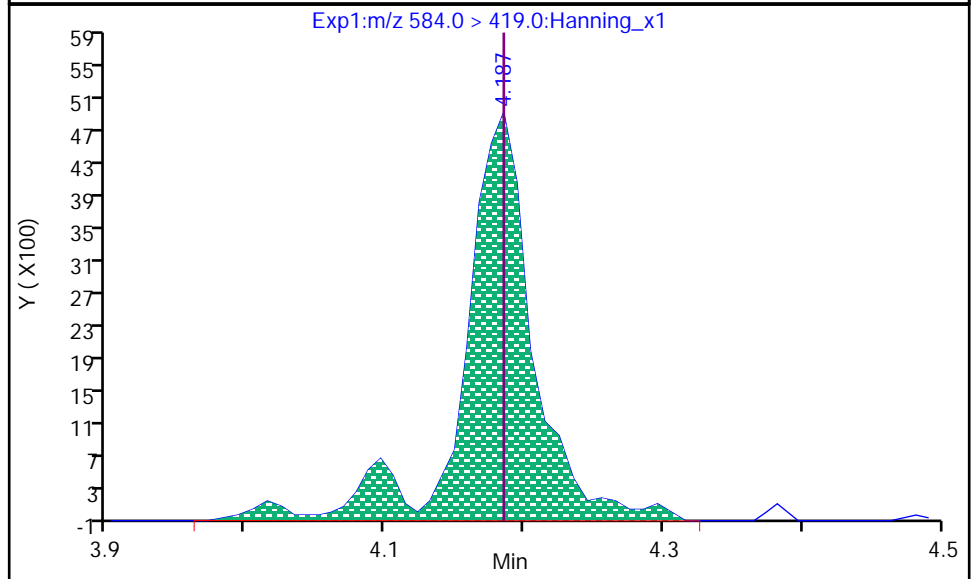
5 N-EtFOSAA, CAS: 2991-50-6

RT: 4.187  
Area: 14675  
Amount: 100.73  
Amount Units: ng/L

Processing Integration Results



RT: 4.187  
Area: 17100  
Amount: 117.38  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

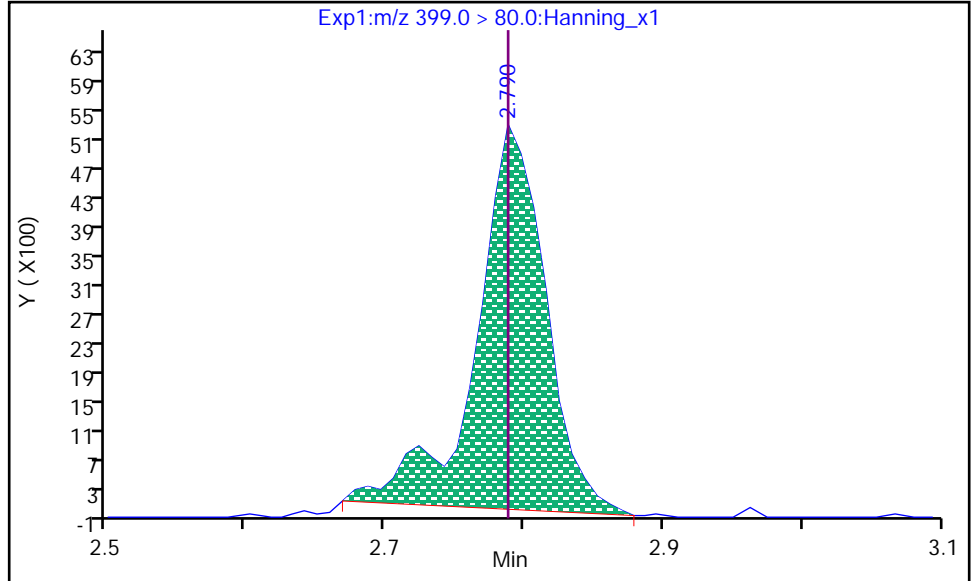
Dil. Factor: 1

Operator: Matthew M. Miller

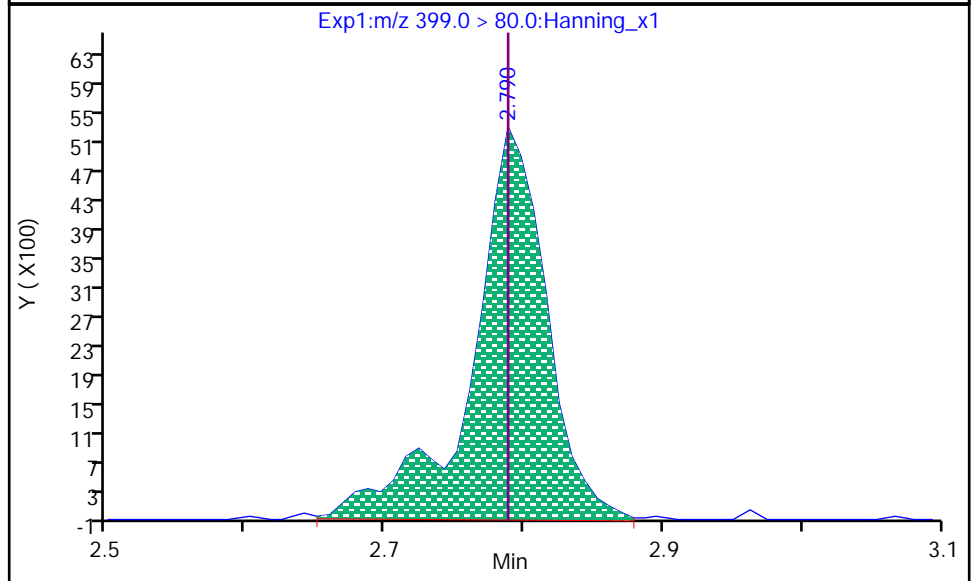
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.790  
Area: 18148  
Amount: 98.286  
Amount Units: ng/L



RT: 2.790  
Area: 19817  
Amount: 107.33  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:24:55

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

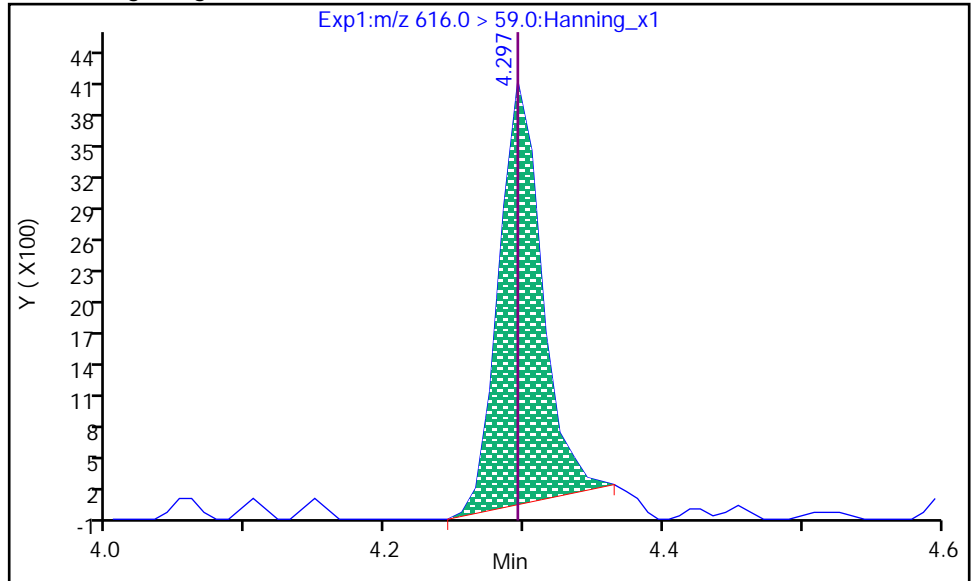
Dil. Factor: 1

Operator: Matthew M. Miller

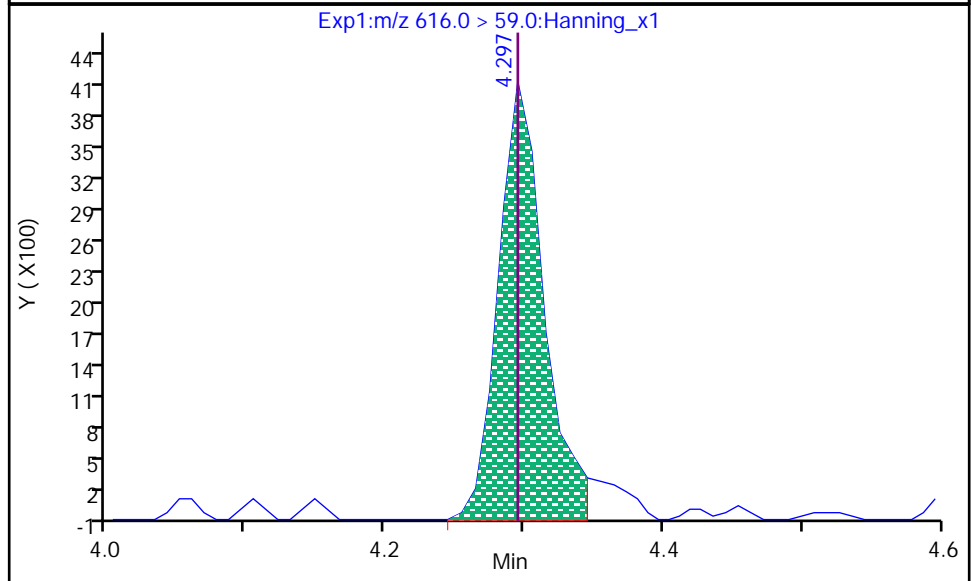
32 MeFOSE, CAS: 24448-09-7

Processing Integration Results

RT: 4.297  
Area: 8440  
Amount: 85.222  
Amount Units: ng/L



RT: 4.297  
Area: 9248  
Amount: 93.380  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:08

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d  
Injection Date: 28-Dec-2020 10:06:27 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	210.82	105	70 - 130
D 46 13C4_PFBA	649747	652120			100	50 - 150
D 50 13C5_PFPeA	665996	666466			100	50 - 150
21 PFPeA			200.00	203.38	102	70 - 130
7 PFBS			176.80	179.29	101	70 - 130
D 44 13C3_PFBS	238207	245386			103	50 - 150
1 4:2 FTS			186.80	190.44	102	70 - 130
D 63 13C2_4:2 FTS_2	144067	134387			93.3	50 - 150
D 49 13C5_PFHxA	743582	734191			98.7	50 - 150
15 PFHxA			200.00	209.63	105	70 - 130
22 PFPeS			187.60	193.82	103	70 - 130
28 GenX			400.00	392.36	98.1	70 - 130
D 66 13C3_GenX	1401050	1374029			98.1	50 - 150
D 47 13C4_PFHpA	633684	618982			97.7	50 - 150
13 PFHpA			200.00	215.23	108	70 - 130
D 45 13C3_PFHxS	174146	177773			102	50 - 150
14 PFHxS			182.00	210.81	116	70 - 130
29 ADONA			188.40	186.60	99	70 - 130
D 64 13C2_6:2 FTS_2	104346	107490			103	50 - 150
2 6:2 FTS			189.60	161.57	85.2	70 - 130
20 PFOA			200.00	213.38	107	70 - 130
D 53 13C8_PFOA	628007	617933			98.4	50 - 150
12 PFHpS			190.40	200.73	105	70 - 130
18 PFOS			185.60	176.38	95	70 - 130
17 PFNA			200.00	204.02	102	70 - 130
D 56 13C9_PFNA	767623	740499			96.5	50 - 150
D 54 13C8_PFOS	152445	158270			104	50 - 150
30 9CI-PF3ONS			186.40	185.39	99.5	70 - 130
D 55 13C8_PFOSA	308857	324597			105	50 - 150
19 PFOSA			200.00	211.44	106	70 - 130
16 PFNS			192.00	212.65	111	70 - 130
D 65 13C2_8:2 FTS_2	100453	101506			101	50 - 150
3 8:2 FTS			191.60	182.43	95.2	70 - 130
10 PFDA			200.00	189.92	95	70 - 130
D 51 13C6_PFDA	672868	721482			107	50 - 150
D 58 d3-MeFOSAA	791564	801442			101	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	206.70	103	70 - 130
9 PFDS			192.80	198.82	103	70 - 130
5 N-EtFOSAA			200.00	184.90	92.5	70 - 130
25 PFUdA			200.00	197.52	98.8	70 - 130
D 60 d5-EtFOSAA	731651	729766			99.7	50 - 150
D 52 13C7_PFUdA	643525	609738			94.7	50 - 150
D 61 d7-MeFOSE	105402	97975			93	50 - 150
32 MeFOSE			200.00	212.13	106	70 - 130
26 MeFOSA			200.00	215.55	108	70 - 130
D 57 d3-MeFOSA	51840	50658			97.7	50 - 150
31 11Cl-PF3OUDS			188.40	188.91	100	70 - 130
D 62 d9-EtFOSE	137116	128851			94	50 - 150
33 EtFOSE			200.00	179.01	89.5	70 - 130
D 59 d5-EtFOSA	50284	52717			105	50 - 150
D 38 13C2_PFDoA	611364	639628			105	50 - 150
4 10:2 FTS			192.80	199.66	104	70 - 130
27 EtFOSA			200.00	185.70	92.8	70 - 130
11 PFDoA			200.00	206.49	103	70 - 130
34 PFDOS			193.60	204.36	106	70 - 130
24 PFTrDA			200.00	199.00	99.5	70 - 130
23 PFTeDA			200.00	195.88	97.9	70 - 130
D 42 13C2_PFTeDA	813074	856900			105	50 - 150
35 PFHxDA			200.00	205.68	103	70 - 130
D 40 13C2_PFHxDA	935525	936899			100	50 - 150
36 PFODA			200.00	197.63	98.8	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d  
 Injection Date: 28-Dec-2020 10:06:27 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 96  
 Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	652120	24	>100:1			1000.00	940.26	100	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	136929	23	74:1			200.00	210.82		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	666466	18	>100:1			1000.00	968.86	100	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.072	1/1	136279	18	>100:1			200.00	203.38		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	245386	17	>100:1			1000.00	1065.83	103	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/0	51872	16	>100:1	Target = 3.50		176.80	179.29		
298.9 > 99	44	2.130	2.125		14156	19	96:1	3.66 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.450	1/0	41256	19	>100:1	Target = 3.10		187.60	193.82		
349 > 99	44	2.451	2.450		12015	15	>100:1	3.43 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.379	1	134387	19	>100:1			5000.00	5551.27	93.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.371	2.388	-1/-2	10215	28	58:1	Target = 1.80		186.80	190.44		
327 > 81	63	2.389	2.388		6556	19	36:1	1.55 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.423	0	734191	20	>100:1			1000.00	996.09	98.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/1	151947	17	>100:1	Target = 18.34		200.00	209.63		
313 > 119	49	2.424	2.423		8327	17	50:1	18.24 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.530	1	1374029	19	>100:1			5000.00	5158.66	98.1	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.530	0/-1	77467	18	>100:1	Target = 0.81		400.00	392.36		
285 > 185	66	2.531	2.530		101733	20	>100:1	0.76 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	618982	20	>100:1			1000.00	1020.33	97.7	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	138189	20	>100:1	Target = 3.70		200.00	215.23		
363 > 169	47	2.773	2.772		33316	19	>100:1	4.14 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	177773	18	>100:1			1000.00	1038.22	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	39735	28	>100:1	Target = 3.21	0.14	182.00	210.81		M
399 > 99	45	2.782	2.790		9403	28	77:1	4.22 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.808	1/0	210609	20	>100:1	Target = 2.97		188.40	186.60		
377 > 85	45	2.809	2.808		70609	19	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.154	0/-1	32416	30	>100:1	Target = 3.08		190.40	200.73		
449 > 99	45	3.149	3.154		9745	18	99:1	3.32 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	107490	25	>100:1			5000.00	5581.46	103	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.128	-1/-2	8241	20	100:1	Target = 1.80		189.60	161.57		
427 > 81	64	3.115	3.128		5498	21	36:1	1.49 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	617933	25	>100:1			1000.00	1044.04	98.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	134417	24	77:1	Target = 2.87		200.00	213.38		
413 > 169	53	3.142	3.148		43163	25	>100:1	3.11 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.513	3.520	0	158270	26	>100:1			1000.00	1055.63	104	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.506	3.520	0/0	33080	48	>100:1	Target = 3.84	0.30	185.60	176.38		
499 > 99	54	3.513	3.520		11508	31	42:1	2.87 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.718	3.722	0/0	98780	20	>100:1			186.40	185.39		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.860	3.865	0/0	25756	20	>100:1	Target = 3.07		192.00	212.65		
549 > 99	54	3.860	3.865		8775	21	48:1	2.93 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.163	4.169	0/0	22837	17	>100:1	Target = 3.03		192.80	198.82		
599 > 99	54	4.163	4.169		9414	16		2.42 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.319	4.317	1/1	84913	17	>100:1			188.40	188.91		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.667	4.663	1/1	25967	17	>100:1	Target = 3.33		193.60	204.36		
699 > 99	54	4.658	4.663		9473	16	87:1	2.74 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.521	3.520	1	740499	22	>100:1			1000.00	986.07	96.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.521	3.520	1/0	151079	21	>100:1	Target = 6.16		200.00	204.02		
463 > 169	56	3.513	3.520		27095	26	>100:1	5.57 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.844	3.849	0	324597	21	>100:1			1000.00	1048.56	105	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.852	3.841	1/1	67635	22	>100:1			200.00	211.44		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.860	3.857	1	101506	19	>100:1			5000.00	5471.98	101	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.852	3.873	-2/-3	7996	24	49:1	Target = 1.95		191.60	182.43		
527 > 81	65	3.860	3.873		5178	16	19:1	1.54 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.449	4.455	0/-1	9367	20	>100:1	Target = 3.14		192.80	199.66		
627 > 80	65	4.449	4.455		3524	18	23:1	2.65 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.868	3.865	1	721482	22	>100:1			1000.00	1087.66	107	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.868	3.873	0/-1	134642	24	>100:1	Target = 15.94		200.00	189.92		
513 > 169	51	3.868	3.873		10209	15	75:1	13.18 (7.97-23.91)					M
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.022	4.029	0	801442	18	>100:1			5000.00	5583.43	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.031	4.029	1/1	25450	35	83:1	Target = 1.33	0.14	200.00	206.70		
570 > 483	58	4.031	4.029		19822	33	>100:1	1.28 (0.66-1.99)	0.04				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	729766	19				5000.00	5494.62	99.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.189	4.187	1/0	26868	33	>100:1	Target = 1.58	0.22	200.00	184.90		
584 > 526	60	4.180	4.187		17521	40		1.53 (0.79-2.37)	0.18				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	609738	18	>100:1			1000.00	964.66	94.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.180	4.178	1/0	113196	18	>100:1	Target = 15.50		200.00	197.52		
563 > 169	52	4.180	4.178		8707	22	32:1	13.00 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	97975	17	>100:1			1000.00	905.43	93	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.299	4.297	1/0	19528	16	>100:1			200.00	212.13		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.299	4.307	0	50658	15	>100:1			1000.00	957.31	97.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.317	1/1	12319	21	72:1	Target = 1.12		200.00	215.55		
512 > 219	57	4.309	4.317		10204	13	90:1	1.20 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.449	4.455	0	128851	18	>100:1			1000.00	1027.56	94	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.467	4.464	1/1	20521	14	>100:1			200.00	179.01		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.449	4.455	0	639628	19	>100:1			1000.00	1056.68	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.449	4.446	1/1	133752	18	69:1	Target = 10.85		200.00	206.49		
613 > 169	38	4.449	4.446		12132	15	>100:1	11.02 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.691	4.688	1/1	125371	19	>100:1	Target = 8.37		200.00	199.00		
663 > 169	38	4.691	4.688		16027	20	>100:1	7.82 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.467	4.473	0	52717	18	>100:1			1000.00	1073.79	105	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.486	4.482	1/1	10695	19		Target = 1.03		200.00	185.70		
526 > 219	59	4.477	4.482		11124	17		0.96 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.900	4.906	0	856900	19	>100:1			1000.00	1017.16	105	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.900	4.906	0/0	145436	19	18:1	Target = 12.11		200.00	195.88		
713 > 169	42	4.900	4.906		12705	28	>100:1	11.44 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.276	5.282	0	936899	19	>100:1			1000.00	1033.92	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.284	5.282	1/1	125911	19	41:1	Target = 11.48		200.00	205.68		
813 > 269	40	5.276	5.282		11771	20	>100:1	10.69 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.620	5.625	0/0	163908	25	19:1	Target = 13.88		200.00	197.63		
913 > 319	40	5.620	5.625		11612	24	>100:1	14.11 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.868	3.873	0	706927	19	>100:1					96.5	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	741977	20	>100:1					101	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	598960	24	>100:1					99.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	621036	24	>100:1					102	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.513	3.520	0	162428	28	>100:1					99.6	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

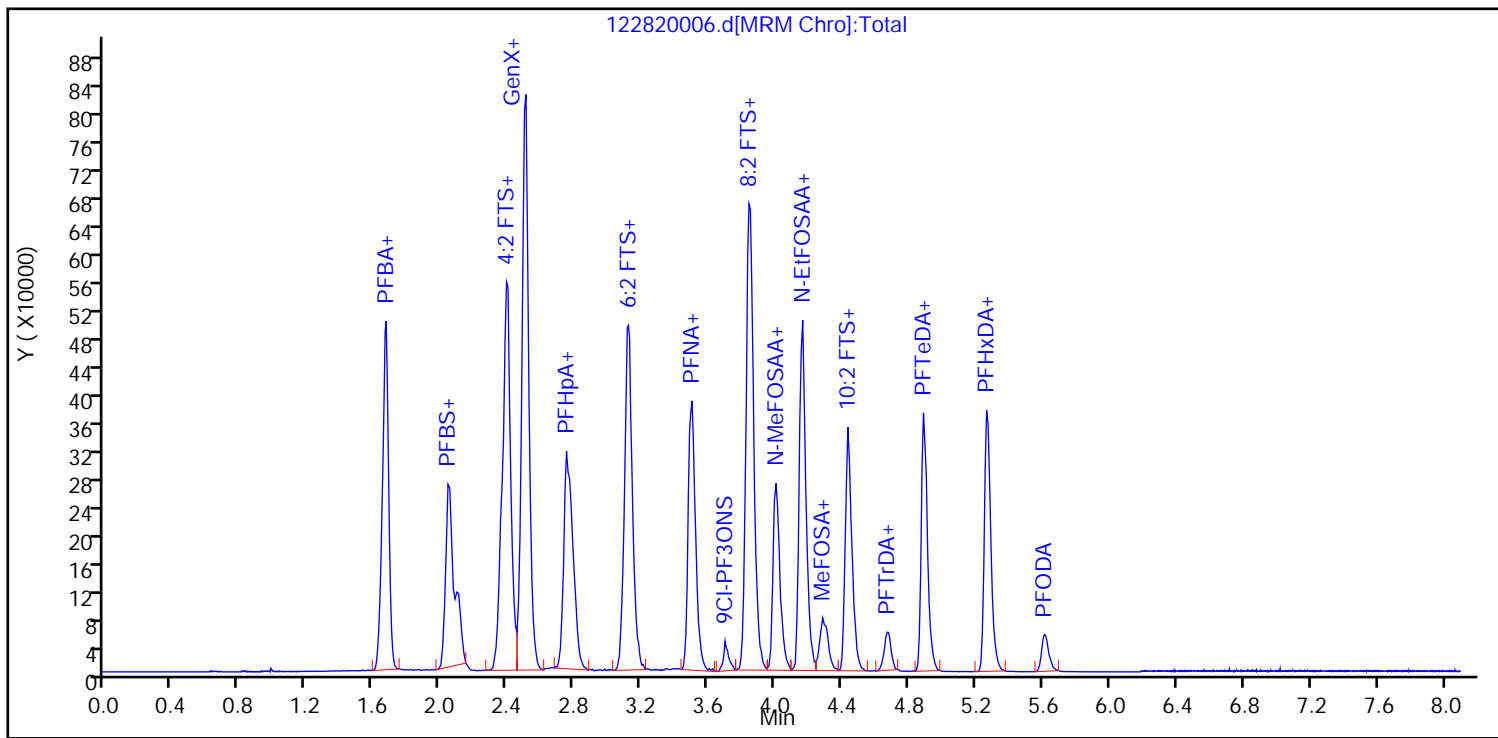
Client ID:

Lab ID: ID CCV 200\_SVLC-1221

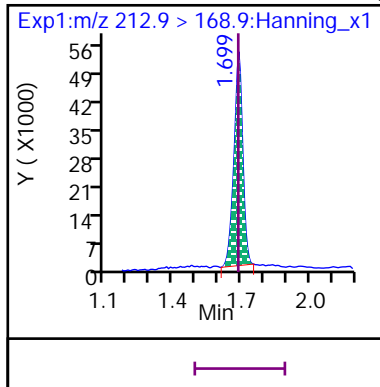
Sample Info: ID CCV 200\_SVLC-1221

Dil. Factor: 1

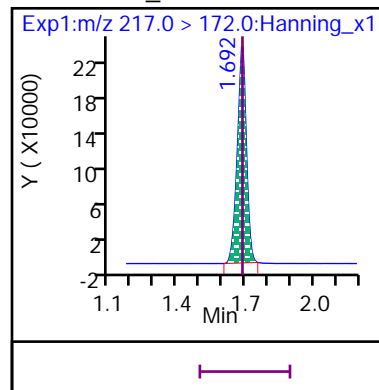
Operator: Matthew M. Miller



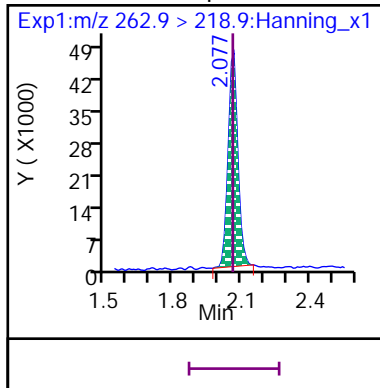
8 Perfluoro-n-butanoic acid (PFBA)



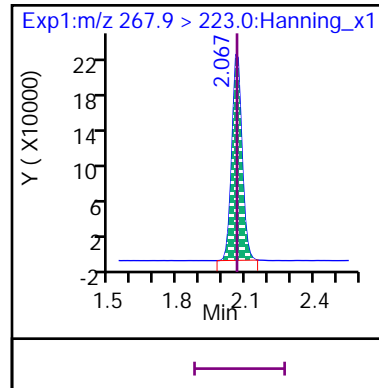
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

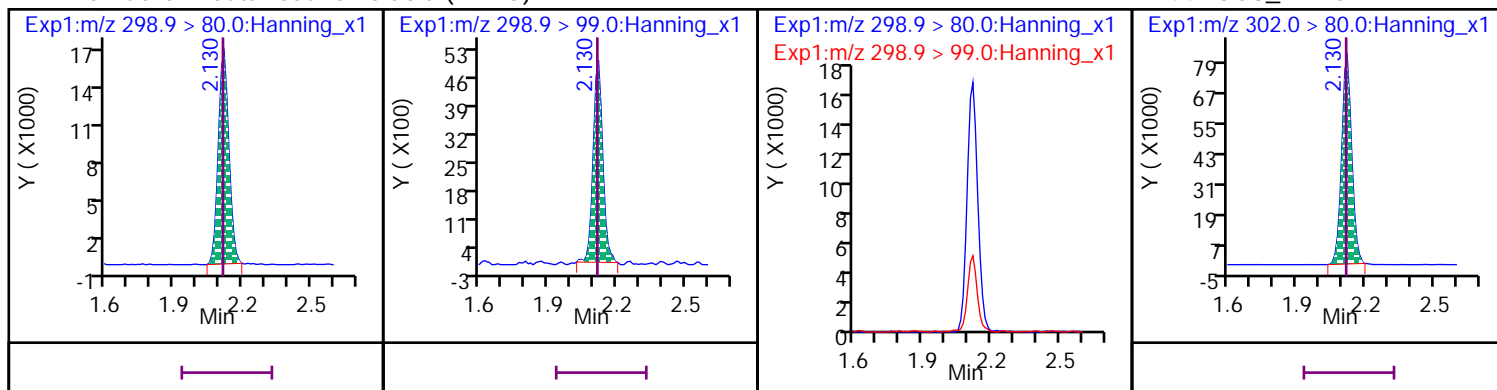


D 50 13C5\_PFPeA



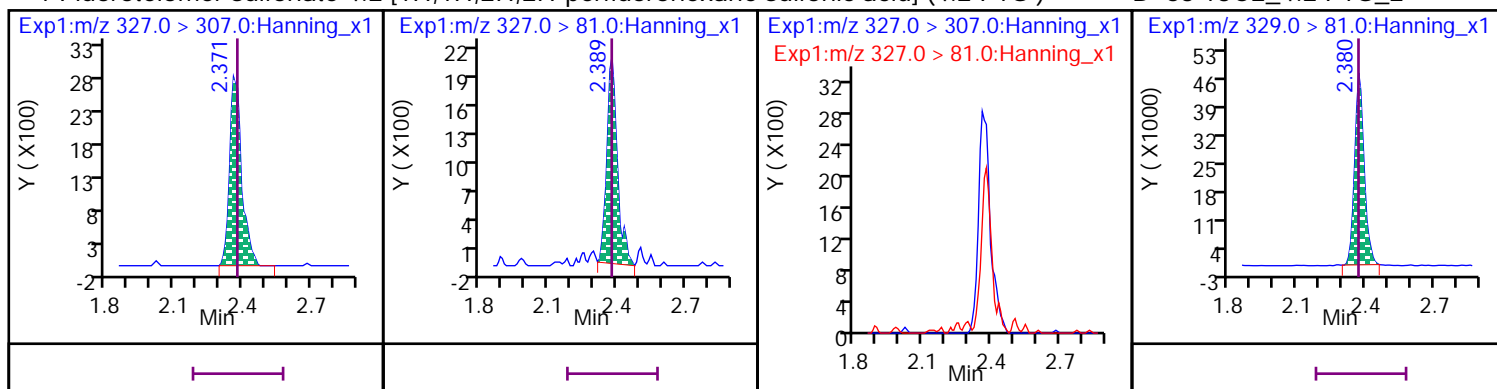
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



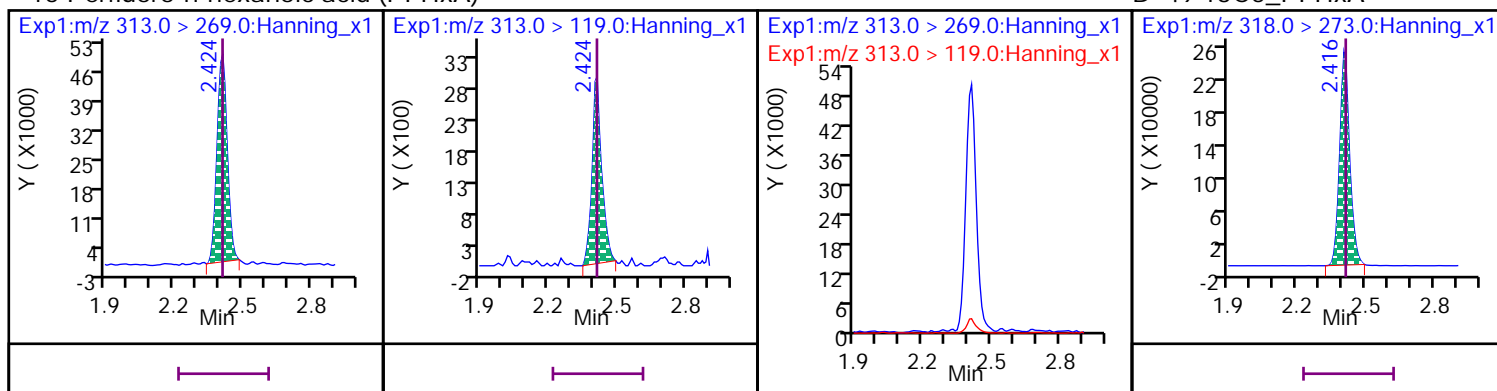
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



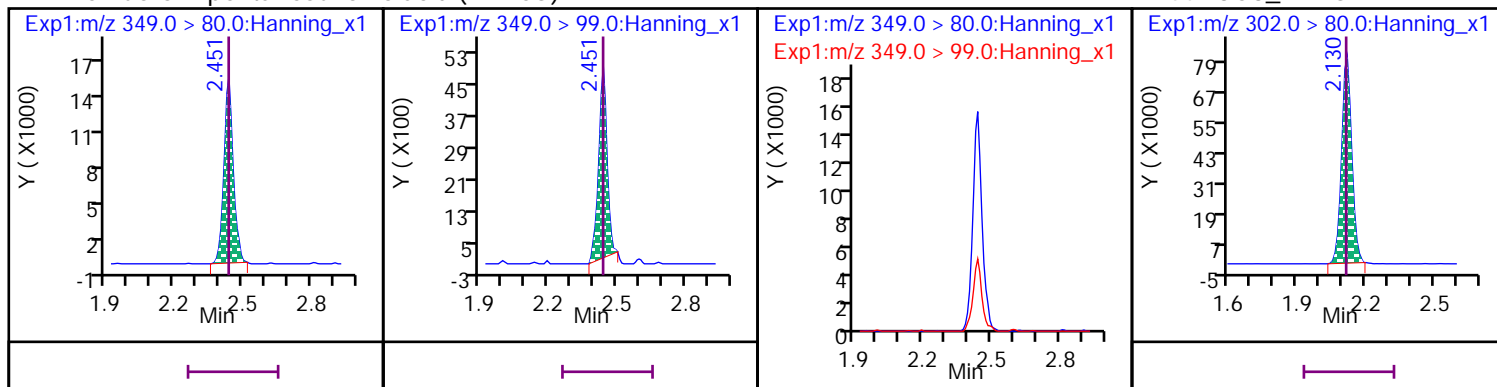
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

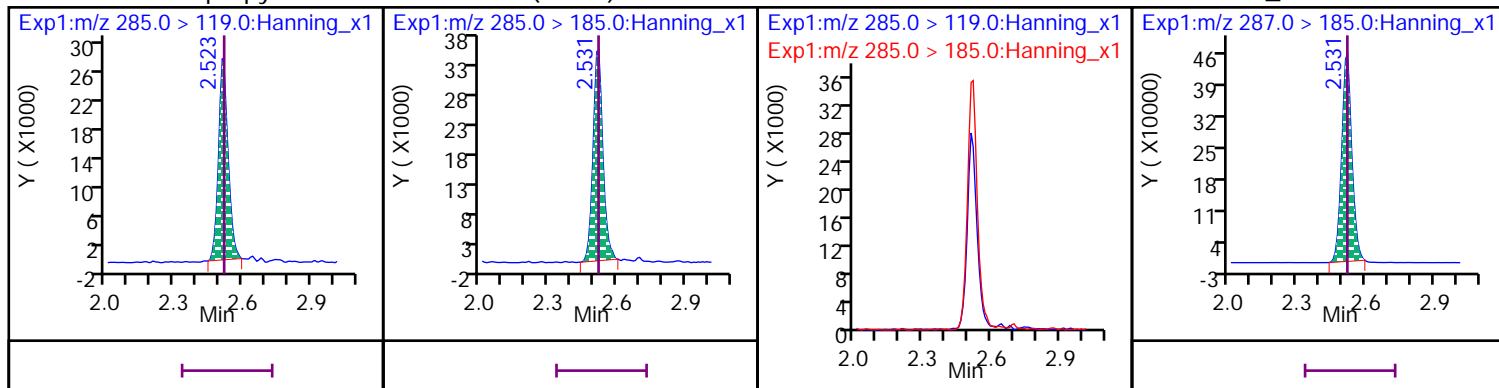
D 44 13C3\_PFBS





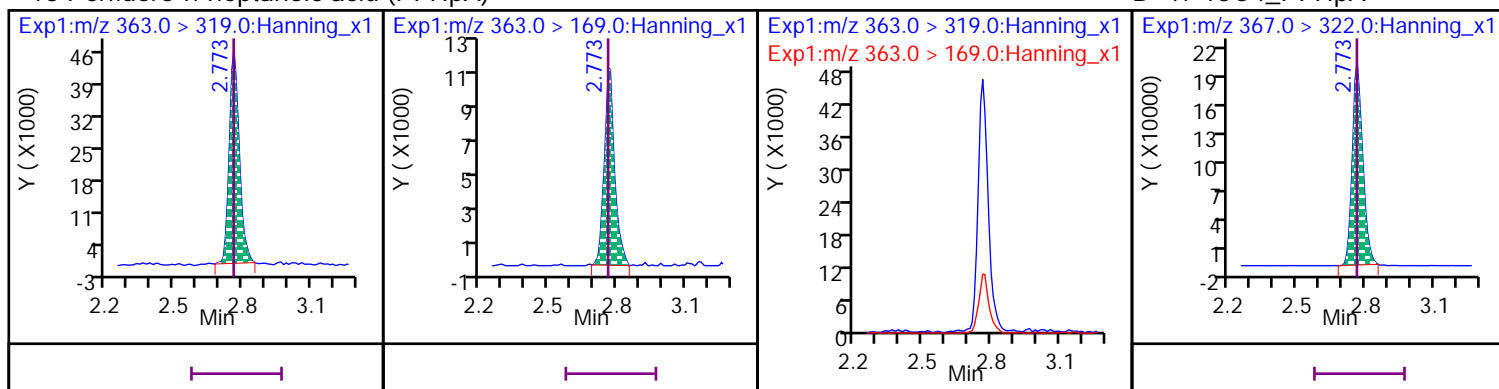
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



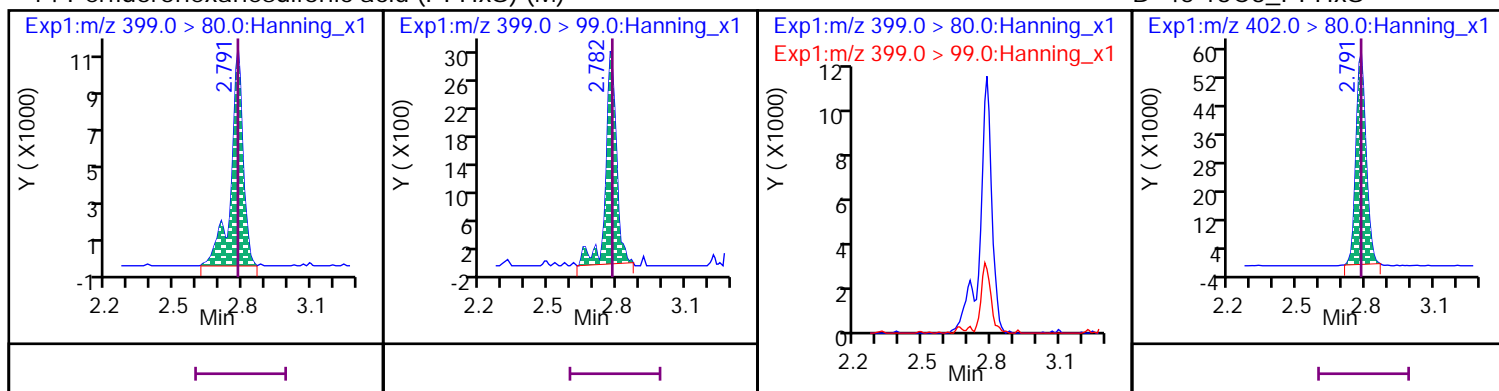
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



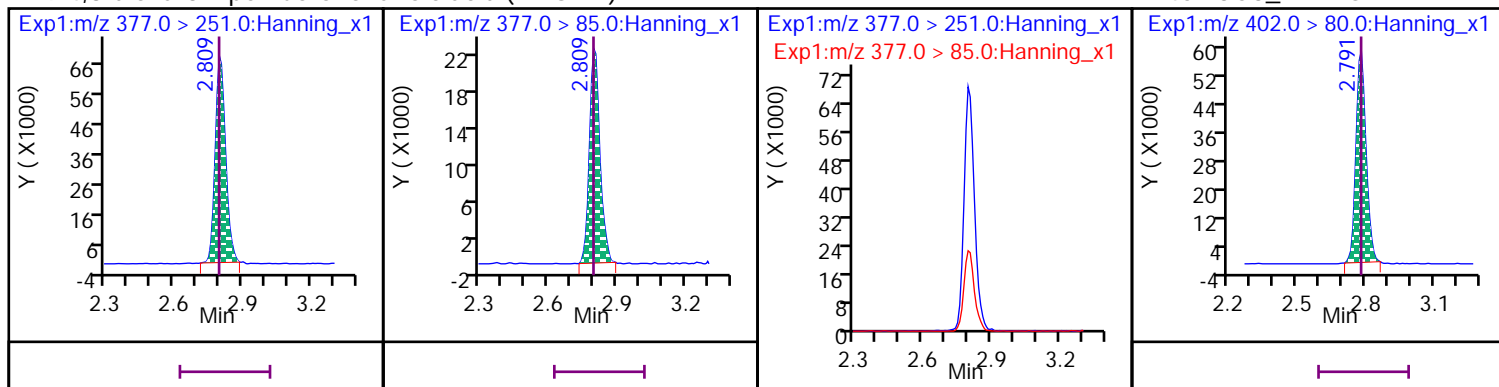
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



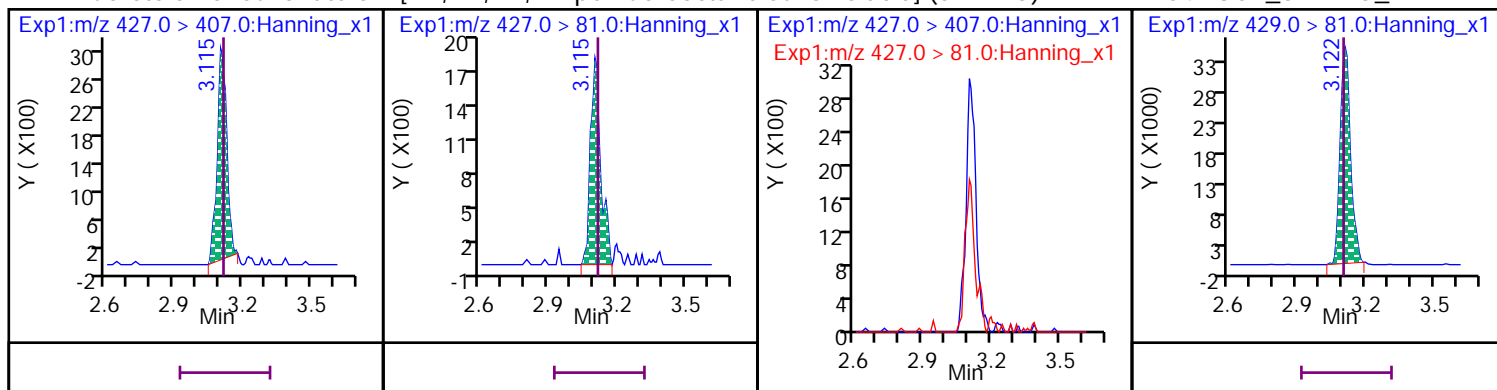
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



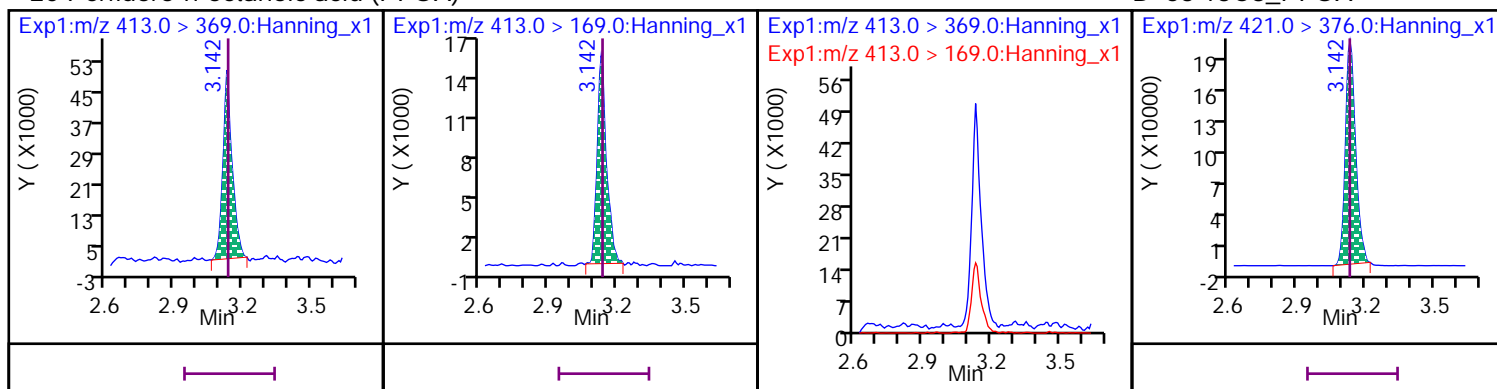
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



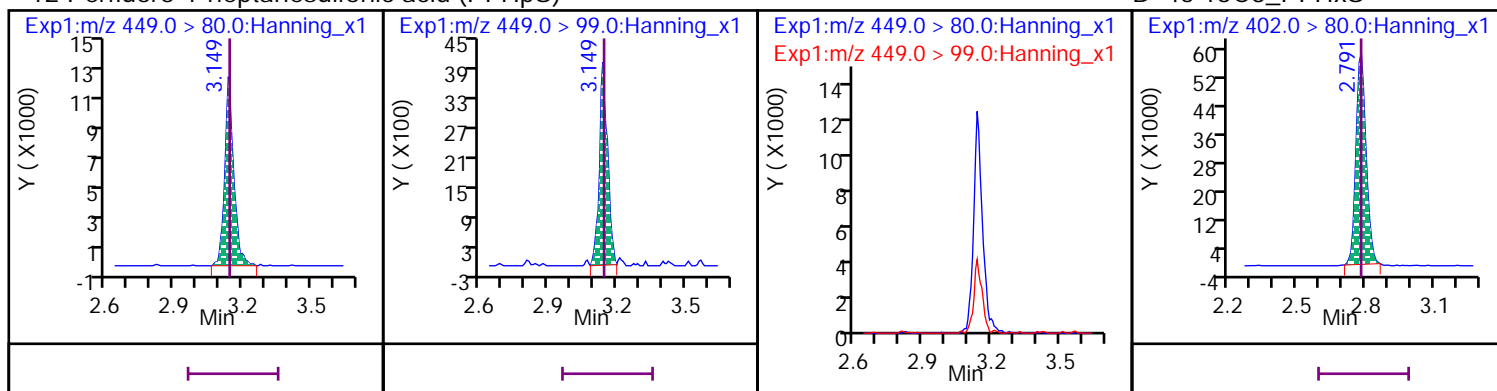
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



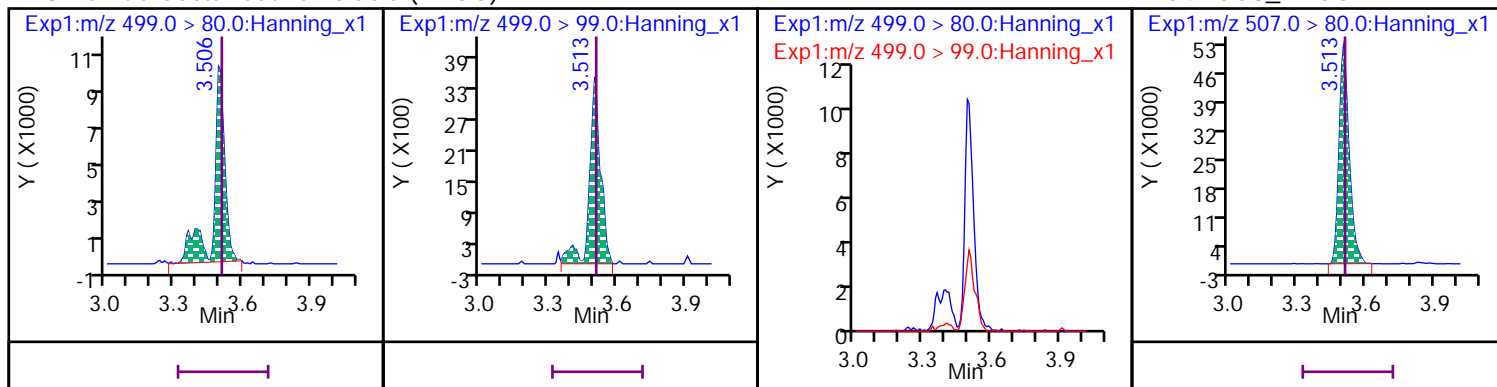
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



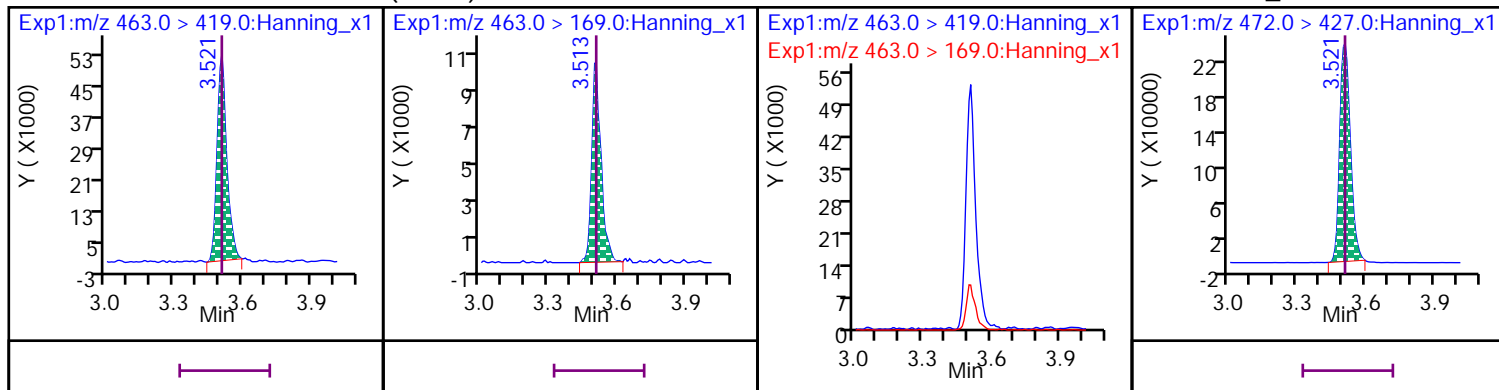
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



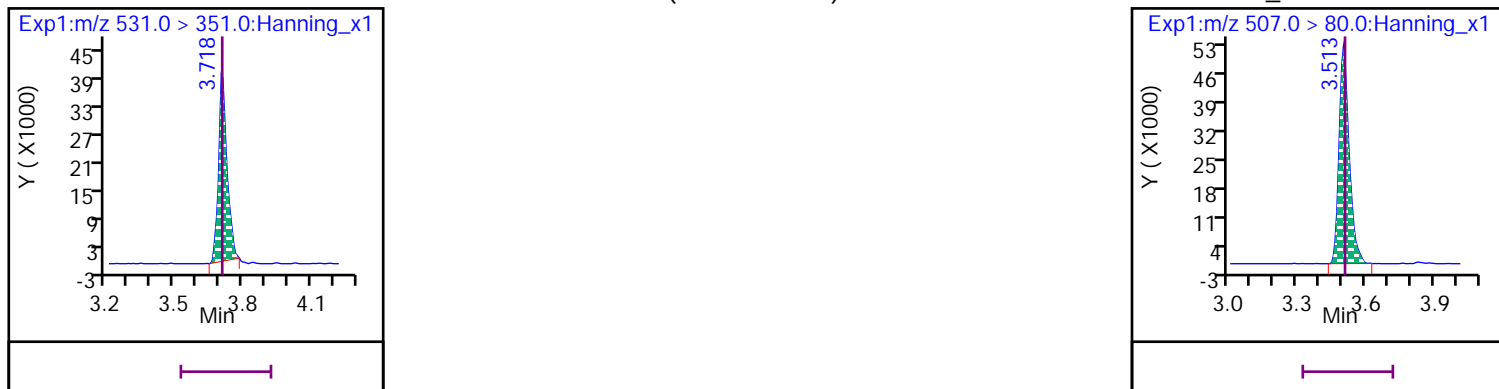
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



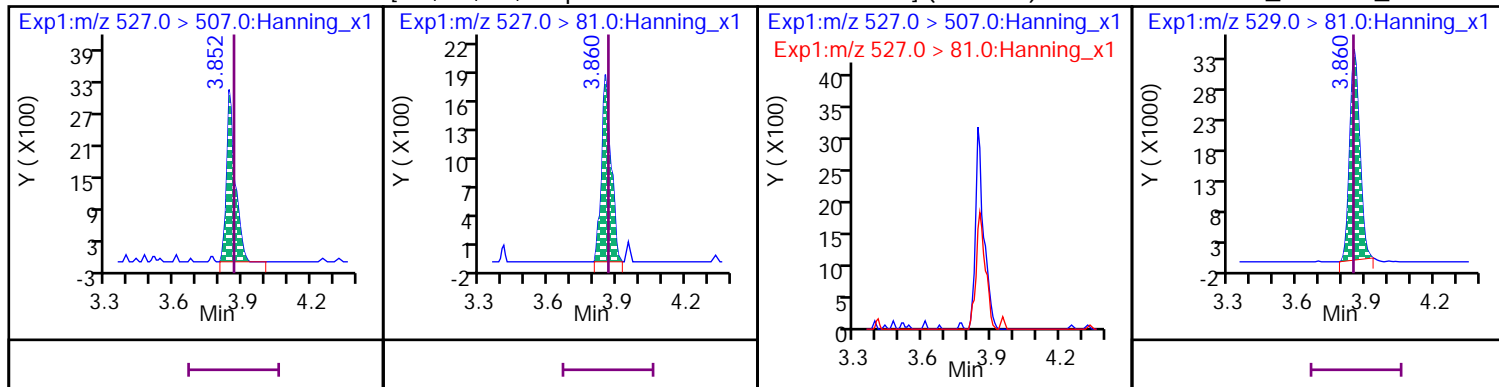
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



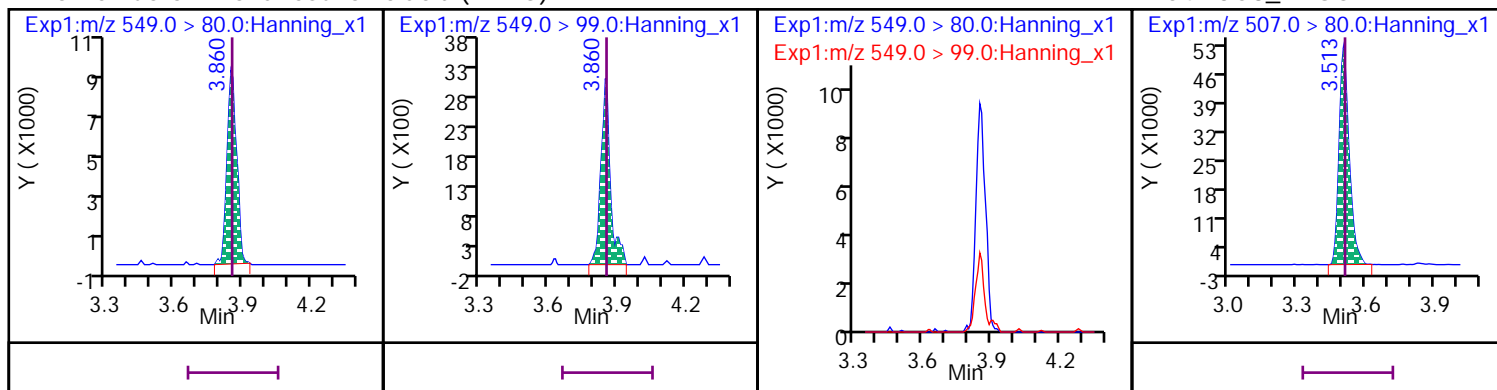
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



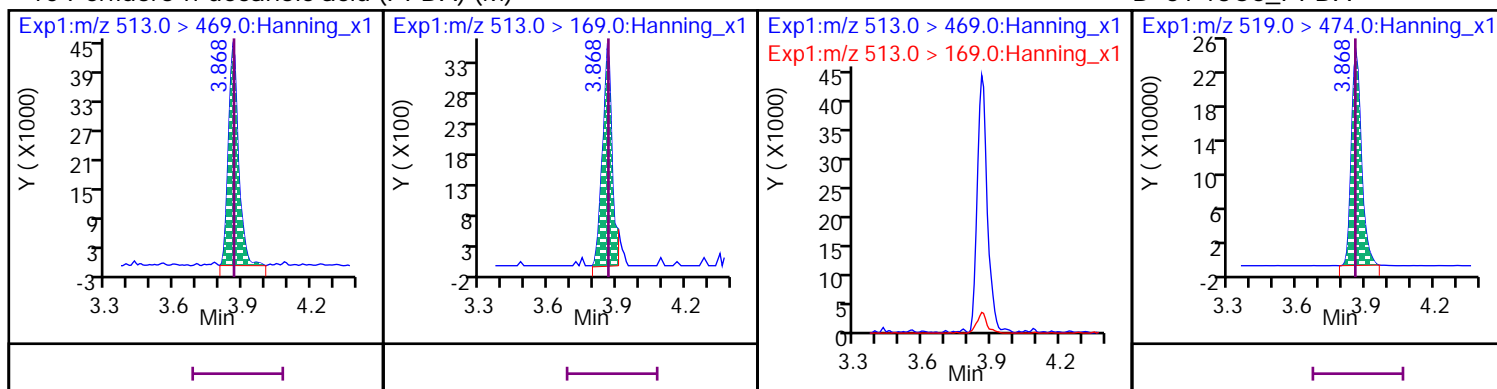
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



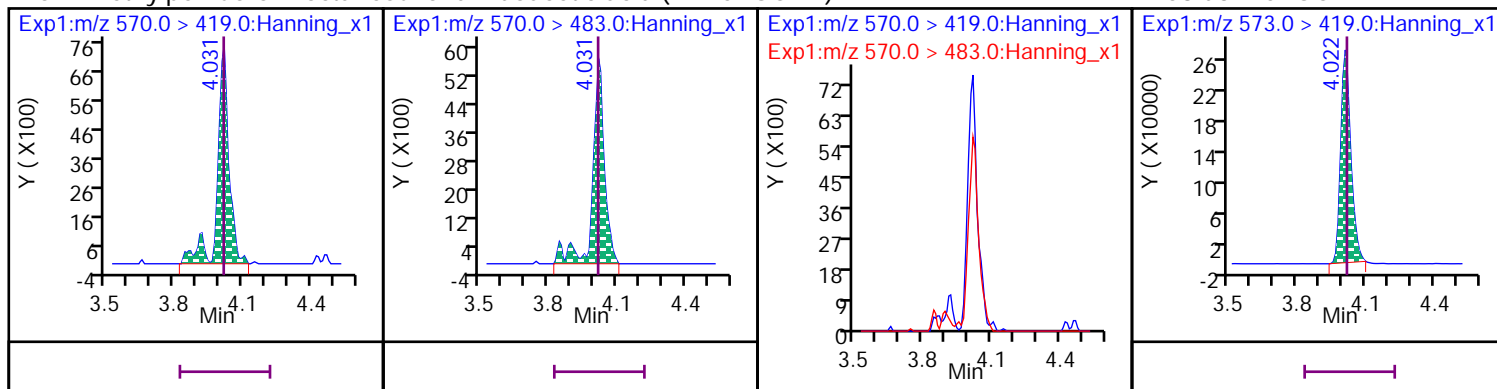
## 10 Perfluoro-n-decanoic acid (PFDA) (M)

D 51 13C6\_PFDA



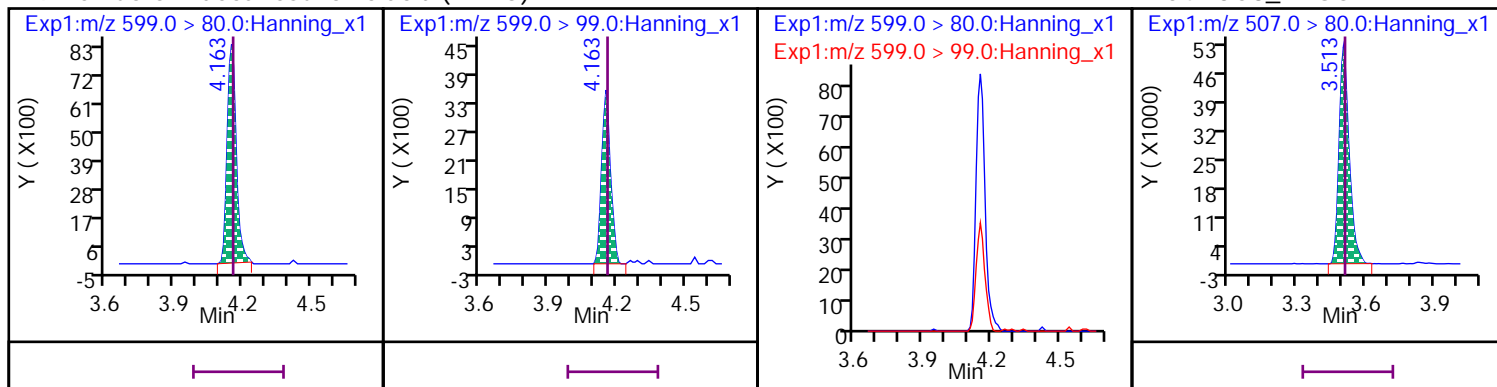
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



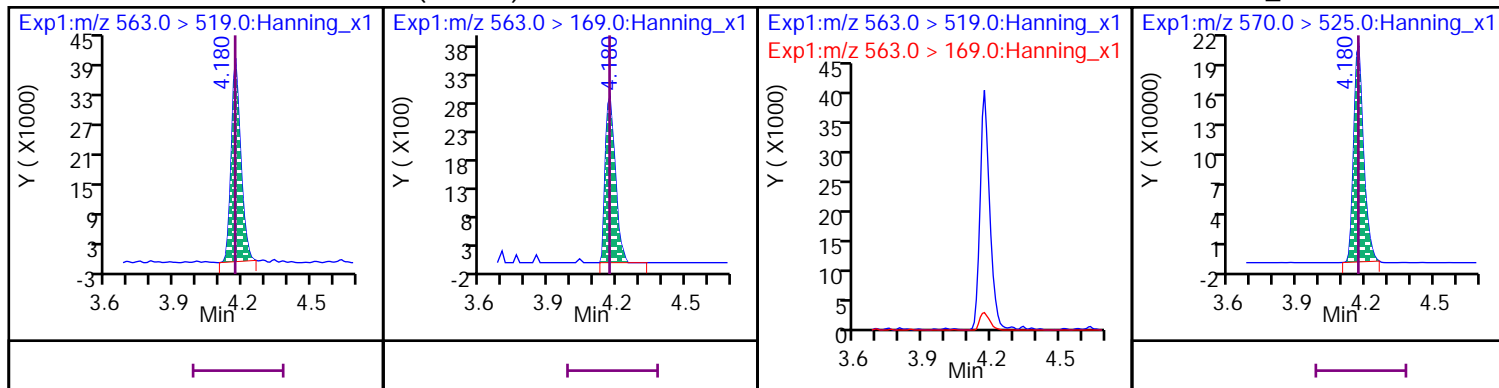
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



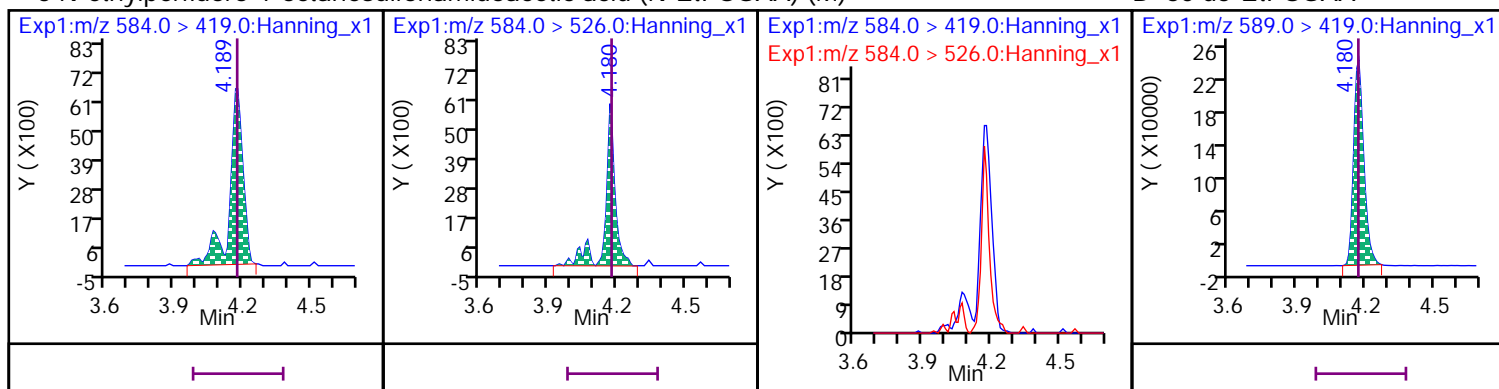
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



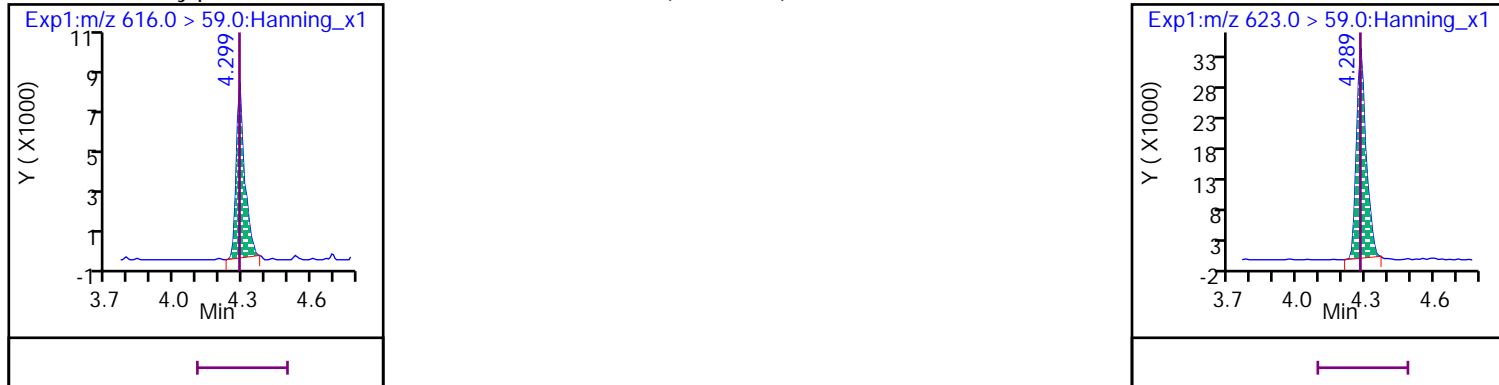
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



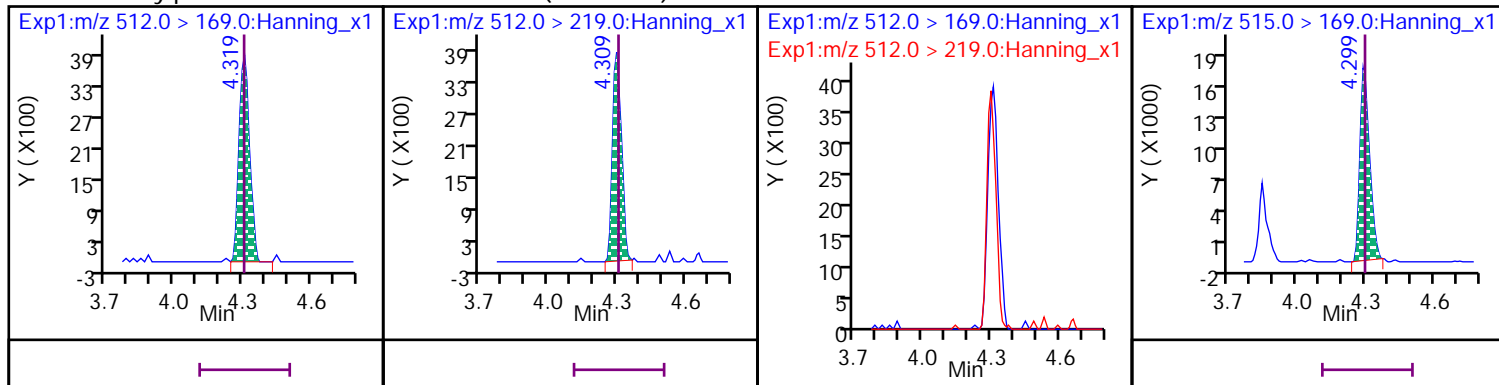
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

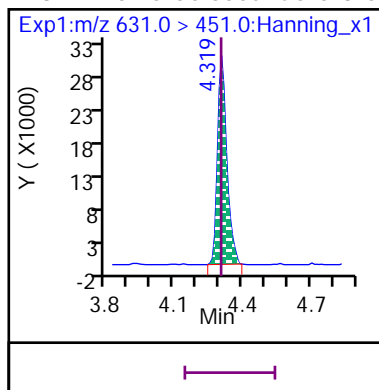


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

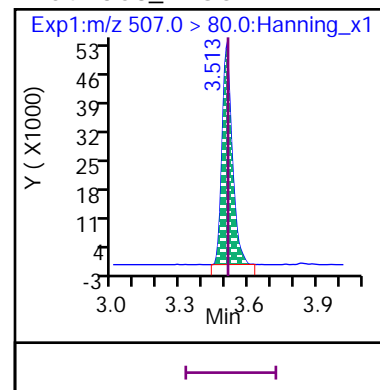
D 57 d3-MeFOSA



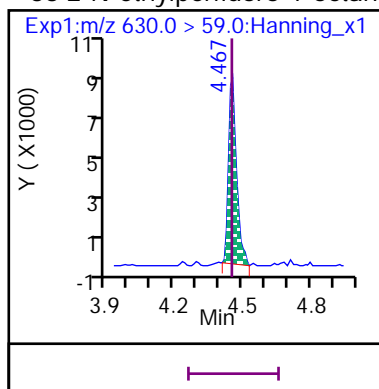
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



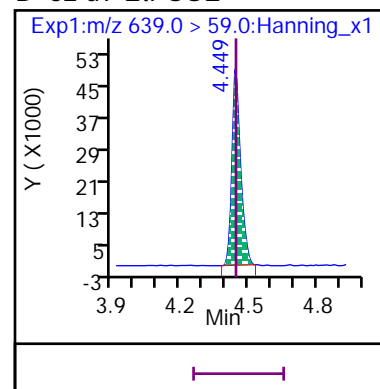
## D 54 13C8\_PFOS



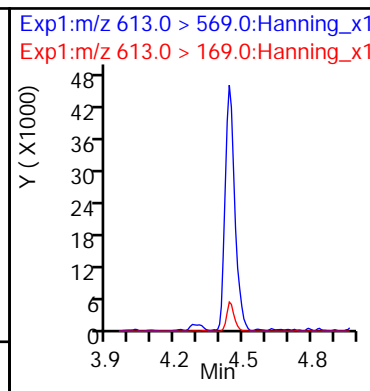
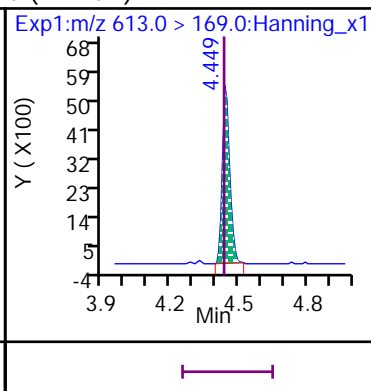
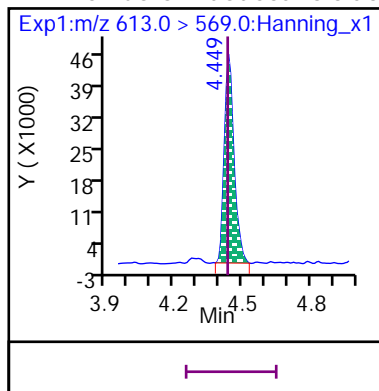
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



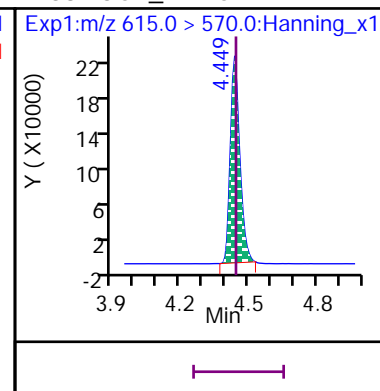
## D 62 d9-EtFOSE



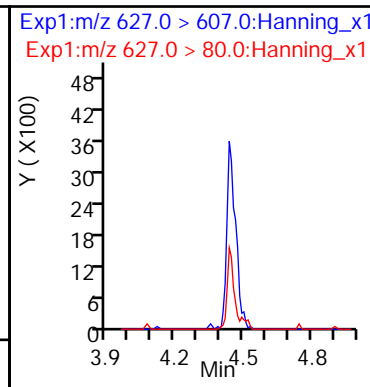
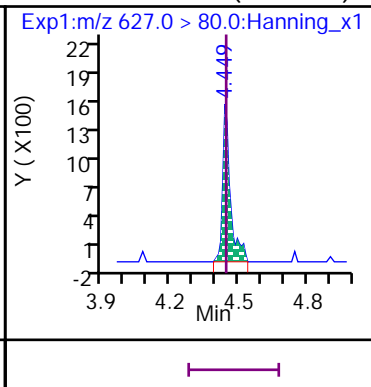
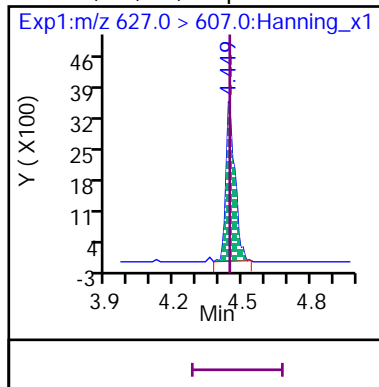
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



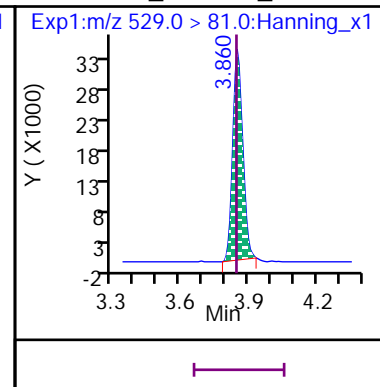
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

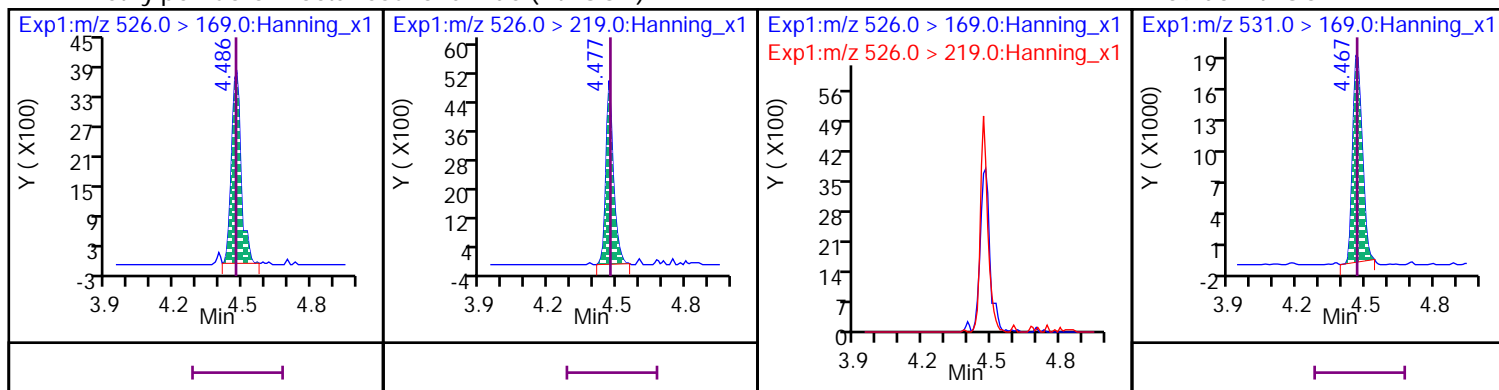


## D 65 13C2\_8:2 FTS\_2



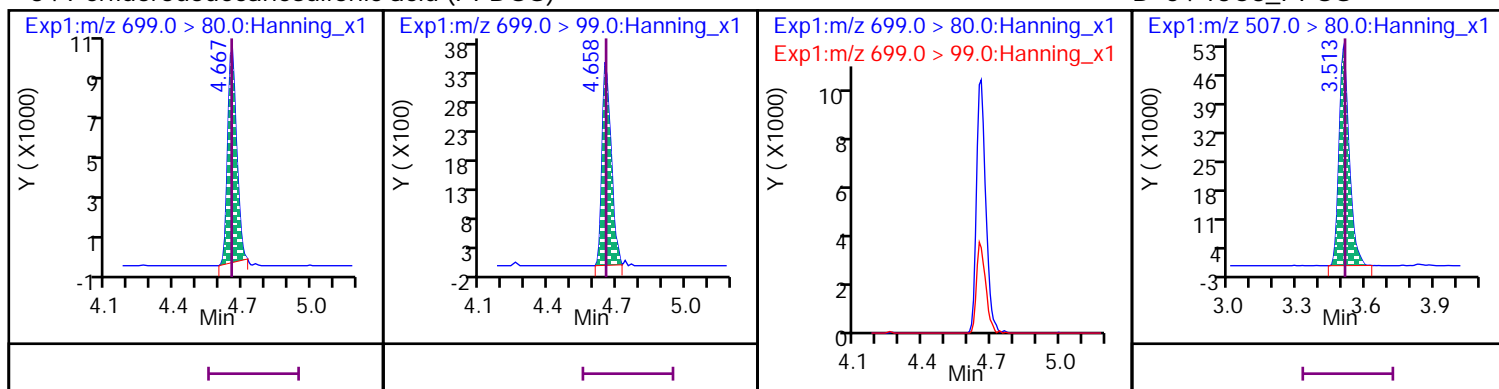
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



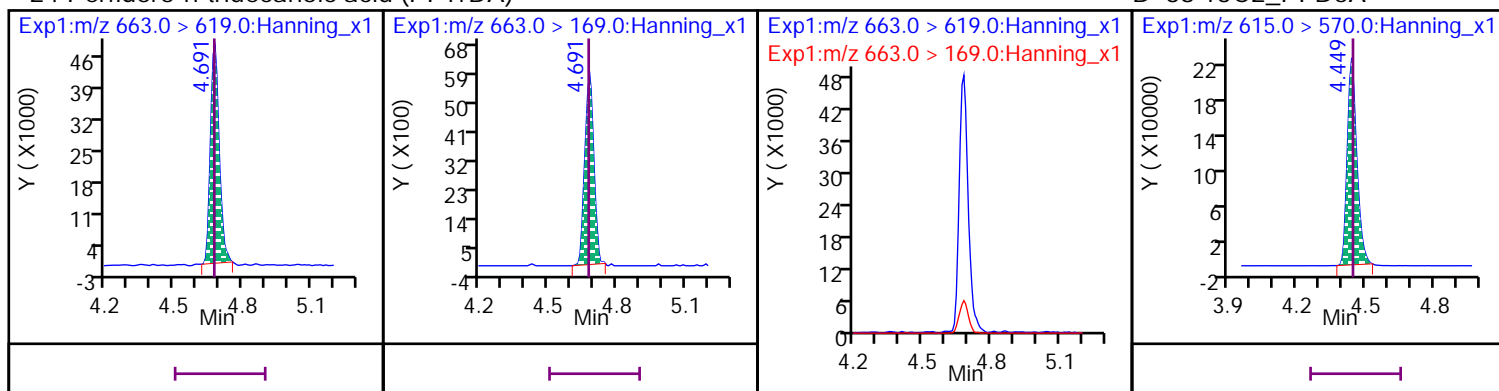
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



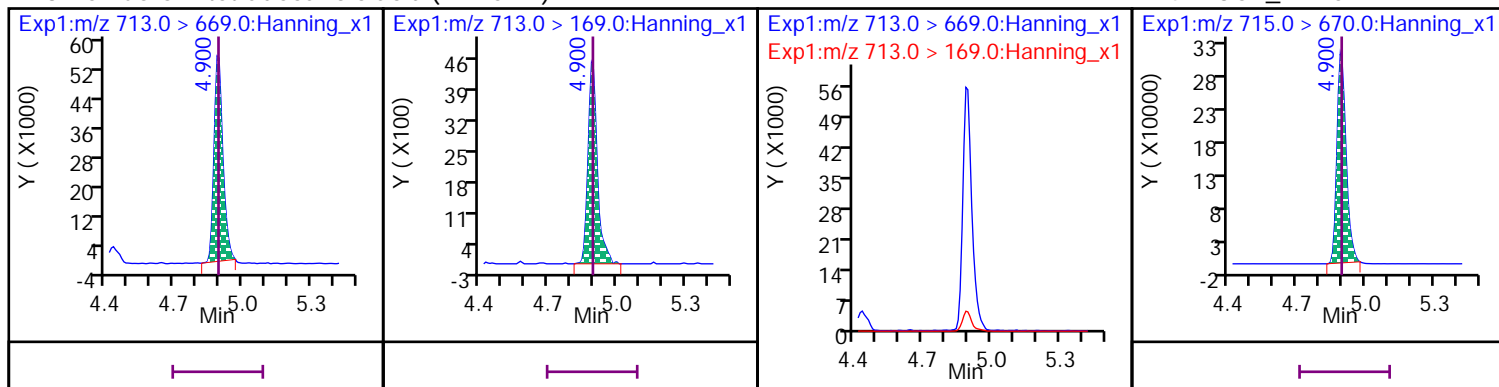
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



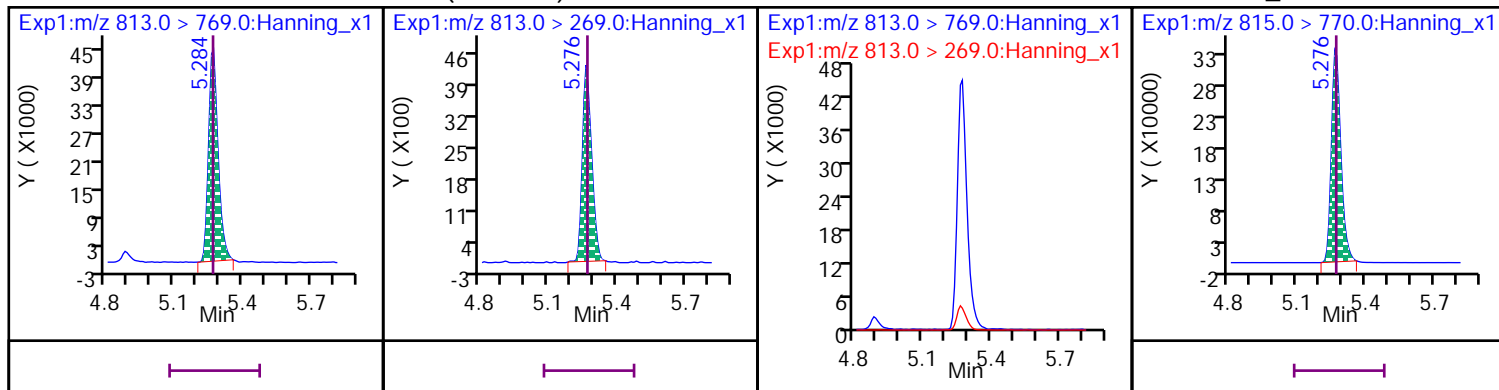
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



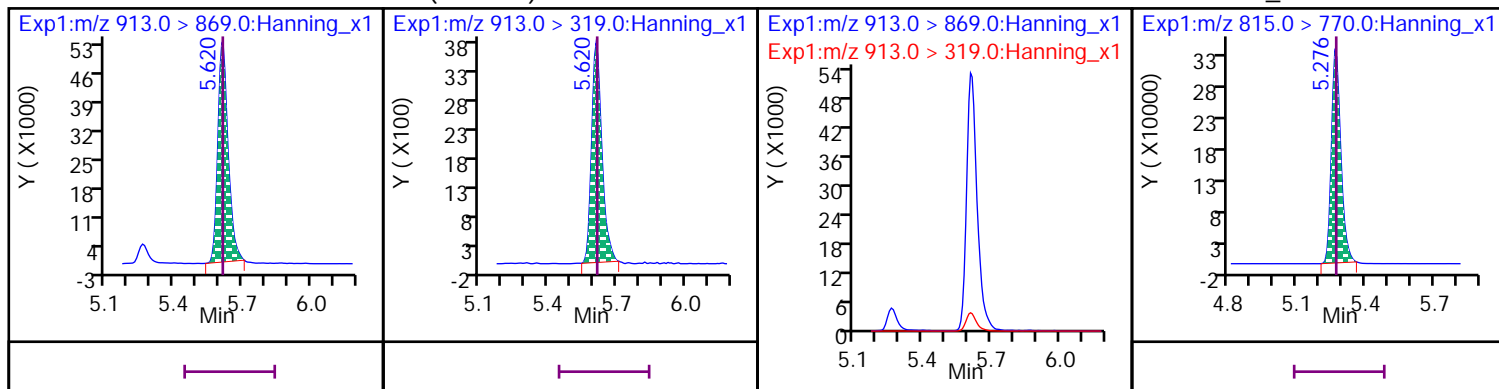
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

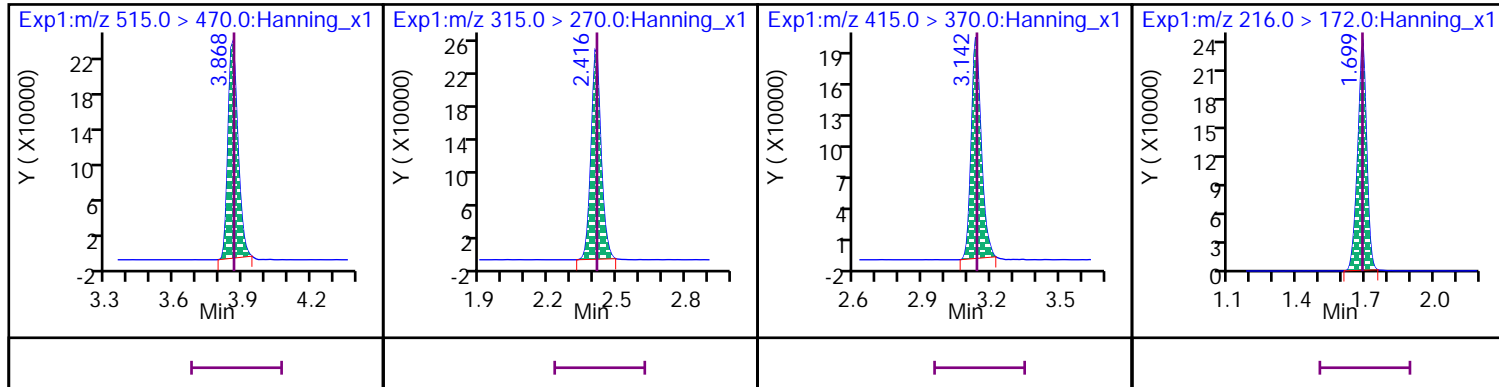


\* 37 13C2\_PFDA

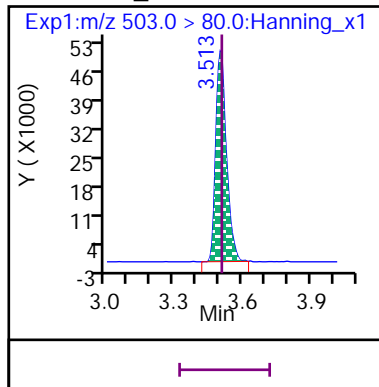
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

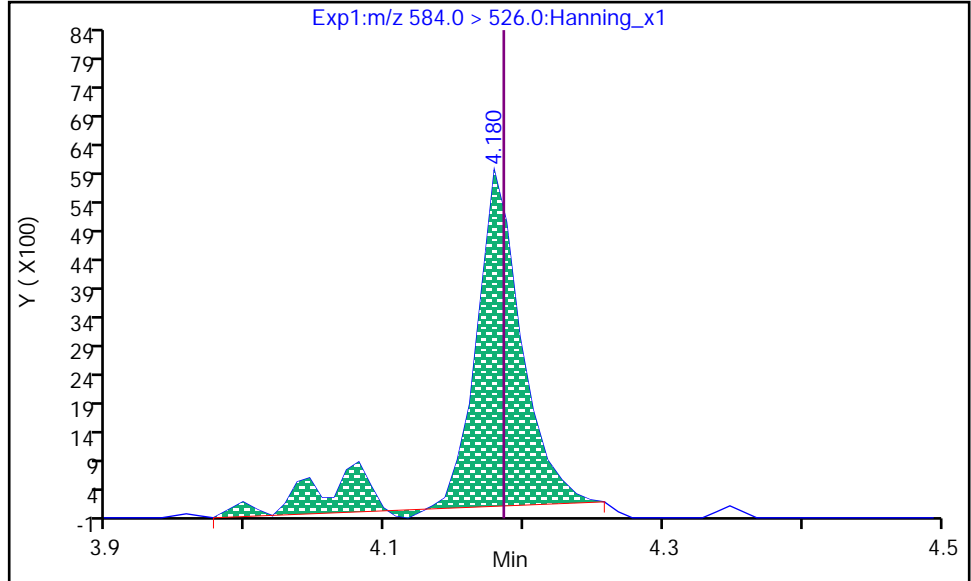
Dil. Factor: 1

Operator: Matthew M. Miller

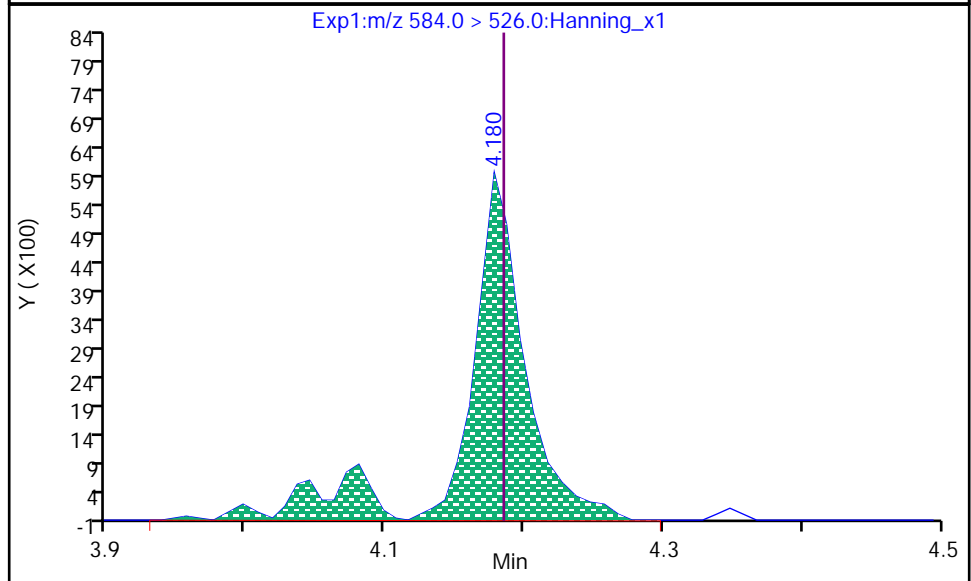
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.180  
Area: 14878  
Amount: 184.90  
Amount Units: ng/L



RT: 4.180  
Area: 17521  
Amount: 184.90  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:46

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

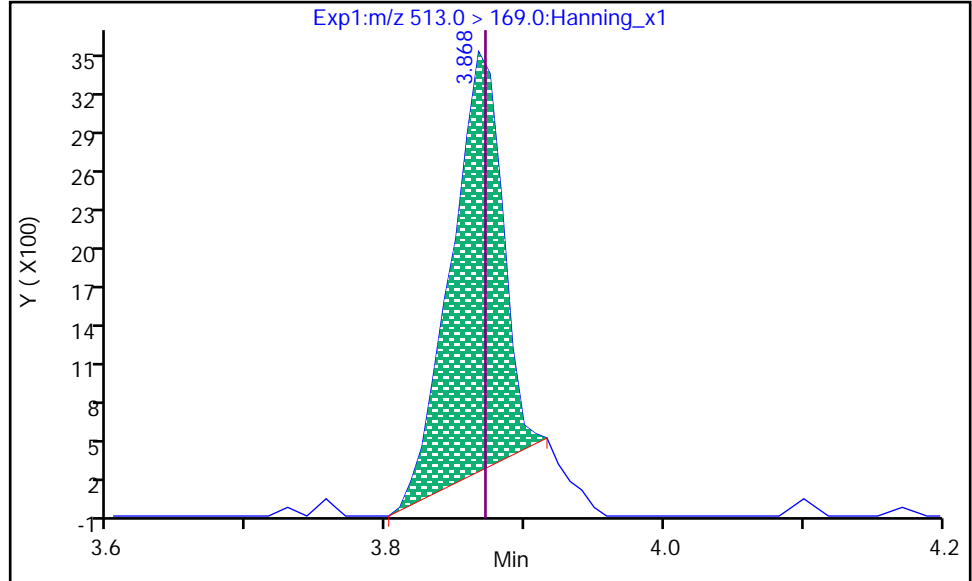
Dil. Factor: 1

Operator: Matthew M. Miller

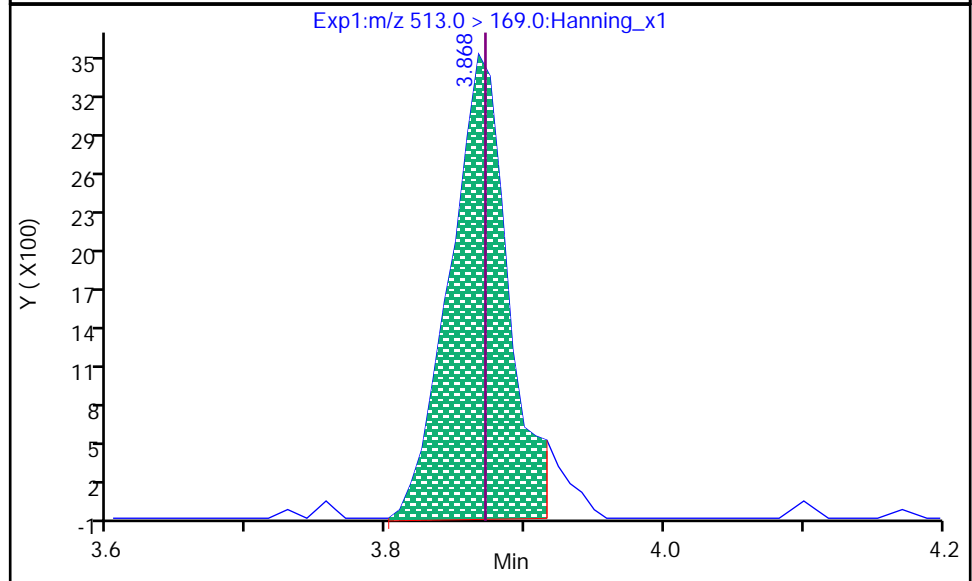
10 PFDA, CAS: 335-76-2

RT: 3.868  
Area: 8127  
Amount: 189.92  
Amount Units: ng/L

Processing Integration Results



RT: 3.868  
Area: 10209  
Amount: 189.92  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:47

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

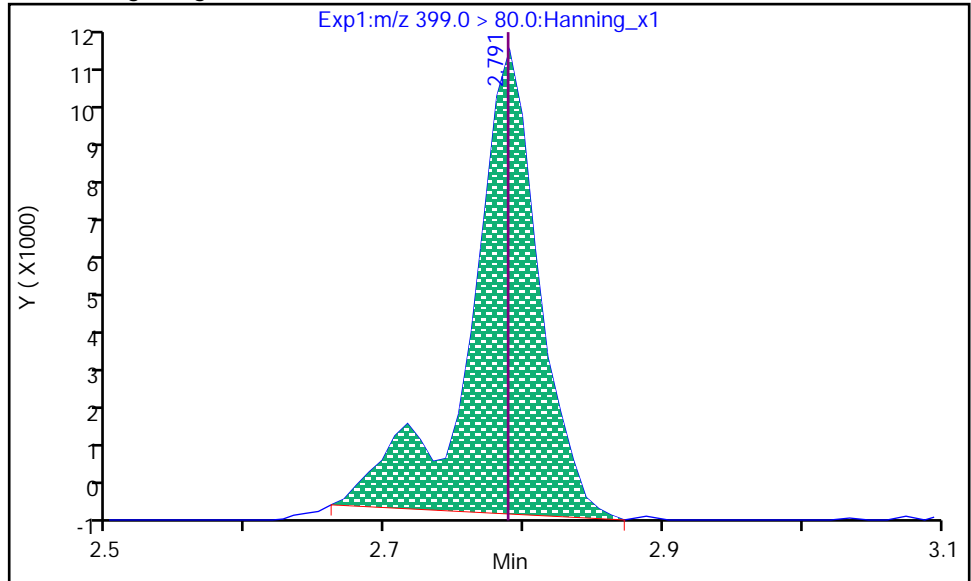
Dil. Factor: 1

Operator: Matthew M. Miller

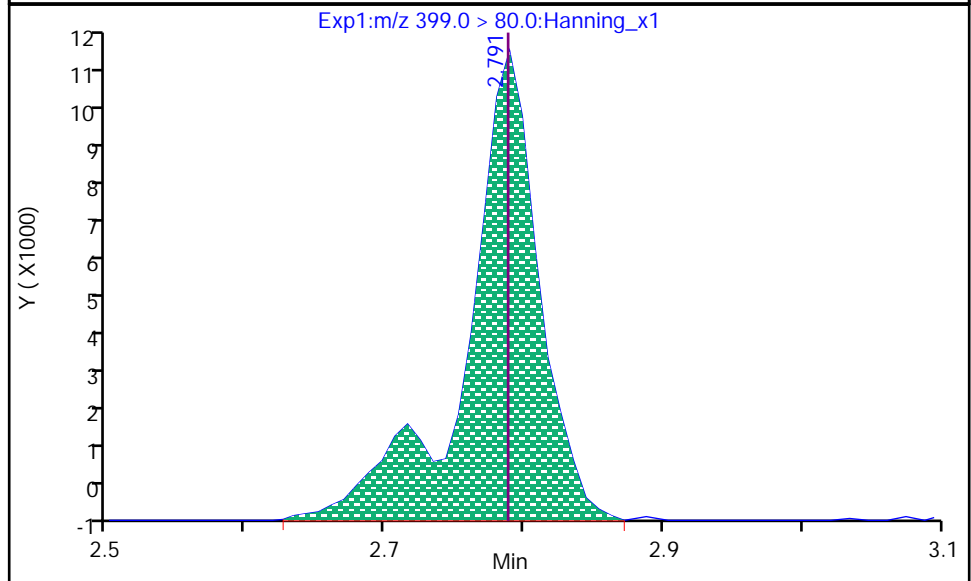
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.791  
Area: 37015  
Amount: 196.38  
Amount Units: ng/L



RT: 2.791  
Area: 39735  
Amount: 210.81  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:37

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d  
Injection Date: 28-Dec-2020 13:06:43 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 15  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	942.51	94.3	70 - 130
D 46 13C4_PFBA	649747	645073			99.3	50 - 150
D 50 13C5_PFPeA	665996	674000			101	50 - 150
21 PFPeA			1000.00	930.74	93.1	70 - 130
7 PFBS			884.00	816.96	92.4	70 - 130
D 44 13C3_PFBS	238207	230670			96.8	50 - 150
1 4:2 FTS			934.00	917.81	98.3	70 - 130
D 63 13C2_4:2 FTS_2	144067	122646			85.1	50 - 150
D 49 13C5_PFHxA	743582	708128			95.2	50 - 150
15 PFHxA			1000.00	917.27	91.7	70 - 130
22 PFPeS			938.00	891.42	95	70 - 130
28 GenX			2000.00	1878.79	93.9	70 - 130
D 66 13C3_GenX	1401050	1337982			95.5	50 - 150
D 47 13C4_PFHpA	633684	595025			93.9	50 - 150
13 PFHpA			1000.00	960.22	96	70 - 130
D 45 13C3_PFHxS	174146	177911			102	50 - 150
14 PFHxS			910.00	842.13	92.5	70 - 130
29 ADONA			942.00	857.41	91	70 - 130
D 64 13C2_6:2 FTS_2	104346	100427			96.2	50 - 150
2 6:2 FTS			948.00	1056.45	111	70 - 130
20 PFOA			1000.00	989.08	98.9	70 - 130
D 53 13C8_PFOA	628007	576963			91.9	50 - 150
12 PFHpS			952.00	885.48	93	70 - 130
18 PFOS			928.00	845.53	91.1	70 - 130
17 PFNA			1000.00	914.90	91.5	70 - 130
D 56 13C9_PFNA	767623	744395			97	50 - 150
D 54 13C8_PFOS	152445	154691			101	50 - 150
30 9Cl-PF3ONS			932.00	849.93	91.2	70 - 130
D 55 13C8_PFOSA	308857	301021			97.5	50 - 150
19 PFOSA			1000.00	942.49	94.2	70 - 130
16 PFNS			960.00	862.83	89.9	70 - 130
D 65 13C2_8:2 FTS_2	100453	86782			86.4	50 - 150
3 8:2 FTS			958.00	992.09	104	70 - 130
10 PFDA			1000.00	950.43	95	70 - 130
D 51 13C6_PFDA	672868	672515			99.9	50 - 150
D 58 d3-MeFOSAA	791564	701823			88.7	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1005.53	101	70 - 130
9 PFDS			964.00	827.68	85.9	70 - 130
5 N-EtFOSAA			1000.00	917.42	91.7	70 - 130
25 PFUdA			1000.00	937.12	93.7	70 - 130
D 60 d5-EtFOSAA	731651	692713			94.7	50 - 150
D 52 13C7_PFUdA	643525	626438			97.3	50 - 150
D 61 d7-MeFOSE	105402	106017			101	50 - 150
32 MeFOSE			1000.00	863.40	86.3	70 - 130
26 MeFOSA			1000.00	857.26	85.7	70 - 130
D 57 d3-MeFOSA	51840	54552			105	50 - 150
31 11Cl-PF3OUDS			942.00	832.74	88.4	70 - 130
D 62 d9-EtFOSE	137116	114256			83.3	50 - 150
33 EtFOSE			1000.00	1068.52	107	70 - 130
D 59 d5-EtFOSA	50284	52541			104	50 - 150
D 38 13C2_PFDoA	611364	601549			98.4	50 - 150
4 10:2 FTS			964.00	956.65	99.2	70 - 130
27 EtFOSA			1000.00	821.00	82.1	70 - 130
11 PFDoA			1000.00	965.50	96.6	70 - 130
34 PFDOS			968.00	903.38	93.3	70 - 130
24 PFTrDA			1000.00	939.31	93.9	70 - 130
23 PFTeDA			1000.00	955.79	95.6	70 - 130
D 42 13C2_PFTeDA	813074	802621			98.7	50 - 150
35 PFHxDA			1000.00	988.25	98.8	70 - 130
D 40 13C2_PFHxDA	935525	873641			93.4	50 - 150
36 PFODA			1000.00	967.04	96.7	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d  
 Injection Date: 28-Dec-2020 13:06:43 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 15  
 Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	645073	24	>100:1			1000.00	930.10	99.3	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/0	605555	25	>100:1			1000.00	942.51		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	674000	17	>100:1			1000.00	979.81	101	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	630718	18	>100:1			1000.00	930.74		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	230670	18	>100:1			1000.00	1001.91	96.8	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/0	222188	17	>100:1	Target = 3.50		884.00	816.96		
298.9 > 99	44	2.130	2.125		64156	19	>100:1	3.46 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.450	1/0	178369	19	>100:1	Target = 3.10		938.00	891.42		
349 > 99	44	2.442	2.450		57492	19	>100:1	3.10 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.379	1	122646	20	>100:1			5000.00	5066.27	85.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.388	0/-1	44930	17	>100:1	Target = 1.80		934.00	917.81		
327 > 81	63	2.380	2.388		26006	23	>100:1	1.72 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.423	0	708128	20	>100:1			1000.00	960.73	95.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.415	2.423	0/0	641283	21	>100:1	Target = 18.34		1000.00	917.27		
313 > 119	49	2.415	2.423		33320	19	>100:1	19.24 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.530	0	1337982	20	>100:1			5000.00	5023.32	95.5	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.522	2.530	0/0	361211	22	>100:1	Target = 0.81		2000.00	1878.79		
285 > 185	66	2.522	2.530		444057	19	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	595025	20	>100:1			1000.00	980.84	93.9	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	592644	21	>100:1	Target = 3.70		1000.00	960.22		
363 > 169	47	2.773	2.772		157979	20	>100:1	3.75 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.790	0	177911	20	>100:1			1000.00	1039.03	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/1	158857	28	>100:1	Target = 3.21	0.14	910.00	842.13		
399 > 99	45	2.782	2.790		52957	28	>100:1	2.99 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.808	1/1	968468	20	>100:1	Target = 2.97		942.00	857.41		
377 > 85	45	2.809	2.808		316019	20	>100:1	3.06 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.154	1/1	143111	22	>100:1	Target = 3.08		952.00	885.48		
449 > 99	45	3.149	3.154		44962	22	>100:1	3.18 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	100427	30	>100:1			5000.00	5214.71	96.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	43846	44	>100:1	Target = 1.80		948.00	1056.45		
427 > 81	64	3.115	3.128		18099	23	>100:1	2.42 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	576963	25	>100:1			1000.00	974.82	91.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	581761	26	>100:1	Target = 2.87		1000.00	989.08		
413 > 169	53	3.142	3.148		188690	24	>100:1	3.08 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	154691	21	>100:1			1000.00	1031.76	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/1	154992	45	>100:1	Target = 3.84	0.25	928.00	845.53		
499 > 99	54	3.514	3.520		40744	39	>100:1	3.80 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/1	442611	24	>100:1			932.00	849.93		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/0	102142	22	>100:1	Target = 3.07		960.00	862.83		
549 > 99	54	3.858	3.865		42460	26	>100:1	2.40 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.169	0/0	92919	20	>100:1	Target = 3.03		964.00	827.68		
599 > 99	54	4.171	4.169		36996	17	>100:1	2.51 (1.51-4.55)					
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.329	4.317	1/1	365835	15	>100:1			942.00	832.74		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.663	1/1	112191	19	>100:1	Target = 3.33		968.00	903.38		
699 > 99	54	4.665	4.663		35773	21	>100:1	3.13 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	744395	23	>100:1			1000.00	991.25	97	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	681065	22	>100:1	Target = 6.16		1000.00	914.90		
463 > 169	56	3.522	3.520		105758	19	>100:1	6.43 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	301021	22	>100:1			1000.00	972.40	97.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	279582	21	>100:1			1000.00	942.49		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	86782	17				5000.00	4678.24	86.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-1	34611	17	>100:1	Target = 1.95		958.00	992.09		
527 > 81	65	3.866	3.873		16524	16	>100:1	2.09 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.455	1/0	38370	21		Target = 3.14		964.00	956.65		
627 > 80	65	4.456	4.455		10744	16		3.57 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	672515	20	>100:1			1000.00	1013.84	99.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.873	0/-1	628056	21	>100:1	Target = 15.94		1000.00	950.43		
513 > 169	51	3.866	3.873		41933	17		14.97 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	701823	20	>100:1			5000.00	4889.41	88.7	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.029	1/0	108417	34	>100:1	Target = 1.33	0.10	1000.00	1005.53		
570 > 483	58	4.030	4.029		80179	34	>100:1	1.35 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	692713	20	>100:1			5000.00	5215.64	94.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.180	4.187	0/-1	126541	36	>100:1	Target = 1.58	0.06	1000.00	917.42		M
584 > 526	60	4.189	4.187		79940	35	>100:1	1.58 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	626438	17	>100:1			1000.00	991.08	97.3	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.180	4.178	1/0	551750	18	>100:1	Target = 15.50		1000.00	937.12		
563 > 169	52	4.180	4.178		34284	16	>100:1	16.09 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	106017	18				1000.00	979.75	101	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.299	4.297	1/0	86006	15	>100:1			1000.00	863.40		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.309	4.307	1	54552	15	87:1			1000.00	1030.90	105	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.309	4.317	0/-1	52761	16	>100:1	Target = 1.12		1000.00	857.26		
512 > 219	57	4.309	4.317		51356	22	>100:1	1.02 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	114256	17	>100:1			1000.00	911.17	83.3	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.464	1/0	108616	17	>100:1			1000.00	1068.52		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	601549	20	>100:1			1000.00	993.78	98.4	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	588154	18	>100:1	Target = 10.85		1000.00	965.50		
613 > 169	38	4.456	4.446		55192	26	>100:1	10.65 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	556533	22	>100:1	Target = 8.37		1000.00	939.31		
663 > 169	38	4.689	4.688		64196	18	>100:1	8.66 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	52541	16	>100:1			1000.00	1070.20	104	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	47127	15	>100:1	Target = 1.03		1000.00	821.00		
526 > 219	59	4.483	4.482		43640	14	>100:1	1.07 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	802621	18	>100:1			1000.00	952.73	98.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	664684	19	99:1	Target = 12.11		1000.00	955.79		
713 > 169	42	4.907	4.906		54893	19	>100:1	12.10 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	873641	20	>100:1			1000.00	964.11	93.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	564123	20	>100:1	Target = 11.48		1000.00	988.25		
813 > 269	40	5.283	5.282		50423	20	>100:1	11.18 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.626	5.625	1/0	747876	25	94:1	Target = 13.88		1000.00	967.04		
913 > 319	40	5.626	5.625		51346	24	>100:1	14.56 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	668270	20	>100:1					91.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.423	0	697097	20	>100:1					95.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	571452	25	>100:1					95.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	596920	24	>100:1					97.9	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.522	3.520	1	160032	23	>100:1					98.2	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d

Injection Date: 28-Dec-2020 13:06:43

Inst. ID: LCMSMS02

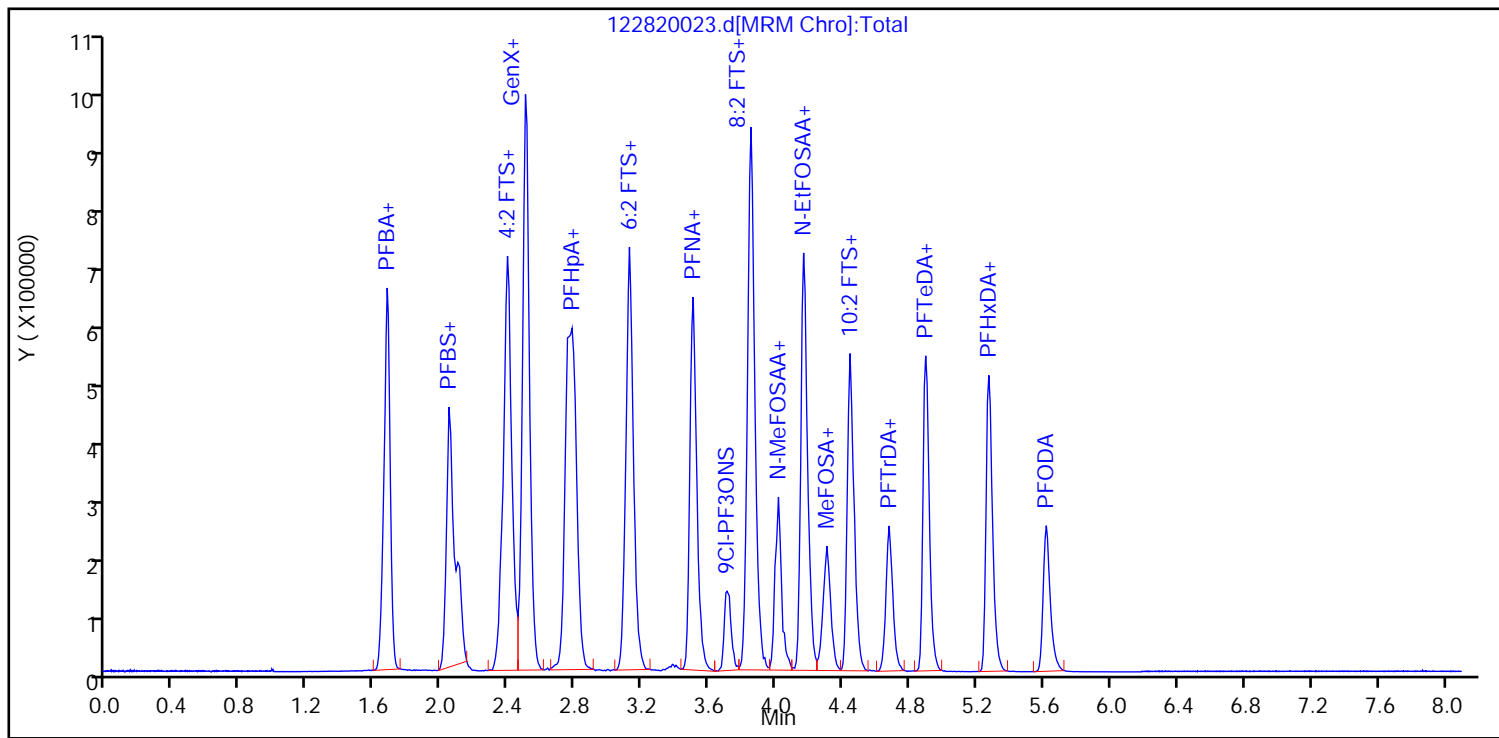
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

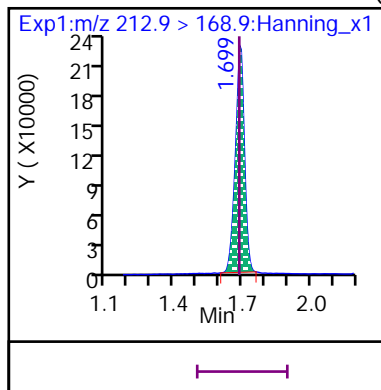
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

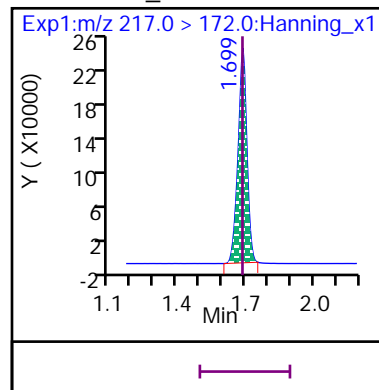
Operator: Matthew M. Miller



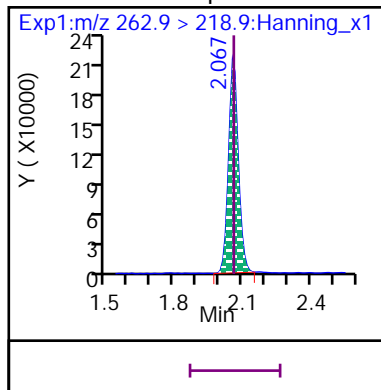
8 Perfluoro-n-butanoic acid (PFBA)



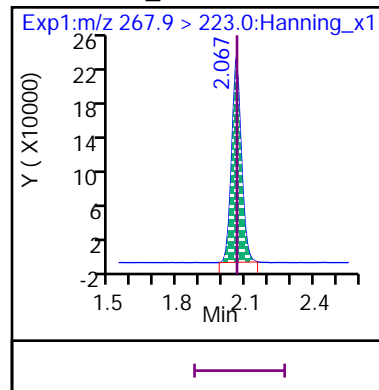
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

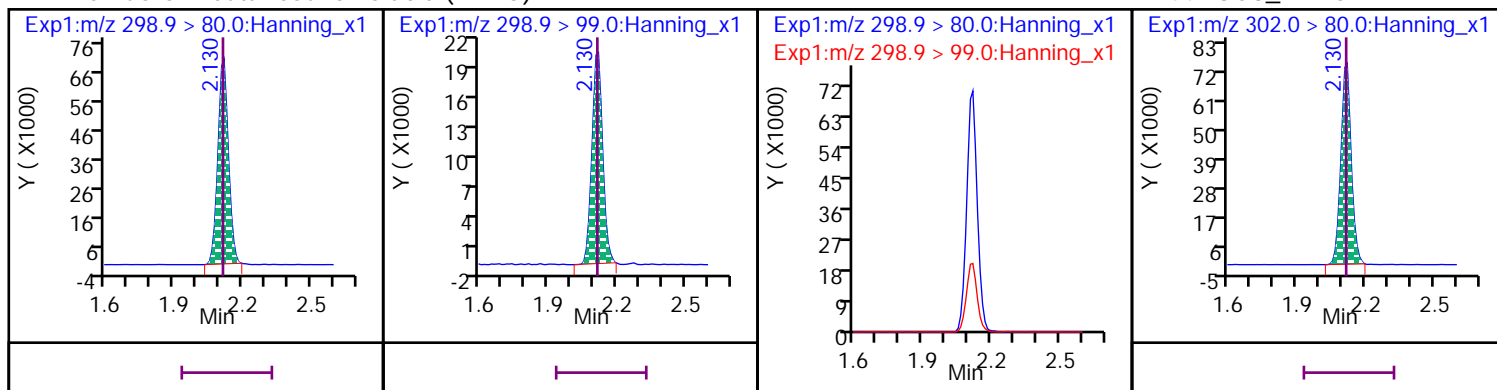


D 50 13C5\_PFPeA



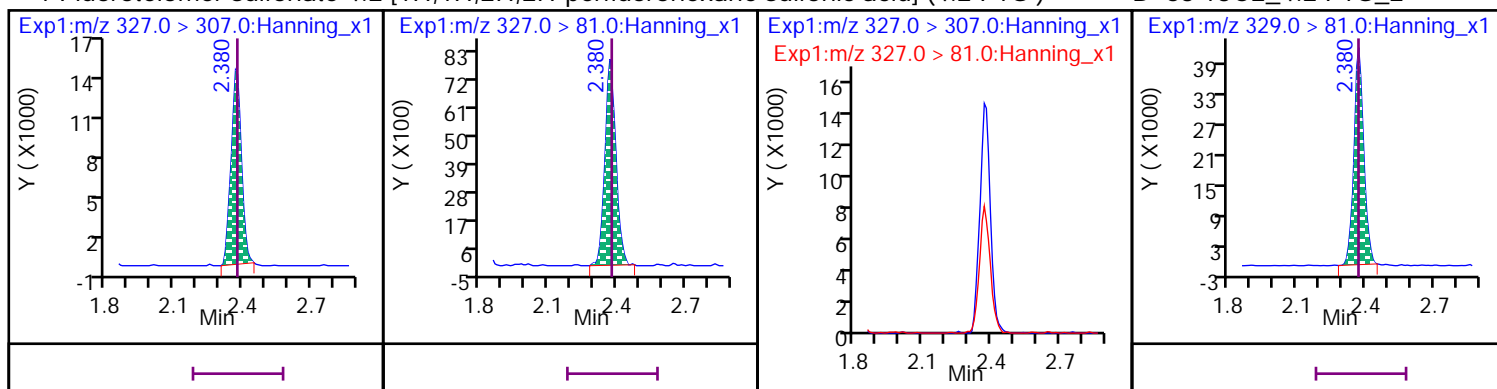
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



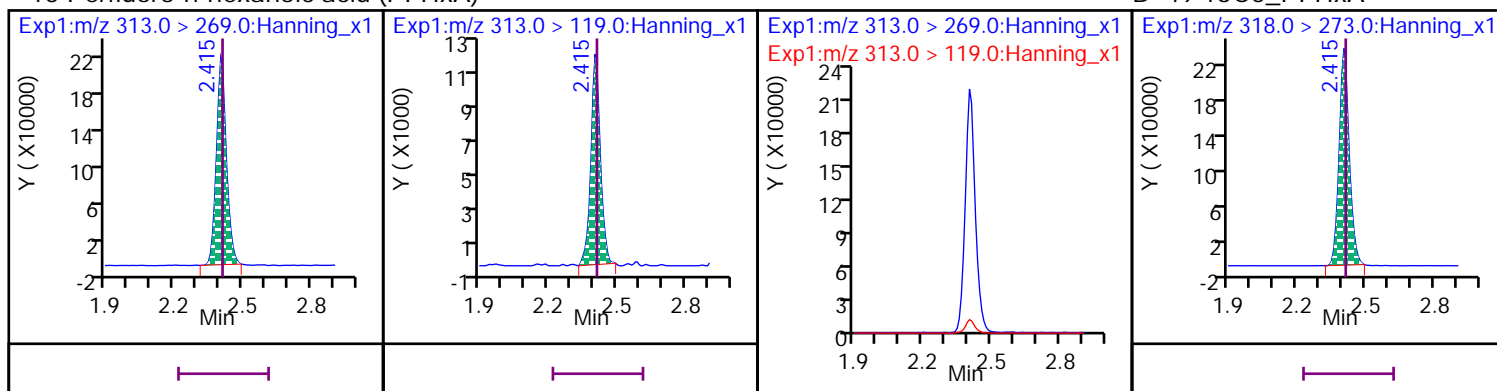
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



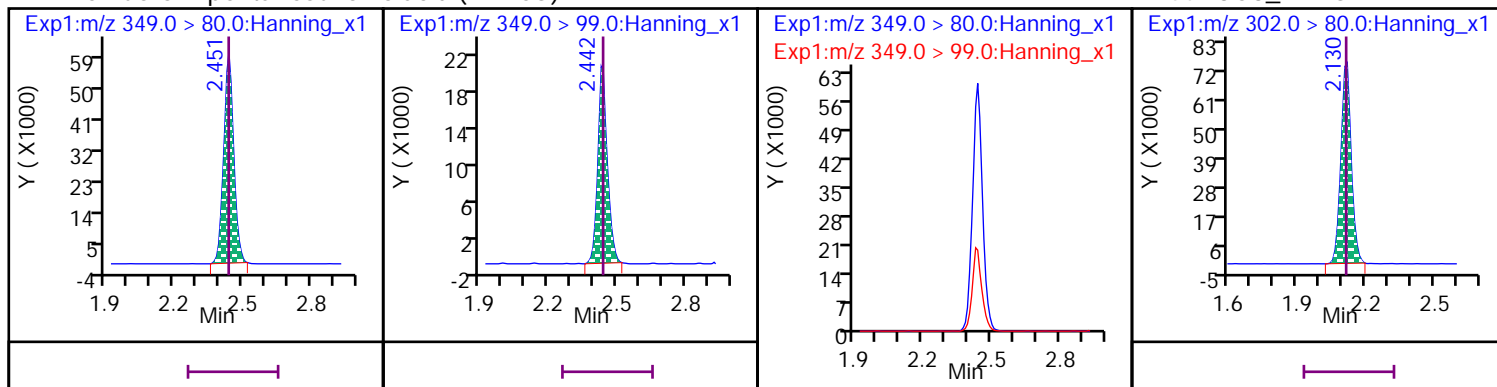
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



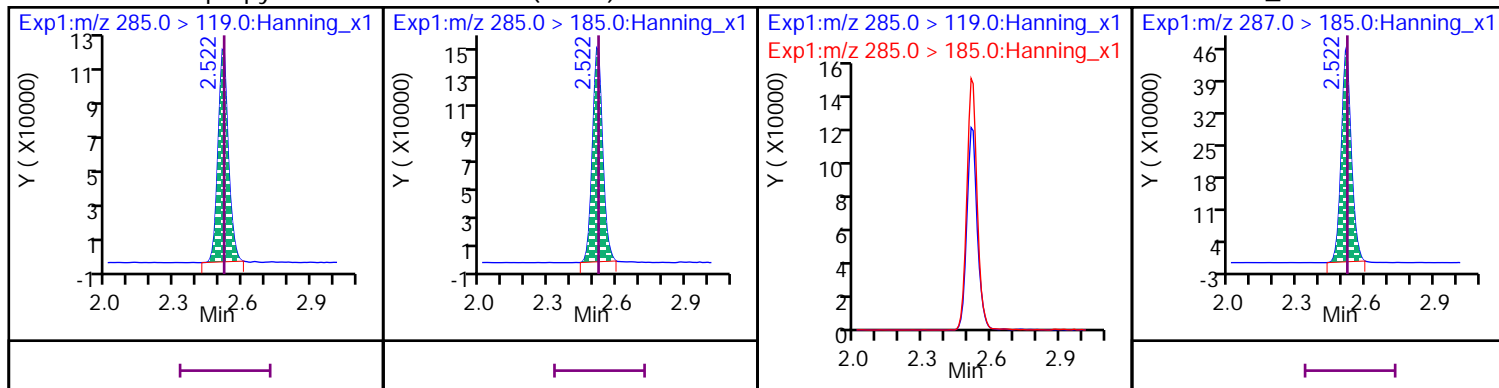
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



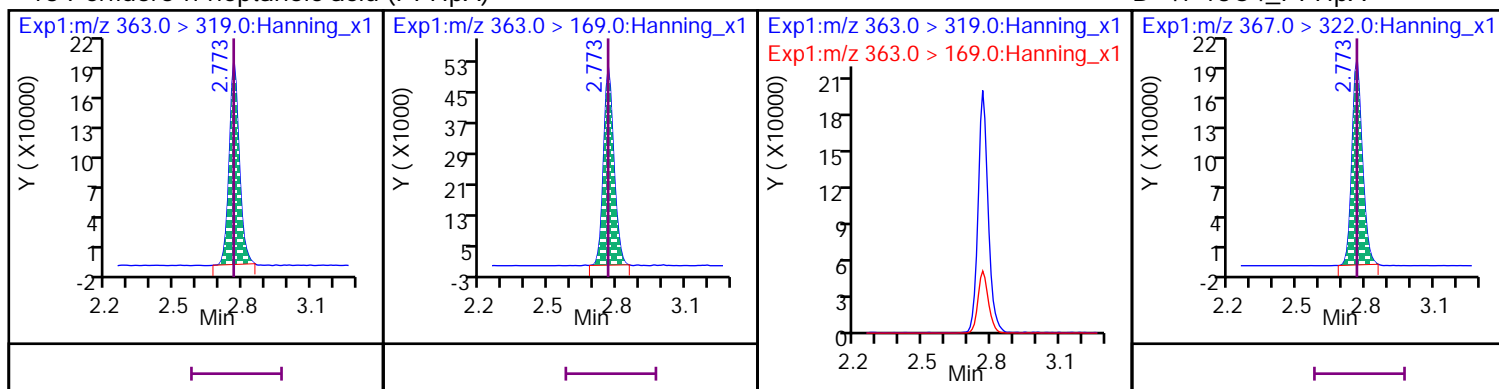
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



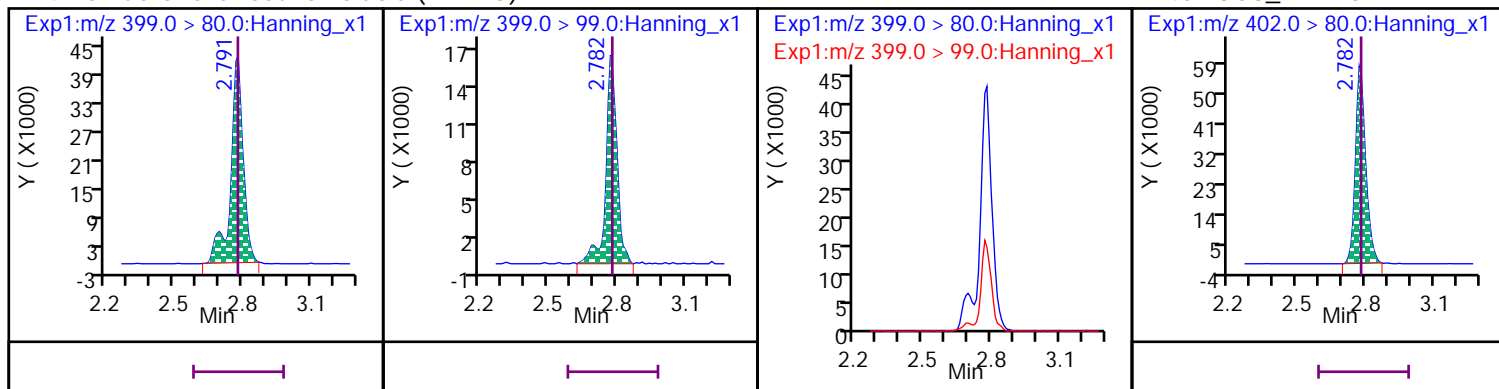
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



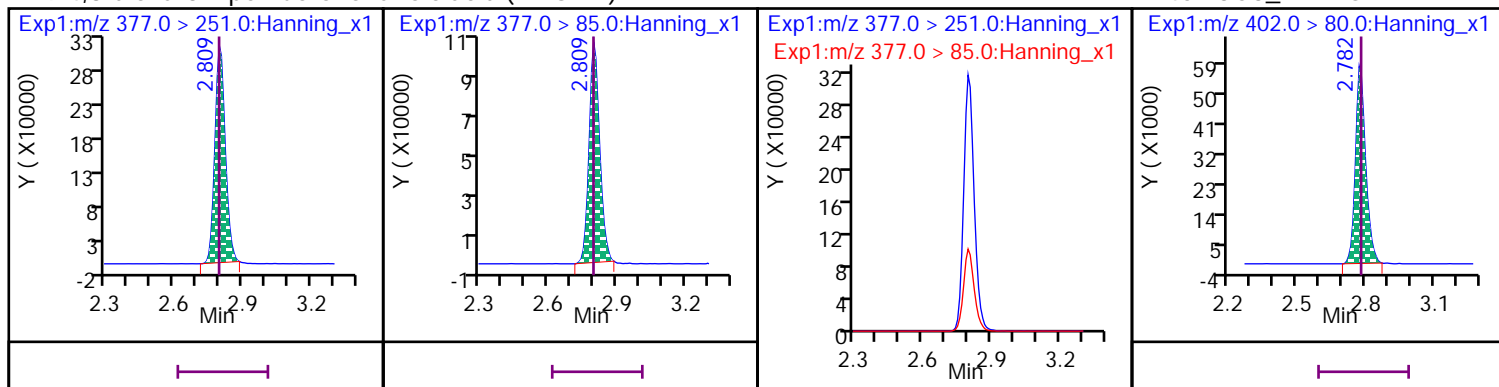
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



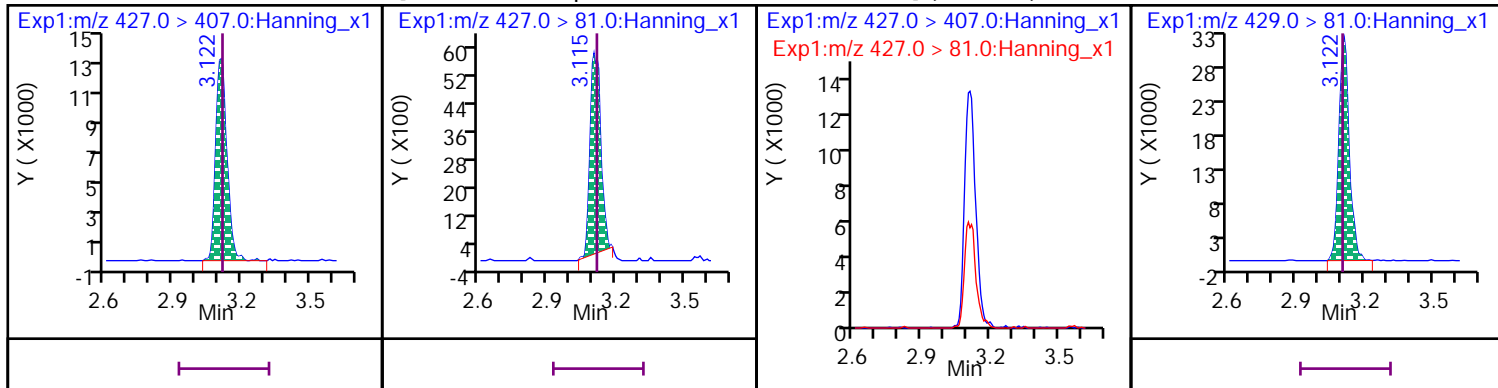
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



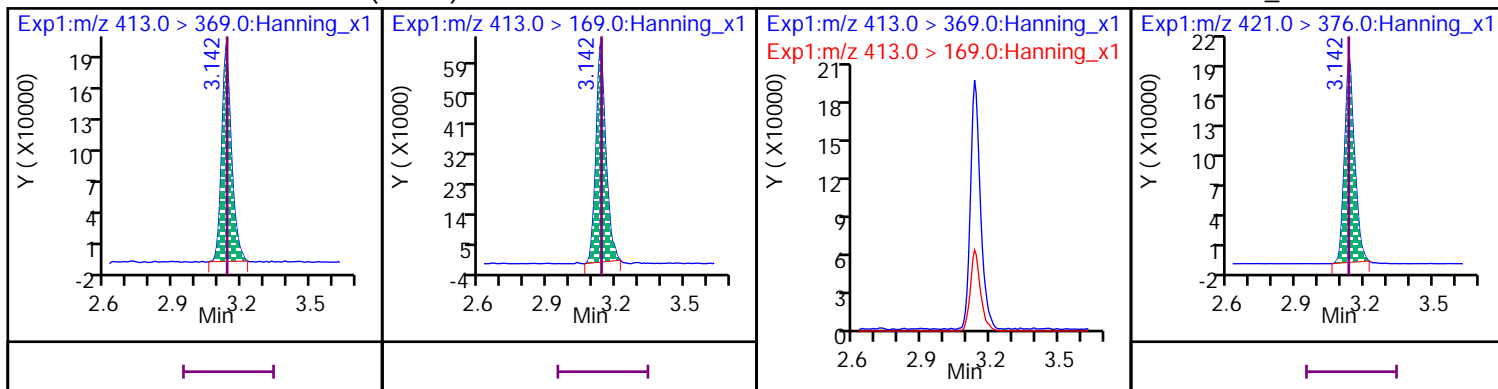
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



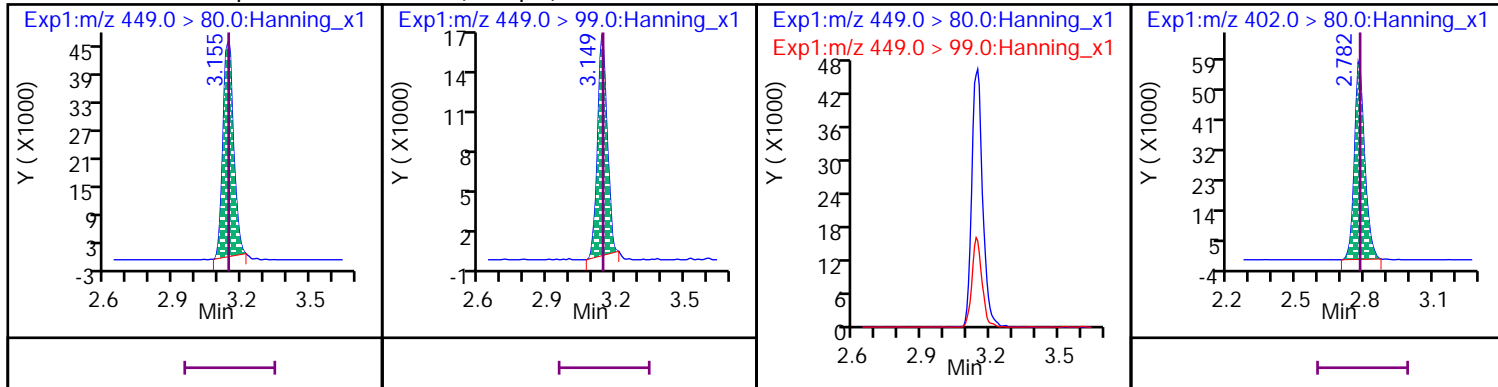
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



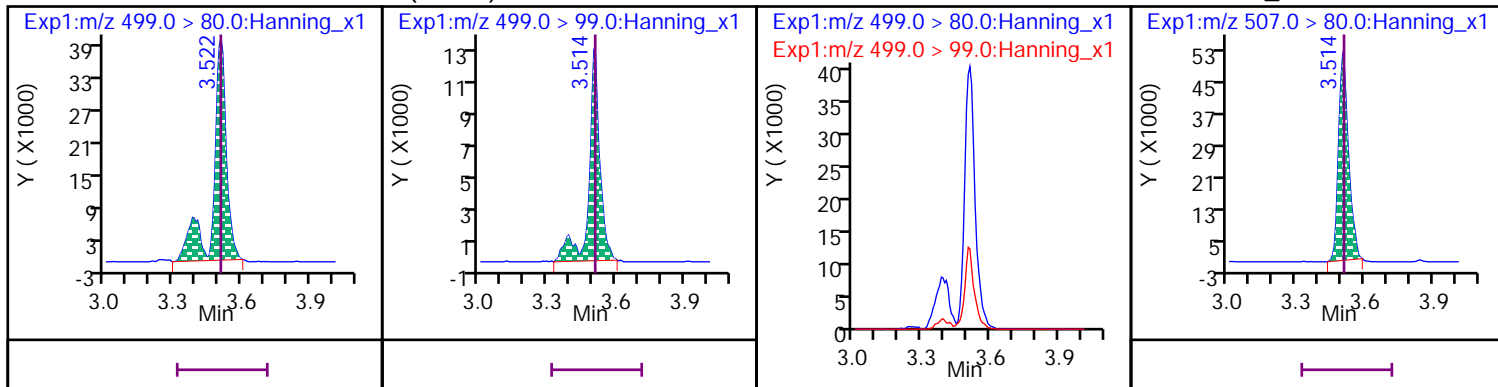
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



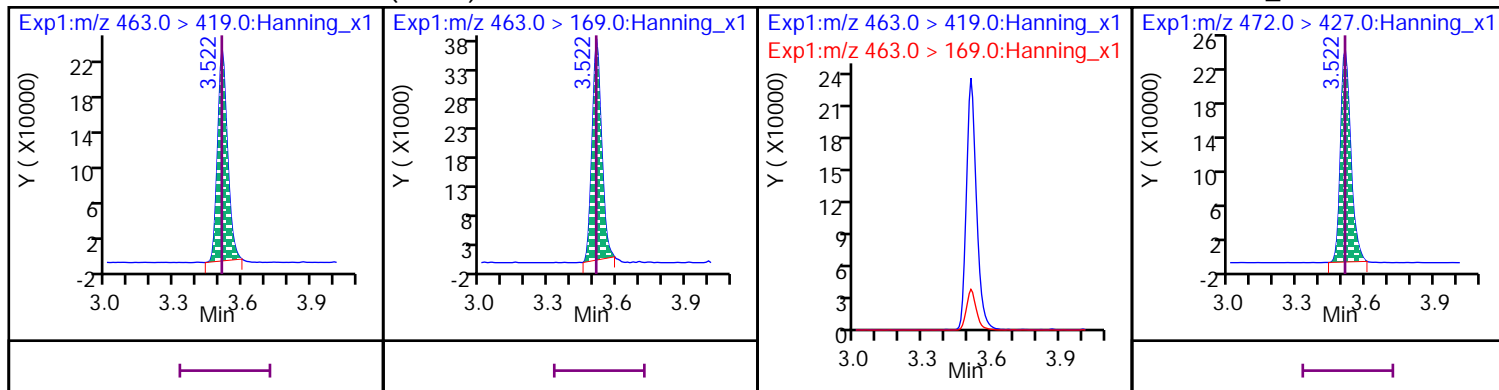
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



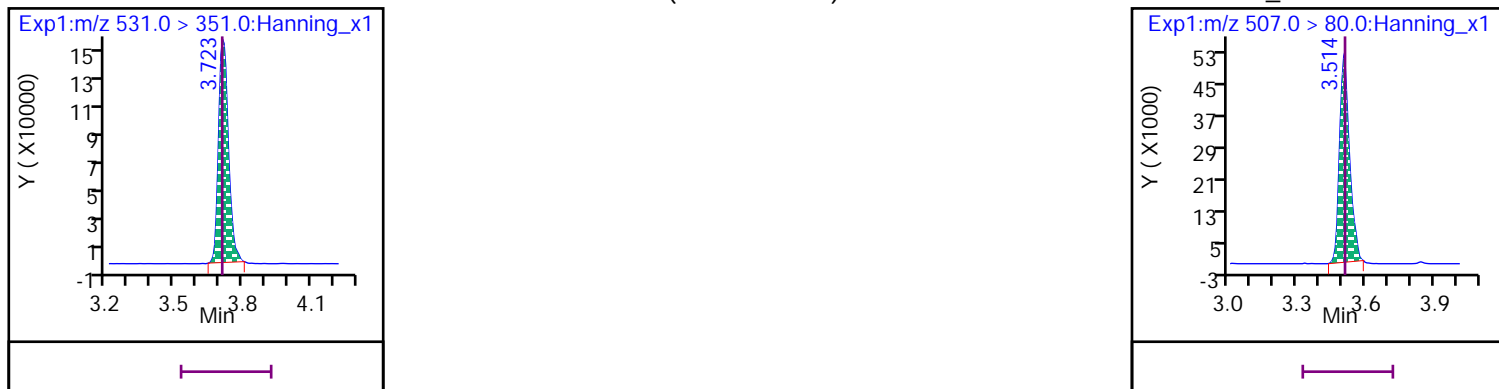
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



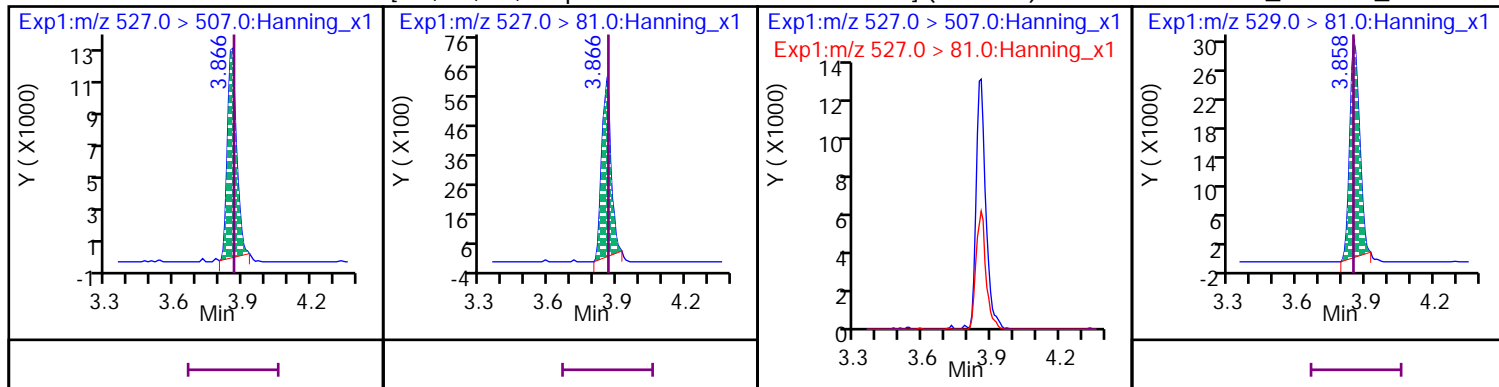
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



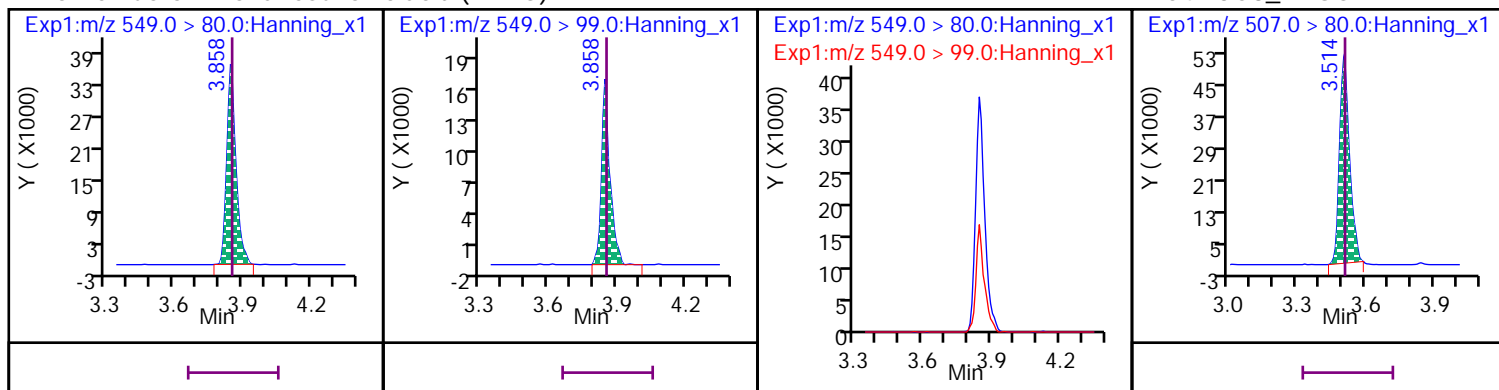
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



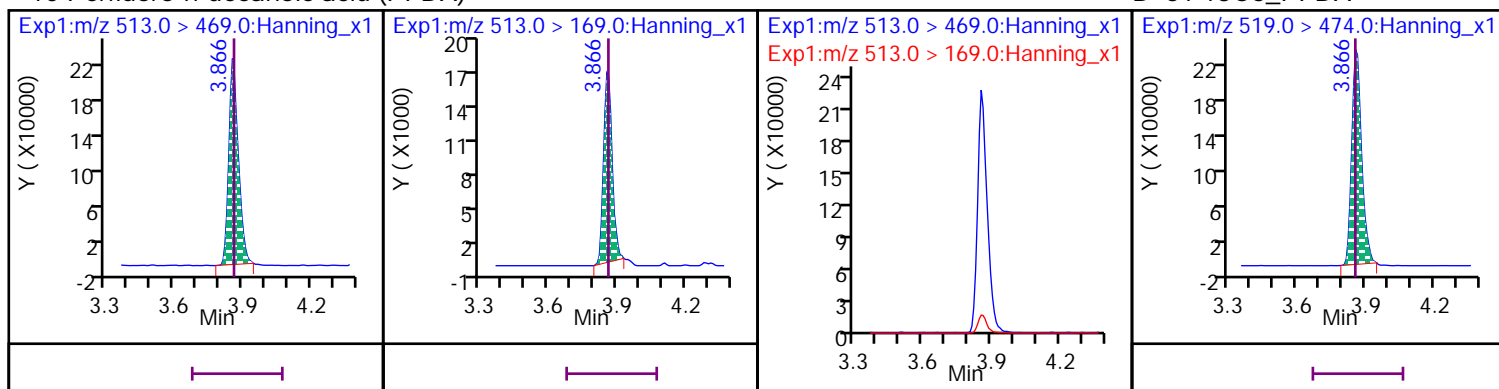
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



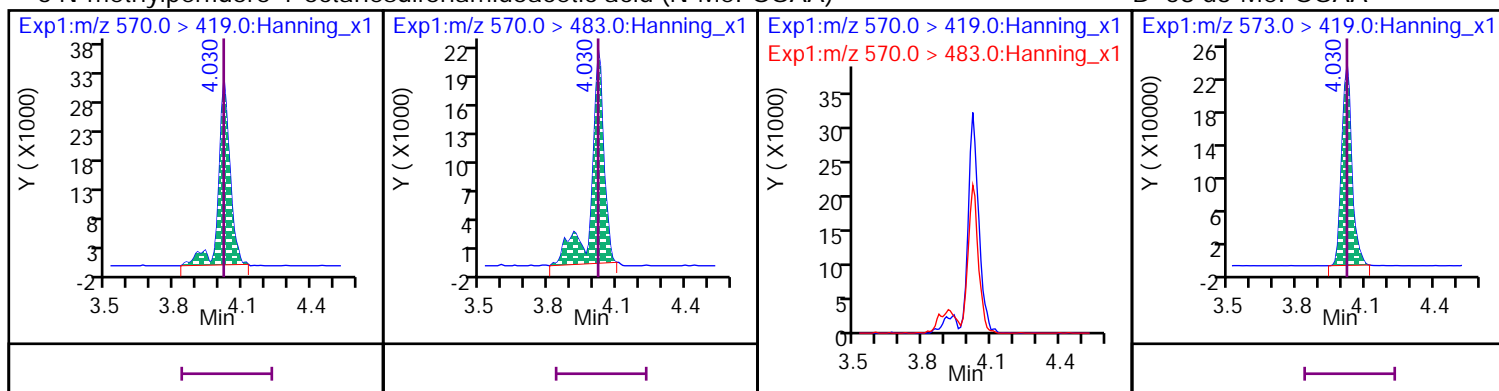
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



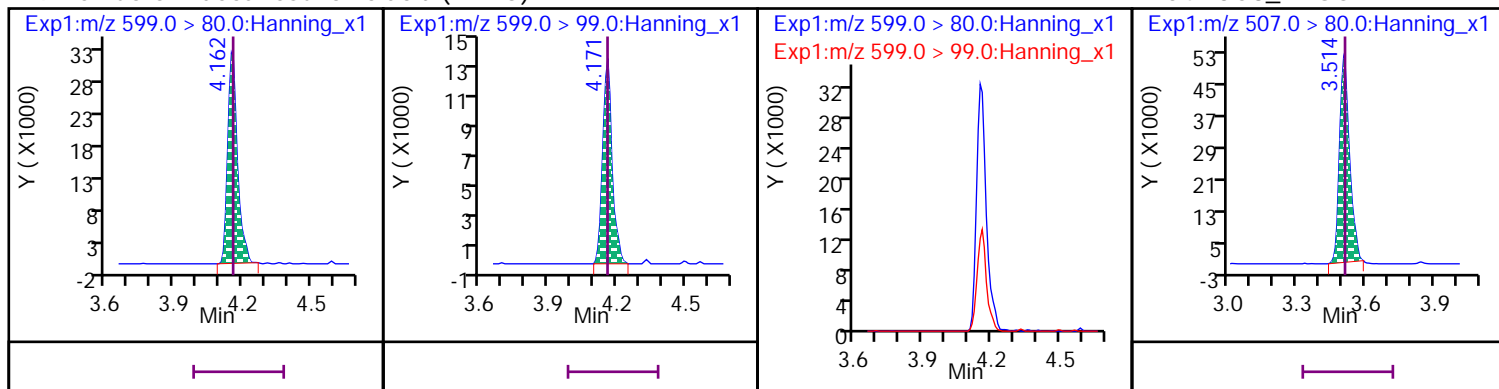
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



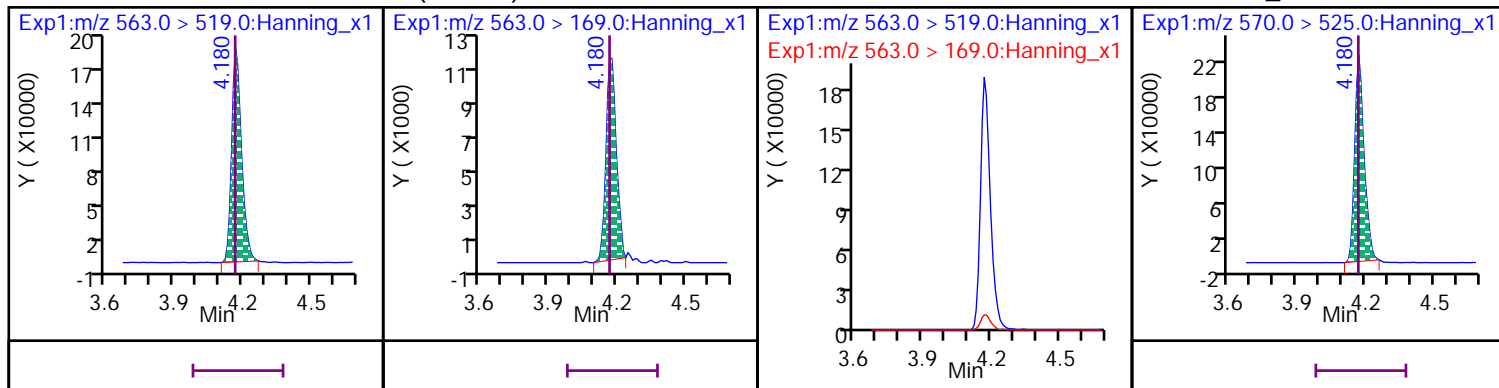
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



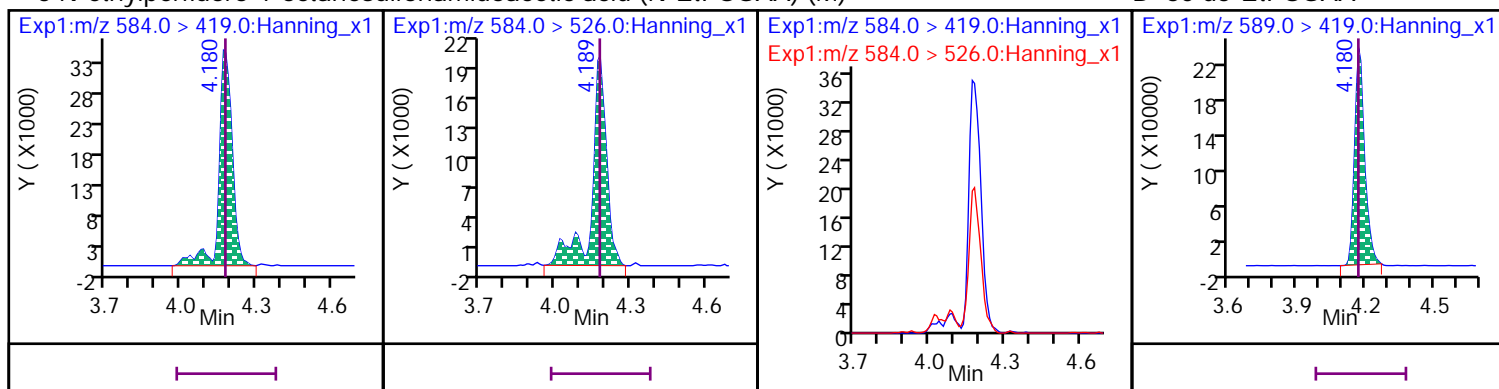
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



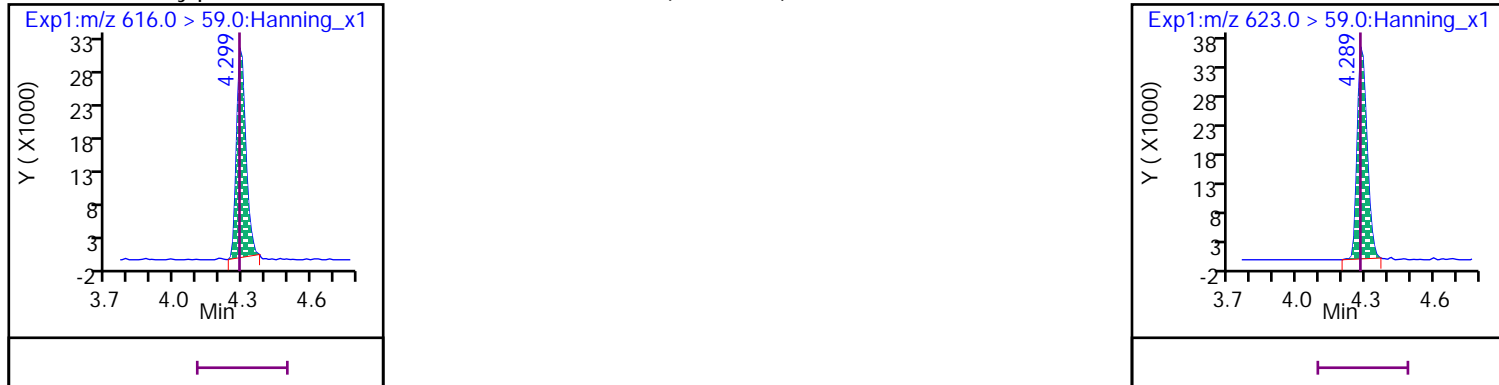
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



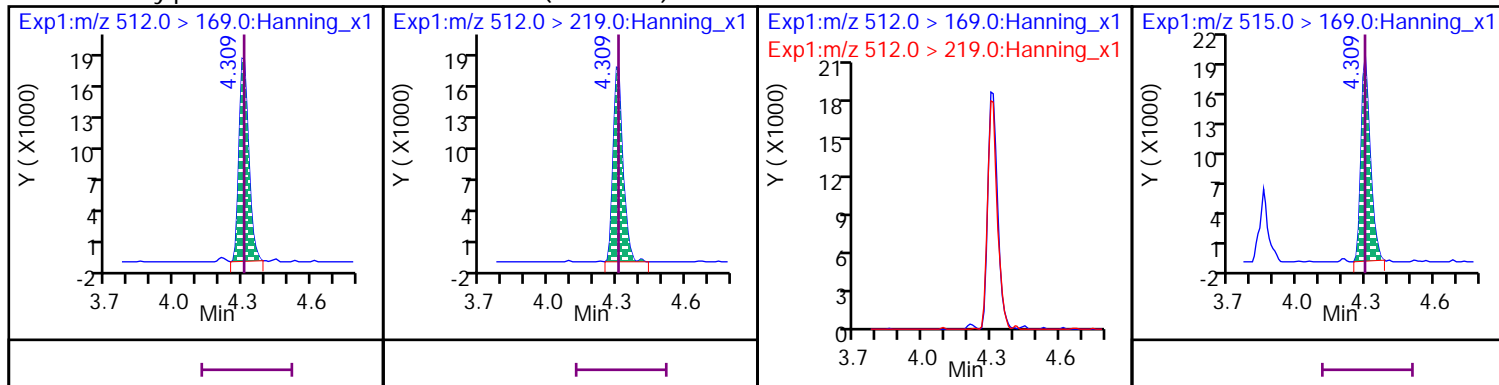
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



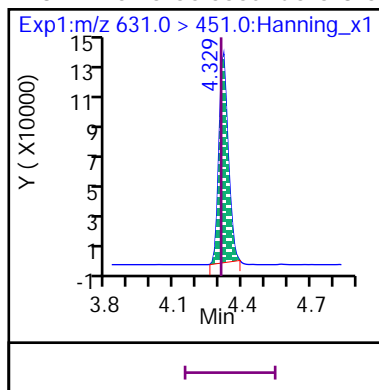
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

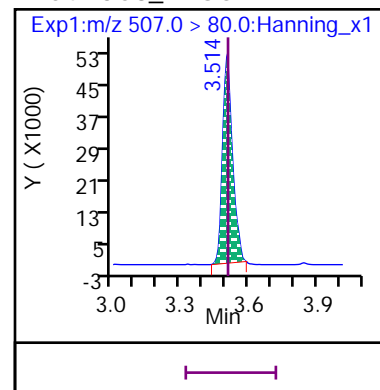




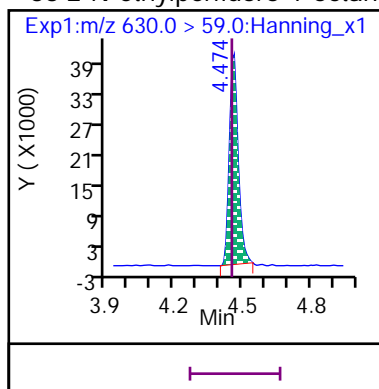
## 31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



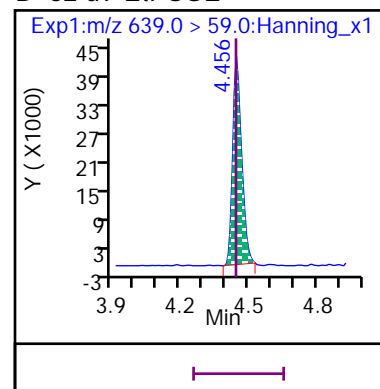
## D 54 13C8\_PFOS



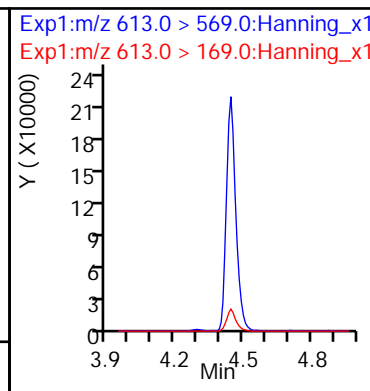
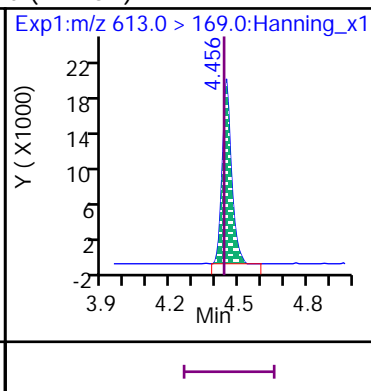
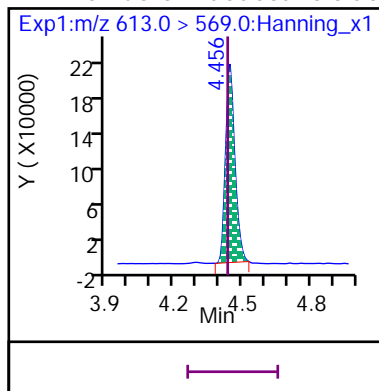
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



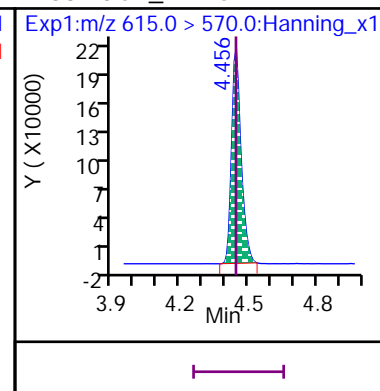
## D 62 d9-EtFOSE



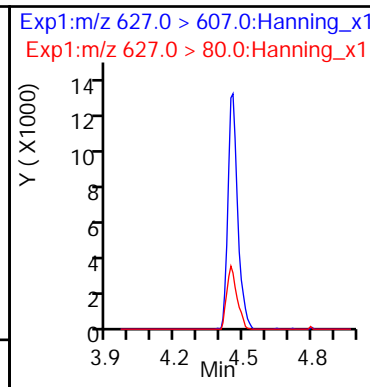
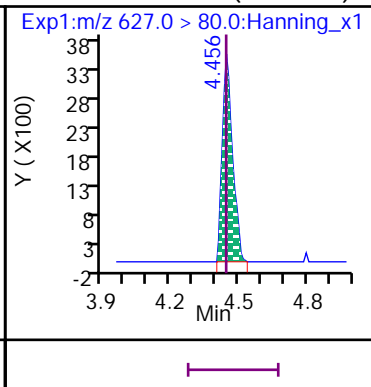
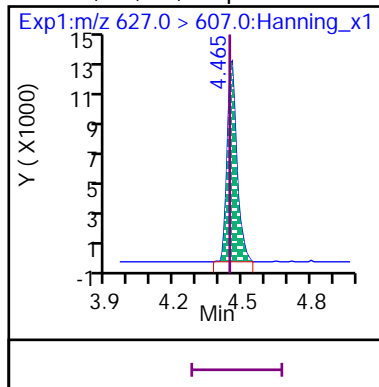
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



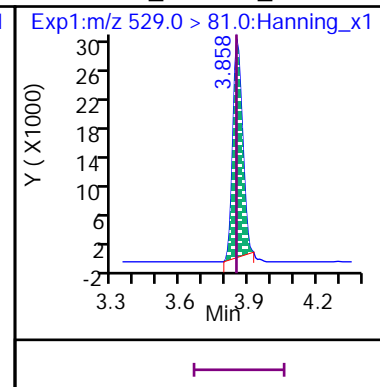
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

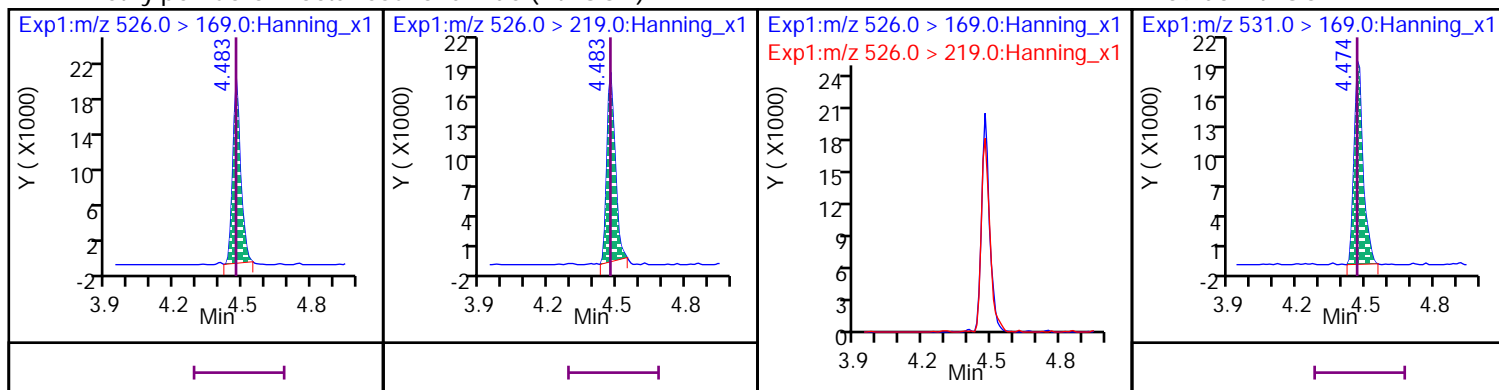


## D 65 13C2\_8:2 FTS\_2



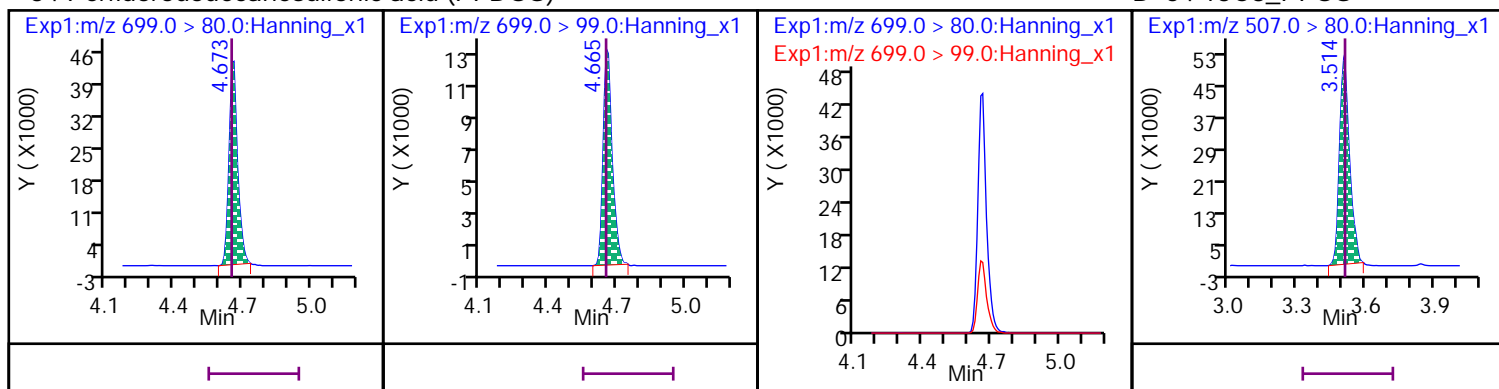
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



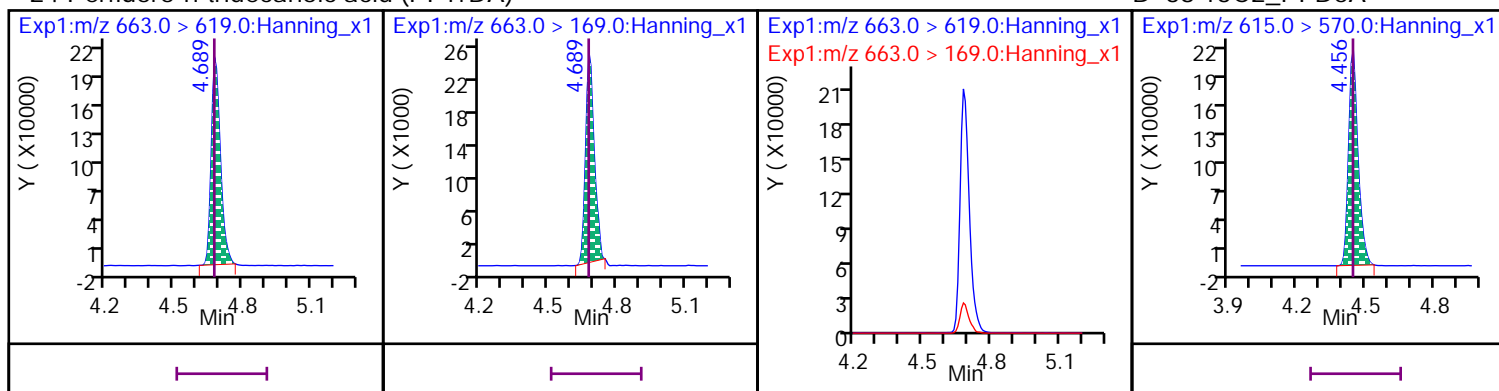
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



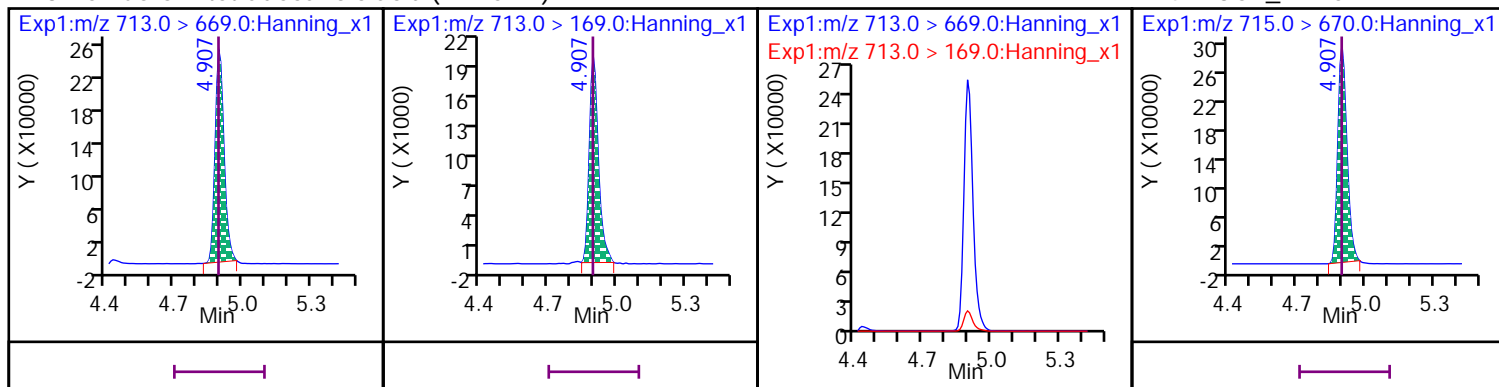
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



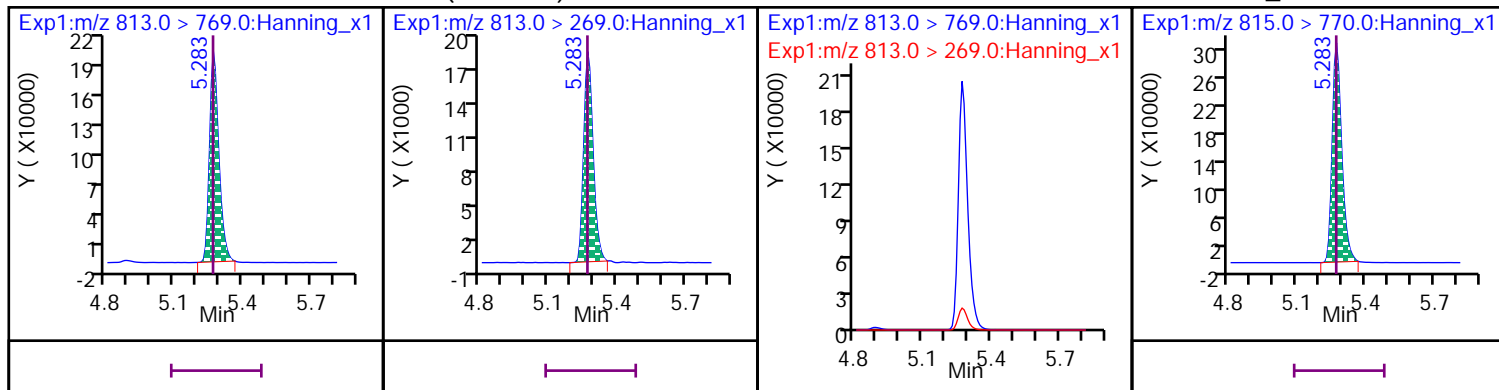
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



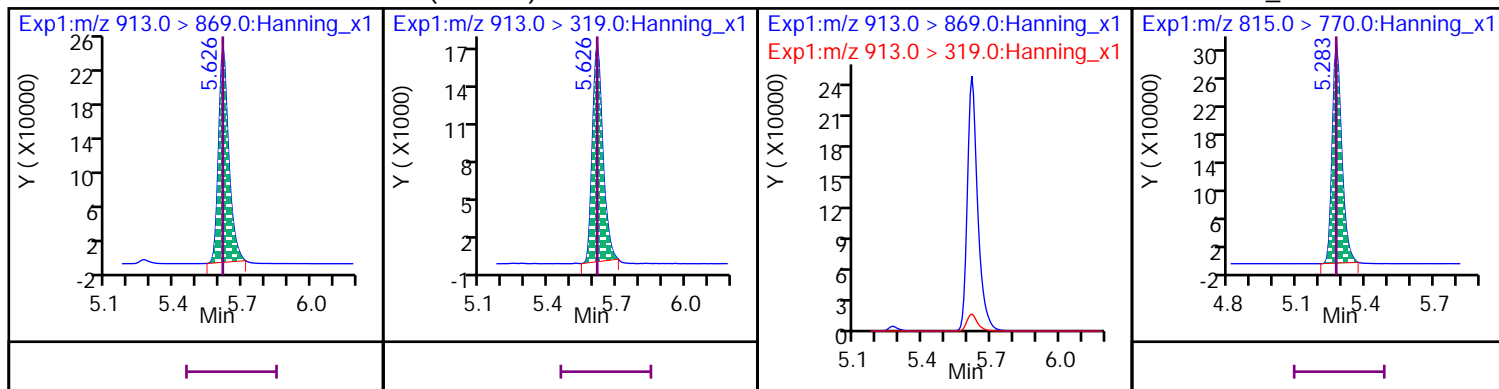
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

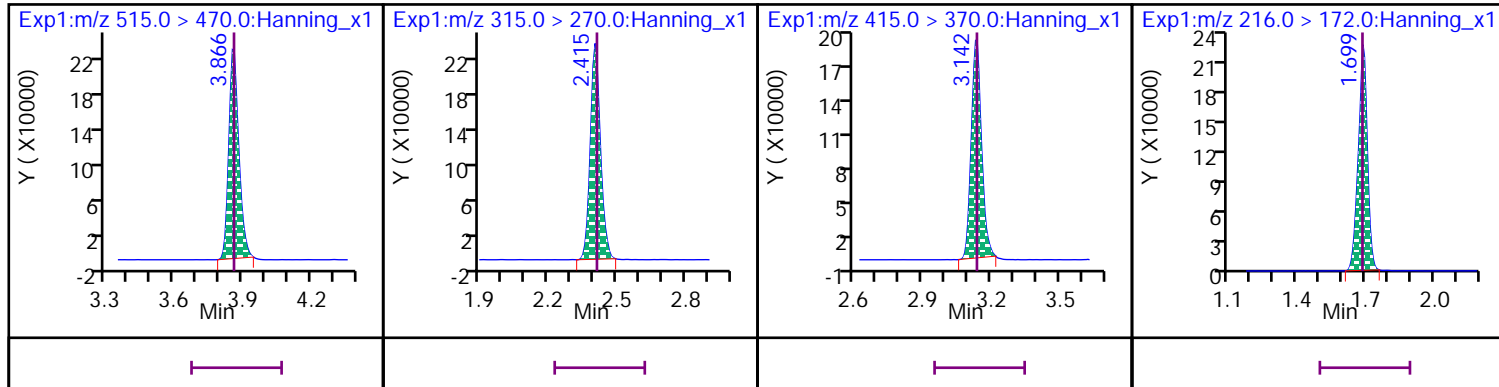


\* 37 13C2\_PFDA

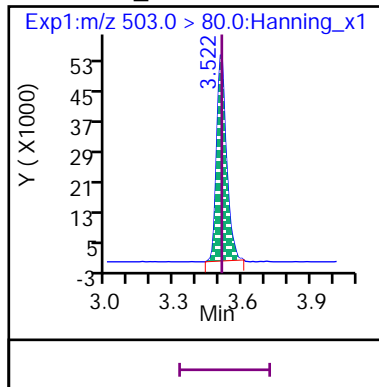
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d

Injection Date: 28-Dec-2020 13:06:43

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

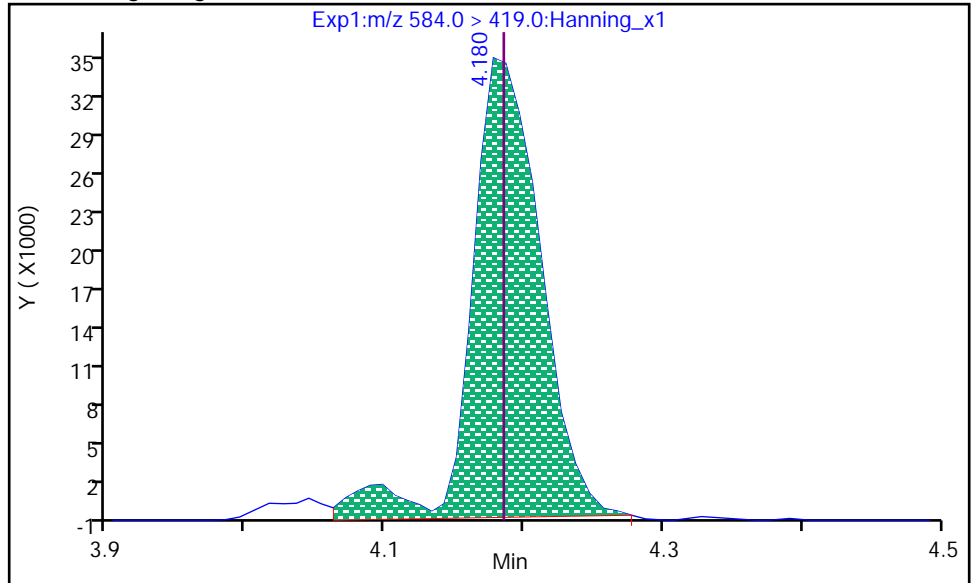
Dil. Factor: 1

Operator: Matthew M. Miller

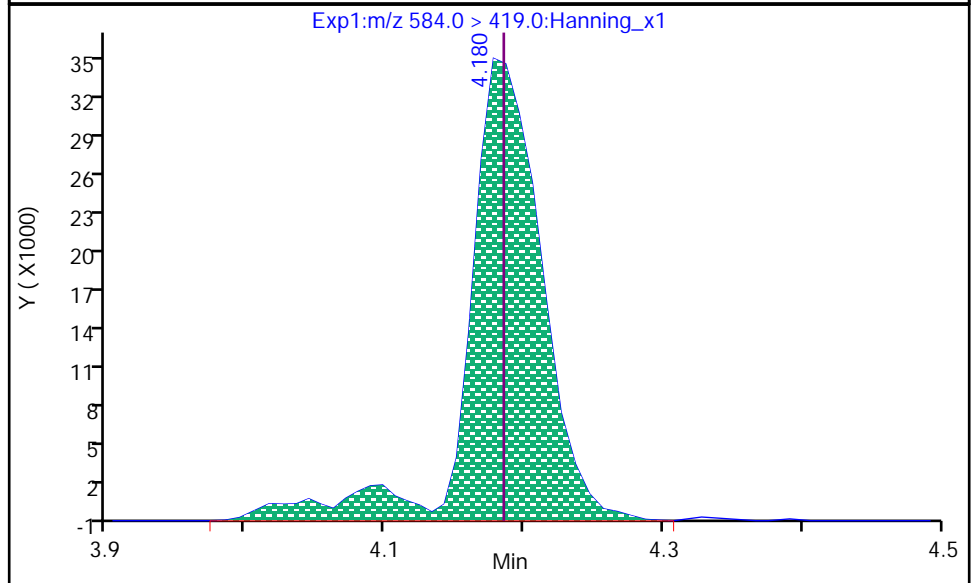
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.180  
Area: 119088  
Amount: 863.39  
Amount Units: ng/L



RT: 4.180  
Area: 126541  
Amount: 917.42  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:35:43

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d  
Injection Date: 28-Dec-2020 15:03:32 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 26  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	918.40	91.8	70 - 130
D 46 13C4_PFBA	649747	546517			84.1	50 - 150
D 50 13C5_PFPeA	665996	560355			84.1	50 - 150
21 PFPeA			1000.00	895.50	89.6	70 - 130
7 PFBS			884.00	836.55	94.6	70 - 130
D 44 13C3_PFBS	238207	196892			82.7	50 - 150
1 4:2 FTS			934.00	879.42	94.2	70 - 130
D 63 13C2_4:2 FTS_2	144067	110884			77	50 - 150
D 49 13C5_PFHxA	743582	610591			82.1	50 - 150
15 PFHxA			1000.00	908.51	90.9	70 - 130
22 PFPeS			938.00	857.12	91.4	70 - 130
28 GenX			2000.00	1828.18	91.4	70 - 130
D 66 13C3_GenX	1401050	1106350			79	50 - 150
D 47 13C4_PFHpA	633684	503010			79.4	50 - 150
13 PFHpA			1000.00	956.12	95.6	70 - 130
D 45 13C3_PFHxS	174146	147717			84.8	50 - 150
14 PFHxS			910.00	823.97	90.5	70 - 130
29 ADONA			942.00	834.94	88.6	70 - 130
D 64 13C2_6:2 FTS_2	104346	82093			78.7	50 - 150
2 6:2 FTS			948.00	973.36	103	70 - 130
20 PFOA			1000.00	958.79	95.9	70 - 130
D 53 13C8_PFOA	628007	497783			79.3	50 - 150
12 PFHpS			952.00	923.43	97	70 - 130
18 PFOS			928.00	875.36	94.3	70 - 130
17 PFNA			1000.00	942.08	94.2	70 - 130
D 56 13C9_PFNA	767623	628147			81.8	50 - 150
D 54 13C8_PFOS	152445	126487			83	50 - 150
30 9Cl-PF3ONS			932.00	901.34	96.7	70 - 130
D 55 13C8_PFOSA	308857	258029			83.5	50 - 150
19 PFOSA			1000.00	977.53	97.8	70 - 130
16 PFNS			960.00	845.74	88.1	70 - 130
D 65 13C2_8:2 FTS_2	100453	79595			79.2	50 - 150
3 8:2 FTS			958.00	1012.22	106	70 - 130
10 PFDA			1000.00	938.15	93.8	70 - 130
D 51 13C6_PFDA	672868	526913			78.3	50 - 150
D 58 d3-MeFOSAA	791564	607684			76.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	983.95	98.4	70 - 130
9 PFDS			964.00	926.00	96.1	70 - 130
5 N-EtFOSAA			1000.00	946.00	94.6	70 - 130
25 PFUdA			1000.00	967.47	96.7	70 - 130
D 60 d5-EtFOSAA	731651	579528			79.2	50 - 150
D 52 13C7_PFUdA	643525	517782			80.5	50 - 150
D 61 d7-MeFOSE	105402	96355			91.4	50 - 150
32 MeFOSE			1000.00	892.57	89.3	70 - 130
26 MeFOSA			1000.00	870.28	87	70 - 130
D 57 d3-MeFOSA	51840	41931			80.9	50 - 150
31 11Cl-PF3OUDS			942.00	876.46	93	70 - 130
D 62 d9-EtFOSE	137116	99273			72.4	50 - 150
33 EtFOSE			1000.00	1030.54	103	70 - 130
D 59 d5-EtFOSA	50284	42245			84	50 - 150
D 38 13C2_PFDoA	611364	537255			87.9	50 - 150
4 10:2 FTS			964.00	920.76	95.5	70 - 130
27 EtFOSA			1000.00	864.06	86.4	70 - 130
11 PFDoA			1000.00	897.91	89.8	70 - 130
34 PFDOS			968.00	880.94	91	70 - 130
24 PFTrDA			1000.00	873.17	87.3	70 - 130
23 PFTeDA			1000.00	938.88	93.9	70 - 130
D 42 13C2_PFTeDA	813074	674645			83	50 - 150
35 PFHxDA			1000.00	966.69	96.7	70 - 130
D 40 13C2_PFHxDA	935525	778067			83.2	50 - 150
36 PFODA			1000.00	923.48	92.3	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d  
 Injection Date: 28-Dec-2020 15:03:32 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 26  
 Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.698	1.696	1	546517	23	>100:1			1000.00	788.00	84.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.696	1/0	499910	24	>100:1			1000.00	918.40		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.072	1	560355	19	>100:1			1000.00	814.60	84.1	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.072	1/0	504518	17	>100:1			1000.00	895.50		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.125	1	196892	17	>100:1			1000.00	855.19	82.7	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.129	2.125	1/0	194200	17	>100:1	Target = 3.50		884.00	836.55		
298.9 > 99	44	2.129	2.125		53923	17	>100:1	3.60 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	146391	19	>100:1	Target = 3.10		938.00	857.12		
349 > 99	44	2.450	2.450		48252	18	>100:1	3.03 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.379	0	110884	19	>100:1			5000.00	4580.41	77	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/0	38922	19	>100:1	Target = 1.80		934.00	879.42		
327 > 81	63	2.388	2.388		21956	18	>100:1	1.77 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.414	2.423	0	610591	20	>100:1			1000.00	828.40	82.1	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	547671	19	>100:1	Target = 18.34		1000.00	908.51		
313 > 119	49	2.423	2.423		30056	16	>100:1	18.22 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1106350	20	>100:1			5000.00	4153.68	79	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	290632	21	>100:1	Target = 0.81		2000.00	1828.18		
285 > 185	66	2.530	2.530		367404	19	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	0	503010	19	>100:1			1000.00	829.16	79.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.772	1/1	498860	19	>100:1	Target = 3.70		1000.00	956.12		
363 > 169	47	2.772	2.772		118919	20	>100:1	4.19 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	147717	20	>100:1			1000.00	862.69	84.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	129052	28	>100:1	Target = 3.21	0.12	910.00	823.97		
399 > 99	45	2.790	2.790		44978	29	>100:1	2.86 (1.60-4.81)	0.05				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.817	2.808	1/1	783034	19	>100:1	Target = 2.97		942.00	834.94		
377 > 85	45	2.817	2.808		266321	21	>100:1	2.94 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	123916	24	>100:1	Target = 3.08		952.00	923.43		
449 > 99	45	3.154	3.154		37071	22	>100:1	3.34 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.114	1	82093	22	>100:1			5000.00	4262.71	78.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.121	3.128	0/-1	33098	25	>100:1	Target = 1.80		948.00	973.36		
427 > 81	64	3.128	3.128		19835	25	>100:1	1.66 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.141	1	497783	25	>100:1			1000.00	841.04	79.3	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	0/-1	486552	25	>100:1	Target = 2.87		1000.00	958.79		
413 > 169	53	3.148	3.148		159104	25	>100:1	3.05 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.520	3.520	0	126487	22	>100:1			1000.00	843.65	83	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.520	0/0	131203	44	>100:1	Target = 3.84	0.28	928.00	875.36		
499 > 99	54	3.520	3.520		37259	36	55:1	3.52 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.729	3.722	1/1	383803	22	>100:1			932.00	901.34		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	0/0	81865	19	>100:1	Target = 3.07		960.00	845.74		
549 > 99	54	3.865	3.865		34053	24		2.40 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.169	4.169	0/0	85003	16	>100:1	Target = 3.03		964.00	926.00		
599 > 99	54	4.169	4.169		28679	19	>100:1	2.96 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.327	4.317	1/1	314838	16	>100:1			942.00	876.46		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.663	1/1	89457	20	>100:1	Target = 3.33		968.00	880.94		
699 > 99	54	4.672	4.663		29313	21		3.05 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.520	3.520	0	628147	20	>100:1			1000.00	836.46	81.8	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.520	1/1	591783	24	>100:1	Target = 6.16		1000.00	942.08		
463 > 169	56	3.528	3.520		90687	21	>100:1	6.52 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.849	3.849	0	258029	21	>100:1			1000.00	833.52	83.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.849	3.841	1/1	248561	21	>100:1			1000.00	977.53		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.857	1	79595	27	>100:1			5000.00	4290.80	79.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.865	3.873	0/-1	32378	25	>100:1	Target = 1.95		958.00	1012.22		
527 > 81	65	3.857	3.873		14559	28	>100:1	2.22 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.464	4.455	1/0	33872	24		Target = 3.14		964.00	920.76		
627 > 80	65	4.473	4.455		9645	24	90:1	3.51 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.873	3.865	1	526913	21	>100:1			1000.00	794.34	78.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	0/-1	485722	20	>100:1	Target = 15.94		1000.00	938.15		
513 > 169	51	3.873	3.873		32268	16	>100:1	15.05 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.028	4.029	0	607684	18	>100:1			5000.00	4233.57	76.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.037	4.029	1/1	91860	37	>100:1	Target = 1.33	0.11	1000.00	983.95		
570 > 483	58	4.028	4.029		61200	33	>100:1	1.50 (0.66-1.99)	0.21				



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.178	4.178	0	579528	19	>100:1			5000.00	4363.43	79.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.187	4.187	0/0	109162	35	>100:1	Target = 1.58		1000.00	946.00		M
584 > 526	60	4.197	4.187		70163	34	>100:1	1.55 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.178	1	517782	17	>100:1			1000.00	819.18	80.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.178	1/0	470818	19	>100:1	Target = 15.50		1000.00	967.47		
563 > 169	52	4.178	4.178		32104	23		14.66 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.287	4.287	0	96355	16	>100:1			1000.00	890.46	91.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.297	4.297	0/0	80809	20	>100:1			1000.00	892.57		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.307	4.307	0	41931	15	66:1			1000.00	792.39	80.9	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	0/0	41170	18		Target = 1.12		1000.00	870.28		
512 > 219	57	4.317	4.317		43038	16	>100:1	0.95 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.455	0	99273	18	>100:1			1000.00	791.68	72.4	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.464	1/1	91018	18	>100:1			1000.00	1030.54		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	0	537255	19	>100:1			1000.00	887.56	87.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.455	4.446	1/1	488519	18	>100:1	Target = 10.85		1000.00	897.91		
613 > 169	38	4.455	4.446		44552	23	>100:1	10.96 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.688	1/1	462047	20	>100:1	Target = 8.37		1000.00	873.17		
663 > 169	38	4.696	4.688		57427	20	>100:1	8.04 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.473	4.473	0	42245	19	>100:1			1000.00	860.48	84	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	0/0	39879	18	>100:1	Target = 1.03		1000.00	864.06		
526 > 219	59	4.482	4.482		39558	18		1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.914	4.906	1	674645	19	>100:1			1000.00	800.82	83	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.914	4.906	1/0	548817	21	90:1	Target = 12.11		1000.00	938.88		
713 > 169	42	4.906	4.906		45482	18	>100:1	12.06 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.282	1	778067	19	>100:1			1000.00	858.64	83.2	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.282	1/0	491449	20	>100:1	Target = 11.48		1000.00	966.69		
813 > 269	40	5.291	5.282		42888	19	>100:1	11.45 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.625	1/0	636053	25	>100:1	Target = 13.88		1000.00	923.48		
913 > 319	40	5.632	5.625		44698	24	>100:1	14.23 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.873	0	568302	21	>100:1					77.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	585757	20	>100:1					80.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	0	490743	25	>100:1					81.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.696	1	506767	24	>100:1					83.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	0	131581	21	>100:1					80.7	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d

Injection Date: 28-Dec-2020 15:03:32

Inst. ID: LCMSMS02

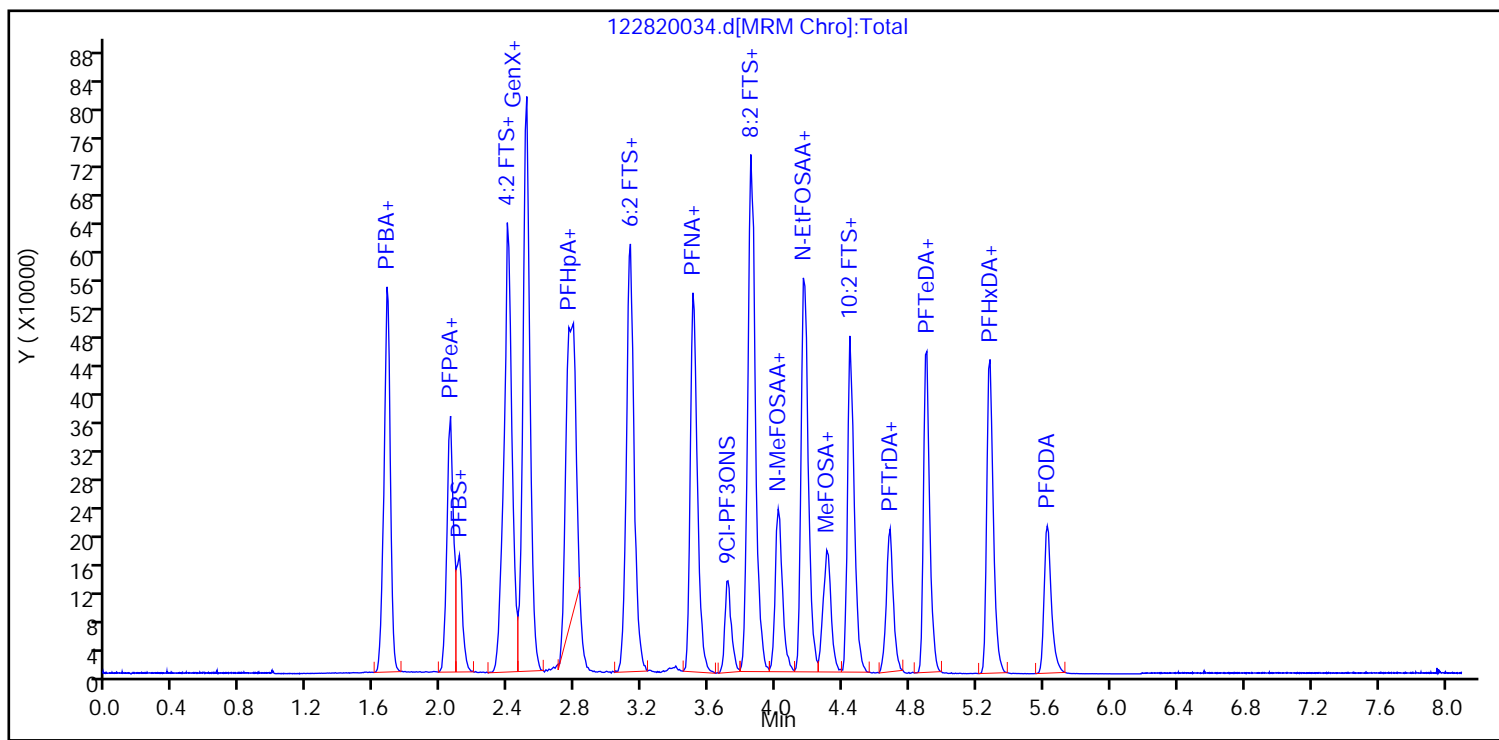
Client ID:

Lab ID: ID CCV 1000A\_SVLC-1248

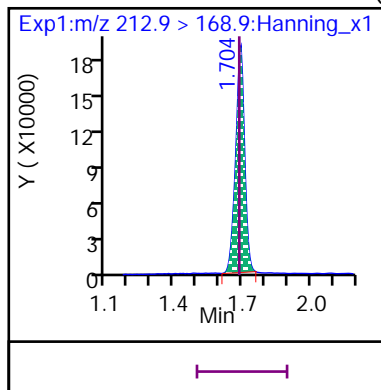
Sample Info: ID CCV 1000A\_SVLC-1248

Dil. Factor: 1

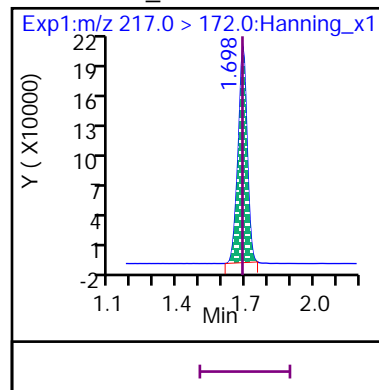
Operator: Matthew M. Miller



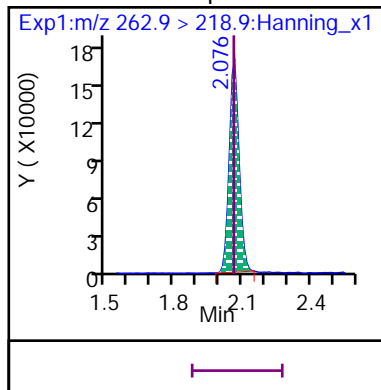
8 Perfluoro-n-butanoic acid (PFBA)



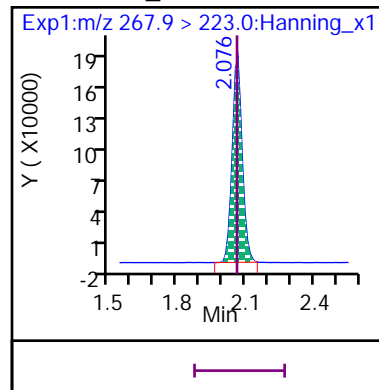
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

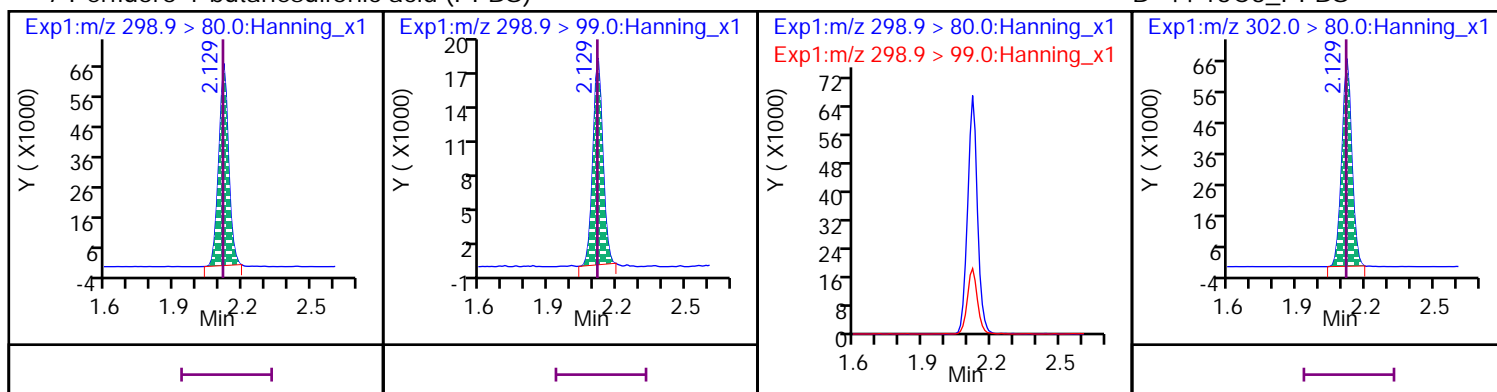


D 50 13C5\_PFPeA



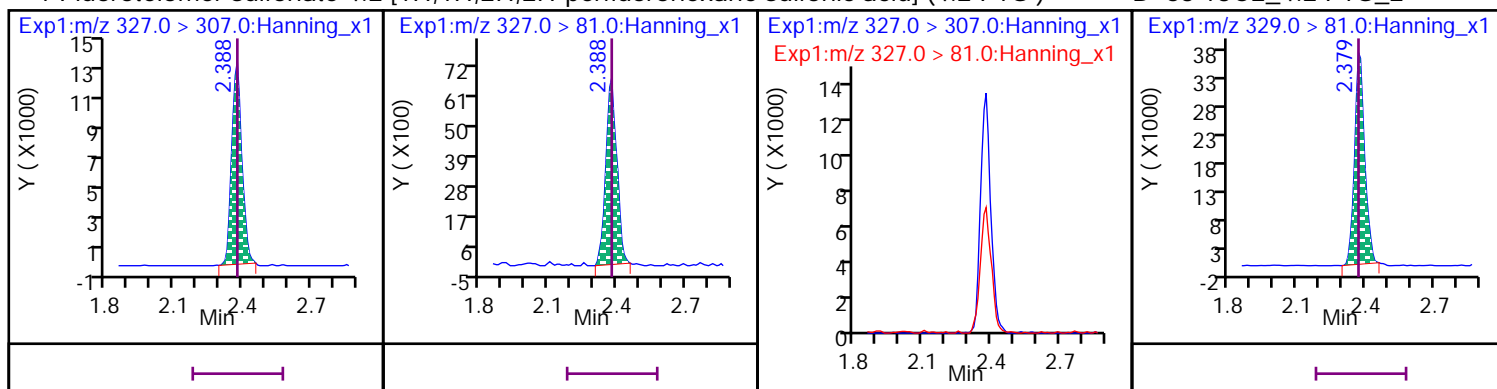
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



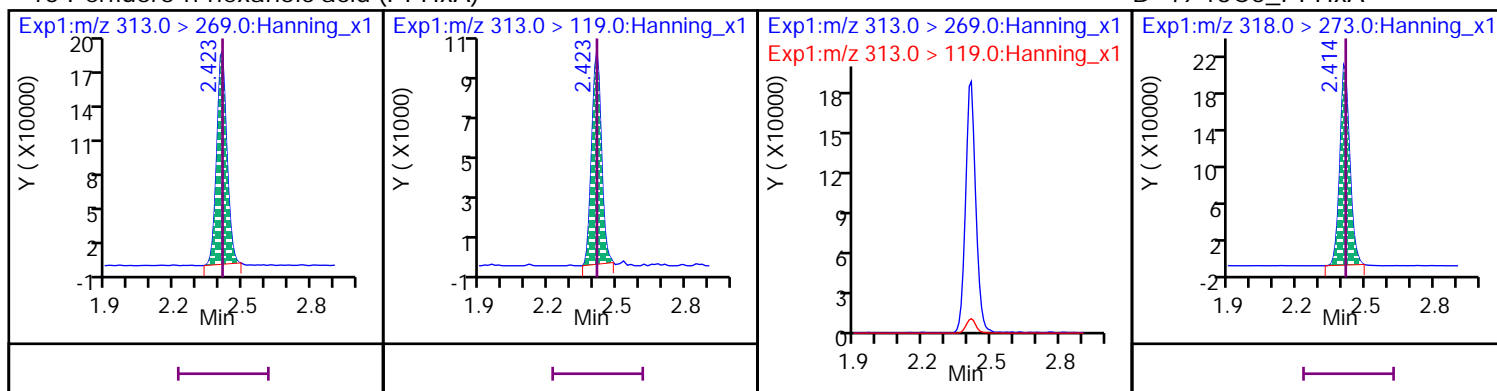
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



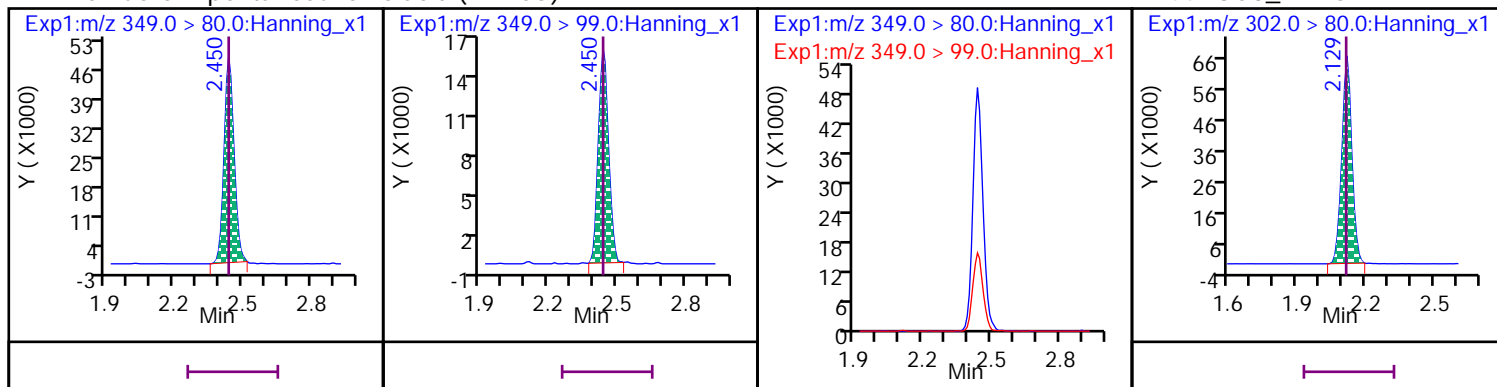
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



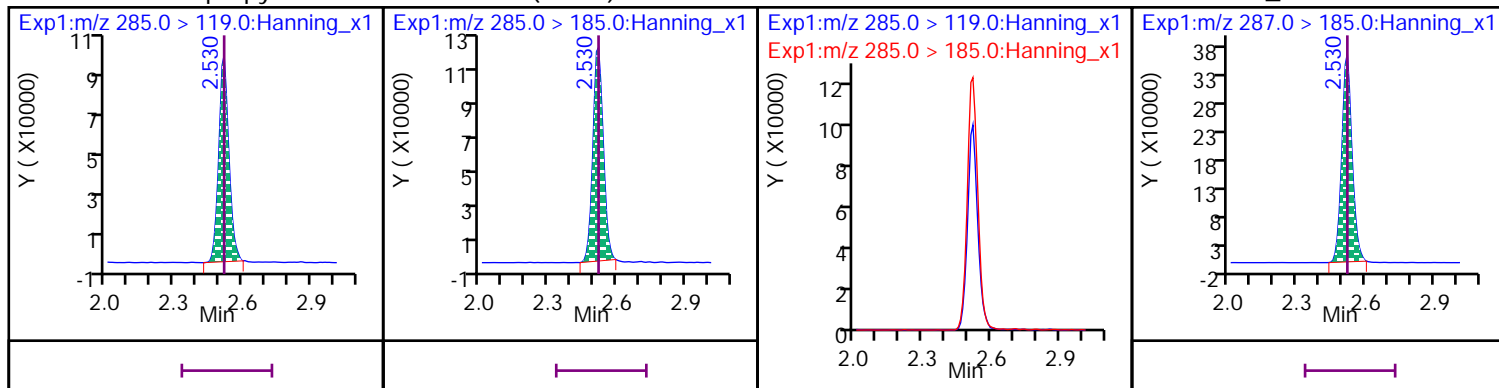
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



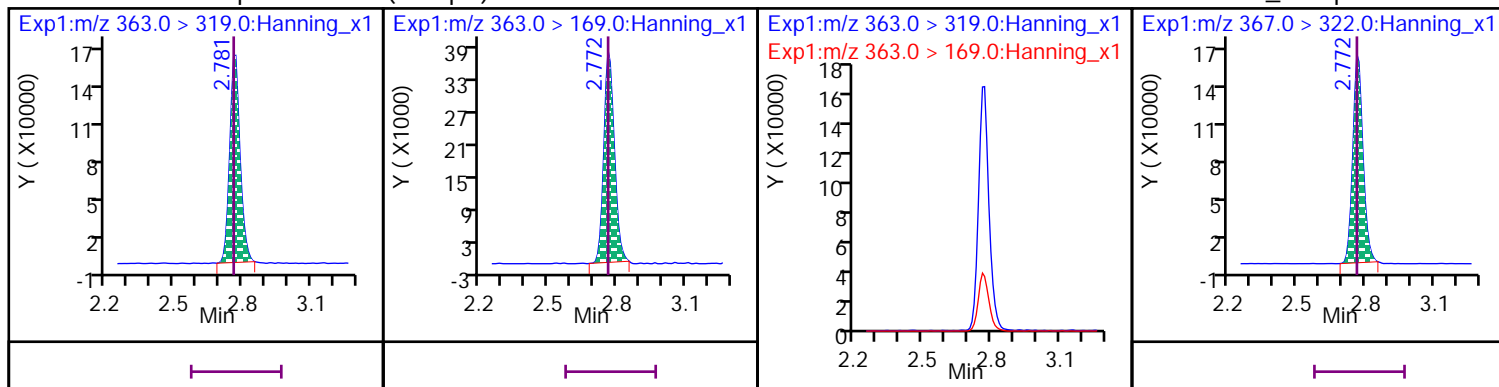
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



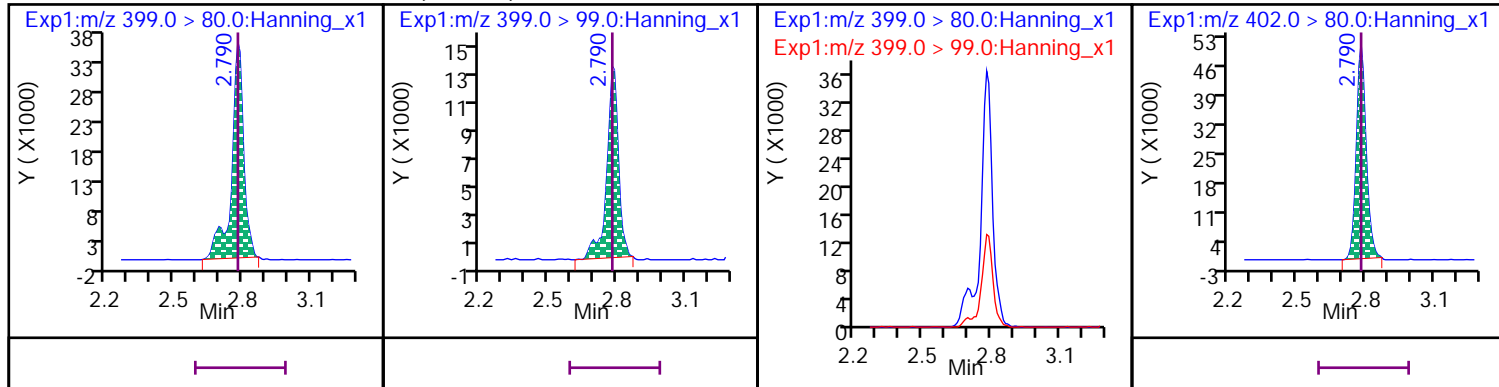
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



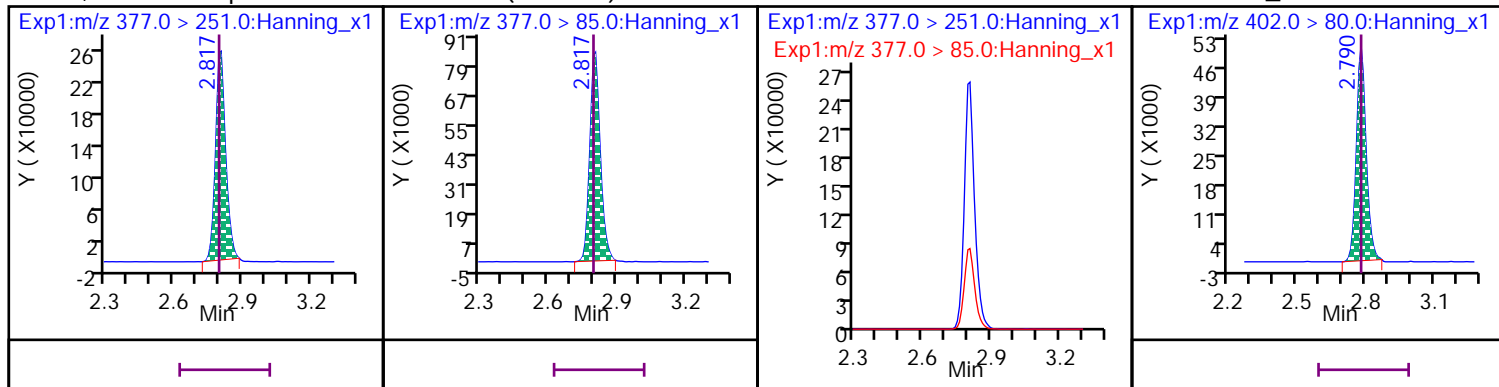
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



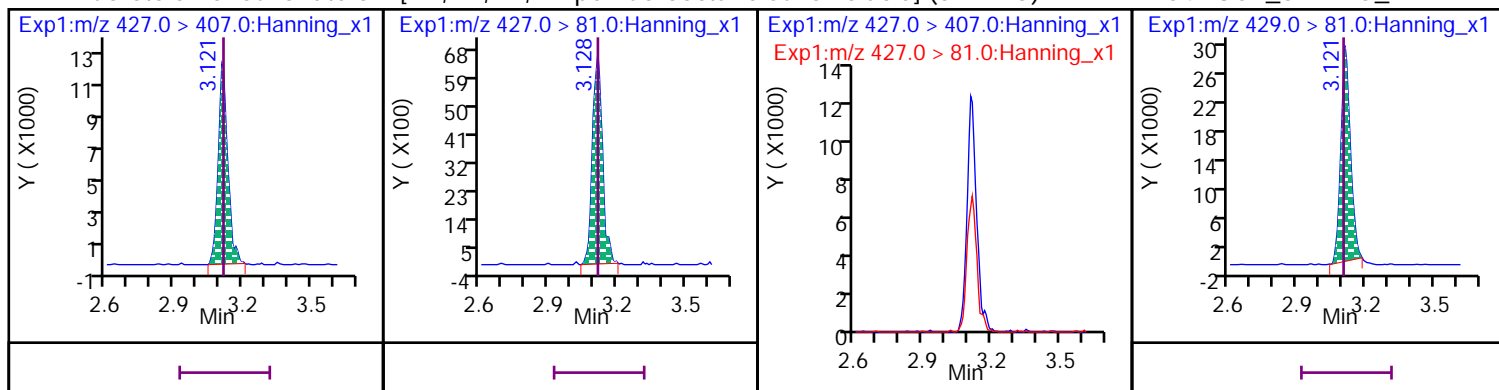
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



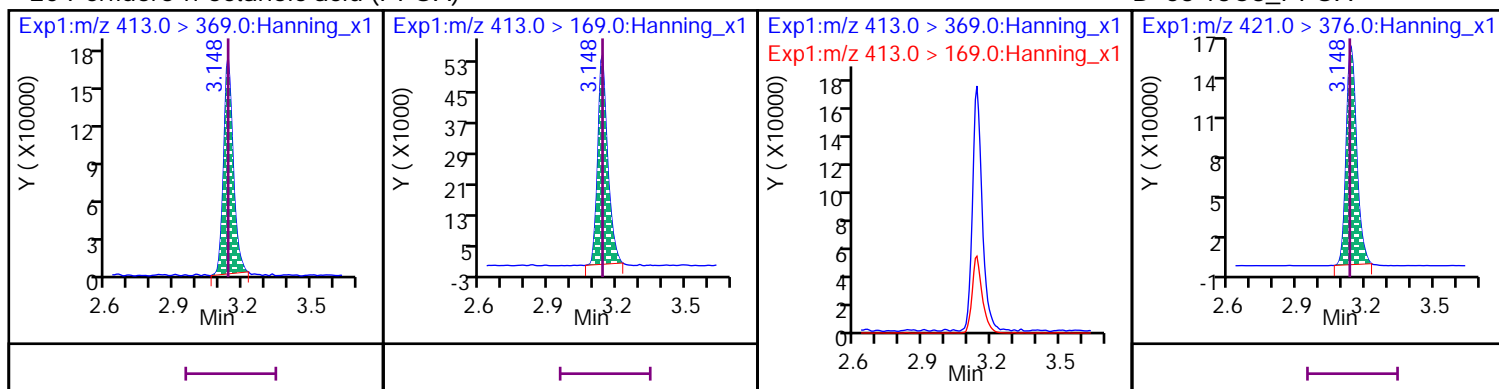
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



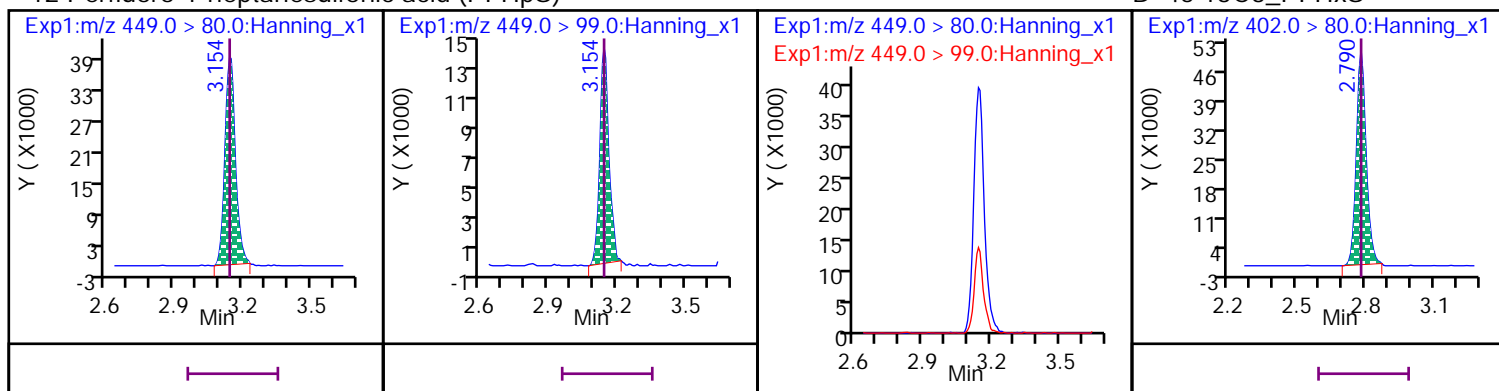
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



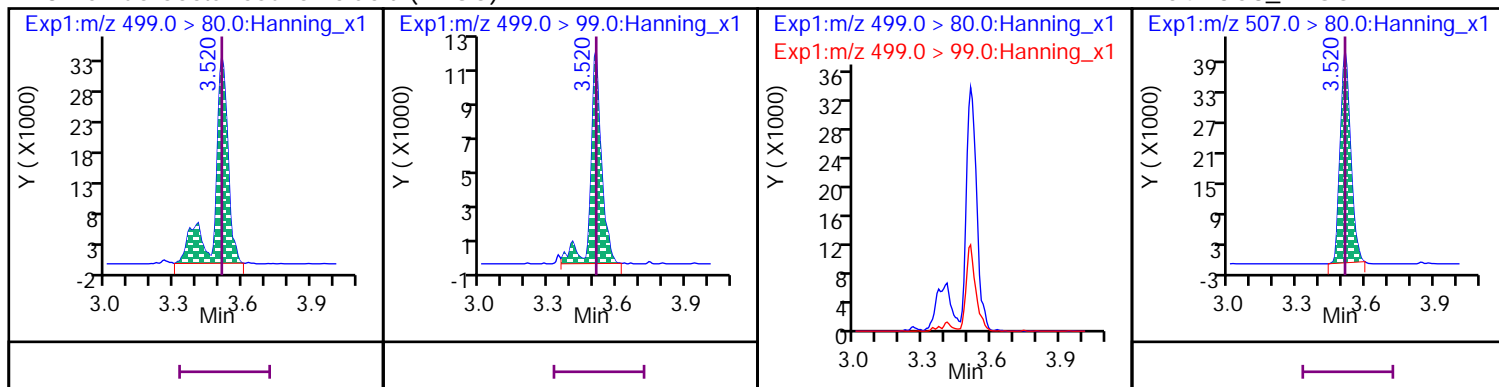
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



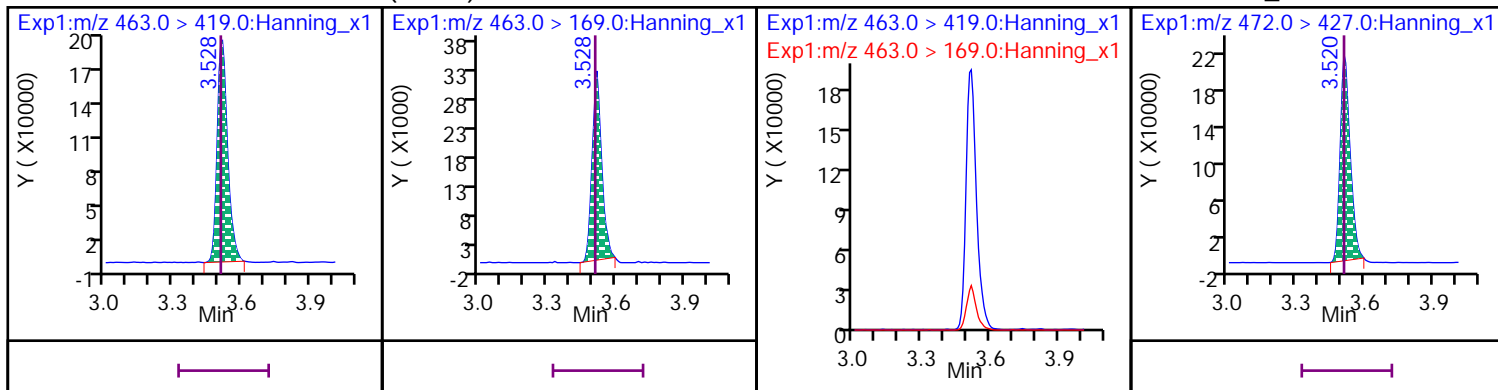
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



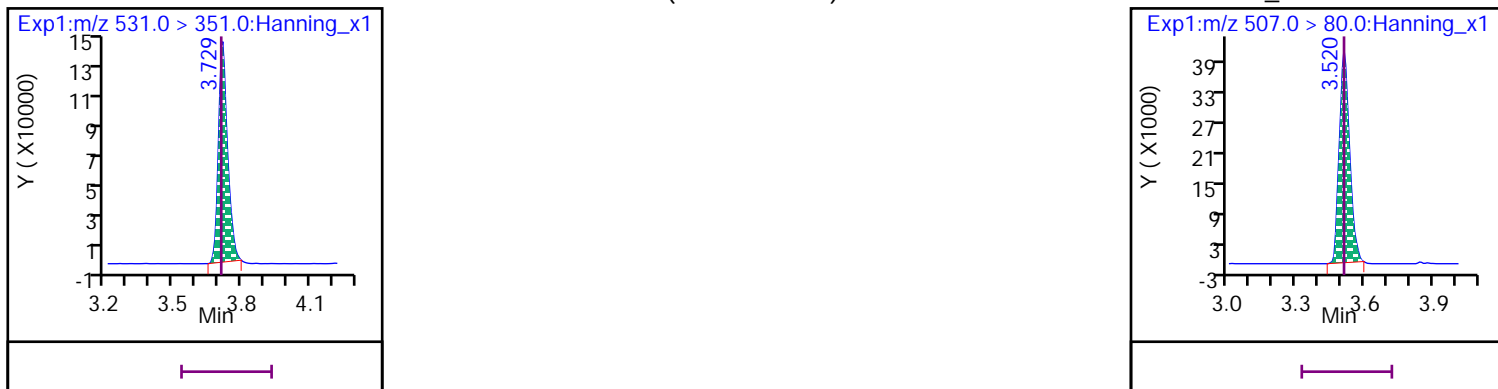
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



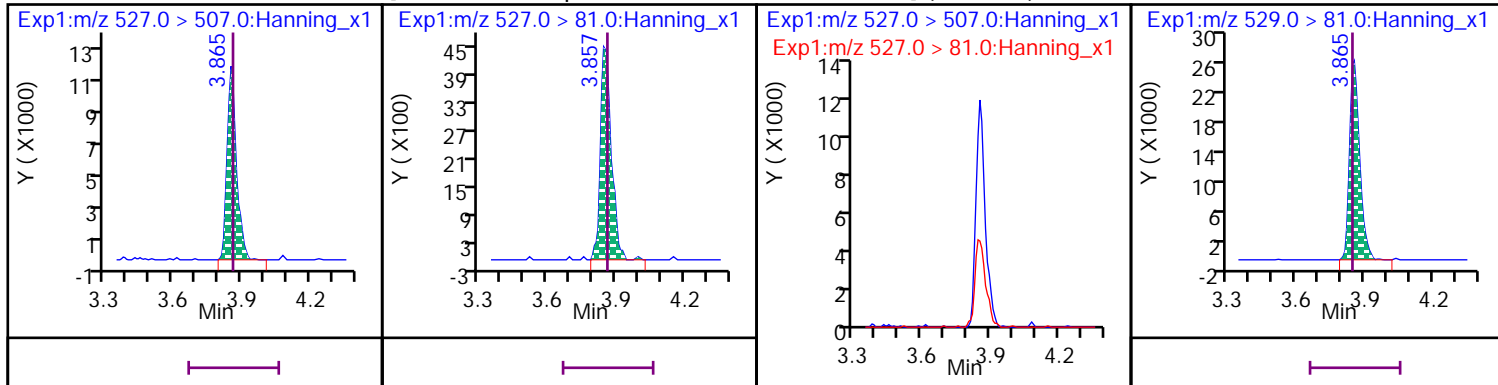
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



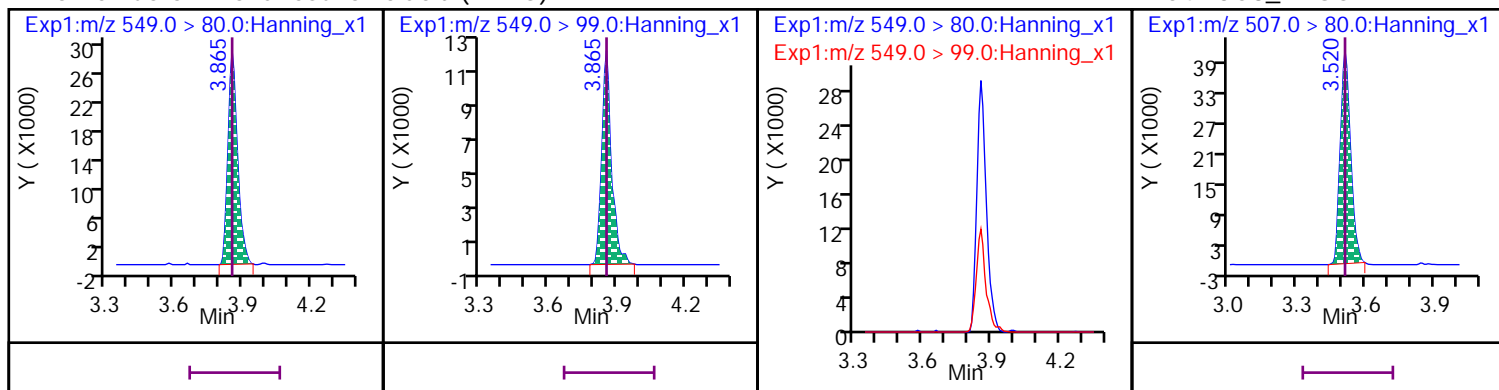
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



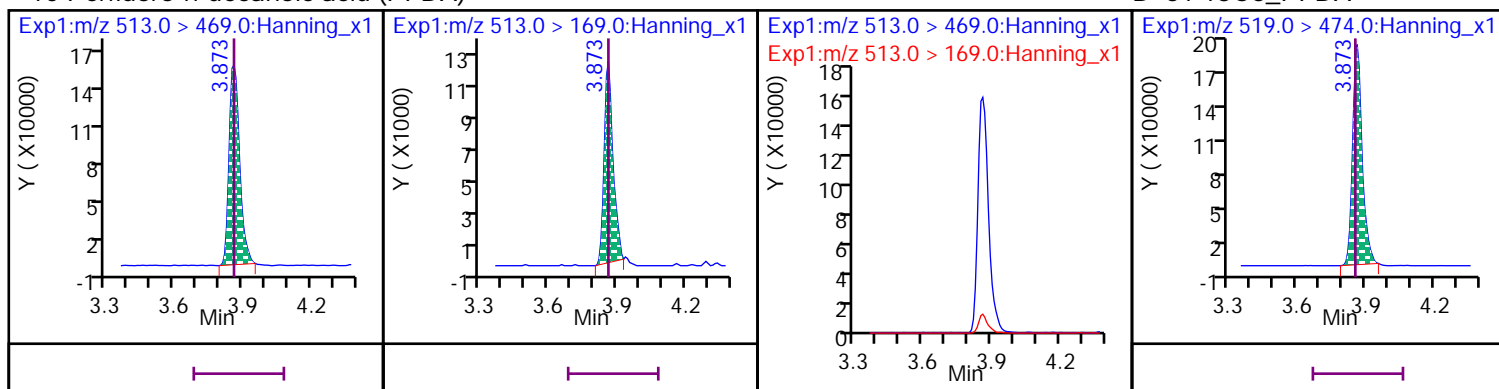
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



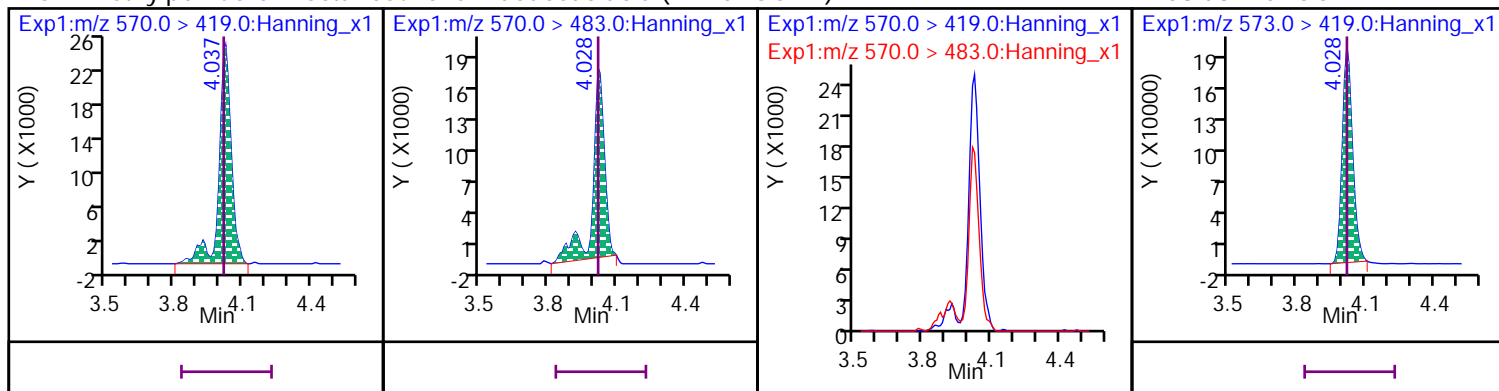
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



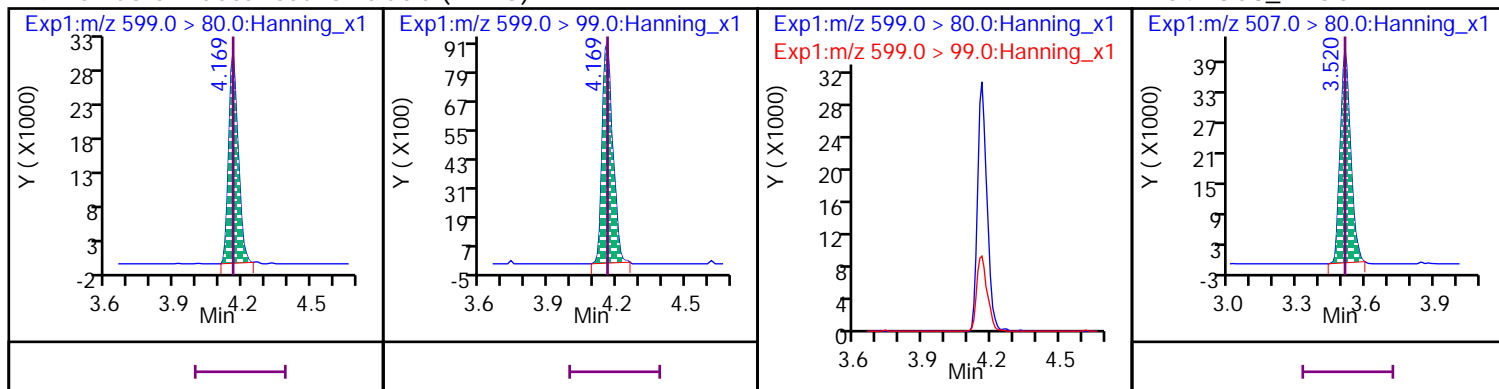
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



9 Perfluoro-1-decanesulfonic acid (PFDS)

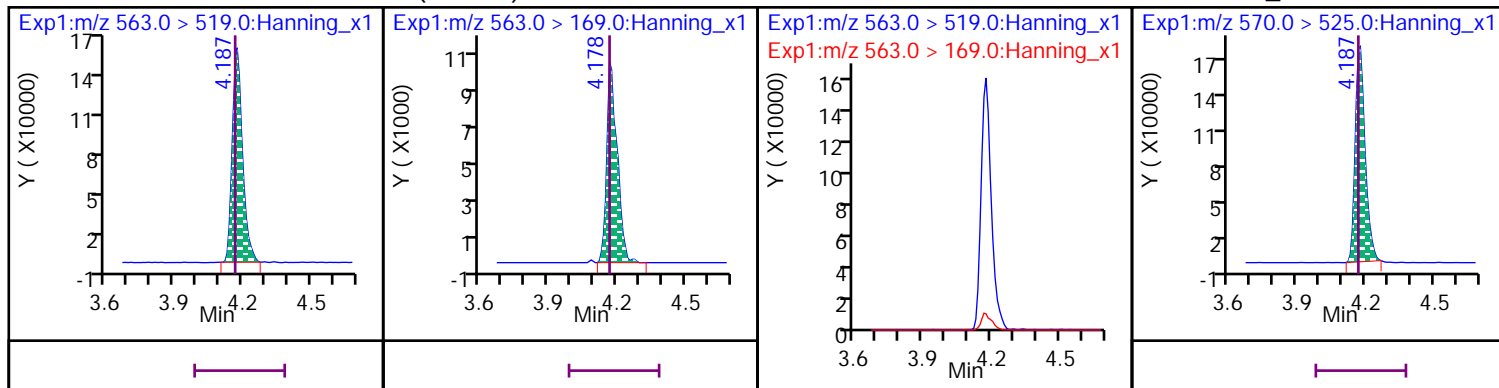
D 54 13C8\_PFOS





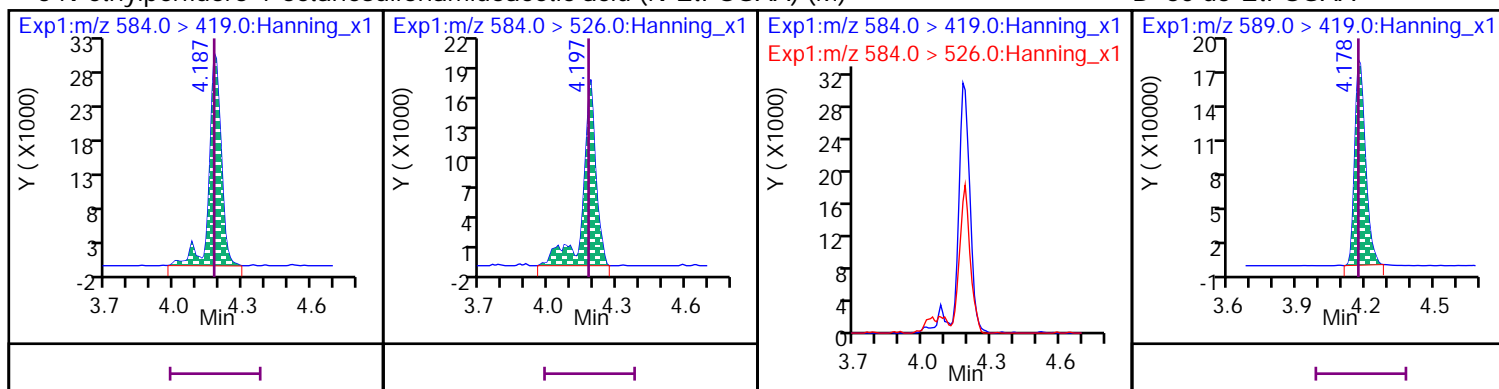
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



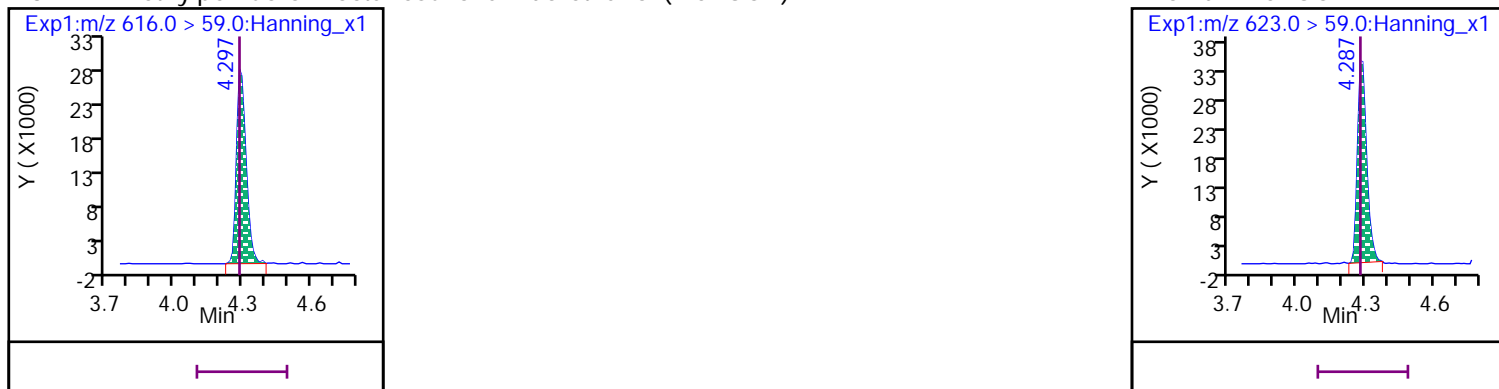
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



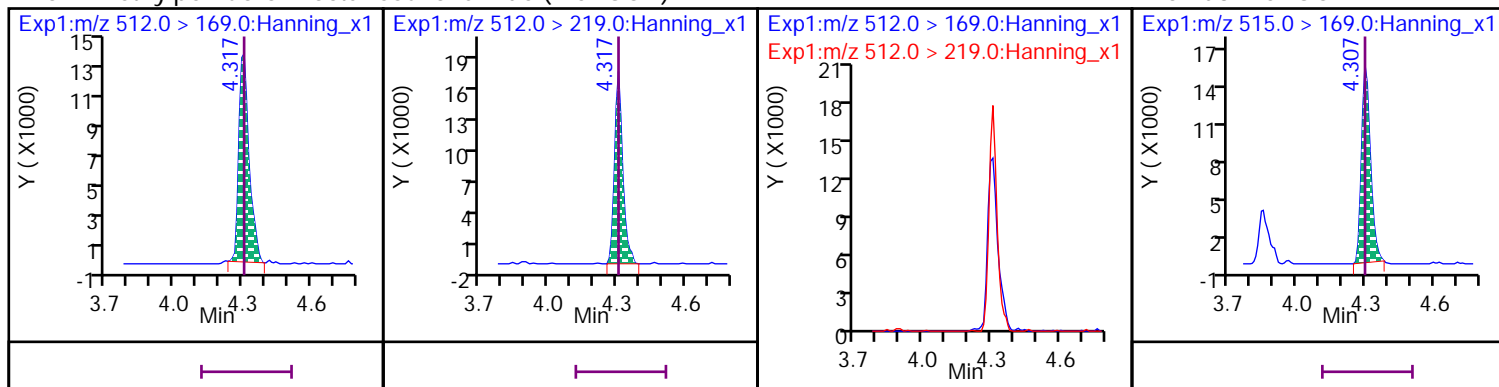
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

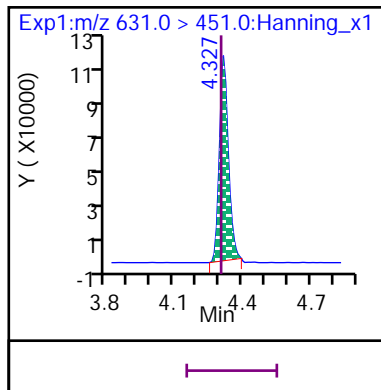


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

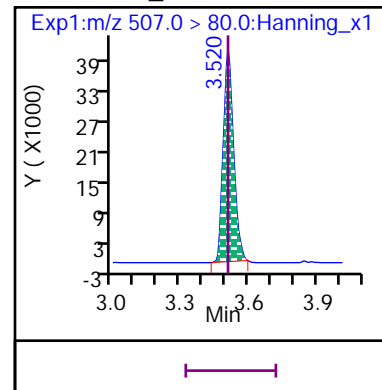
D 57 d3-MeFOSA



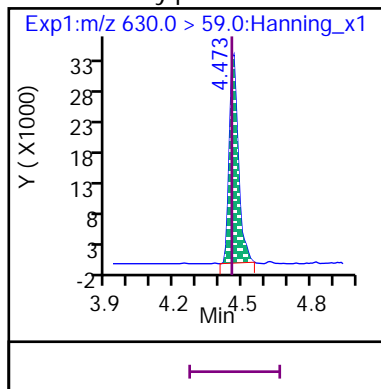
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



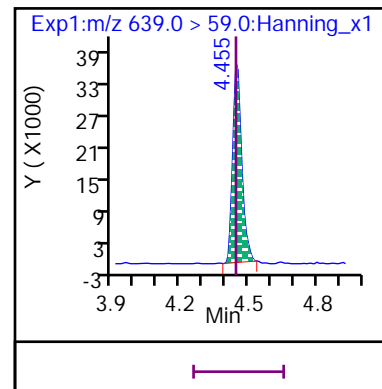
D 54 13C8\_PFOS



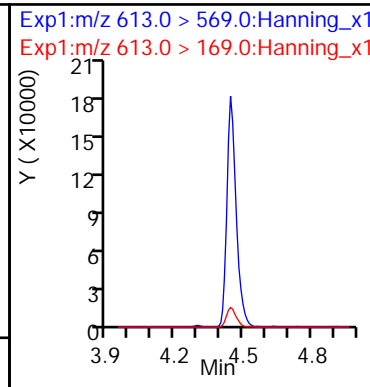
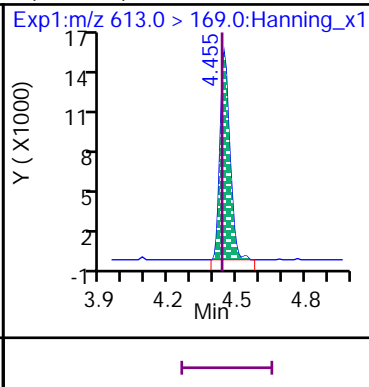
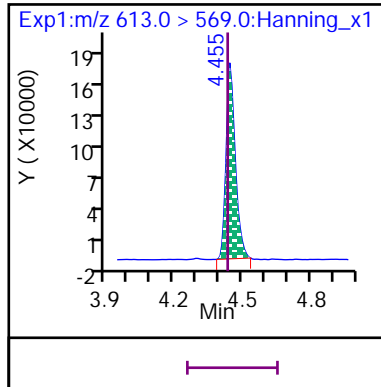
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



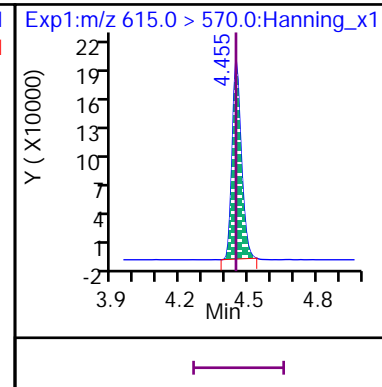
D 62 d9-EtFOSE



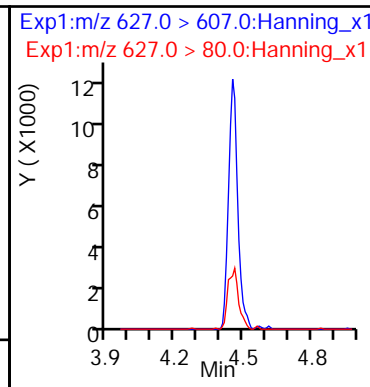
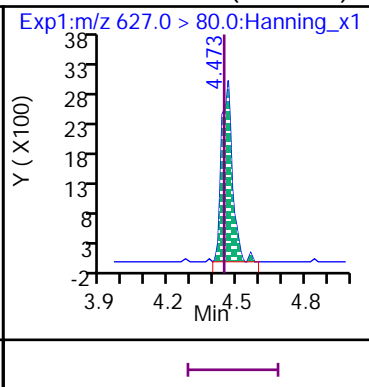
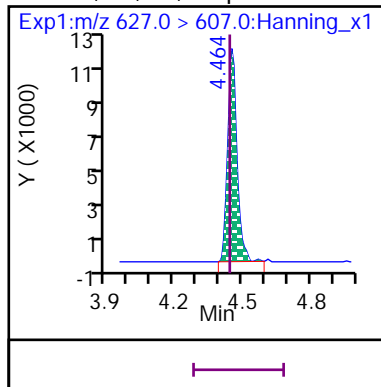
11 Perfluoro-n-dodecanoic acid (PFDoA)



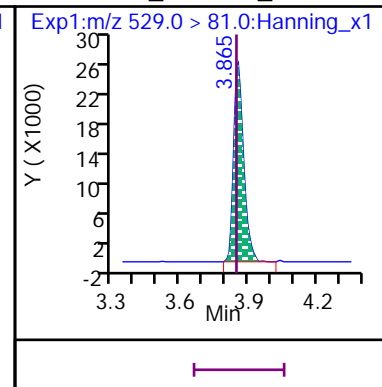
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

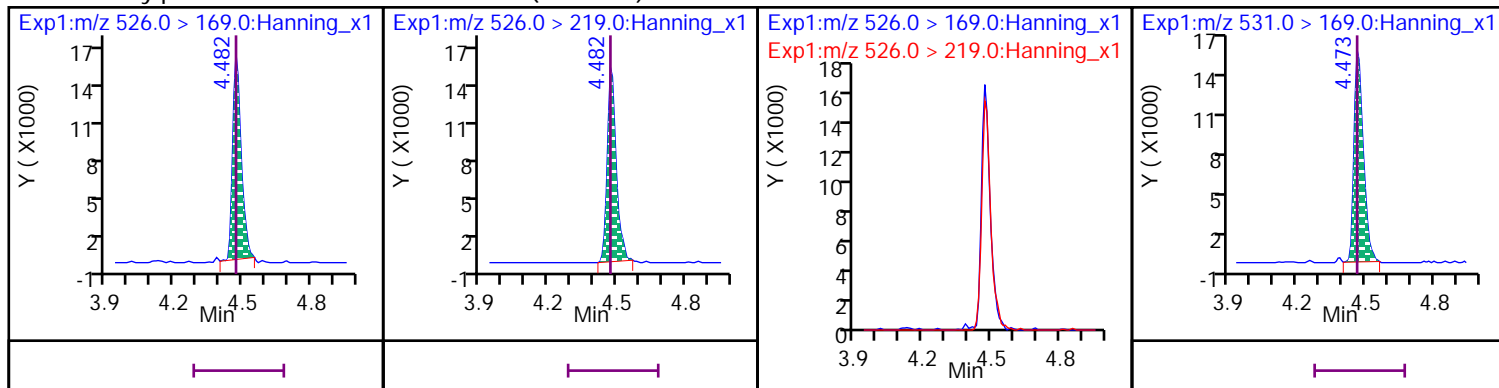


D 65 13C2\_8:2 FTS\_2



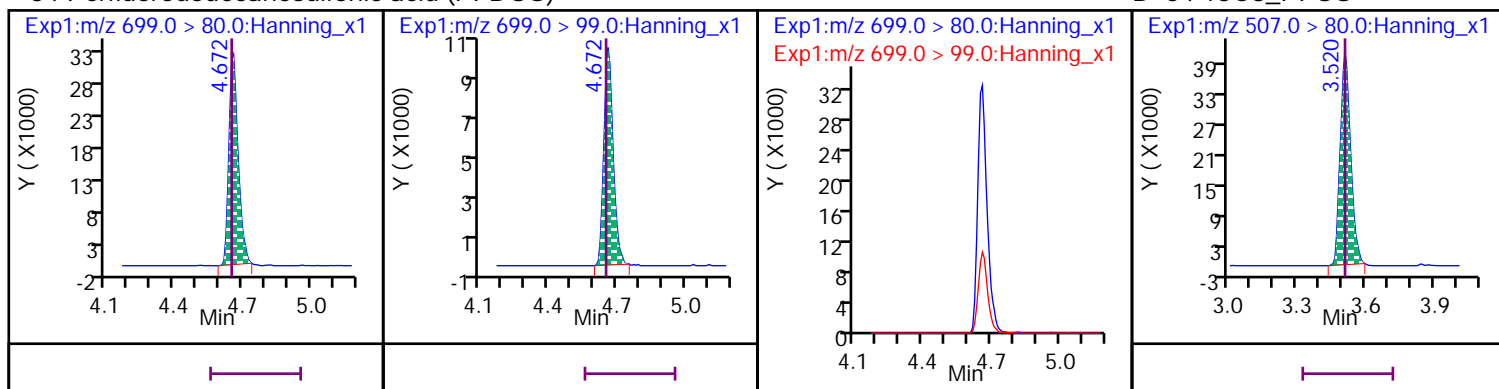
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



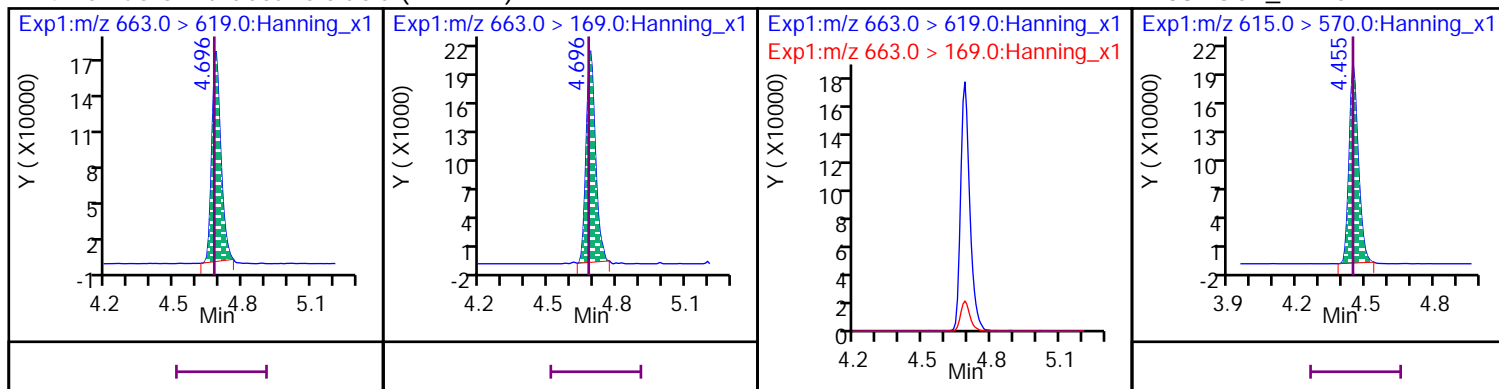
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



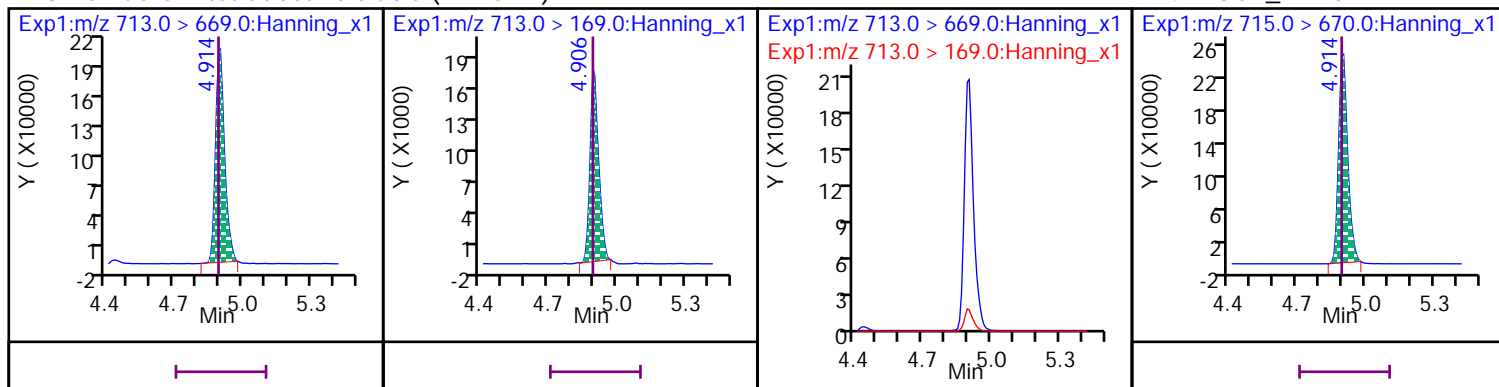
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



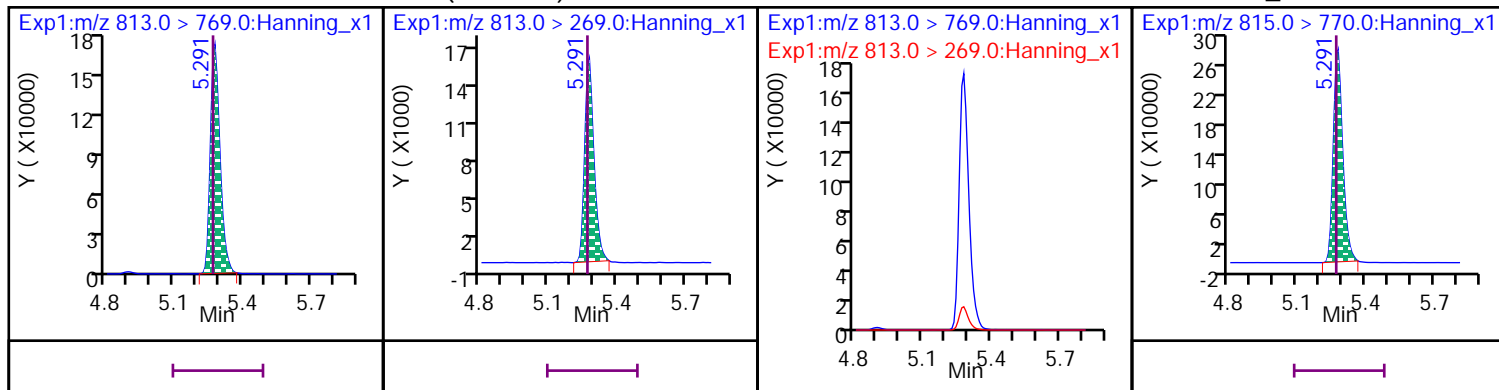
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



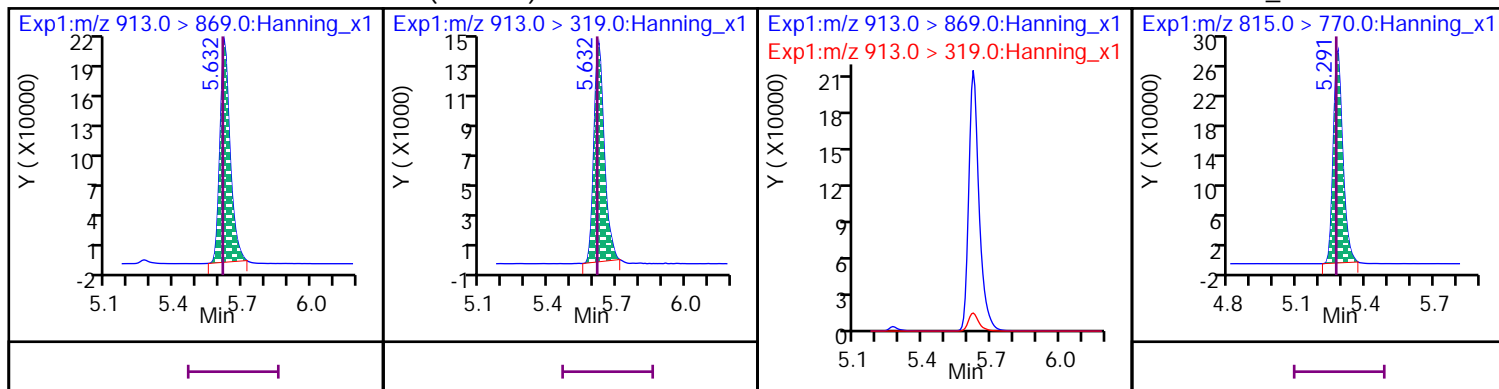
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

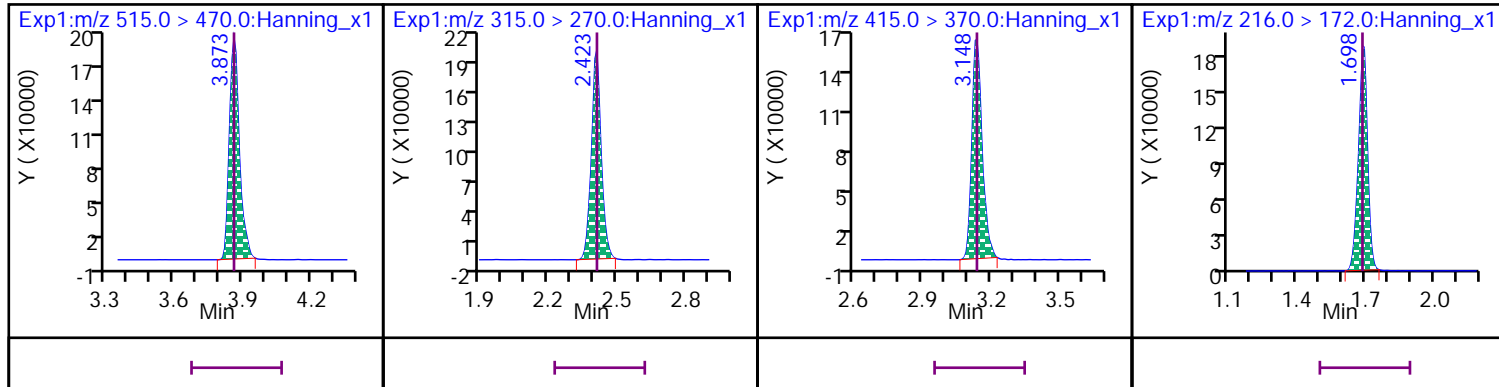


\* 37 13C2\_PFDA

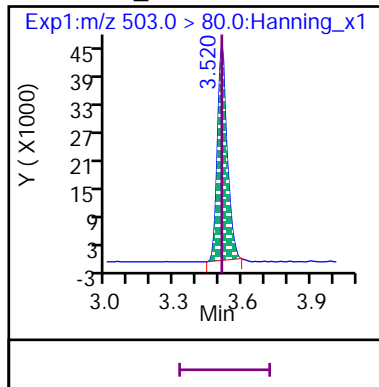
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d

Injection Date: 28-Dec-2020 15:03:32

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000A\_SVLC-1248

Sample Info: ID CCV 1000A\_SVLC-1248

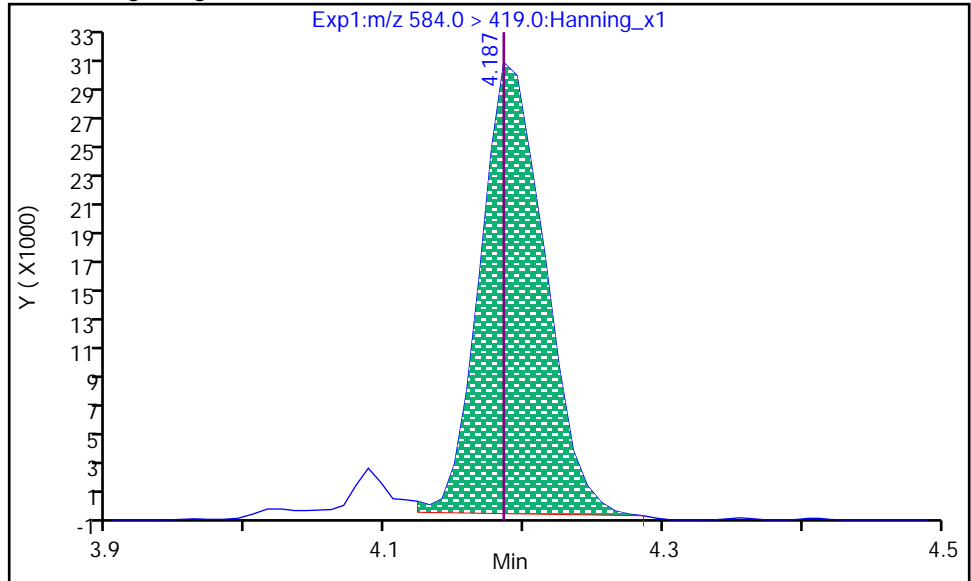
Dil. Factor: 1

Operator: Matthew M. Miller

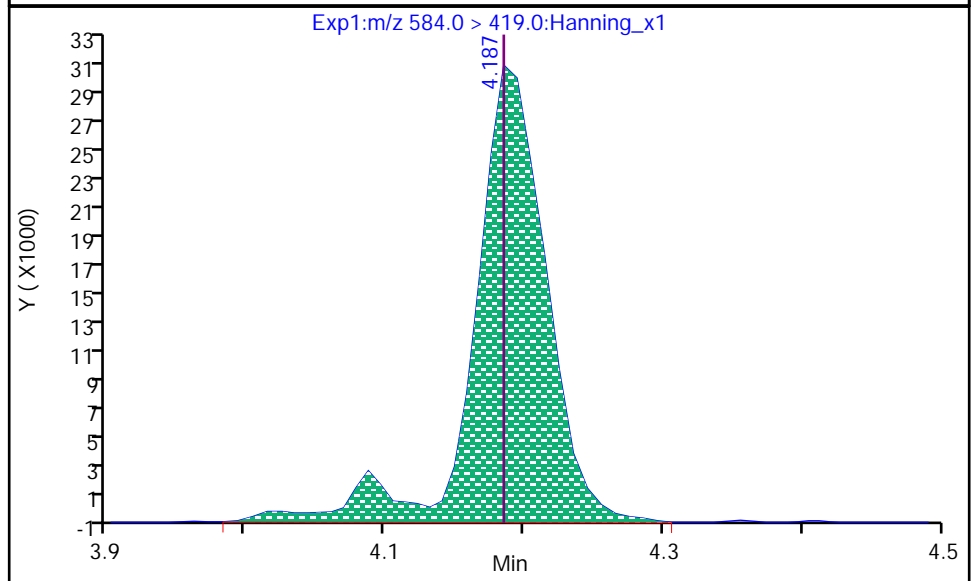
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.187  
Area: 95876  
Amount: 830.86  
Amount Units: ng/L



RT: 4.187  
Area: 109162  
Amount: 946.00  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:41:29

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d  
Injection Date: 28-Dec-2020 15:46:06 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 30  
Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	924.61	92.5	70 - 130
D 46 13C4_PFBA	649747	561534			86.4	50 - 150
D 50 13C5_PFPeA	665996	574349			86.2	50 - 150
21 PFPeA			1000.00	917.88	91.8	70 - 130
7 PFBS			884.00	817.38	92.5	70 - 130
D 44 13C3_PFBS	238207	203714			85.5	50 - 150
1 4:2 FTS			934.00	898.33	96.2	70 - 130
D 63 13C2_4:2 FTS_2	144067	109018			75.7	50 - 150
D 49 13C5_PFHxA	743582	597519			80.4	50 - 150
15 PFHxA			1000.00	979.97	98	70 - 130
22 PFPeS			938.00	876.23	93.4	70 - 130
28 GenX			2000.00	1883.51	94.2	70 - 130
D 66 13C3_GenX	1401050	1148511			82	50 - 150
D 47 13C4_PFHpA	633684	522228			82.4	50 - 150
13 PFHpA			1000.00	915.10	91.5	70 - 130
D 45 13C3_PFHxS	174146	151253			86.9	50 - 150
14 PFHxS			910.00	844.55	92.8	70 - 130
29 ADONA			942.00	884.16	93.9	70 - 130
D 64 13C2_6:2 FTS_2	104346	82866			79.4	50 - 150
2 6:2 FTS			948.00	1049.37	111	70 - 130
20 PFOA			1000.00	953.80	95.4	70 - 130
D 53 13C8_PFOA	628007	502895			80.1	50 - 150
12 PFHpS			952.00	901.63	94.7	70 - 130
18 PFOS			928.00	827.55	89.2	70 - 130
17 PFNA			1000.00	903.46	90.3	70 - 130
D 56 13C9_PFNA	767623	645363			84.1	50 - 150
D 54 13C8_PFOS	152445	130974			85.9	50 - 150
30 9CI-PF3ONS			932.00	859.55	92.2	70 - 130
D 55 13C8_PFOA	308857	260099			84.2	50 - 150
19 PFOSA			1000.00	946.62	94.7	70 - 130
16 PFNS			960.00	893.48	93.1	70 - 130
D 65 13C2_8:2 FTS_2	100453	77414			77.1	50 - 150
3 8:2 FTS			958.00	835.34	87.2	70 - 130
10 PFDA			1000.00	978.26	97.8	70 - 130
D 51 13C6_PFDA	672868	556533			82.7	50 - 150
D 58 d3-MeFOSAA	791564	632923			80	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	937.29	93.7	70 - 130
9 PFDS			964.00	867.22	90	70 - 130
5 N-EtFOSAA			1000.00	979.08	97.9	70 - 130
25 PFUdA			1000.00	992.73	99.3	70 - 130
D 60 d5-EtFOSAA	731651	592679			81	50 - 150
D 52 13C7_PFUdA	643525	521905			81.1	50 - 150
D 61 d7-MeFOSE	105402	95892			91	50 - 150
32 MeFOSE			1000.00	986.50	98.7	70 - 130
26 MeFOSA			1000.00	1076.28	108	70 - 130
D 57 d3-MeFOSA	51840	41275			79.6	50 - 150
31 11Cl-PF3OUDS			942.00	890.35	94.5	70 - 130
D 62 d9-EtFOSE	137116	101203			73.8	50 - 150
33 EtFOSE			1000.00	998.07	99.8	70 - 130
D 59 d5-EtFOSA	50284	41850			83.2	50 - 150
D 38 13C2_PFDoA	611364	536079			87.7	50 - 150
4 10:2 FTS			964.00	876.10	90.9	70 - 130
27 EtFOSA			1000.00	935.86	93.6	70 - 130
11 PFDoA			1000.00	859.50	85.9	70 - 130
34 PFDOS			968.00	865.33	89.4	70 - 130
24 PFTrDA			1000.00	892.67	89.3	70 - 130
23 PFTeDA			1000.00	961.87	96.2	70 - 130
D 42 13C2_PFTeDA	813074	678956			83.5	50 - 150
35 PFHxDA			1000.00	980.62	98.1	70 - 130
D 40 13C2_PFHxDA	935525	779161			83.3	50 - 150
36 PFODA			1000.00	972.65	97.3	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d  
 Injection Date: 28-Dec-2020 15:46:06 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 30  
 Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.703	1.696	1	561534	24	>100:1			1000.00	809.65	86.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.703	1.696	1/0	517119	24	>100:1			1000.00	924.61		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	0	574349	16	>100:1			1000.00	834.95	86.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	0/0	530038	17	>100:1			1000.00	917.88		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	203714	16	>100:1			1000.00	884.83	85.5	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.136	2.125	1/0	196324	18	>100:1	Target = 3.50		884.00	817.38		
298.9 > 99	44	2.125	2.125		54346	16	>100:1	3.61 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	154840	19		Target = 3.10		938.00	876.23		
349 > 99	44	2.450	2.450		47336	18	>100:1	3.27 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.379	1	109018	19	>100:1			5000.00	4503.33	75.7	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/-1	39090	21	>100:1	Target = 1.80		934.00	898.33		
327 > 81	63	2.379	2.388		19898	19	>100:1	1.96 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	0	597519	19	>100:1			1000.00	810.67	80.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	578101	20	>100:1	Target = 18.34		1000.00	979.97		
313 > 119	49	2.423	2.423		29691	18	>100:1	19.47 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1148511	21	>100:1			5000.00	4311.97	82	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	310839	21	>100:1	Target = 0.81		2000.00	1883.51		
285 > 185	66	2.530	2.530		372814	21	>100:1	0.83 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	0	522228	21	>100:1			1000.00	860.84	82.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.772	0/0	495698	20	>100:1	Target = 3.70		1000.00	915.10		
363 > 169	47	2.772	2.772		132751	20	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	151253	21				1000.00	883.34	86.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	135442	27	>100:1	Target = 3.21	0.15	910.00	844.55		
399 > 99	45	2.790	2.790		42050	27	>100:1	3.22 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.808	1/1	849041	21	>100:1	Target = 2.97		942.00	884.16		
377 > 85	45	2.818	2.808		277173	19	>100:1	3.06 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	123886	25	>100:1	Target = 3.08		952.00	901.63		
449 > 99	45	3.154	3.154		40523	30	>100:1	3.05 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.128	3.114	1	82866	21	>100:1			5000.00	4302.85	79.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.128	0/-1	35943	23	>100:1	Target = 1.80		948.00	1049.37		
427 > 81	64	3.128	3.128		17597	22	>100:1	2.04 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.141	1	502895	23	>100:1			1000.00	849.68	80.1	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	0/-1	488989	24	>100:1	Target = 2.87		1000.00	953.80		
413 > 169	53	3.148	3.148		163764	24	>100:1	2.98 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.528	3.520	1	130974	23	>100:1			1000.00	873.57	85.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.528	3.520	1/0	128437	42	>100:1	Target = 3.84	0.27	928.00	827.55		
499 > 99	54	3.520	3.520		38583	32	>100:1	3.32 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.729	3.722	1/0	378994	24	>100:1			932.00	859.55		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	1/0	89554	21	>100:1	Target = 3.07		960.00	893.48		
549 > 99	54	3.865	3.865		27721	19		3.23 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	82431	16	>100:1	Target = 3.03		964.00	867.22		
599 > 99	54	4.178	4.169		34166	24		2.41 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.327	4.317	1/0	331174	19	>100:1			942.00	890.35		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.663	1/0	90989	18	>100:1	Target = 3.33		968.00	865.33		
699 > 99	54	4.680	4.663		28202	18	>100:1	3.22 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.528	3.520	1	645363	22	>100:1			1000.00	859.38	84.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.520	1/0	583075	21	>100:1	Target = 6.16		1000.00	903.46		
463 > 169	56	3.520	3.520		95008	26	>100:1	6.13 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.849	1	260099	21	>100:1			1000.00	840.21	84.2	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.857	3.841	1/0	242633	23	>100:1			1000.00	946.62		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.857	1	77414	20	>100:1			5000.00	4173.23	77.1	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.873	1/0	26078	19	86:1	Target = 1.95		958.00	835.34		
527 > 81	65	3.873	3.873		15291	18	87:1	1.70 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.473	4.455	2/1	31346	23	>100:1	Target = 3.14		964.00	876.10		
627 > 80	65	4.464	4.455		11417	24	>100:1	2.74 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.873	3.865	1	556533	20	>100:1			1000.00	839.00	82.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	1/0	534957	21	>100:1	Target = 15.94		1000.00	978.26		
513 > 169	51	3.873	3.873		33559	20	>100:1	15.94 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.029	1	632923	18	>100:1			5000.00	4409.40	80	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.046	4.029	2/1	91138	38	>100:1	Target = 1.33	0.12	1000.00	937.29		
570 > 483	58	4.038	4.029		72079	34	>100:1	1.26 (0.66-1.99)	0.26				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.178	1	592679	18	>100:1			5000.00	4462.45	81	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.197	4.187	1/0	115543	38	>100:1	Target = 1.58	0.07	1000.00	979.08		M
584 > 526	60	4.197	4.187		69484	31		1.66 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.178	1	521905	18				1000.00	825.70	81.1	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.178	1/0	486960	17	>100:1	Target = 15.50		1000.00	992.73		
563 > 169	52	4.187	4.178		30574	18	>100:1	15.92 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.287	1	95892	18	>100:1			1000.00	886.18	91	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.297	1/0	88884	16	>100:1			1000.00	986.50		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.307	1	41275	16	>100:1			1000.00	780.00	79.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	1/0	50119	16	>100:1	Target = 1.12		1000.00	1076.28		
512 > 219	57	4.317	4.317		44292	15	>100:1	1.13 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.455	1	101203	17	>100:1			1000.00	807.07	73.8	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.464	1/0	89864	17	>100:1			1000.00	998.07		
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.455	4.455	1	536079	20	>100:1			1000.00	885.62	87.7	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.446	2/1	466596	20	>100:1	Target = 10.85		1000.00	859.50		
613 > 169	38	4.464	4.446		46299	22		10.07 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.688	1/0	471336	21	>100:1	Target = 8.37		1000.00	892.67		
663 > 169	38	4.696	4.688		59156	29	>100:1	7.96 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.473	1	41850	19	>100:1			1000.00	852.44	83.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	1/0	42789	19	>100:1	Target = 1.03		1000.00	935.86		
526 > 219	59	4.482	4.482		44070	17	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.914	4.906	1	678956	18	>100:1			1000.00	805.94	83.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.914	4.906	1/0	565848	21	92:1	Target = 12.11		1000.00	961.87		
713 > 169	42	4.914	4.906		50734	18	>100:1	11.15 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.282	1	779161	19	>100:1			1000.00	859.84	83.3	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.282	1/0	499229	19	>100:1	Target = 11.48		1000.00	980.62		
813 > 269	40	5.291	5.282		44078	20	>100:1	11.32 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.625	1/0	670861	26	>100:1	Target = 13.88		1000.00	972.65		
913 > 319	40	5.632	5.625		45590	26	>100:1	14.71 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.873	1	561006	21	>100:1					76.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	584973	21	>100:1					80	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	0	517960	25	>100:1					86.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.703	1.696	1	516639	24	>100:1					84.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	1	143138	22	>100:1					87.8	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d

Injection Date: 28-Dec-2020 15:46:06

Inst. ID: LCMSMS02

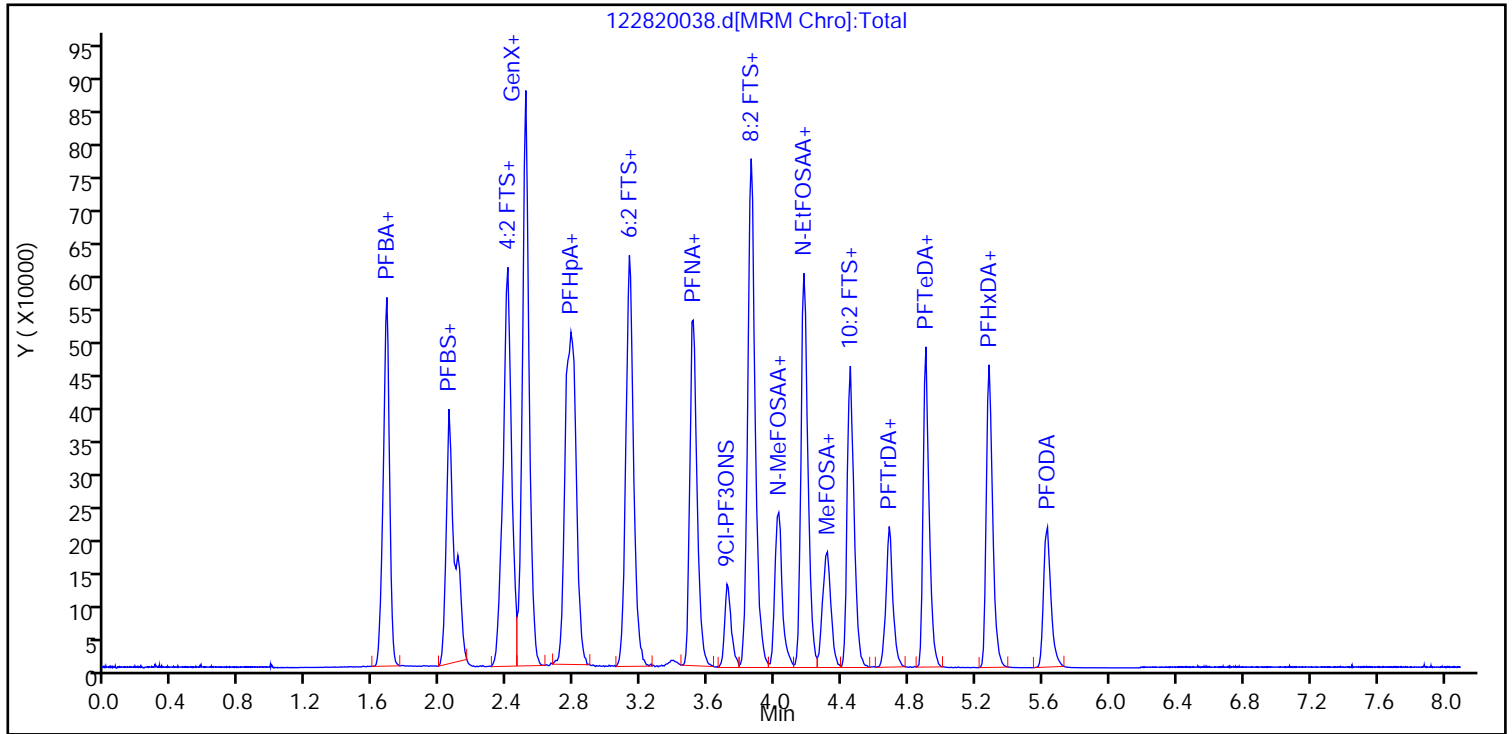
Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

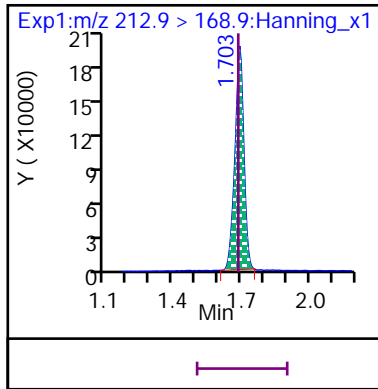
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Dil. Factor: 1

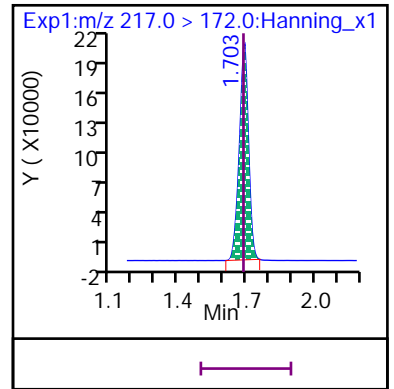
Operator: Matthew M. Miller



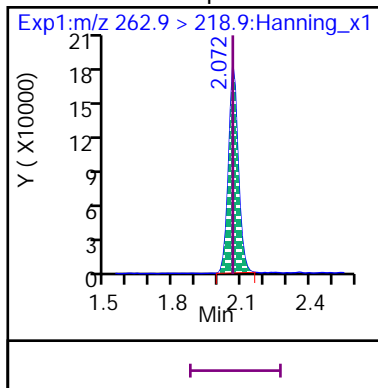
8 Perfluoro-n-butanoic acid (PFBA)



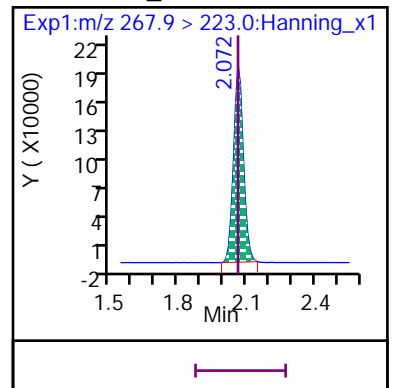
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

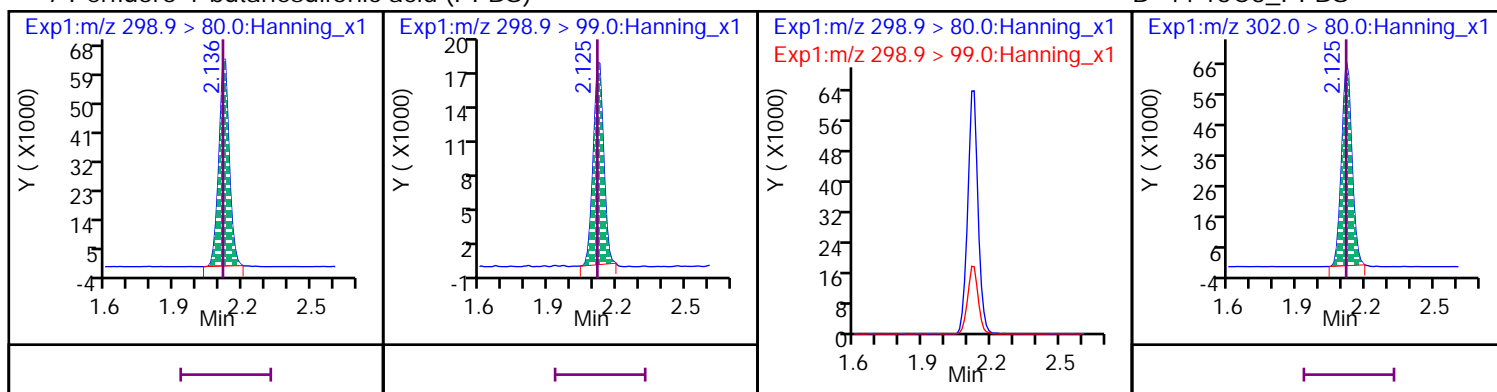


D 50 13C5\_PFPeA



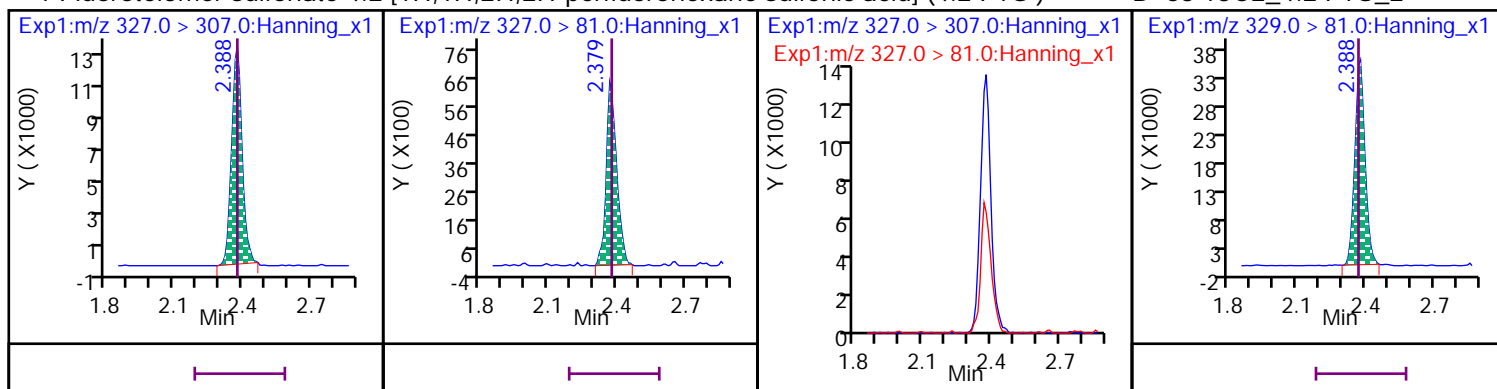
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



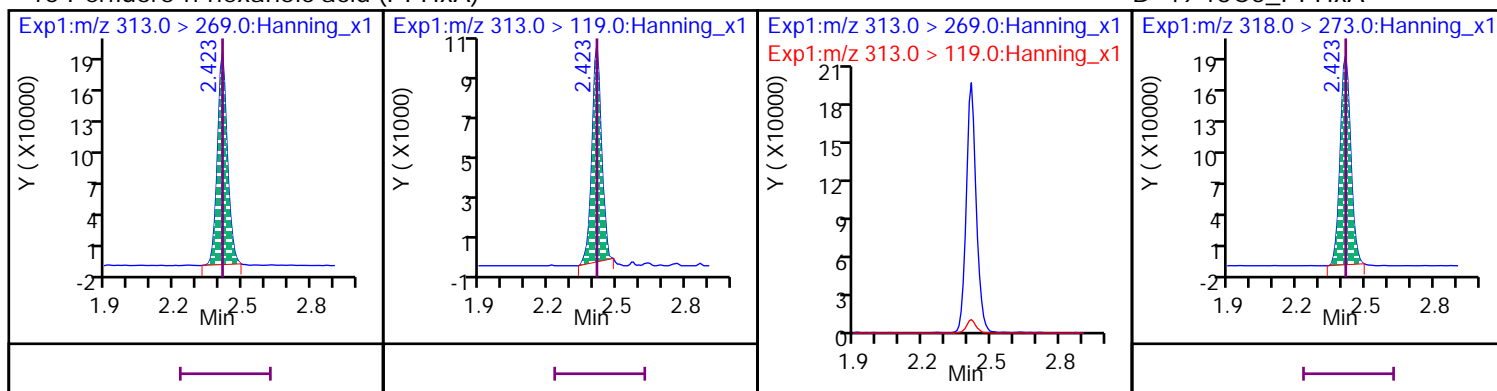
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



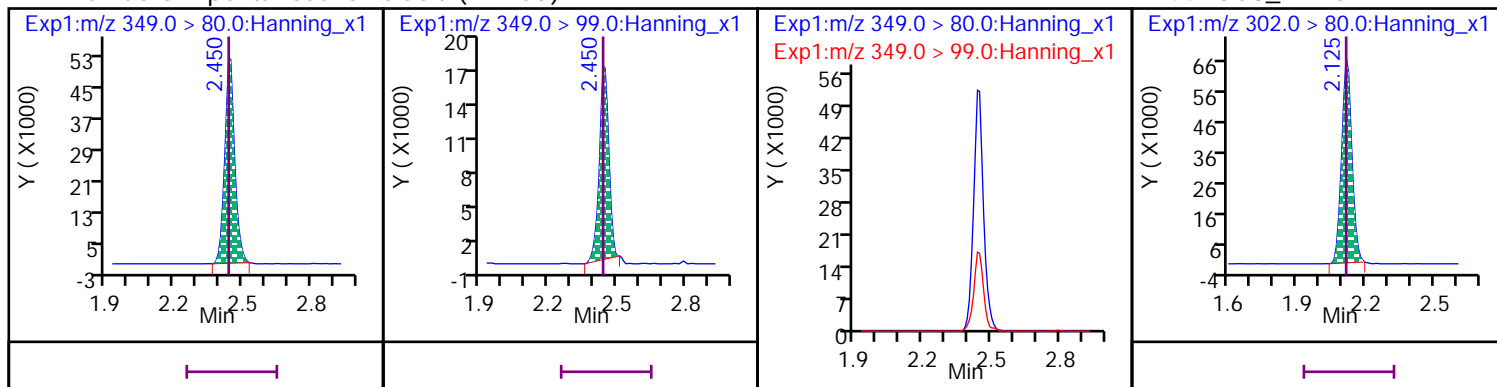
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



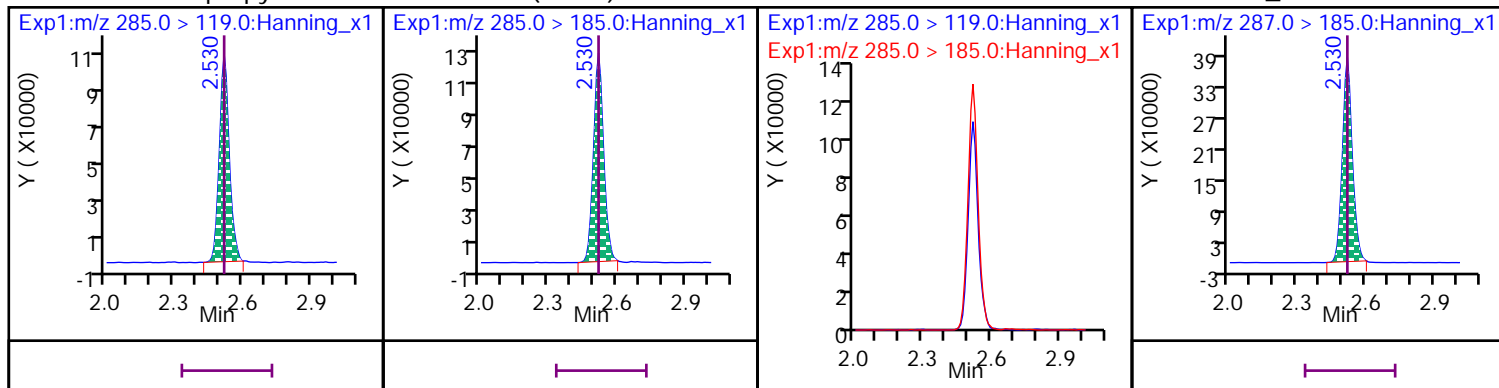
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



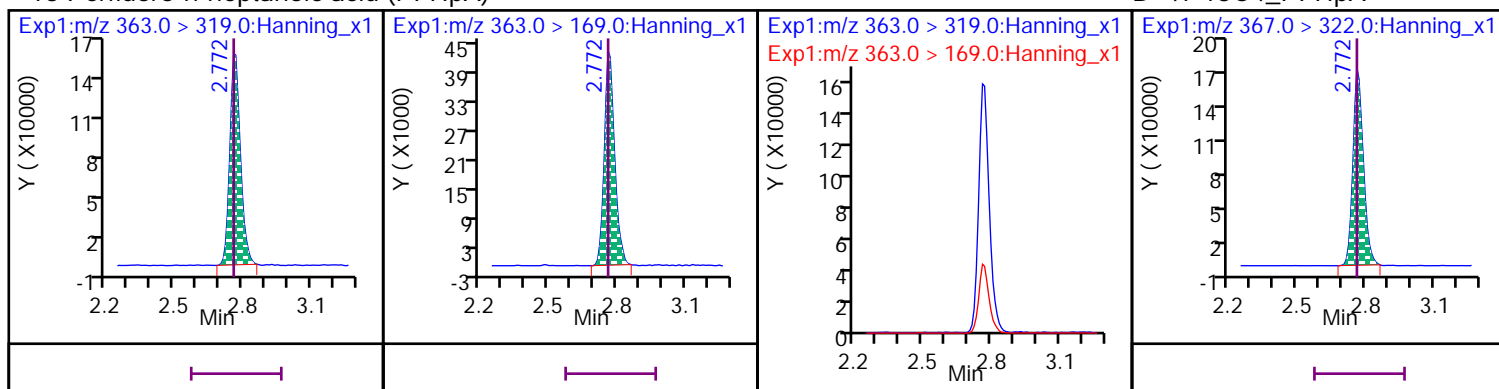
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



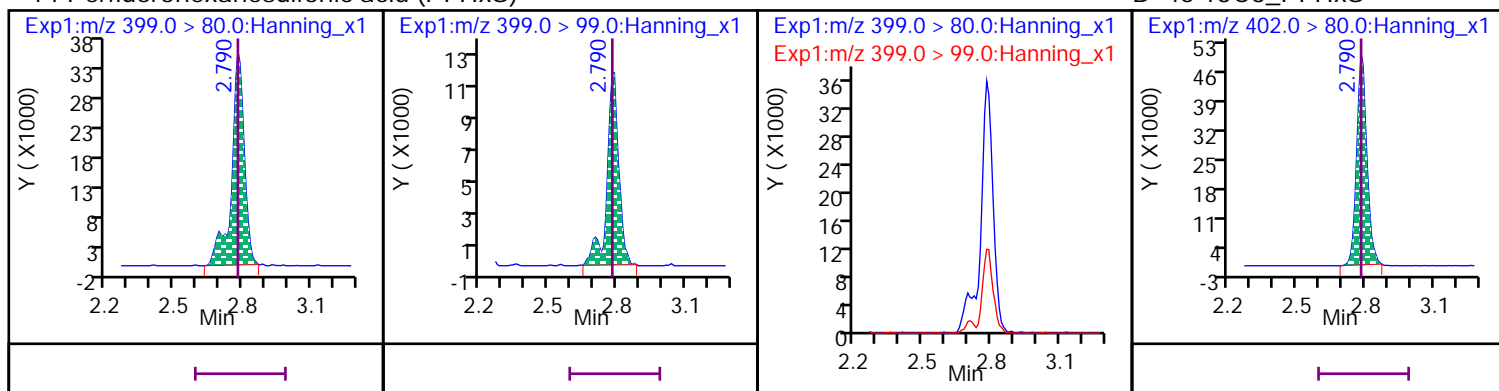
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



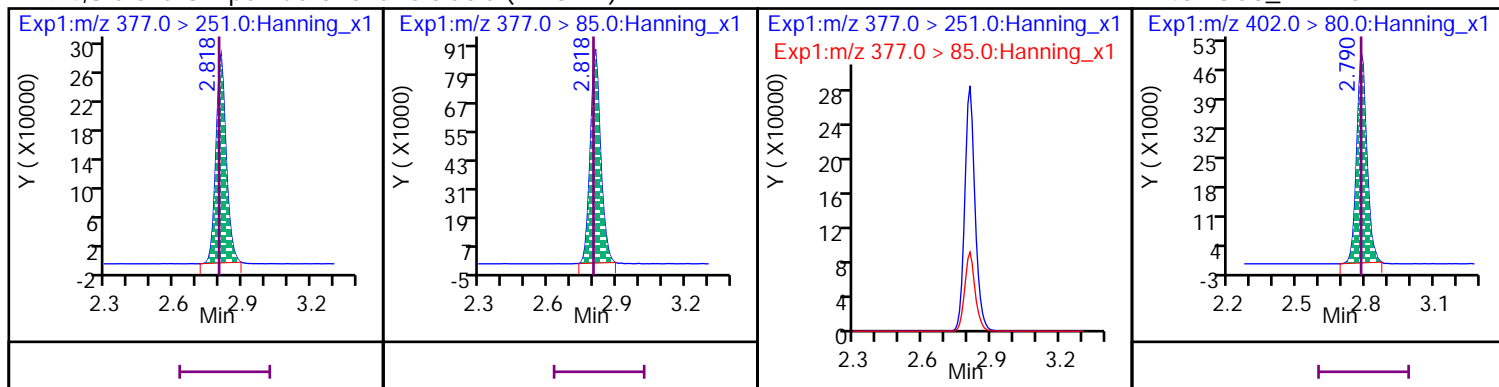
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



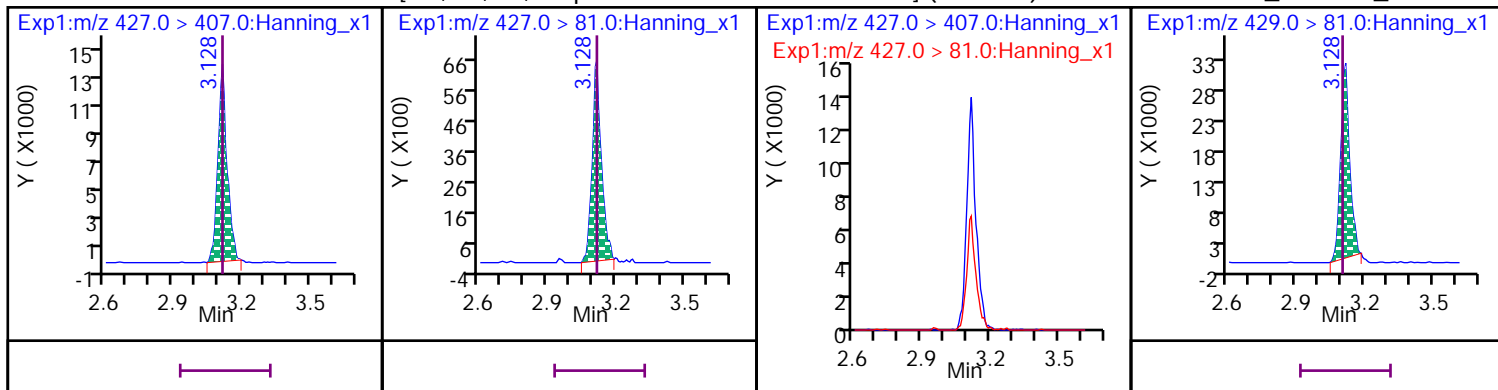
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



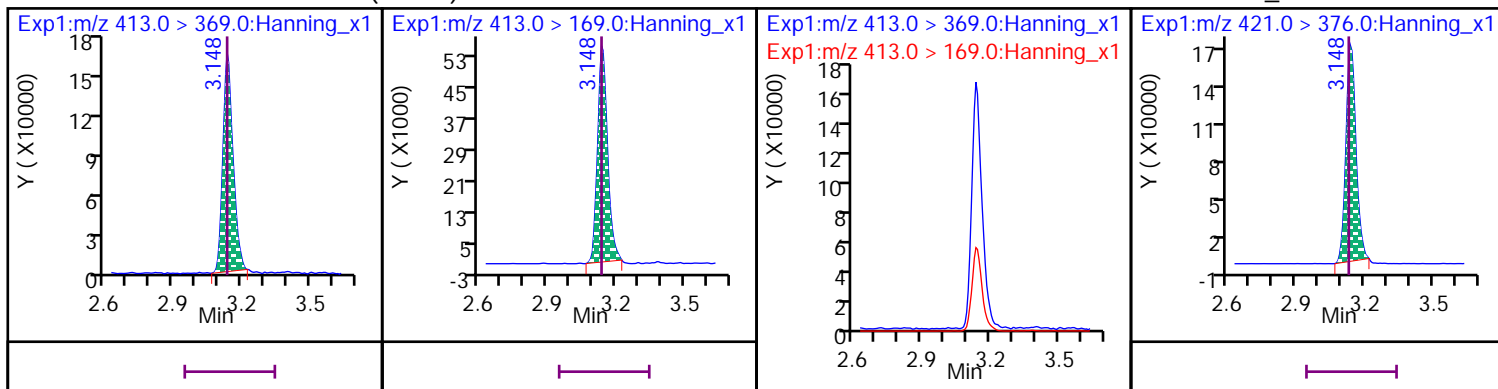
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



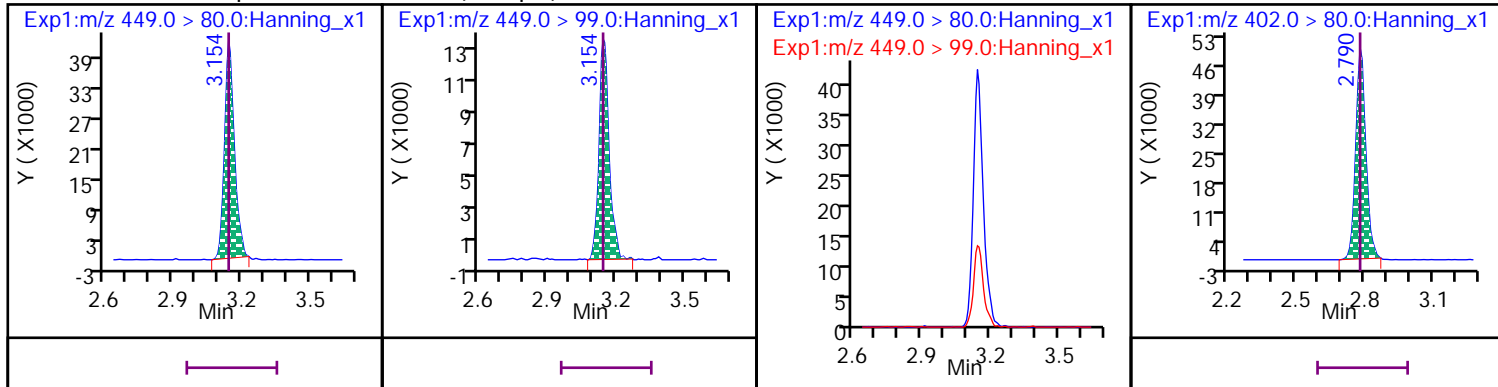
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



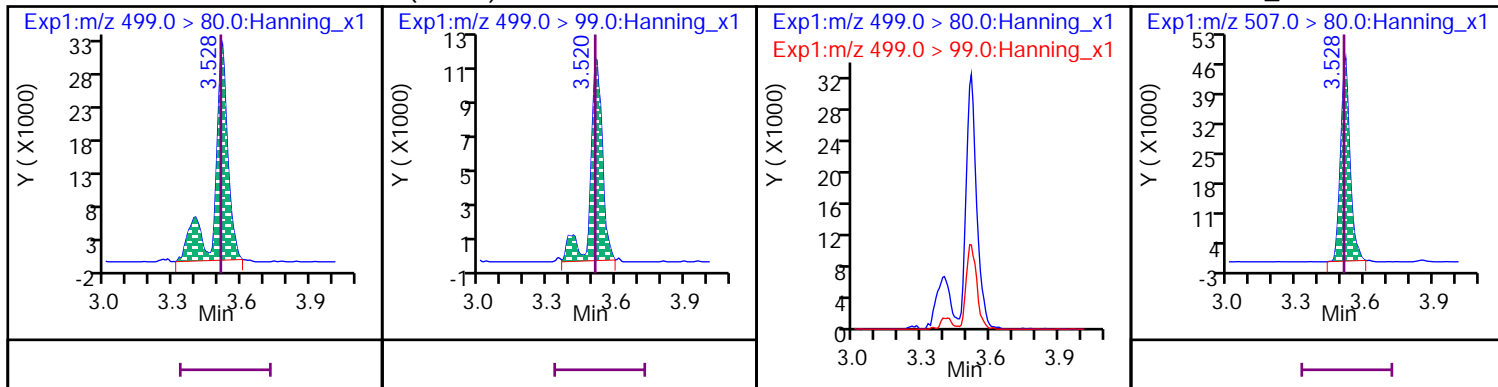
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



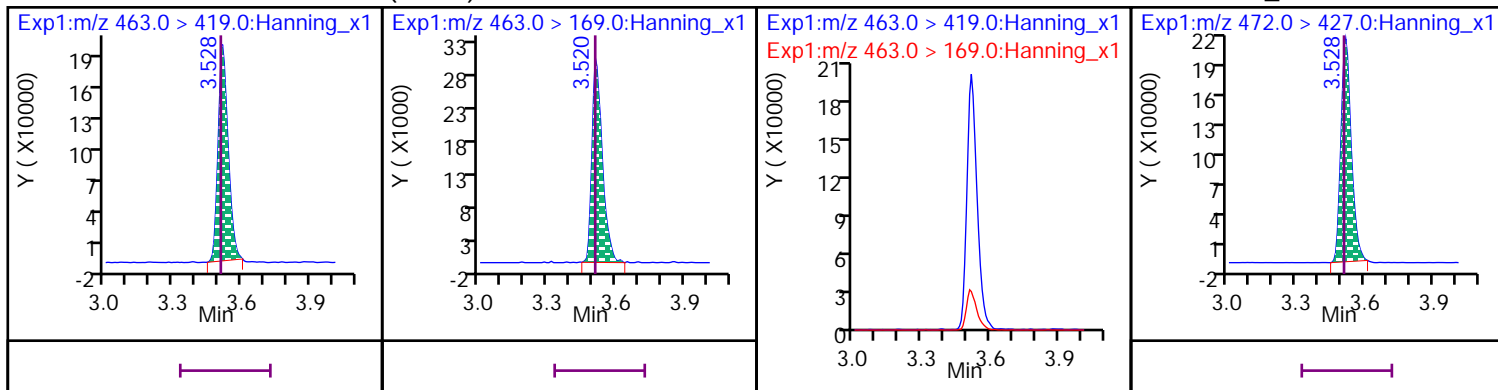
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



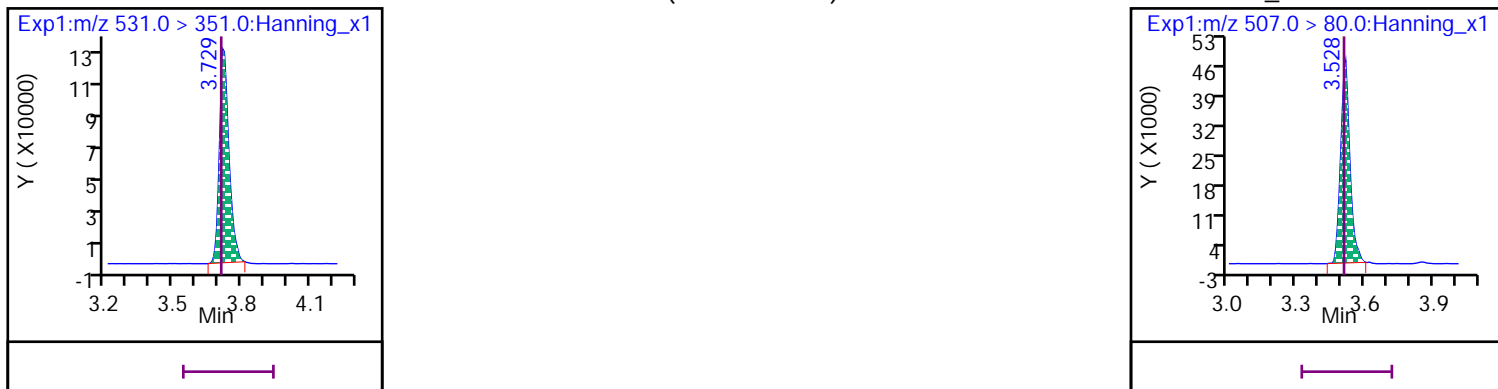
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



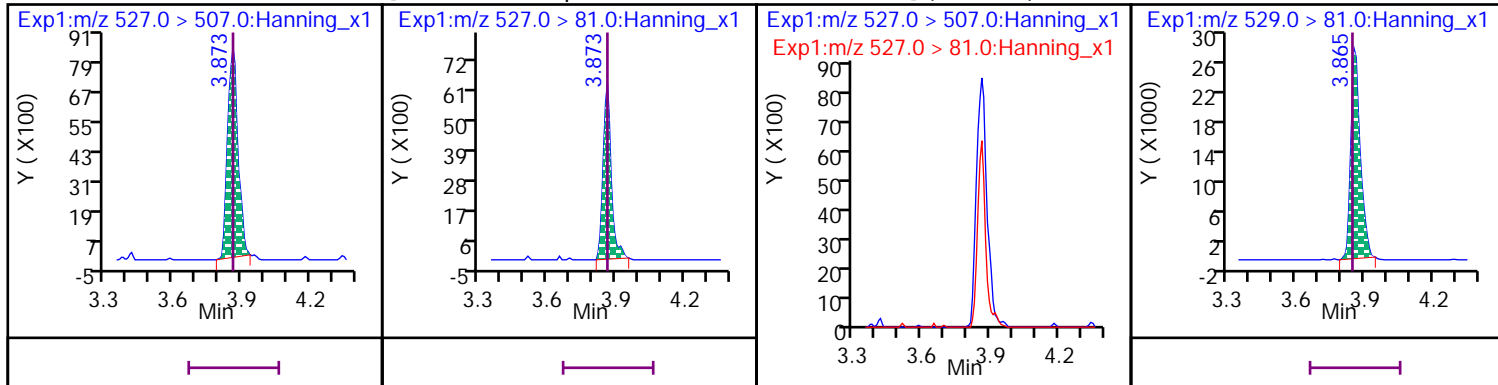
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

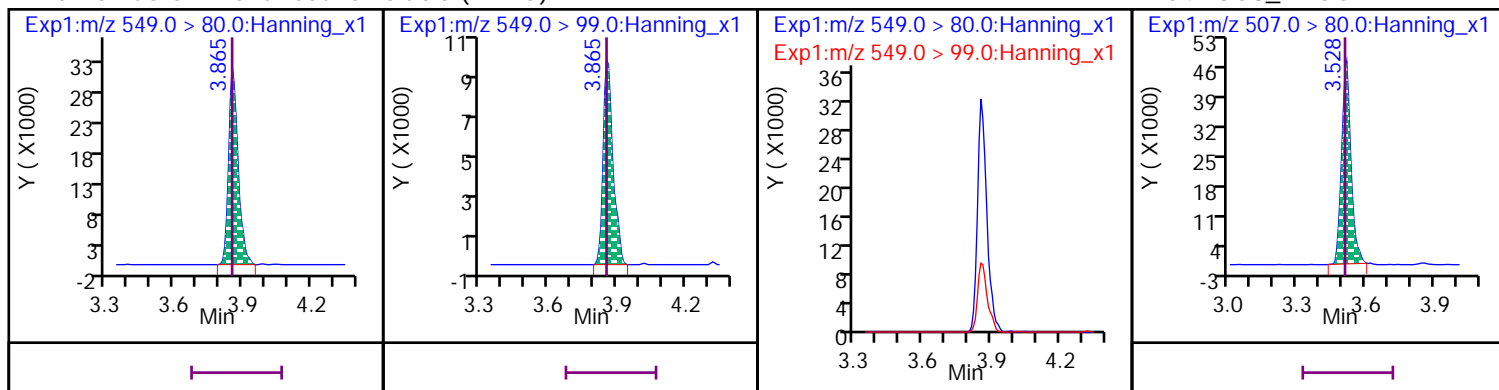
D 65 13C2\_8:2 FTS\_2





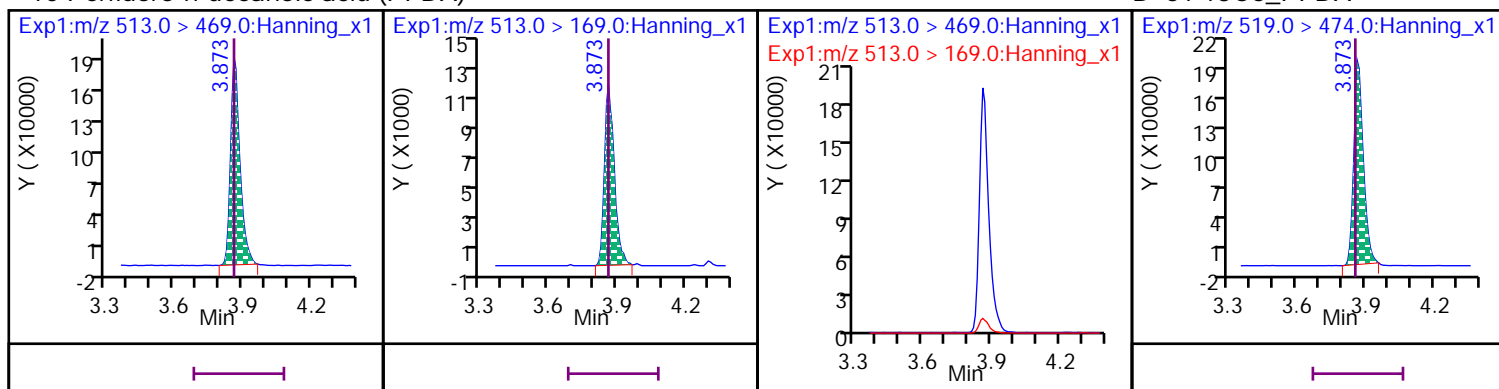
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



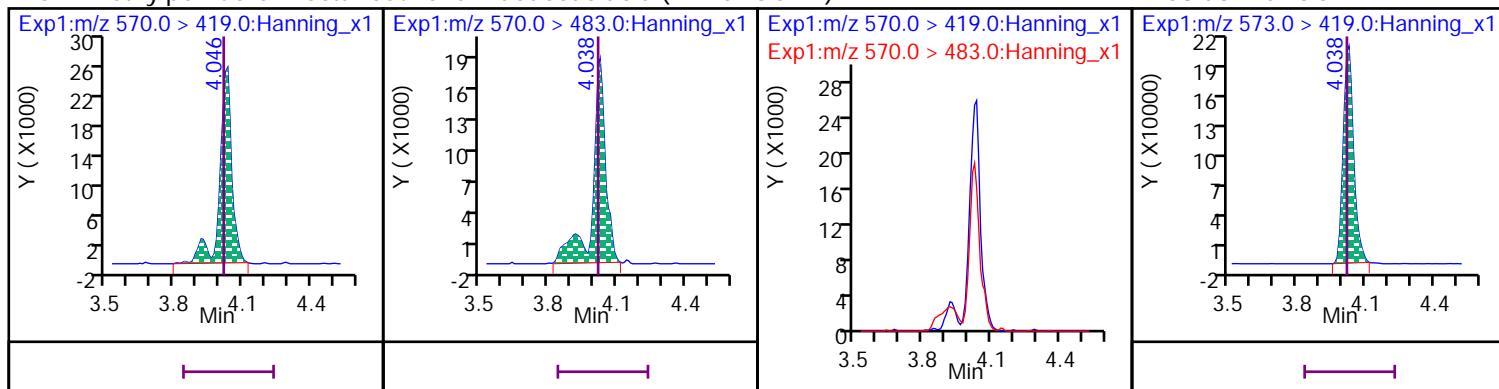
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



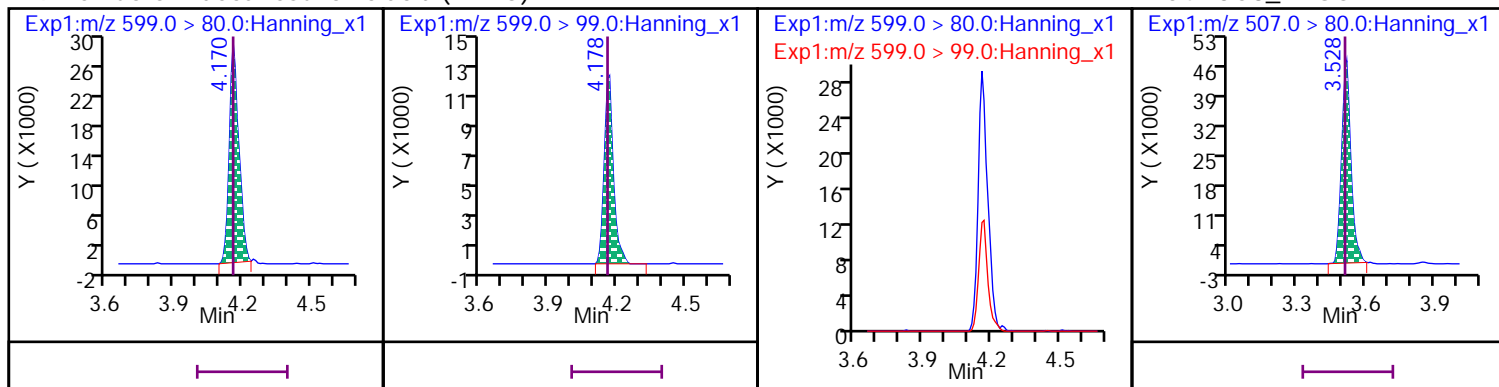
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



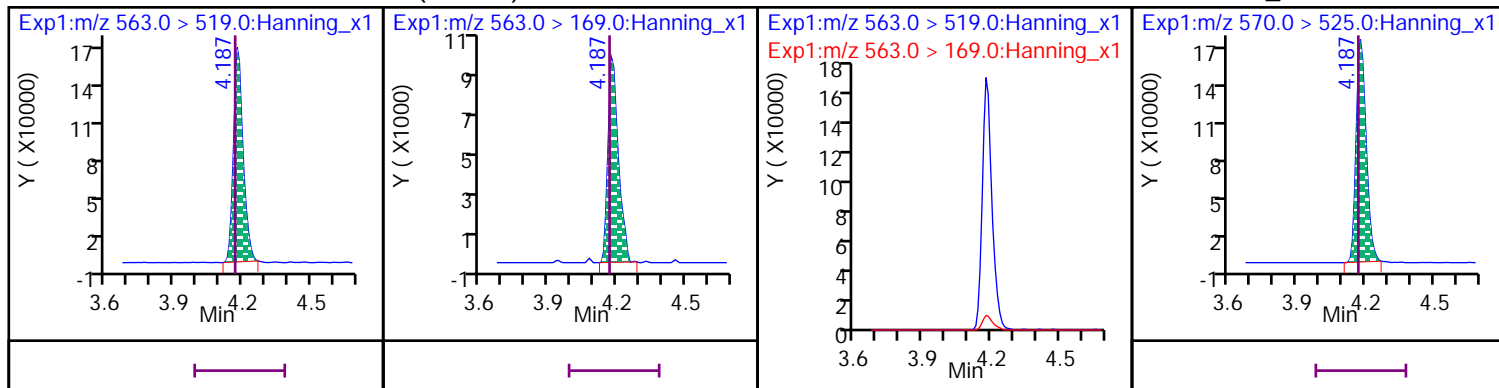
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



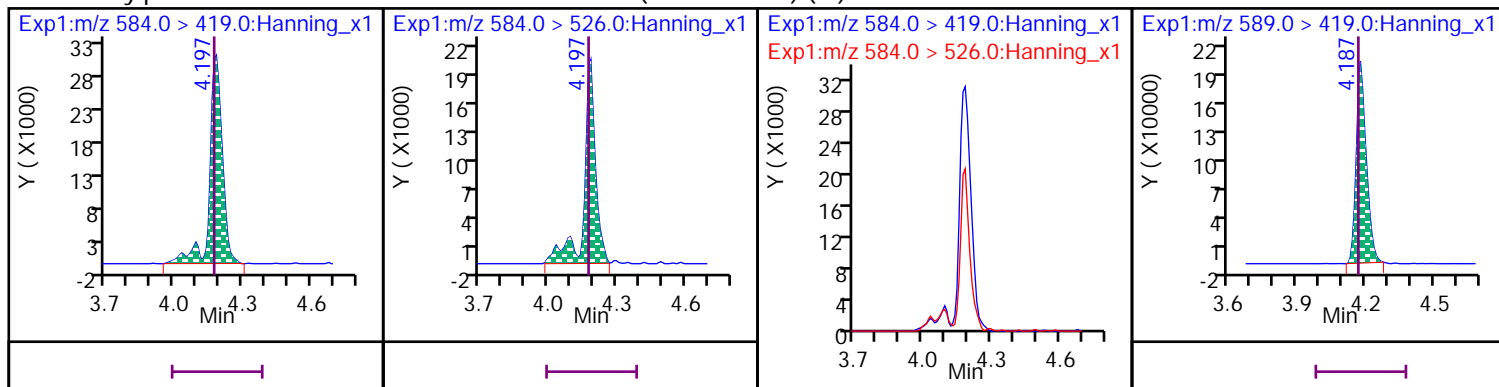
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



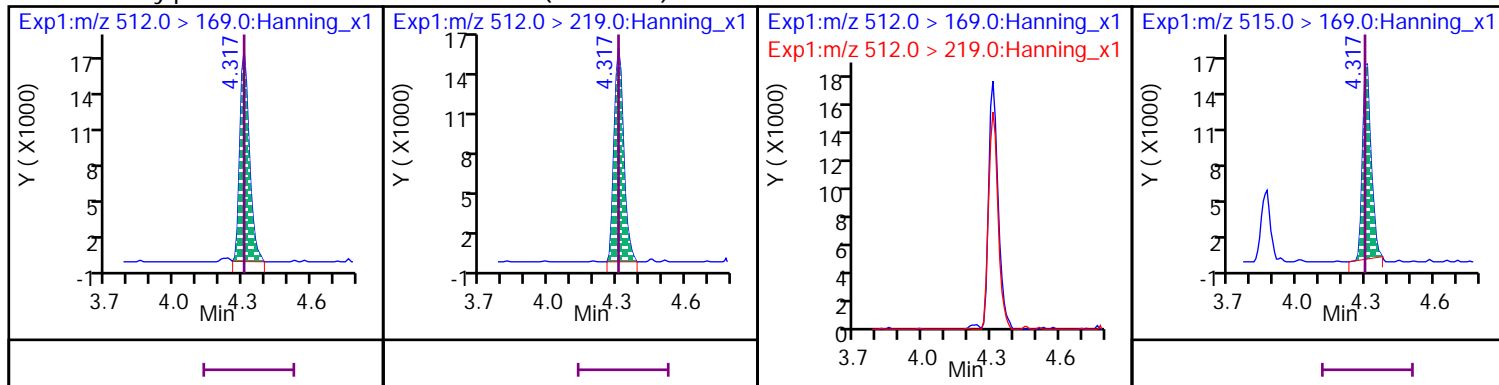
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

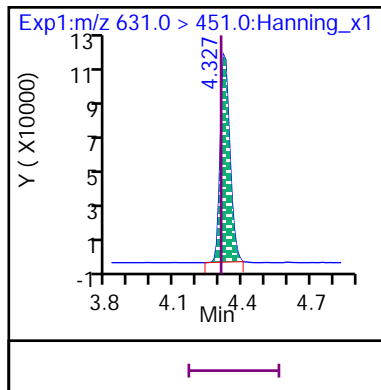


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

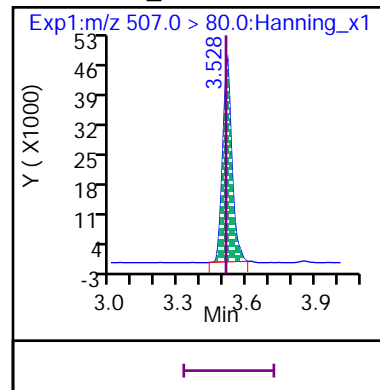
D 57 d3-MeFOSA



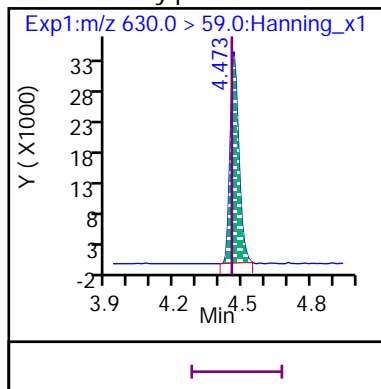
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



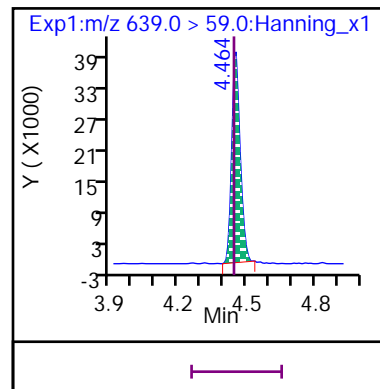
D 54 13C8\_PFOS



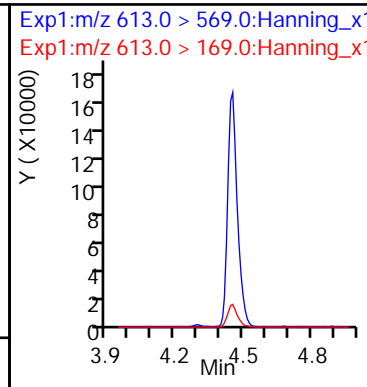
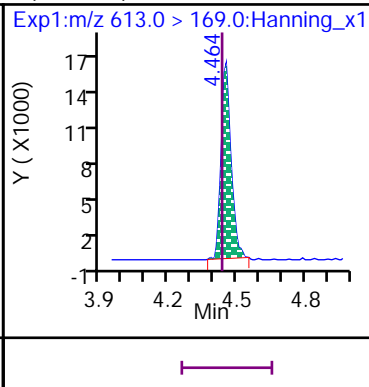
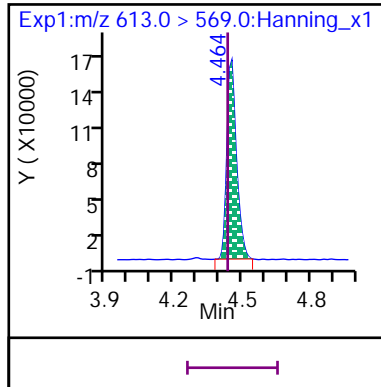
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



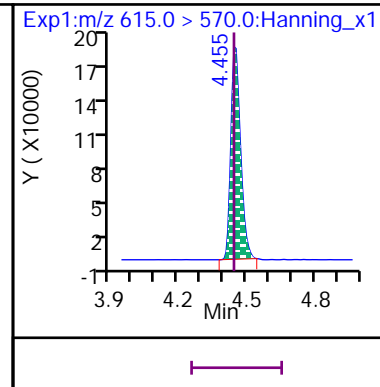
D 62 d9-EtFOSE



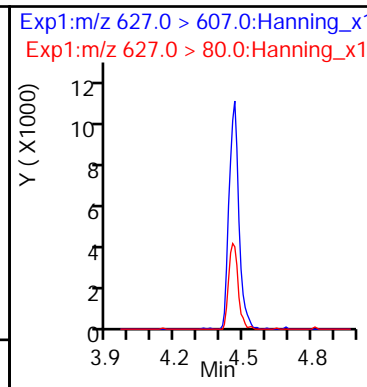
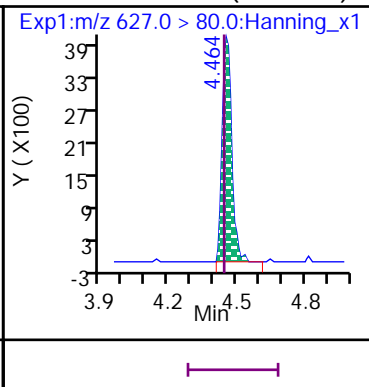
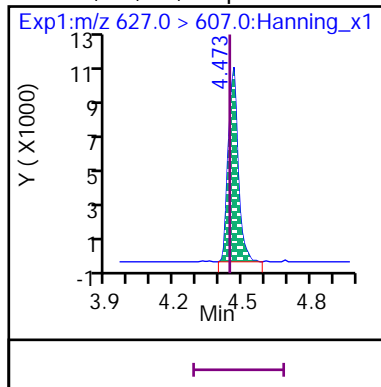
11 Perfluoro-n-dodecanoic acid (PFDoA)



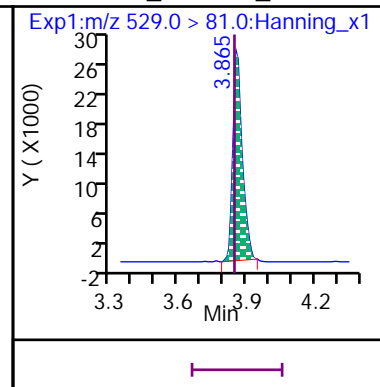
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

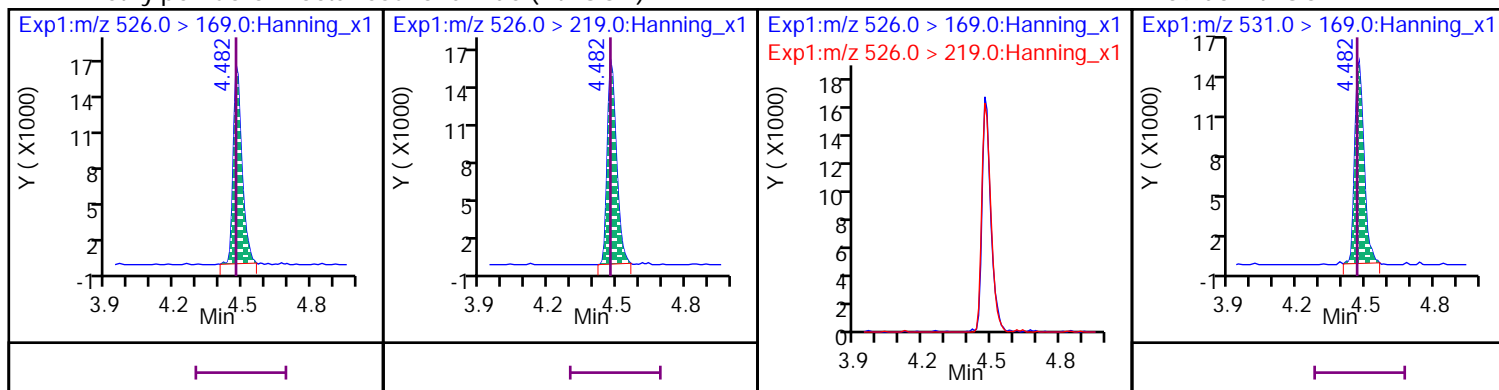


D 65 13C2\_8:2 FTS\_2



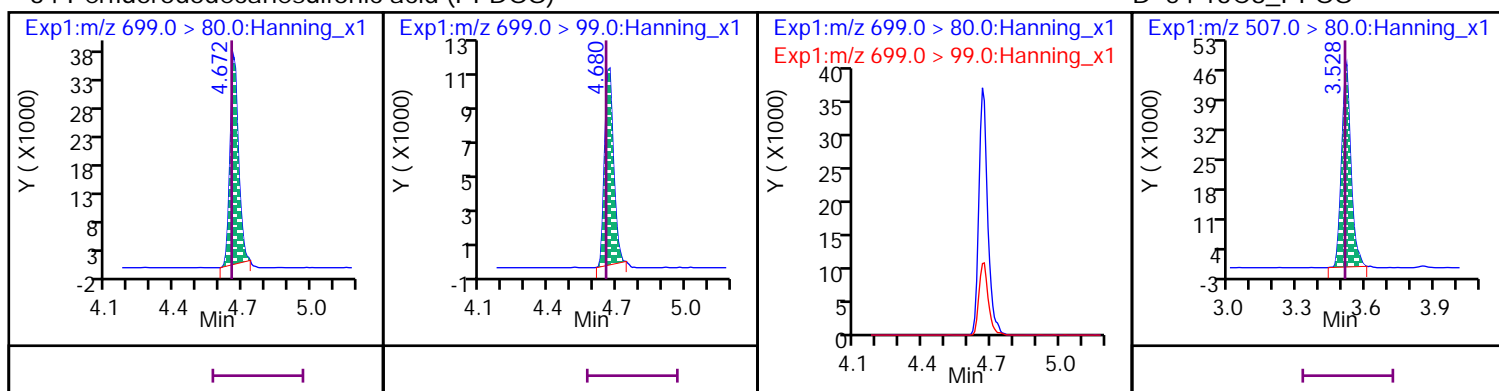
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



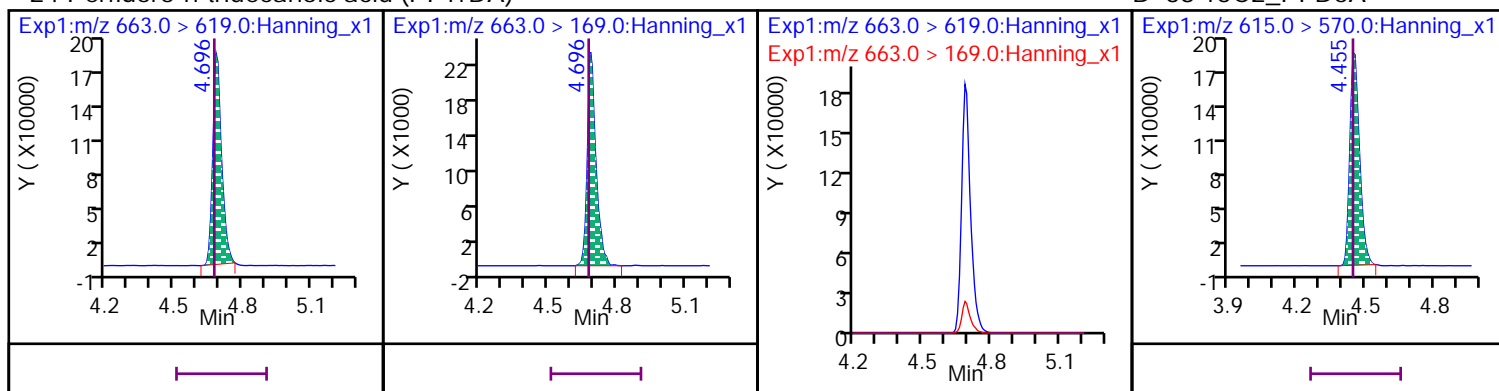
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



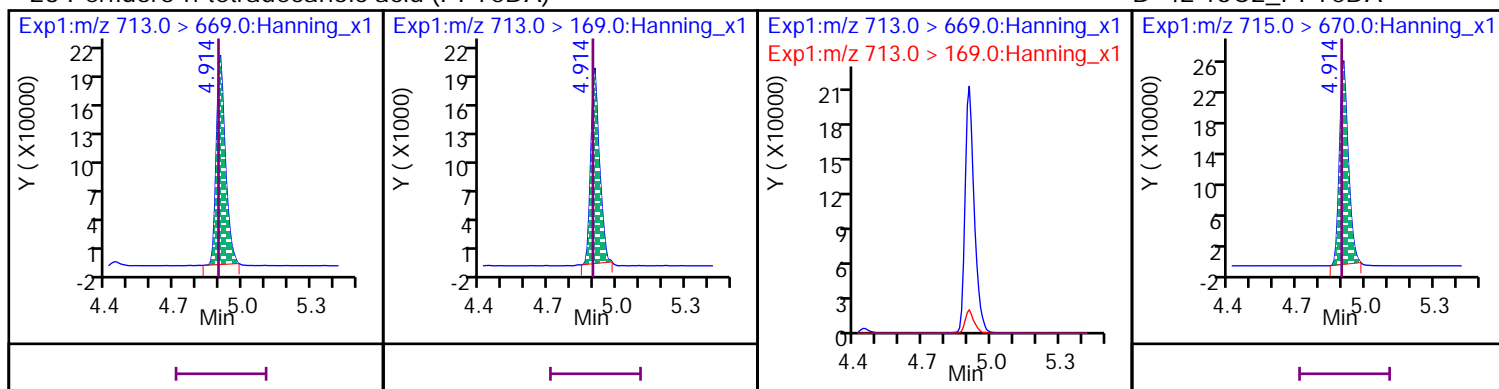
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



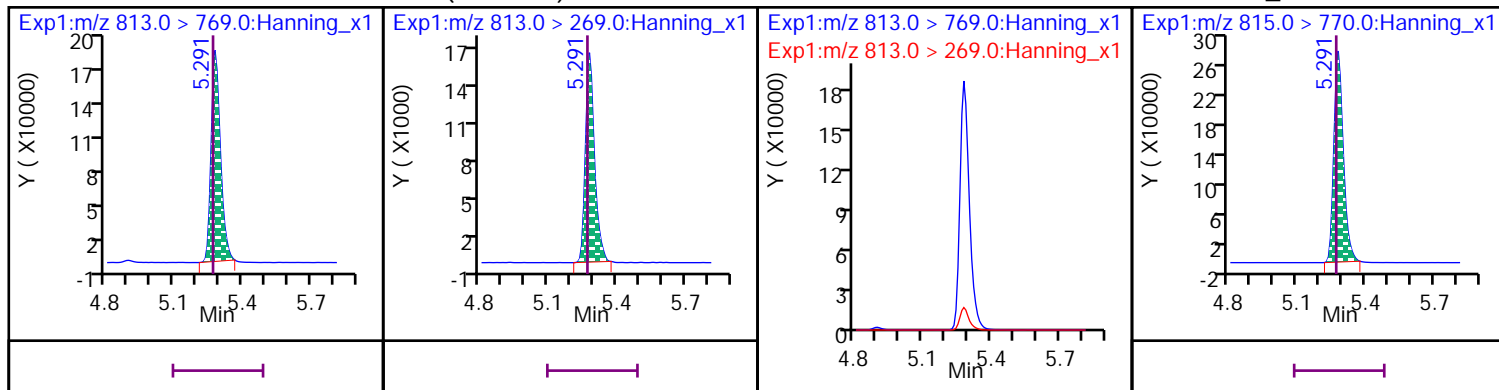
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



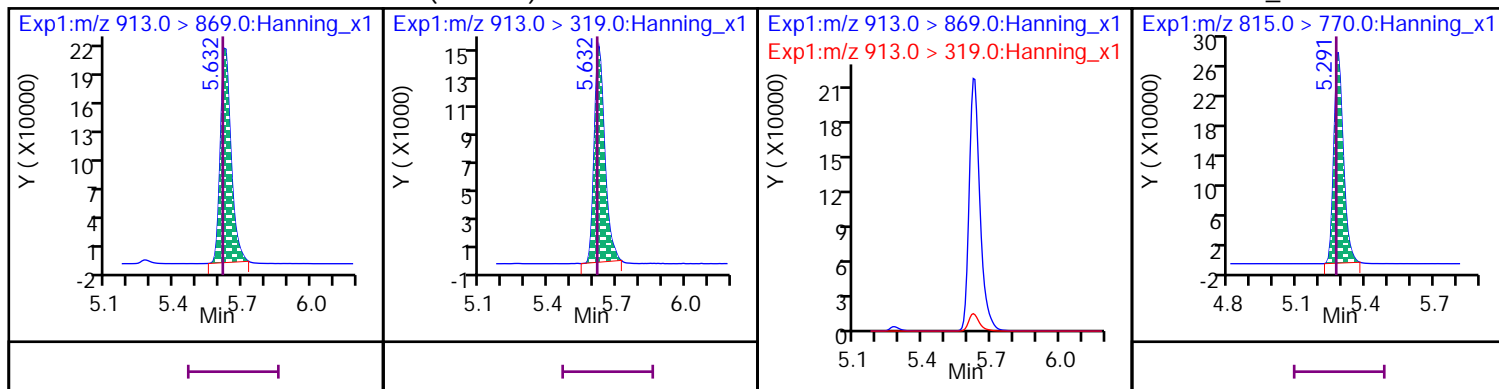
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

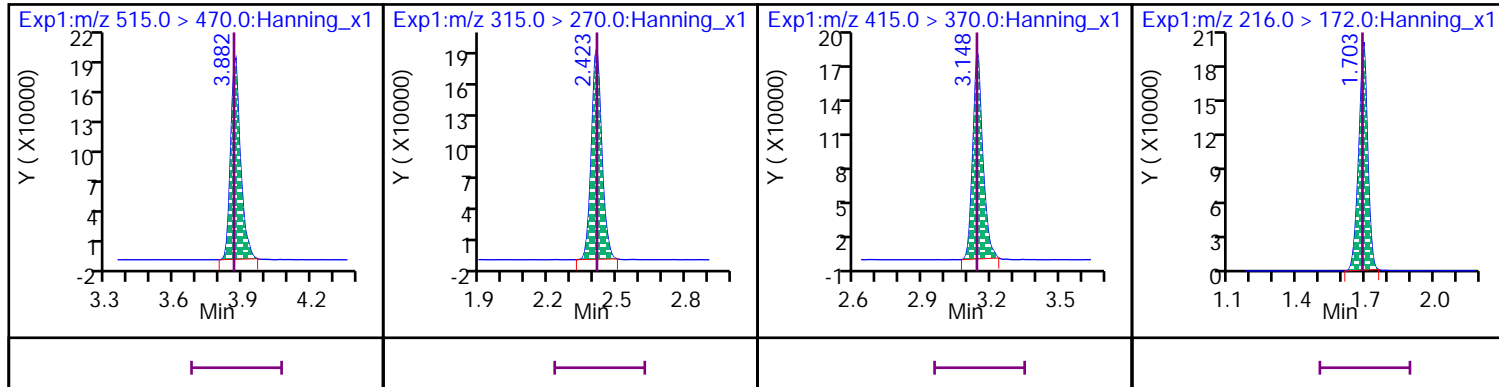


\* 37 13C2\_PFDA

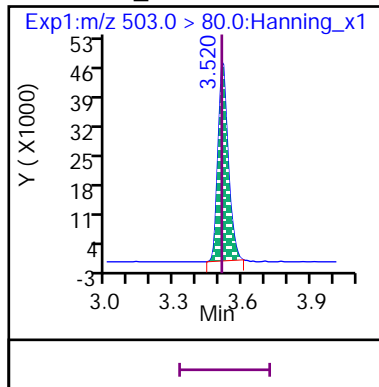
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d

Injection Date: 28-Dec-2020 15:46:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

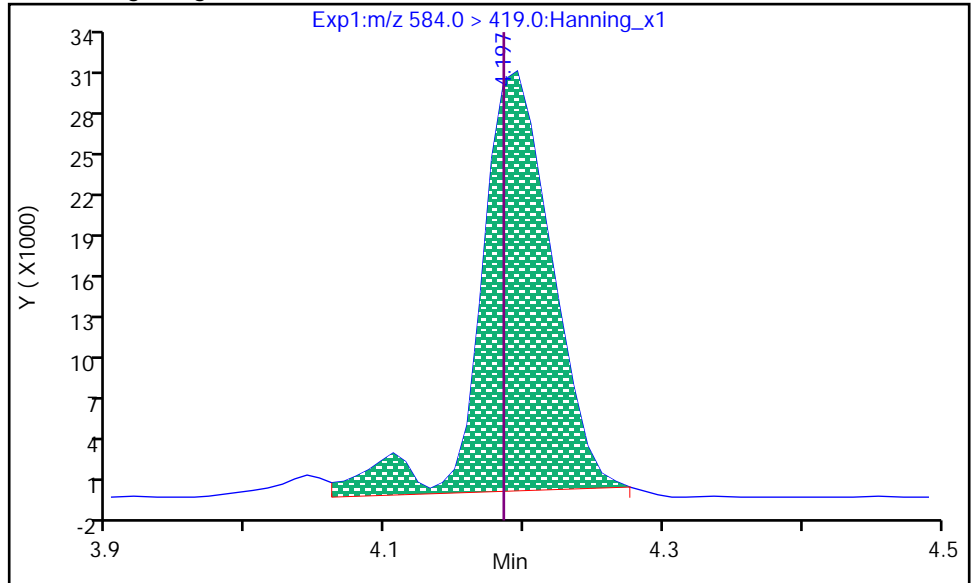
Dil. Factor: 1

Operator: Matthew M. Miller

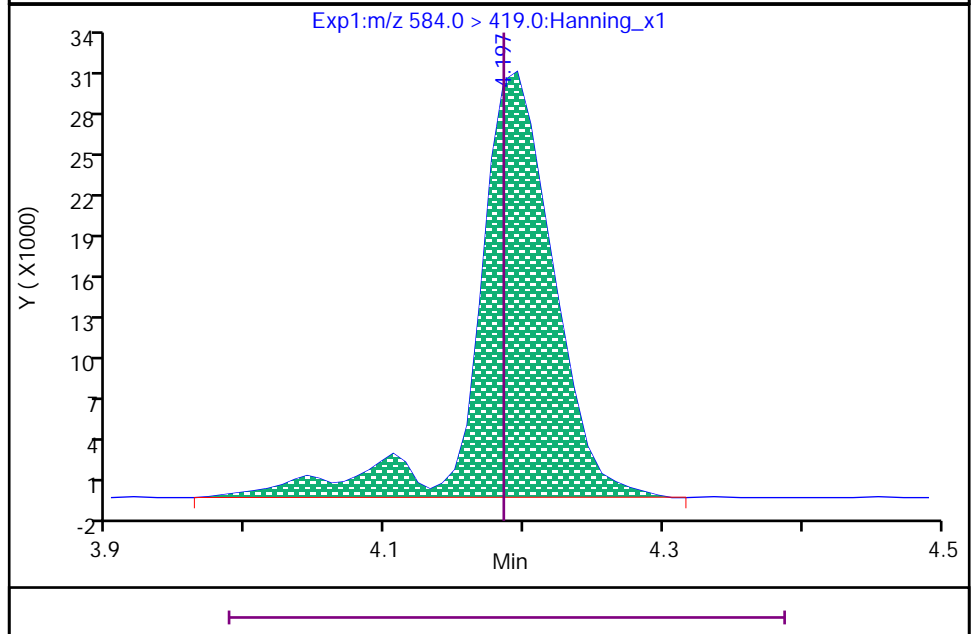
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.197  
Area: 106655  
Amount: 903.76  
Amount Units: ng/L



RT: 4.197  
Area: 115543  
Amount: 979.08  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:43:07

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d  
Injection Date: 28-Dec-2020 17:32:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 40  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	921.62	92.2	70 - 130
D 46 13C4_PFBA	649747	552912			85.1	50 - 150
D 50 13C5_PFPeA	665996	554850			83.3	50 - 150
21 PFPeA			1000.00	952.51	95.3	70 - 130
7 PFBS			884.00	823.24	93.1	70 - 130
D 44 13C3_PFBS	238207	200702			84.3	50 - 150
1 4:2 FTS			934.00	932.10	99.8	70 - 130
D 63 13C2_4:2 FTS_2	144067	112871			78.3	50 - 150
D 49 13C5_PFHxA	743582	622455			83.7	50 - 150
15 PFHxA			1000.00	900.45	90	70 - 130
22 PFPeS			938.00	920.55	98.1	70 - 130
28 GenX			2000.00	1750.22	87.5	70 - 130
D 66 13C3_GenX	1401050	1137718			81.2	50 - 150
D 47 13C4_PFHpA	633684	502311			79.3	50 - 150
13 PFHpA			1000.00	960.48	96	70 - 130
D 45 13C3_PFHxS	174146	156468			89.8	50 - 150
14 PFHxS			910.00	836.22	91.9	70 - 130
29 ADONA			942.00	811.74	86.2	70 - 130
D 64 13C2_6:2 FTS_2	104346	86545			82.9	50 - 150
2 6:2 FTS			948.00	933.00	98.4	70 - 130
20 PFOA			1000.00	901.38	90.1	70 - 130
D 53 13C8_PFOA	628007	501087			79.8	50 - 150
12 PFHpS			952.00	853.66	89.7	70 - 130
18 PFOS			928.00	812.39	87.5	70 - 130
17 PFNA			1000.00	966.88	96.7	70 - 130
D 56 13C9_PFNA	767623	625420			81.5	50 - 150
D 54 13C8_PFOS	152445	134387			88.2	50 - 150
30 9CI-PF3ONS			932.00	832.59	89.3	70 - 130
D 55 13C8_PFOSA	308857	272963			88.4	50 - 150
19 PFOSA			1000.00	923.66	92.4	70 - 130
16 PFNS			960.00	834.24	86.9	70 - 130
D 65 13C2_8:2 FTS_2	100453	81731			81.4	50 - 150
3 8:2 FTS			958.00	973.47	102	70 - 130
10 PFDA			1000.00	911.08	91.1	70 - 130
D 51 13C6_PFDA	672868	579163			86.1	50 - 150
D 58 d3-MeFOSAA	791564	646987			81.7	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	910.11	91	70 - 130
9 PFDS			964.00	900.92	93.5	70 - 130
5 N-EtFOSAA			1000.00	860.91	86.1	70 - 130
25 PFUdA			1000.00	904.25	90.4	70 - 130
D 60 d5-EtFOSAA	731651	655305			89.6	50 - 150
D 52 13C7_PFUdA	643525	540202			83.9	50 - 150
D 61 d7-MeFOSE	105402	87996			83.5	50 - 150
32 MeFOSE			1000.00	882.51	88.3	70 - 130
26 MeFOSA			1000.00	922.80	92.3	70 - 130
D 57 d3-MeFOSA	51840	42811			82.6	50 - 150
31 11Cl-PF3OUDS			942.00	838.68	89	70 - 130
D 62 d9-EtFOSE	137116	107736			78.6	50 - 150
33 EtFOSE			1000.00	965.39	96.5	70 - 130
D 59 d5-EtFOSA	50284	40643			80.8	50 - 150
D 38 13C2_PFDoA	611364	499154			81.6	50 - 150
4 10:2 FTS			964.00	793.16	82.3	70 - 130
27 EtFOSA			1000.00	1022.29	102	70 - 130
11 PFDoA			1000.00	931.55	93.2	70 - 130
34 PFDOS			968.00	865.34	89.4	70 - 130
24 PFTrDA			1000.00	937.03	93.7	70 - 130
23 PFTeDA			1000.00	962.31	96.2	70 - 130
D 42 13C2_PFTeDA	813074	661479			81.4	50 - 150
35 PFHxDA			1000.00	979.68	98	70 - 130
D 40 13C2_PFHxDA	935525	794037			84.9	50 - 150
36 PFODA			1000.00	950.93	95.1	70 - 130



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d  
Injection Date: 28-Dec-2020 17:32:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 40  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.696	1	552912	23	>100:1			1000.00	797.22	85.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.696	1/0	507533	24	>100:1			1000.00	921.62		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	554850	19	>100:1			1000.00	806.60	83.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.072	1/0	531364	17	>100:1			1000.00	952.51		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	200702	18	>100:1			1000.00	871.74	84.3	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.141	2.125	1/0	194808	17	>100:1	Target = 3.50		884.00	823.24		
298.9 > 99	44	2.141	2.125		52632	17	>100:1	3.70 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.460	2.450	1/0	160266	19	>100:1	Target = 3.10		938.00	920.55		
349 > 99	44	2.460	2.450		47872	17	>100:1	3.34 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.379	1	112871	19	>100:1			5000.00	4662.49	78.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/0	41993	20	>100:1	Target = 1.80		934.00	932.10		
327 > 81	63	2.389	2.388		22585	20	>100:1	1.85 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	622455	20	>100:1			1000.00	844.50	83.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	553362	20	>100:1	Target = 18.34		1000.00	900.45		
313 > 119	49	2.433	2.423		29073	20	>100:1	19.03 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.530	1	1137718	21	>100:1			5000.00	4271.45	81.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.540	2.530	1/0	286128	19	>100:1	Target = 0.81		2000.00	1750.22		
285 > 185	66	2.531	2.530		379734	21	>100:1	0.75 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.772	1	502311	20	>100:1			1000.00	828.01	79.3	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.772	1/0	500437	22	>100:1	Target = 3.70		1000.00	960.48		
363 > 169	47	2.782	2.772		129685	20	>100:1	3.85 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.790	1	156468	19	>100:1			1000.00	913.80	89.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.790	1/0	138729	28		Target = 3.21	0.11	910.00	836.22		
399 > 99	45	2.800	2.790		39041	20	47:1	3.55 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.808	1/0	806377	20	>100:1	Target = 2.97		942.00	811.74		
377 > 85	45	2.819	2.808		269773	21	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.162	3.154	1/0	121340	23	>100:1	Target = 3.08		952.00	853.66		
449 > 99	45	3.169	3.154		42938	33	>100:1	2.82 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.114	1	86545	24	>100:1			5000.00	4493.88	82.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.128	1/0	33488	24		Target = 1.80		948.00	933.00		
427 > 81	64	3.129	3.128		16807	22	>100:1	1.99 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.155	3.141	1	501087	23	>100:1			1000.00	846.62	79.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.148	1/0	460456	24	>100:1	Target = 2.87		1000.00	901.38		
413 > 169	53	3.162	3.148		163312	26	>100:1	2.81 (1.43-4.31)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.529	3.520	1	134387	24	>100:1			1000.00	896.34	88.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.520	1/0	129371	41	>100:1	Target = 3.84	0.24	928.00	812.39		
499 > 99	54	3.529	3.520		39986	42	>100:1	3.23 (1.92-5.76)	0.12				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.722	1/0	376671	24	>100:1			932.00	832.59		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.865	1/0	85795	21		Target = 3.07		960.00	834.24		
549 > 99	54	3.874	3.865		34961	18	>100:1	2.45 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	87866	18	>100:1	Target = 3.03		964.00	900.92		
599 > 99	54	4.179	4.169		30993	18	>100:1	2.83 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.338	4.317	2/1	320085	18	>100:1			942.00	838.68		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.681	4.663	2/1	93362	18		Target = 3.33		968.00	865.34		
699 > 99	54	4.681	4.663		28688	21	>100:1	3.25 (1.66-5.00)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.537	3.520	1	625420	24	>100:1			1000.00	832.82	81.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.537	3.520	1/0	604726	24	>100:1	Target = 6.16		1000.00	966.88		
463 > 169	56	3.529	3.520		94264	22	>100:1	6.41 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.849	1	272963	21	>100:1			1000.00	881.77	88.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.841	2/1	248457	21	>100:1			1000.00	923.66		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.857	2	81731	19				5000.00	4405.95	81.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorododecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-2	31995	18	>100:1	Target = 1.95		958.00	973.47		M
527 > 81	65	3.874	3.873		17042	18		1.87 (0.97-2.93)					M
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.455	2/0	29961	25	>100:1	Target = 3.14		964.00	793.16		
627 > 80	65	4.474	4.455		9937	18		3.01 (1.57-4.72)					
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.882	3.865	2	579163	21	>100:1			1000.00	873.11	86.1	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.873	1/-1	518478	21	>100:1	Target = 15.94		1000.00	911.08		
513 > 169	51	3.882	3.873		36349	25	>100:1	14.26 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.029	1	646987	18	>100:1			5000.00	4507.38	81.7	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.029	1/0	90462	33	>100:1	Target = 1.33	0.11	1000.00	910.11		
570 > 483	58	4.038	4.029		77993	35	>100:1	1.15 (0.66-1.99)	0.16				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.178	1	655305	19	>100:1			5000.00	4933.98	89.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.187	1/0	112333	33		Target = 1.58	0.11	1000.00	860.91		
584 > 526	60	4.198	4.187		65606	35	>100:1	1.71 (0.79-2.37)	0.17				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.198	4.178	2	540202	18	>100:1			1000.00	854.65	83.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.178	2/0	459110	19	>100:1	Target = 15.50		1000.00	904.25		
563 > 169	52	4.188	4.178		32850	16	>100:1	13.97 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.287	1	87996	18	>100:1			1000.00	813.21	83.5	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.297	1/0	72967	16	>100:1			1000.00	882.51		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.307	1	42811	18	6.0:1			1000.00	809.02	82.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.317	1/0	44571	15	>100:1	Target = 1.12		1000.00	922.80		
512 > 219	57	4.318	4.317		45683	17	>100:1	0.97 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.455	1	107736	19	>100:1			1000.00	859.17	78.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.464	1/0	92533	19	>100:1			1000.00	965.39		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.455	1	499154	19	>100:1			1000.00	824.62	81.6	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.446	2/1	470876	18	>100:1	Target = 10.85		1000.00	931.55		
613 > 169	38	4.465	4.446		49231	19	>100:1	9.56 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.704	4.688	1/0	460680	20	>100:1	Target = 8.37		1000.00	937.03		
663 > 169	38	4.704	4.688		58937	23	>100:1	7.81 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.473	1	40643	16	>100:1			1000.00	827.85	80.8	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.482	1/0	45393	21	>100:1	Target = 1.03		1000.00	1022.29		
526 > 219	59	4.492	4.482		41994	17	>100:1	1.08 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.906	1	661479	19	>100:1			1000.00	785.19	81.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.906	1/0	551534	21	97:1	Target = 12.11		1000.00	962.31		
713 > 169	42	4.915	4.906		46372	18	>100:1	11.89 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.300	5.282	2	794037	19	>100:1			1000.00	876.26	84.9	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.300	5.282	2/0	508274	21	>100:1	Target = 11.48		1000.00	979.68		
813 > 269	40	5.300	5.282		43114	21	>100:1	11.78 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.640	5.625	1/-1	668407	26	98:1	Target = 13.88		1000.00	950.93		
913 > 319	40	5.640	5.625		45956	26	>100:1	14.54 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.873	1	575171	21	>100:1					78.5	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	588236	20	>100:1					80.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.148	1	485412	26	>100:1					81	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.696	1	510985	23	>100:1					83.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.537	3.520	1	137966	22	>100:1					84.6	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

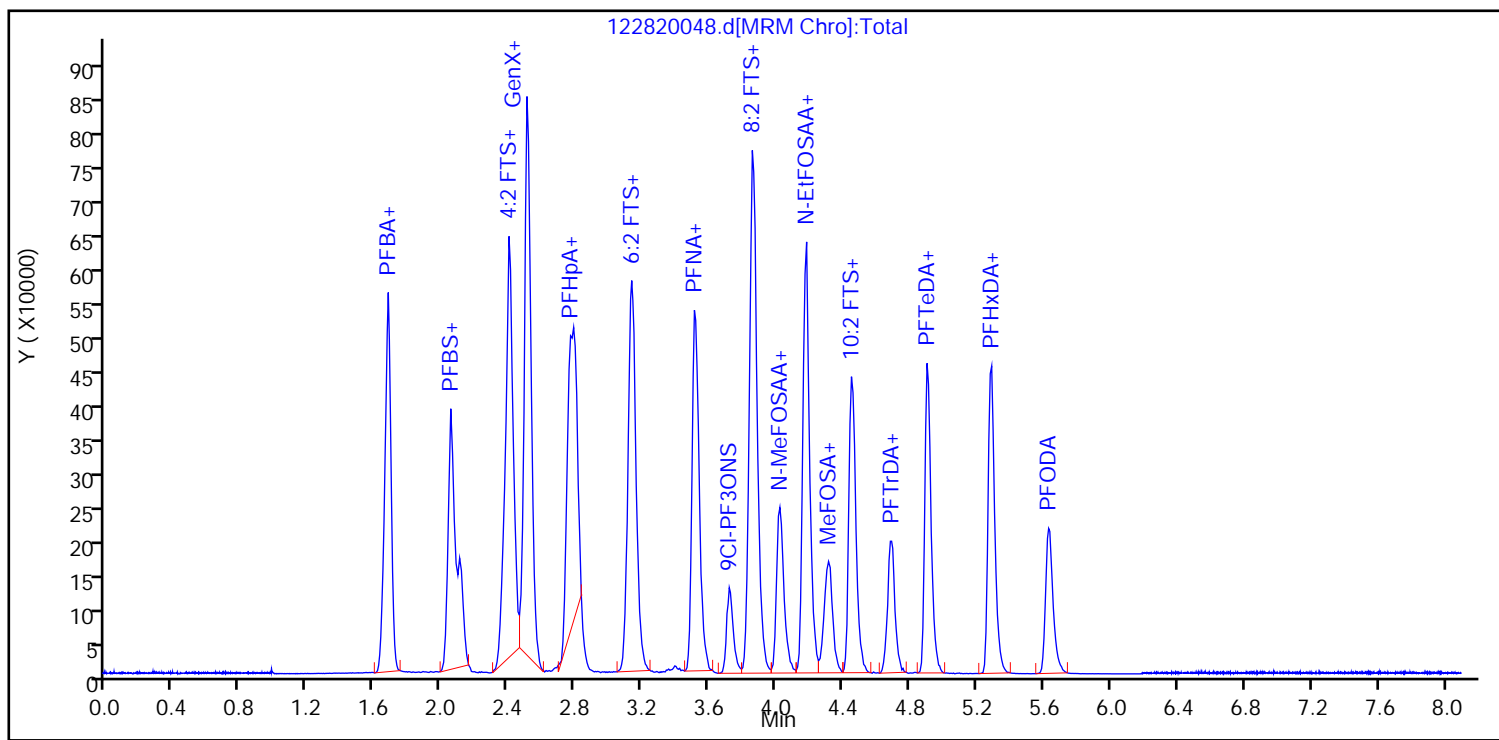
Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

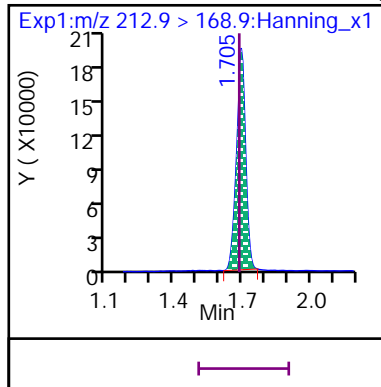
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Dil. Factor: 1

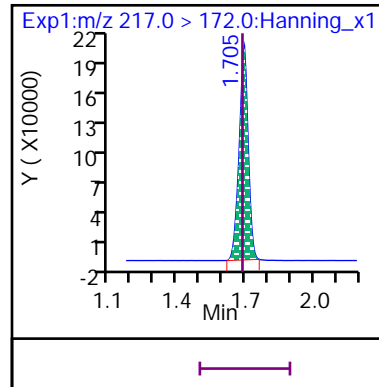
Operator: Matthew M. Miller



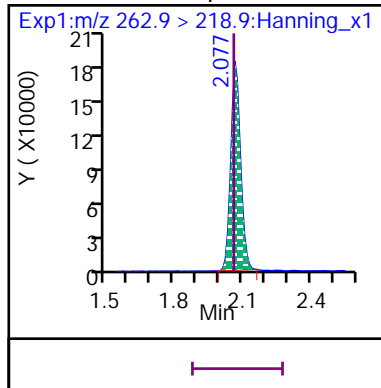
8 Perfluoro-n-butanoic acid (PFBA)



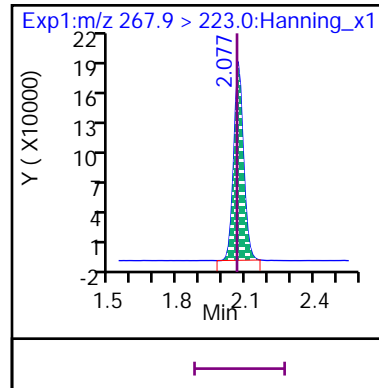
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

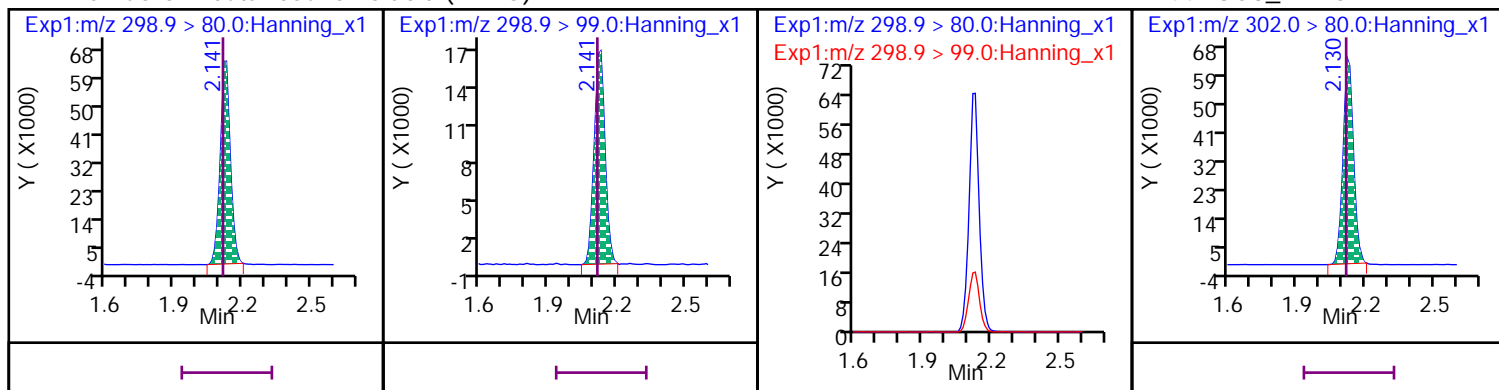


D 50 13C5\_PFPeA



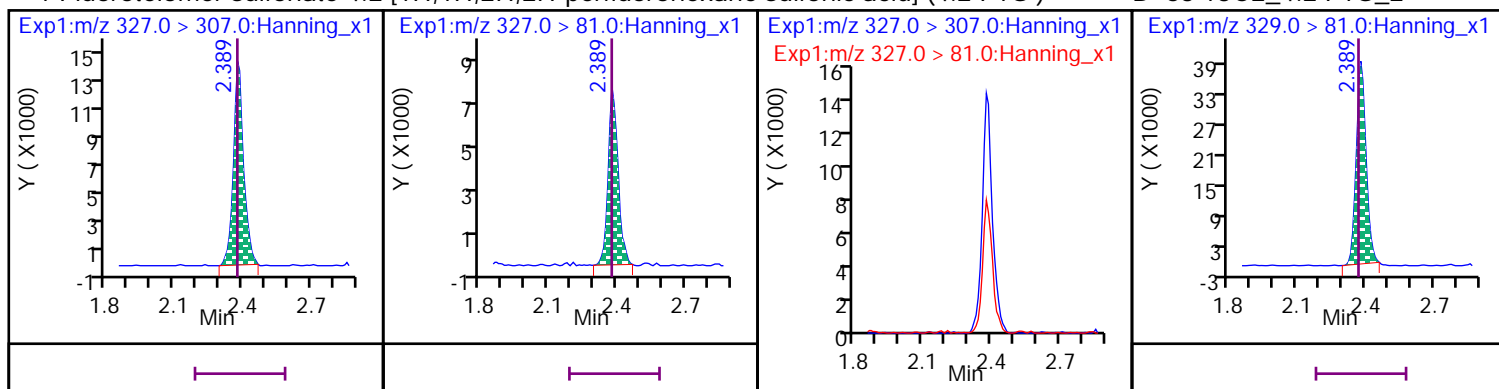
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



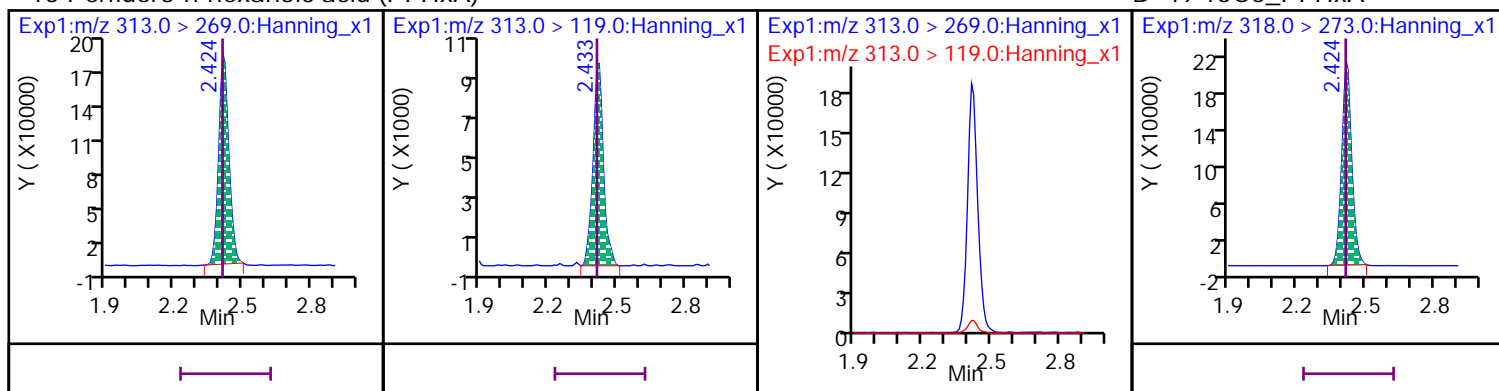
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



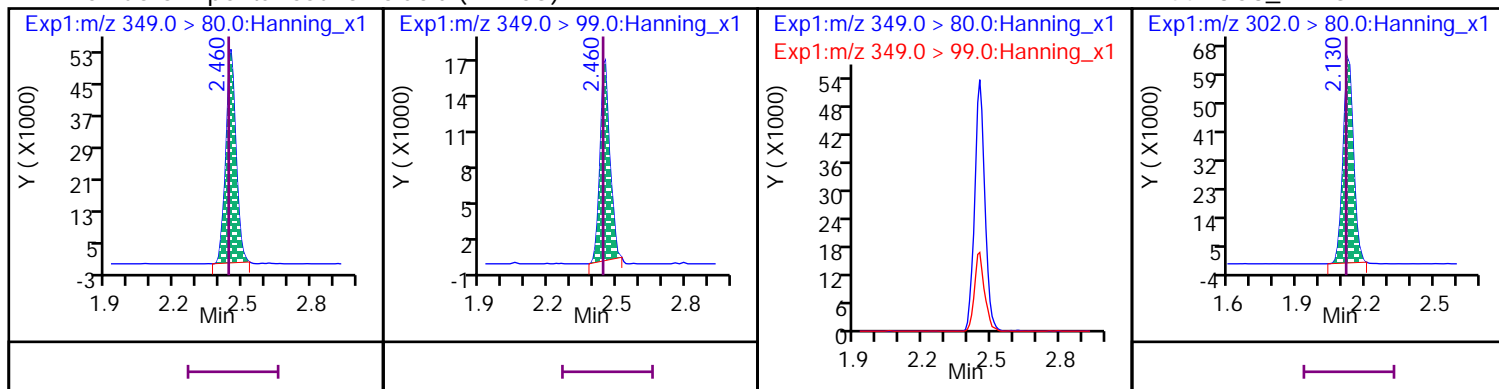
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



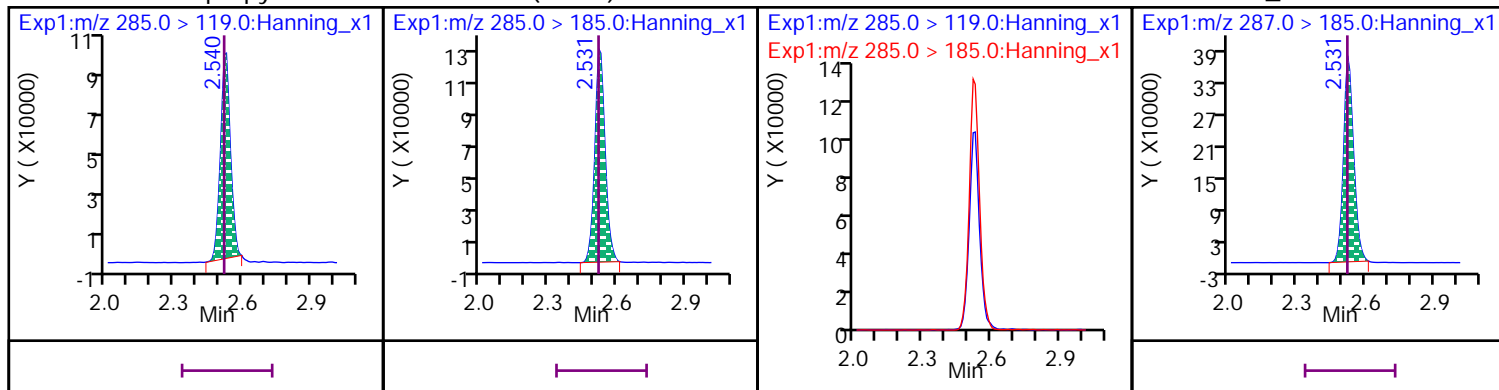
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



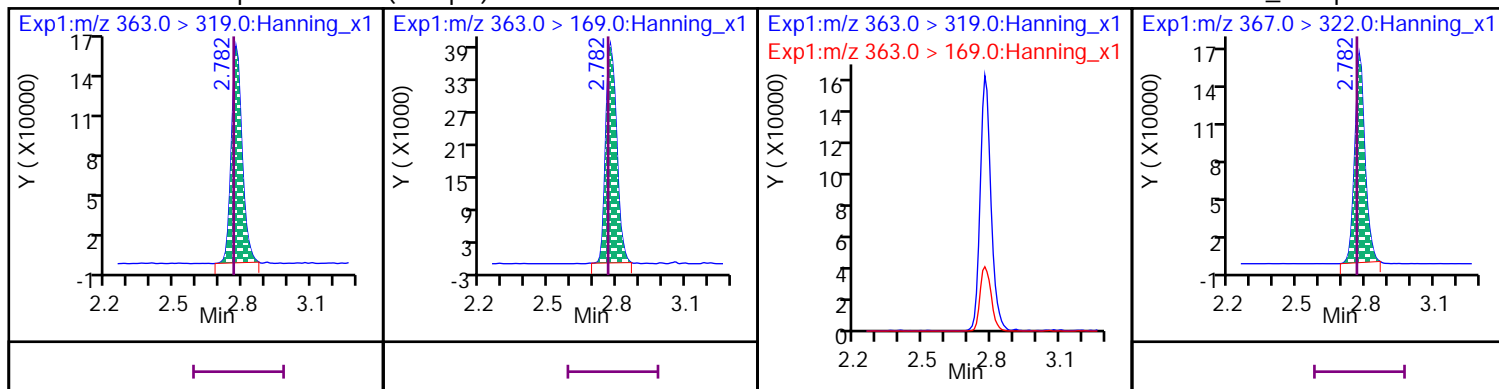
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



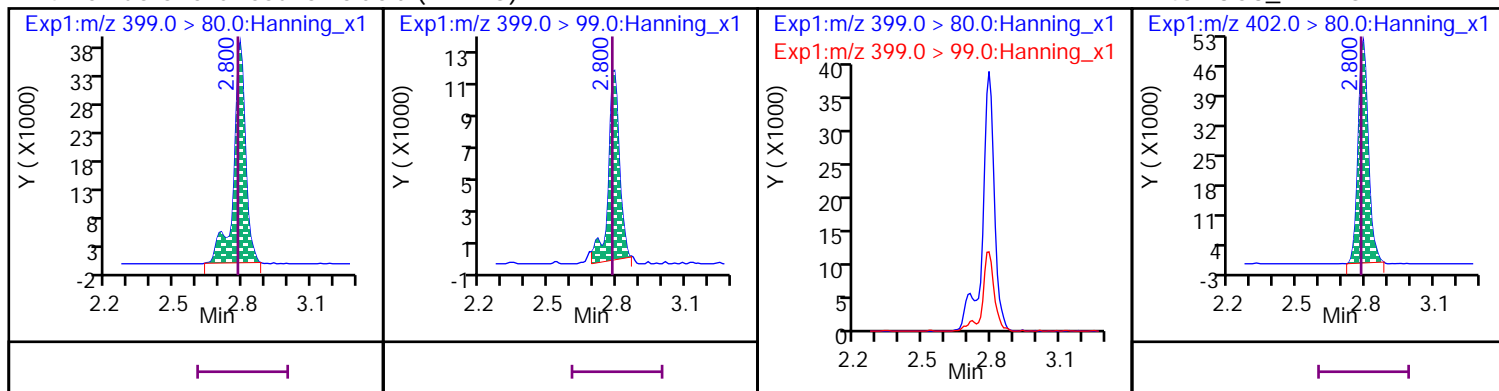
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



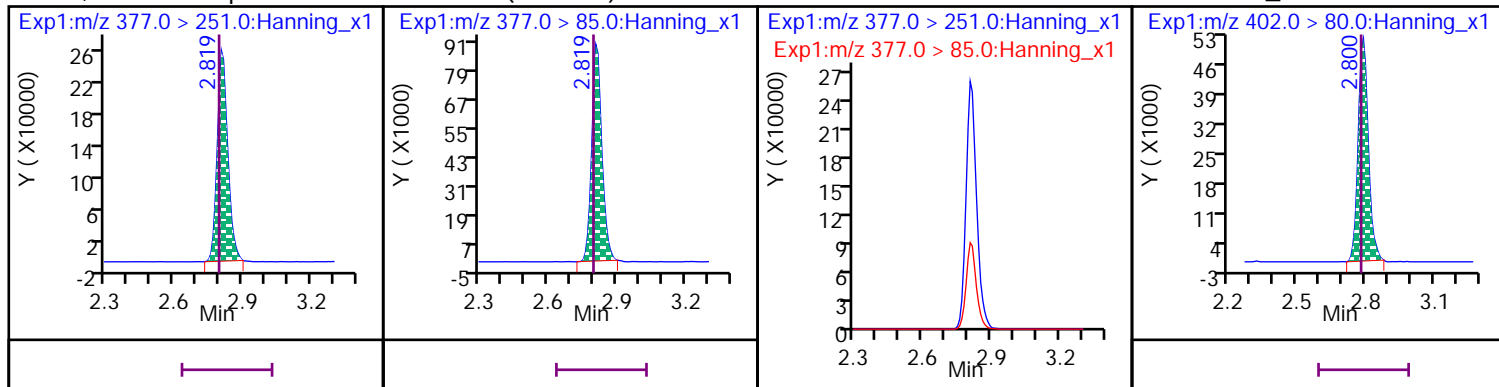
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



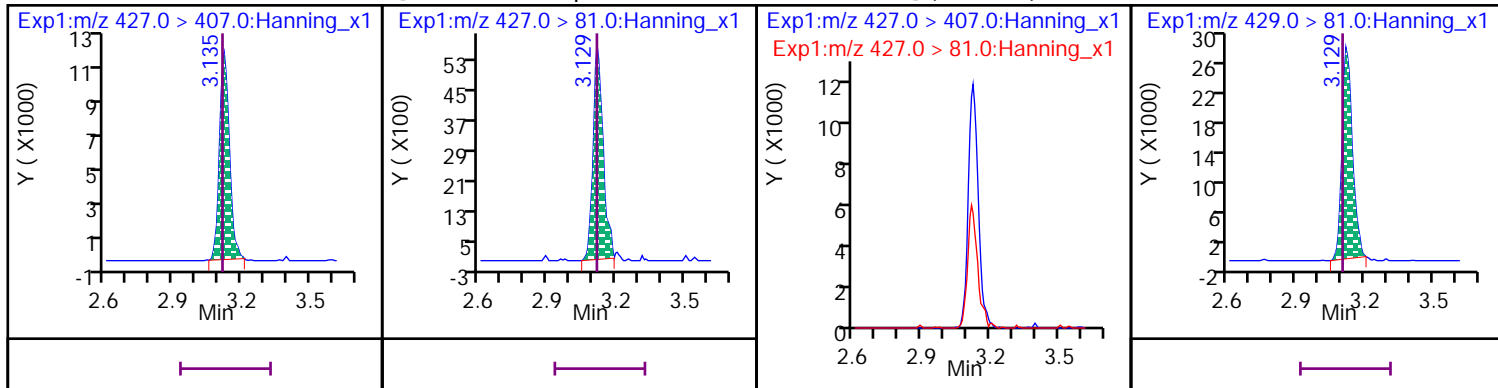
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



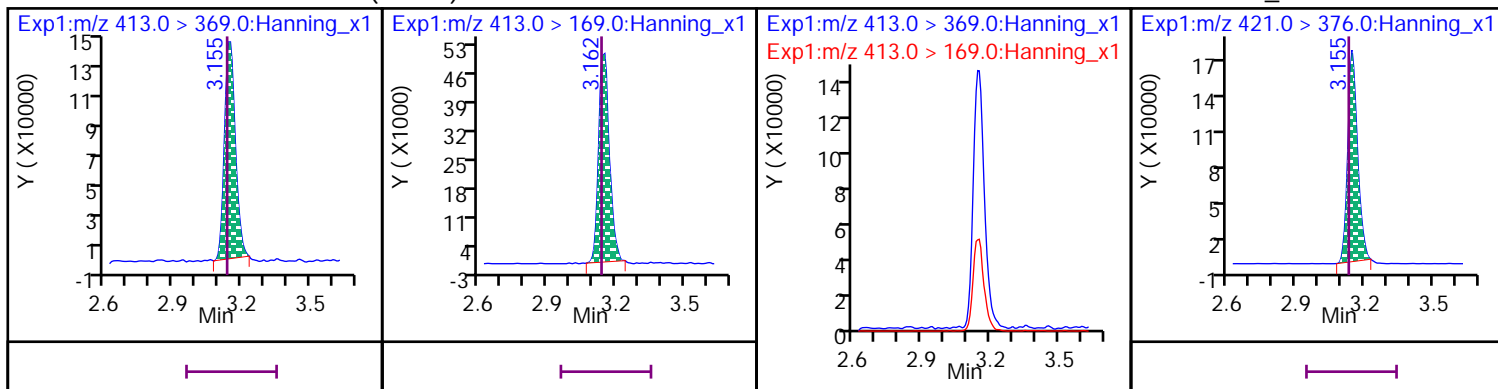
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



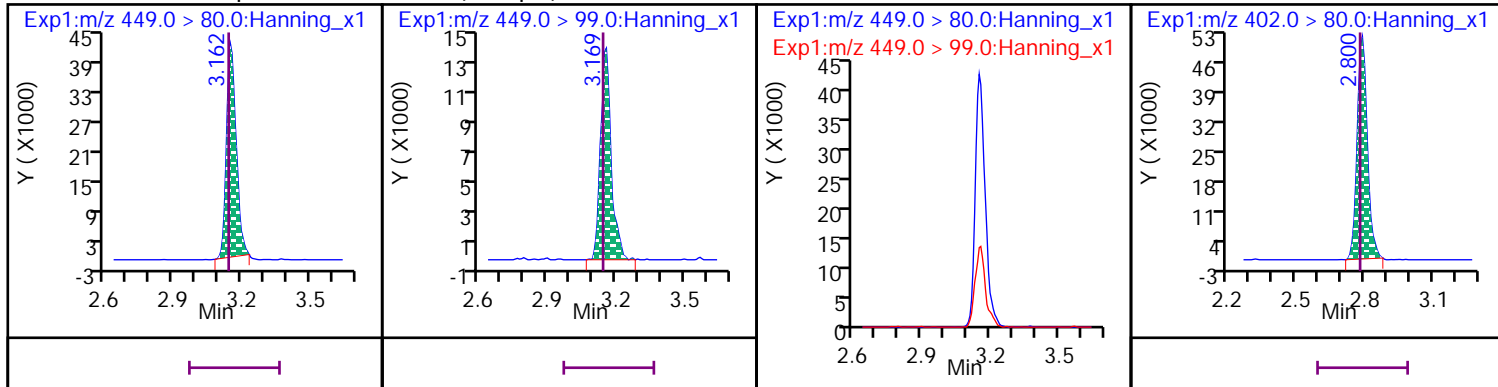
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



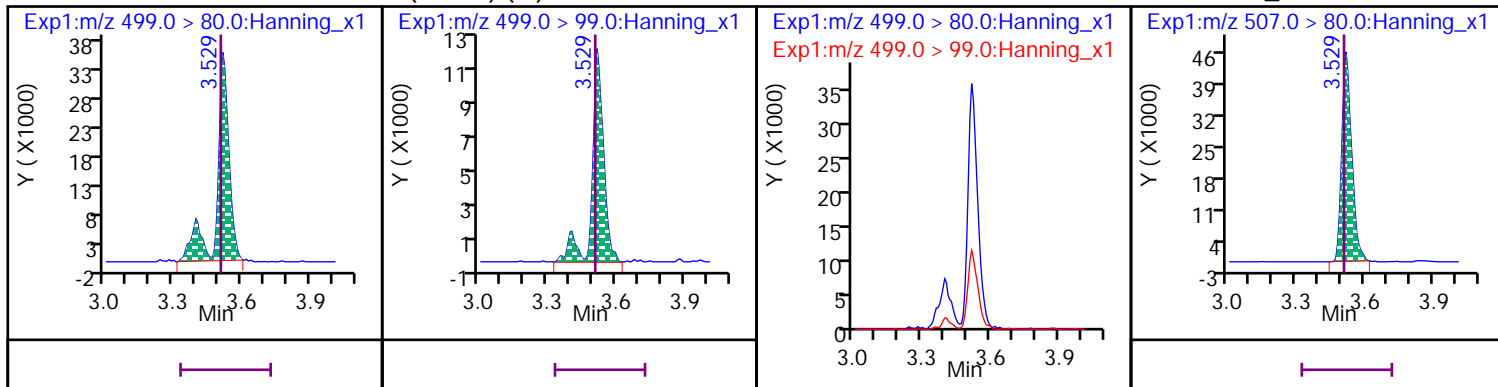
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS) (M)

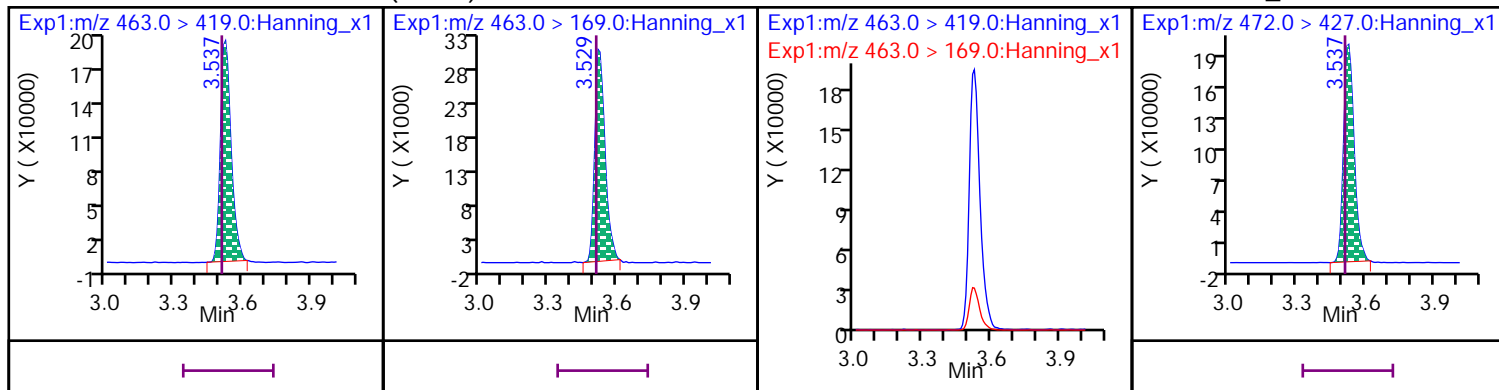
D 54 13C8\_PFOS





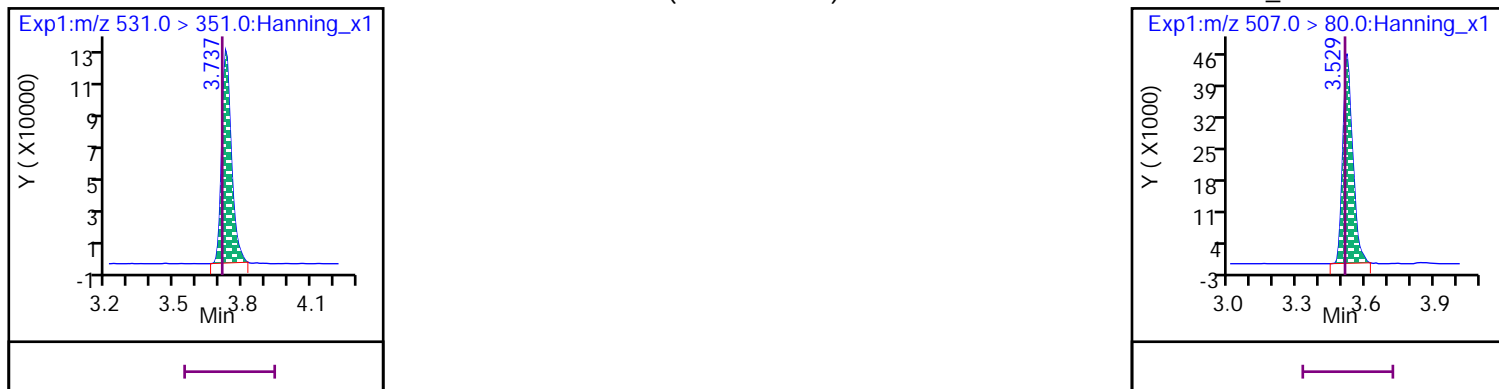
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



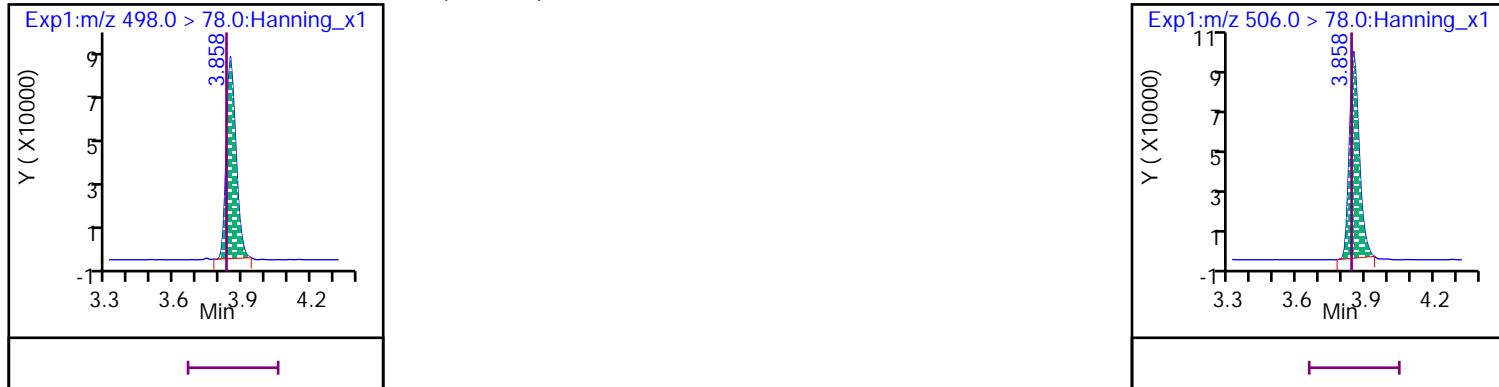
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



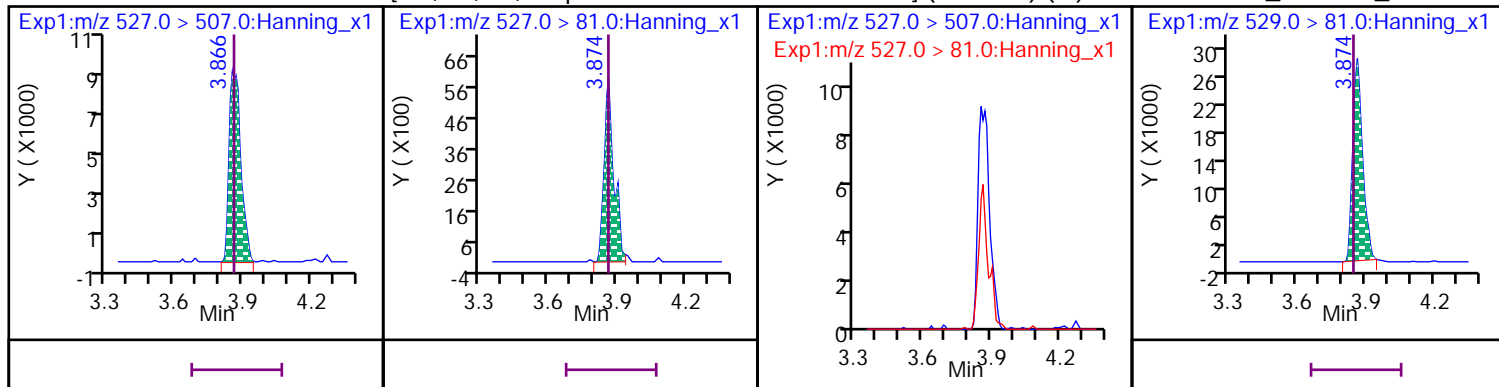
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



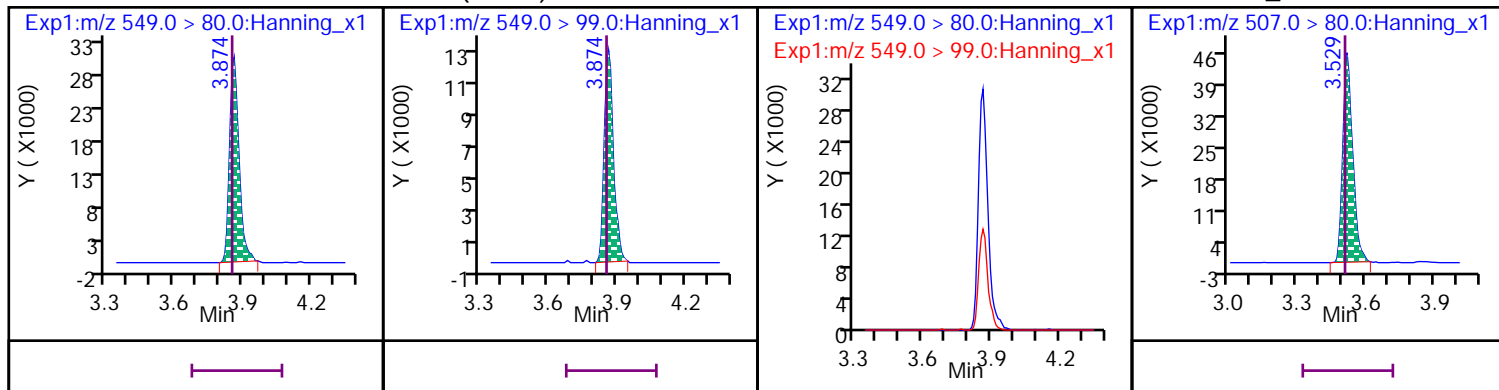
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



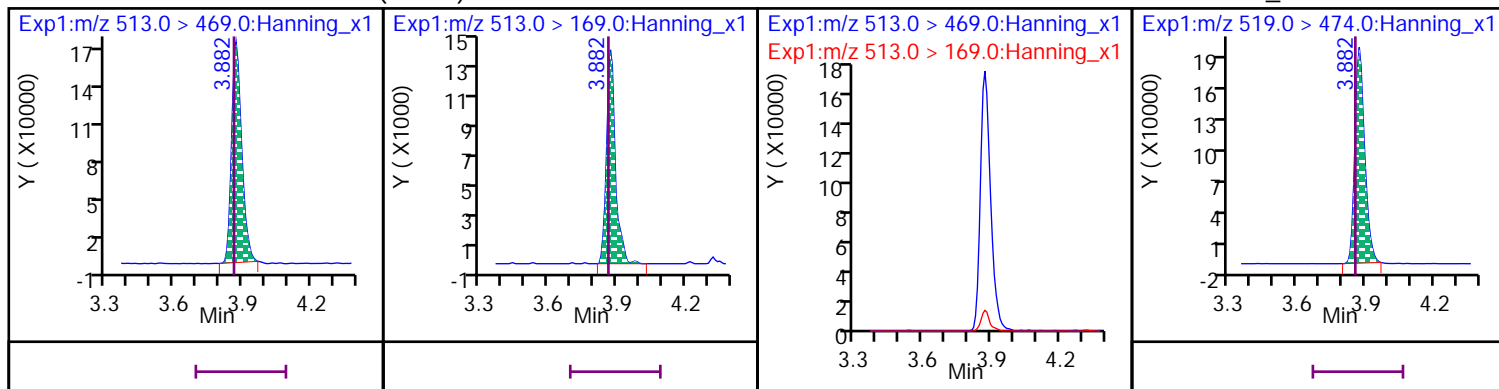
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



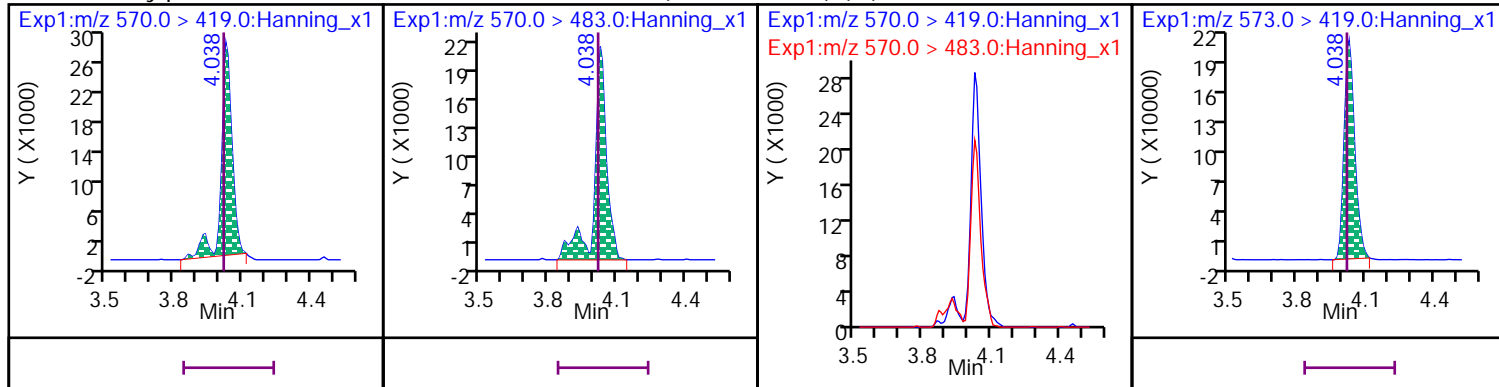
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



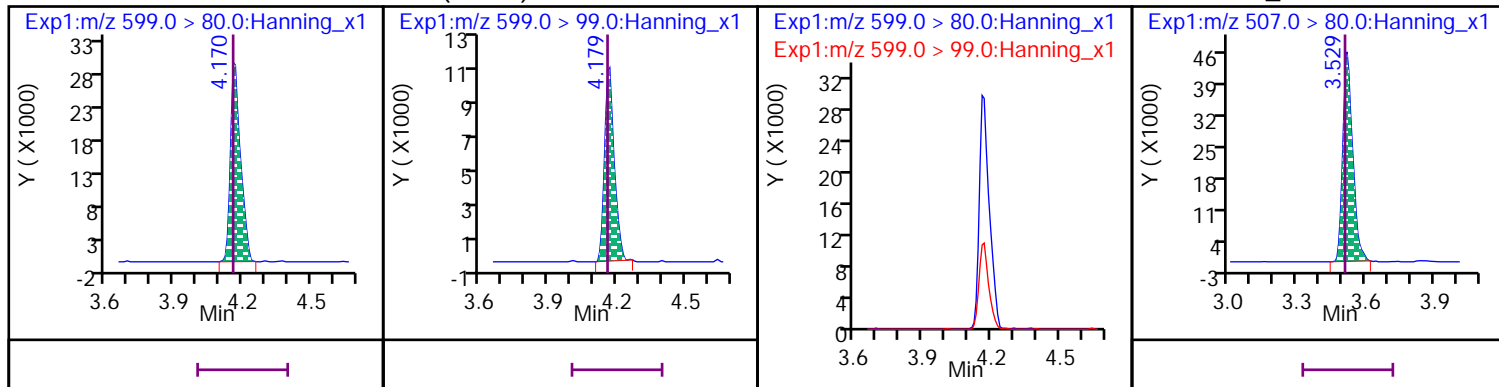
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



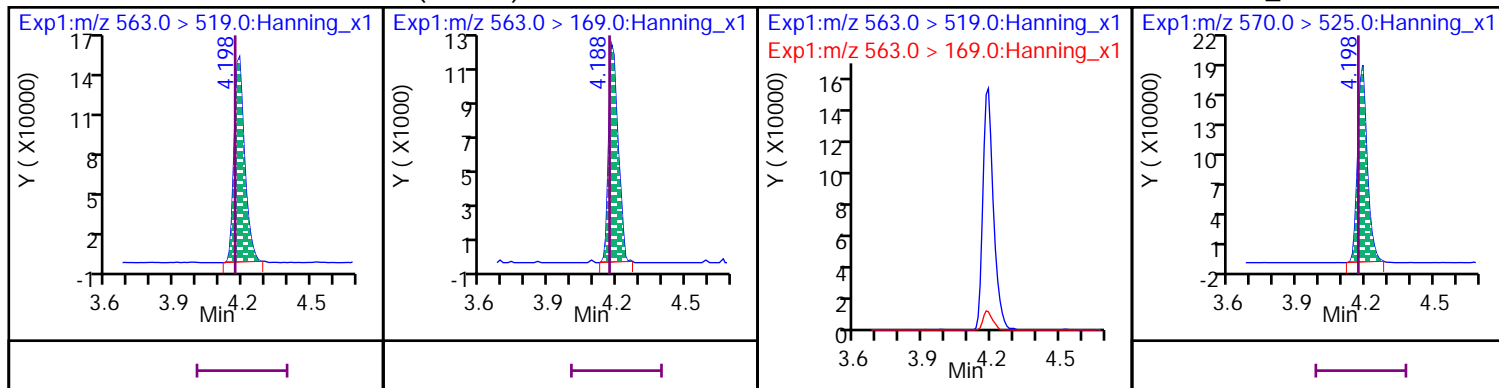
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



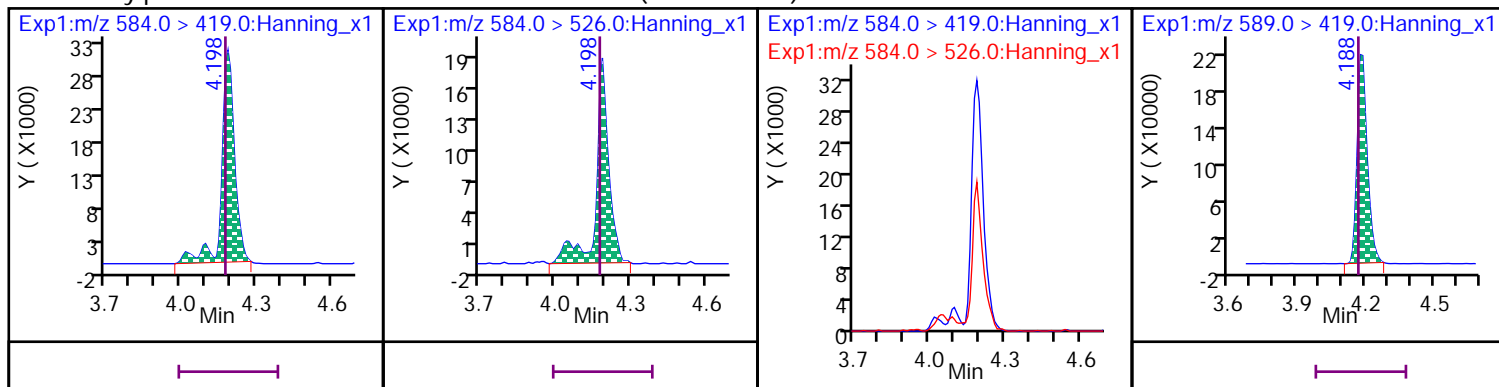
## 25 Perfluoro-n-undecanoic acid (PFUDa)

## D 52 13C7\_PFUdA



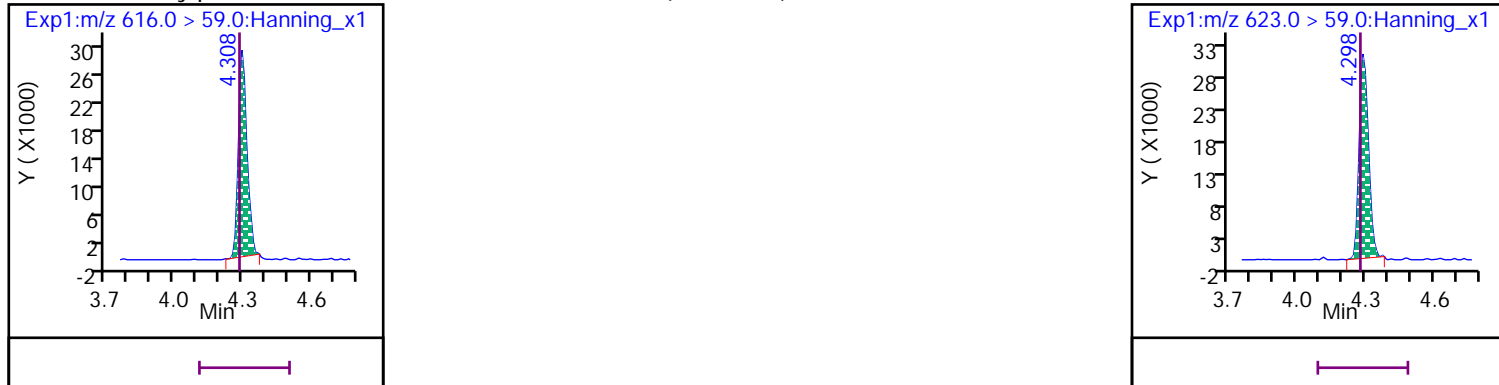
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

## D 60 d5-EtFOSAA



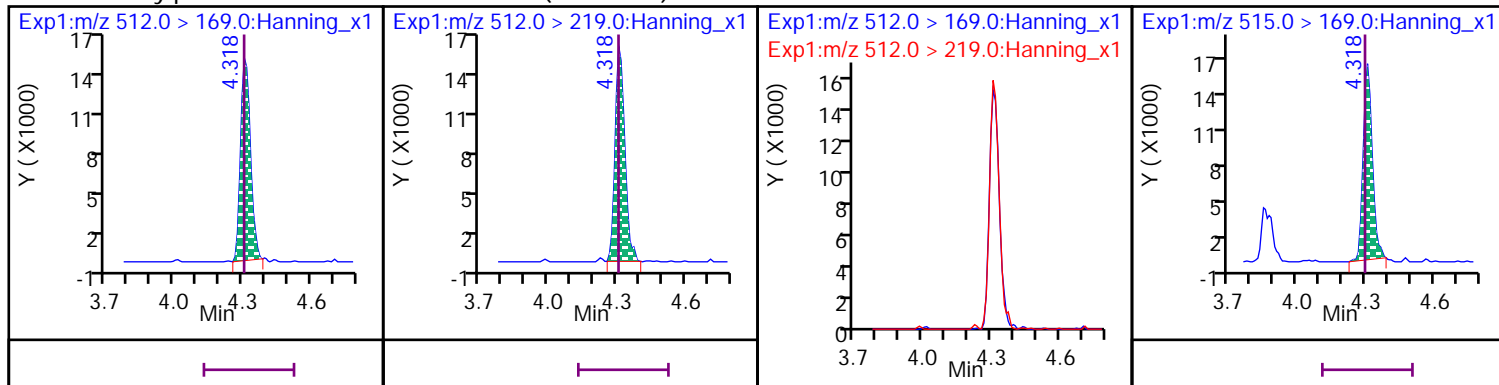
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

## D 61 d7-MeFOSE

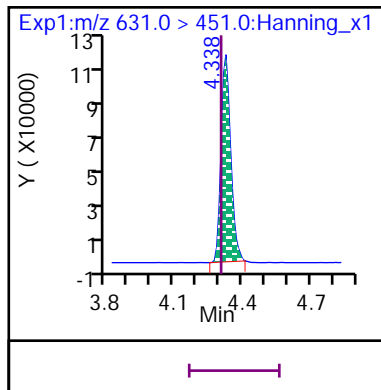


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

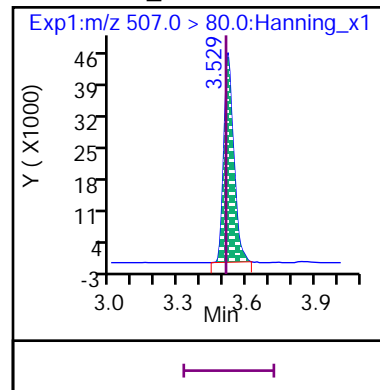
## D 57 d3-MeFOSA



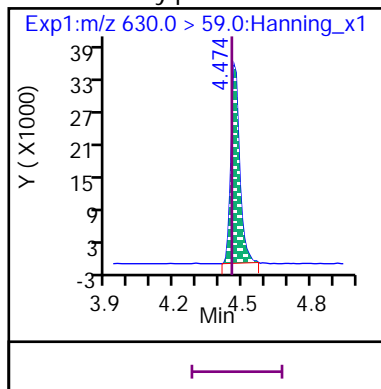
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



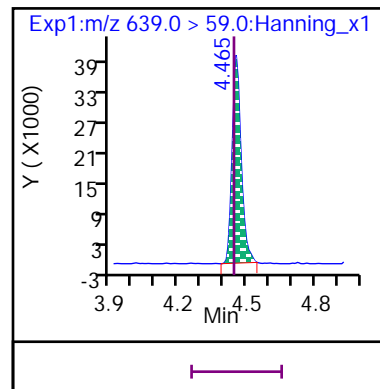
D 54 13C8\_PFOS



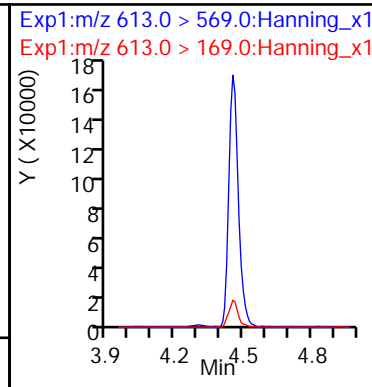
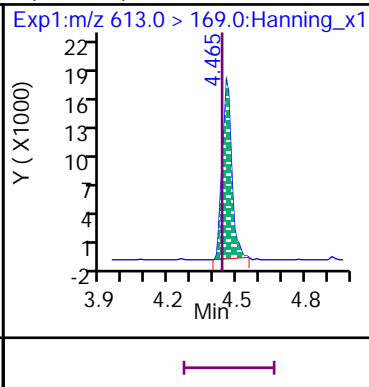
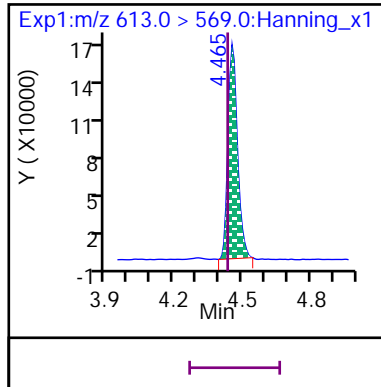
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



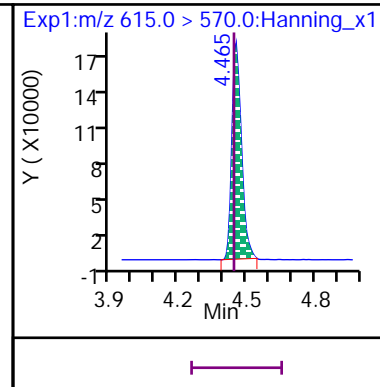
D 62 d9-EtFOSE



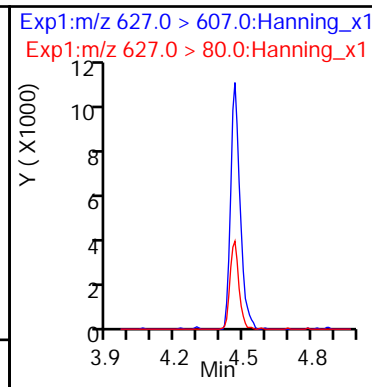
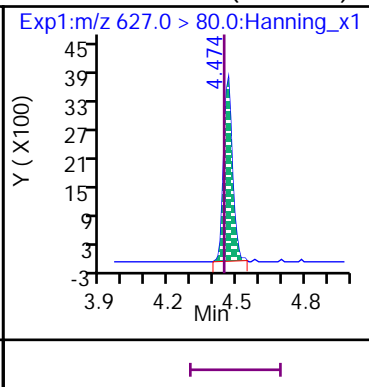
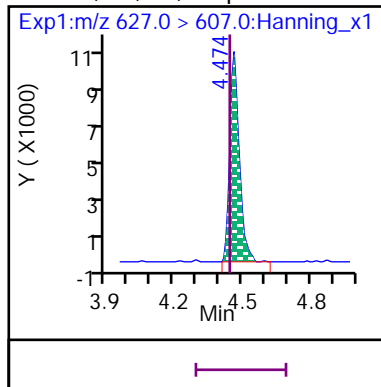
11 Perfluoro-n-dodecanoic acid (PFDoA)



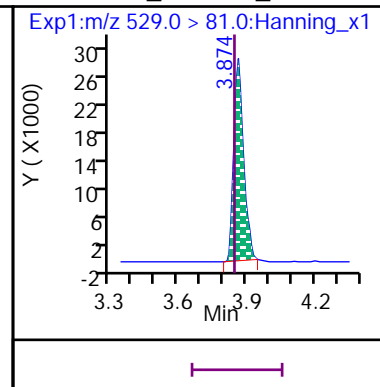
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

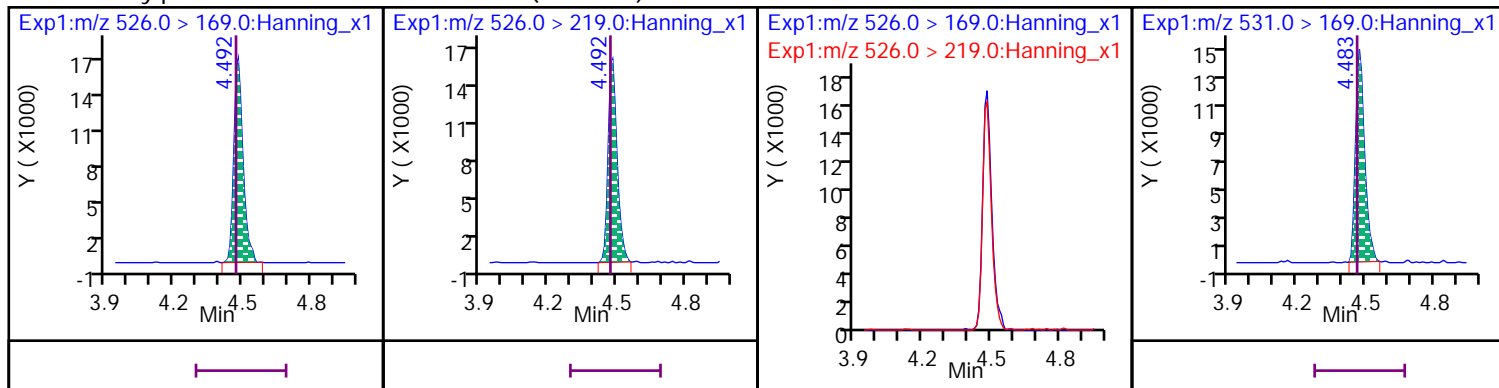


D 65 13C2\_8:2 FTS\_2



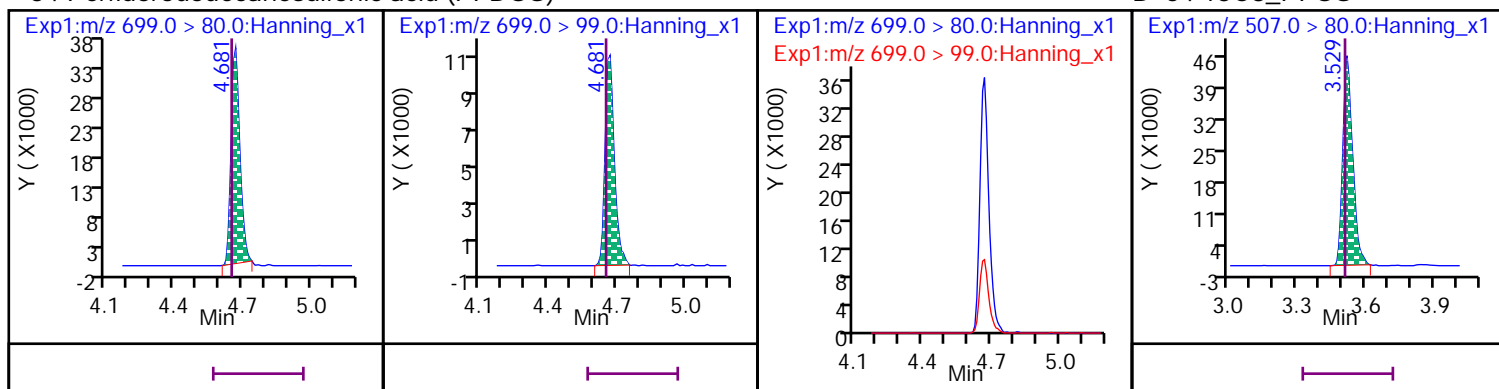
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



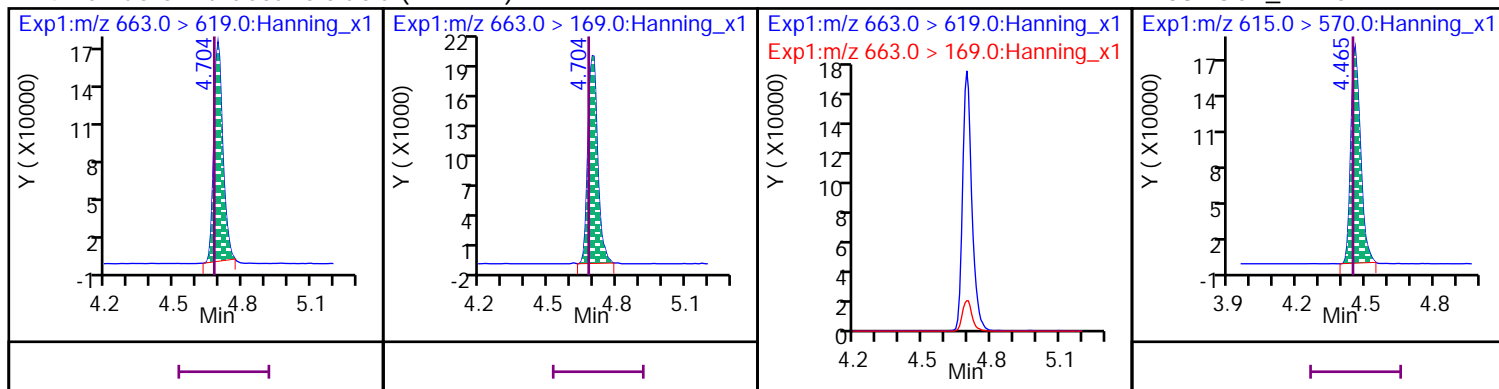
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



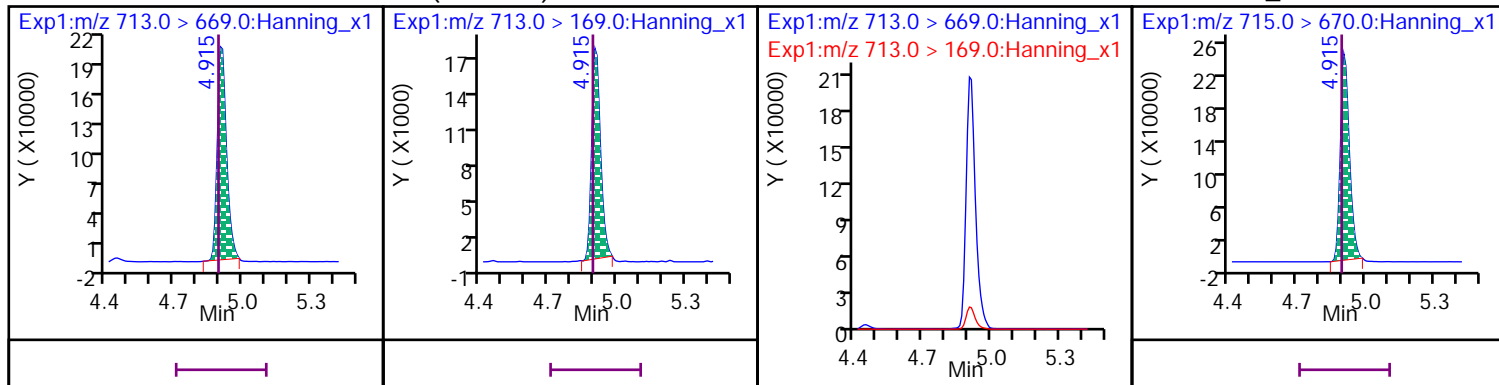
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



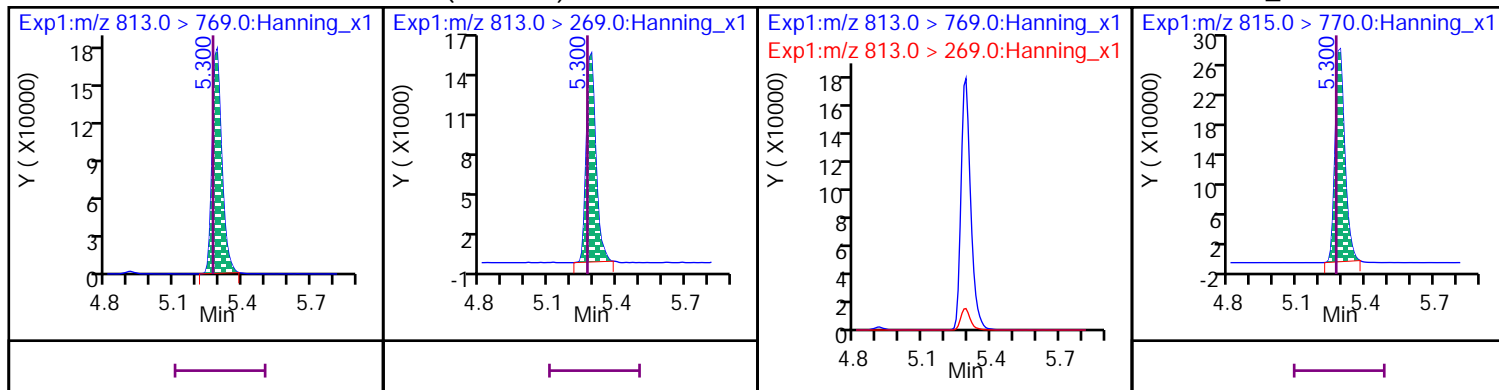
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



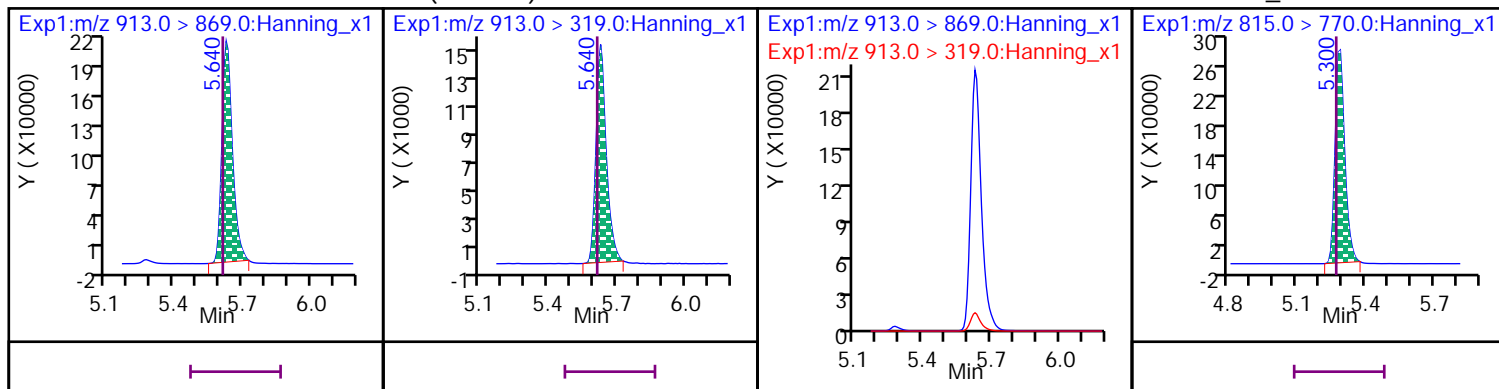
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

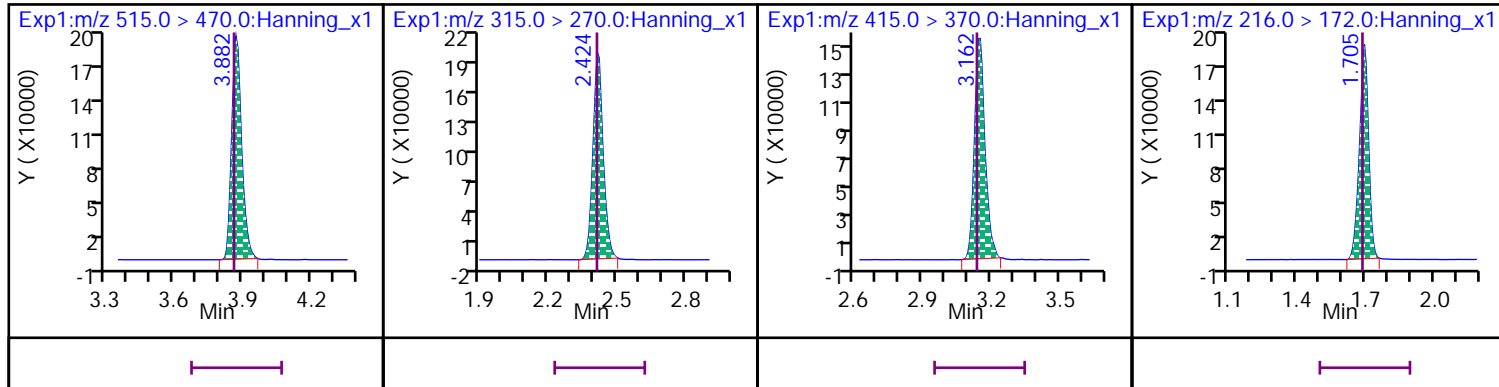


\* 37 13C2\_PFDA

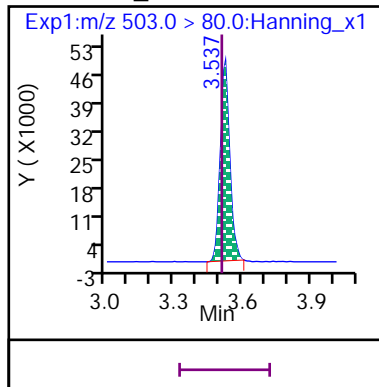
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

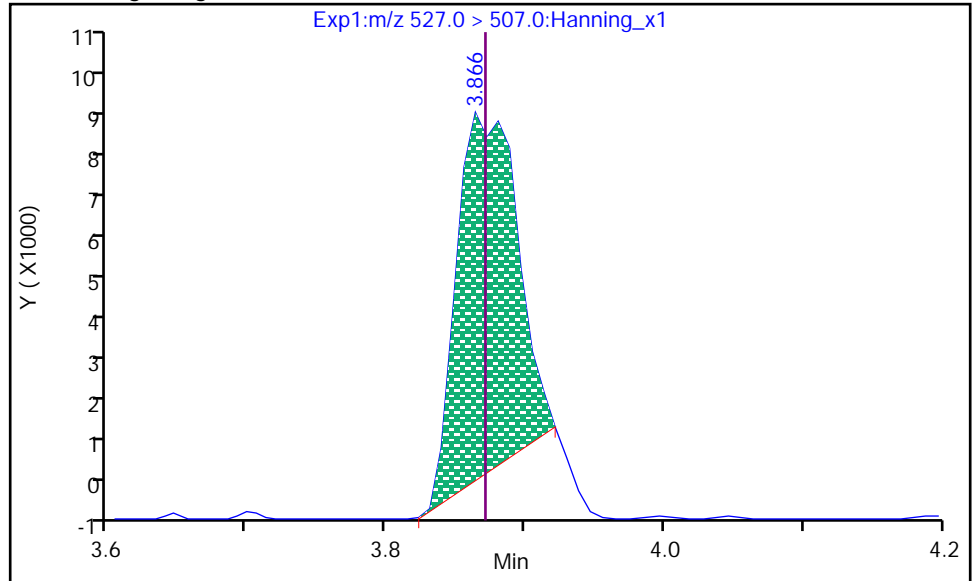
Dil. Factor: 1

Operator: Matthew M. Miller

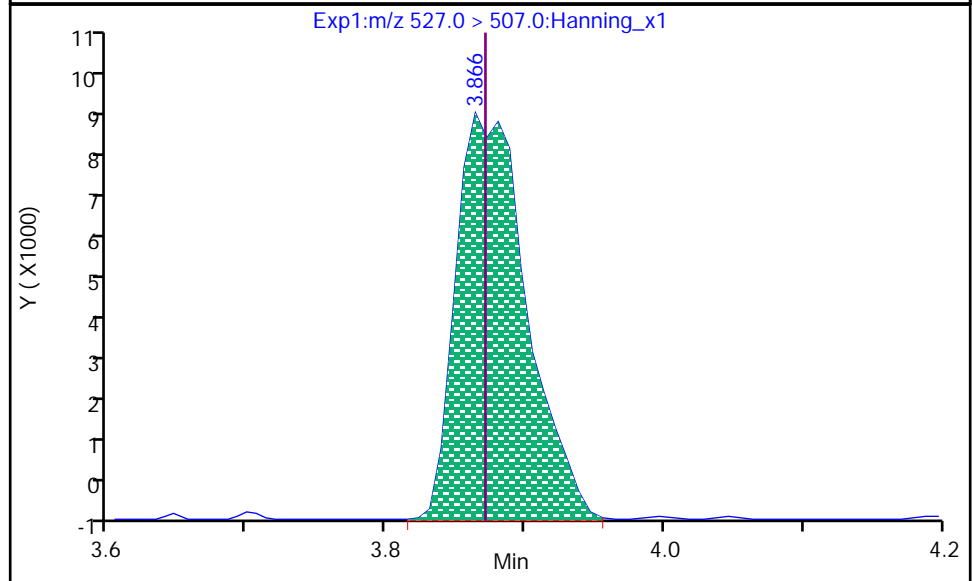
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.866  
Area: 24155  
Amount: 730.81  
Amount Units: ng/L



RT: 3.866  
Area: 31995  
Amount: 973.47  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:53

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

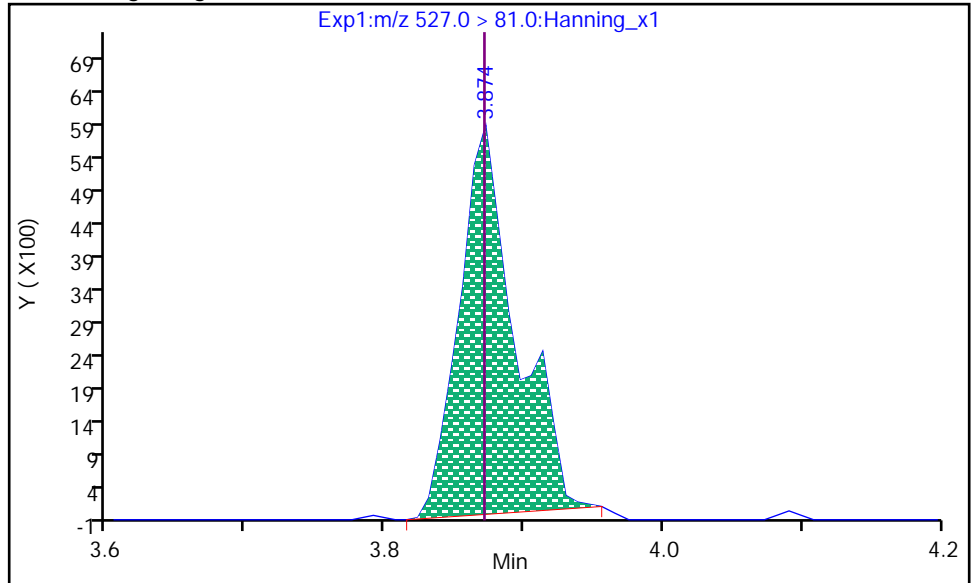
Dil. Factor: 1

Operator: Matthew M. Miller

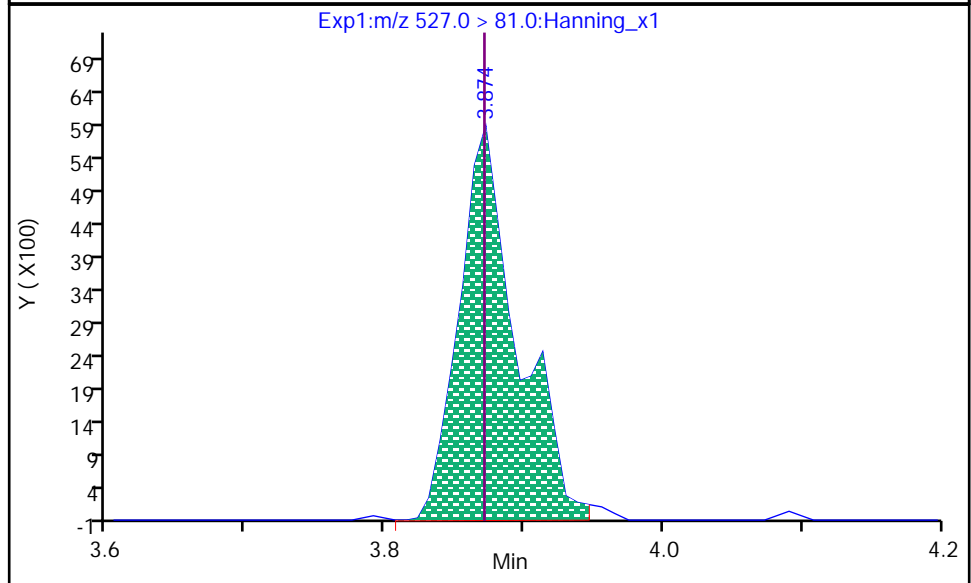
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.874  
Area: 16288  
Amount: 973.47  
Amount Units: ng/L



RT: 3.874  
Area: 17042  
Amount: 973.47  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:58

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

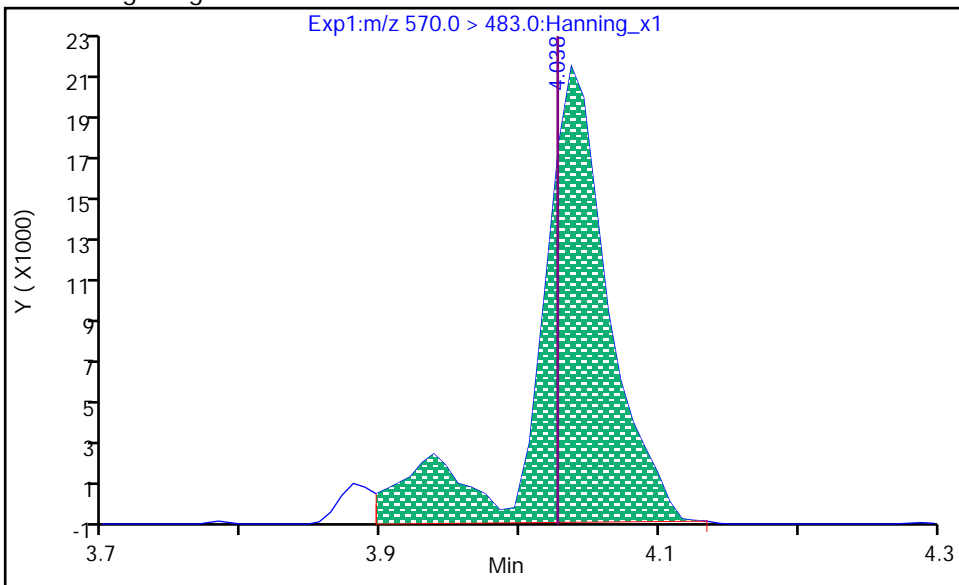
Dil. Factor: 1

Operator: Matthew M. Miller

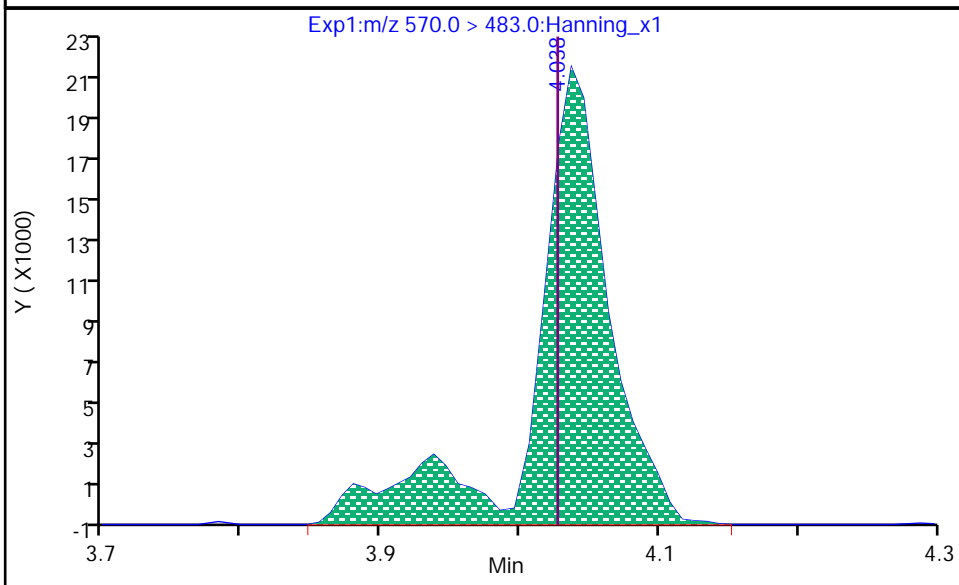
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.038  
Area: 73636  
Amount: 910.11  
Amount Units: ng/L



RT: 4.038  
Area: 77993  
Amount: 910.11  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:50:05

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

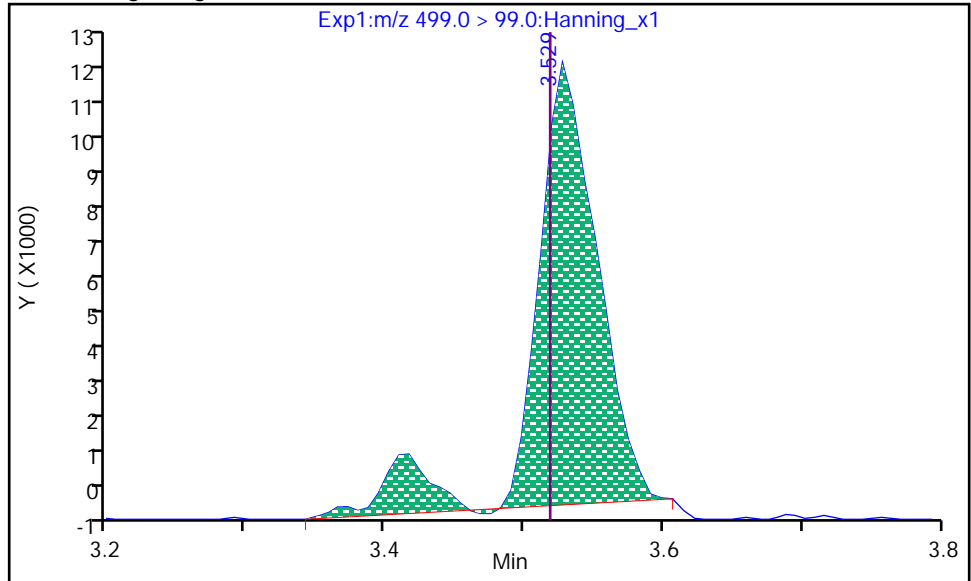
Dil. Factor: 1

Operator: Matthew M. Miller

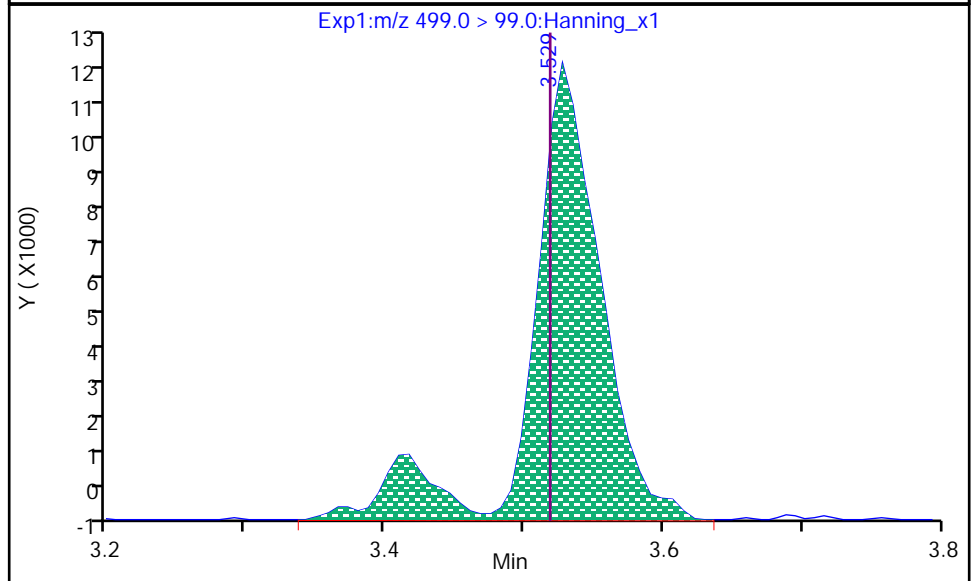
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.529  
Area: 35227  
Amount: 812.39  
Amount Units: ng/L



RT: 3.529  
Area: 39986  
Amount: 812.39  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:45

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d  
Injection Date: 28-Dec-2020 19:50:36 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 52  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	916.63	91.7	70 - 130
D 46 13C4_PFBFA	649747	605166			93.1	50 - 150
D 50 13C5_PFPeA	665996	617611			92.7	50 - 150
21 PFPeA			1000.00	924.32	92.4	70 - 130
7 PFBS			884.00	792.35	89.6	70 - 130
D 44 13C3_PFBFS	238207	221732			93.1	50 - 150
1 4:2 FTS			934.00	877.41	93.9	70 - 130
D 63 13C2_4:2 FTS_2	144067	123865			86	50 - 150
D 49 13C5_PFHxA	743582	670789			90.2	50 - 150
15 PFHxA			1000.00	929.09	92.9	70 - 130
22 PFPeS			938.00	900.38	96	70 - 130
28 GenX			2000.00	1738.13	86.9	70 - 130
D 66 13C3_GenX	1401050	1245450			88.9	50 - 150
D 47 13C4_PFHpA	633684	532901			84.1	50 - 150
13 PFHpA			1000.00	953.84	95.4	70 - 130
D 45 13C3_PFHxS	174146	171902			98.7	50 - 150
14 PFHxS			910.00	752.55	82.7	70 - 130
29 ADONA			942.00	797.11	84.6	70 - 130
D 64 13C2_6:2 FTS_2	104346	96090			92.1	50 - 150
2 6:2 FTS			948.00	929.97	98.1	70 - 130
20 PFOA			1000.00	907.82	90.8	70 - 130
D 53 13C8_PFOA	628007	559219			89	50 - 150
12 PFHpS			952.00	876.91	92.1	70 - 130
18 PFOS			928.00	894.88	96.4	70 - 130
17 PFNA			1000.00	922.79	92.3	70 - 130
D 56 13C9_PFNA	767623	707970			92.2	50 - 150
D 54 13C8_PFOS	152445	142321			93.4	50 - 150
30 9CI-PF3ONS			932.00	838.87	90	70 - 130
D 55 13C8_PFOSA	308857	285015			92.3	50 - 150
19 PFOSA			1000.00	965.59	96.6	70 - 130
16 PFNS			960.00	944.54	98.4	70 - 130
D 65 13C2_8:2 FTS_2	100453	83585			83.2	50 - 150
3 8:2 FTS			958.00	987.61	103	70 - 130
10 PFDA			1000.00	905.25	90.5	70 - 130
D 51 13C6_PFDA	672868	626358			93.1	50 - 150
D 58 d3-MeFOSAA	791564	692035			87.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1076.48	108	70 - 130
9 PFDS			964.00	912.75	94.7	70 - 130
5 N-EtFOSAA			1000.00	862.69	86.3	70 - 130
25 PFUdA			1000.00	891.31	89.1	70 - 130
D 60 d5-EtFOSAA	731651	699325			95.6	50 - 150
D 52 13C7_PFUdA	643525	578713			89.9	50 - 150
D 61 d7-MeFOSE	105402	99287			94.2	50 - 150
32 MeFOSE			1000.00	878.36	87.8	70 - 130
26 MeFOSA			1000.00	916.27	91.6	70 - 130
D 57 d3-MeFOSA	51840	50971			98.3	50 - 150
31 11Cl-PF3OUDS			942.00	843.76	89.6	70 - 130
D 62 d9-EtFOSE	137116	109140			79.6	50 - 150
33 EtFOSE			1000.00	960.99	96.1	70 - 130
D 59 d5-EtFOSA	50284	43259			86	50 - 150
D 38 13C2_PFDoA	611364	556160			91	50 - 150
4 10:2 FTS			964.00	876.96	91	70 - 130
27 EtFOSA			1000.00	935.08	93.5	70 - 130
11 PFDoA			1000.00	921.03	92.1	70 - 130
34 PFDOS			968.00	859.59	88.8	70 - 130
24 PFTrDA			1000.00	955.42	95.5	70 - 130
23 PFTeDA			1000.00	965.36	96.5	70 - 130
D 42 13C2_PFTeDA	813074	703343			86.5	50 - 150
35 PFHxDA			1000.00	1005.23	101	70 - 130
D 40 13C2_PFHxDA	935525	836498			89.4	50 - 150
36 PFODA			1000.00	966.37	96.6	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d  
Injection Date: 28-Dec-2020 19:50:36 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 52  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.704	1.696	1	605166	23	>100:1			1000.00	872.56	93.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.696	1/0	552493	22	>100:1			1000.00	916.63		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.072	1	617611	17	>100:1			1000.00	897.84	92.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.072	1/0	573961	17	>100:1			1000.00	924.32		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.125	1	221732	16	>100:1			1000.00	963.09	93.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.140	2.125	1/0	207145	17	>100:1	Target = 3.50		884.00	792.35		
298.9 > 99	44	2.140	2.125		58013	17	>100:1	3.57 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.450	1/0	173181	20	>100:1	Target = 3.10		938.00	900.38		
349 > 99	44	2.459	2.450		56027	19	>100:1	3.09 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.379	1	123865	20	>100:1			5000.00	5116.63	86	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/0	43379	38		Target = 1.80		934.00	877.41		
327 > 81	63	2.388	2.388		19972	19	90:1	2.17 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	670789	19	>100:1			1000.00	910.07	90.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	615294	19	>100:1	Target = 18.34		1000.00	929.09		
313 > 119	49	2.423	2.423		30997	18	>100:1	19.85 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	1	1245450	21	>100:1			5000.00	4675.92	88.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	1/0	311058	20	>100:1	Target = 0.81		2000.00	1738.13		
285 > 185	66	2.530	2.530		408753	19	>100:1	0.76 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.772	1	532901	19	>100:1			1000.00	878.44	84.1	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.772	1/0	527241	20	>100:1	Target = 3.70		1000.00	953.84		
363 > 169	47	2.781	2.772		141032	21	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.790	1	171902	25	>100:1			1000.00	1003.93	98.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.790	1/0	137163	29	>100:1	Target = 3.21	0.15	910.00	752.55		
399 > 99	45	2.808	2.790		46659	29	>100:1	2.93 (1.60-4.81)	0.09				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.808	1/0	869946	19	>100:1	Target = 2.97		942.00	797.11		
377 > 85	45	2.818	2.808		300675	20	>100:1	2.89 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.154	1/0	136939	25	>100:1	Target = 3.08		952.00	876.91		
449 > 99	45	3.161	3.154		44126	25	>100:1	3.10 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.128	3.114	1	96090	25	>100:1			5000.00	4989.51	92.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.128	1/0	37064	30		Target = 1.80		948.00	929.97		
427 > 81	64	3.141	3.128		20020	28	>100:1	1.85 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.154	3.141	1	559219	25	>100:1			1000.00	944.84	89	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.148	1/0	517546	25	>100:1	Target = 2.87		1000.00	907.82		
413 > 169	53	3.161	3.148		182564	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.535	3.520	1	142321	22	>100:1			1000.00	949.26	93.4	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.535	3.520	1/0	150920	41	>100:1	Target = 3.84	0.26	928.00	894.88		
499 > 99	54	3.535	3.520		39618	34	>100:1	3.80 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.743	3.722	2/1	401921	23	>100:1			932.00	838.87		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.881	3.865	1/0	102873	21	>100:1	Target = 3.07		960.00	944.54		
549 > 99	54	3.881	3.865		36740	21	>100:1	2.80 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.178	4.169	1/0	94275	18	>100:1	Target = 3.03		964.00	912.75		
599 > 99	54	4.178	4.169		34663	18	>100:1	2.71 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.337	4.317	2/1	341034	16	>100:1			942.00	843.76		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.680	4.663	1/0	98216	18		Target = 3.33		968.00	859.59		
699 > 99	54	4.680	4.663		30730	21	>100:1	3.19 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.535	3.520	1	707970	22	>100:1			1000.00	942.75	92.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.543	3.520	2/1	653325	20	>100:1	Target = 6.16		1000.00	922.79		
463 > 169	56	3.535	3.520		98941	22	>100:1	6.60 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.849	1	285015	20	>100:1			1000.00	920.70	92.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.841	2/1	271203	21	>100:1			1000.00	965.59		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.881	3.857	2	83585	19				5000.00	4505.90	83.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.881	3.873	1/-1	33188	23	>100:1	Target = 1.95		958.00	987.61		
527 > 81	65	3.873	3.873		15710	19	>100:1	2.11 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.473	4.455	2/0	33878	21	>100:1	Target = 3.14		964.00	876.96		
627 > 80	65	4.473	4.455		10825	21	59:1	3.12 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.890	3.865	2	626358	21	>100:1			1000.00	944.26	93.1	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.890	3.873	1/-1	557141	19	>100:1	Target = 15.94		1000.00	905.25		
513 > 169	51	3.890	3.873		42581	27		13.08 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.037	4.029	1	692035	18	>100:1			5000.00	4821.22	87.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.046	4.029	2/1	114449	35	>100:1	Target = 1.33	0.12	1000.00	1076.48		
570 > 483	58	4.046	4.029		76338	35	>100:1	1.49 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.197	4.178	2	699325	18	>100:1			5000.00	5265.42	95.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.206	4.187	2/0	120127	34	>100:1	Target = 1.58	0.08	1000.00	862.69		M
584 > 526	60	4.206	4.187		71724	34	82:1	1.67 (0.79-2.37)					M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.197	4.178	2	578713	18	>100:1			1000.00	915.58	89.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.197	4.178	2/0	484800	18	>100:1	Target = 15.50		1000.00	891.31		
563 > 169	52	4.197	4.178		38789	18	>100:1	12.49 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.287	1	99287	16	>100:1			1000.00	917.56	94.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.297	1/0	81942	15	>100:1			1000.00	878.36		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.307	1	50971	15	93:1			1000.00	963.23	98.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	1/0	52691	17	>100:1	Target = 1.12		1000.00	916.27		
512 > 219	57	4.317	4.317		48269	15	>100:1	1.09 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.455	1	109140	17	>100:1			1000.00	870.37	79.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.464	2/1	93312	16	>100:1			1000.00	960.99		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.464	4.455	1	556160	18	>100:1			1000.00	918.79	91	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.446	2/1	518729	18	>100:1	Target = 10.85		1000.00	921.03		
613 > 169	38	4.473	4.446		53017	20	>100:1	9.78 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.703	4.688	1/0	523361	21	>100:1	Target = 8.37		1000.00	955.42		
663 > 169	38	4.703	4.688		60162	18	>100:1	8.69 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.473	1	43259	15	>100:1			1000.00	881.14	86	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.482	1/0	44193	15		Target = 1.03		1000.00	935.08		
526 > 219	59	4.491	4.482		45514	15	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.923	4.906	2	703343	18	>100:1			1000.00	834.89	86.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.923	4.906	2/0	588299	18	>100:1	Target = 12.11		1000.00	965.36		
713 > 169	42	4.923	4.906		50525	19	>100:1	11.64 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.299	5.282	2	836498	18	>100:1			1000.00	923.12	89.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.299	5.282	2/0	549418	20	>100:1	Target = 11.48		1000.00	1005.23		
813 > 269	40	5.299	5.282		47501	20	>100:1	11.56 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.646	5.625	2/0	715584	24	99:1	Target = 13.88		1000.00	966.37		
913 > 319	40	5.646	5.625		51219	24	>100:1	13.97 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.890	3.873	1	625153	20	>100:1					85.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	623552	19	>100:1					85.3	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.154	3.148	1	550811	25	>100:1					91.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.704	1.696	1	543582	24	>100:1					89.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.535	3.520	1	150191	21	>100:1					92.1	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

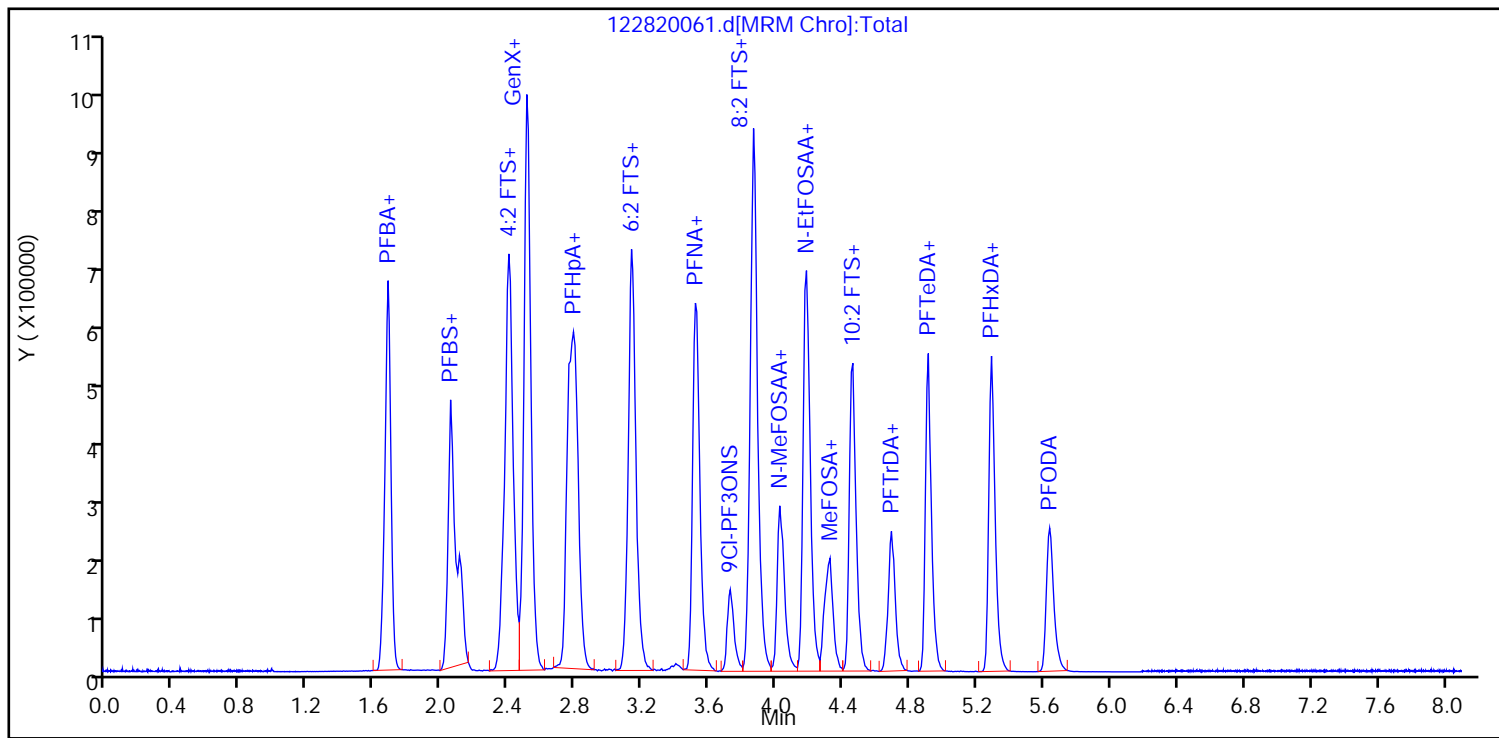
Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

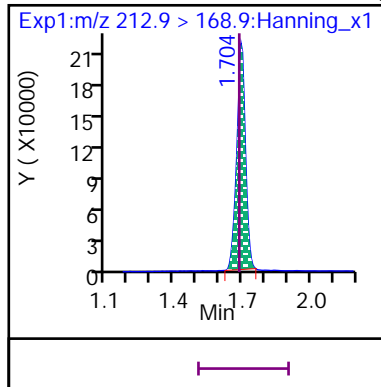
Sample Info: ID CCV 1000D\_SVLC-1248

Dil. Factor: 1

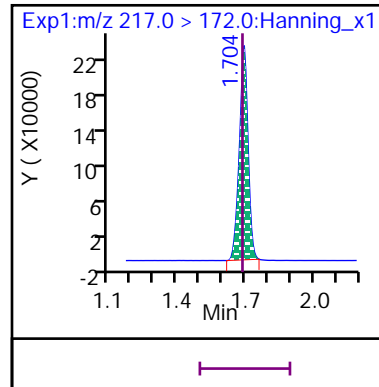
Operator: Matthew M. Miller



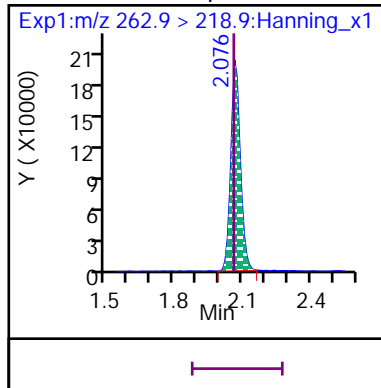
8 Perfluoro-n-butanoic acid (PFBA)



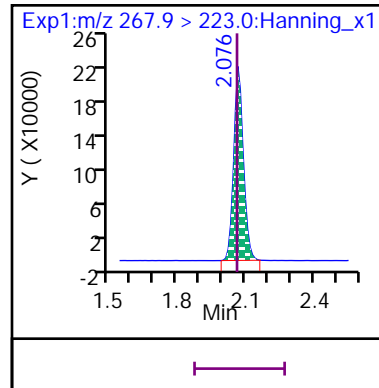
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

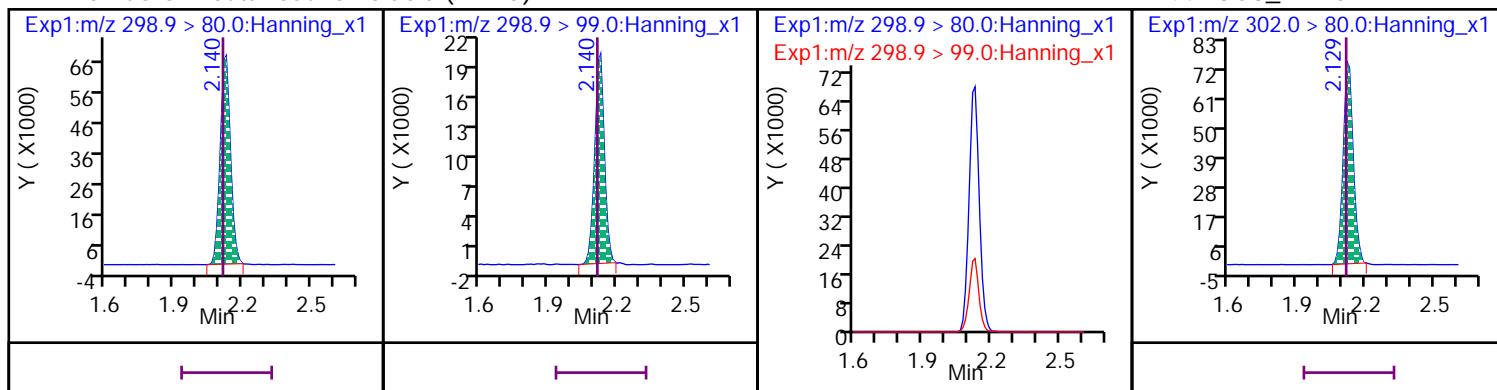


D 50 13C5\_PFPeA



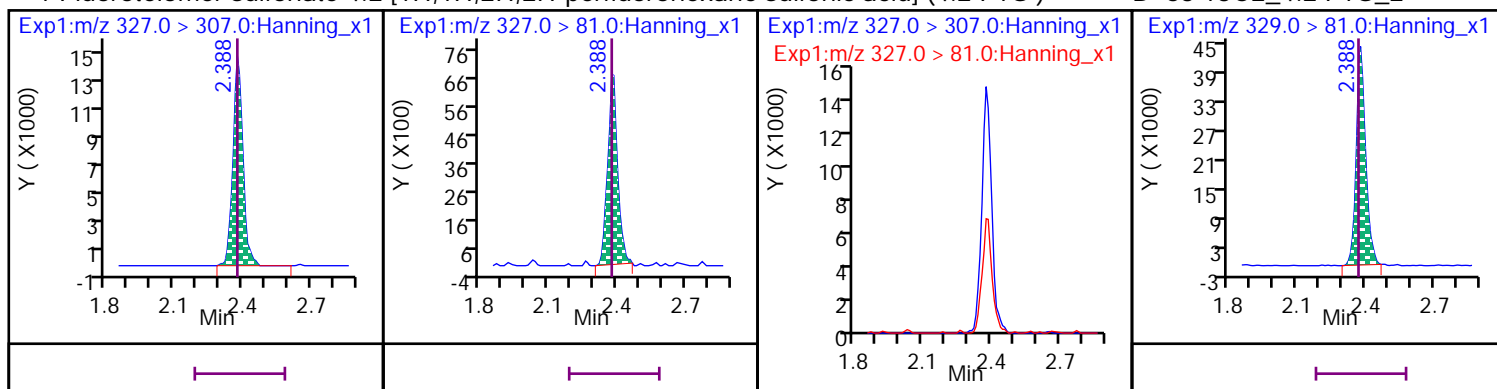
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



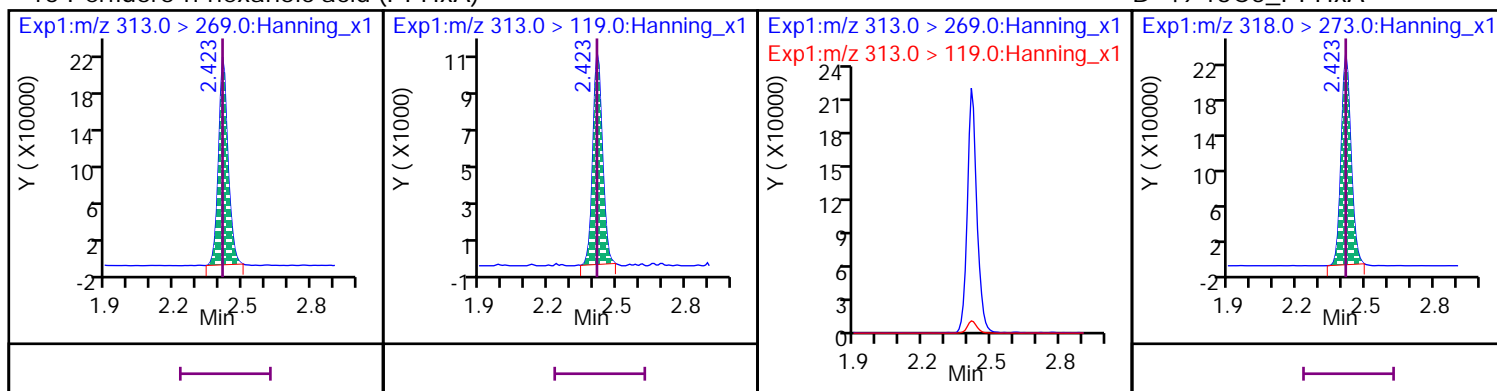
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



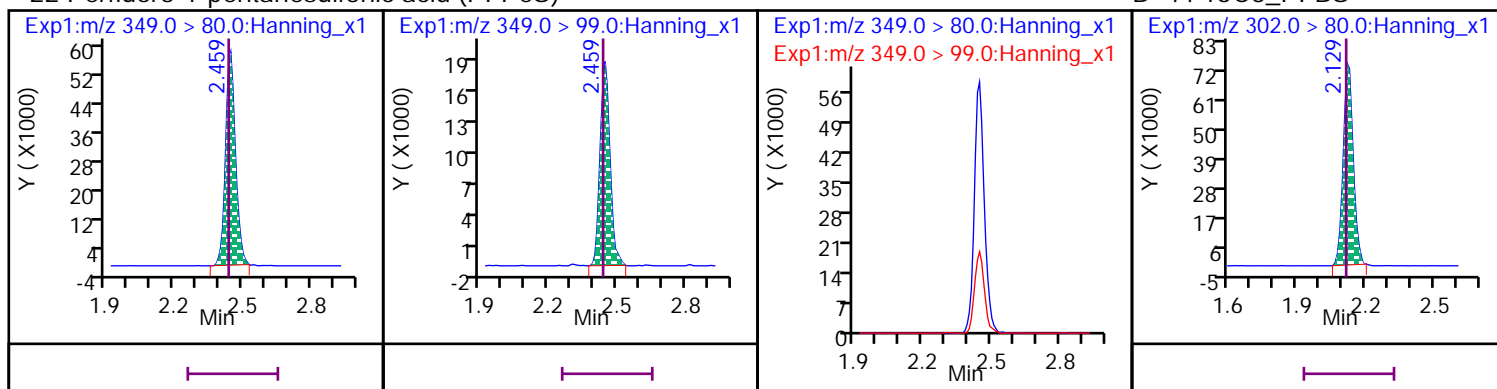
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



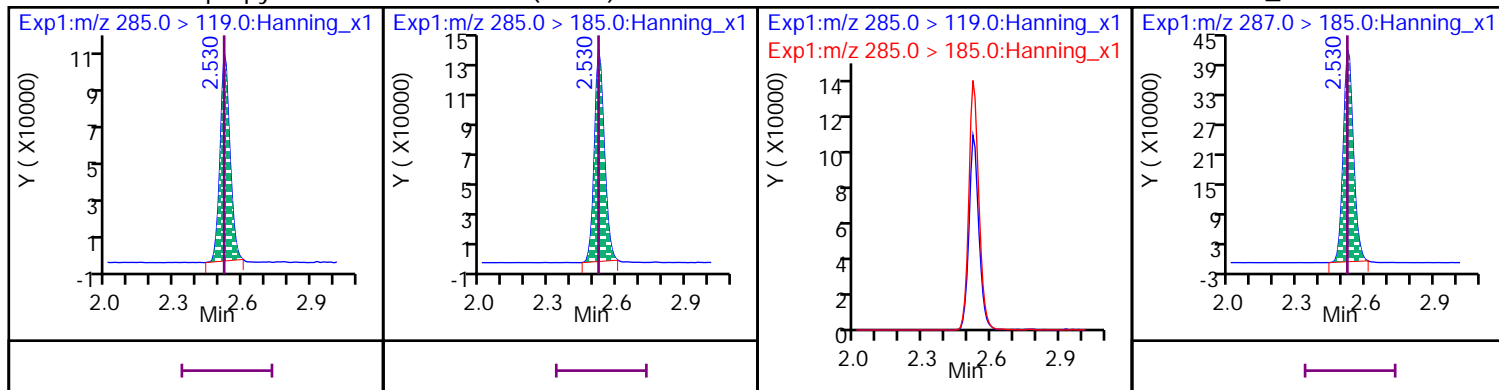
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



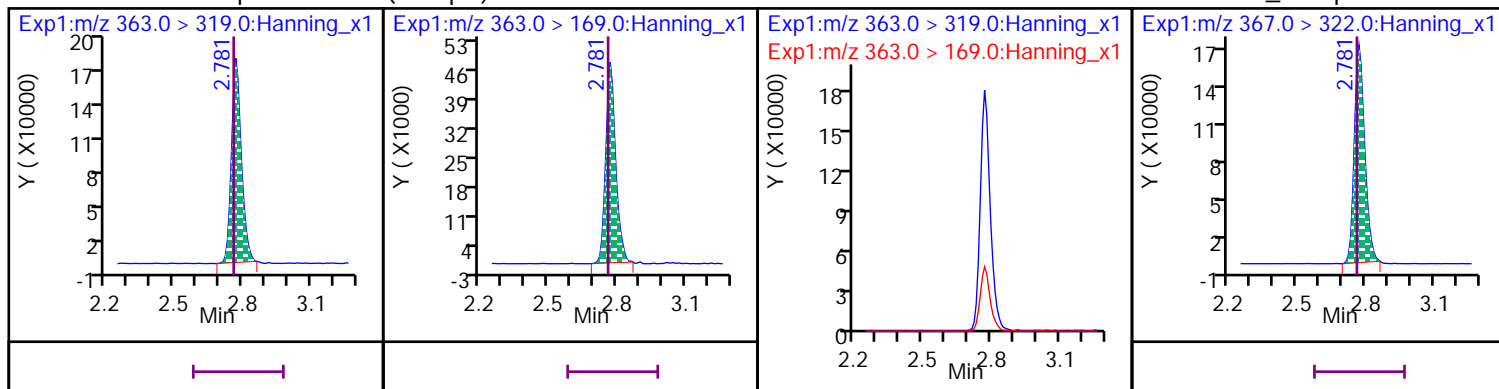
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



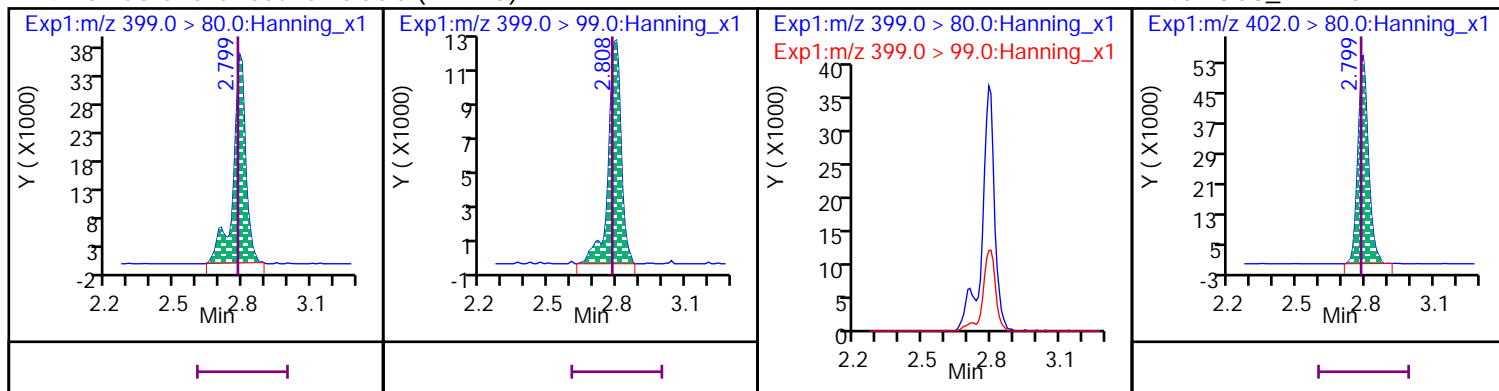
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



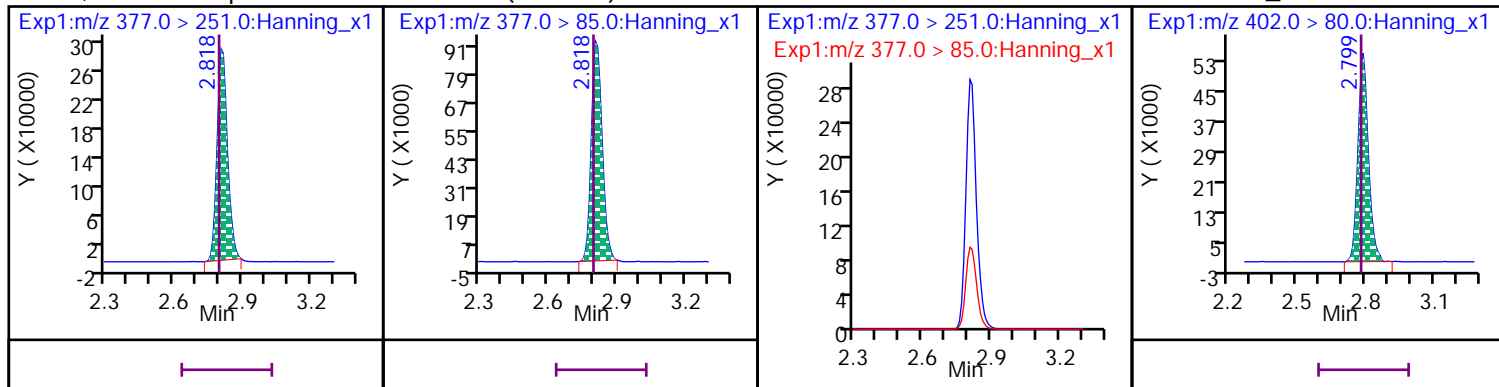
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



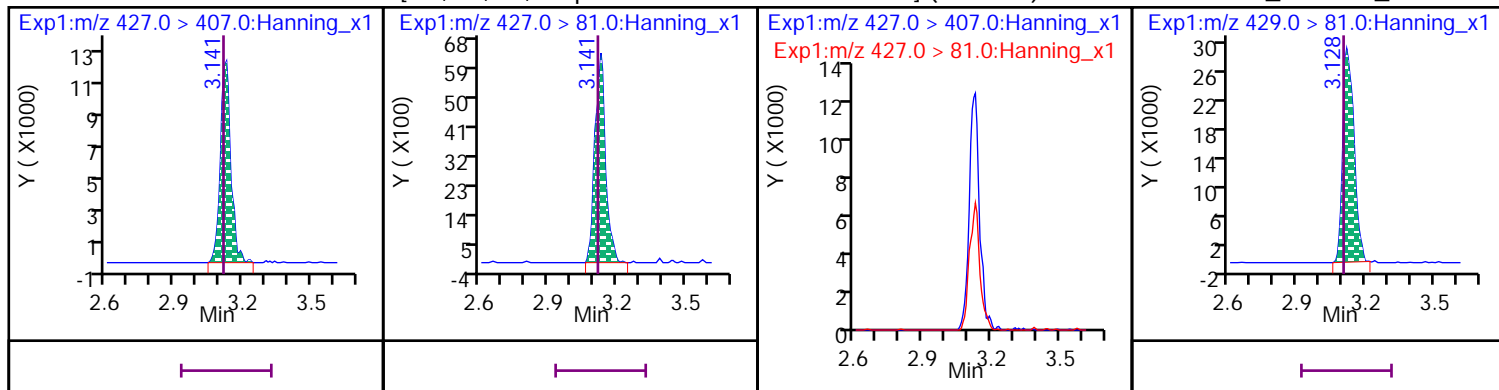
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



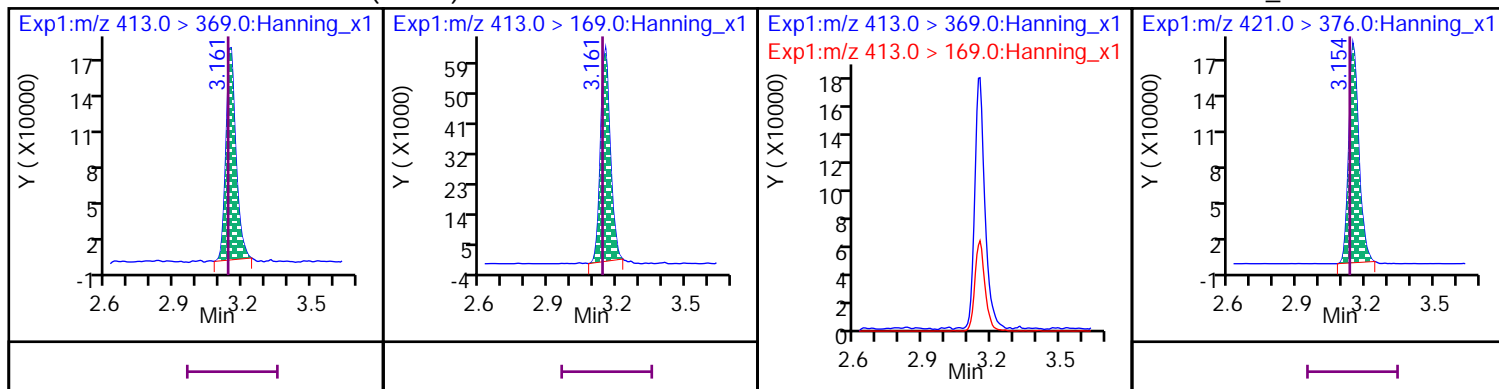
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



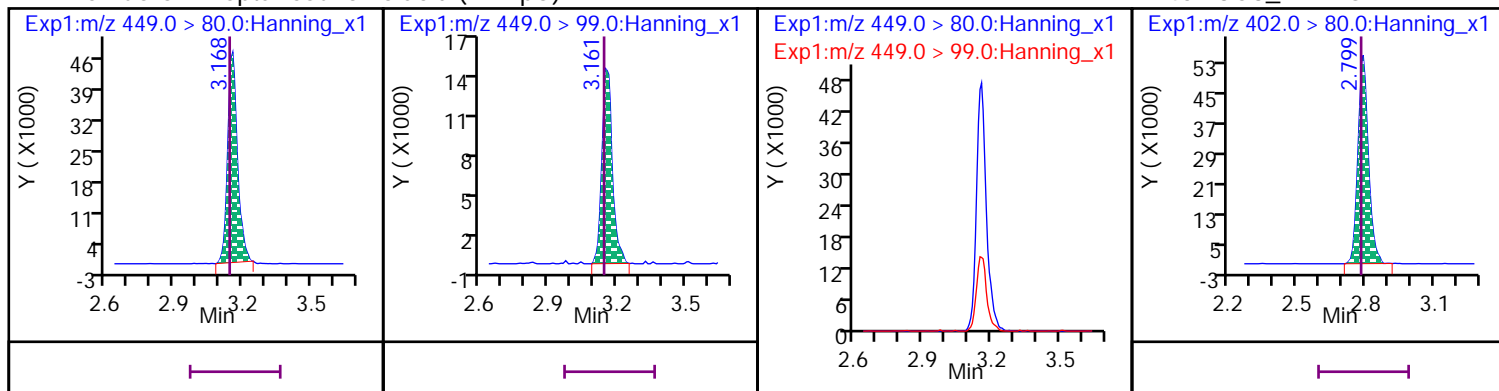
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



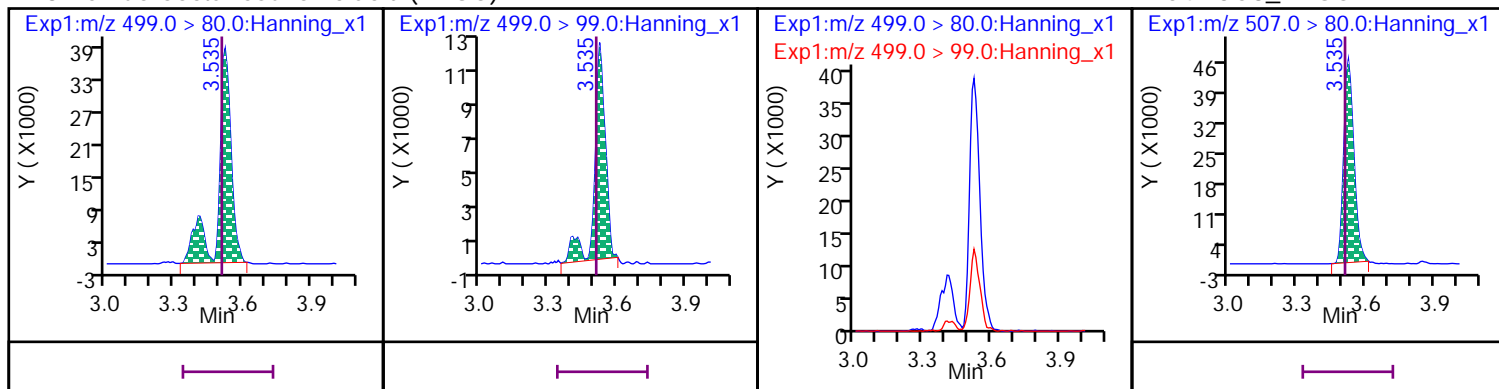
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



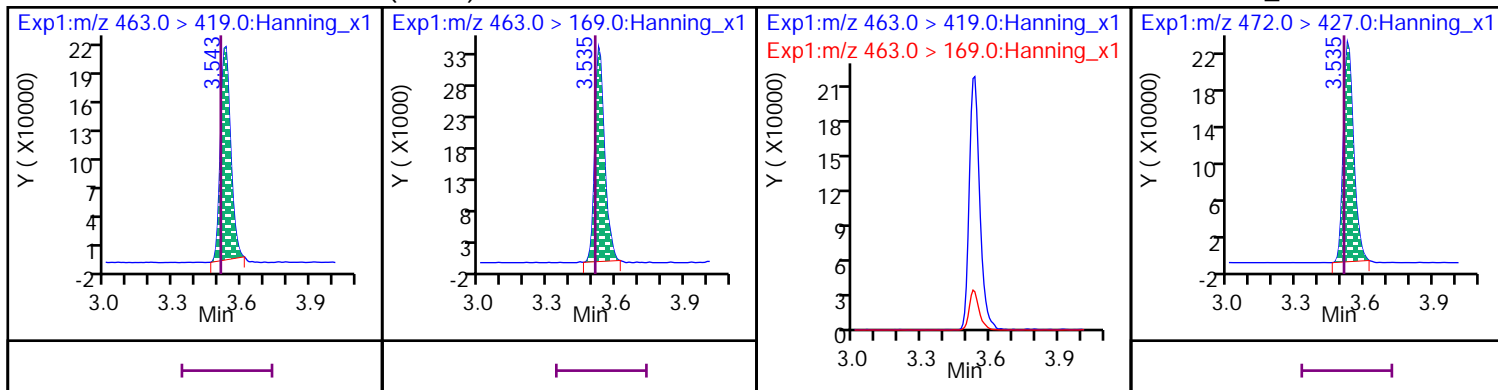
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



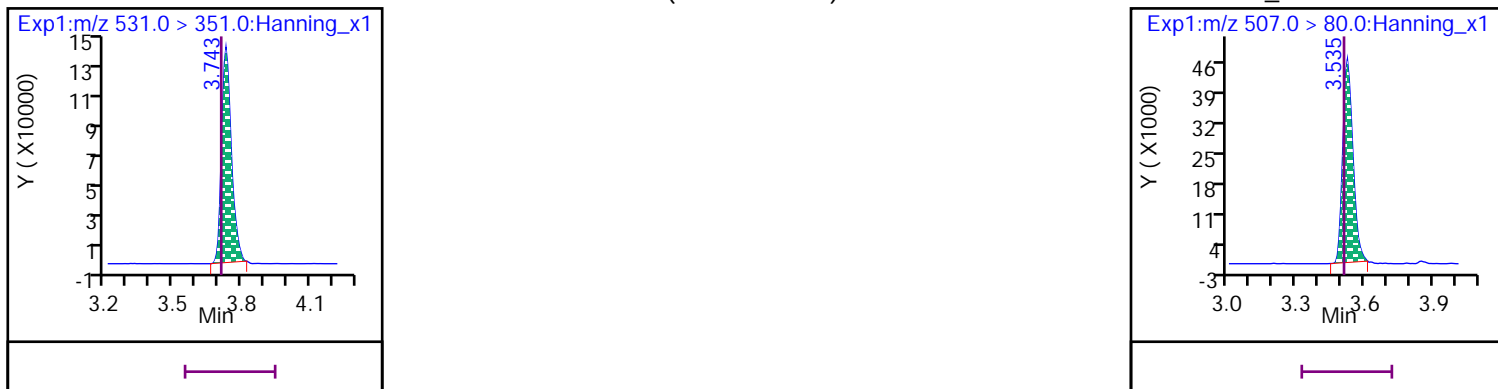
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



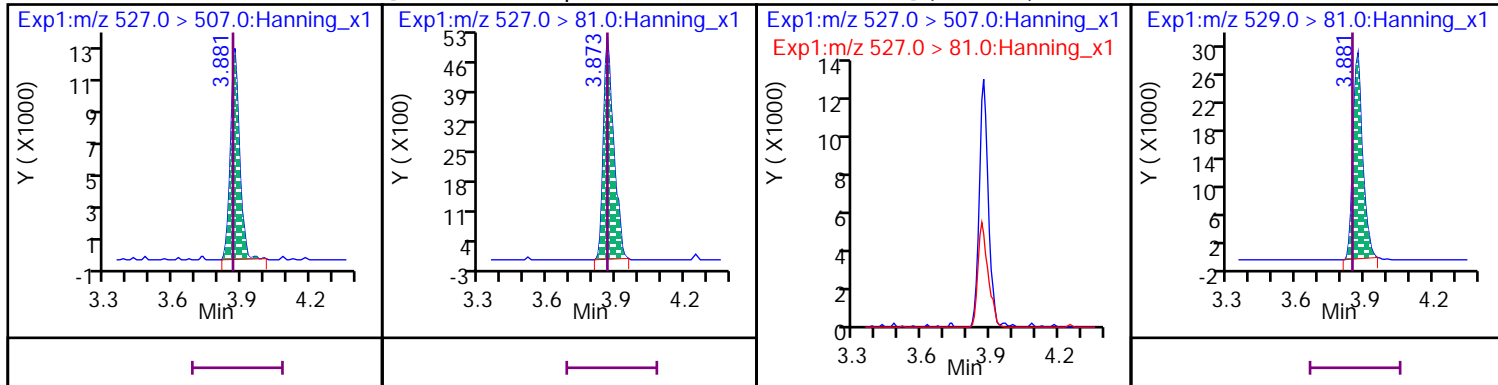
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



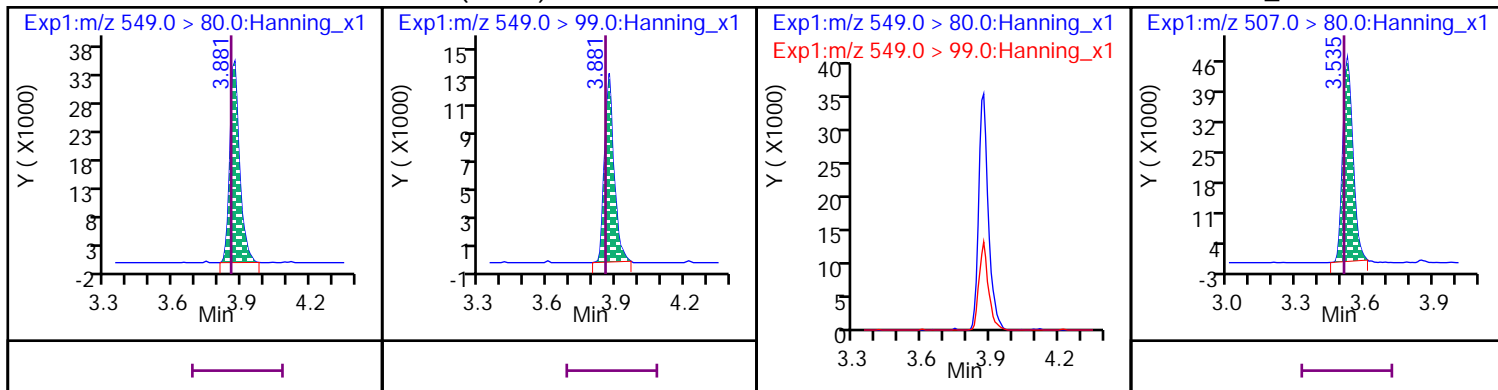
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



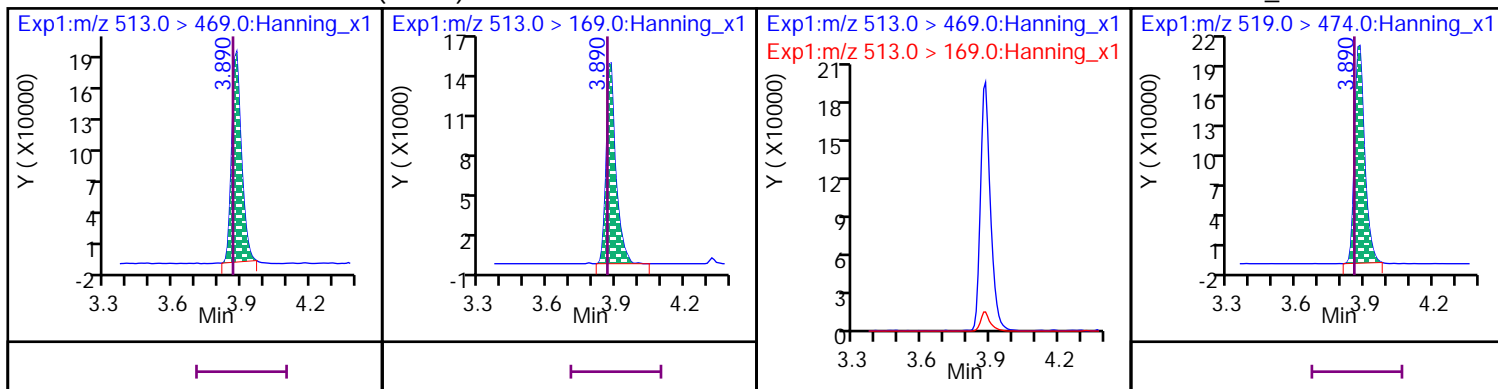
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



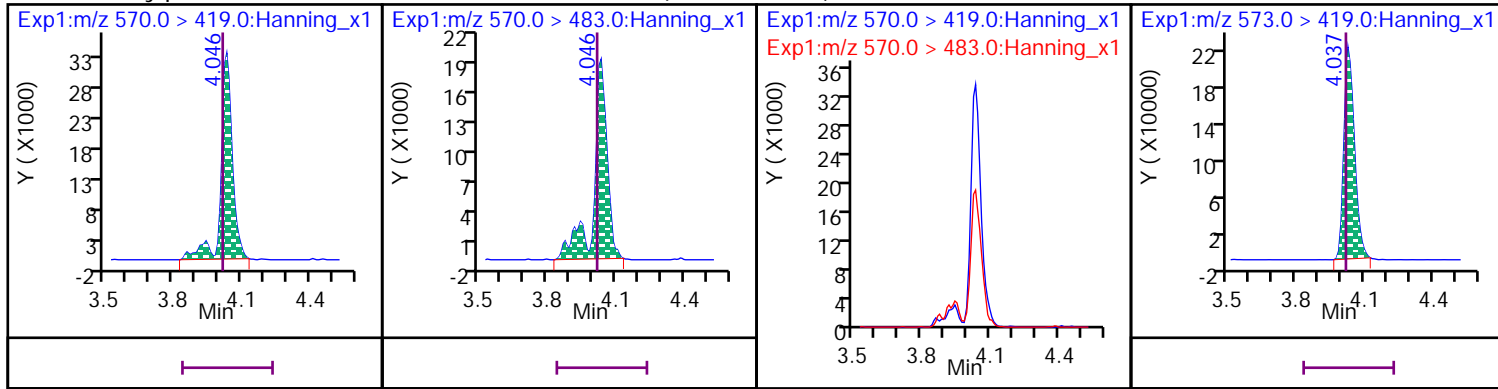
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



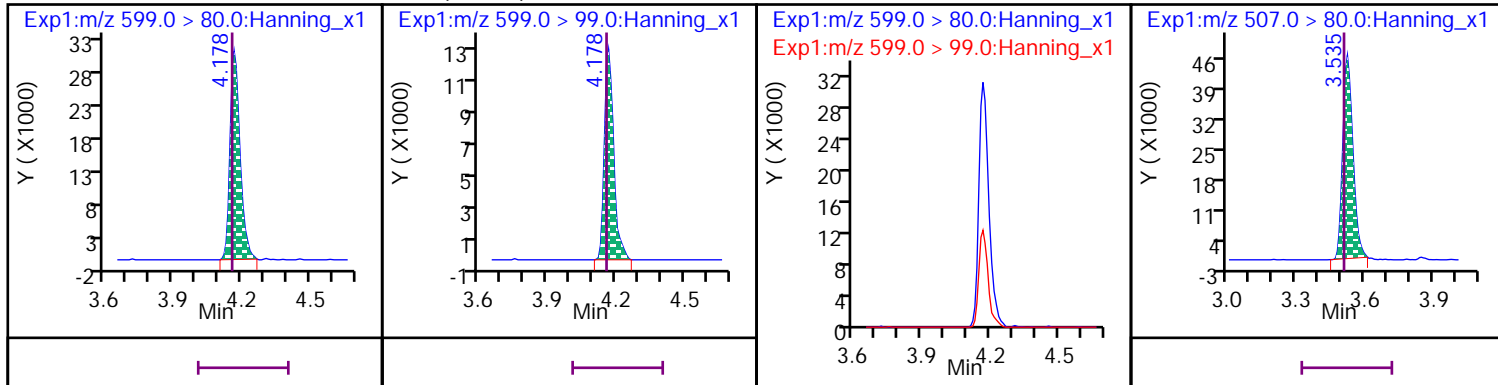
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



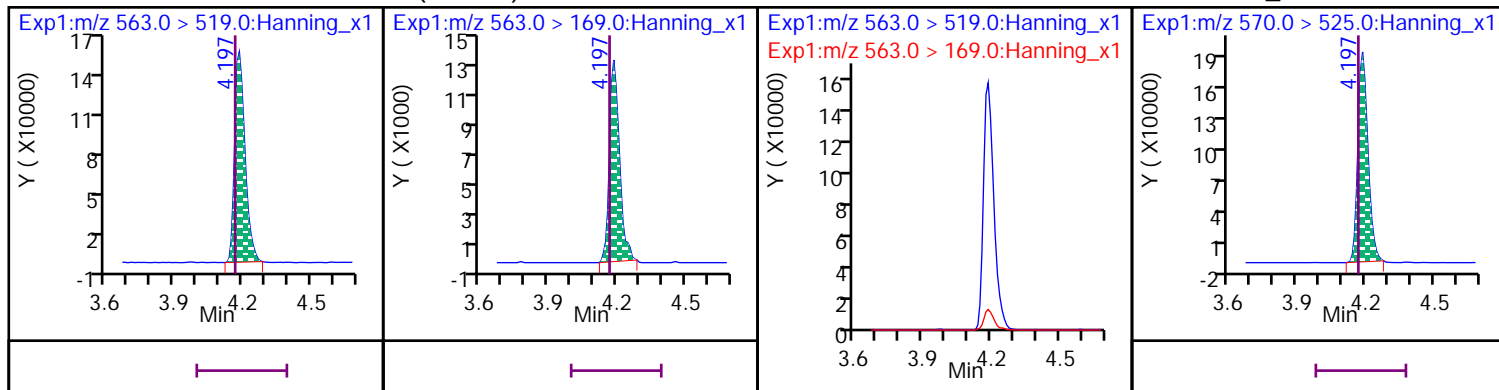
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



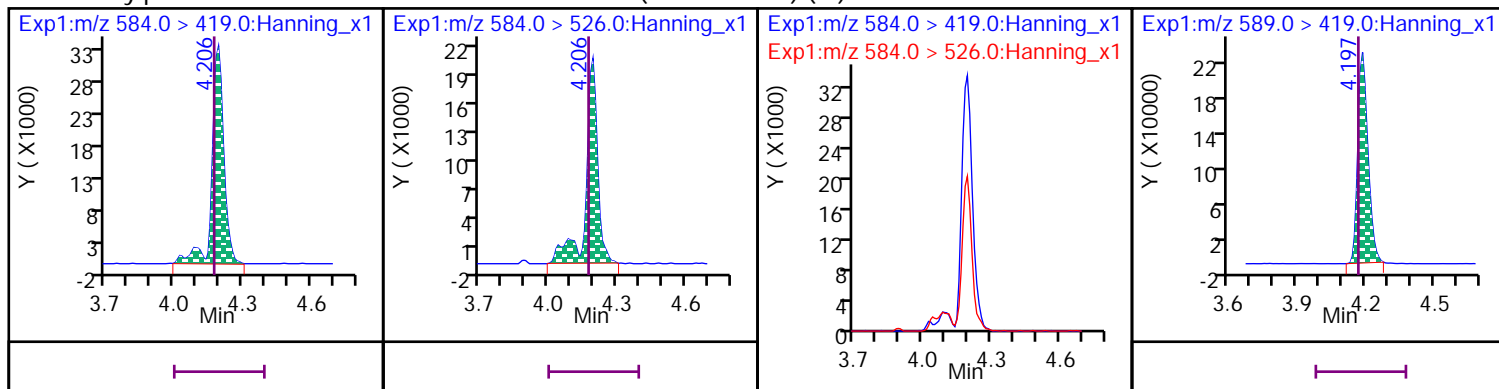
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



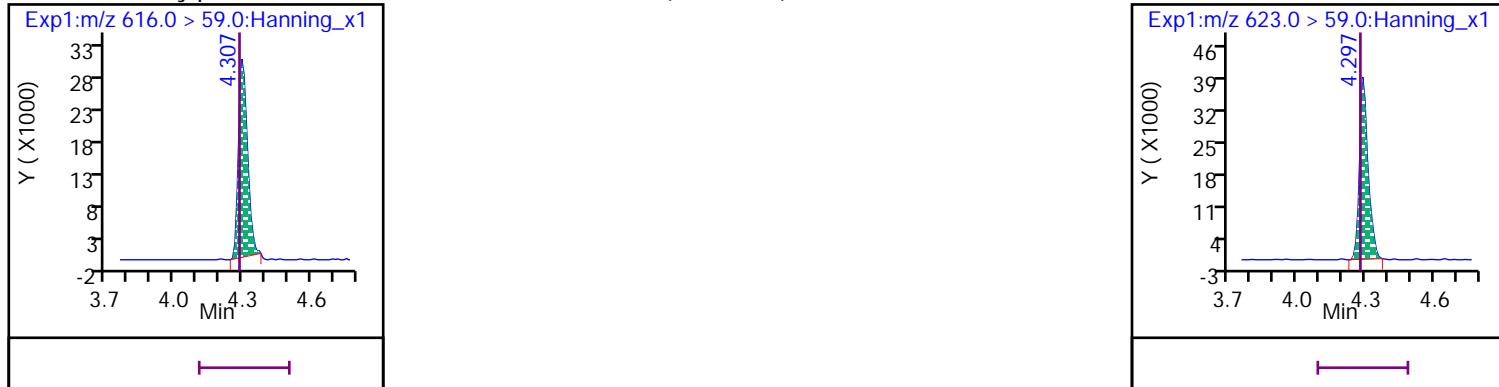
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



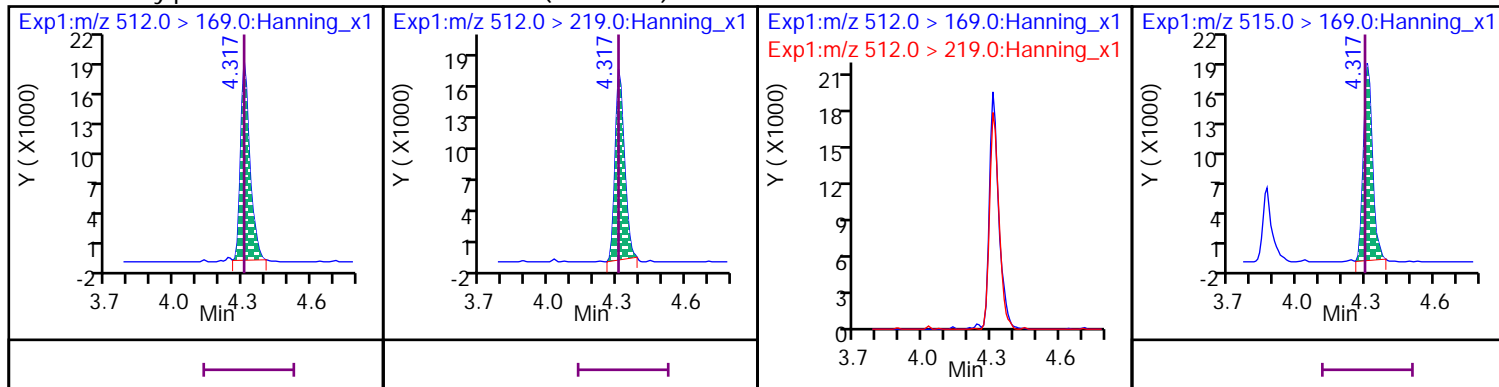
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

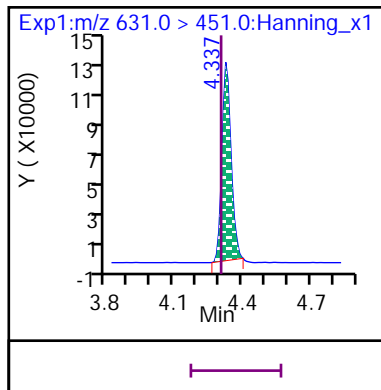


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

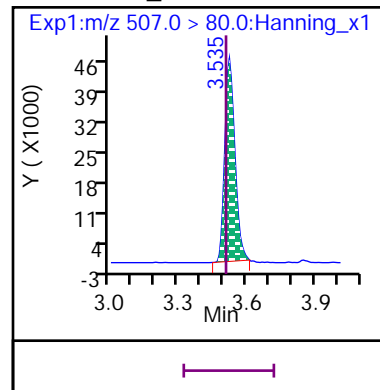
D 57 d3-MeFOSA



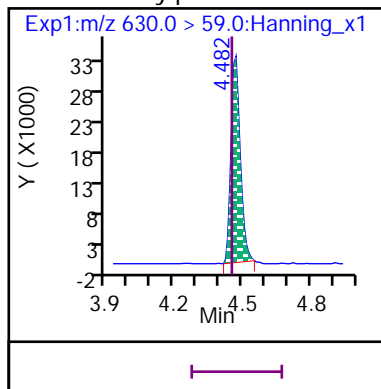
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



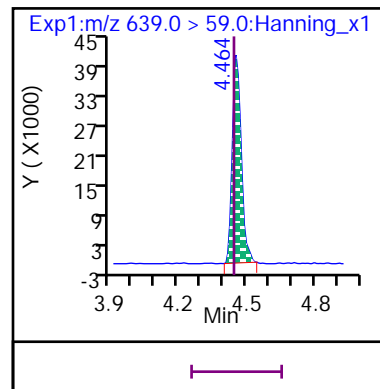
D 54 13C8\_PFOS



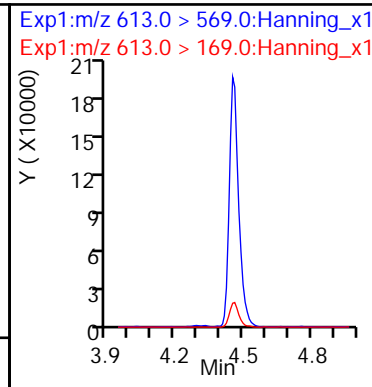
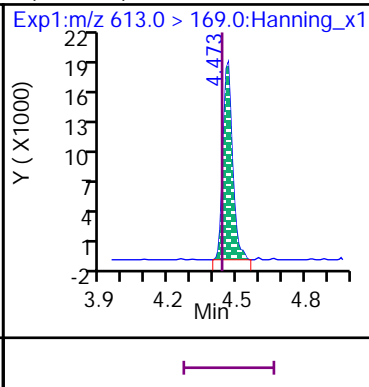
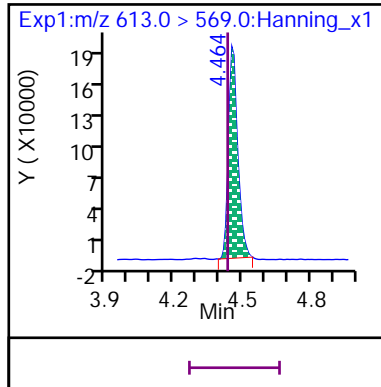
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



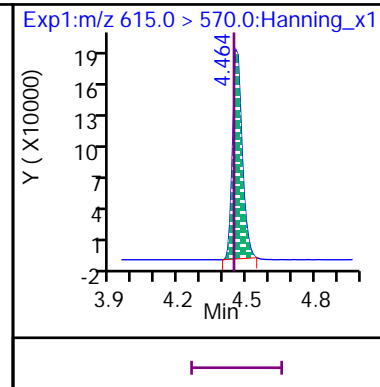
D 62 d9-EtFOSE



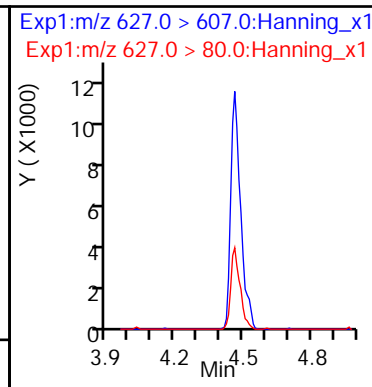
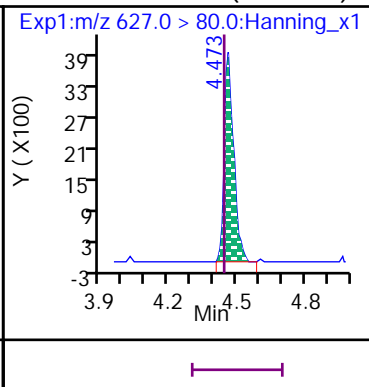
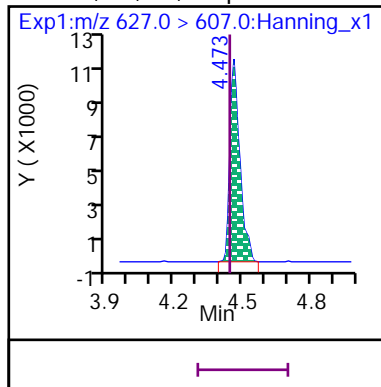
11 Perfluoro-n-dodecanoic acid (PFDaA)



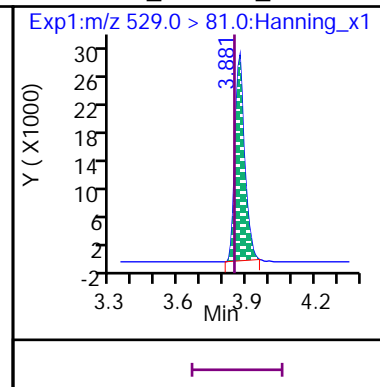
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



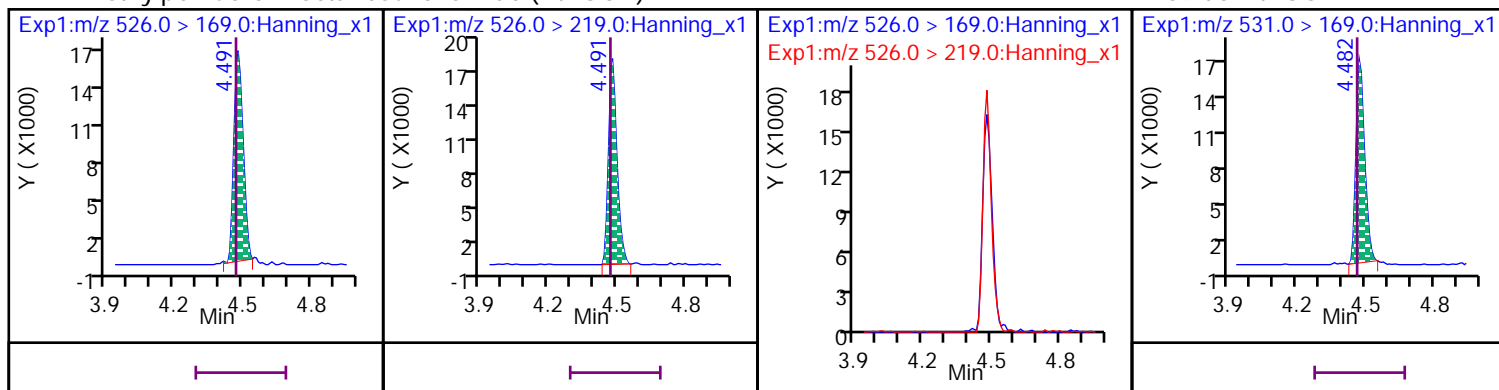
D 65 13C2\_8:2 FTS\_2





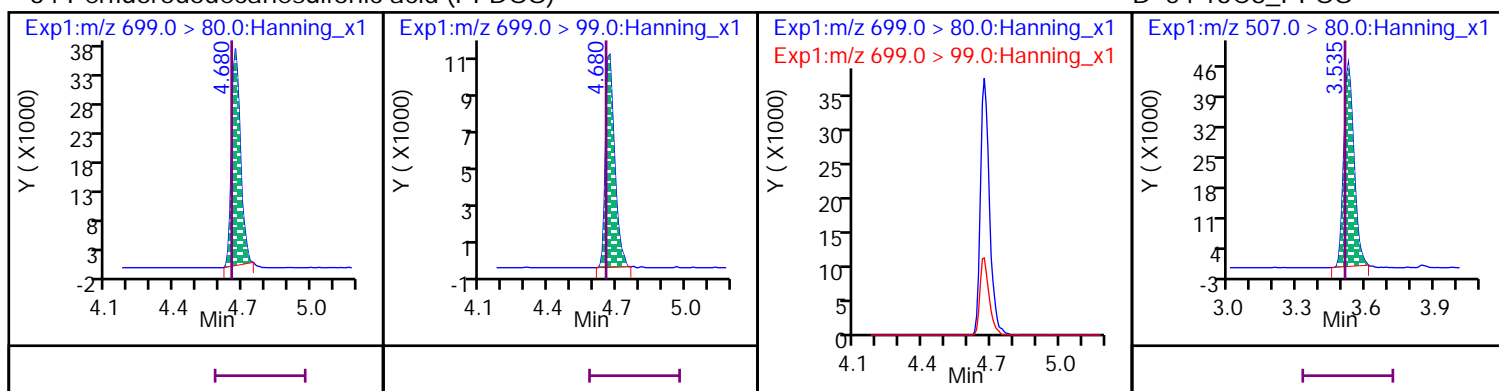
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



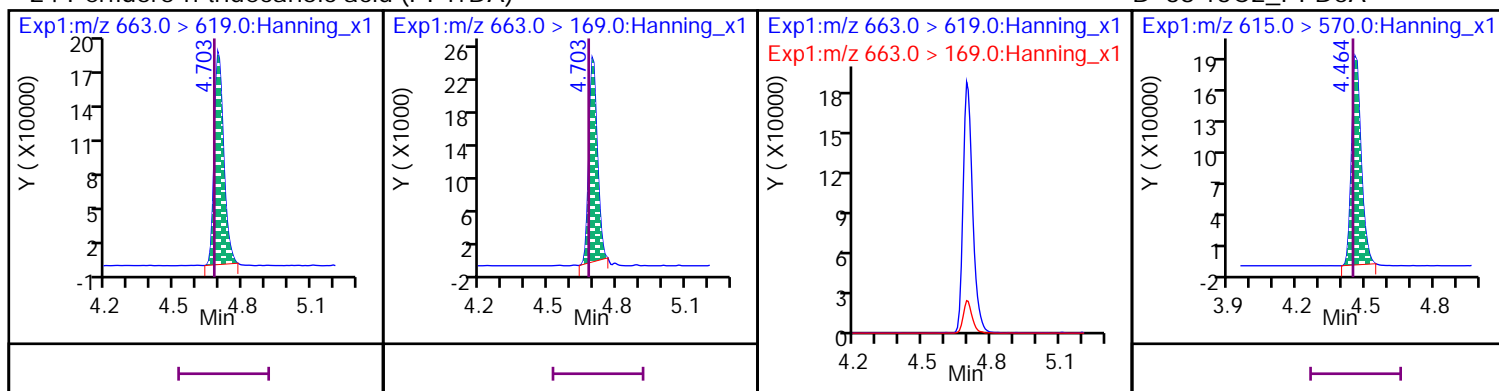
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



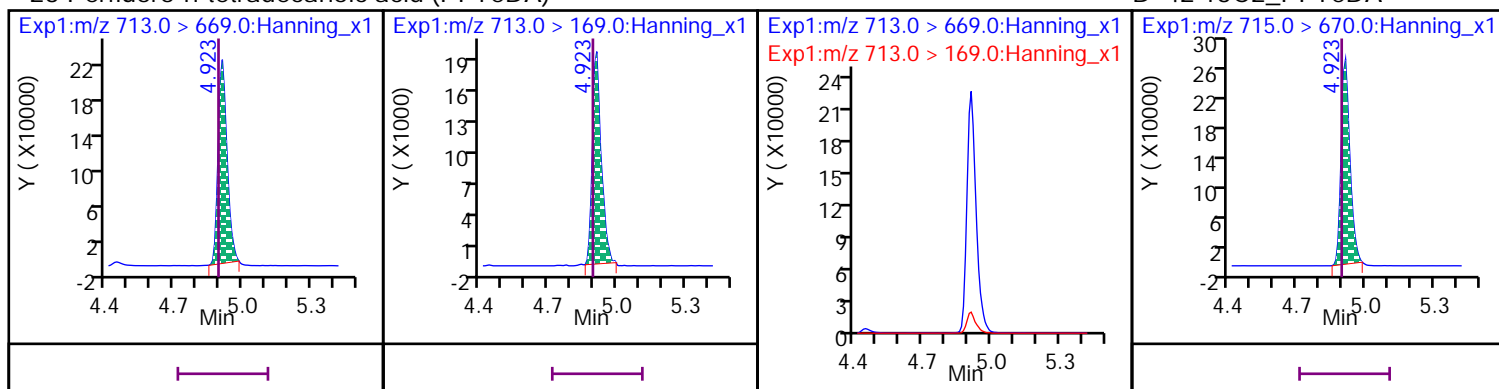
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



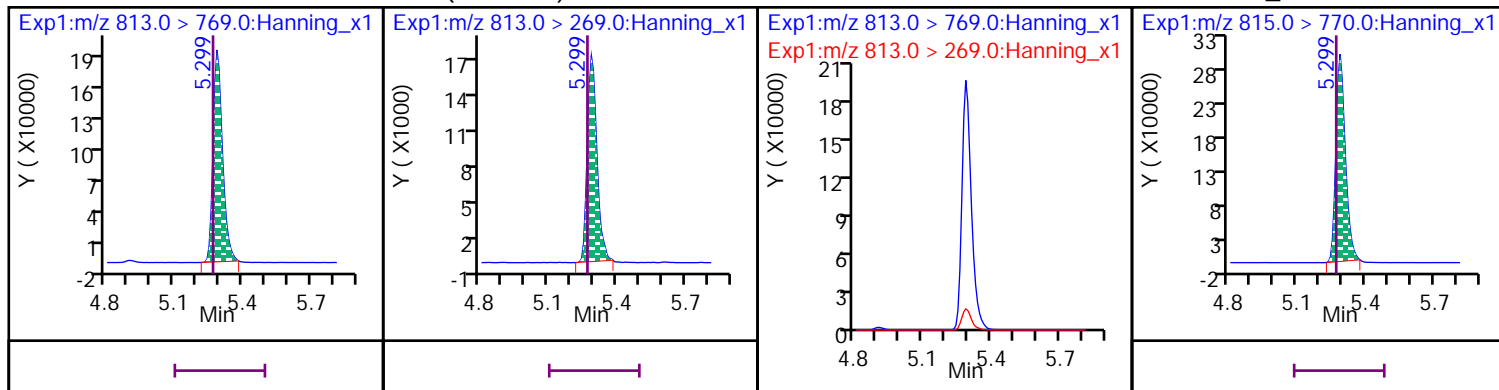
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



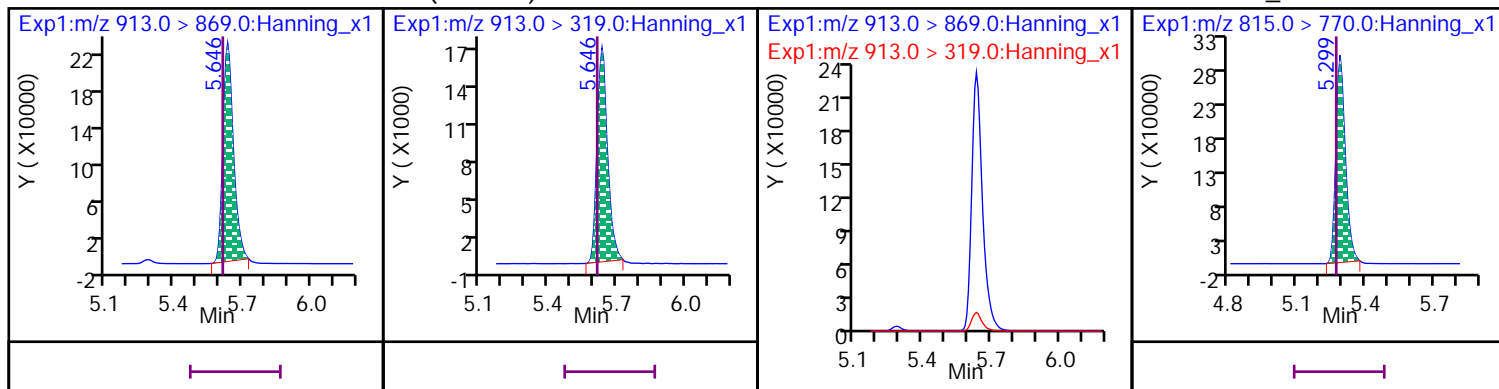
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

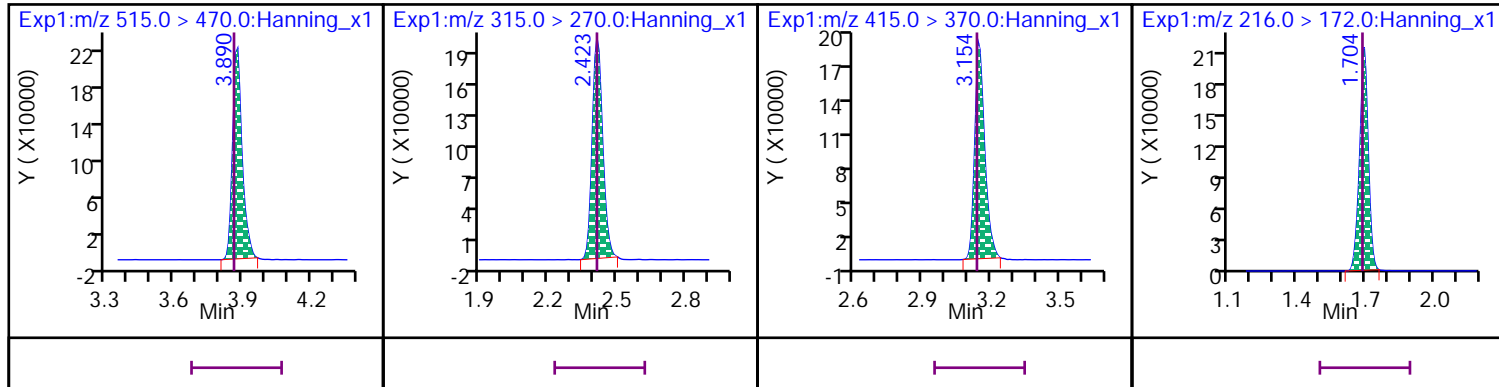


\* 37 13C2\_PFDA

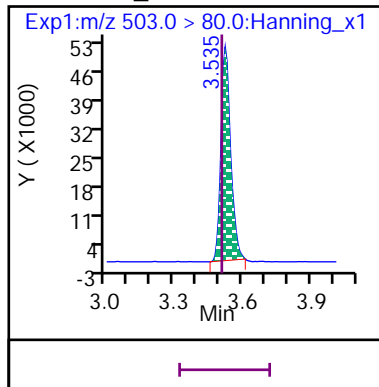
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

Sample Info: ID CCV 1000D\_SVLC-1248

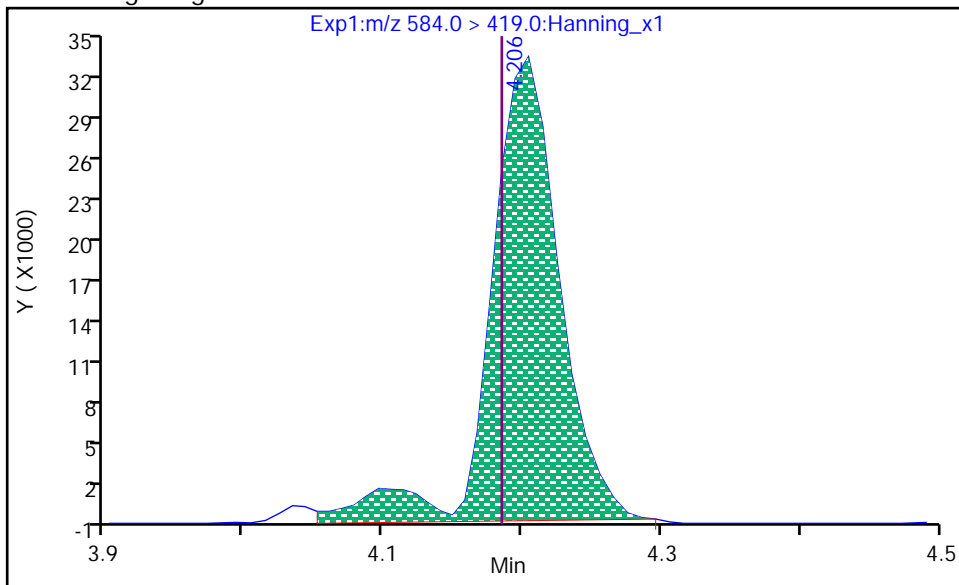
Dil. Factor: 1

Operator: Matthew M. Miller

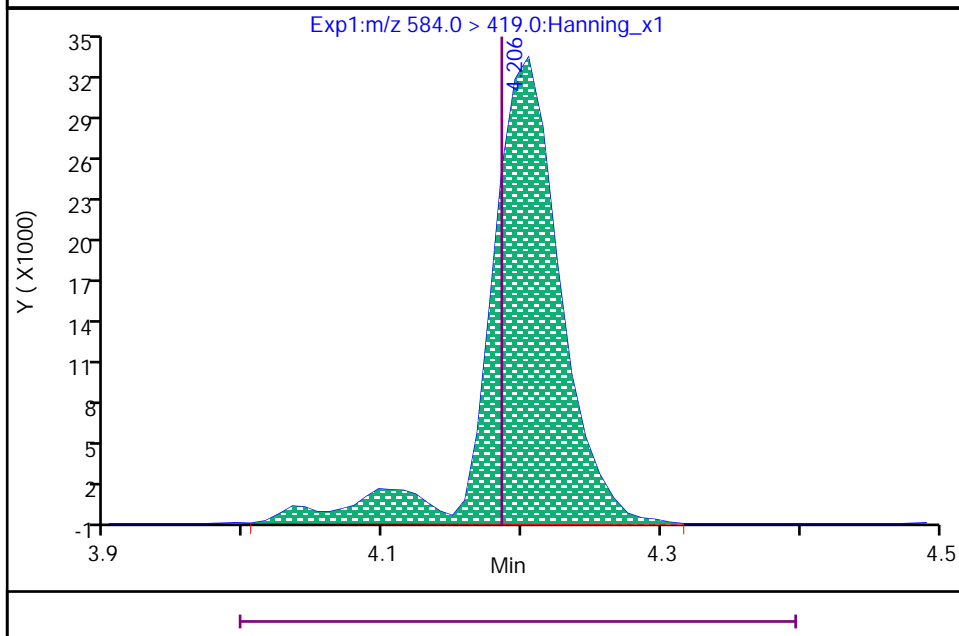
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.206  
Area: 114962  
Amount: 825.60  
Amount Units: ng/L



RT: 4.206  
Area: 120127  
Amount: 862.69  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:52:58

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

Sample Info: ID CCV 1000D\_SVLC-1248

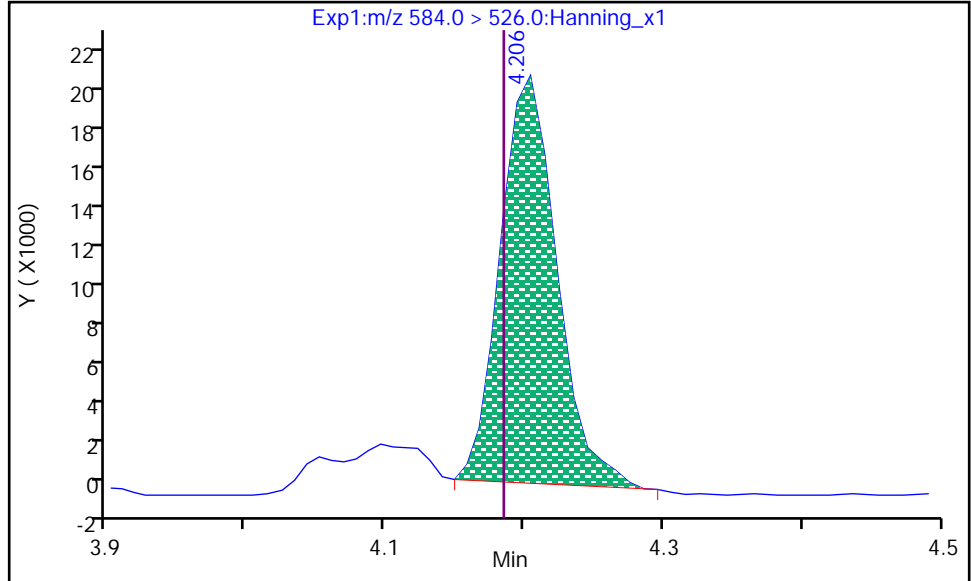
Dil. Factor: 1

Operator: Matthew M. Miller

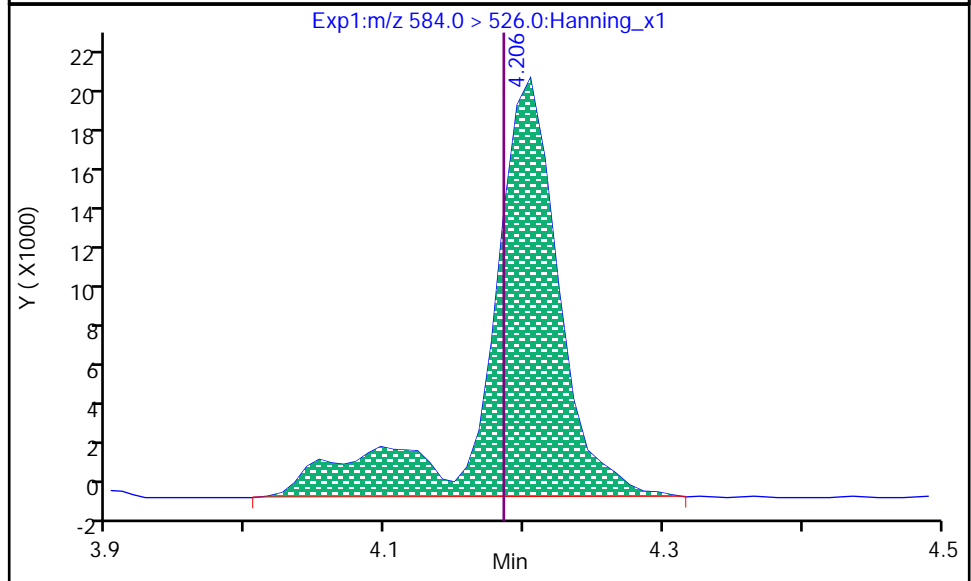
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.206  
Area: 55401  
Amount: 862.69  
Amount Units: ng/L



RT: 4.206  
Area: 71724  
Amount: 862.69  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:53:02

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d  
Injection Date: 29-Dec-2020 10:13:38 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	105.54	106	70 - 130
D 46 13C4_PFBFA	735341	669792			91.1	50 - 150
D 50 13C5_PFPeA	728206	688361			94.5	50 - 150
21 PFPeA			100.00	107.43	107	70 - 130
7 PFBS			88.400	85.769	97	70 - 130
D 44 13C3_PFBFS	247575	241196			97.4	50 - 150
1 4:2 FTS			93.400	107.91	116	70 - 130
D 63 13C2_4:2 FTS_2	126464	136264			108	50 - 150
D 49 13C5_PFHxA	774364	755876			97.6	50 - 150
15 PFHxA			100.00	104.20	104	70 - 130
22 PFPeS			93.800	91.523	97.6	70 - 130
28 GenX			200.00	201.70	101	70 - 130
D 66 13C3_GenX	1412202	1415766			100	50 - 150
D 47 13C4_PFHpA	616003	613536			99.6	50 - 150
13 PFHpA			100.00	107.11	107	70 - 130
D 45 13C3_PFHxS	179294	185779			104	50 - 150
14 PFHxS			91.000	96.579	106	70 - 130
29 ADONA			94.200	93.123	98.9	70 - 130
D 64 13C2_6:2 FTS_2	104623	105371			101	50 - 150
2 6:2 FTS			94.800	97.263	103	70 - 130
20 PFOA			100.00	107.57	108	70 - 130
D 53 13C8_PFOA	654941	607240			92.7	50 - 150
12 PFHpS			95.200	104.37	110	70 - 130
18 PFOS			92.800	100.19	108	70 - 130
17 PFNA			100.00	103.89	104	70 - 130
D 56 13C9_PFNA	792377	787757			99.4	50 - 150
D 54 13C8_PFOS	154357	153541			99.5	50 - 150
30 9CI-PF3ONS			93.200	102.93	110	70 - 130
D 55 13C8_PFOA	330552	318847			96.5	50 - 150
19 PFOSA			100.00	114.29	114	70 - 130
16 PFNS			96.000	116.88	122	70 - 130
D 65 13C2_8:2 FTS_2	93314	104593			112	50 - 150
3 8:2 FTS			95.800	110.01	115	70 - 130
10 PFDA			100.00	102.56	103	70 - 130
D 51 13C6_PFDA	698114	701677			101	50 - 150
D 58 d3-MeFOSAA	762102	727199			95.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	117.72	118	70 - 130
9 PFDS			96.400	115.41	120	70 - 130
5 N-EtFOSAA			100.00	98.350	98.3	70 - 130
25 PFUdA			100.00	103.40	103	70 - 130
D 60 d5-EtFOSAA	738335	710460			96.2	50 - 150
D 52 13C7_PFUdA	678701	641343			94.5	50 - 150
D 61 d7-MeFOSE	117292	96951			82.7	50 - 150
32 MeFOSE			100.00	97.568	97.6	70 - 130
26 MeFOSA			100.00	130.24	130	70 - 130
D 57 d3-MeFOSA	54969	52459			95.4	50 - 150
31 11Cl-PF3OUDS			94.200	94.419	100	70 - 130
D 62 d9-EtFOSE	121851	123442			101	50 - 150
33 EtFOSE			100.00	100.94	101	70 - 130
D 59 d5-EtFOSA	51517	48002			93.2	50 - 150
D 38 13C2_PFDoA	649290	609821			93.9	50 - 150
4 10:2 FTS			96.400	80.905	83.9	70 - 130
27 EtFOSA			100.00	79.992	80	70 - 130
11 PFDoA			100.00	101.36	101	70 - 130
34 PFDOS			96.800	108.56	112	70 - 130
24 PFTrDA			100.00	100.28	100	70 - 130
23 PFTeDA			100.00	114.52	115	70 - 130
D 42 13C2_PFTeDA	887372	786208			88.6	50 - 150
35 PFHxDA			100.00	112.42	112	70 - 130
D 40 13C2_PFHxDA	913664	908883			99.5	50 - 150
36 PFODA			100.00	102.31	102	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d  
Injection Date: 29-Dec-2020 10:13:38 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.702	1.702	1	669792	23	>100:1			1000.00	965.74	91.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.709	1.709	1/0	70406	23	38:1			100.00	105.54		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.080	2.080	1	688361	17	>100:1			1000.00	1000.69	94.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.080	2.080	1/0	74348	16	>100:1			100.00	107.43		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.133	2.133	1	241196	17	>100:1			1000.00	1047.63	97.4	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.133	2.133	1/0	24391	16	>100:1	Target = 3.50		88.400	85.769		
298.9 > 99	44	2.133	2.133		7050	18	69:1	3.45 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.446	2.446	0/-1	19149	15	>100:1	Target = 3.10		93.800	91.523		
349 > 99	44	2.455	2.446		6737	24	66:1	2.84 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.393	2.393	1	136264	21	>100:1			5000.00	5628.81	108	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.393	2.393	1/0	5869	22	90:1	Target = 1.80		93.400	107.91		
327 > 81	63	2.402	2.393		4067	25	23:1	1.44 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.429	2.429	1	755876	20	>100:1			1000.00	1025.51	97.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.420	2.420	0/-1	77758	19	>100:1	Target = 18.34		100.00	104.20		
313 > 119	49	2.429	2.420		3614	15	29:1	21.51 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.536	2.536	0	1415766	20	>100:1			5000.00	5315.36	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.536	2.536	0/0	41032	20	>100:1	Target = 0.81		200.00	201.70		
285 > 185	66	2.536	2.536		50585	18	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.777	2.777	0	613536	22	>100:1			1000.00	1011.36	99.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.786	2.786	0/0	68164	20	94:1	Target = 3.70		100.00	107.11		
363 > 169	47	2.777	2.786		16876	19	55:1	4.03 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.795	2.795	0	185779	19	>100:1			1000.00	1084.98	104	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.795	2.795	0/0	19024	26	>100:1	Target = 3.21	0.16	91.000	96.579		
399 > 99	45	2.804	2.795		6319	24	29:1	3.01 (1.60-4.81)	0.09				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.823	2.823	0/0	109837	19	>100:1	Target = 2.97		94.200	93.123		
377 > 85	45	2.814	2.823		36417	27	>100:1	3.01 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.166	3.166	0/0	17614	23	>100:1	Target = 3.08		95.200	104.37		
449 > 99	45	3.172	3.166		6016	21	58:1	2.92 (1.54-4.63)					M
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.132	3.132	0	105371	29	>100:1			5000.00	5471.43	101	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.139	3.139	1/1	5353	26	67:1	Target = 1.80		94.800	97.263		
427 > 81	64	3.145	3.139		2873	17		1.86 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.159	3.159	0	607240	25	>100:1			1000.00	1025.98	92.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.159	3.159	0/0	66590	22	44:1	Target = 2.87		100.00	107.57		
413 > 169	53	3.152	3.159		25388	23	>100:1	2.62 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.533	3.533	0	153541	20	>100:1			1000.00	1024.09	99.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.533	3.533	0/0	18229	37		Target = 3.84	0.53	92.800	100.19		M
499 > 99	54	3.526	3.533		5412	42	37:1	3.36 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.740	3.740	0/0	53204	21	>100:1			93.200	102.93		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.879	3.879	0/0	13733	17	>100:1	Target = 3.07		96.000	116.88		
549 > 99	54	3.870	3.879		4009	23		3.42 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.175	4.175	-1/-1	12860	20	>100:1	Target = 3.03		96.400	115.41		
599 > 99	54	4.184	4.175		4036	22	17:1	3.18 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.334	4.334	-1/-1	41171	17	>100:1			94.200	94.419		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.677	4.677	-1/-1	13382	16	>100:1	Target = 3.33		96.800	108.56		
699 > 99	54	4.669	4.677		4146	16	38:1	3.22 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.533	3.533	0	787757	22	>100:1			1000.00	1049.00	99.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.533	3.533	0/0	81843	20	>100:1	Target = 6.16		100.00	103.89		
463 > 169	56	3.533	3.533		14635	17	>100:1	5.59 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.854	3.854	0	318847	20	>100:1			1000.00	1029.99	96.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.854	3.854	0/0	35912	27	>100:1			100.00	114.29		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.879	3.879	0	104593	21				5000.00	5638.39	112	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.911	3.911	3/3	5245	20	15:1	Target = 1.95		95.800	110.01		M
527 > 81	65	3.879	3.911		3013	23		1.74 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.479	4.479	0/0	3911	20	46:1	Target = 3.14		96.400	80.905		
627 > 80	65	4.470	4.479		1794	16		2.18 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.887	3.887	0	701677	20	>100:1			1000.00	1057.81	101	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.887	3.887	0/0	70709	20	92:1	Target = 15.94		100.00	102.56		
513 > 169	51	3.879	3.887		4938	20	9.4:1	14.31 (7.97-23.91)					M
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.034	4.034	-1	727199	17	>100:1			5000.00	5066.20	95.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.043	4.043	-1/0	13152	25	53:1	Target = 1.33	0.08	100.00	117.72		
570 > 483	58	4.043	4.043		8685	31	37:1	1.51 (0.66-1.99)	0.35				



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.193	4.193	-1	710460	18	>100:1			5000.00	5349.26	96.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.203	4.203	0/1	13913	30	77:1	Target = 1.58	0.22	100.00	98.350		
584 > 526	60	4.193	4.203		7957	32	37:1	1.74 (0.79-2.37)	0.31				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.193	4.193	-1	641343	18	>100:1			1000.00	1014.66	94.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.193	4.193	-1/0	62330	19	>100:1	Target = 15.50		100.00	103.40		
563 > 169	52	4.203	4.193		5865	24		10.62 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.294	4.294	0	96951	17	>100:1			1000.00	895.97	82.7	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.304	4.304	0/0	8888	19	26:1			100.00	97.568		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.314	4.314	0	52459	16	80:1			1000.00	991.35	95.4	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.334	4.334	0/0	7708	24		Target = 1.12		100.00	130.24		
512 > 219	57	4.314	4.334		5478	18	47:1	1.40 (0.56-1.68)					M
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.461	4.461	0	123442	17	>100:1			1000.00	984.42	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.470	4.470	0/0	11086	17	43:1			100.00	100.94		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.461	4.461	-1	609821	19	>100:1			1000.00	1007.44	93.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.461	4.461	-1/0	62592	19	16:1	Target = 10.85		100.00	101.36		
613 > 169	38	4.470	4.461		5218	21	52:1	11.99 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.701	4.701	-1/0	60233	18	>100:1	Target = 8.37		100.00	100.28		
663 > 169	38	4.701	4.701		7924	21	82:1	7.60 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.479	4.479	0	48002	19	>100:1			1000.00	977.75	93.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.479	4.479	0/0	4195	14	36:1	Target = 1.03		100.00	79.992		
526 > 219	59	4.479	4.479		6209	23	32:1	0.67 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.918	4.918	-1	786208	18	>100:1			1000.00	933.25	88.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.918	4.918	-1/0	78009	19	11:1	Target = 12.11		100.00	114.52		
713 > 169	42	4.918	4.918		6944	23	41:1	11.23 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.296	5.296	-2	908883	19	>100:1			1000.00	1003.00	99.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.296	5.296	-2/0	66761	20	18:1	Target = 11.48		100.00	112.42		
813 > 269	40	5.296	5.296		5494	25	>100:1	12.15 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.643	5.643	-2/0	82316	24	10:1	Target = 13.88		100.00	102.31		
913 > 319	40	5.636	5.643		5602	24	>100:1	14.69 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.887	3.887	0	688059	22	>100:1					94.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.429	2.429	1	731130	19	>100:1					97.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.152	3.152	0	616634	25	>100:1					95.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.702	1.702	1	640092	24	>100:1					96.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80	3.533	3.533	0	172175	23	>100:1						106	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID:

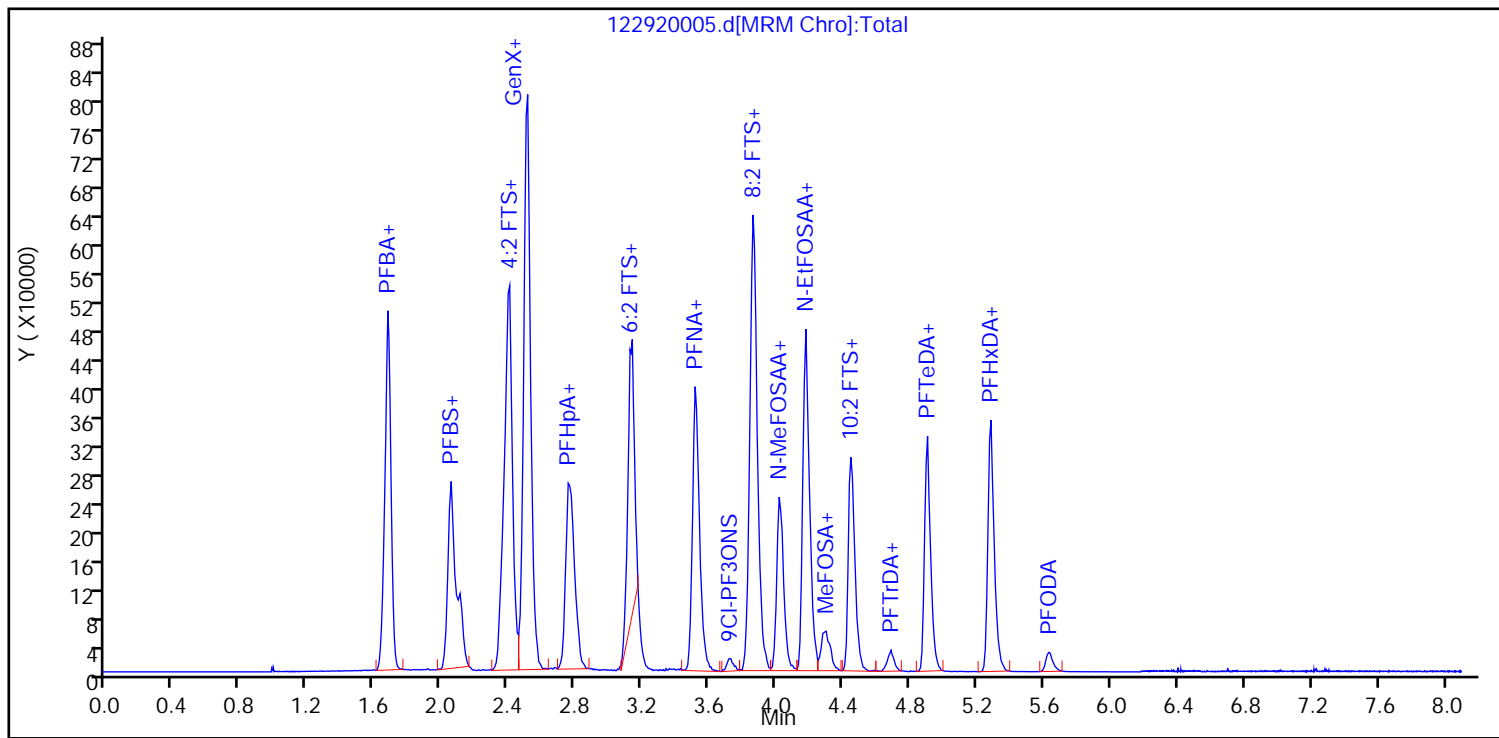
ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

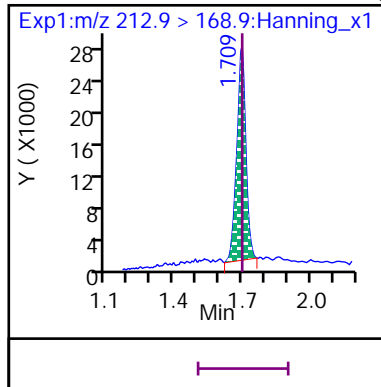
Dil. Factor: 1

Operator:

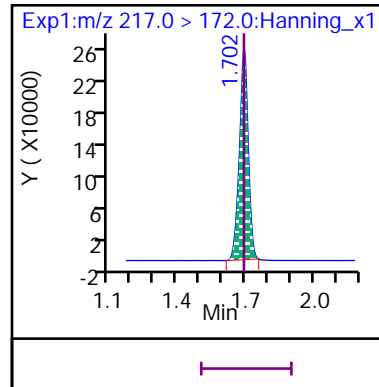
Matthew M. Miller



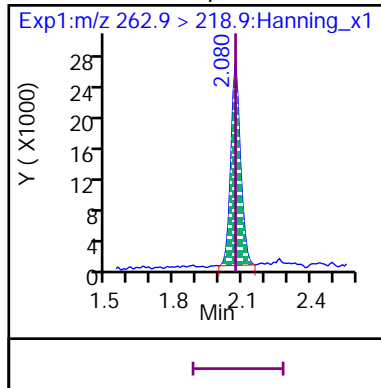
8 Perfluoro-n-butanoic acid (PFBA)



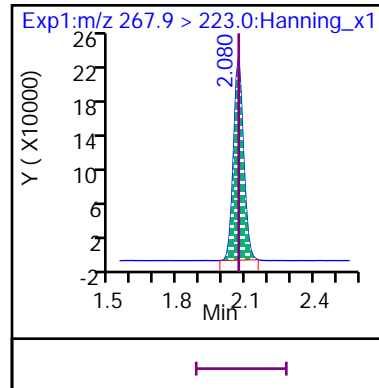
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

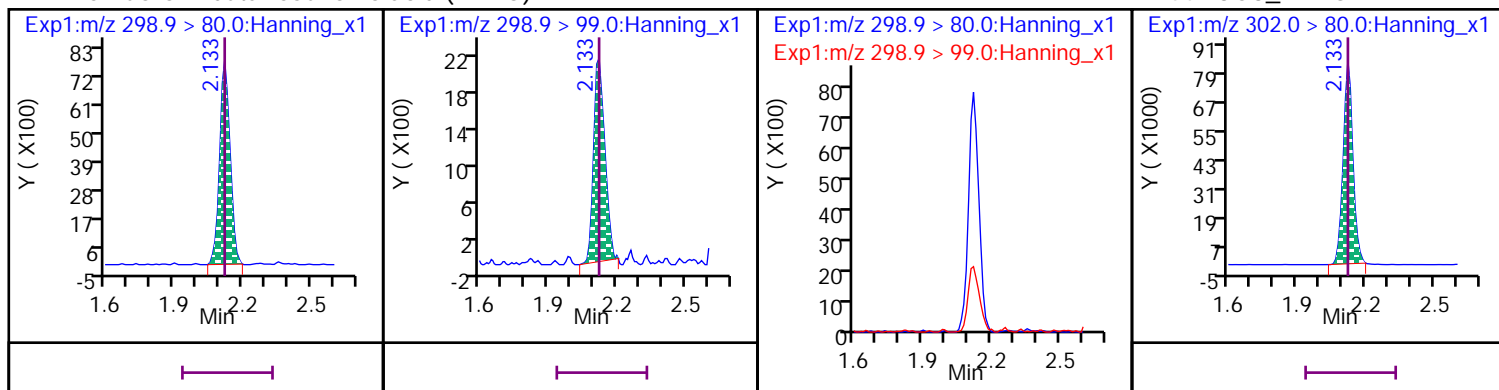


D 50 13C5\_PFPeA



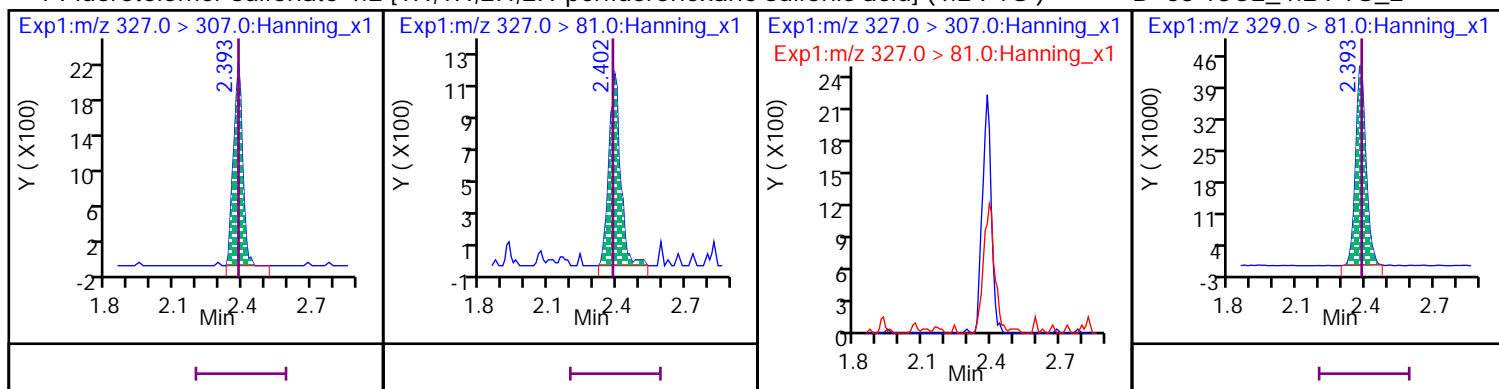
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



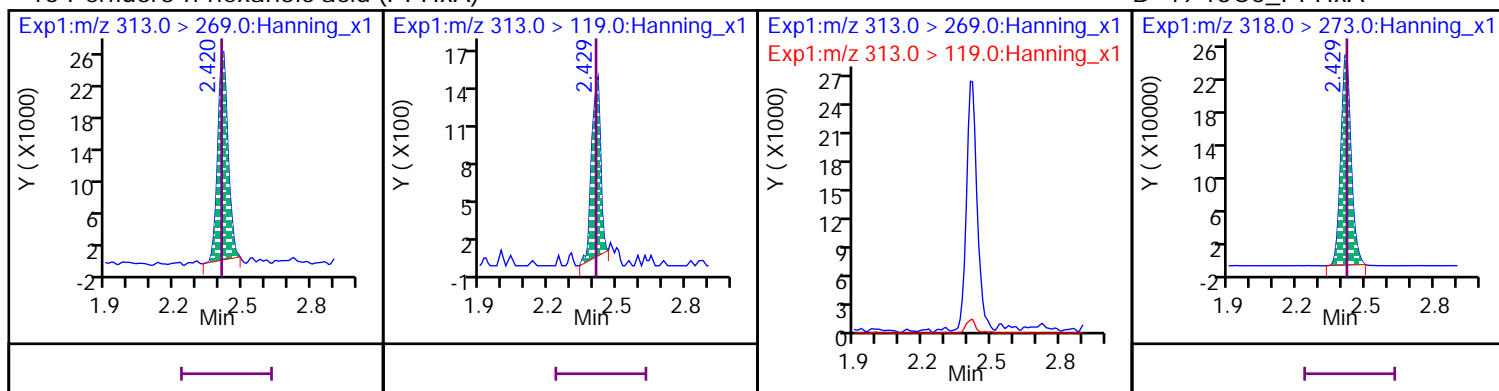
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



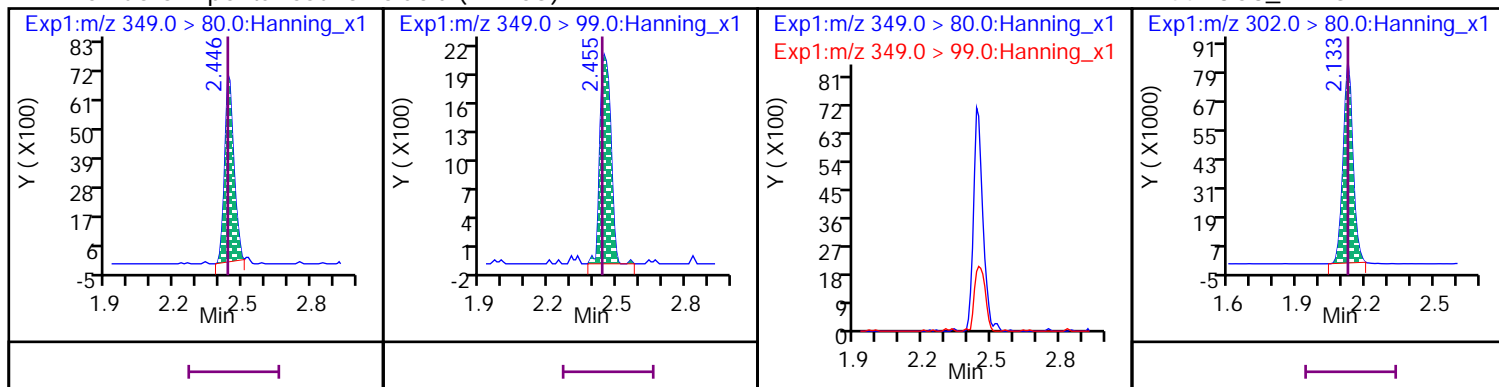
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



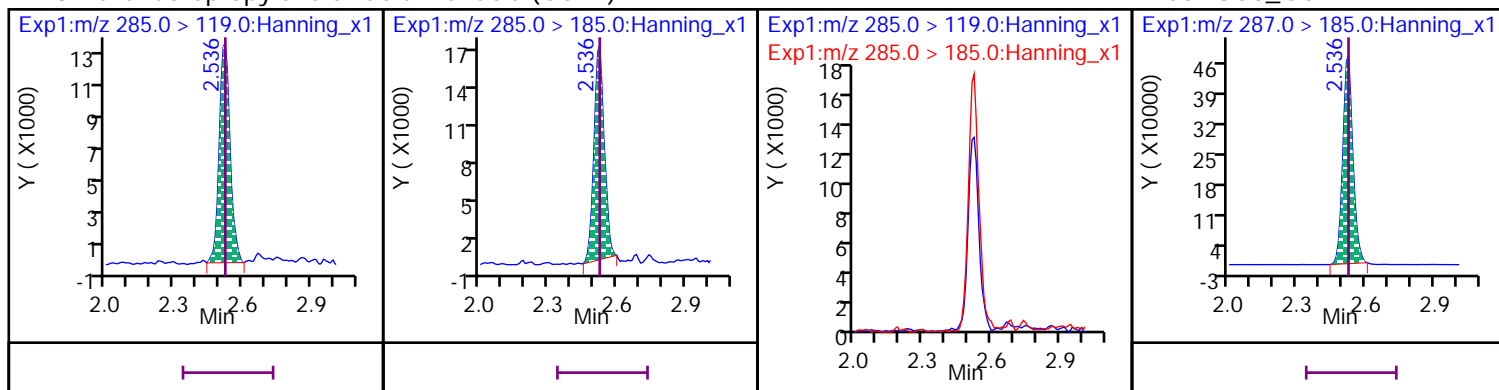
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



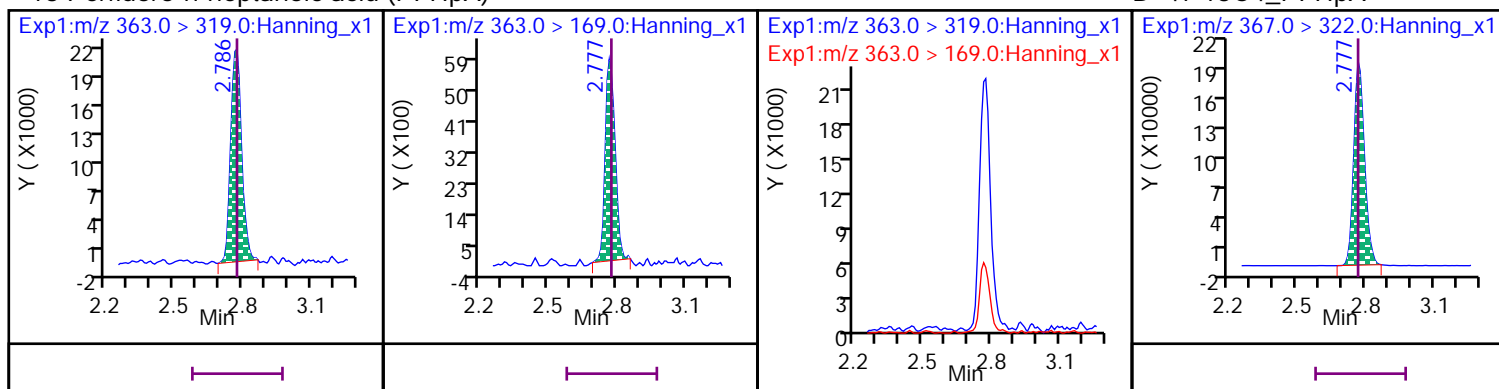
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



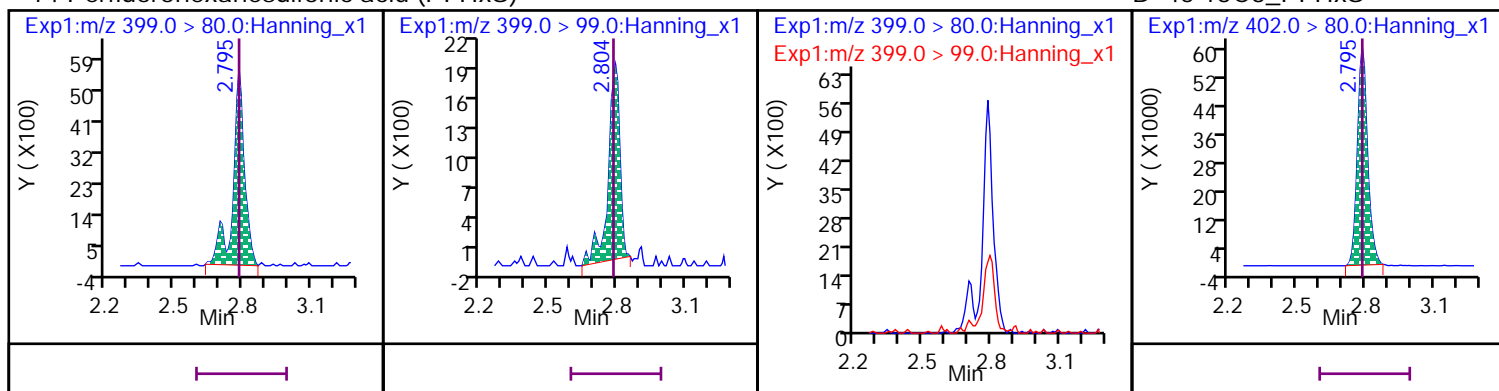
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



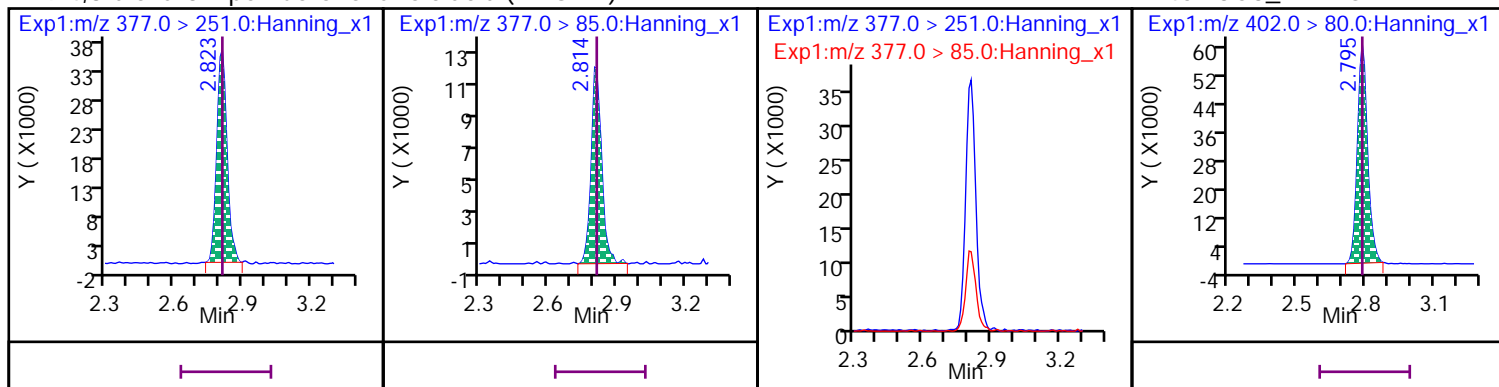
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



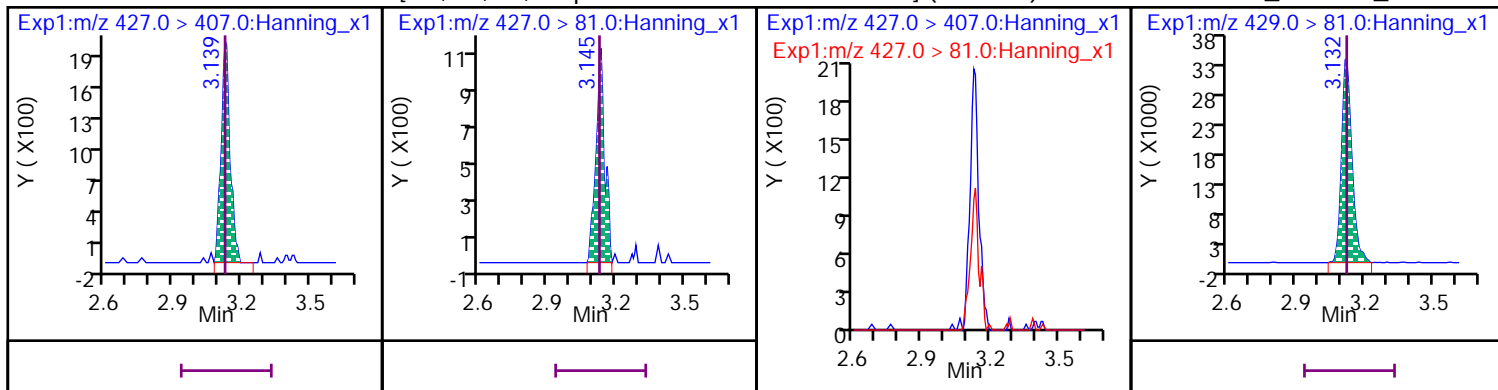
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



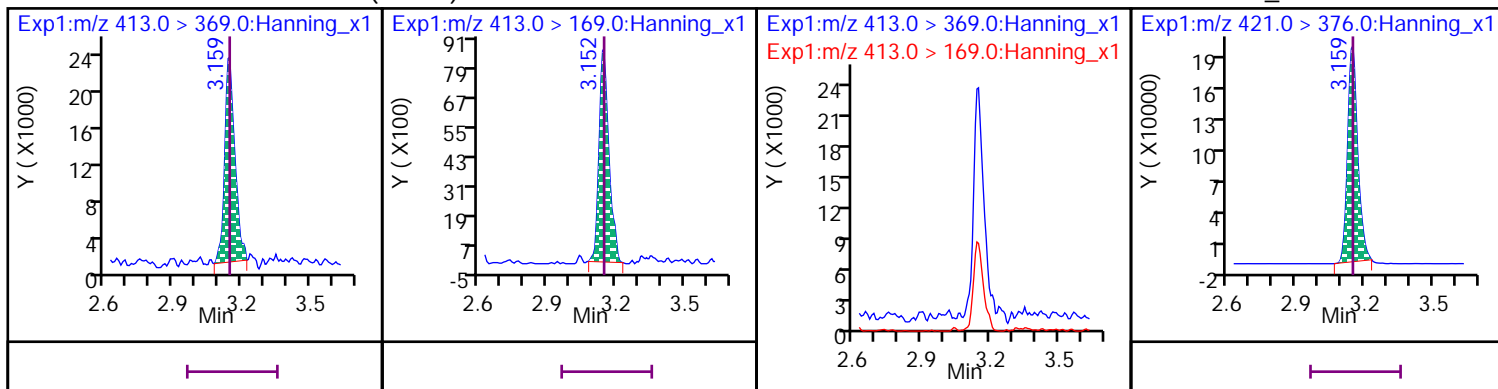
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



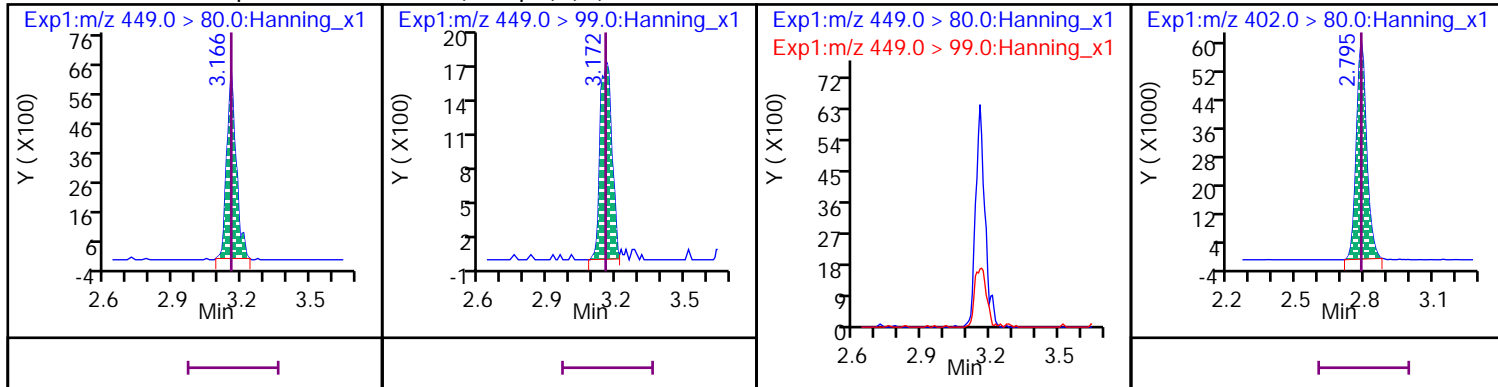
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



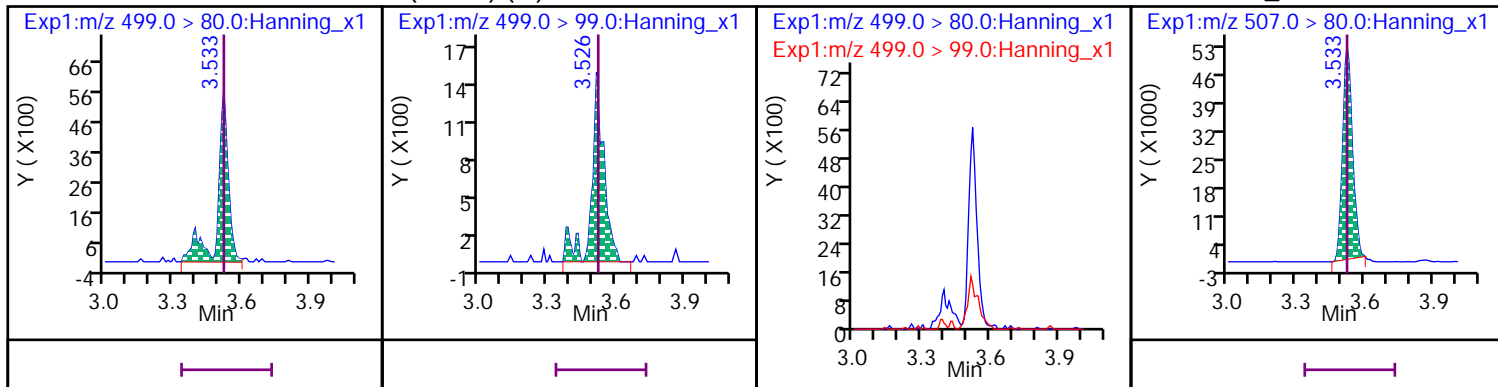
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (M)

D 45 13C3\_PFHxS



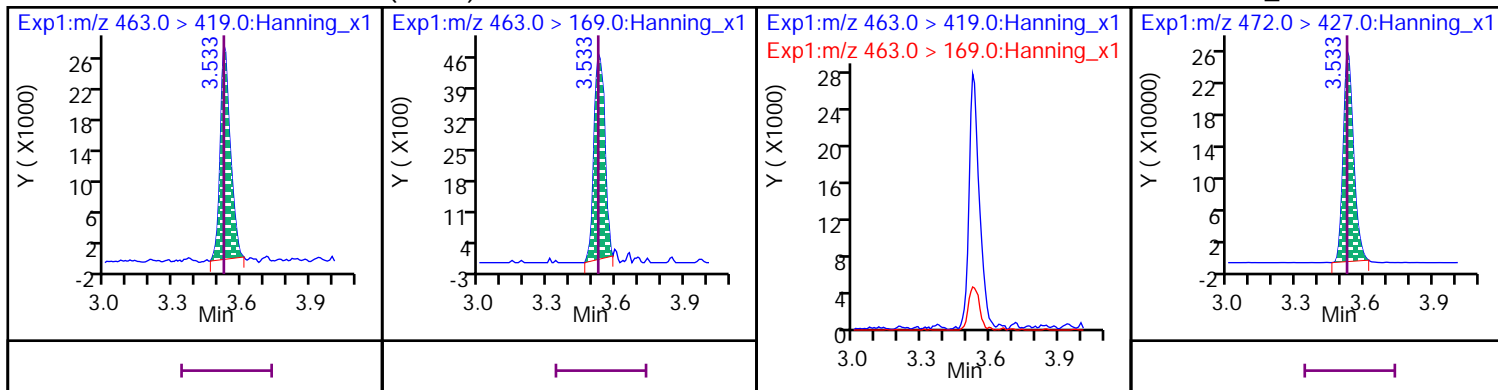
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



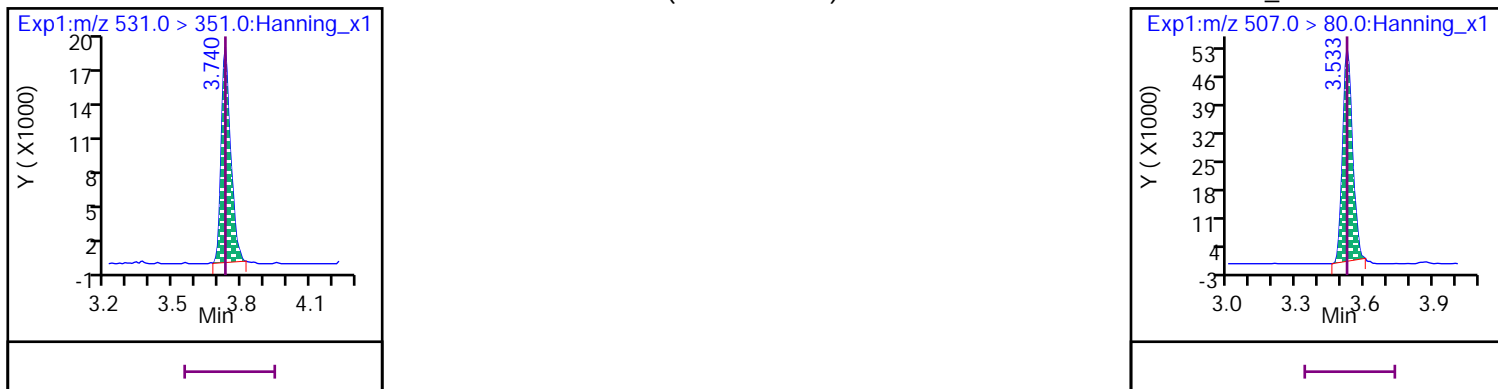
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



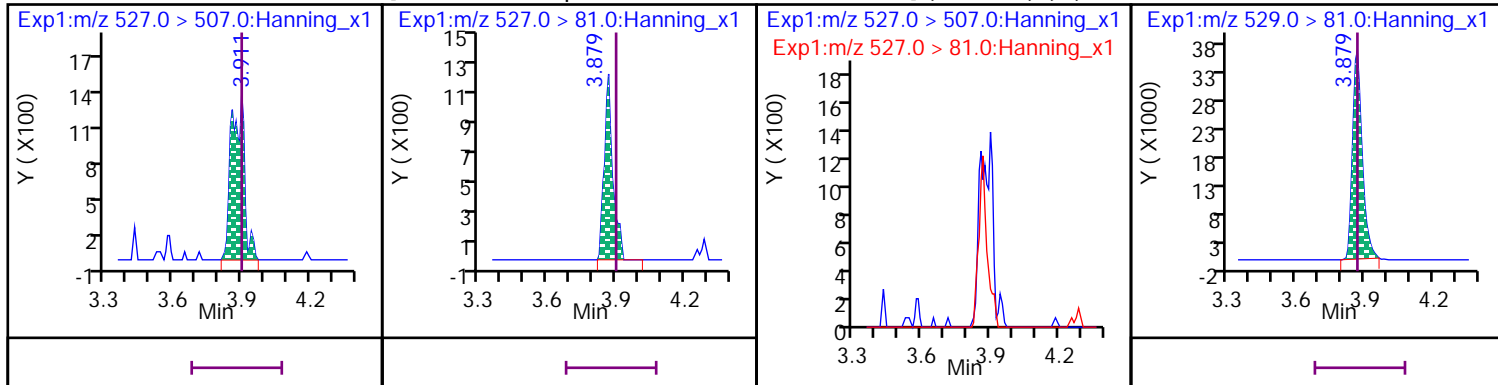
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



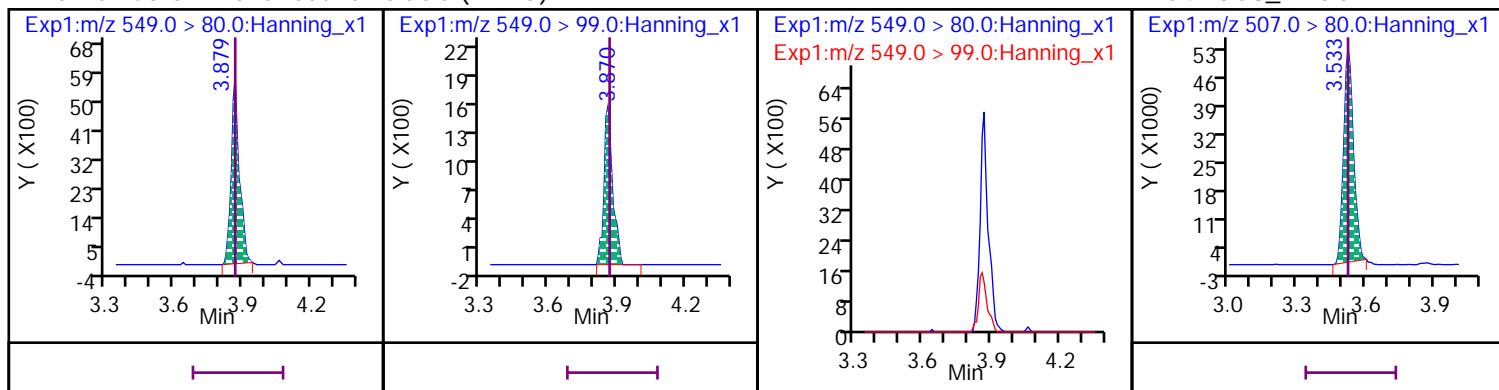
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



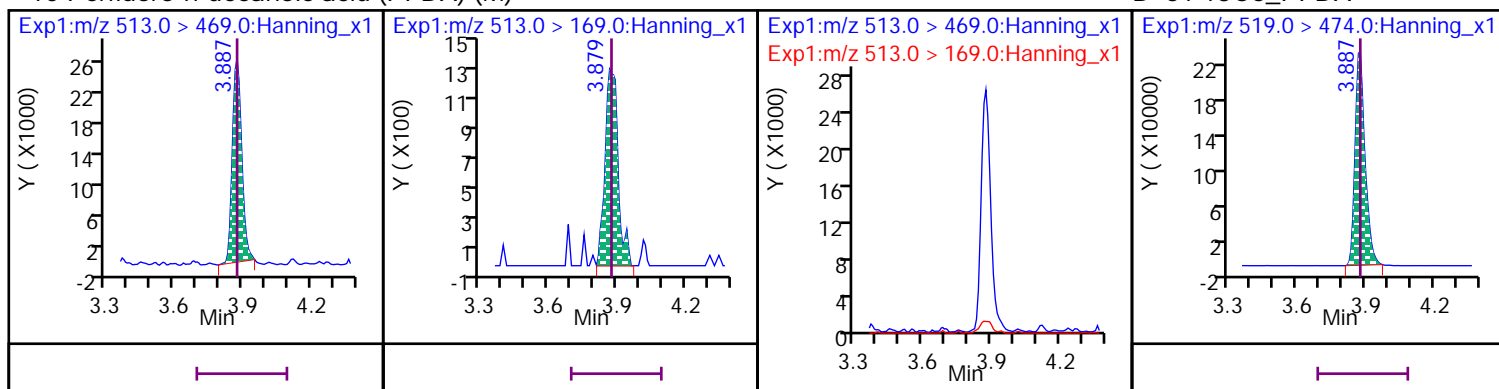
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



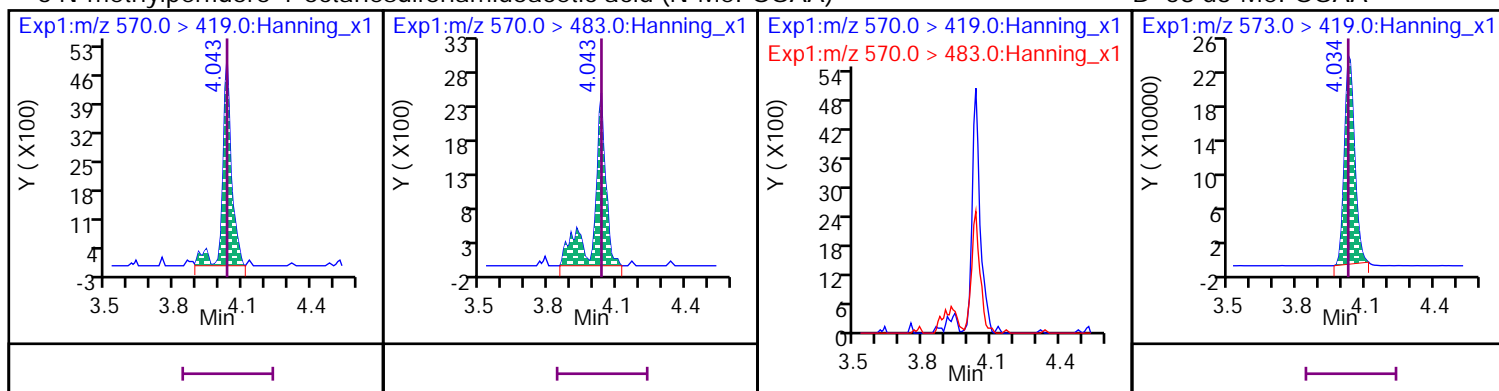
10 Perfluoro-n-decanoic acid (PFDA) (M)

D 51 13C6\_PFDA



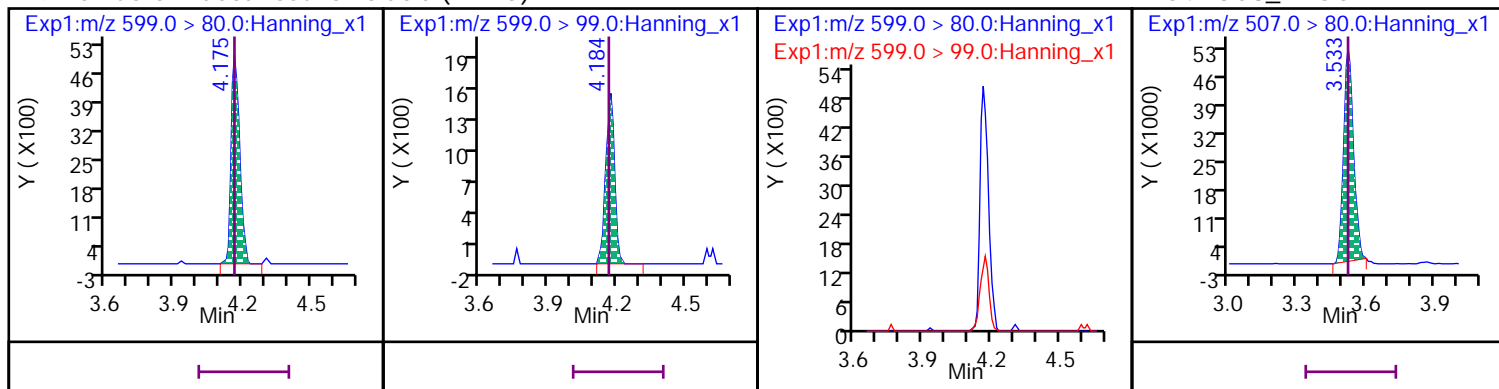
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



9 Perfluoro-1-decanesulfonic acid (PFDS)

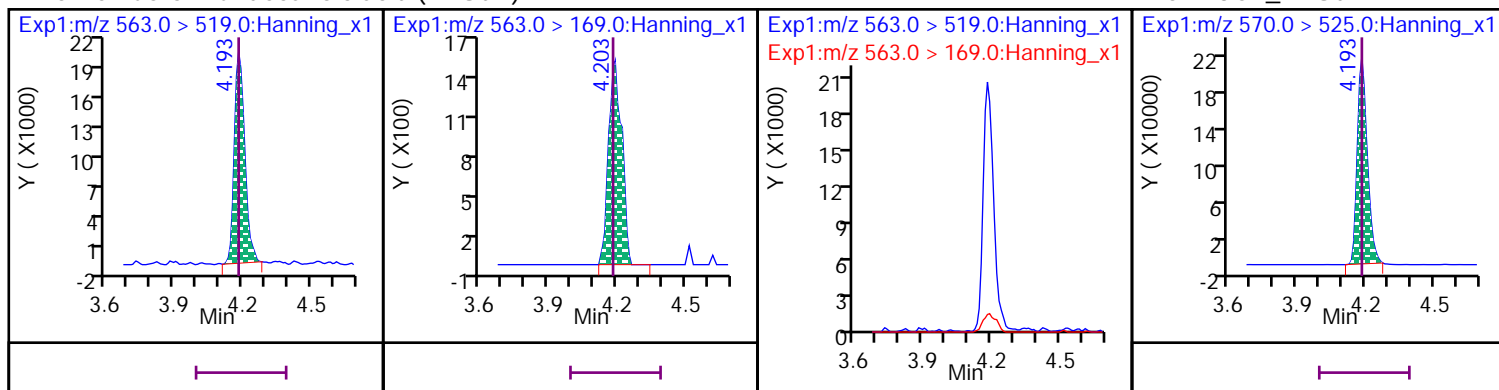
D 54 13C8\_PFOS





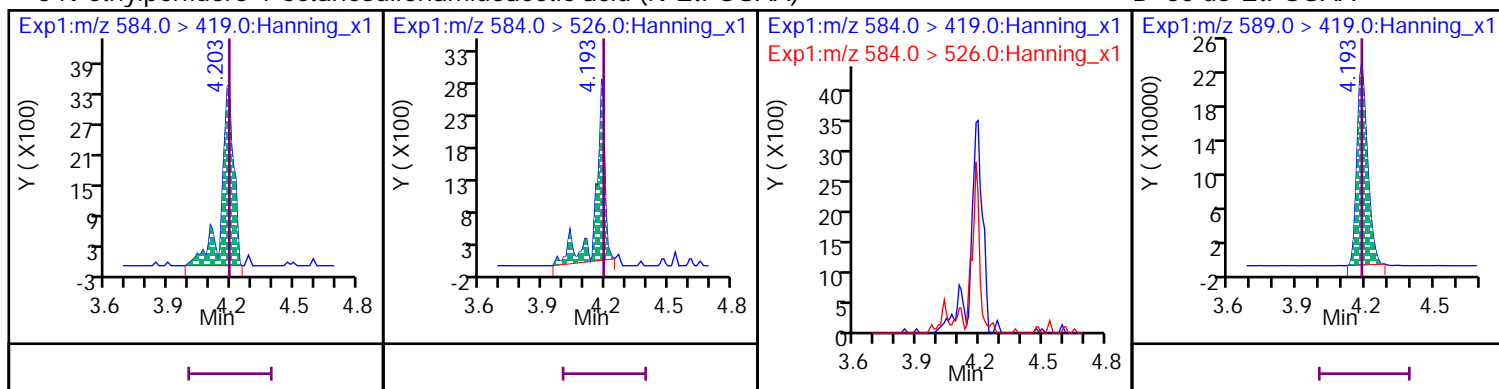
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



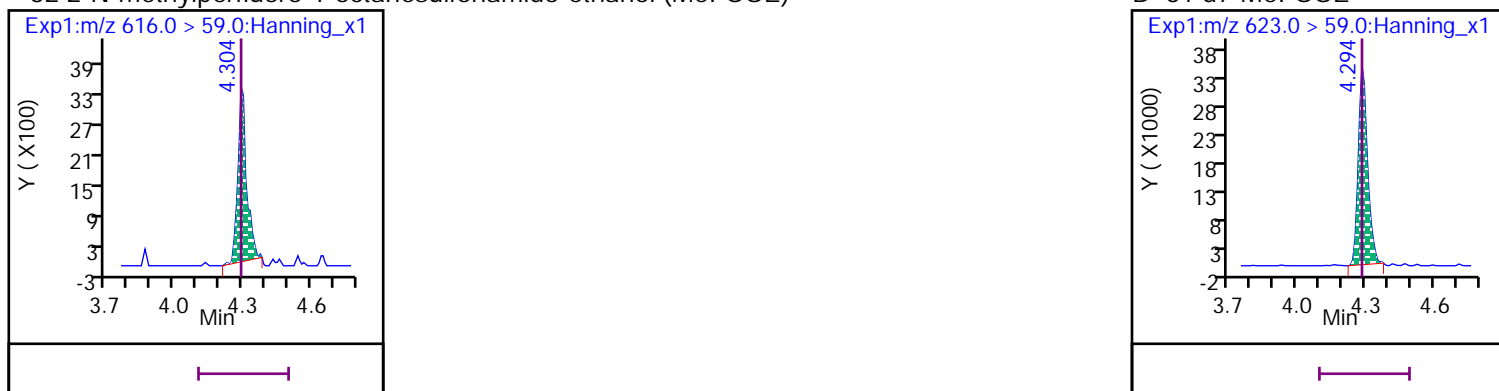
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



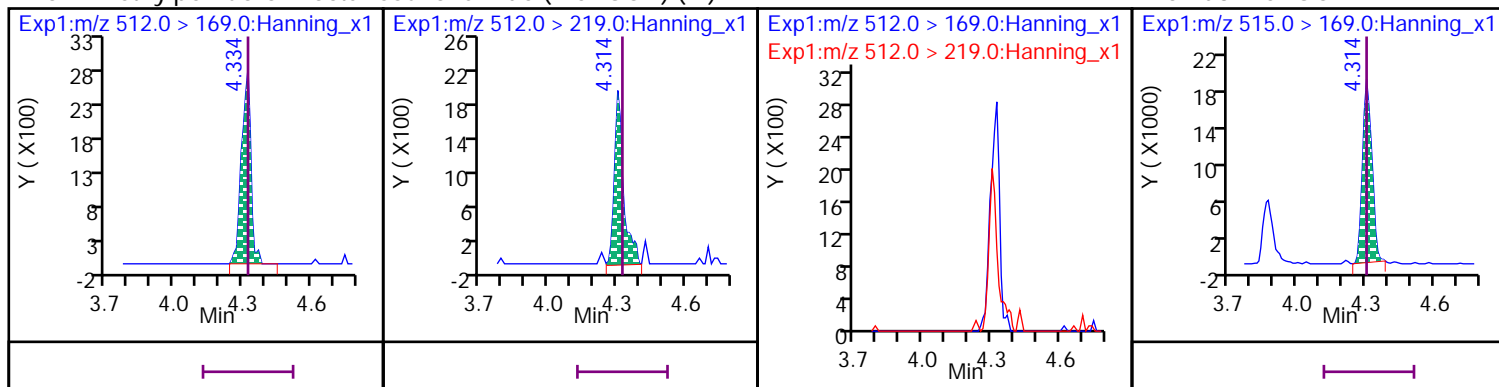
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

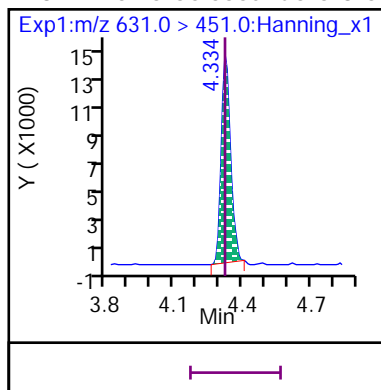


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (M)

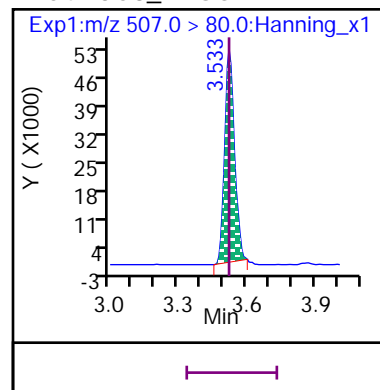
D 57 d3-MeFOSA



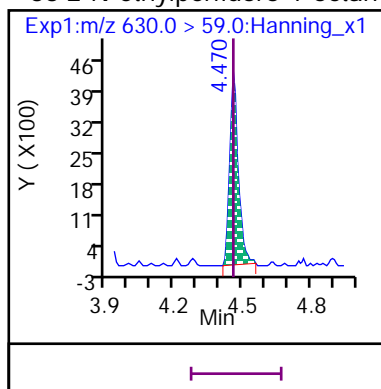
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



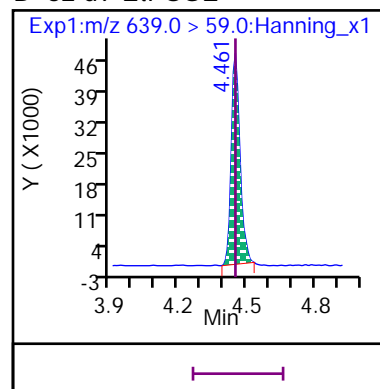
D 54 13C8\_PFOS



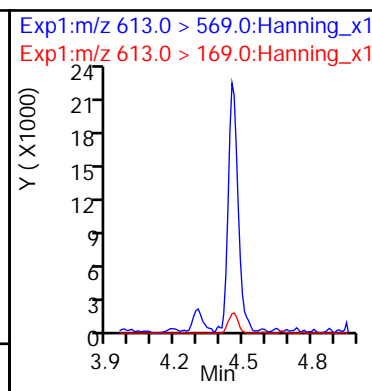
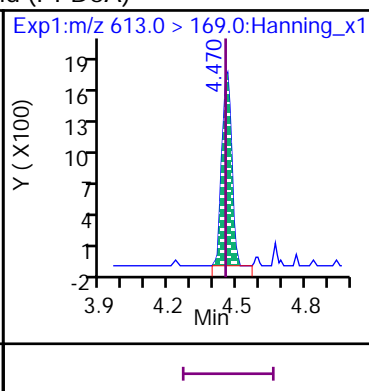
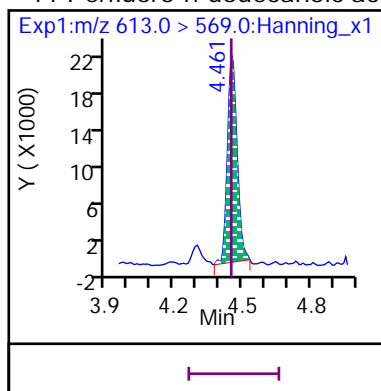
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



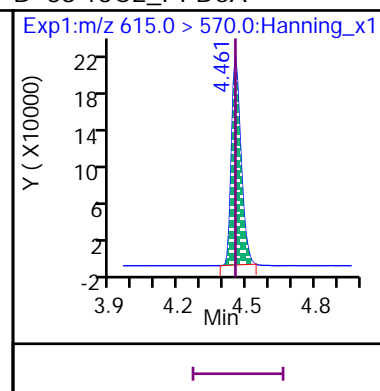
D 62 d9-EtFOSE



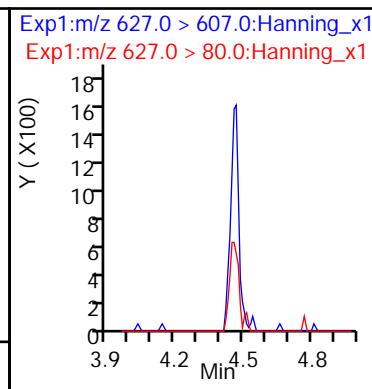
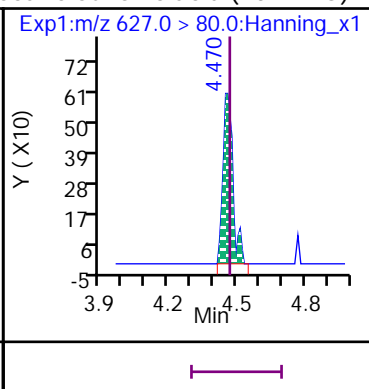
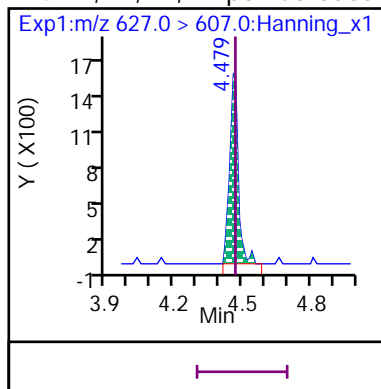
11 Perfluoro-n-dodecanoic acid (PFDoA)



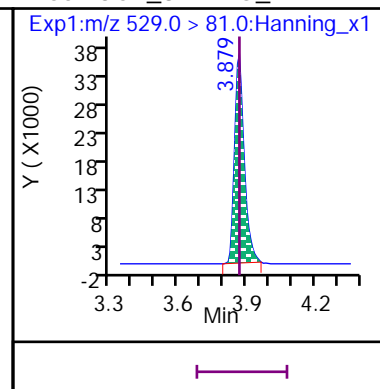
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

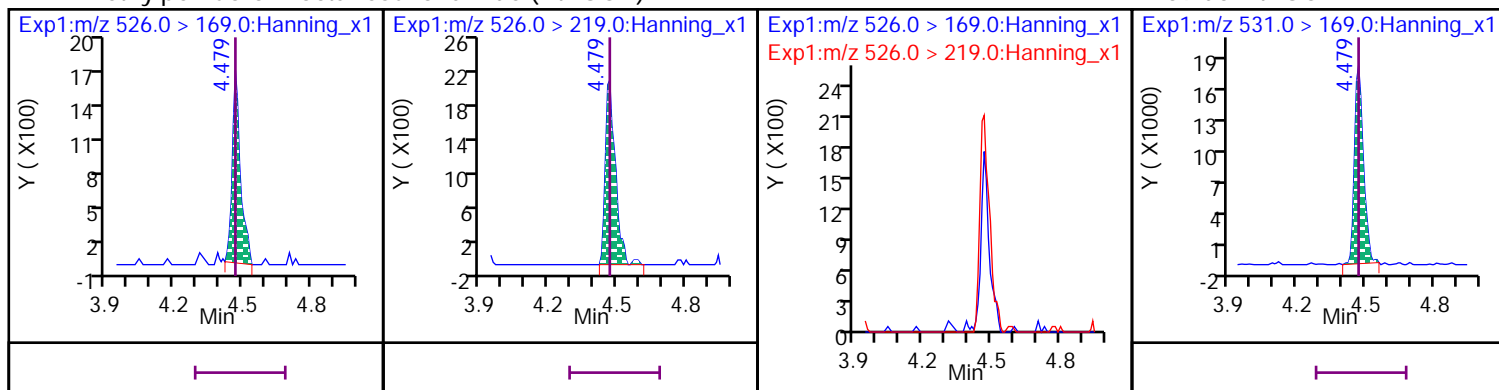


D 65 13C2\_8:2 FTS\_2



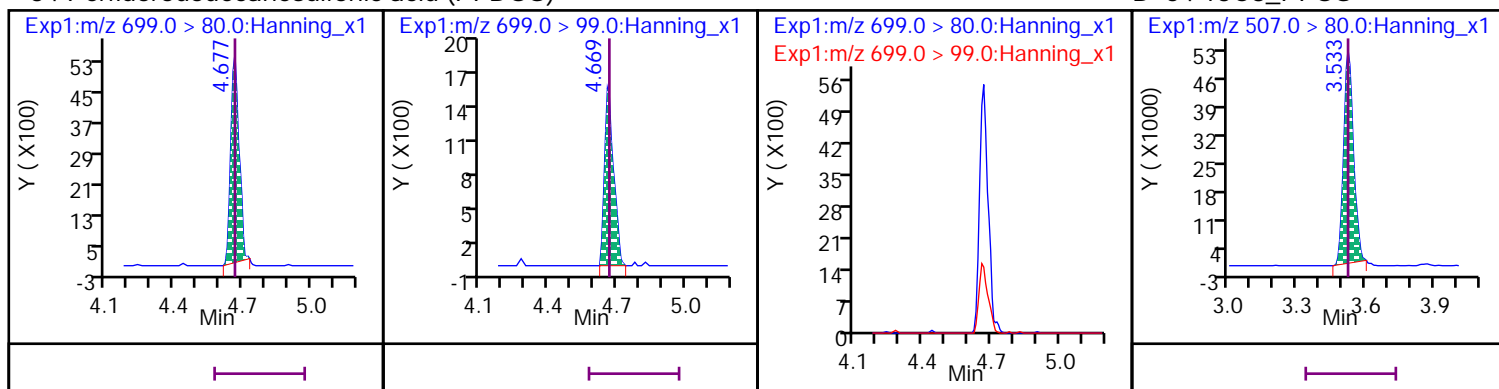
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



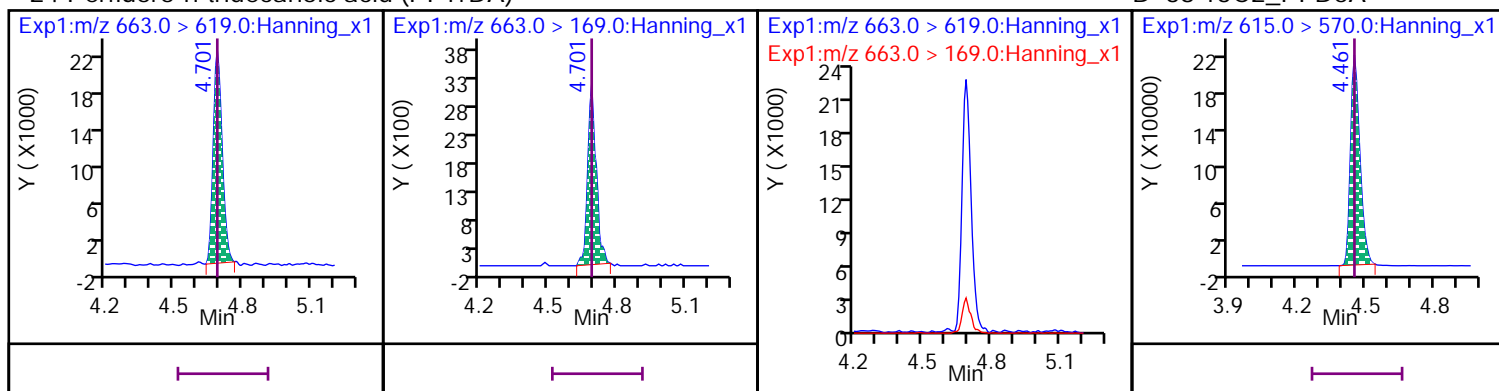
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



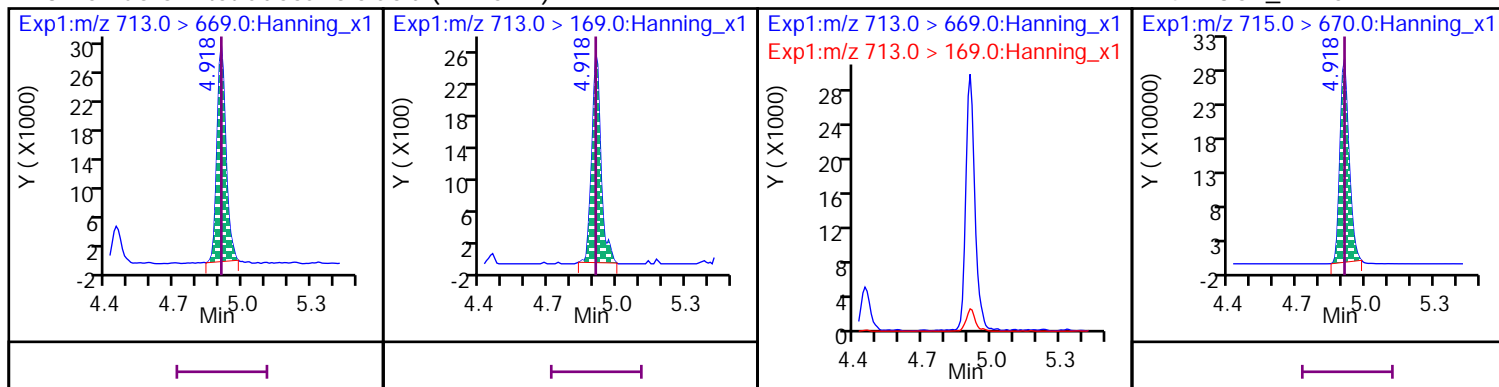
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



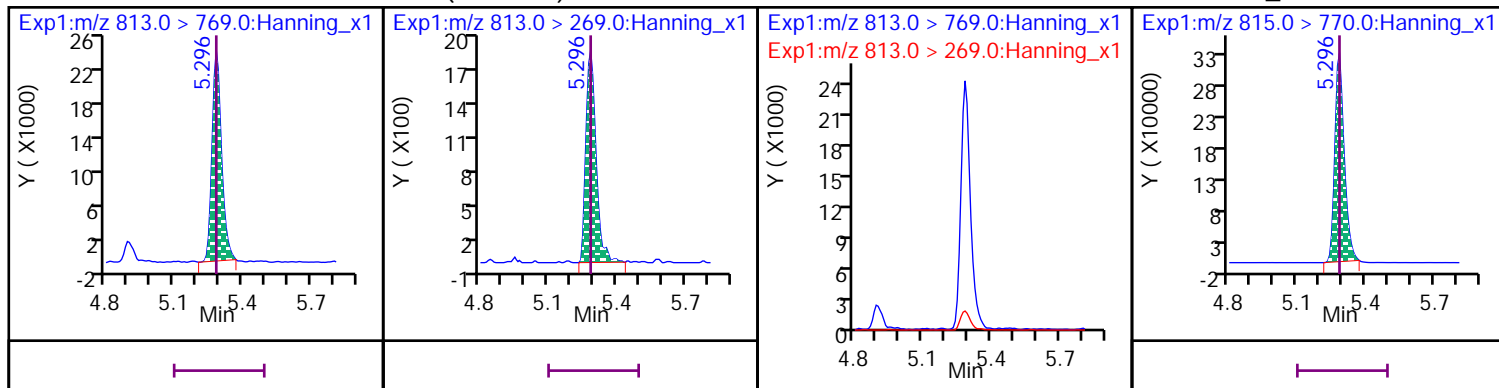
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



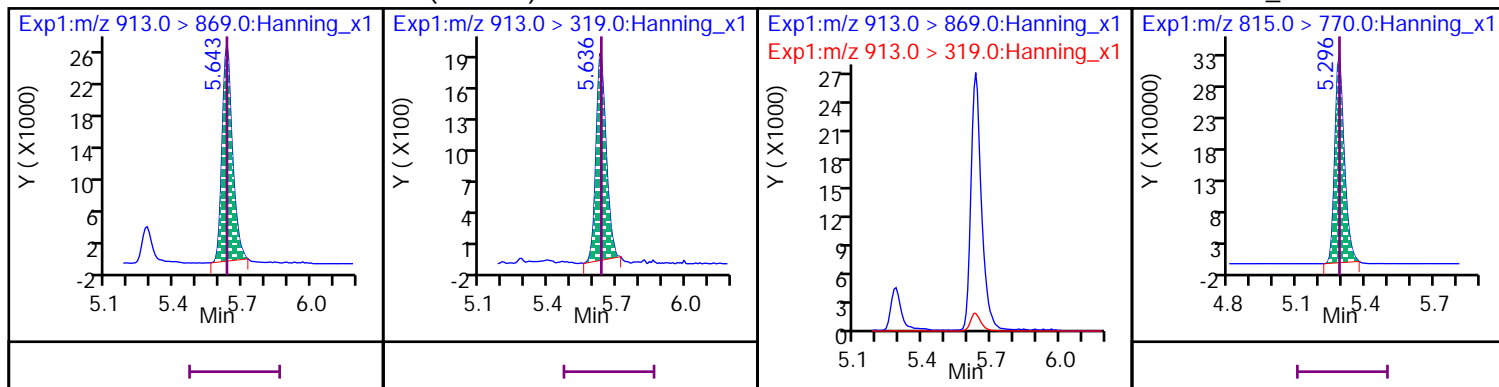
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

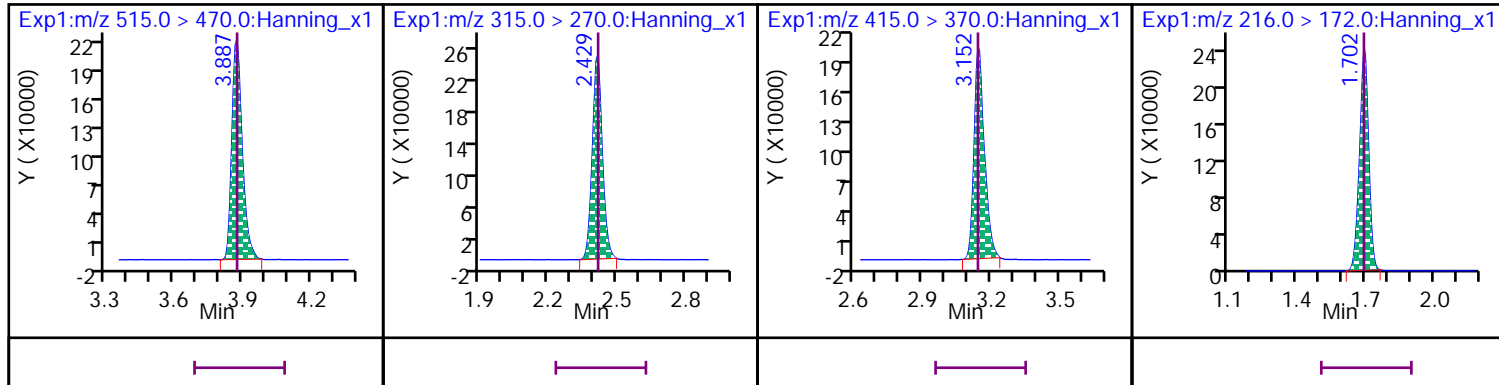


\* 37 13C2\_PFDA

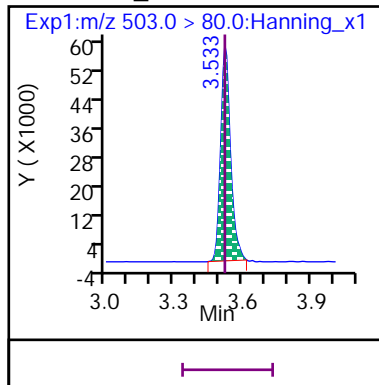
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOs



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

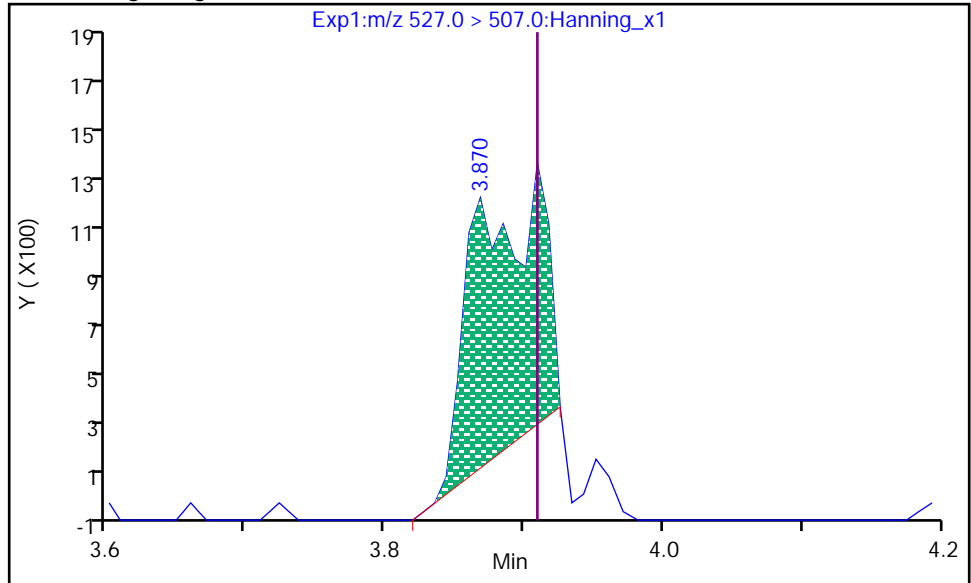
Dil. Factor: 1

Operator: Matthew M. Miller

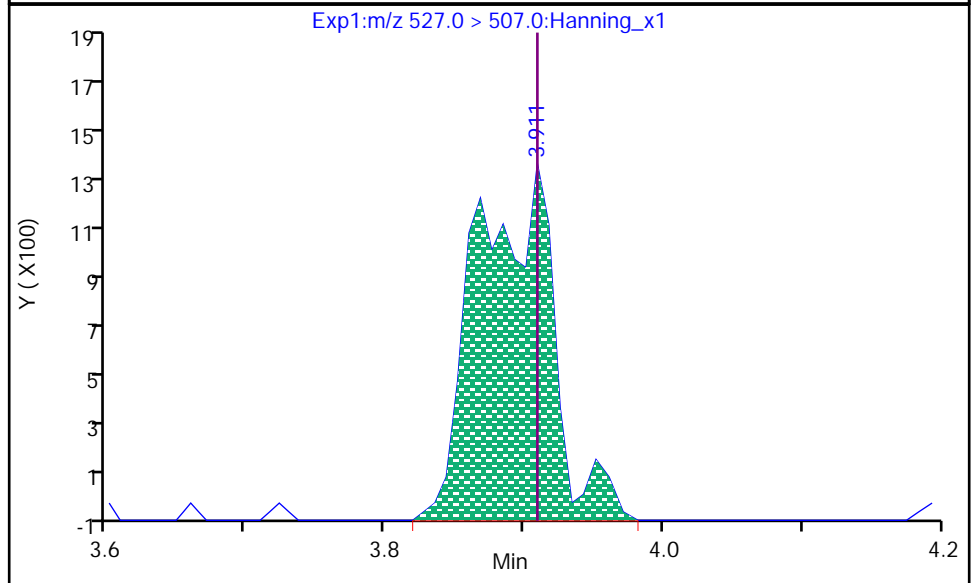
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.870  
Area: 3446  
Amount: 66.502  
Amount Units: ng/L



RT: 3.911  
Area: 5245  
Amount: 110.01  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 10:27:45

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

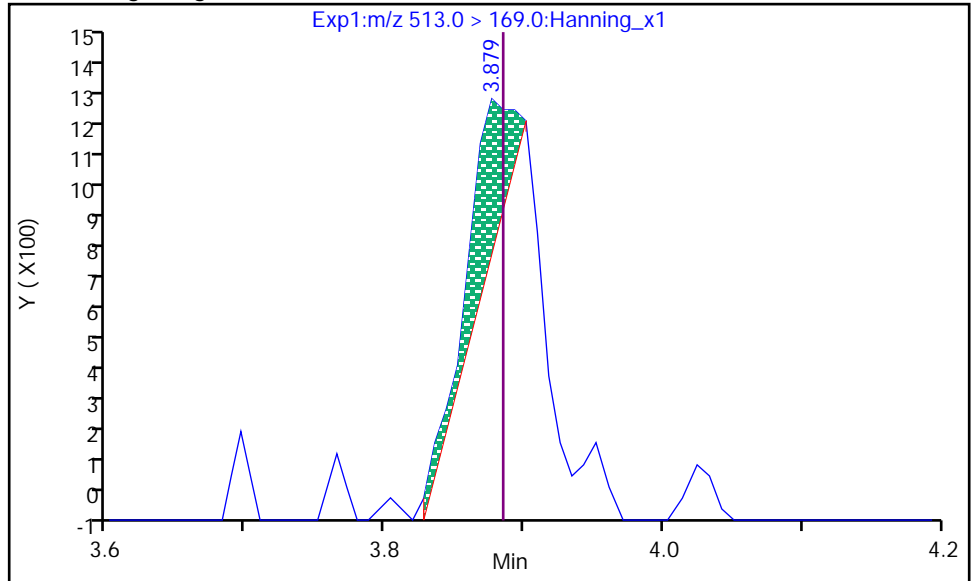
Dil. Factor: 1

Operator: Matthew M. Miller

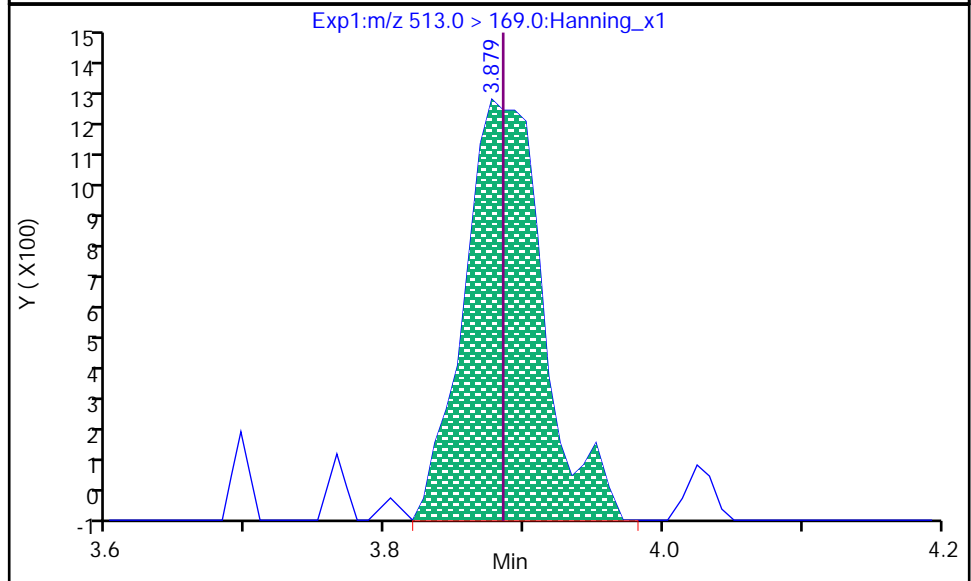
10 PFDA, CAS: 335-76-2

Processing Integration Results

RT: 3.879  
Area: 938  
Amount: 102.56  
Amount Units: ng/L



RT: 3.879  
Area: 4938  
Amount: 102.56  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:35:26

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

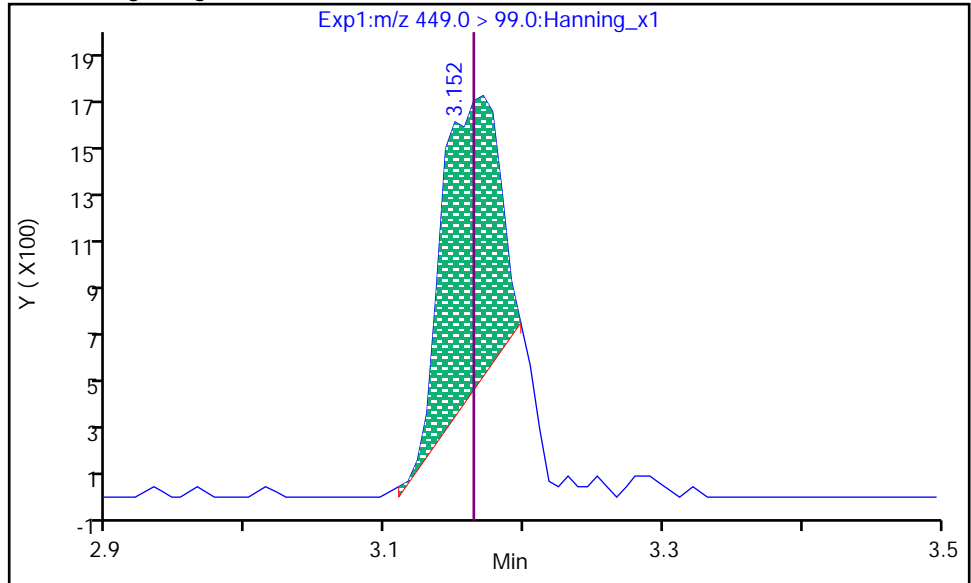
Dil. Factor: 1

Operator: Matthew M. Miller

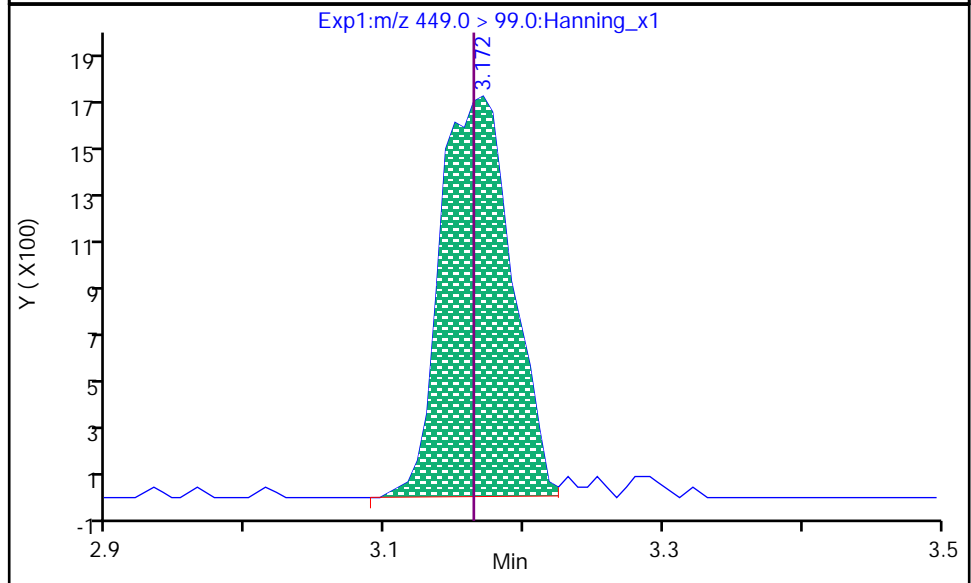
12 PFHpS, CAS: 375-92-8

Processing Integration Results

RT: 3.152  
Area: 3578  
Amount: 104.37  
Amount Units: ng/L



RT: 3.172  
Area: 6016  
Amount: 104.37  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:34:14

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

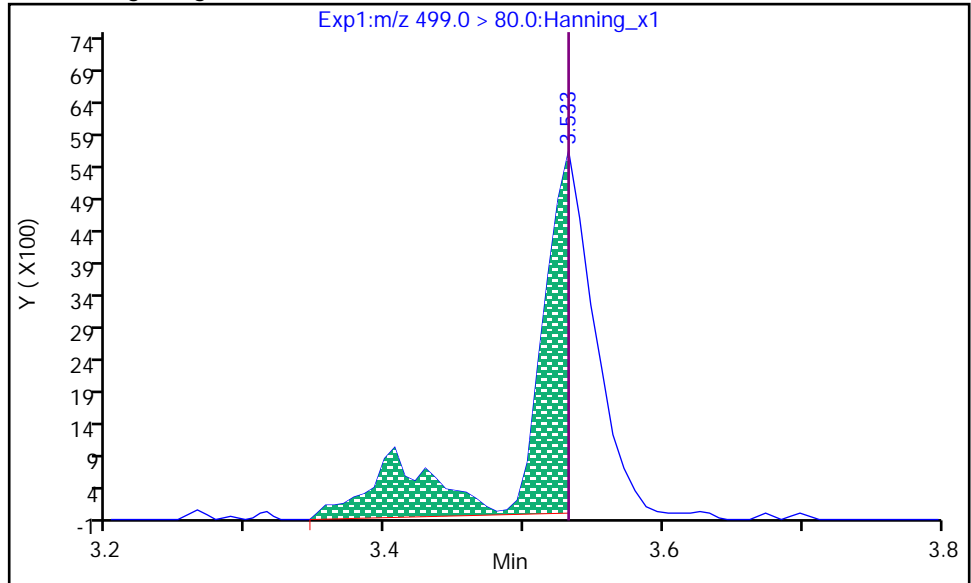
Dil. Factor: 1

Operator: Matthew M. Miller

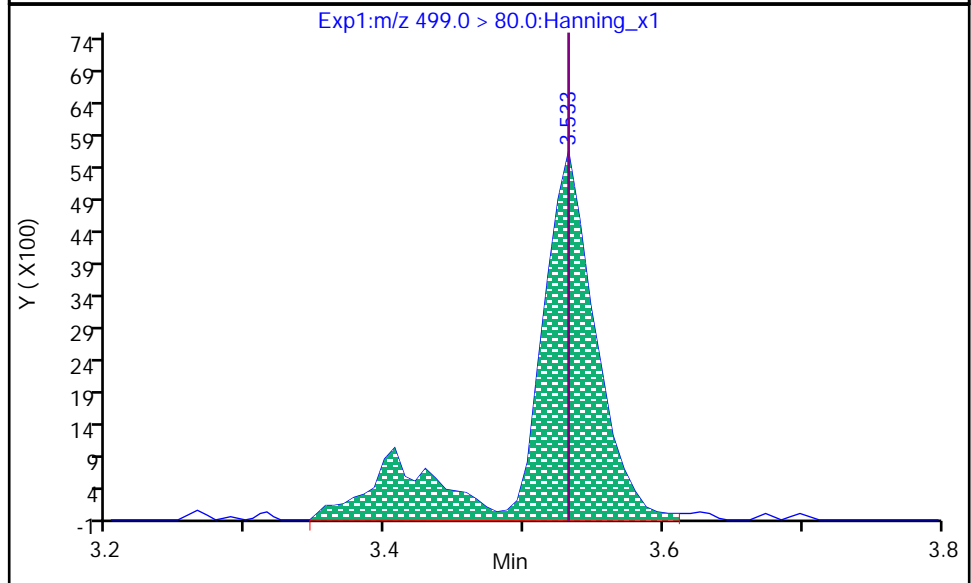
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.533  
Area: 9949  
Amount: 54.682  
Amount Units: ng/L



RT: 3.533  
Area: 18229  
Amount: 100.19  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 10:27:39

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

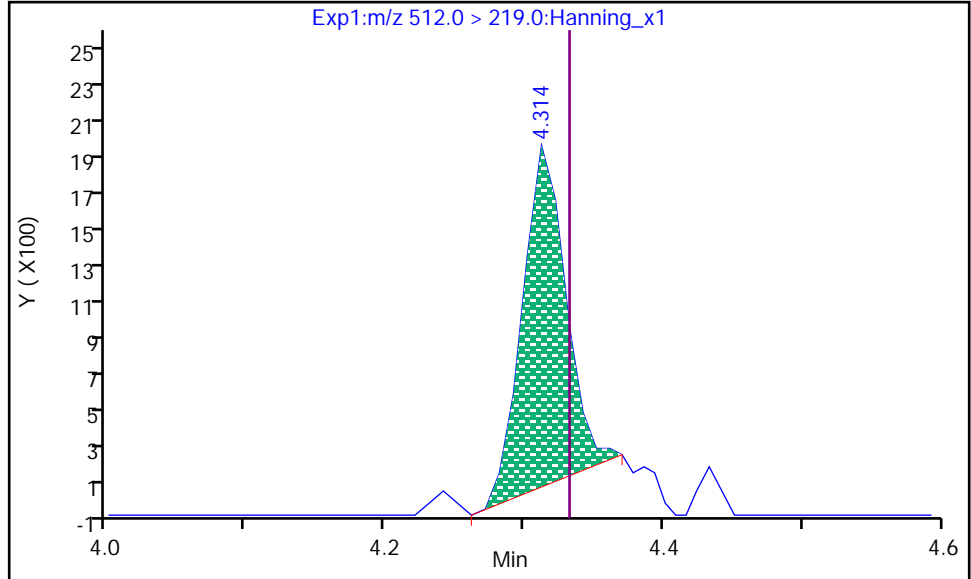
Dil. Factor: 1

Operator: Matthew M. Miller

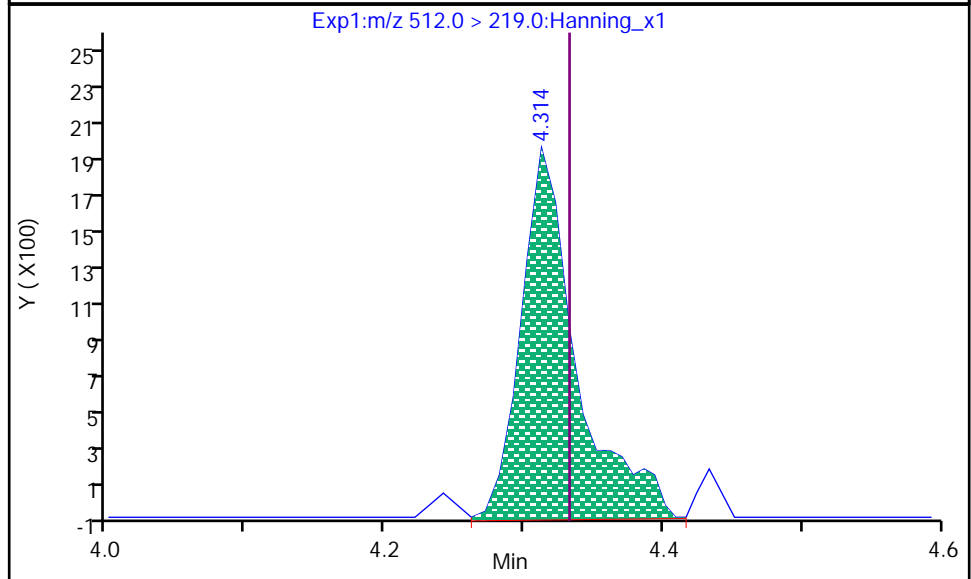
26 MeFOSA, CAS: 31506-32-8

Processing Integration Results

RT: 4.314  
Area: 3897  
Amount: 130.24  
Amount Units: ng/L



RT: 4.314  
Area: 5478  
Amount: 130.24  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:35:42

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d  
Injection Date: 29-Dec-2020 10:24:12 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.49	102	70 - 130
D 46 13C4_PFBA	669792	688588			103	50 - 150
D 50 13C5_PFPeA	688361	708040			103	50 - 150
21 PFPeA			200.00	199.24	99.6	70 - 130
7 PFBS			176.80	185.86	105	70 - 130
D 44 13C3_PFBS	241196	245383			102	50 - 150
1 4:2 FTS			186.80	183.02	98	70 - 130
D 63 13C2_4:2 FTS_2	136264	140370			103	50 - 150
D 49 13C5_PFHxA	755876	770487			102	50 - 150
15 PFHxA			200.00	203.73	102	70 - 130
22 PFPeS			187.60	195.58	104	70 - 130
28 GenX			400.00	386.83	96.7	70 - 130
D 66 13C3_GenX	1415766	1424329			101	50 - 150
D 47 13C4_PFHpA	613536	615197			100	50 - 150
13 PFHpA			200.00	214.41	107	70 - 130
D 45 13C3_PFHxS	185779	190236			102	50 - 150
14 PFHxS			182.00	171.05	94	70 - 130
29 ADONA			188.40	184.27	97.8	70 - 130
D 64 13C2_6:2 FTS_2	105371	109300			104	50 - 150
2 6:2 FTS			189.60	194.61	103	70 - 130
20 PFOA			200.00	191.52	95.8	70 - 130
D 53 13C8_PFOA	607240	617201			102	50 - 150
12 PFHpS			190.40	199.79	105	70 - 130
18 PFOS			185.60	186.33	100	70 - 130
17 PFNA			200.00	198.39	99.2	70 - 130
D 56 13C9_PFNA	787757	814662			103	50 - 150
D 54 13C8_PFOS	153541	164823			107	50 - 150
30 9CI-PF3ONS			186.40	181.71	97.5	70 - 130
D 55 13C8_PFOSA	318847	310617			97.4	50 - 150
19 PFOSA			200.00	206.63	103	70 - 130
16 PFNS			192.00	181.55	94.6	70 - 130
D 65 13C2_8:2 FTS_2	104593	93821			89.7	50 - 150
3 8:2 FTS			191.60	190.51	99.4	70 - 130
10 PFDA			200.00	188.95	94.5	70 - 130
D 51 13C6_PFDA	701677	702571			100	50 - 150
D 58 d3-MeFOSAA	727199	783818			108	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	221.56	111	70 - 130
9 PFDS			192.80	203.99	106	70 - 130
5 N-EtFOSAA			200.00	214.43	107	70 - 130
25 PFUdA			200.00	208.81	104	70 - 130
D 60 d5-EtFOSAA	710460	714919			101	50 - 150
D 52 13C7_PFUdA	641343	676868			106	50 - 150
D 61 d7-MeFOSE	96951	111121			115	50 - 150
32 MeFOSE			200.00	179.20	89.6	70 - 130
26 MeFOSA			200.00	223.35	112	70 - 130
D 57 d3-MeFOSA	52459	54336			104	50 - 150
31 11Cl-PF3OUDS			188.40	186.91	99.2	70 - 130
D 62 d9-EtFOSE	123442	119635			96.9	50 - 150
33 EtFOSE			200.00	183.43	91.7	70 - 130
D 59 d5-EtFOSA	48002	51915			108	50 - 150
D 38 13C2_PFDoA	609821	626300			103	50 - 150
4 10:2 FTS			192.80	228.33	118	70 - 130
27 EtFOSA			200.00	210.48	105	70 - 130
11 PFDoA			200.00	190.54	95.3	70 - 130
34 PFDOS			193.60	179.09	92.5	70 - 130
24 PFTrDA			200.00	197.62	98.8	70 - 130
23 PFTeDA			200.00	211.05	106	70 - 130
D 42 13C2_PFTeDA	786208	804927			102	50 - 150
35 PFHxDA			200.00	211.85	106	70 - 130
D 40 13C2_PFHxDA	908883	937823			103	50 - 150
36 PFODA			200.00	194.50	97.2	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d  
Injection Date: 29-Dec-2020 10:24:12 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	688588	23	>100:1			1000.00	992.84	103	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.709	0/-1	140247	29	75:1			200.00	204.49		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.080	0	708040	17	>100:1			1000.00	1029.30	103	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.080	0/0	141831	15	>100:1			200.00	199.24		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	245383	16	>100:1			1000.00	1065.81	102	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.133	0/0	53771	18	>100:1	Target = 3.50		176.80	185.86		
298.9 > 99	44	2.130	2.133		13438	15	100:1	4.00 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.446	1/1	41631	19	>100:1	Target = 3.10		187.60	195.58		
349 > 99	44	2.451	2.446		13199	26	>100:1	3.15 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.393	0	140370	19	>100:1			5000.00	5798.42	103	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.397	2.393	1/1	10254	23	44:1	Target = 1.80		186.80	183.02		
327 > 81	63	2.388	2.393		4977	15	15:1	2.06 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.429	0	770487	21	>100:1			1000.00	1045.34	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.420	1/1	154978	20	>100:1	Target = 18.34		200.00	203.73		
313 > 119	49	2.424	2.420		7987	22	57:1	19.40 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.536	0	1424329	20	>100:1			5000.00	5347.50	101	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.536	0/0	79170	19	>100:1	Target = 0.81		400.00	386.83		
285 > 185	66	2.531	2.536		98762	24	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.777	1	615197	19	>100:1			1000.00	1014.09	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.786	0/-1	136818	20	>100:1	Target = 3.70		200.00	214.41		
363 > 169	47	2.782	2.786		38702	20	>100:1	3.53 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	190236	20	>100:1			1000.00	1111.01	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.795	0/0	34501	26	>100:1	Target = 3.21	0.16	182.00	171.05		
399 > 99	45	2.800	2.795		11863	28	59:1	2.90 (1.60-4.81)	0.13				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.823	0/0	222554	19	>100:1	Target = 2.97		188.40	184.27		
377 > 85	45	2.818	2.823		68725	21	>100:1	3.23 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.162	3.166	0/0	34527	31		Target = 3.08		190.40	199.79		
449 > 99	45	3.155	3.166		12298	27	>100:1	2.80 (1.54-4.63)					M
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.132	0	109300	25	>100:1			5000.00	5675.45	104	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.139	0/0	9832	22	>100:1	Target = 1.80		189.60	194.61		
427 > 81	64	3.121	3.139		6505	37	54:1	1.51 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.159	0	617201	28	>100:1			1000.00	1042.81	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.159	0/0	120506	21	77:1	Target = 2.87		200.00	191.52		
413 > 169	53	3.155	3.159		43450	22	>100:1	2.77 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.529	3.533	0	164823	21	>100:1			1000.00	1099.34	107	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.533	0/0	36393	38	>100:1	Target = 3.84	0.26	185.60	186.33		
499 > 99	54	3.529	3.533		10850	43		3.35 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.740	0/0	100826	28	>100:1			186.40	181.71		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.879	0/0	22900	21	>100:1	Target = 3.07		192.00	181.55		
549 > 99	54	3.874	3.879		10201	24	48:1	2.24 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.171	4.175	0/0	24401	15		Target = 3.03		192.80	203.99		
599 > 99	54	4.171	4.175		8776	21	52:1	2.78 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	87490	19	>100:1			188.40	186.91		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.677	0/0	23698	18	>100:1	Target = 3.33		193.60	179.09		
699 > 99	54	4.673	4.677		7584	18	>100:1	3.12 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	814662	24	>100:1			1000.00	1084.82	103	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.533	0/0	161628	20	>100:1	Target = 6.16		200.00	198.39		
463 > 169	56	3.529	3.533		25973	20	>100:1	6.22 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.854	1	310617	19				1000.00	1003.40	97.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.854	1/0	63250	18	>100:1			200.00	206.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.879	0	93821	21				5000.00	5057.70	89.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.911	-2/-2	7690	16	44:1	Target = 1.95		191.60	190.51		
527 > 81	65	3.866	3.911		4872	27	44:1	1.57 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.479	0/0	9901	22		Target = 3.14		192.80	228.33		
627 > 80	65	4.474	4.479		2982	24		3.32 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.883	3.887	0	702571	21	>100:1			1000.00	1059.15	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.883	3.887	0/0	130441	18	>100:1	Target = 15.94		200.00	188.95		
513 > 169	51	3.874	3.887		10384	18	46:1	12.56 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.039	4.034	1	783818	19	>100:1			5000.00	5460.65	108	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.039	4.043	0/-1	26680	34		Target = 1.33	0.07	200.00	221.56		M
570 > 483	58	4.039	4.043		17672	38	>100:1	1.50 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	714919	18	>100:1			5000.00	5382.83	101	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.203	0/0	30524	33	89:1	Target = 1.58	0.03	200.00	214.43		
584 > 526	60	4.207	4.203		18289	31	78:1	1.66 (0.79-2.37)	0.19				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	676868	18	>100:1			1000.00	1070.87	106	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.193	1/1	132838	17	>100:1	Target = 15.50		200.00	208.81		
563 > 169	52	4.188	4.193		8645	26	38:1	15.36 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	111121	15	>100:1			1000.00	1026.92	115	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	18710	17	>100:1			200.00	179.20		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.314	1	54336	14	91:1			1000.00	1026.82	104	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.334	0/-1	13692	21	89:1	Target = 1.12		200.00	223.35		
512 > 219	57	4.318	4.334		9689	15	56:1	1.41 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.461	0	119635	17	>100:1			1000.00	954.06	96.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.470	1/1	19524	21	>100:1			200.00	183.43		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.461	1	626300	17	>100:1			1000.00	1034.66	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.461	1/0	120845	17	55:1	Target = 10.85		200.00	190.54		
613 > 169	38	4.465	4.461		12130	16	65:1	9.96 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.697	4.701	0/-1	121905	19	>100:1	Target = 8.37		200.00	197.62		
663 > 169	38	4.697	4.701		14921	37	>100:1	8.17 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	51915	17	>100:1			1000.00	1057.45	108	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.479	1/0	11938	15	62:1	Target = 1.03		200.00	210.48		
526 > 219	59	4.483	4.479		11740	23		1.01 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.916	4.918	0	804927	18	>100:1			1000.00	955.47	102	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.916	4.918	0/0	147189	21	20:1	Target = 12.11		200.00	211.05		
713 > 169	42	4.916	4.918		11798	18	78:1	12.47 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	937823	20	>100:1			1000.00	1034.94	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	129815	17	37:1	Target = 11.48		200.00	211.85		
813 > 269	40	5.292	5.296		12108	40	>100:1	10.72 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.640	5.643	0/0	161466	25	19:1	Target = 13.88		200.00	194.50		
913 > 319	40	5.633	5.643		11986	25	>100:1	13.47 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.883	3.887	0	680248	19	>100:1					98.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.429	0	750108	21	>100:1					103	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.155	3.152	1	620593	25	>100:1					101	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	635780	25	>100:1					99.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.529	3.533	0	177266	21	>100:1					103	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

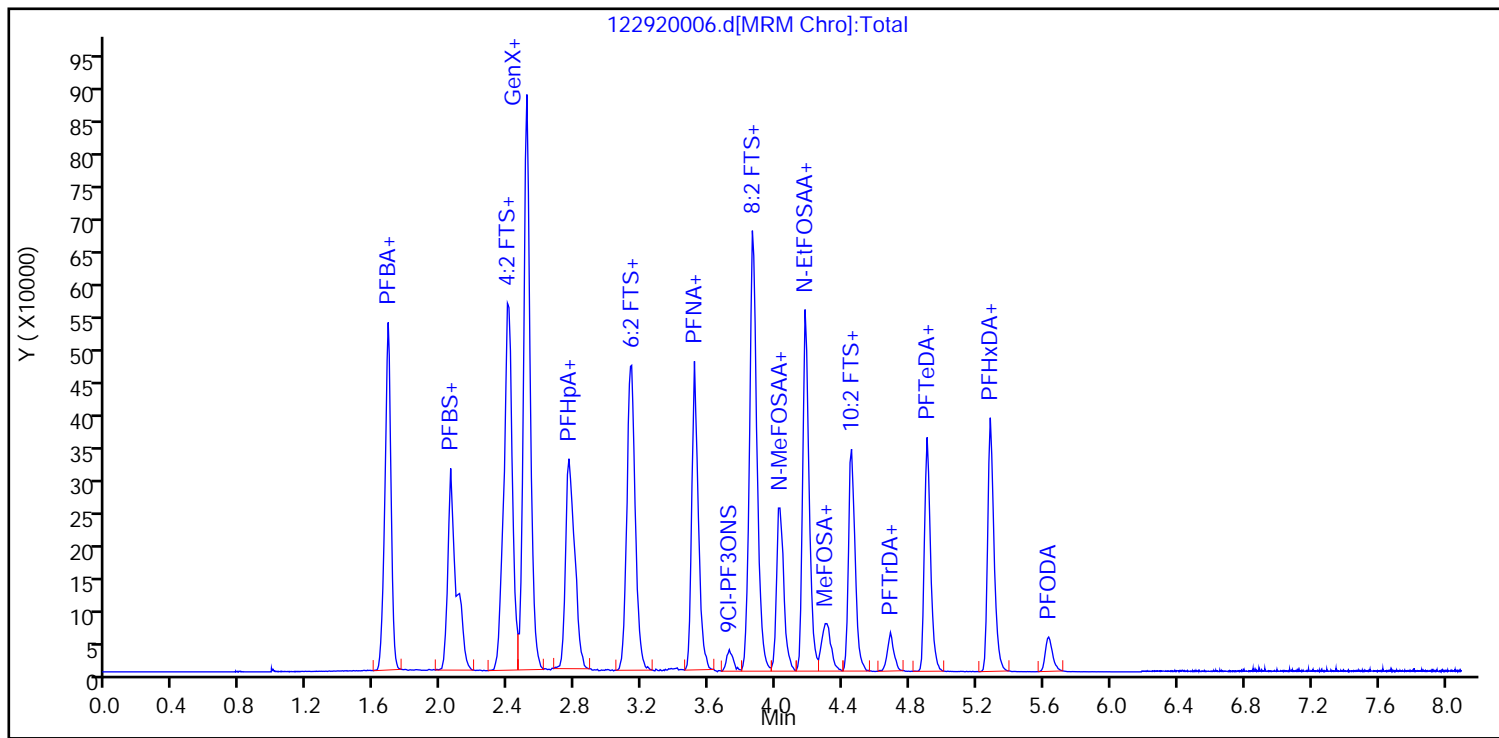
Client ID:

Lab ID: ID CCV 200\_SVLC-1221

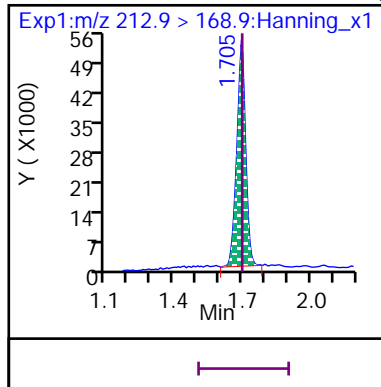
Sample Info: ID CCV 200\_SVLC-1221

Dil. Factor: 1

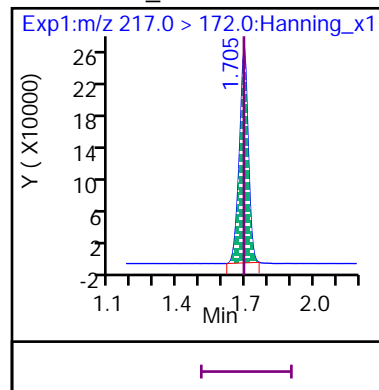
Operator: Matthew M. Miller



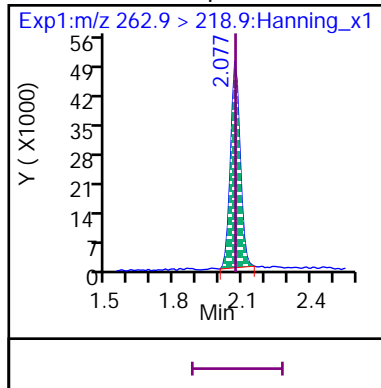
8 Perfluoro-n-butanoic acid (PFBA)



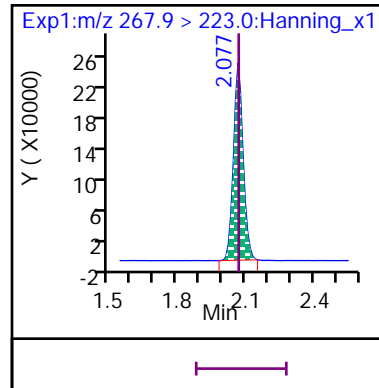
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



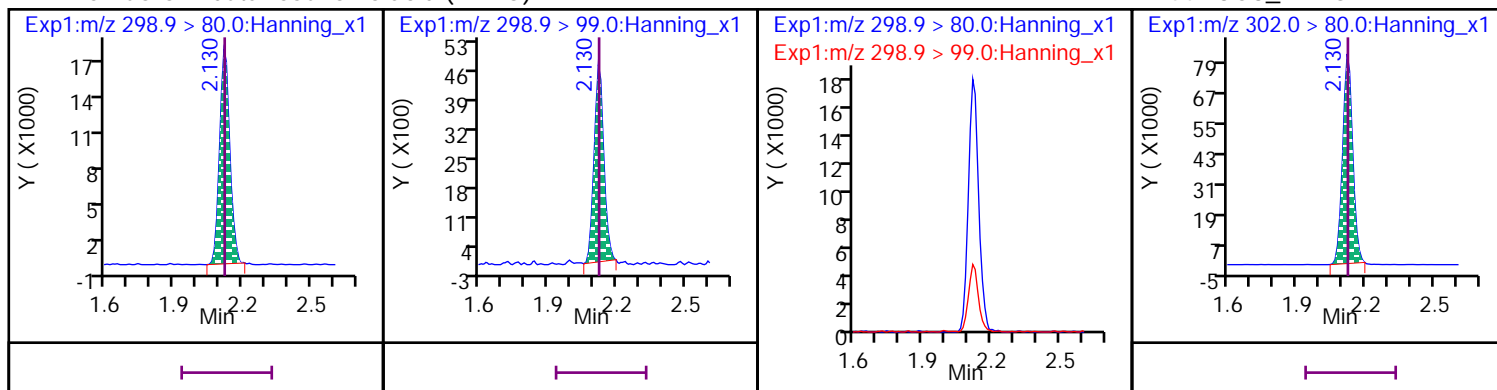
D 50 13C5\_PFPeA





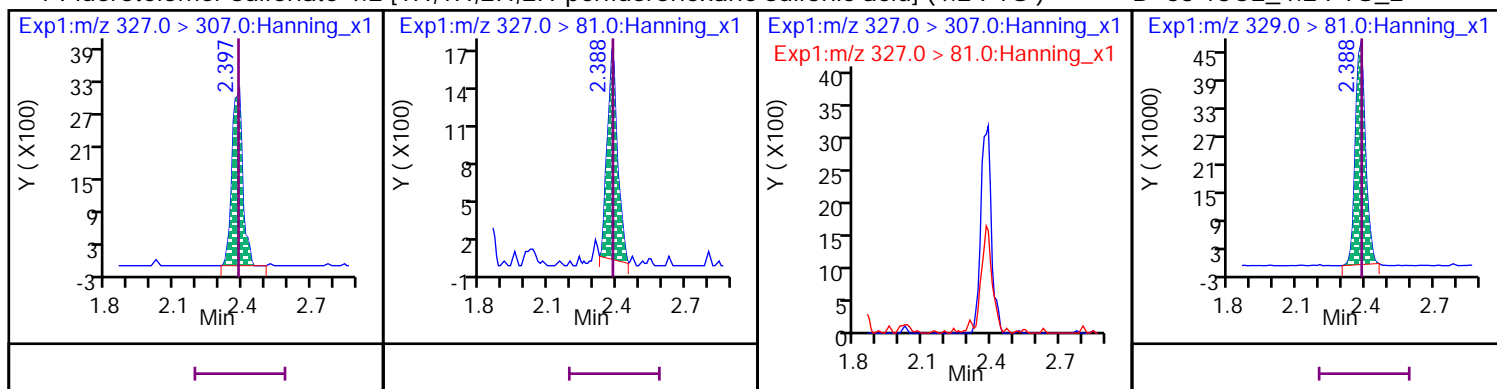
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



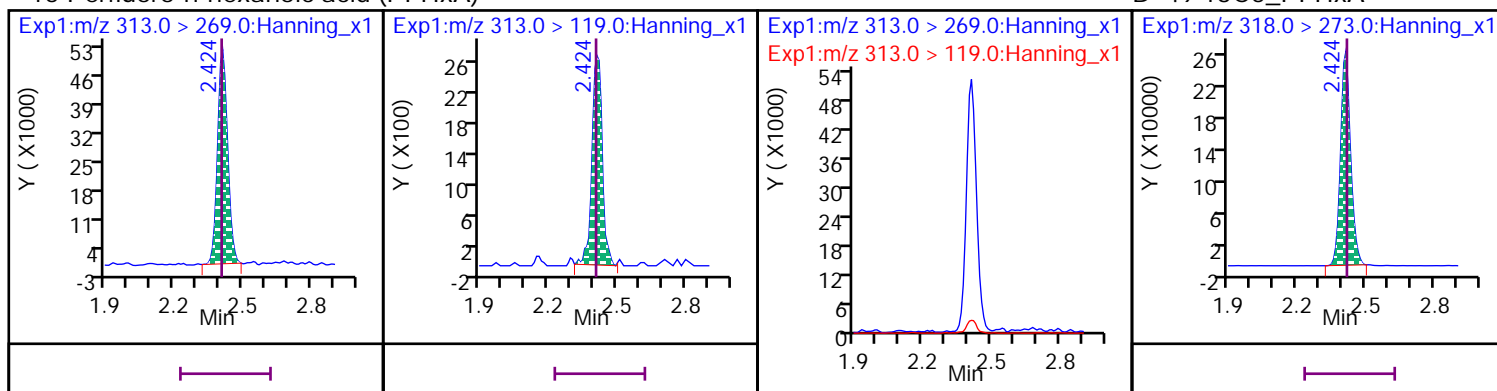
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



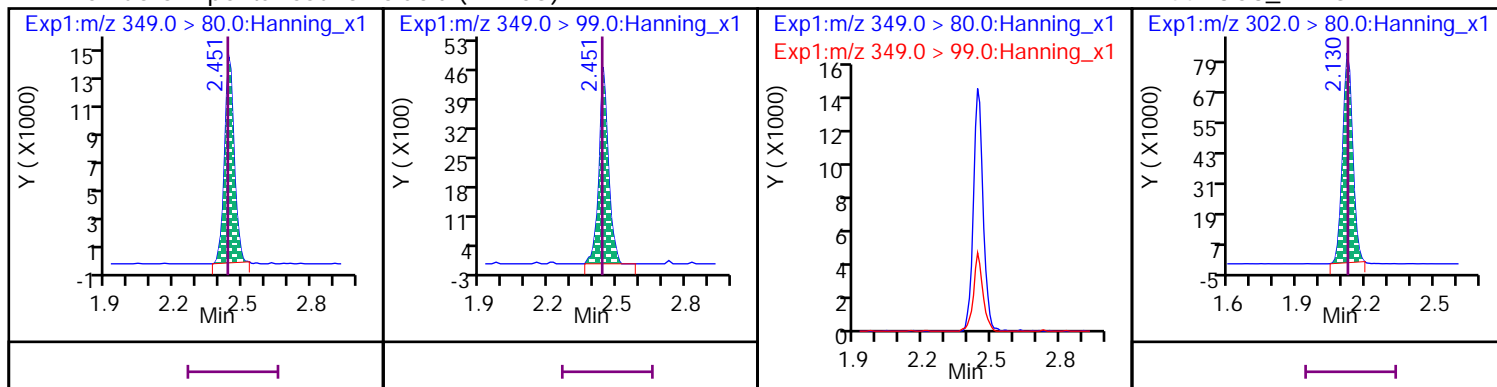
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



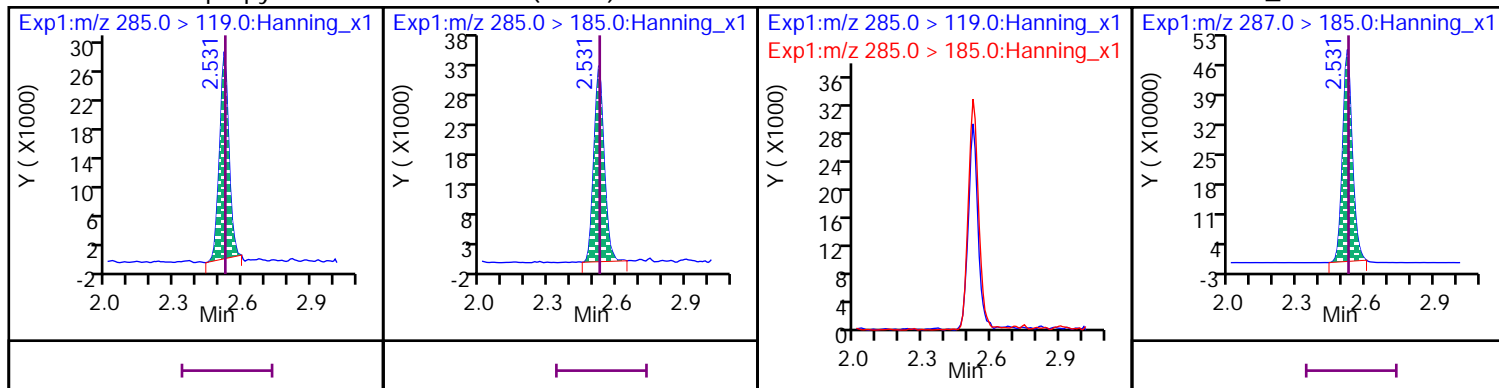
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



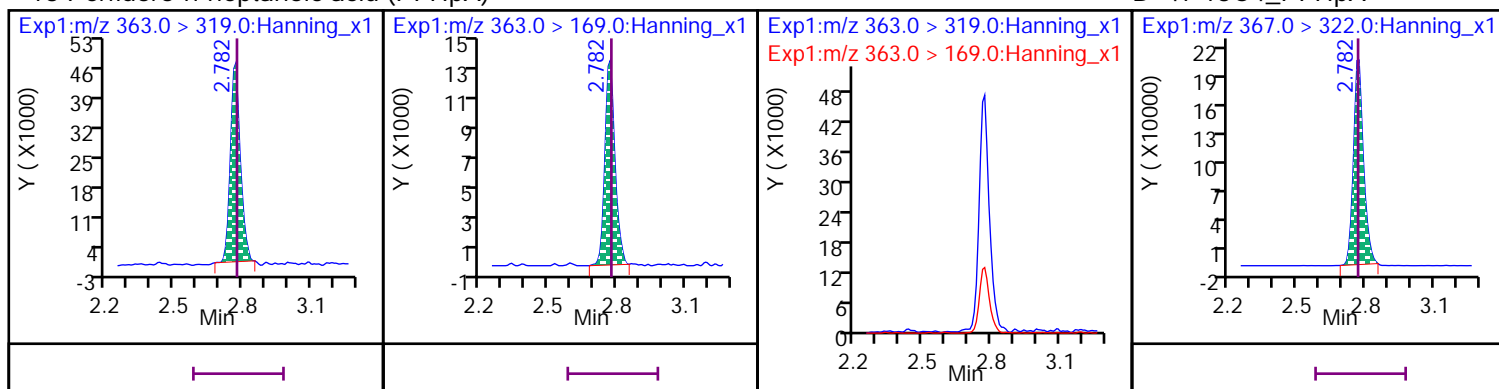
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



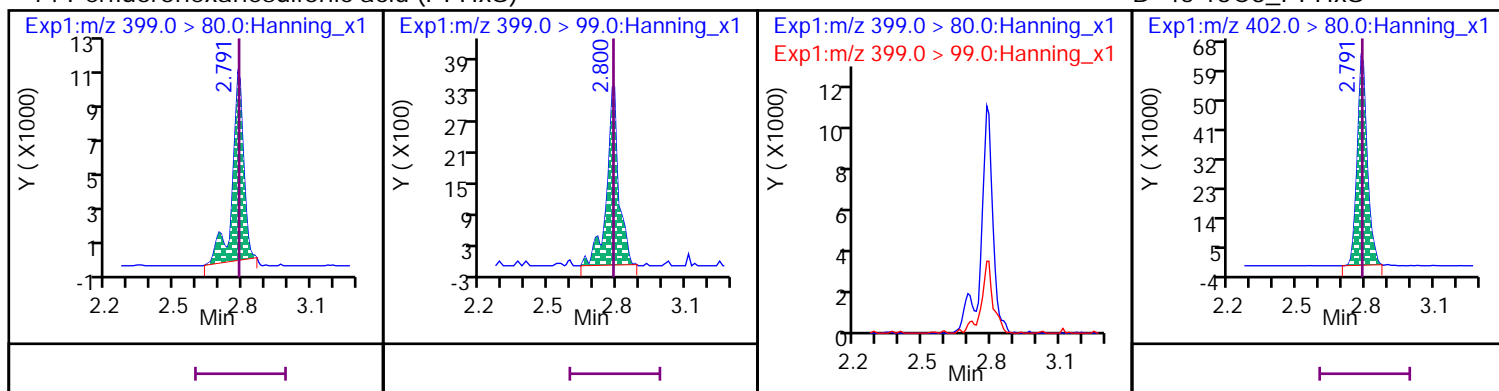
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



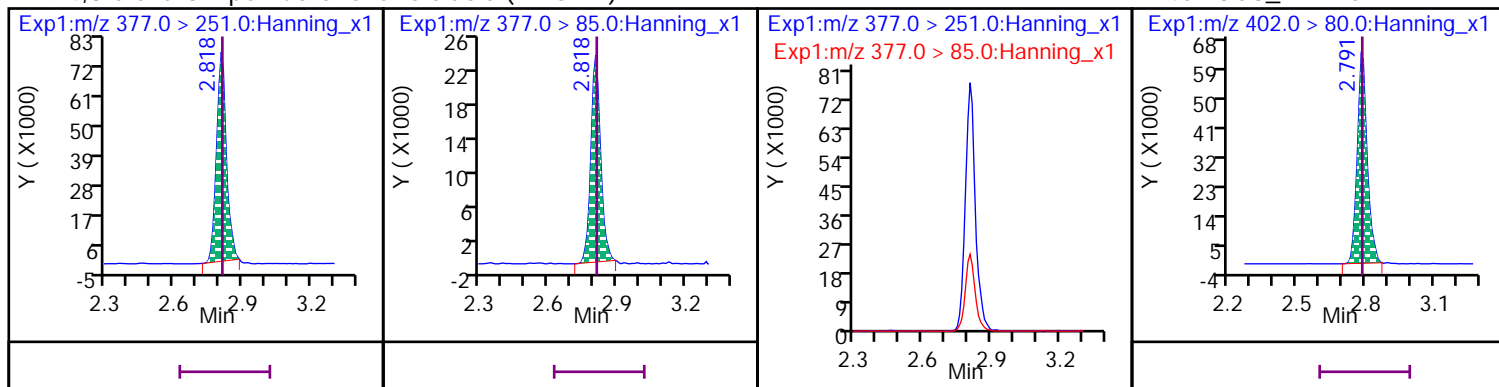
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



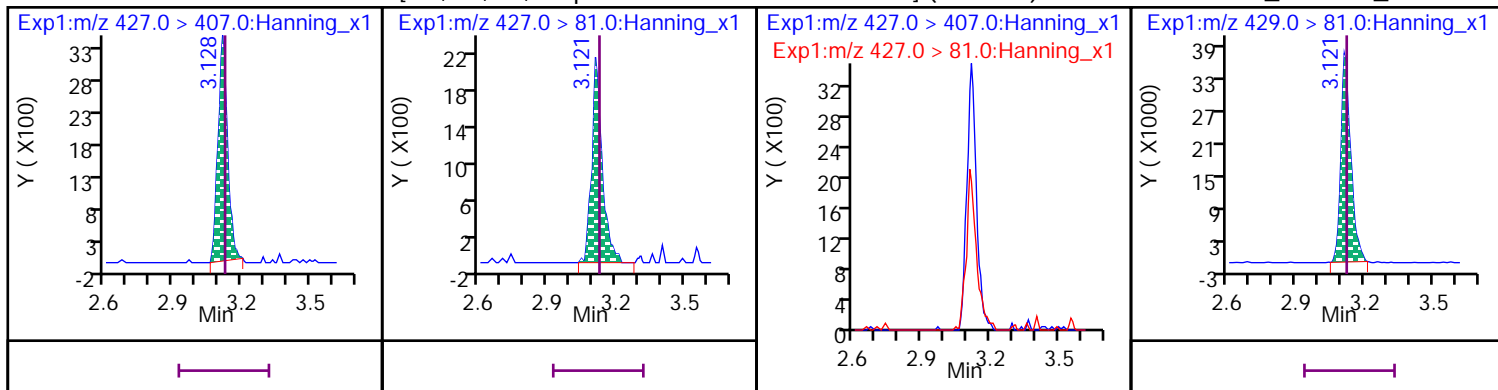
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



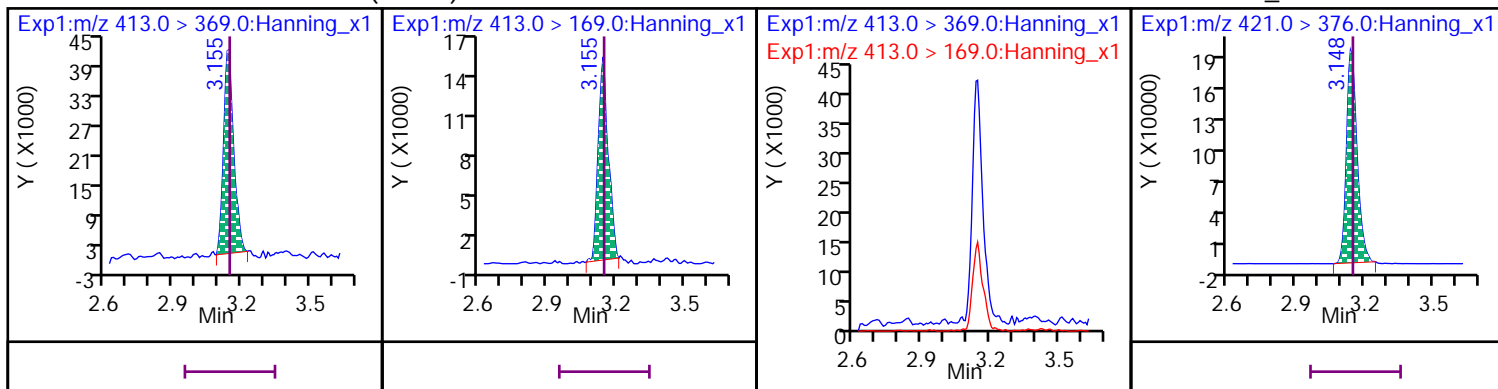
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



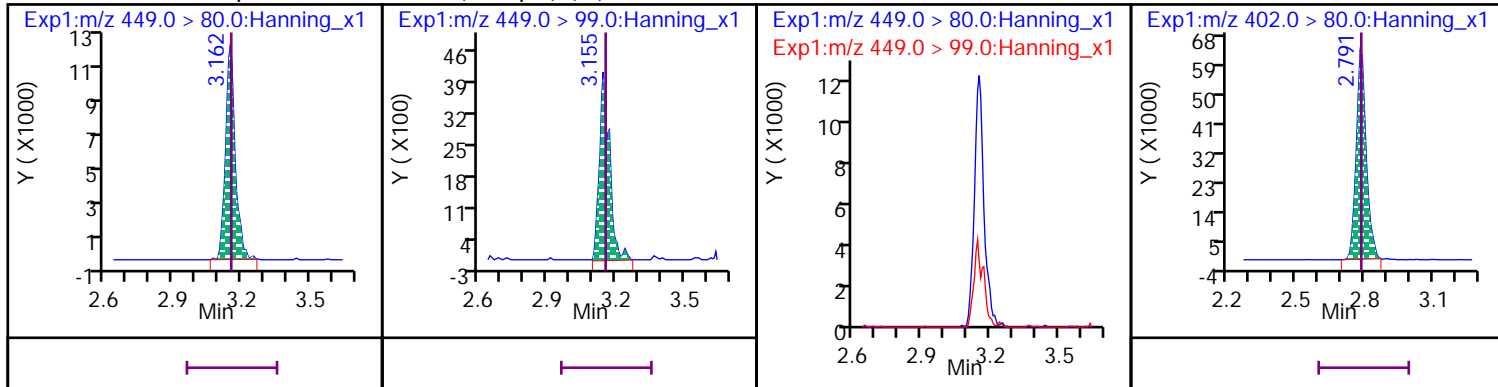
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



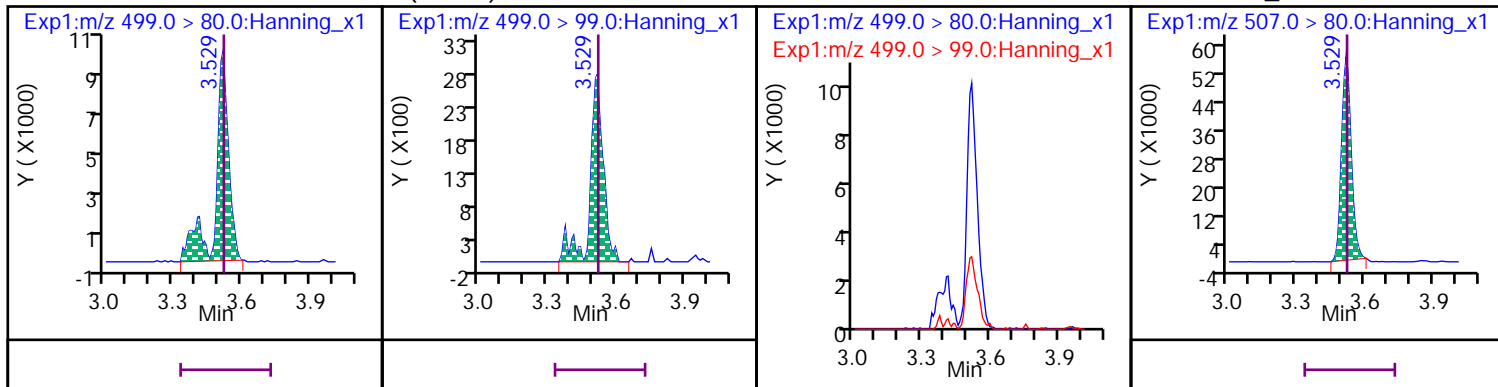
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (M)

D 45 13C3\_PFHxS



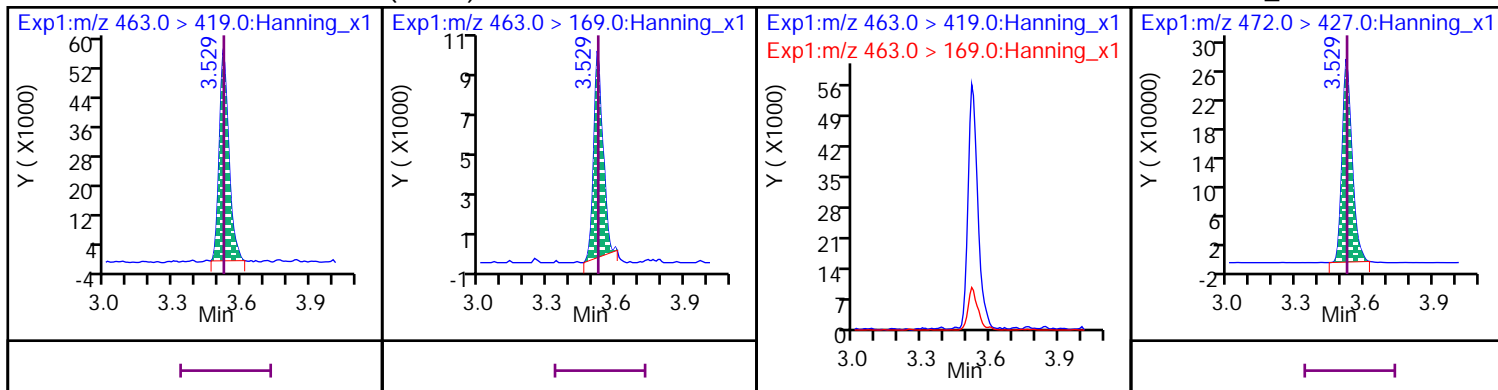
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



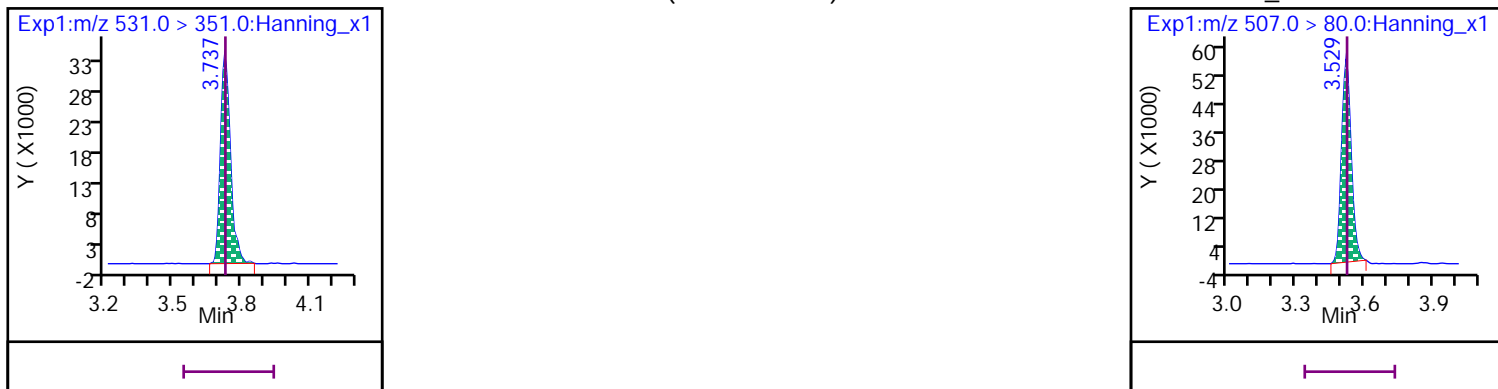
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



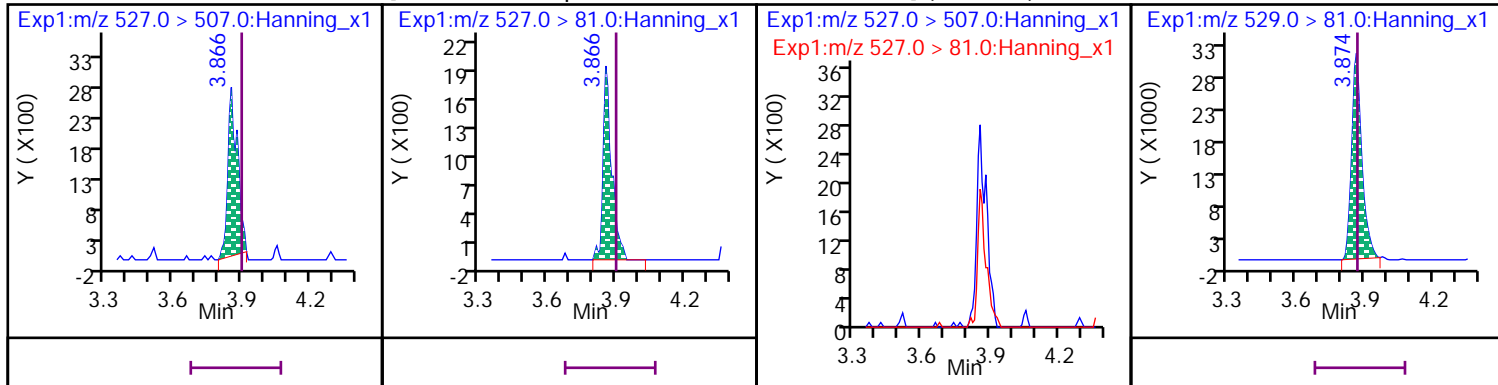
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



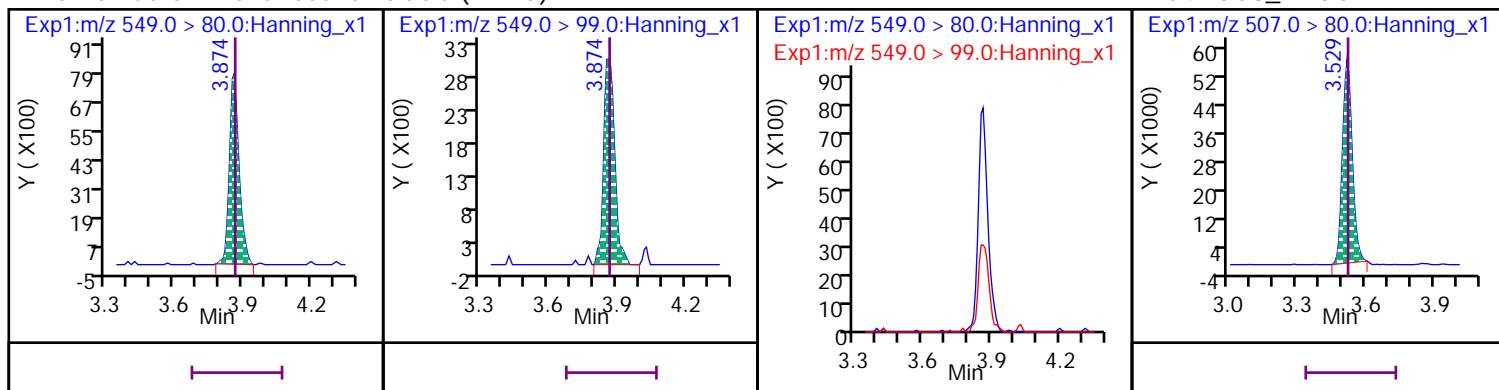
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



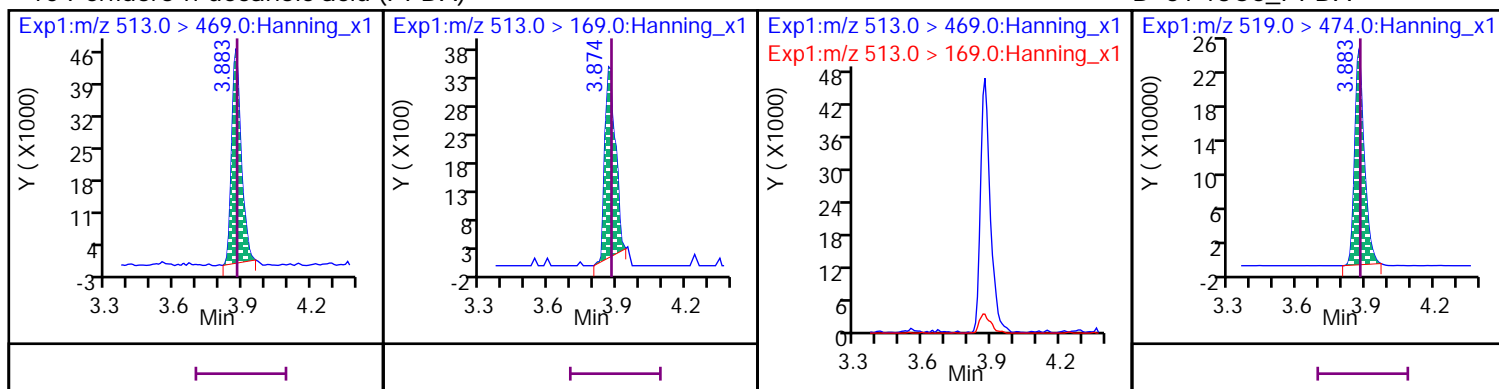
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



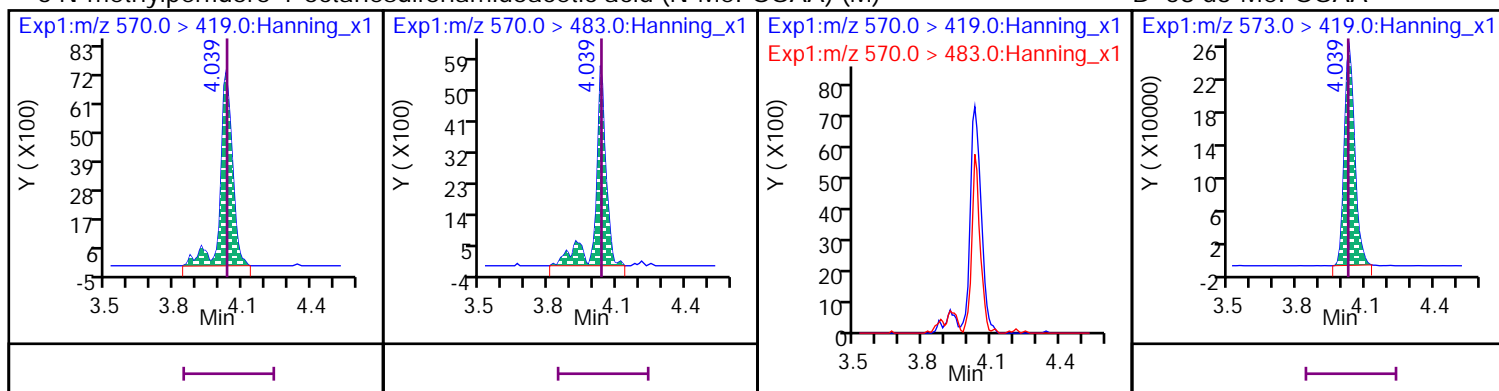
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



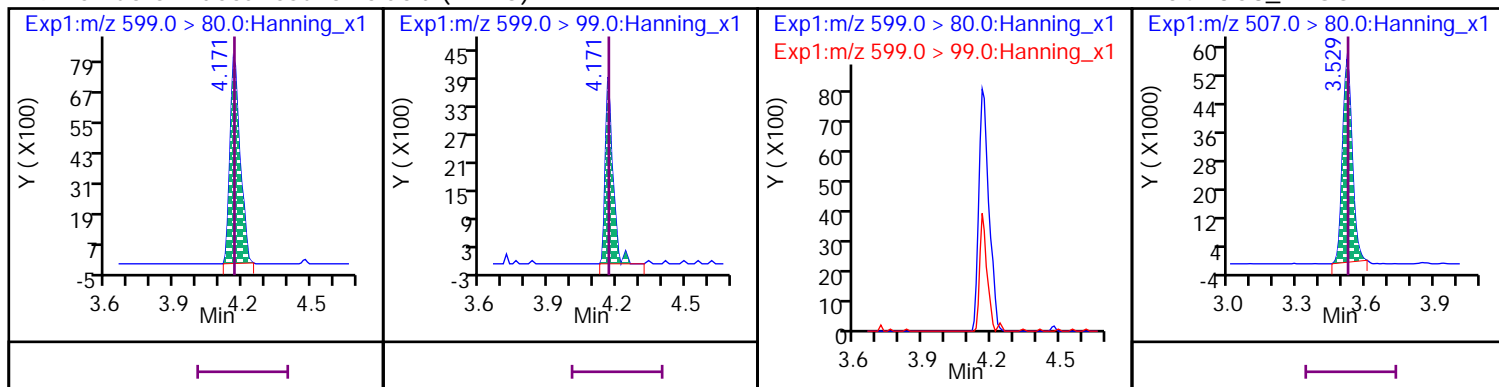
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



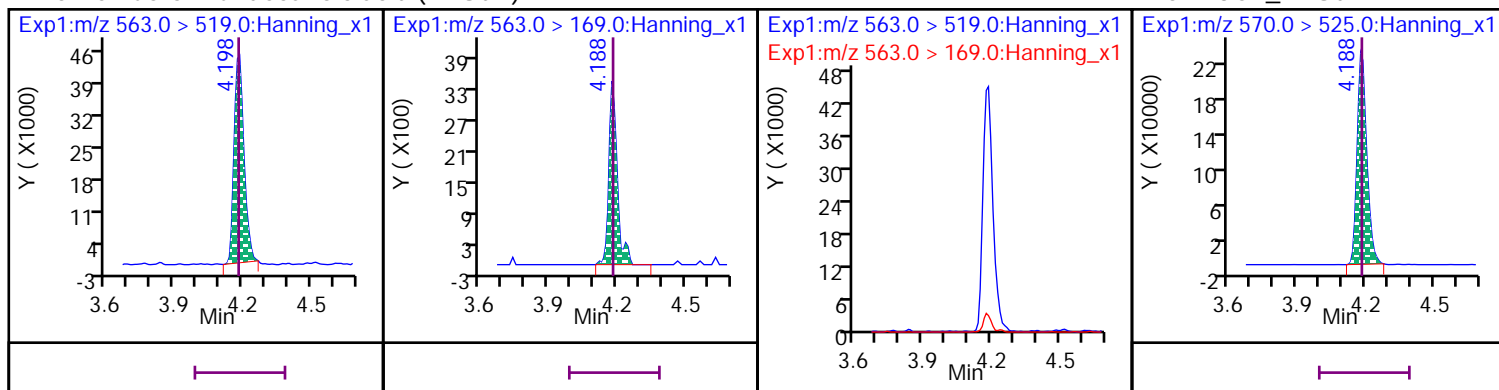
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



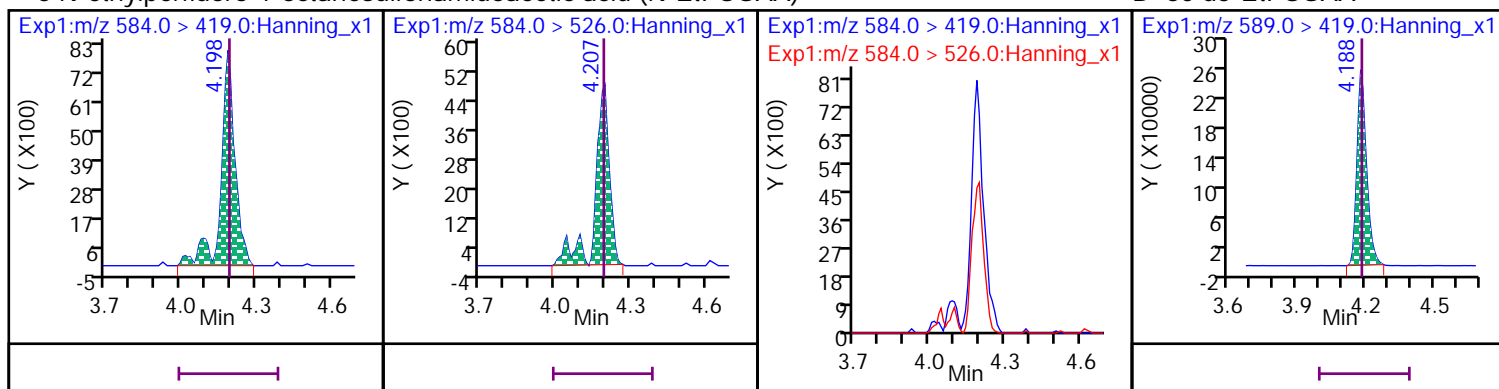
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



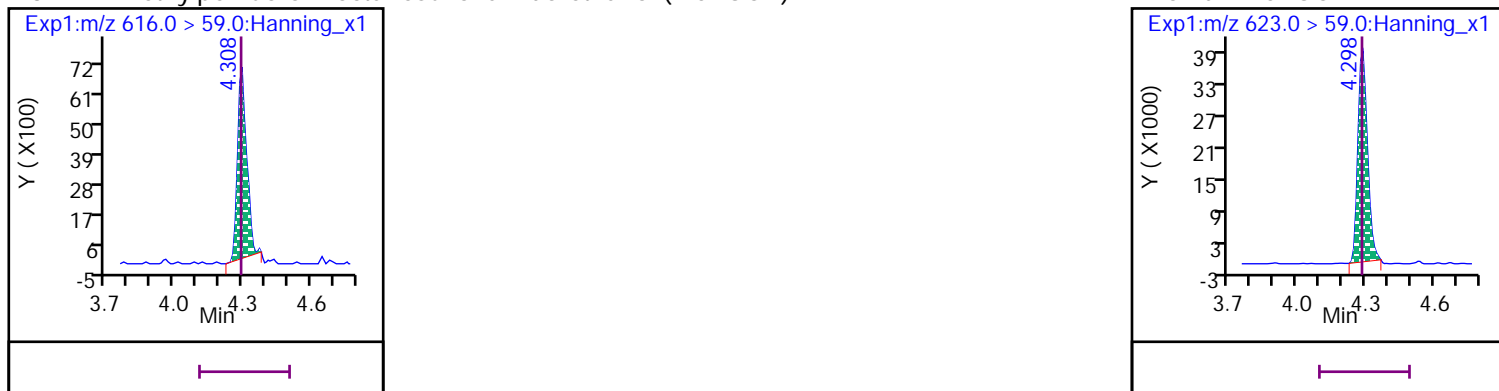
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



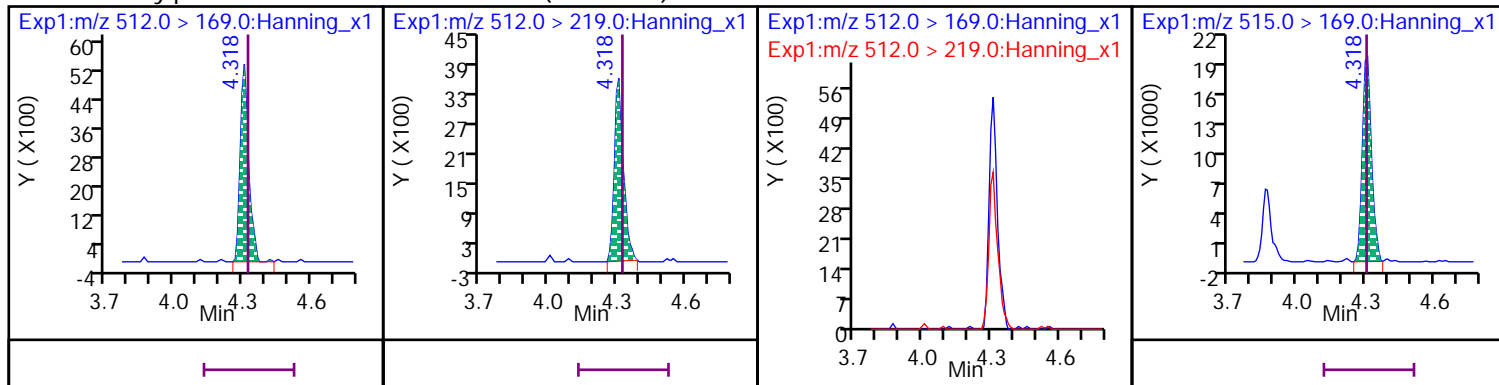
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

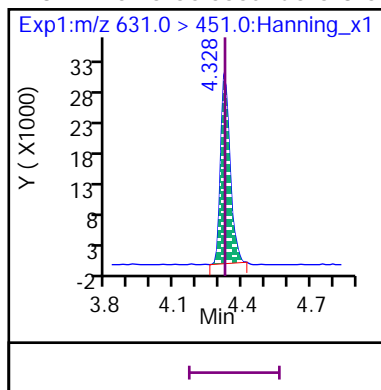


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

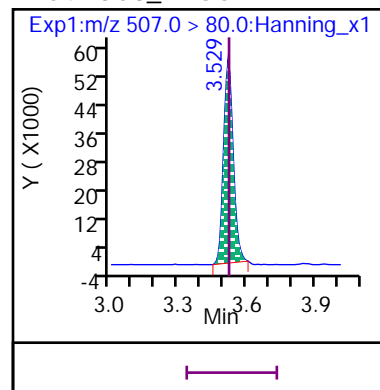
D 57 d3-MeFOSA



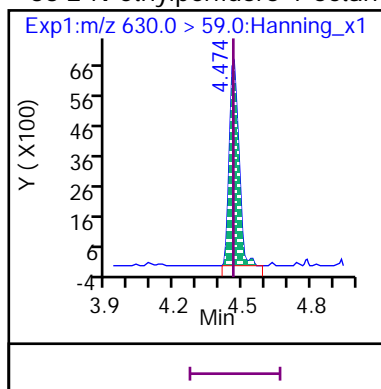
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



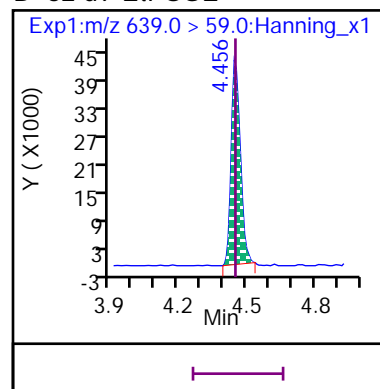
D 54 13C8\_PFOS



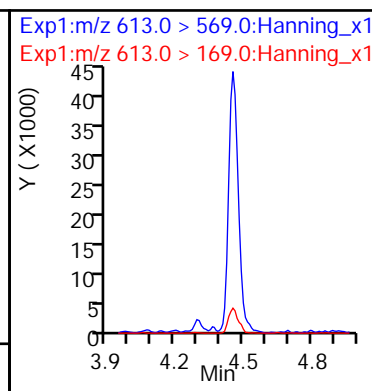
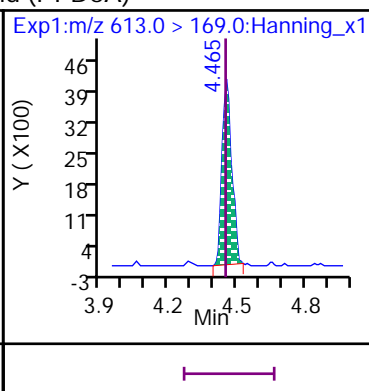
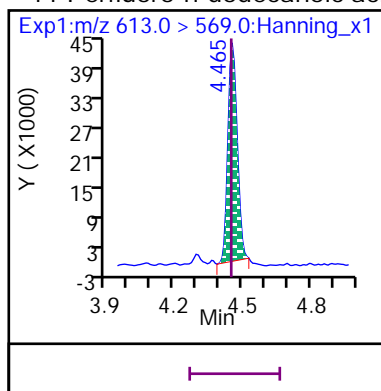
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



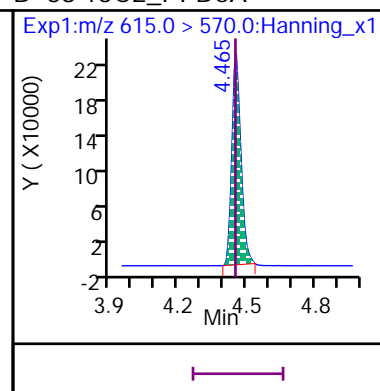
D 62 d9-EtFOSE



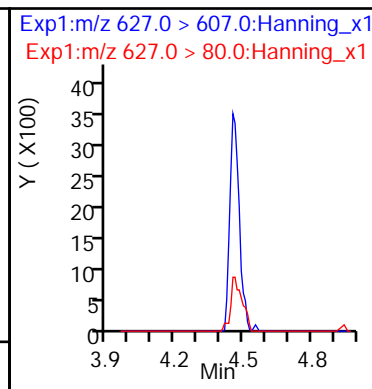
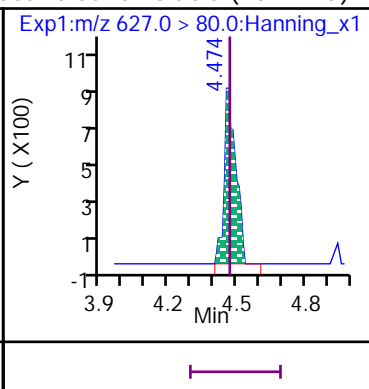
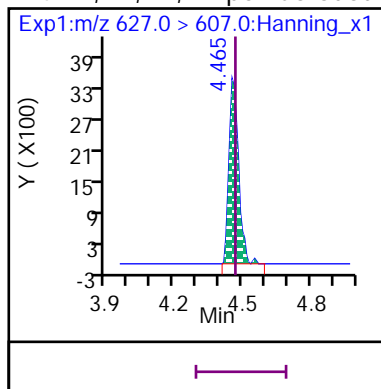
11 Perfluoro-n-dodecanoic acid (PFDoA)



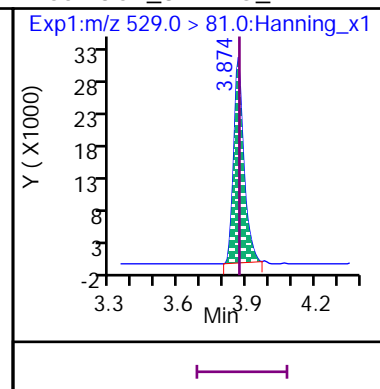
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

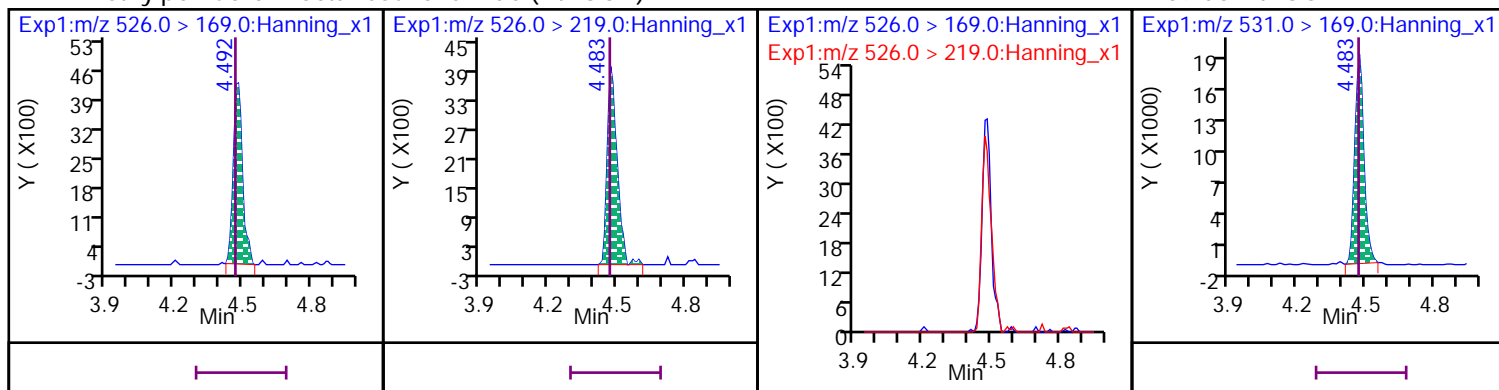


D 65 13C2\_8:2 FTS\_2



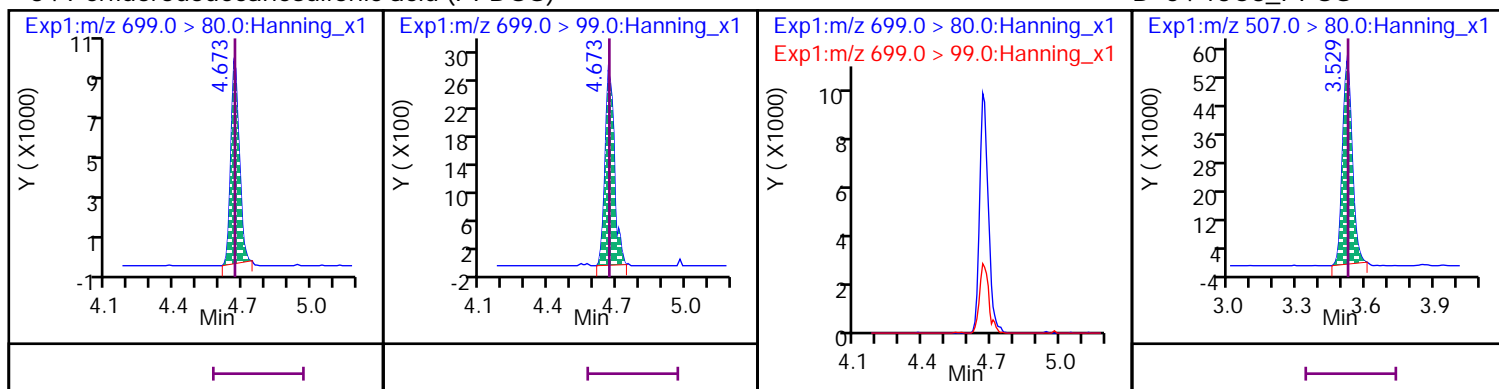
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



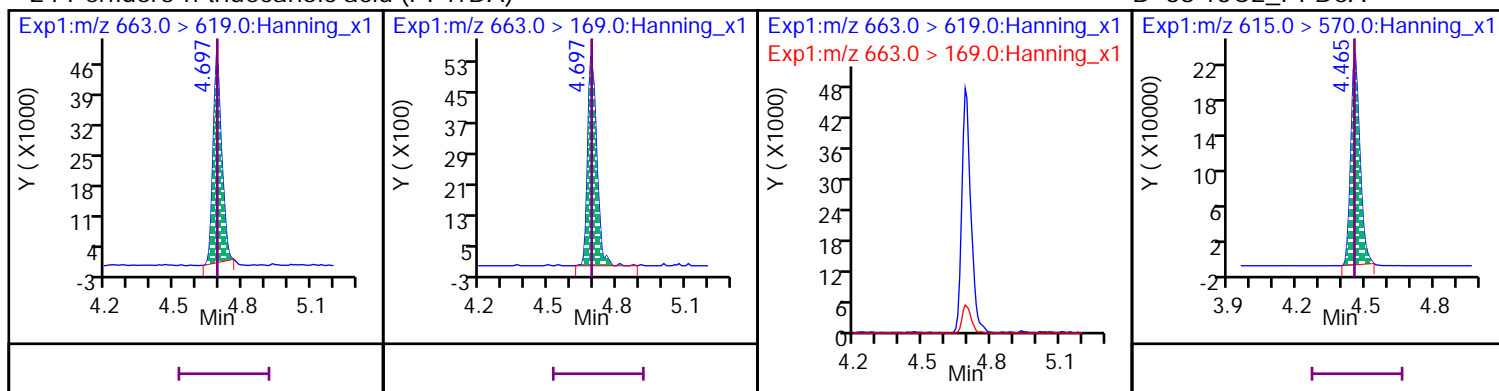
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



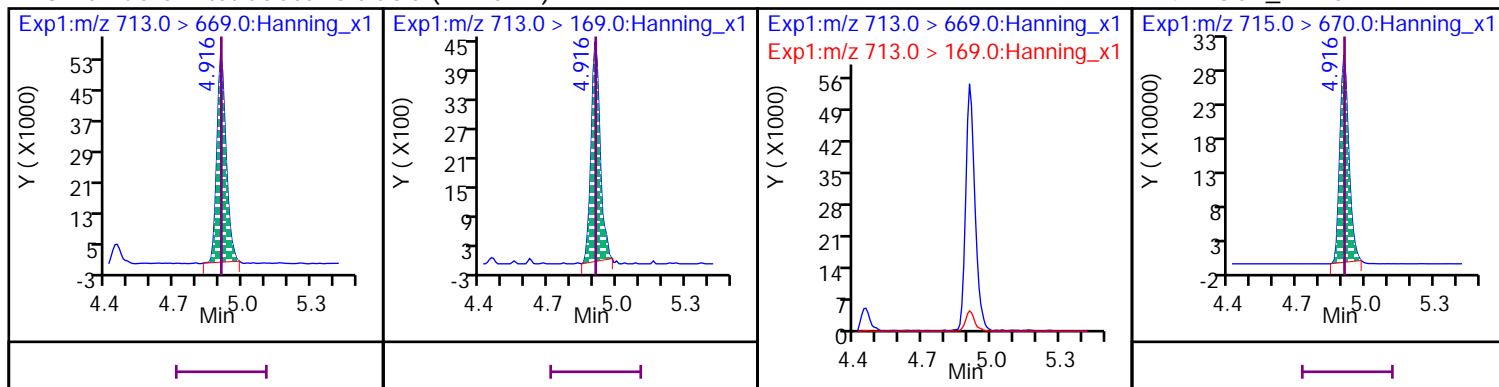
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

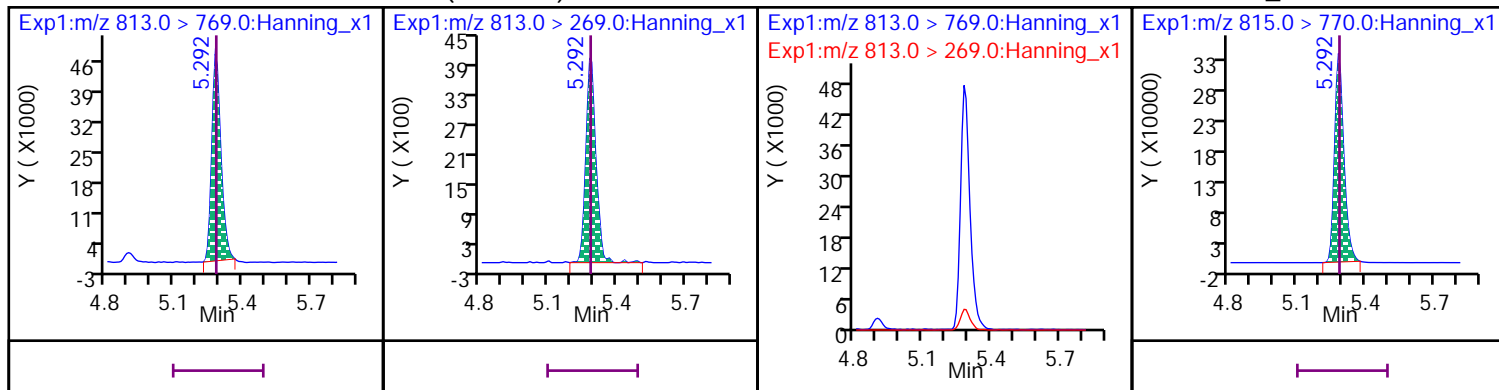
## D 42 13C2\_PFTeDA





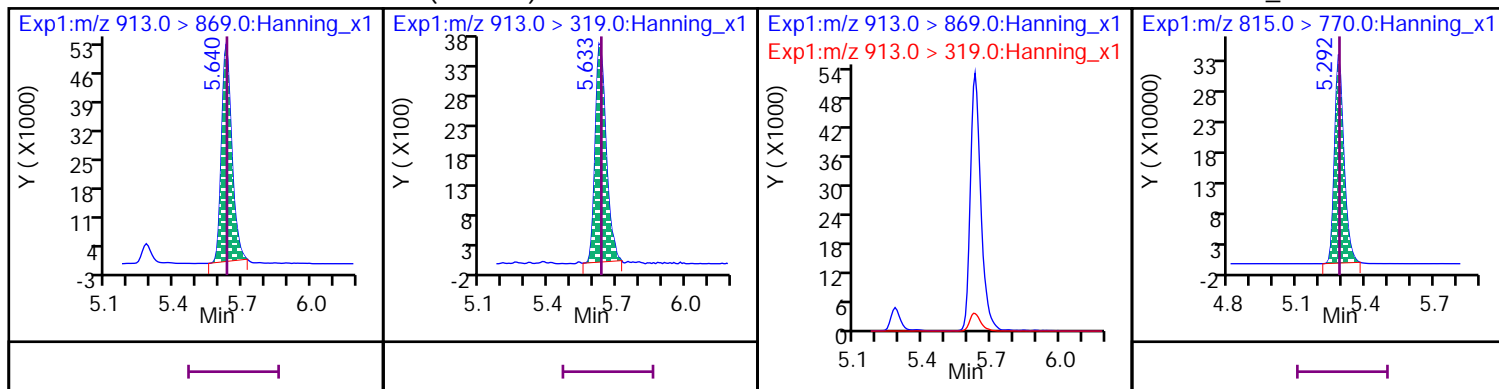
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

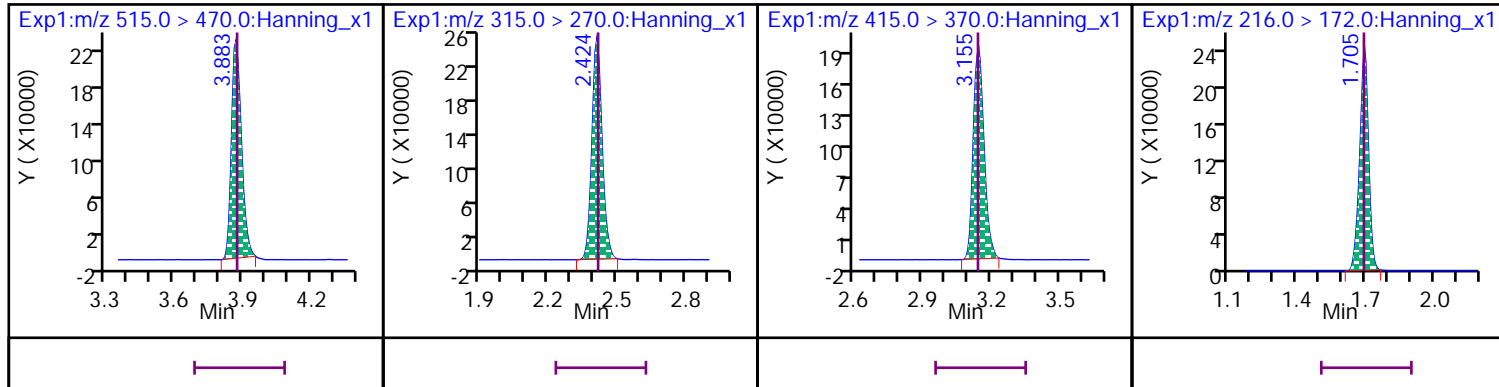


\* 37 13C2\_PFDA

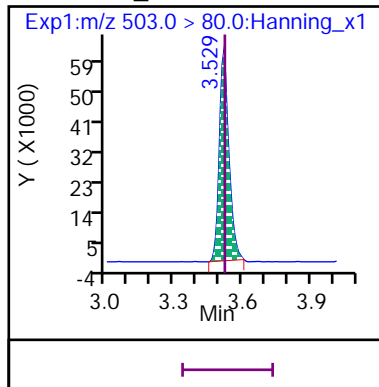
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

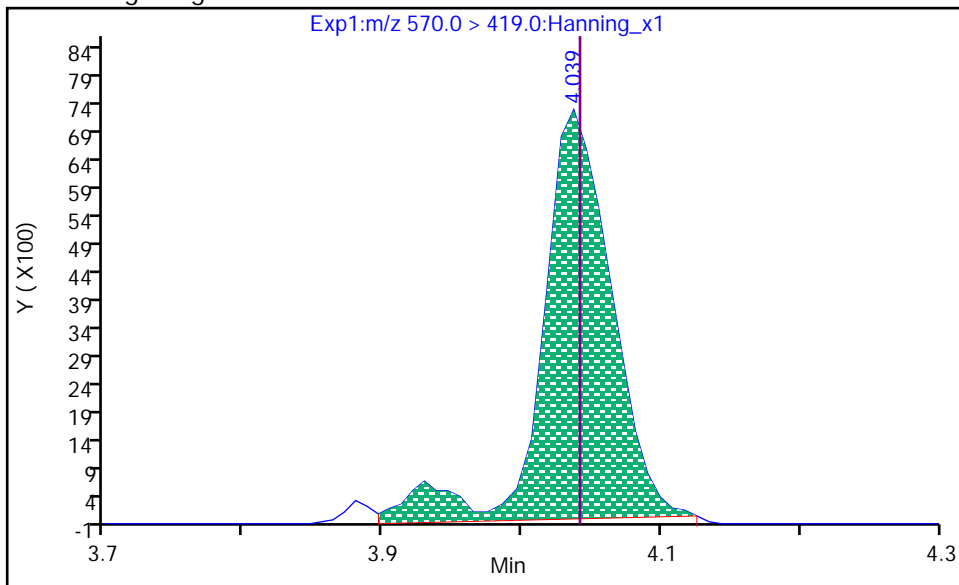
Dil. Factor: 1

Operator: Matthew M. Miller

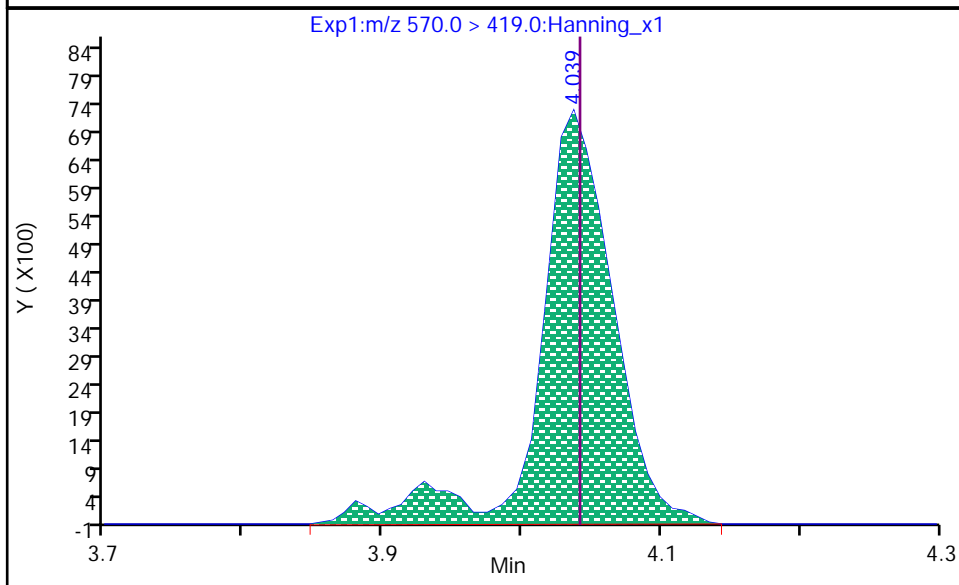
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.039  
Area: 25062  
Amount: 208.12  
Amount Units: ng/L



RT: 4.039  
Area: 26680  
Amount: 221.56  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:36:34

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

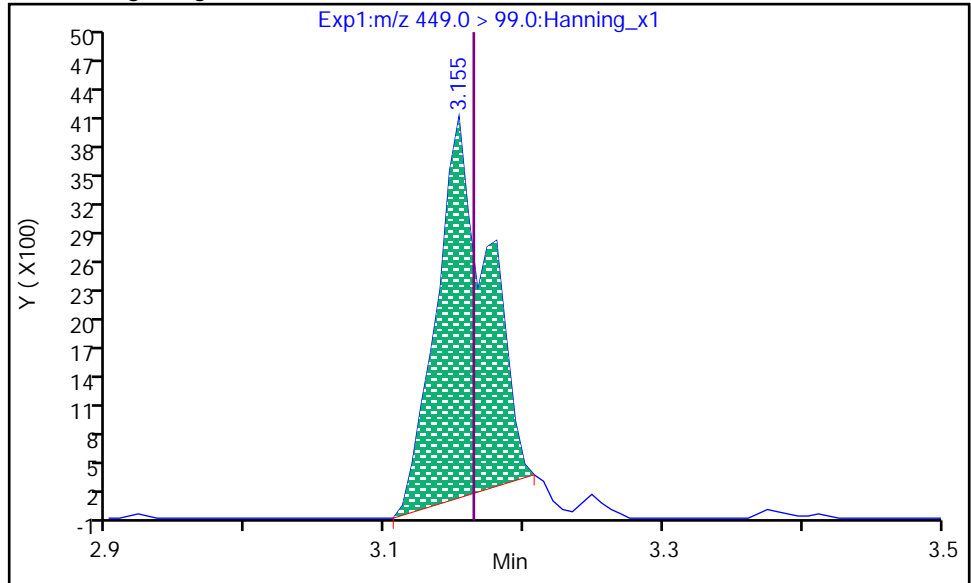
Dil. Factor: 1

Operator: Matthew M. Miller

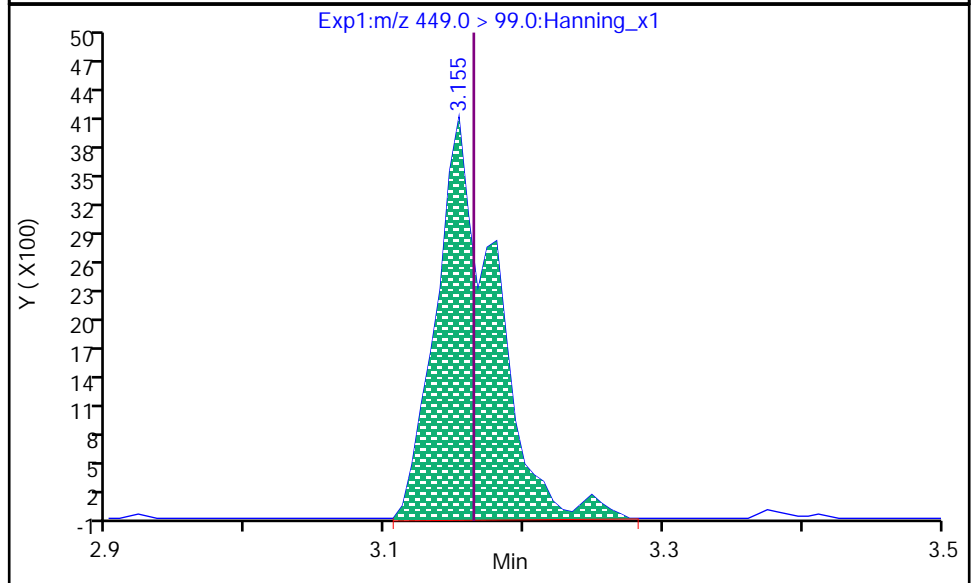
12 PFHpS, CAS: 375-92-8

Processing Integration Results

RT: 3.155  
Area: 10113  
Amount: 199.79  
Amount Units: ng/L



RT: 3.155  
Area: 12298  
Amount: 199.79  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:36:22

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d  
Injection Date: 29-Dec-2020 12:10:17 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 9  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	939.55	94	70 - 130
D 46 13C4_PFBFA	669792	652461			97.4	50 - 150
D 50 13C5_PFPeA	688361	676602			98.3	50 - 150
21 PFPeA			1000.00	908.11	90.8	70 - 130
7 PFBS			884.00	804.09	91	70 - 130
D 44 13C3_PFBFS	241196	241420			100	50 - 150
1 4:2 FTS			934.00	971.41	104	70 - 130
D 63 13C2_4:2 FTS_2	136264	123944			91	50 - 150
D 49 13C5_PFHxA	755876	714129			94.5	50 - 150
15 PFHxA			1000.00	921.86	92.2	70 - 130
22 PFPeS			938.00	848.90	90.5	70 - 130
28 GenX			2000.00	1829.51	91.5	70 - 130
D 66 13C3_GenX	1415766	1314549			92.9	50 - 150
D 47 13C4_PFHpA	613536	601085			98	50 - 150
13 PFHpA			1000.00	960.95	96.1	70 - 130
D 45 13C3_PFHxS	185779	173240			93.3	50 - 150
14 PFHxS			910.00	888.21	97.6	70 - 130
29 ADONA			942.00	859.16	91.2	70 - 130
D 64 13C2_6:2 FTS_2	105371	103475			98.2	50 - 150
2 6:2 FTS			948.00	893.43	94.2	70 - 130
20 PFOA			1000.00	917.82	91.8	70 - 130
D 53 13C8_PFOA	607240	593449			97.7	50 - 150
12 PFHpS			952.00	958.42	101	70 - 130
18 PFOS			928.00	820.66	88.4	70 - 130
17 PFNA			1000.00	954.95	95.5	70 - 130
D 56 13C9_PFNA	787757	731519			92.9	50 - 150
D 54 13C8_PFOS	153541	154039			100	50 - 150
30 9CI-PF3ONS			932.00	845.82	90.8	70 - 130
D 55 13C8_PFOA	318847	306147			96	50 - 150
19 PFOSA			1000.00	958.74	95.9	70 - 130
16 PFNS			960.00	852.15	88.8	70 - 130
D 65 13C2_8:2 FTS_2	104593	92237			88.2	50 - 150
3 8:2 FTS			958.00	990.57	103	70 - 130
10 PFDA			1000.00	926.83	92.7	70 - 130
D 51 13C6_PFDA	701677	661287			94.2	50 - 150
D 58 d3-MeFOSAA	727199	694521			95.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	991.90	99.2	70 - 130
9 PFDS			964.00	859.74	89.2	70 - 130
5 N-EtFOSAA			1000.00	950.44	95	70 - 130
25 PFUdA			1000.00	949.06	94.9	70 - 130
D 60 d5-EtFOSAA	710460	671897			94.6	50 - 150
D 52 13C7_PFUdA	641343	605349			94.4	50 - 150
D 61 d7-MeFOSE	96951	107158			111	50 - 150
32 MeFOSE			1000.00	869.77	87	70 - 130
26 MeFOSA			1000.00	902.93	90.3	70 - 130
D 57 d3-MeFOSA	52459	54407			104	50 - 150
31 11Cl-PF3OUDS			942.00	830.51	88.2	70 - 130
D 62 d9-EtFOSE	123442	116044			94	50 - 150
33 EtFOSE			1000.00	1030.51	103	70 - 130
D 59 d5-EtFOSA	48002	47564			99.1	50 - 150
D 38 13C2_PFDoA	609821	576213			94.5	50 - 150
4 10:2 FTS			964.00	789.19	81.9	70 - 130
27 EtFOSA			1000.00	829.59	83	70 - 130
11 PFDoA			1000.00	930.58	93.1	70 - 130
34 PFDOS			968.00	853.11	88.1	70 - 130
24 PFTrDA			1000.00	918.51	91.9	70 - 130
23 PFTeDA			1000.00	969.70	97	70 - 130
D 42 13C2_PFTeDA	786208	742034			94.4	50 - 150
35 PFHxDA			1000.00	999.69	100	70 - 130
D 40 13C2_PFHxDA	908883	859077			94.5	50 - 150
36 PFODA			1000.00	966.10	96.6	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d  
Injection Date: 29-Dec-2020 12:10:17 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 9  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	652461	24	>100:1			1000.00	940.75	97.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.709	0/-1	610566	23	>100:1			1000.00	939.55		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.078	2.080	0	676602	17	>100:1			1000.00	983.60	98.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.078	2.080	0/0	617759	16	>100:1			1000.00	908.11		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	241420	18	>100:1			1000.00	1048.60	100	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.133	0/0	228879	18	>100:1	Target = 3.50		884.00	804.09		
298.9 > 99	44	2.130	2.133		65577	17	>100:1	3.49 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.446	1/1	177776	20	>100:1	Target = 3.10		938.00	848.90		
349 > 99	44	2.451	2.446		53097	20	>100:1	3.34 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.393	0	123944	19	>100:1			5000.00	5119.89	91	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.393	0/0	48057	17	>100:1	Target = 1.80		934.00	971.41		
327 > 81	63	2.380	2.393		25357	20	>100:1	1.89 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.429	0	714129	19	>100:1			1000.00	968.87	94.5	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.420	1/1	649952	20	>100:1	Target = 18.34		1000.00	921.86		
313 > 119	49	2.416	2.420		37926	18	>100:1	17.13 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.536	0	1314549	20	>100:1			5000.00	4935.35	92.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.536	0/0	345577	20	>100:1	Target = 0.81		2000.00	1829.51		
285 > 185	66	2.532	2.536		443687	20	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.777	0	601085	21	>100:1			1000.00	990.83	98	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.786	0/0	599137	19	>100:1	Target = 3.70		1000.00	960.95		
363 > 169	47	2.773	2.786		158553	21	>100:1	3.77 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	173240	21	>100:1			1000.00	1011.75	93.3	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.795	0/0	163150	27	>100:1	Target = 3.21	0.13	910.00	888.21		
399 > 99	45	2.791	2.795		47870	28	>100:1	3.40 (1.60-4.81)	0.14				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.823	0/0	944966	21	>100:1	Target = 2.97		942.00	859.16		
377 > 85	45	2.819	2.823		319849	20	>100:1	2.95 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.156	3.166	0/0	150832	25	>100:1	Target = 3.08		952.00	958.42		
449 > 99	45	3.156	3.166		45425	21	>100:1	3.32 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.132	0	103475	23	>100:1			5000.00	5372.98	98.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.129	3.139	0/0	38392	28	>100:1	Target = 1.80		948.00	893.43		
427 > 81	64	3.122	3.139		22154	24	>100:1	1.73 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.159	0	593449	25	>100:1			1000.00	1002.68	97.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.159	0/0	555273	25	>100:1	Target = 2.87		1000.00	917.82		
413 > 169	53	3.149	3.159		185964	24	>100:1	2.98 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.522	3.533	0	154039	22	>100:1			1000.00	1027.41	100	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.533	0/0	149799	42	>100:1	Target = 3.84	0.25	928.00	820.66		
499 > 99	54	3.522	3.533		43097	46	>100:1	3.47 (1.92-5.76)	0.16				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.730	3.740	0/0	438614	23	>100:1			932.00	845.82		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.879	0/0	100452	21	>100:1	Target = 3.07		960.00	852.15		
549 > 99	54	3.866	3.879		35877	24	>100:1	2.79 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.171	4.175	0/0	96111	17		Target = 3.03		964.00	859.74		
599 > 99	54	4.171	4.175		35828	17		2.68 (1.51-4.55)					
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	363315	17	>100:1			942.00	830.51		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.677	0/0	105502	18	>100:1	Target = 3.33		968.00	853.11		
699 > 99	54	4.673	4.677		34432	18		3.06 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	731519	22	>100:1			1000.00	974.11	92.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.533	0/0	698586	23	>100:1	Target = 6.16		1000.00	954.95		
463 > 169	56	3.529	3.533		110157	21	>100:1	6.34 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.854	0	306147	22	>100:1			1000.00	988.96	96	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.854	0/0	289245	21	>100:1			1000.00	958.74		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.879	0	92237	22				5000.00	4972.31	88.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.911	-2/-2	36731	22	>100:1	Target = 1.95		958.00	990.57		
527 > 81	65	3.874	3.911		21425	39		1.71 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.479	0/0	33643	23	>100:1	Target = 3.14		964.00	789.19		
627 > 80	65	4.465	4.479		10624	17	70:1	3.16 (1.57-4.72)					M
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.874	3.887	0	661287	20	>100:1			1000.00	996.92	94.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.874	3.887	0/0	602232	20	>100:1	Target = 15.94		1000.00	926.83		
513 > 169	51	3.874	3.887		46934	25	>100:1	12.83 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.034	0	694521	18	>100:1			5000.00	4838.54	95.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.039	4.043	0/0	105835	35		Target = 1.33	0.12	1000.00	991.90		M
570 > 483	58	4.039	4.043		78462	35	>100:1	1.34 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	671897	19	>100:1			5000.00	5058.91	94.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.203	0/0	127156	36	>100:1	Target = 1.58	0.09	1000.00	950.44		M
584 > 526	60	4.188	4.203		74054	31	>100:1	1.71 (0.79-2.37)	0.16				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	605349	18				1000.00	957.72	94.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.188	4.193	0/0	539970	19	>100:1	Target = 15.50		1000.00	949.06		
563 > 169	52	4.198	4.193		37479	21	>100:1	14.40 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	107158	15	>100:1			1000.00	990.30	111	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	87573	15	>100:1			1000.00	869.77		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.314	0	54407	15	67:1			1000.00	1028.16	104	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.334	-1/-1	55424	15	>100:1	Target = 1.12		1000.00	902.93		
512 > 219	57	4.318	4.334		51549	19	>100:1	1.07 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.461	0	116044	16	>100:1			1000.00	925.42	94	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.470	0/0	106392	17	>100:1			1000.00	1030.51		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.461	0	576213	18	>100:1			1000.00	951.92	94.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.461	0/0	543007	20	>100:1	Target = 10.85		1000.00	930.58		
613 > 169	38	4.456	4.461		48410	18	>100:1	11.21 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.697	4.701	0/0	521286	20	>100:1	Target = 8.37		1000.00	918.51		
663 > 169	38	4.697	4.701		61067	21	>100:1	8.53 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	47564	15	>100:1			1000.00	968.83	99.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.479	1/0	43109	24	>100:1	Target = 1.03		1000.00	829.59		
526 > 219	59	4.483	4.479		45785	18	>100:1	0.94 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	742034	19	>100:1			1000.00	880.81	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.918	0/0	623457	20	87:1	Target = 12.11		1000.00	969.70		
713 > 169	42	4.915	4.918		57053	21	>100:1	10.92 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	859077	19	>100:1			1000.00	948.04	94.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	561136	20	>100:1	Target = 11.48		1000.00	999.69		
813 > 269	40	5.292	5.296		50163	19	>100:1	11.18 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.633	5.643	0/0	734689	25	92:1	Target = 13.88		1000.00	966.10		
913 > 319	40	5.633	5.643		51921	27	>100:1	14.15 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.883	3.887	0	651606	21	>100:1					94.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.429	0	708508	19	>100:1					96.9	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.152	0	573720	24	>100:1					93	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	604507	25	>100:1					94.4	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.522	3.533	0	165064	23	>100:1					95.9	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

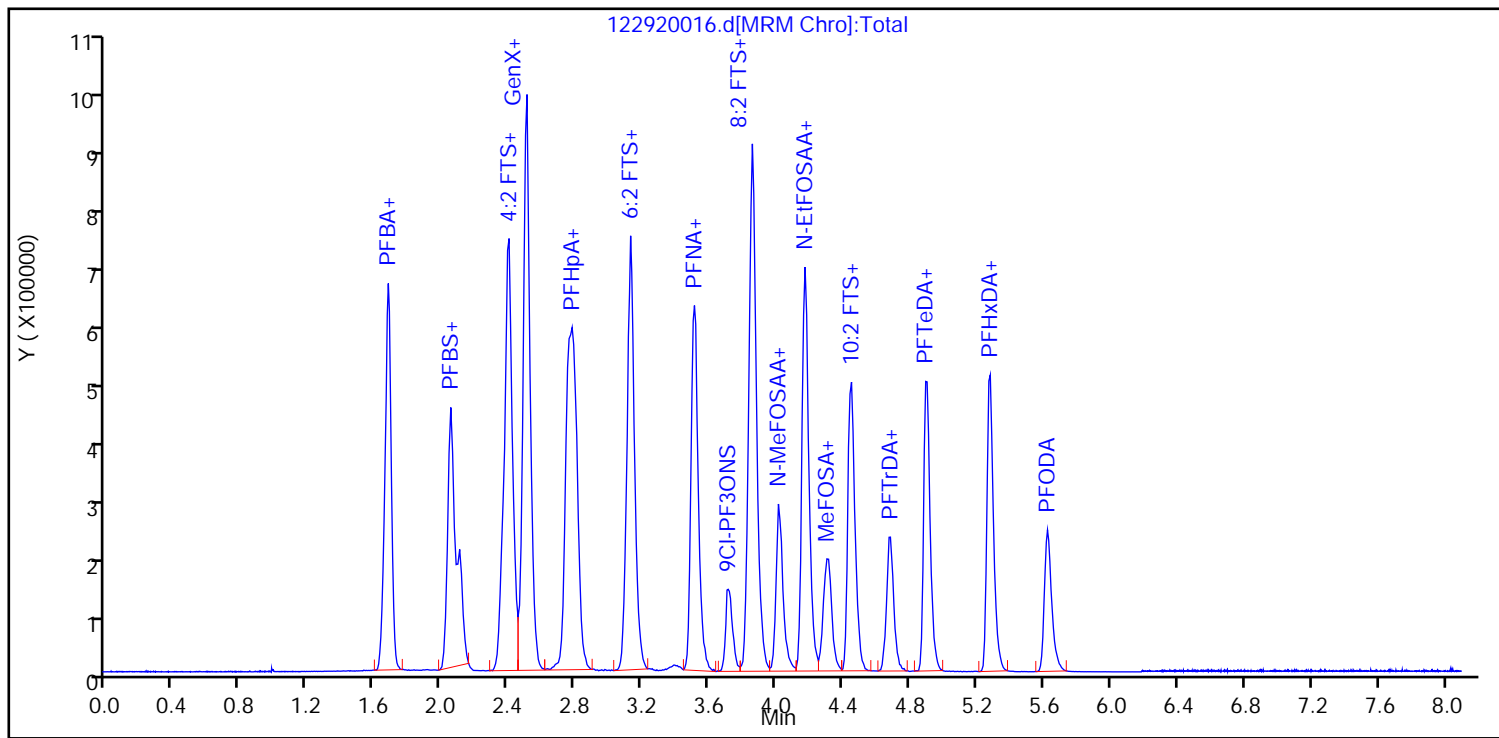
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

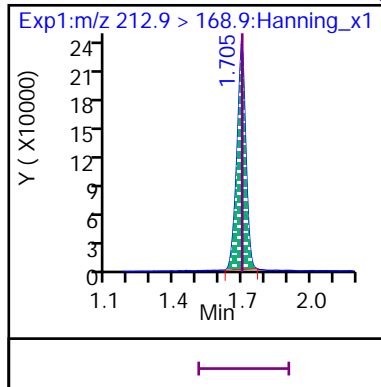
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

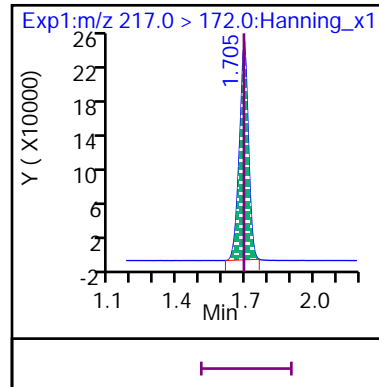
Operator: Matthew M. Miller



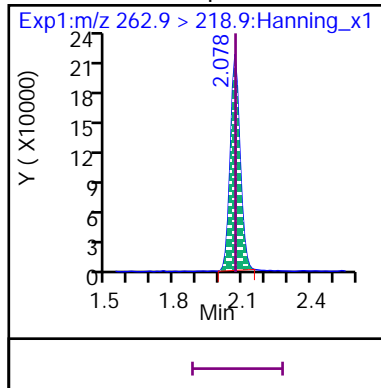
8 Perfluoro-n-butanoic acid (PFBA)



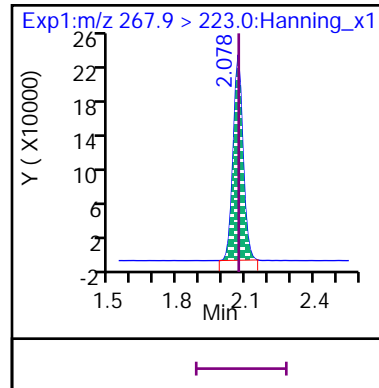
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

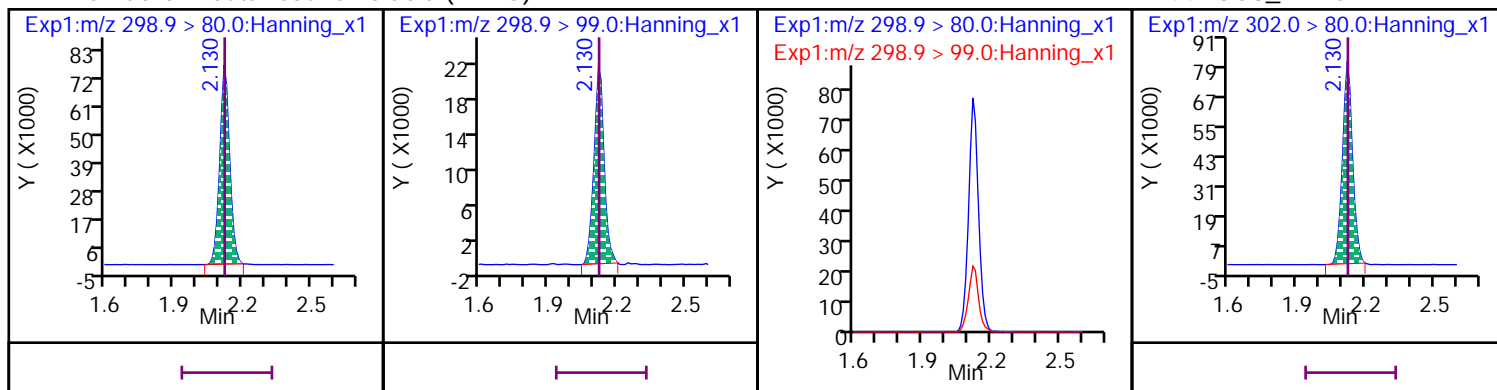


D 50 13C5\_PFPeA



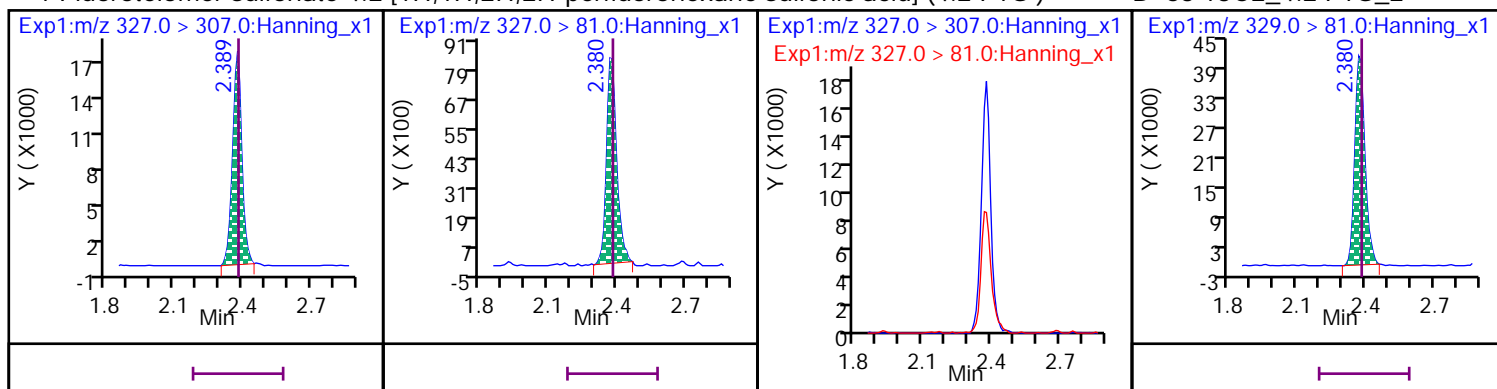
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



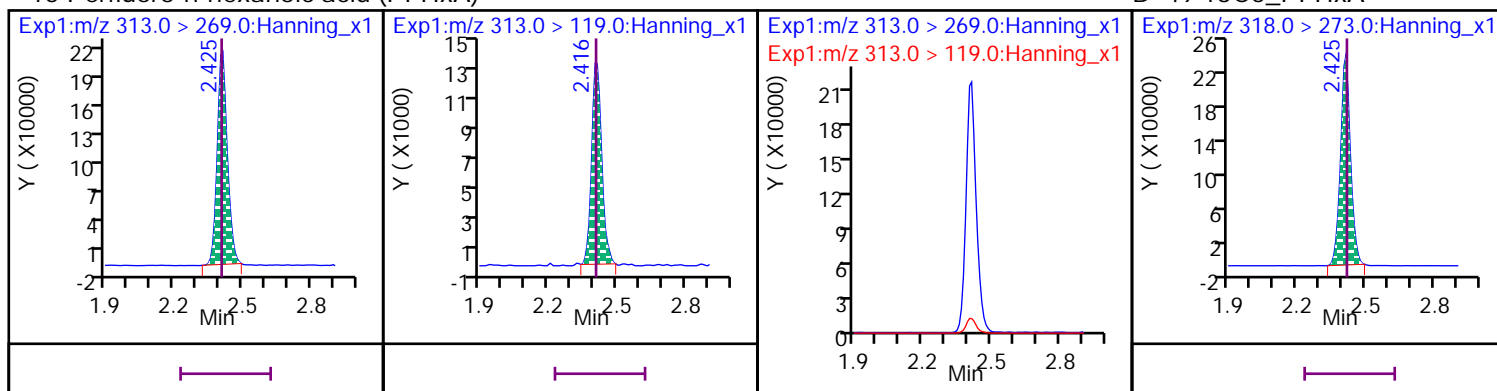
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



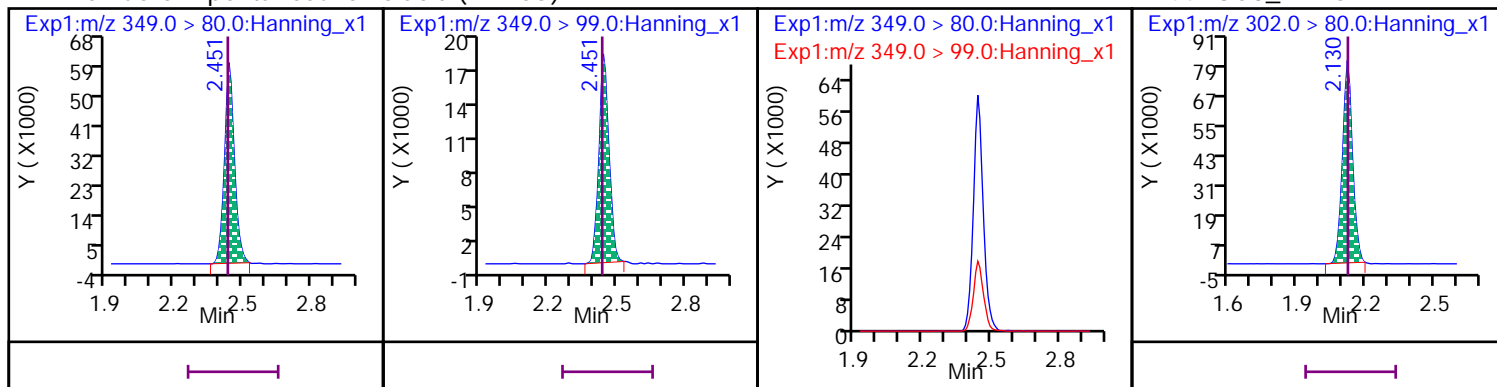
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



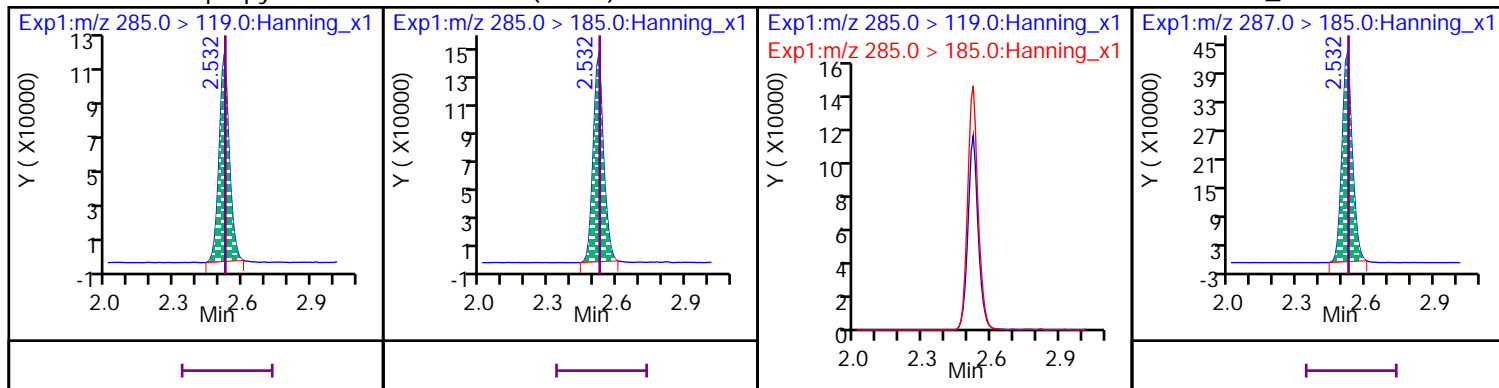
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



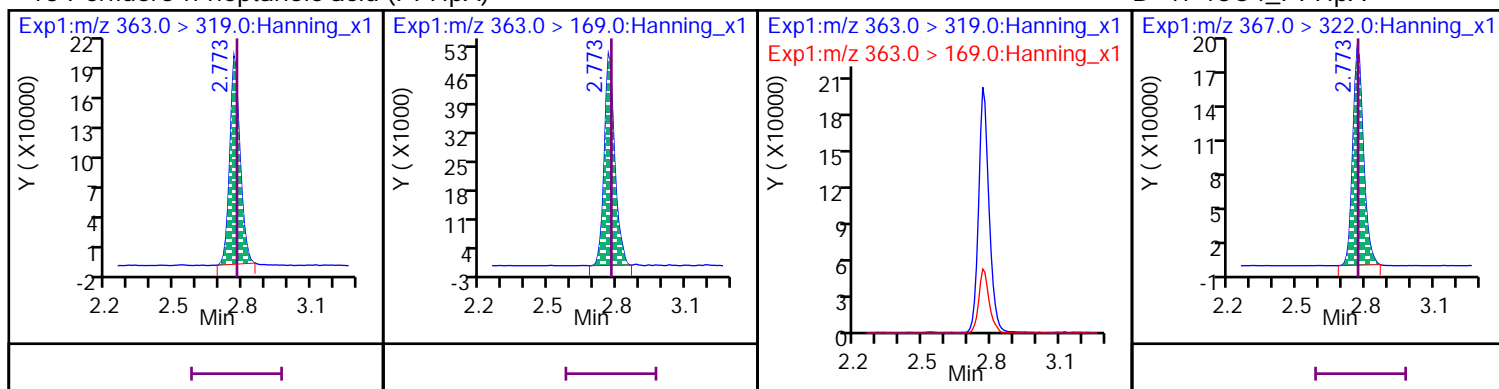
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



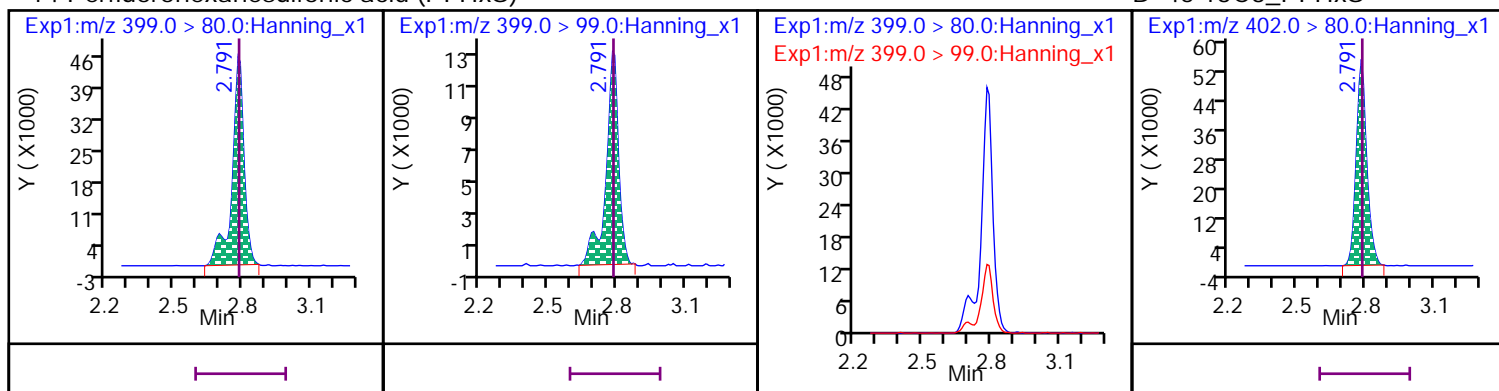
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



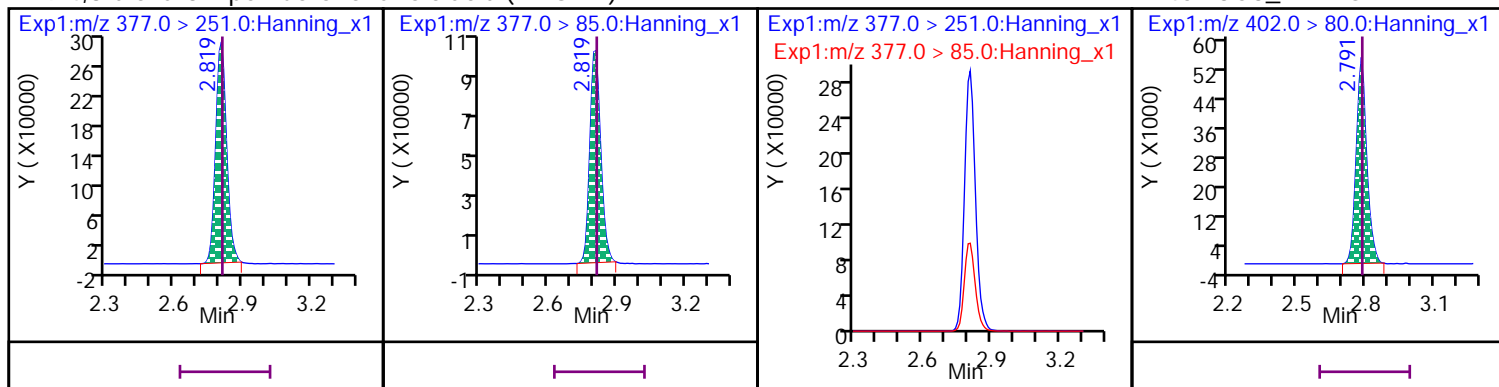
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



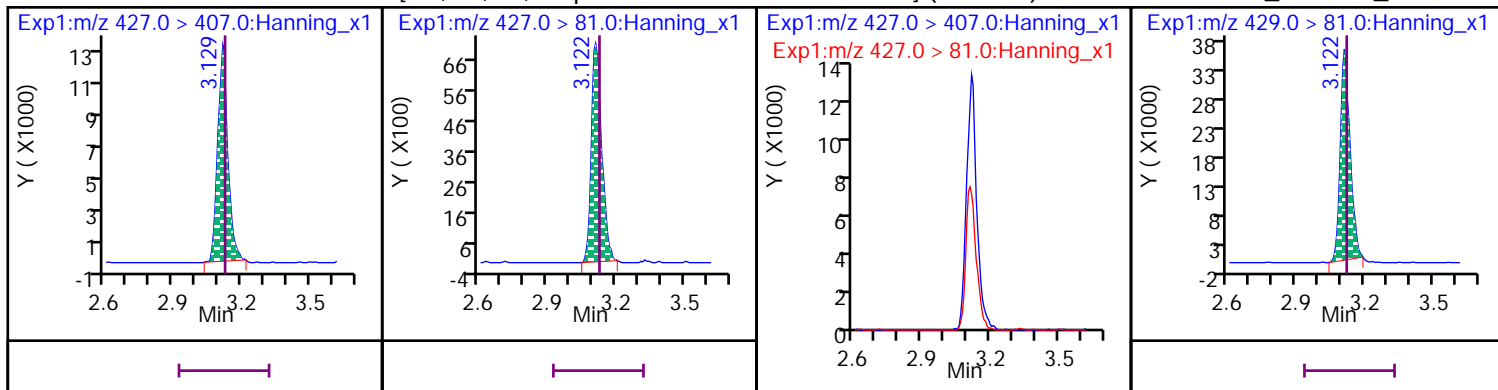
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



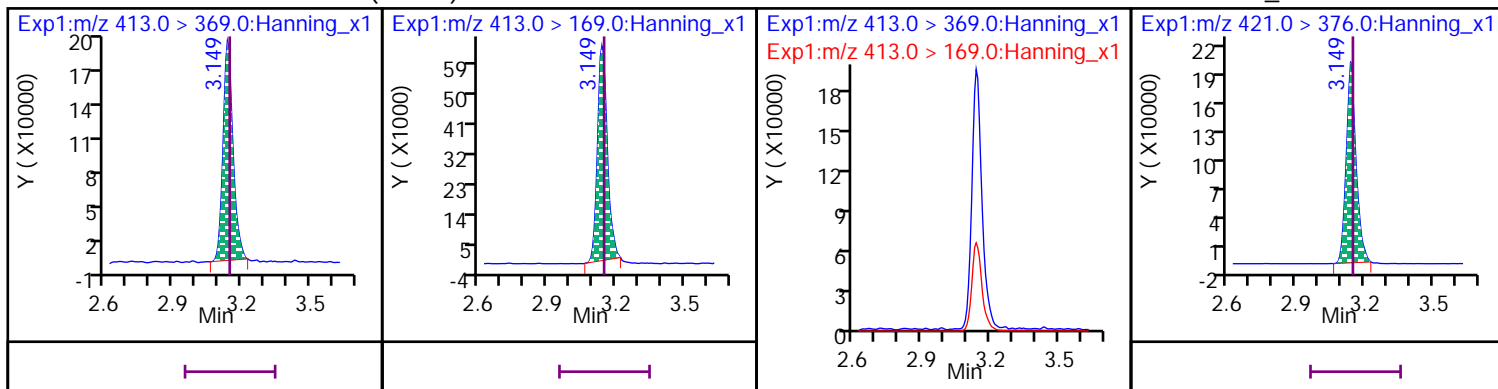
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



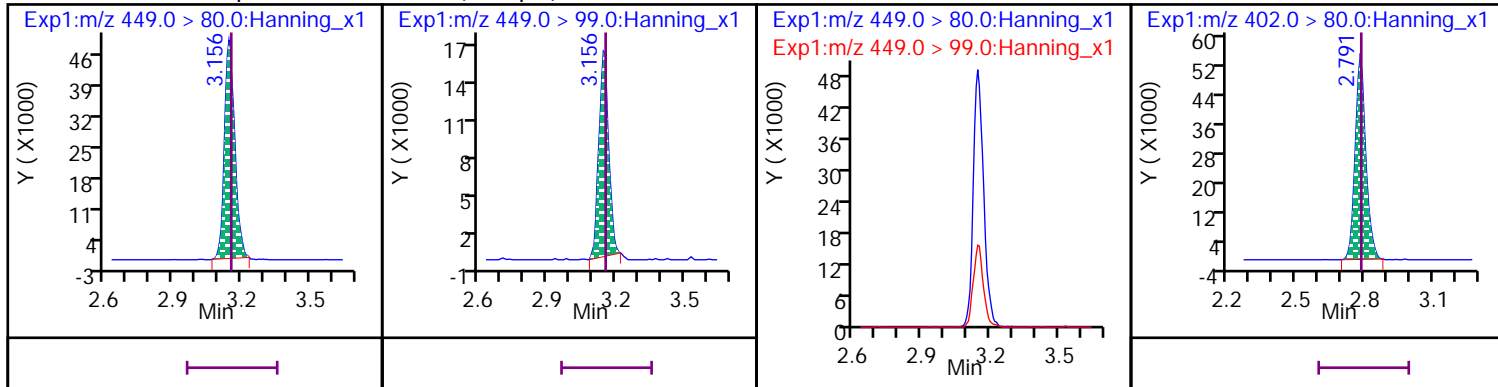
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



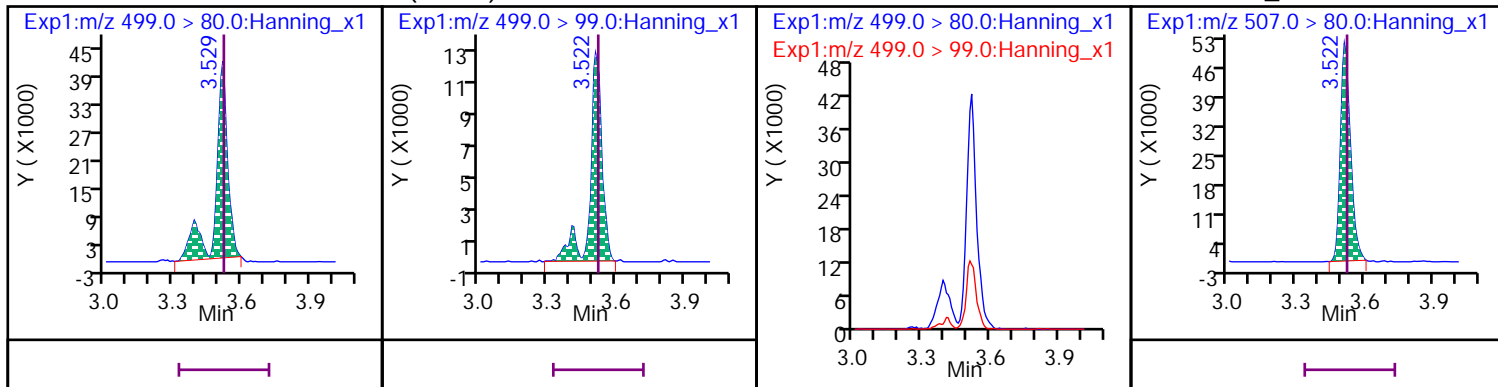
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



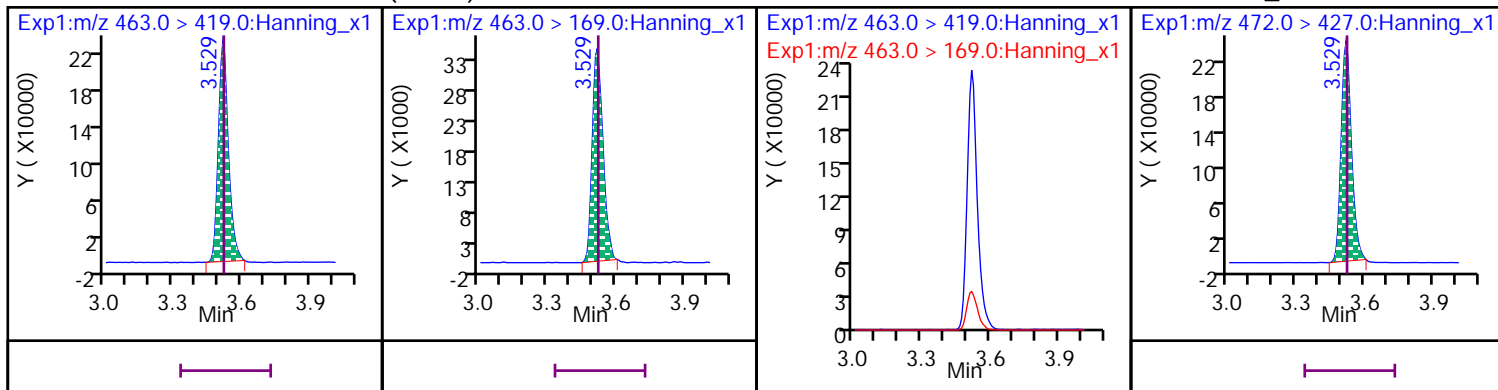
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



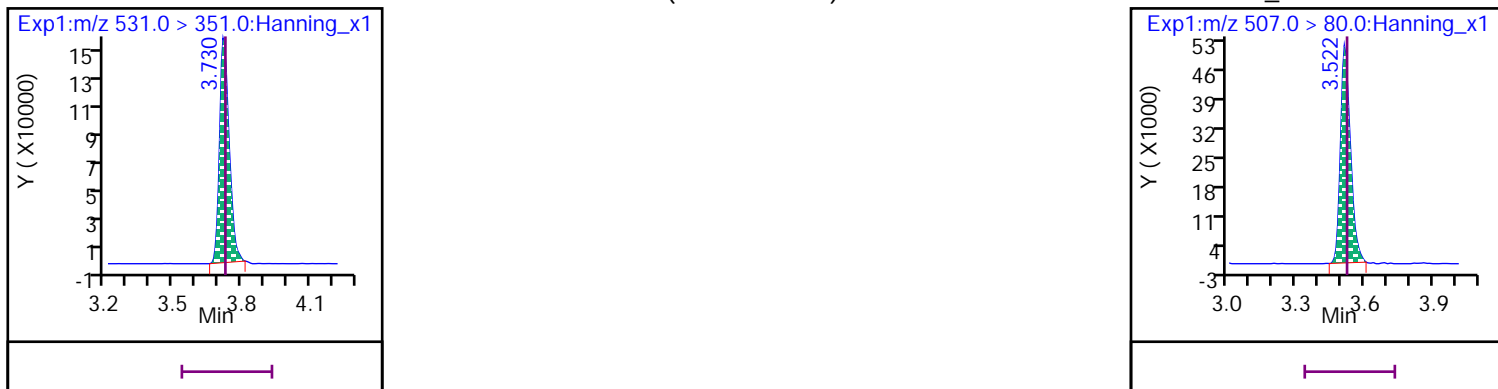
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



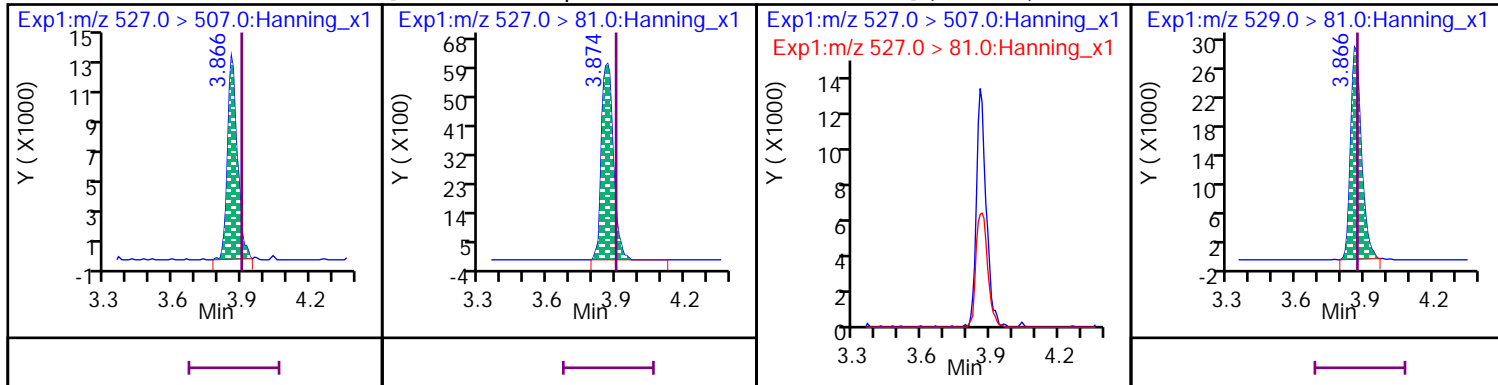
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



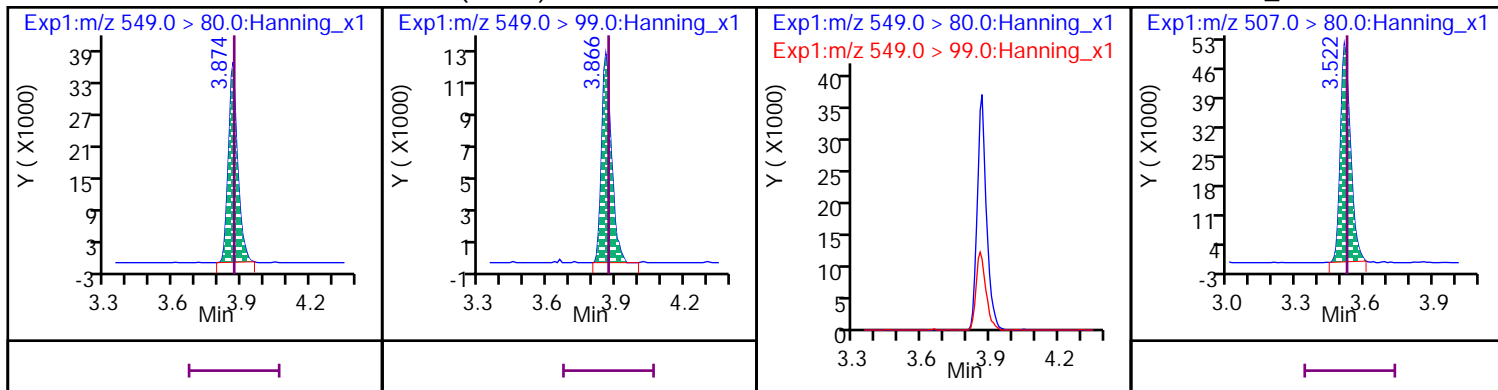
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



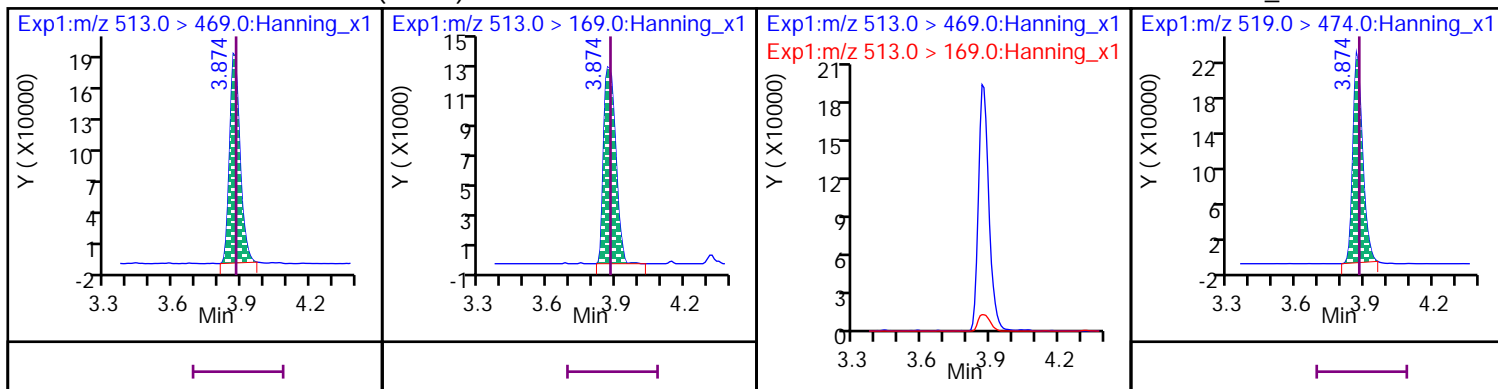
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



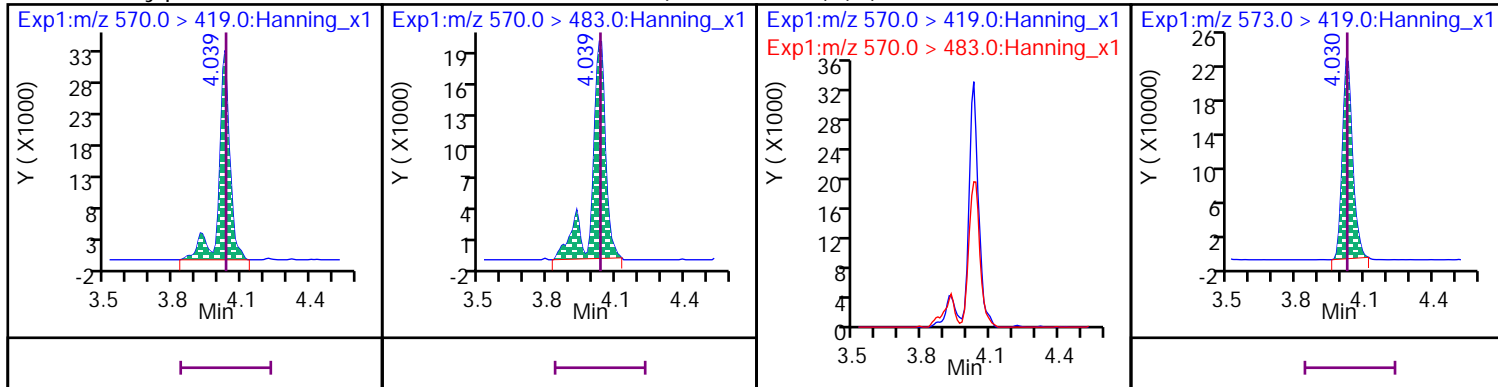
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



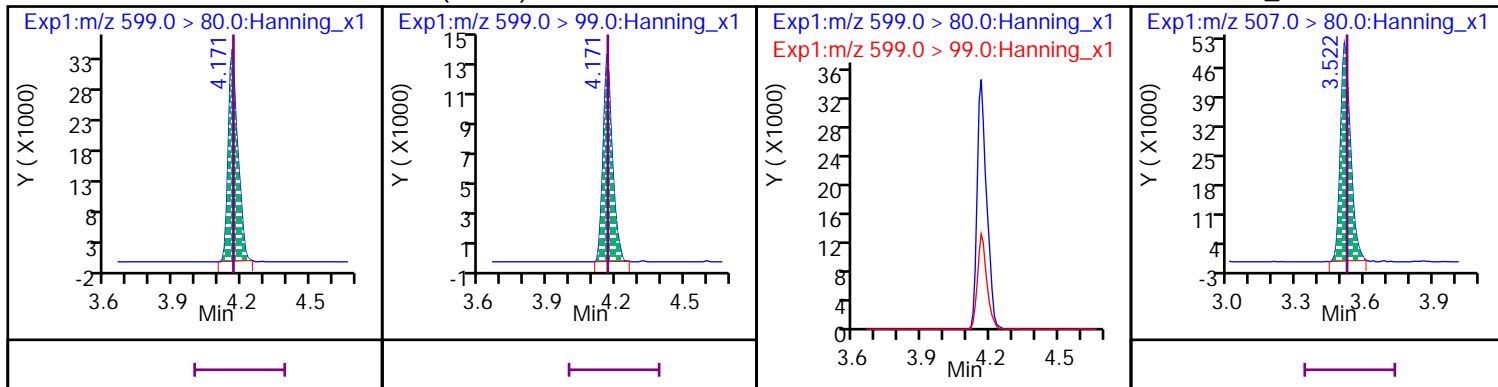
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



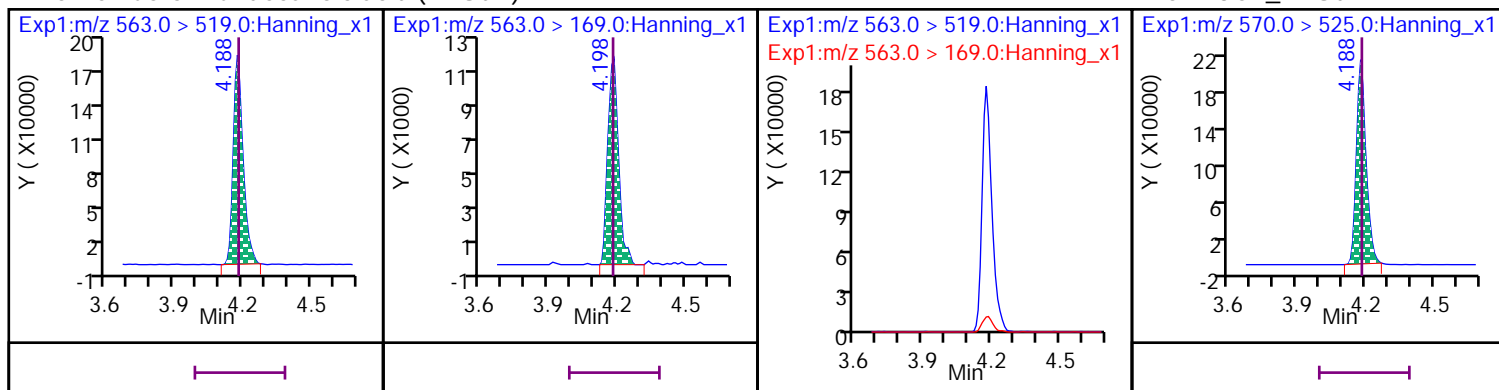
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



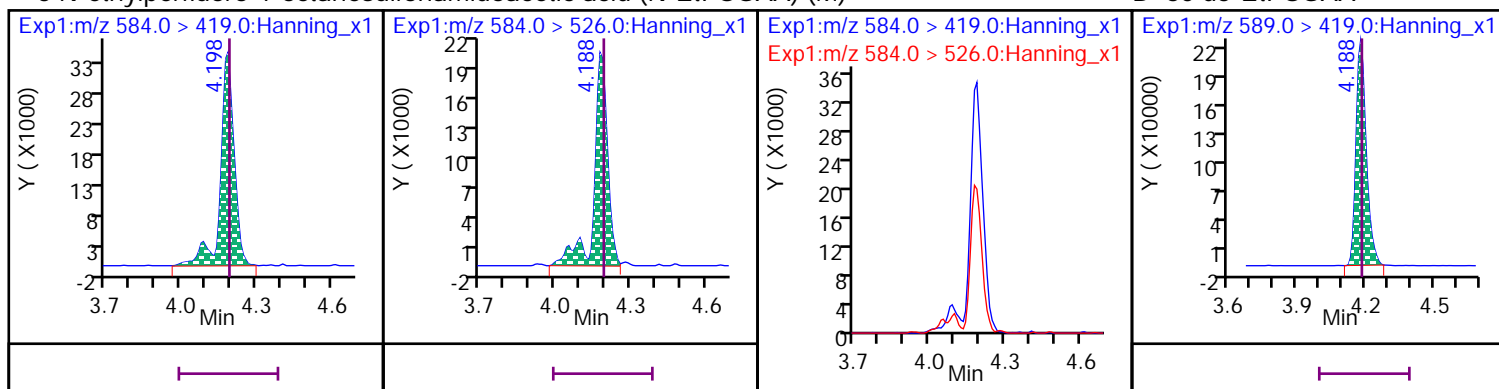
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



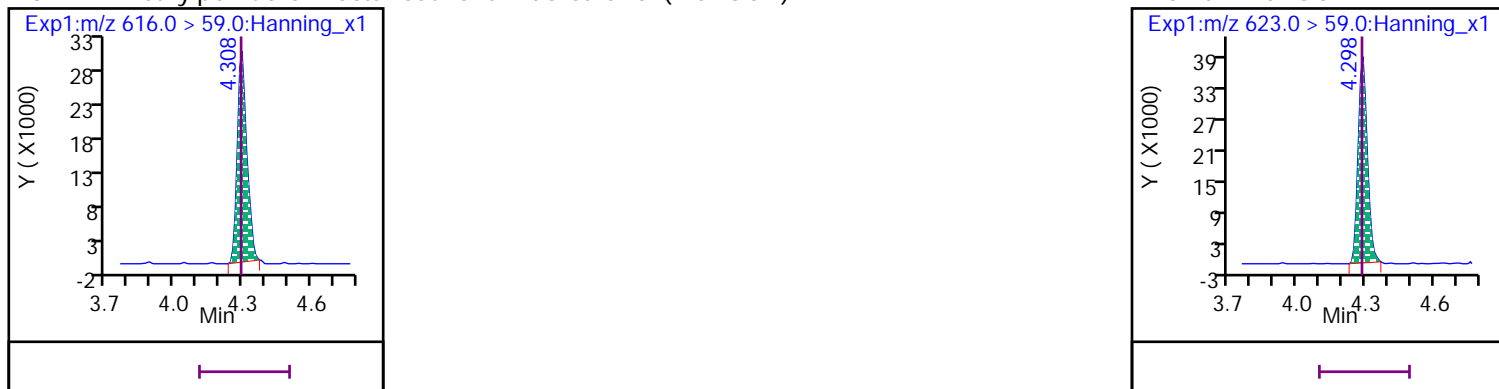
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



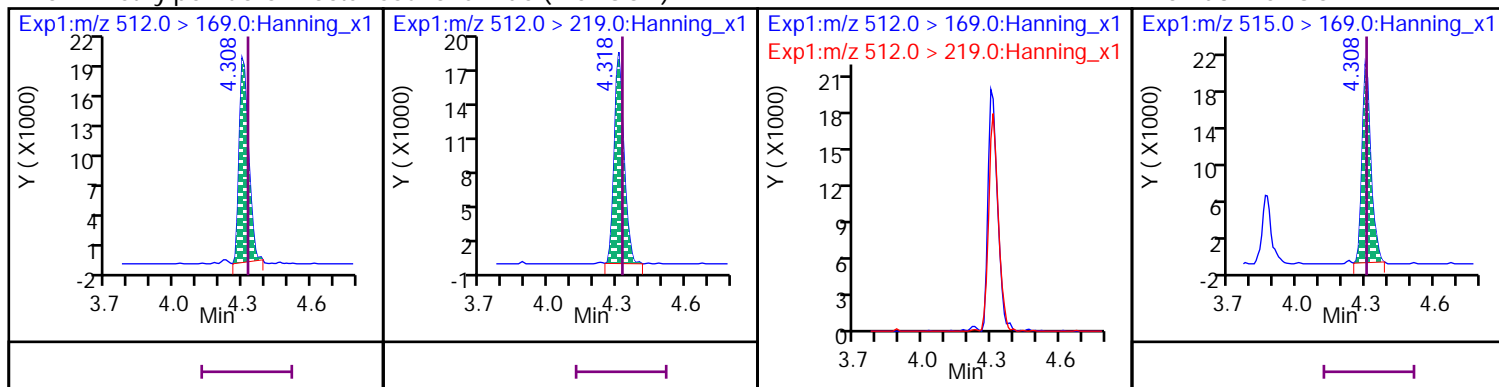
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



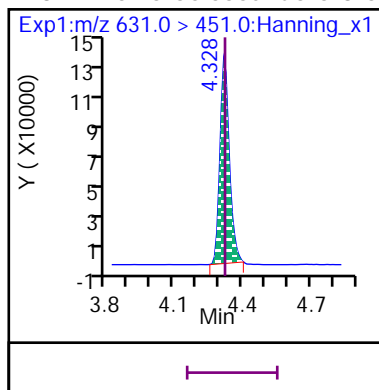
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

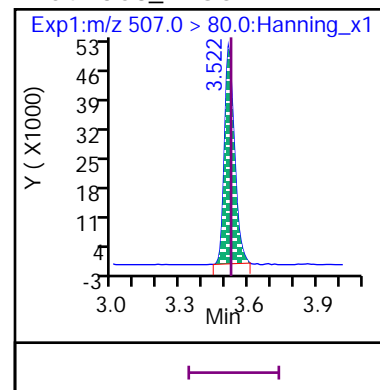




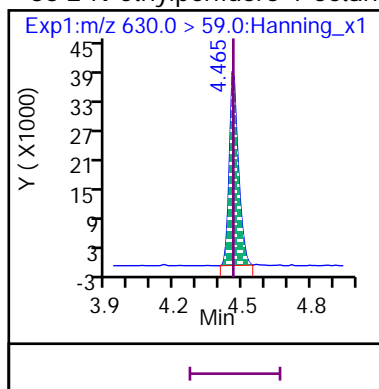
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



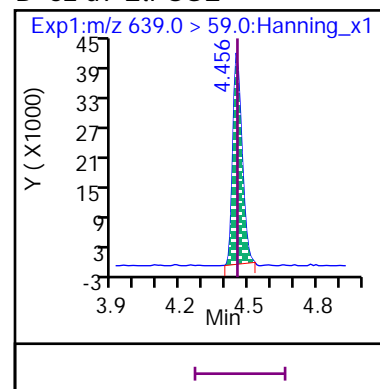
## D 54 13C8\_PFOS



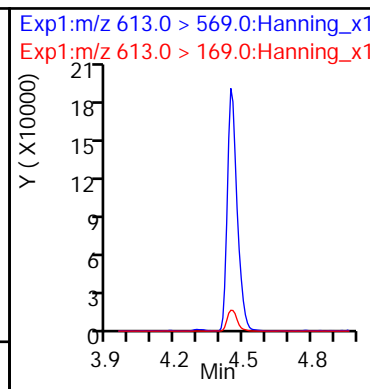
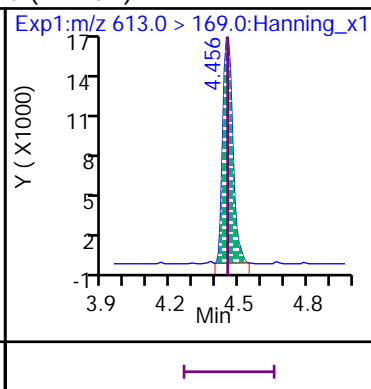
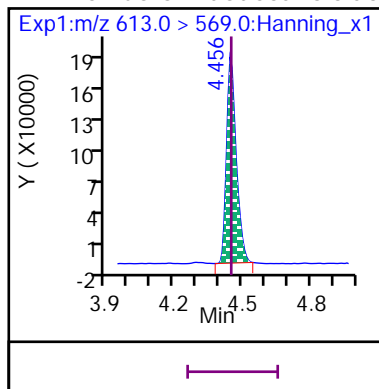
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



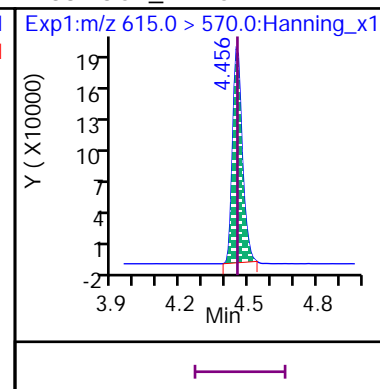
## D 62 d9-EtFOSE



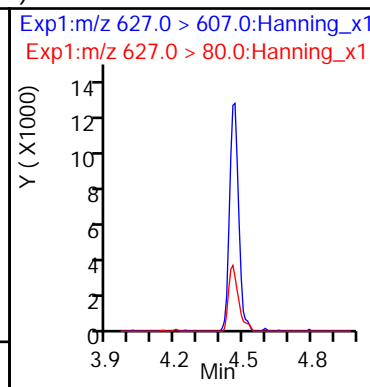
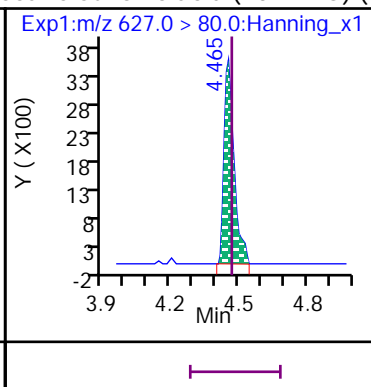
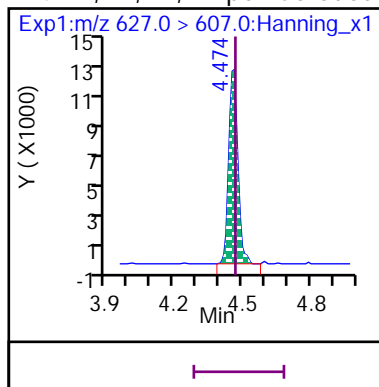
## 11 Perfluoro-n-dodecanoic acid (PFDaA)



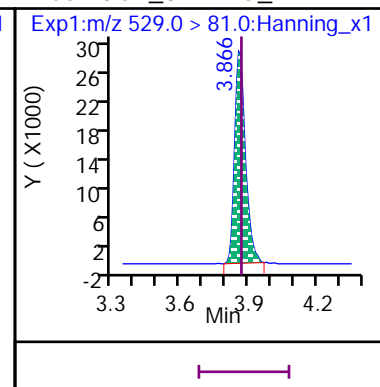
## D 38 13C2\_PFDaA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (M)

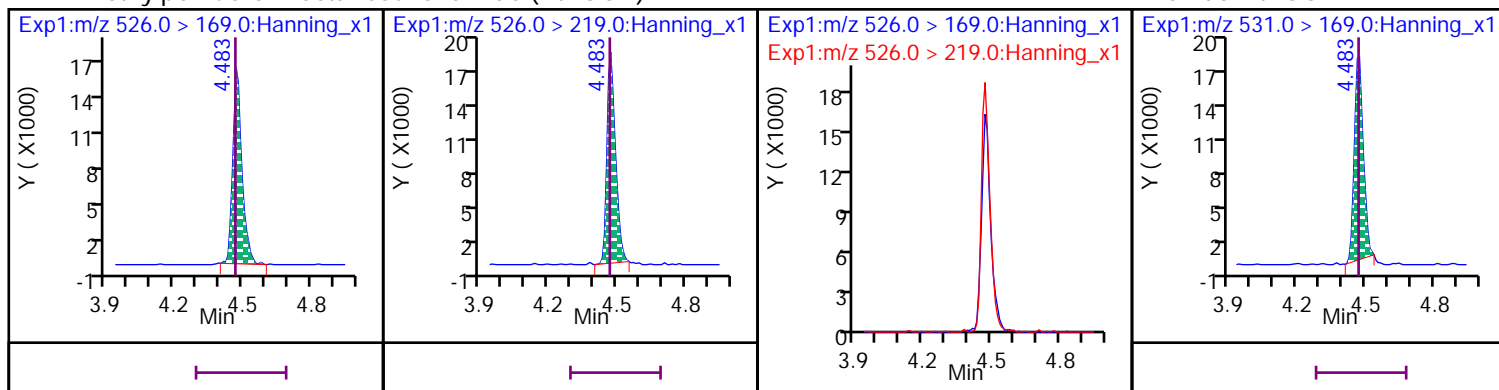


## D 65 13C2\_8:2 FTS\_2



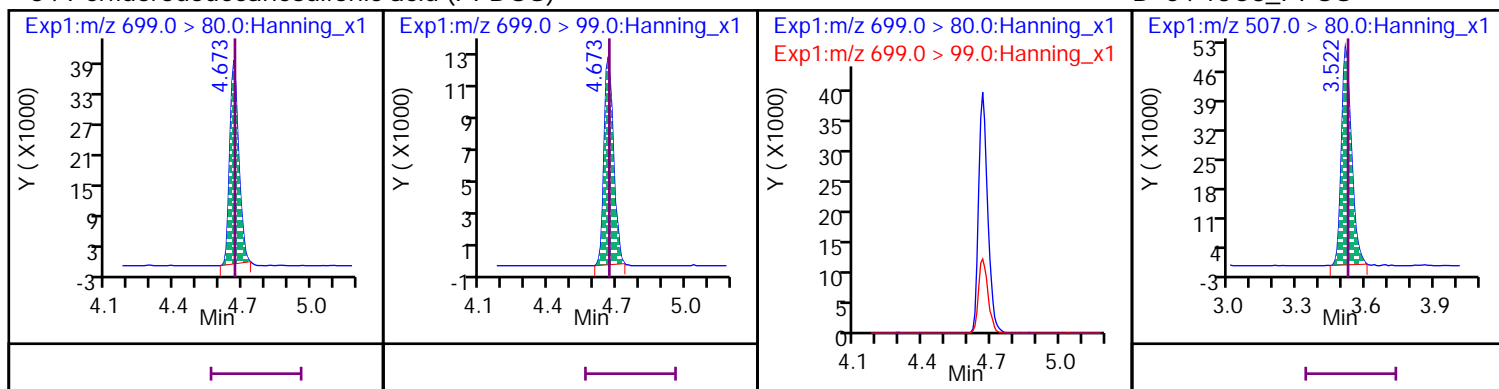
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



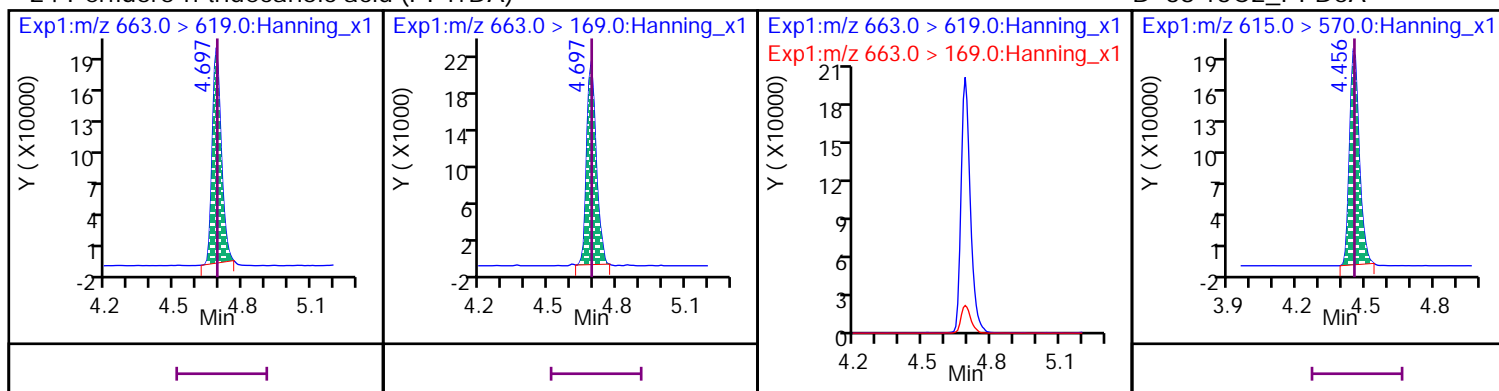
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



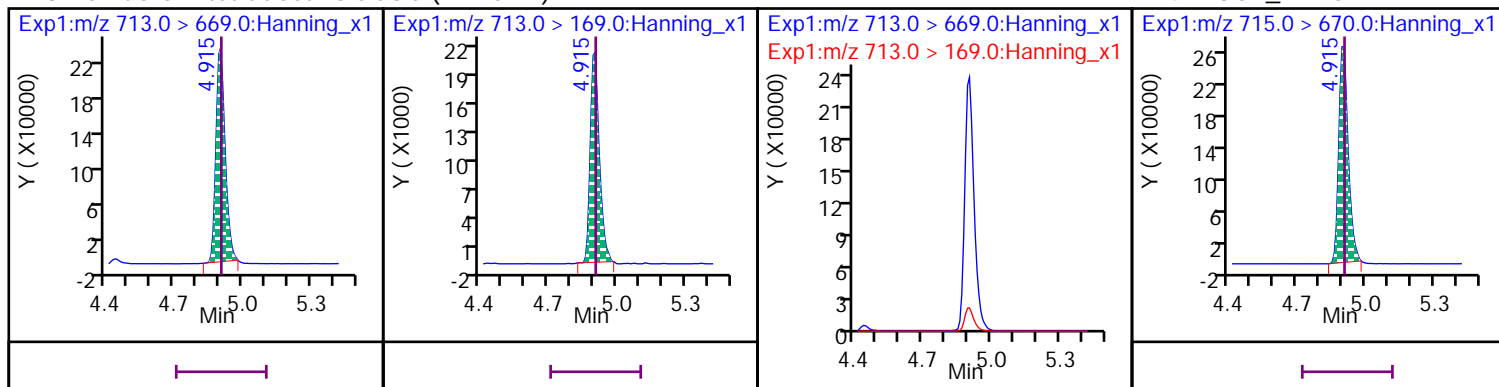
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



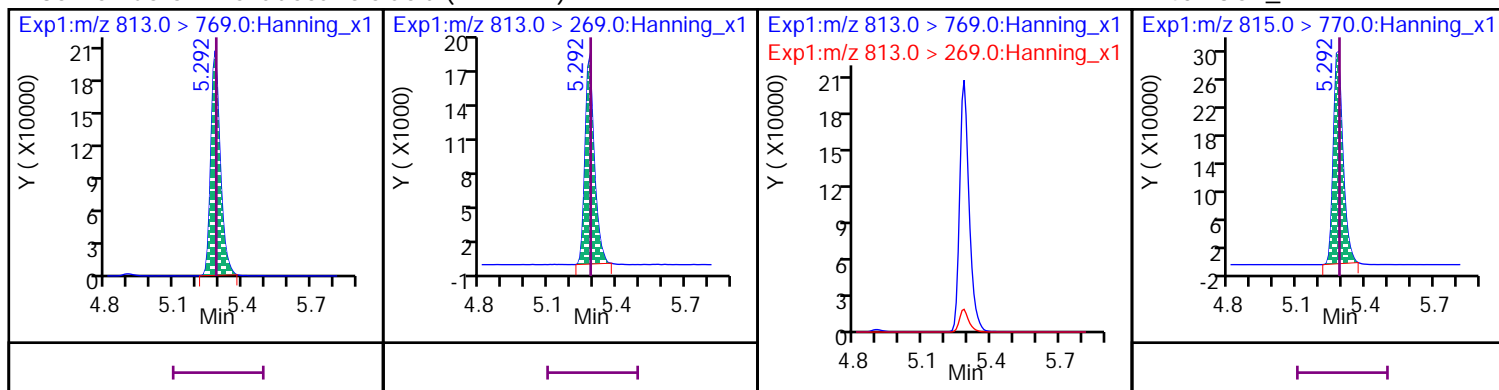
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



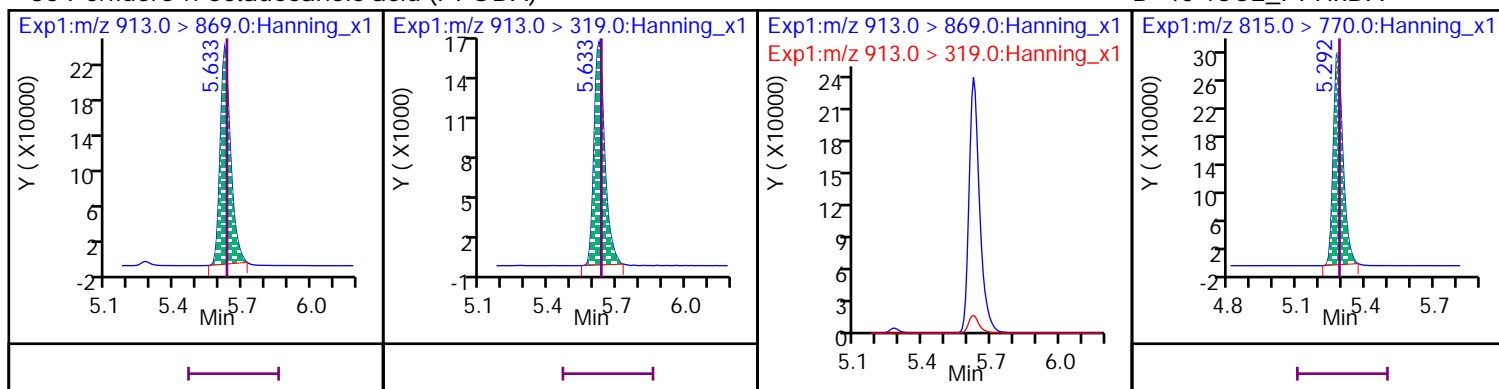
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

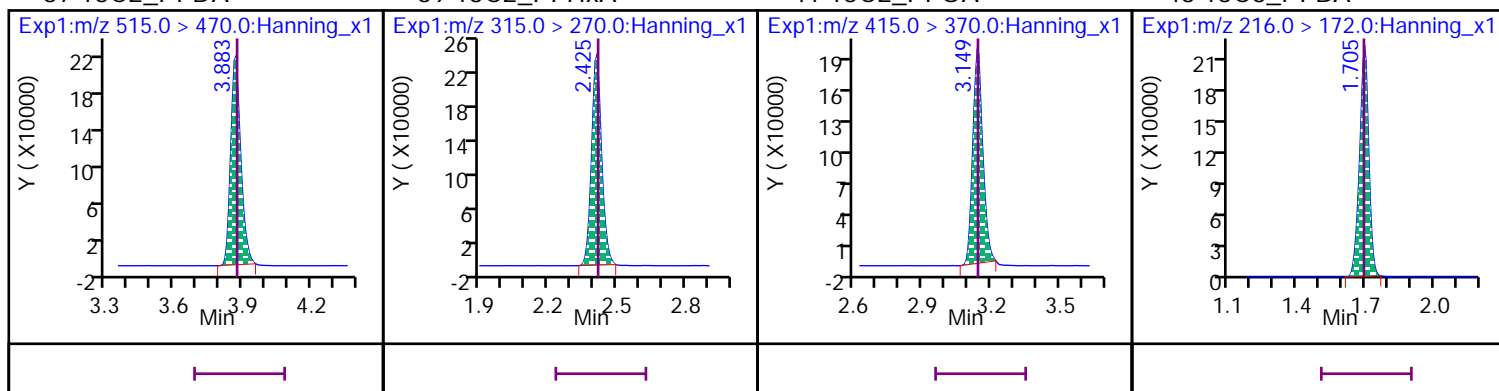


\* 37 13C2\_PFDA

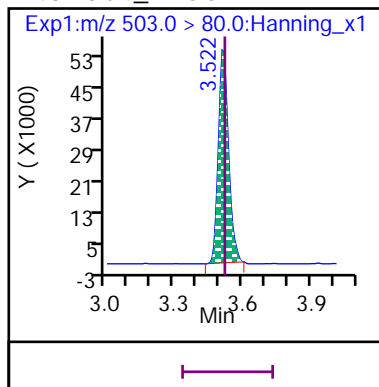
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

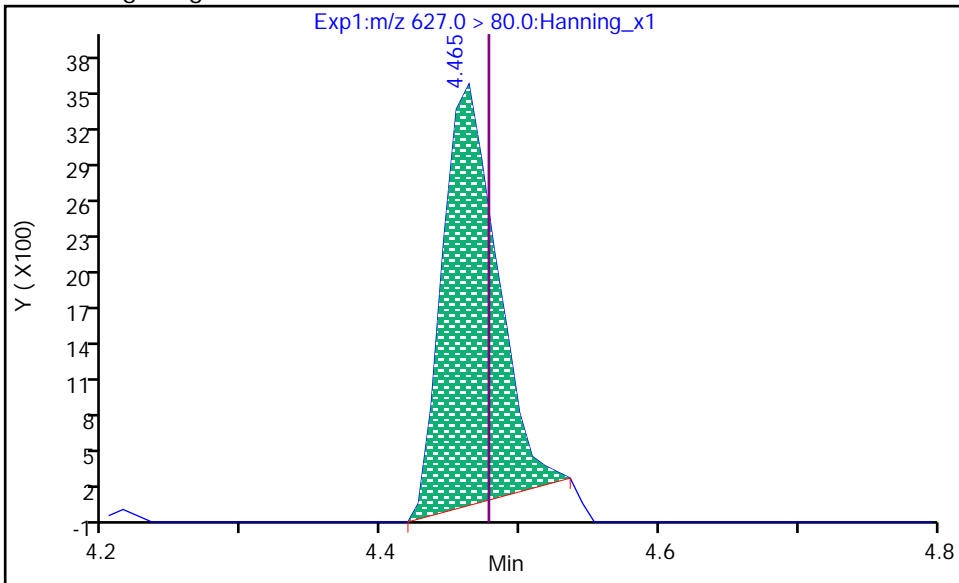
Dil. Factor: 1

Operator: Matthew M. Miller

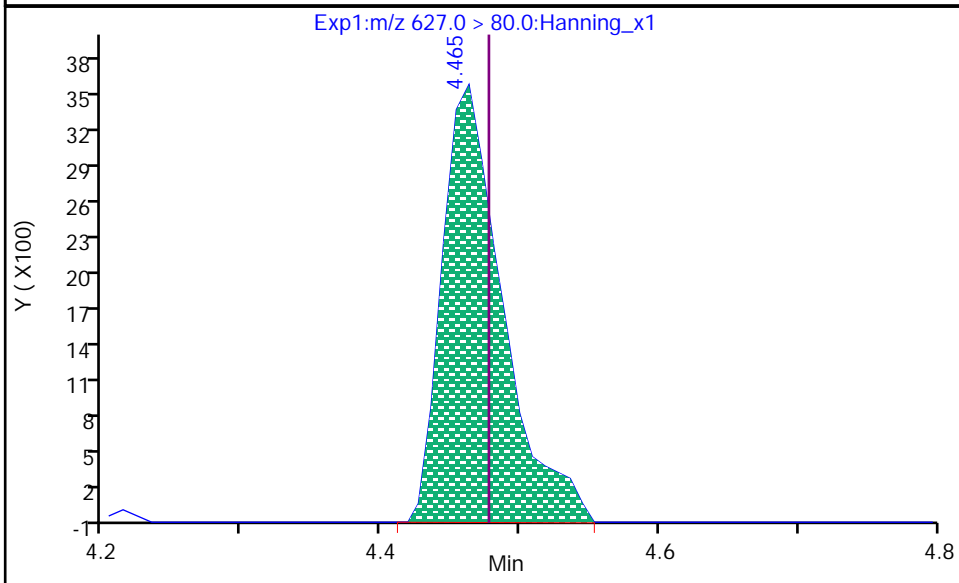
4 10:2 FTS, CAS: 120226-60-0

Processing Integration Results

RT: 4.465  
Area: 9210  
Amount: 789.19  
Amount Units: ng/L



RT: 4.465  
Area: 10624  
Amount: 789.19  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:31

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

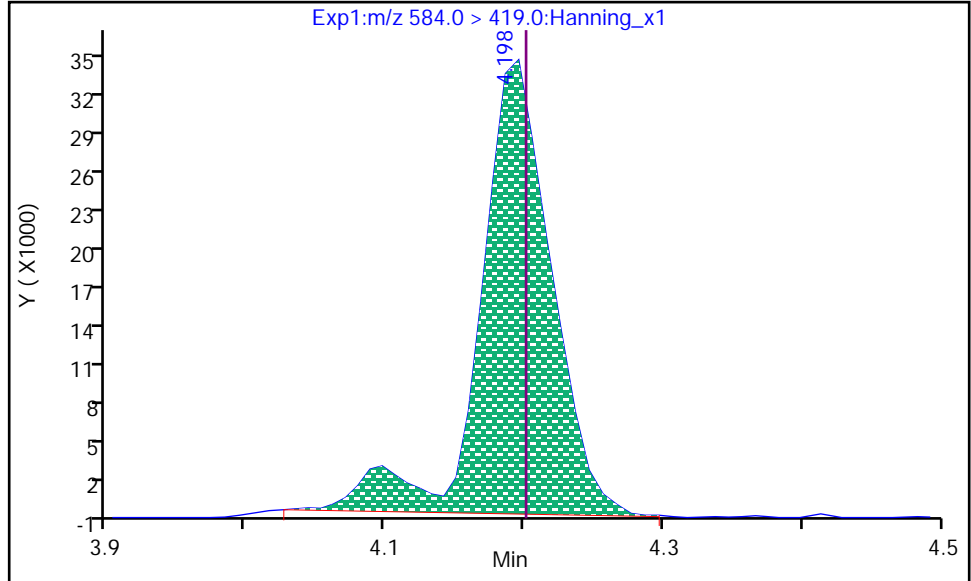
Dil. Factor: 1

Operator: Matthew M. Miller

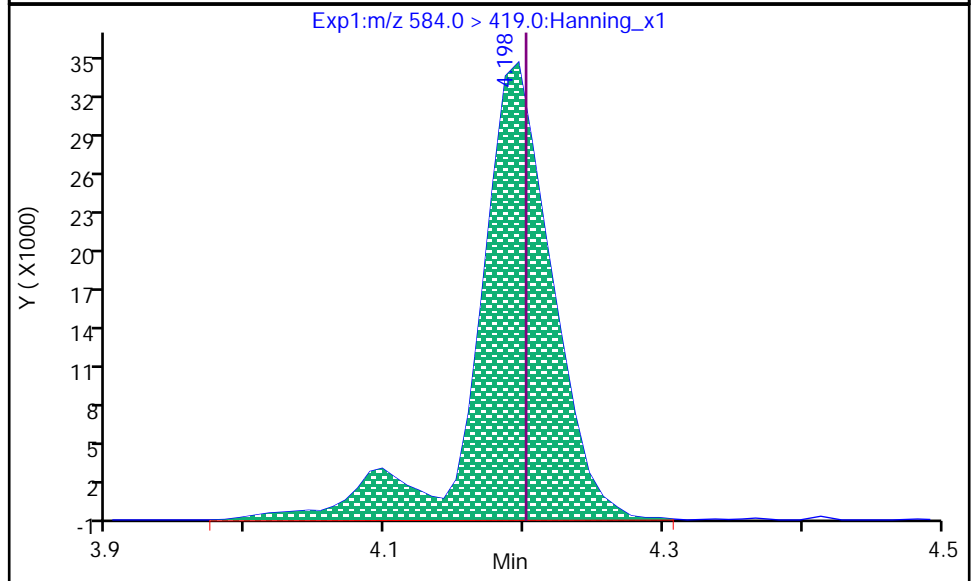
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.198  
Area: 120224  
Amount: 898.63  
Amount Units: ng/L



RT: 4.198  
Area: 127156  
Amount: 950.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:13

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

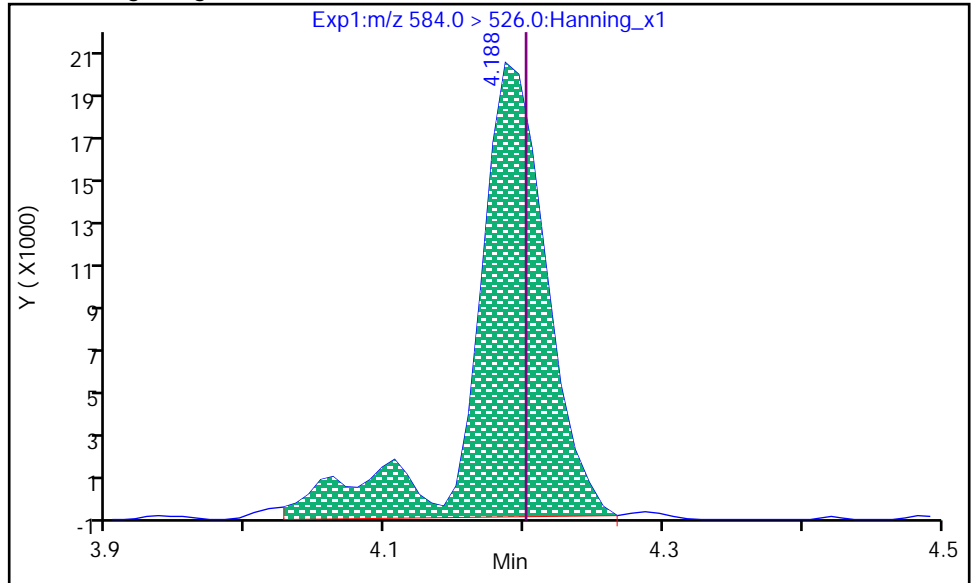
Dil. Factor: 1

Operator: Matthew M. Miller

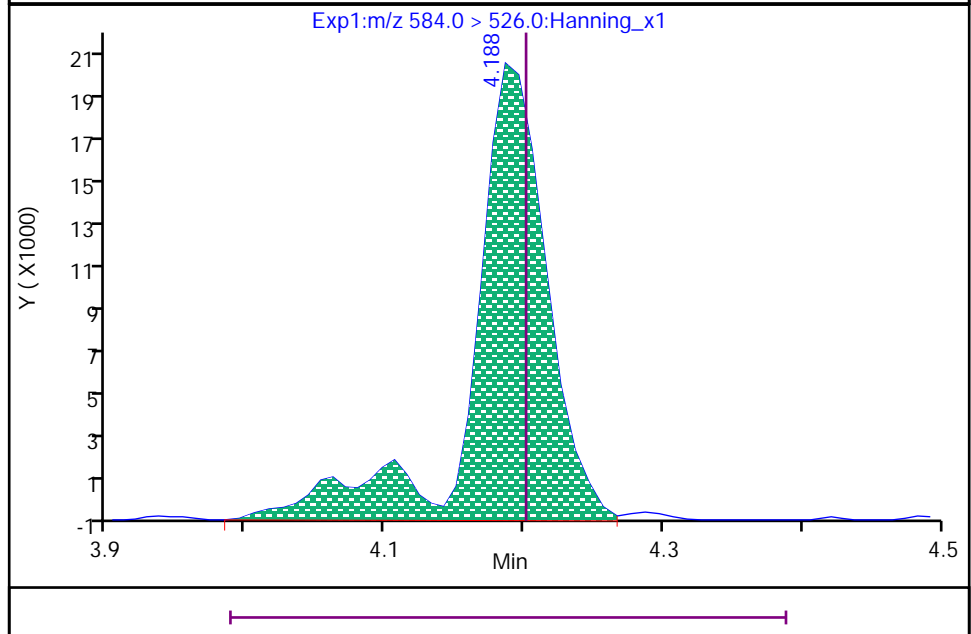
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.188  
Area: 71776  
Amount: 950.44  
Amount Units: ng/L



RT: 4.188  
Area: 74054  
Amount: 950.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:19

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

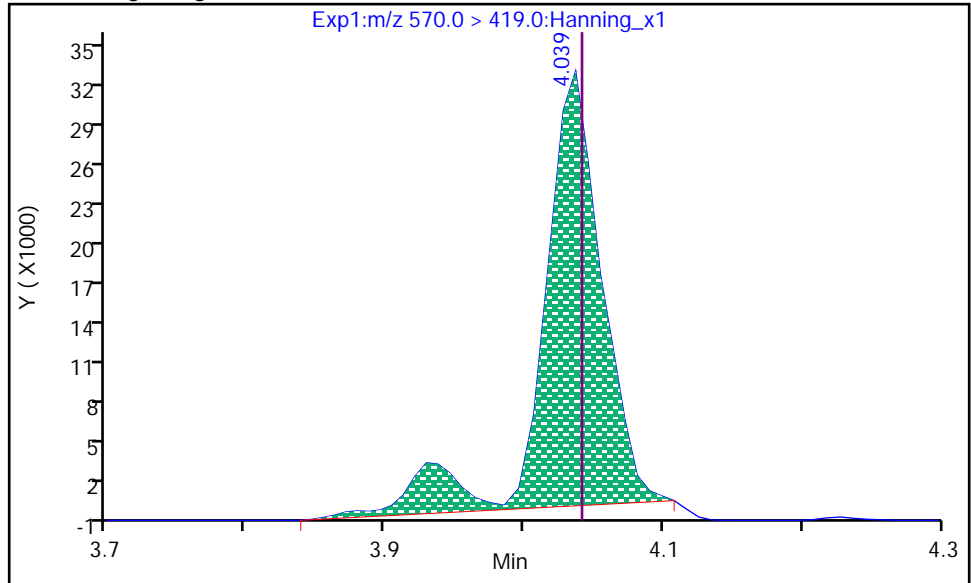
Dil. Factor: 1

Operator: Matthew M. Miller

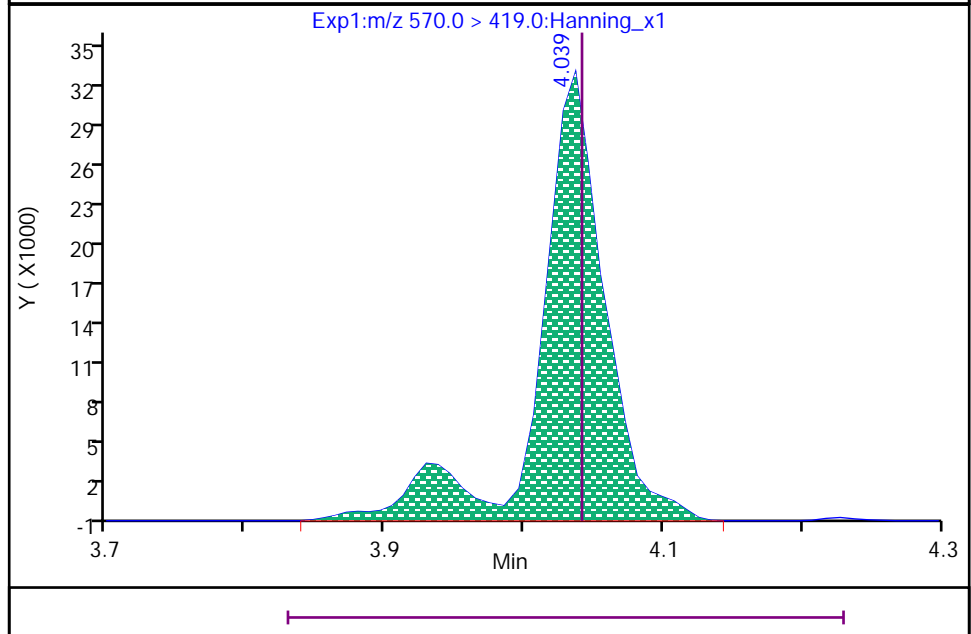
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.039  
Area: 93326  
Amount: 874.66  
Amount Units: ng/L



RT: 4.039  
Area: 105835  
Amount: 991.90  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:03

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d  
Injection Date: 29-Dec-2020 14:28:22 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 22  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	914.74	91.5	70 - 130
D 46 13C4_PFBA	669792	666639			99.5	50 - 150
D 50 13C5_PFPeA	688361	665962			96.7	50 - 150
21 PFPeA			1000.00	929.90	93	70 - 130
7 PFBS			884.00	831.75	94.1	70 - 130
D 44 13C3_PFBS	241196	236632			98.1	50 - 150
1 4:2 FTS			934.00	921.79	98.7	70 - 130
D 63 13C2_4:2 FTS_2	136264	127069			93.3	50 - 150
D 49 13C5_PFHxA	755876	731588			96.8	50 - 150
15 PFHxA			1000.00	950.74	95.1	70 - 130
22 PFPeS			938.00	882.41	94.1	70 - 130
28 GenX			2000.00	1822.33	91.1	70 - 130
D 66 13C3_GenX	1415766	1316227			93	50 - 150
D 47 13C4_PFHpA	613536	586926			95.7	50 - 150
13 PFHpA			1000.00	991.53	99.2	70 - 130
D 45 13C3_PFHxS	185779	170919			92	50 - 150
14 PFHxS			910.00	848.17	93.2	70 - 130
29 ADONA			942.00	898.35	95.4	70 - 130
D 64 13C2_6:2 FTS_2	105371	101240			96.1	50 - 150
2 6:2 FTS			948.00	946.73	99.9	70 - 130
20 PFOA			1000.00	968.47	96.8	70 - 130
D 53 13C8_PFOA	607240	609051			100	50 - 150
12 PFHpS			952.00	942.42	99	70 - 130
18 PFOS			928.00	866.48	93.4	70 - 130
17 PFNA			1000.00	919.26	91.9	70 - 130
D 56 13C9_PFNA	787757	774032			98.3	50 - 150
D 54 13C8_PFOS	153541	154557			101	50 - 150
30 9CI-PF3ONS			932.00	834.68	89.6	70 - 130
D 55 13C8_PFOSA	318847	291566			91.4	50 - 150
19 PFOSA			1000.00	1004.63	100	70 - 130
16 PFNS			960.00	837.23	87.2	70 - 130
D 65 13C2_8:2 FTS_2	104593	92569			88.5	50 - 150
3 8:2 FTS			958.00	998.21	104	70 - 130
10 PFDA			1000.00	971.83	97.2	70 - 130
D 51 13C6_PFDA	701677	654027			93.2	50 - 150
D 58 d3-MeFOSAA	727199	671090			92.3	50 - 150



Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1059.66	106	70 - 130
9 PFDS			964.00	917.62	95.2	70 - 130
5 N-EtFOSAA			1000.00	910.50	91.1	70 - 130
25 PFUdA			1000.00	939.23	93.9	70 - 130
D 60 d5-EtFOSAA	710460	694515			97.8	50 - 150
D 52 13C7_PFUdA	641343	652486			102	50 - 150
D 61 d7-MeFOSE	96951	104083			107	50 - 150
32 MeFOSE			1000.00	926.91	92.7	70 - 130
26 MeFOSA			1000.00	942.55	94.3	70 - 130
D 57 d3-MeFOSA	52459	50004			95.3	50 - 150
31 11Cl-PF3OUDS			942.00	876.83	93.1	70 - 130
D 62 d9-EtFOSE	123442	113477			91.9	50 - 150
33 EtFOSE			1000.00	991.58	99.2	70 - 130
D 59 d5-EtFOSA	48002	46908			97.7	50 - 150
D 38 13C2_PFDoA	609821	569911			93.5	50 - 150
4 10:2 FTS			964.00	877.35	91	70 - 130
27 EtFOSA			1000.00	954.87	95.5	70 - 130
11 PFDoA			1000.00	962.89	96.3	70 - 130
34 PFDOS			968.00	890.43	92	70 - 130
24 PFTrDA			1000.00	978.30	97.8	70 - 130
23 PFTeDA			1000.00	918.58	91.9	70 - 130
D 42 13C2_PFTeDA	786208	802237			102	50 - 150
35 PFHxDA			1000.00	982.36	98.2	70 - 130
D 40 13C2_PFHxDA	908883	905354			99.6	50 - 150
36 PFODA			1000.00	955.46	95.5	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d  
 Injection Date: 29-Dec-2020 14:28:22 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 22  
 Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.704	1.702	1	666639	23	>100:1			1000.00	961.20	99.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.709	0/-1	607360	24	>100:1			1000.00	914.74		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.080	0	665962	18	>100:1			1000.00	968.13	96.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.080	0/0	622633	16	>100:1			1000.00	929.90		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.133	0	236632	18	>100:1			1000.00	1027.80	98.1	
<b>7 Perfluoro-1-butanefluorobutanoic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.129	2.133	0/0	232056	18	>100:1	Target = 3.50		884.00	831.75		
298.9 > 99	44	2.129	2.133		63783	16	>100:1	3.63 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.446	1/1	181129	19	>100:1	Target = 3.10		938.00	882.41		
349 > 99	44	2.450	2.446		58055	25	>100:1	3.11 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.393	0	127069	19	>100:1			5000.00	5248.98	93.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.379	2.393	0/0	46752	18	>100:1	Target = 1.80		934.00	921.79		
327 > 81	63	2.388	2.393		24388	17	>100:1	1.91 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.429	0	731588	20	>100:1			1000.00	992.56	96.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.420	1/1	686699	20	>100:1	Target = 18.34		1000.00	950.74		
313 > 119	49	2.423	2.420		34404	19	>100:1	19.95 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.536	0	1316227	21	>100:1			5000.00	4941.65	93	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.536	0/0	344660	21	>100:1	Target = 0.81		2000.00	1822.33		
285 > 185	66	2.530	2.536		443226	21	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.777	0	586926	21	>100:1			1000.00	967.49	95.7	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.786	0/0	603642	21	>100:1	Target = 3.70		1000.00	991.53		
363 > 169	47	2.772	2.786		152183	20	>100:1	3.96 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.795	0	170919	19	>100:1			1000.00	998.19	92	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.795	0/0	153708	27	>100:1	Target = 3.21	0.18	910.00	848.17		
399 > 99	45	2.799	2.795		51304	29	>100:1	2.99 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.823	0/0	974833	20	>100:1	Target = 2.97		942.00	898.35		
377 > 85	45	2.818	2.823		322646	20	>100:1	3.02 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.166	0/0	146327	25	>100:1	Target = 3.08		952.00	942.42		
449 > 99	45	3.155	3.166		47842	26	>100:1	3.05 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.132	0	101240	26	>100:1			5000.00	5256.93	96.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.139	0/0	39733	25		Target = 1.80		948.00	946.73		
427 > 81	64	3.121	3.139		23297	29	>100:1	1.70 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.155	3.159	0	609051	24	>100:1			1000.00	1029.04	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.159	0/0	601320	33	>100:1	Target = 2.87		1000.00	968.47		
413 > 169	53	3.148	3.159		197129	25	>100:1	3.05 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.528	3.533	0	154557	23	>100:1			1000.00	1030.87	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.528	3.533	0/0	158693	42	>100:1	Target = 3.84	0.27	928.00	866.48		
499 > 99	54	3.520	3.533		44536	40	>100:1	3.56 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.736	3.740	0/0	434293	24	>100:1			932.00	834.68		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.879	0/0	99026	20	>100:1	Target = 3.07		960.00	837.23		
549 > 99	54	3.865	3.879		35585	19	>100:1	2.78 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.175	0/0	102926	18		Target = 3.03		964.00	917.62		
599 > 99	54	4.170	4.175		39740	27	>100:1	2.58 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	384870	17	>100:1			942.00	876.83		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.677	0/0	110487	19	>100:1	Target = 3.33		968.00	890.43		
699 > 99	54	4.672	4.677		30972	18	>100:1	3.56 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.528	3.533	0	774032	23	>100:1			1000.00	1030.72	98.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.533	0/0	711555	22	>100:1	Target = 6.16		1000.00	919.26		
463 > 169	56	3.528	3.533		112822	25	>100:1	6.30 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.854	1	291566	20	>100:1			1000.00	941.86	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.849	3.854	0/-1	288655	21	>100:1			1000.00	1004.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.873	3.879	0	92569	21				5000.00	4990.20	88.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.911	-2/-2	37143	27	>100:1	Target = 1.95		958.00	998.21		
527 > 81	65	3.865	3.911		14926	16		2.48 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.464	4.479	0/0	37536	16		Target = 3.14		964.00	877.35		
627 > 80	65	4.464	4.479		10214	24	>100:1	3.67 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.882	3.887	0	654027	21	>100:1			1000.00	985.97	93.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.887	0/0	624541	21	>100:1	Target = 15.94		1000.00	971.83		
513 > 169	51	3.882	3.887		42575	20	>100:1	14.66 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.037	4.034	1	671090	17	>100:1			5000.00	4675.30	92.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.037	4.043	0/-1	109251	35	>100:1	Target = 1.33	0.13	1000.00	1059.66		
570 > 483	58	4.037	4.043		85382	34	>100:1	1.27 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.193	0	694515	19	>100:1			5000.00	5229.20	97.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.197	4.203	0/0	125913	36	>100:1	Target = 1.58	0.13	1000.00	910.50		
584 > 526	60	4.187	4.203		81520	32	>100:1	1.54 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.193	0	652486	20	>100:1			1000.00	1032.29	102	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.193	0/0	575986	18	>100:1	Target = 15.50		1000.00	939.23		
563 > 169	52	4.187	4.193		36038	17	>100:1	15.98 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	104083	15	>100:1			1000.00	961.88	107	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	90649	15	>100:1			1000.00	926.91		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.314	0	50004	19	>100:1			1000.00	944.95	95.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.334	0/0	53174	16	>100:1	Target = 1.12		1000.00	942.55		
512 > 219	57	4.318	4.334		56380	19	>100:1	0.94 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.461	0	113477	18	>100:1			1000.00	904.95	91.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.470	1/1	100108	18	>100:1			1000.00	991.58		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.464	4.461	1	569911	18	>100:1			1000.00	941.51	93.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.461	1/0	555714	18	>100:1	Target = 10.85		1000.00	962.89		
613 > 169	38	4.464	4.461		53726	17	>100:1	10.34 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.701	0/-1	549144	21	>100:1	Target = 8.37		1000.00	978.30		
663 > 169	38	4.696	4.701		65760	20	>100:1	8.35 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.479	1	46908	20	>100:1			1000.00	955.46	97.7	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.479	1/0	48935	18	>100:1	Target = 1.03		1000.00	954.87		
526 > 219	59	4.482	4.479		47070	14	>100:1	1.03 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	802237	18	>100:1			1000.00	952.27	102	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.918	0/0	638504	19	80:1	Target = 12.11		1000.00	918.58		
713 > 169	42	4.915	4.918		51560	19	>100:1	12.38 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.296	0	905354	18	>100:1			1000.00	999.11	99.6	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.296	0/0	581115	21	>100:1	Target = 11.48		1000.00	982.36		
813 > 269	40	5.291	5.296		53753	20	>100:1	10.81 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.643	0/0	765739	24	>100:1	Target = 13.88		1000.00	955.46		
913 > 319	40	5.632	5.643		52861	23	>100:1	14.48 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.887	0	646131	21	>100:1					93.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.429	0	705070	21	>100:1					96.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.152	0	601618	23	>100:1					97.6	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.704	1.702	1	609031	24	>100:1					95.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.528	3.533	0	167813	21	>100:1					97.5	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d

Injection Date: 29-Dec-2020 14:28:22

Inst. ID: LCMSMS02

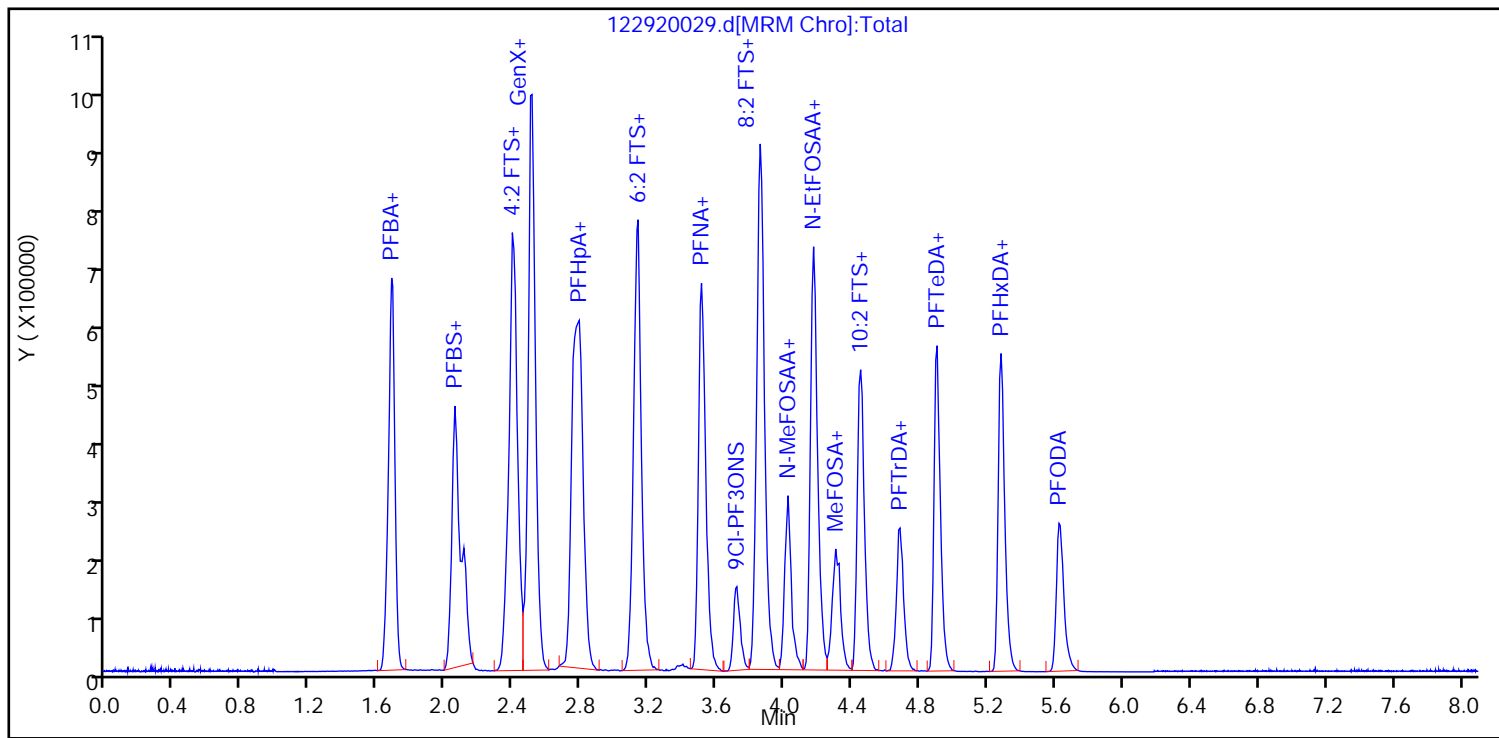
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

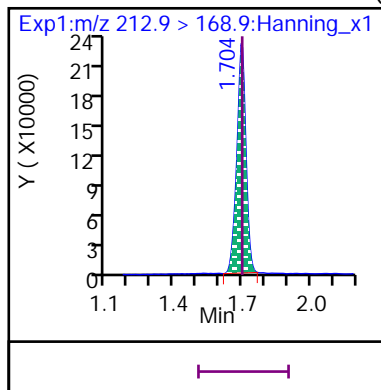
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

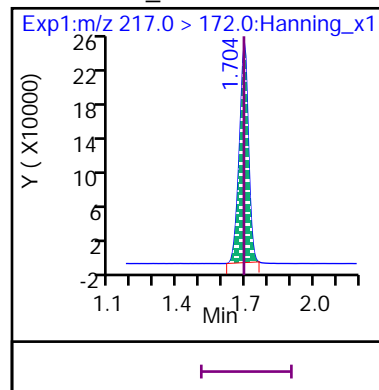
Operator: Matthew M. Miller



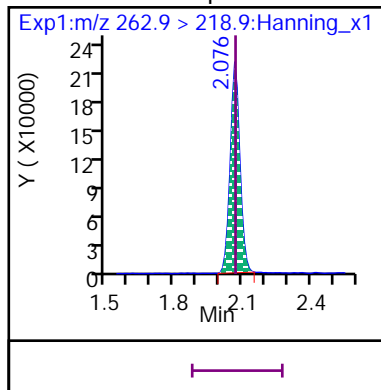
8 Perfluoro-n-butanoic acid (PFBA)



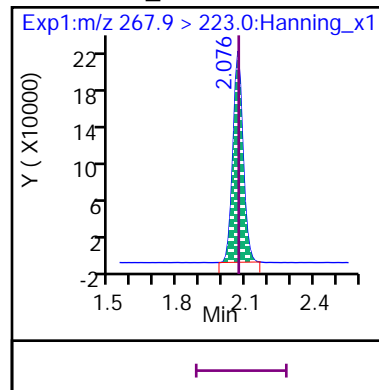
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

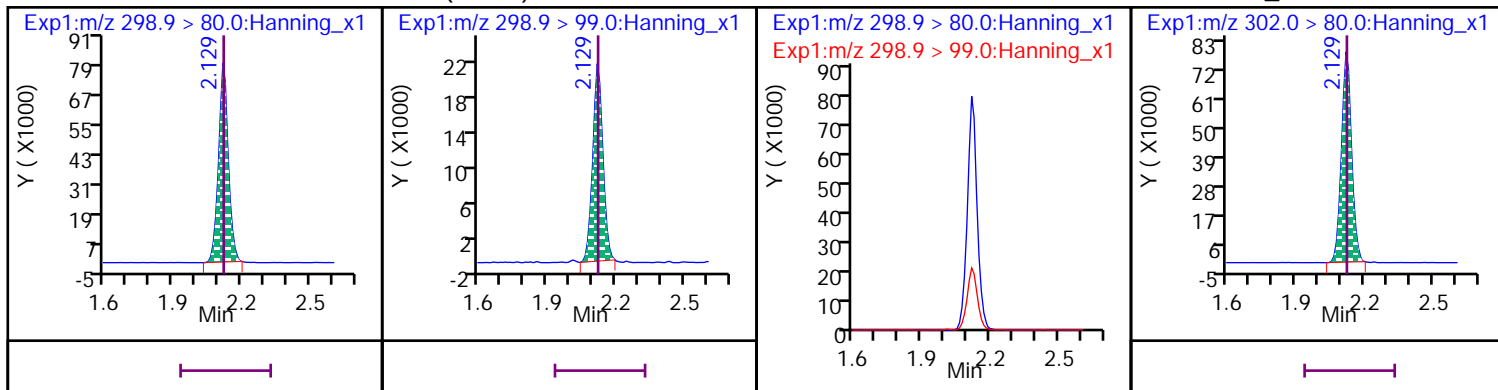


D 50 13C5\_PFPeA



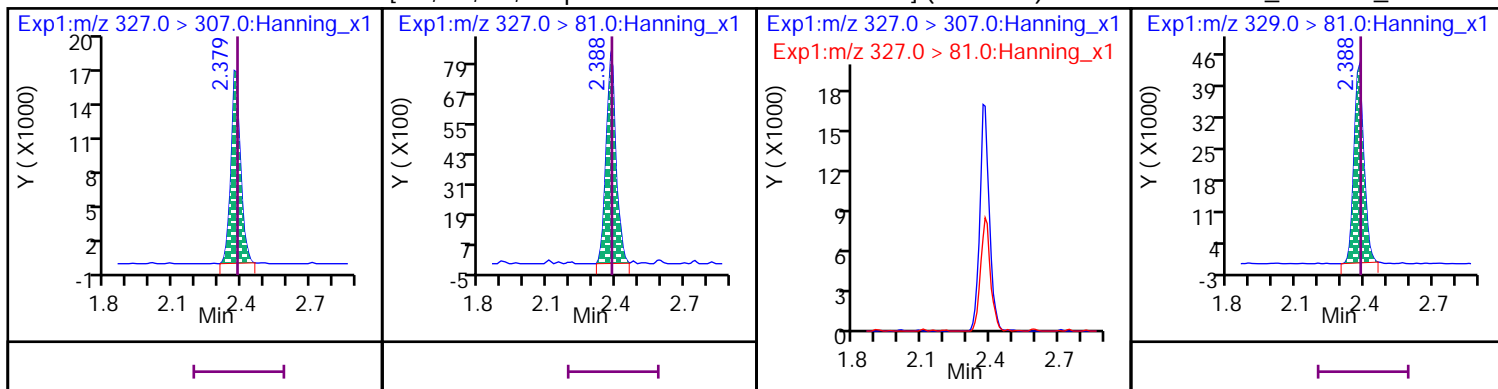
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



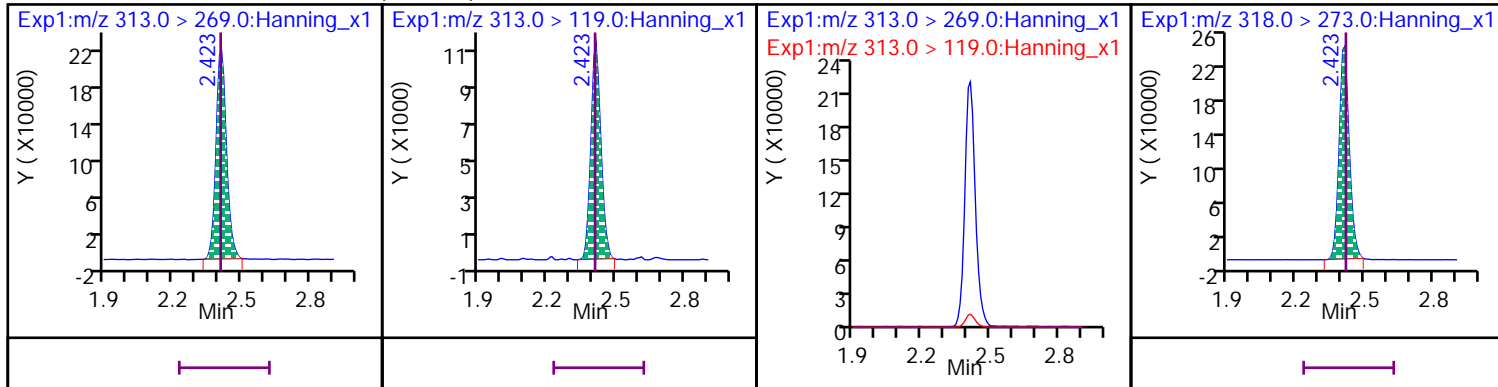
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



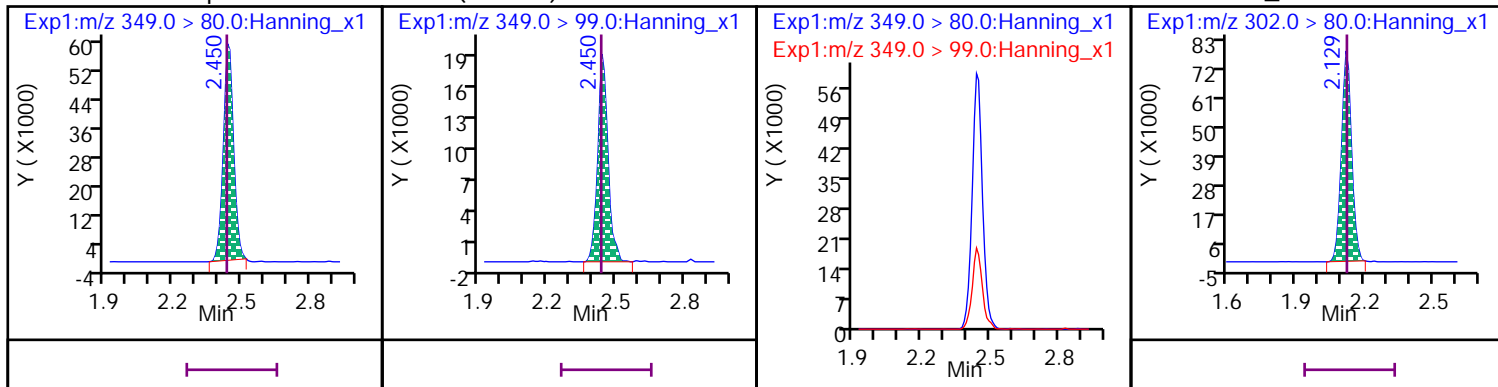
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



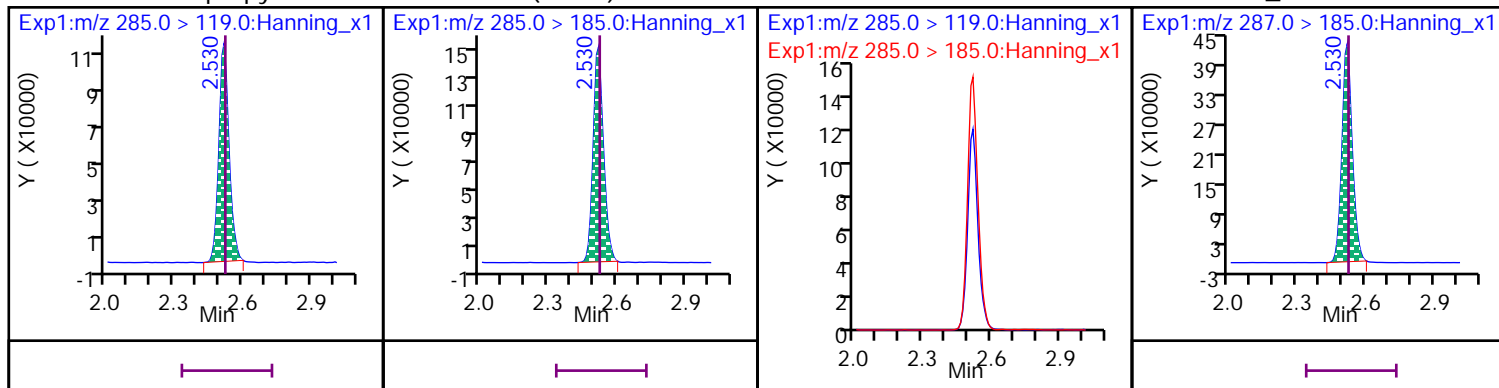
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



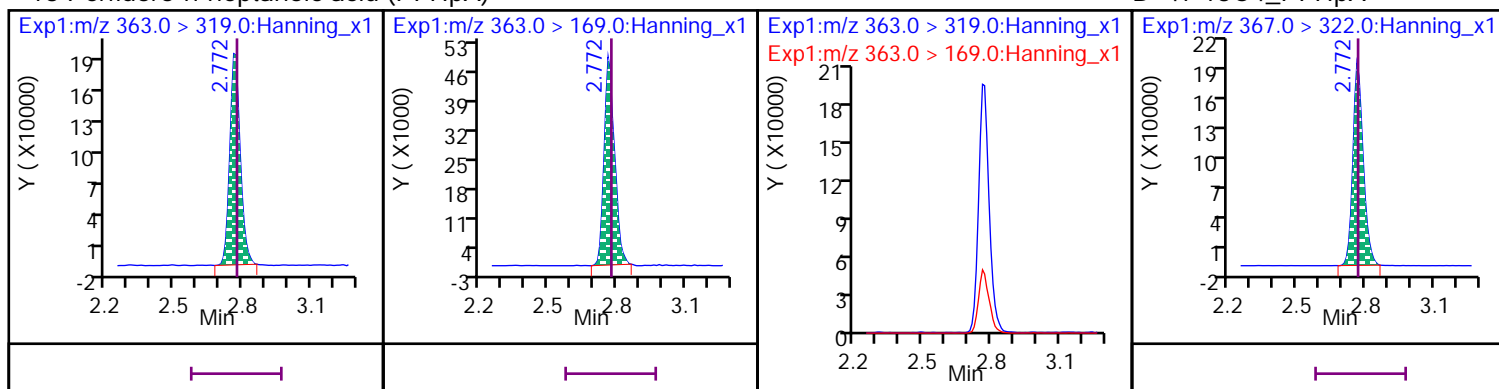
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



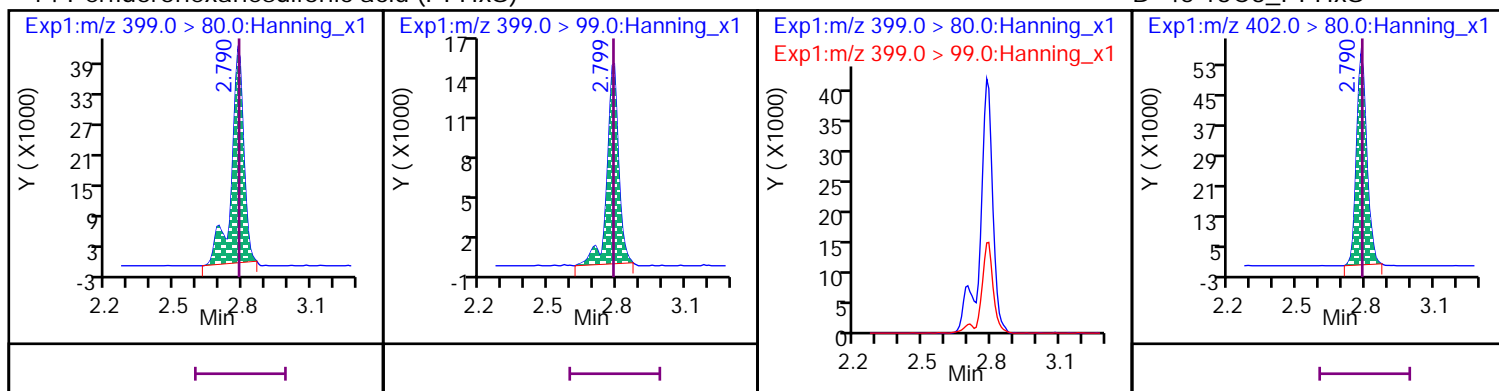
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



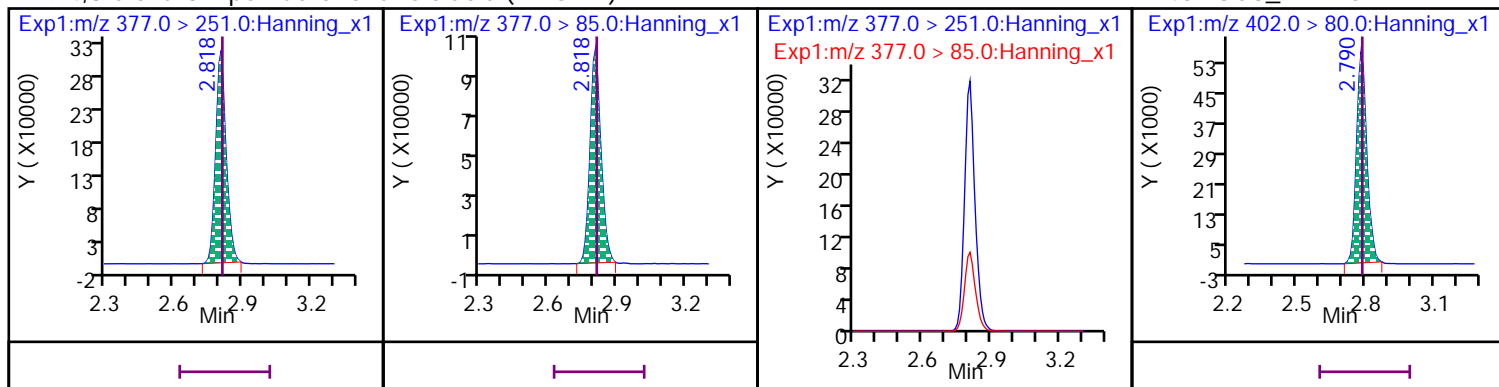
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

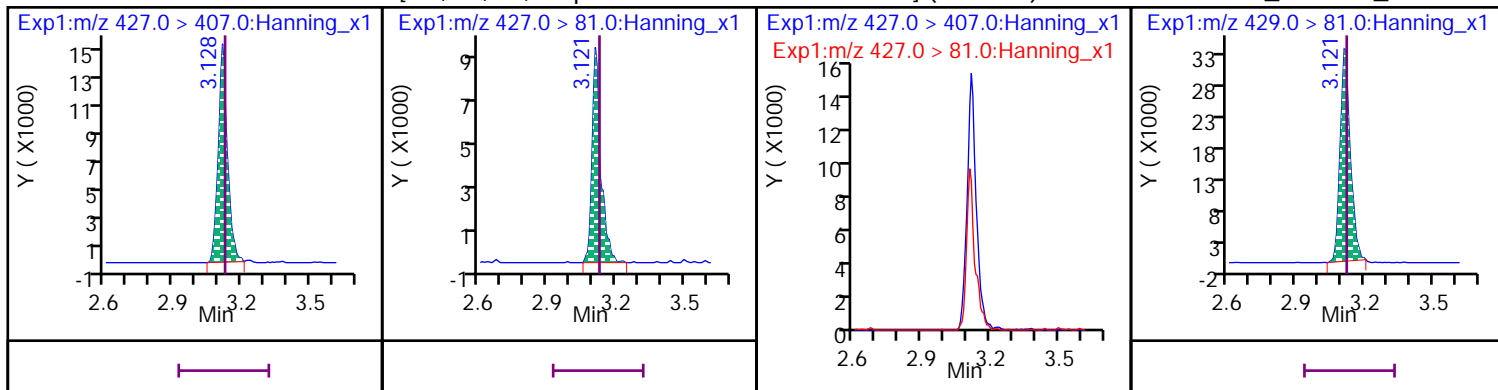
D 45 13C3\_PFHxS





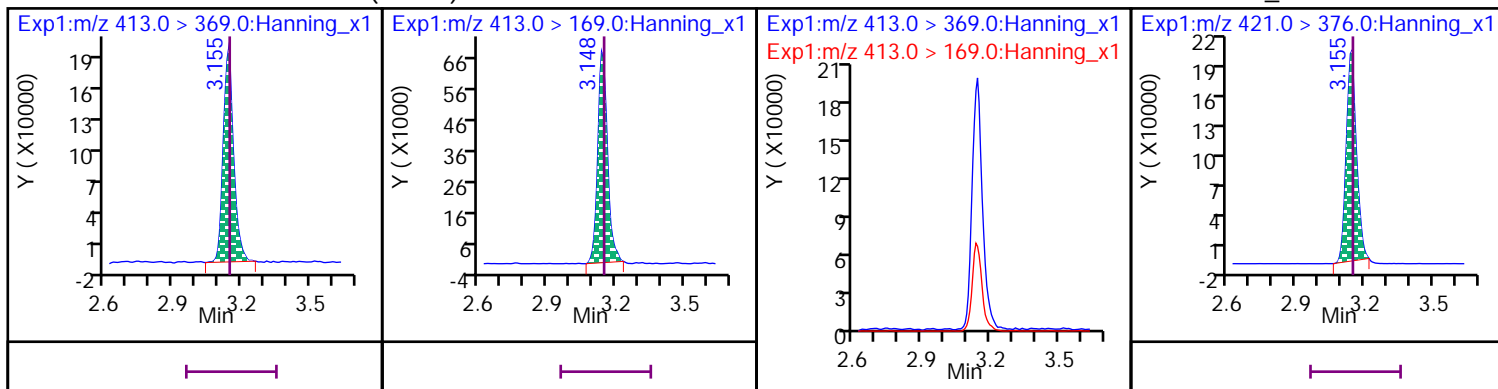
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



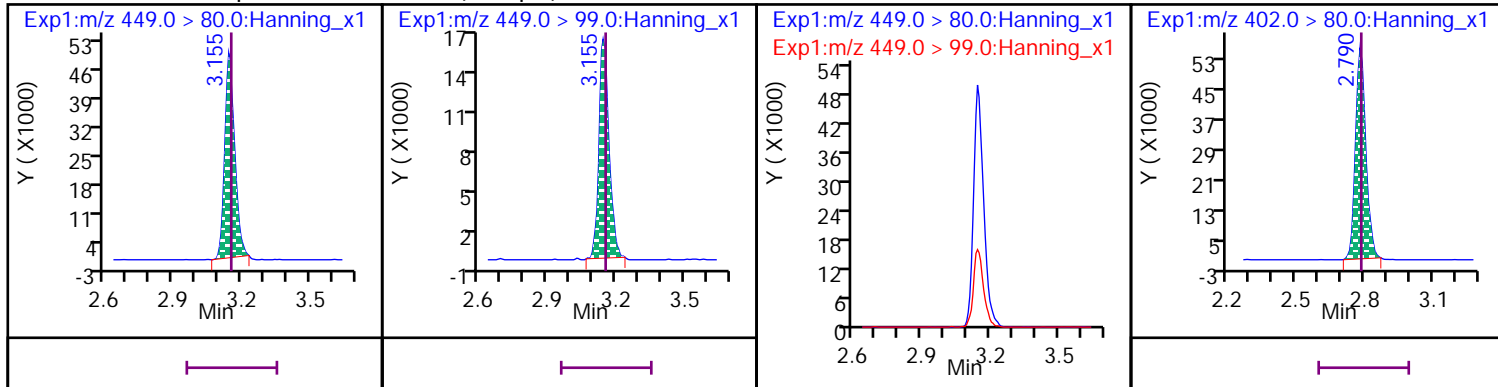
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



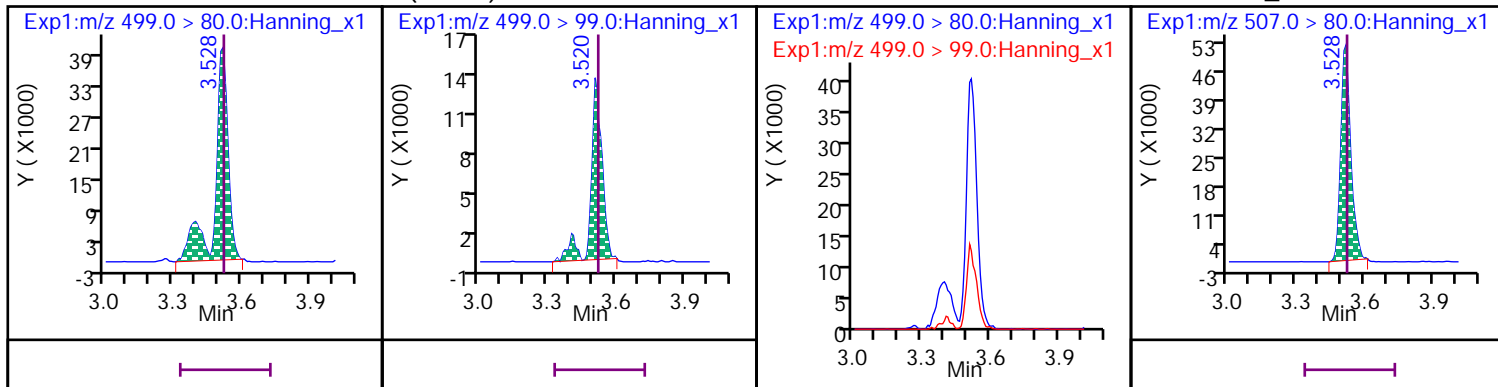
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



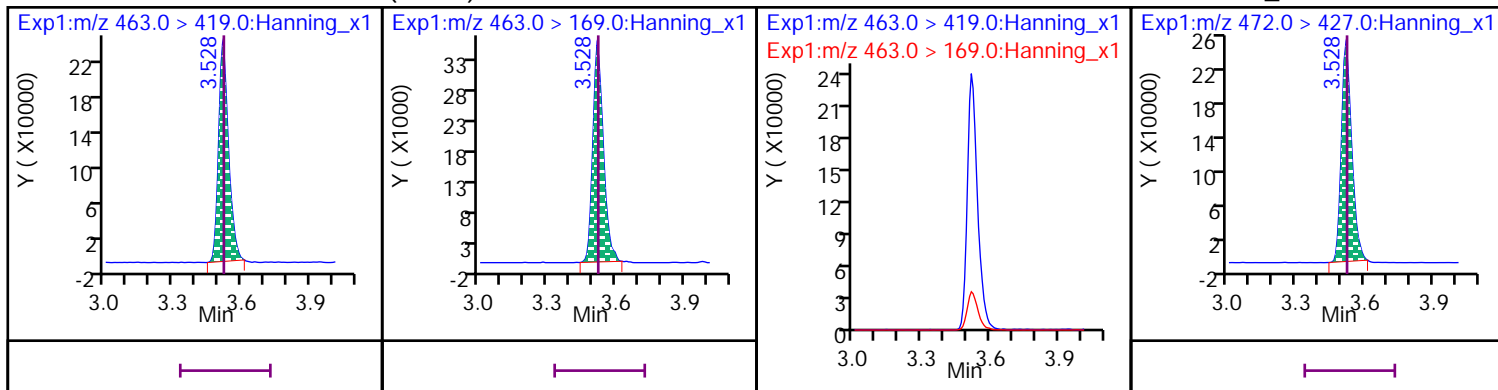
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



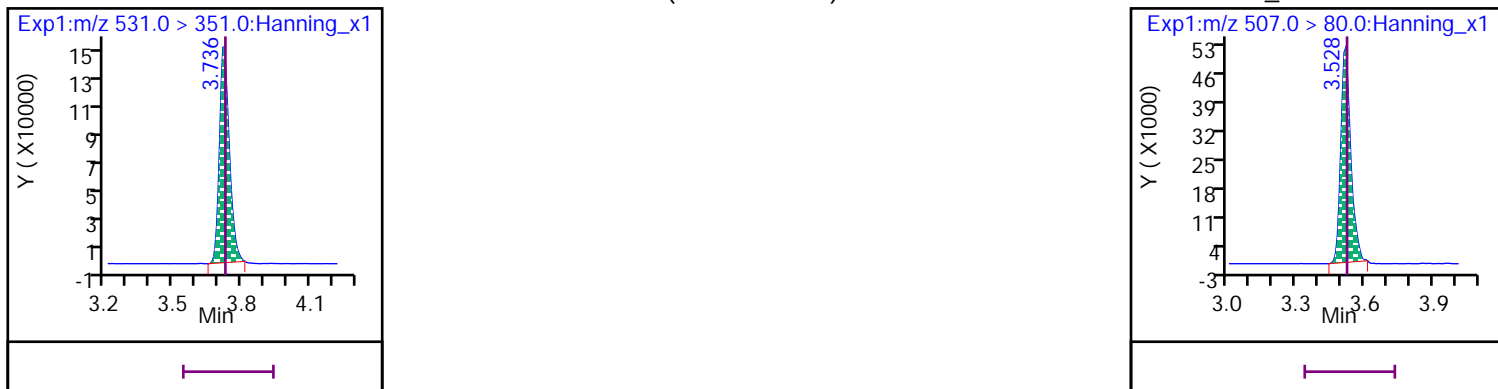
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



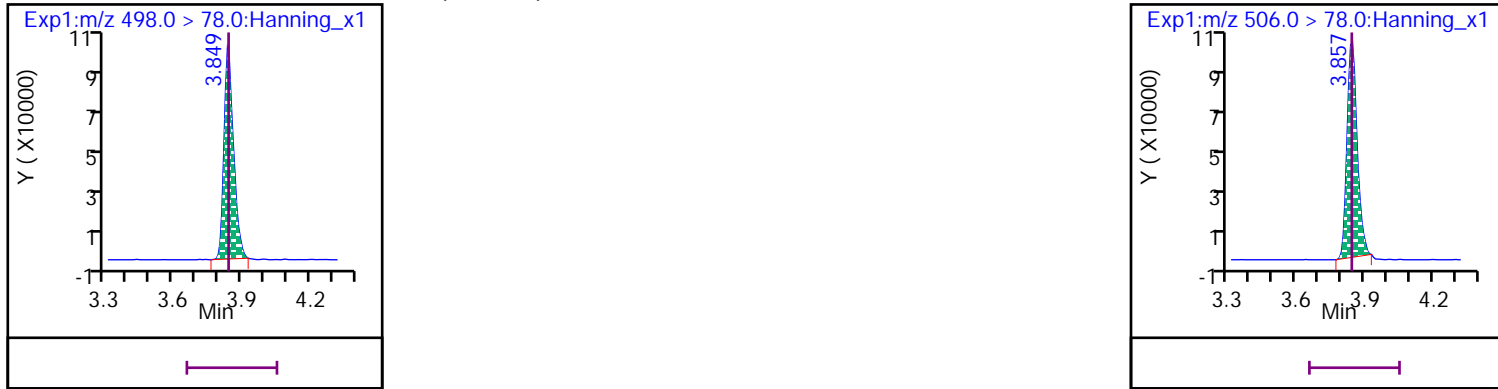
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



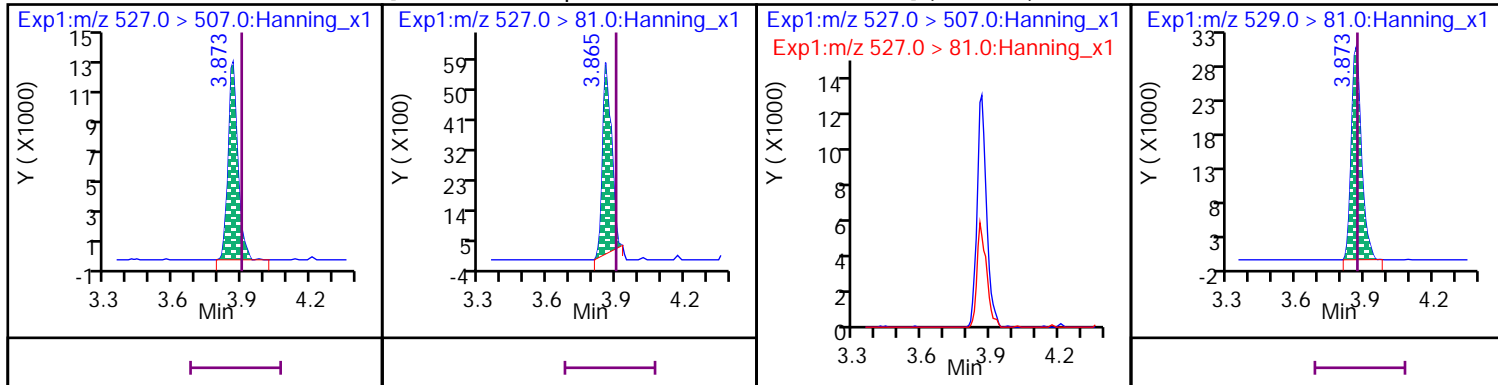
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



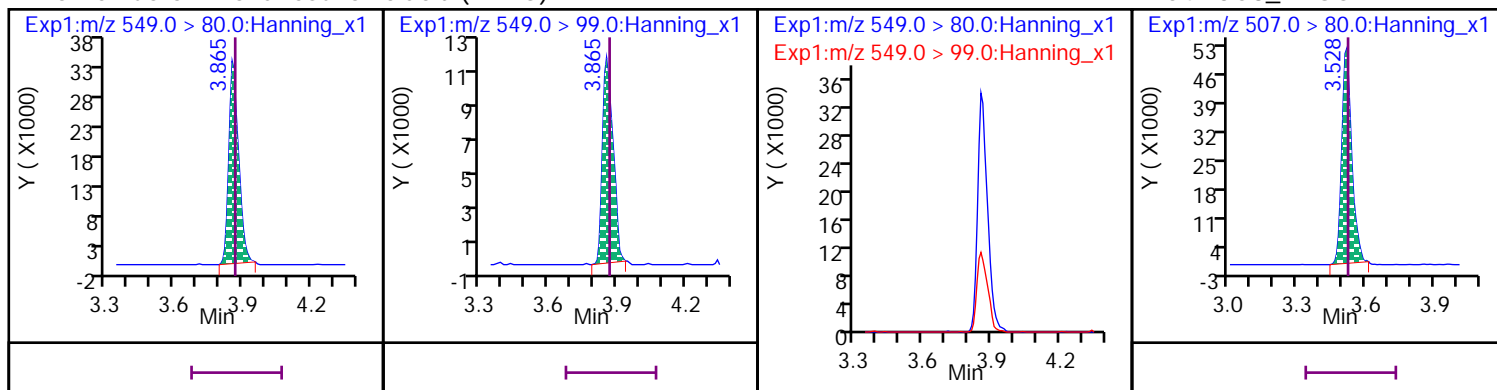
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



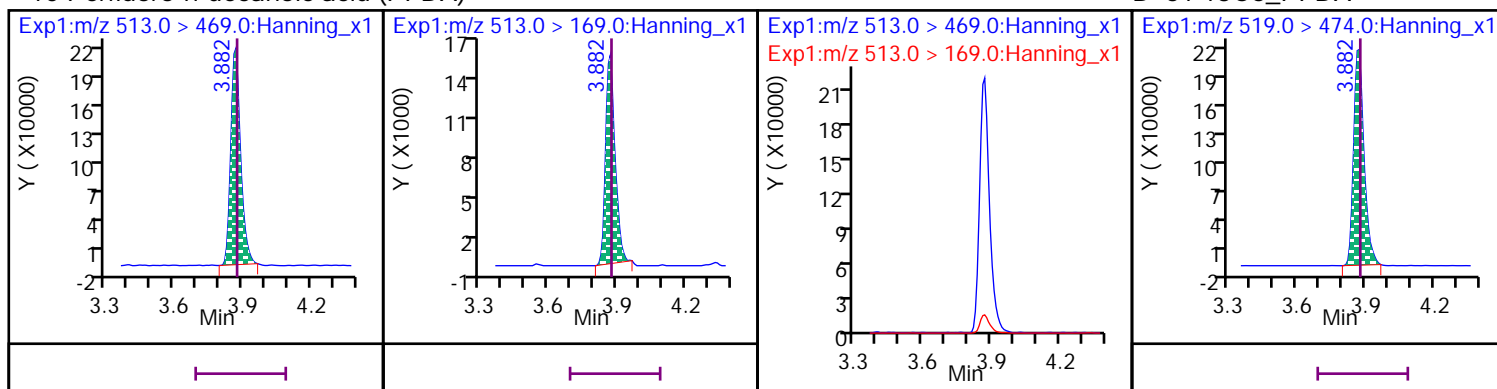
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



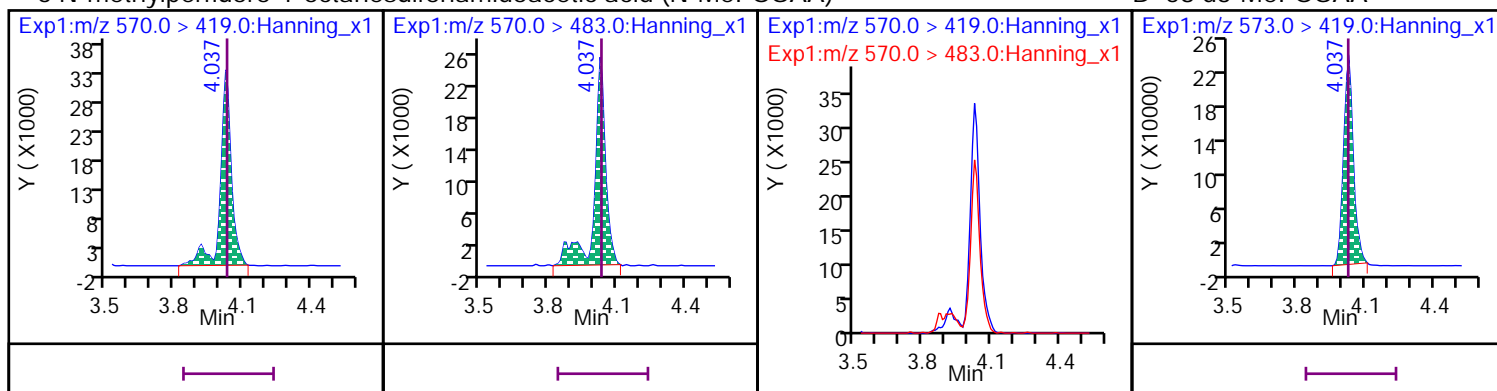
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



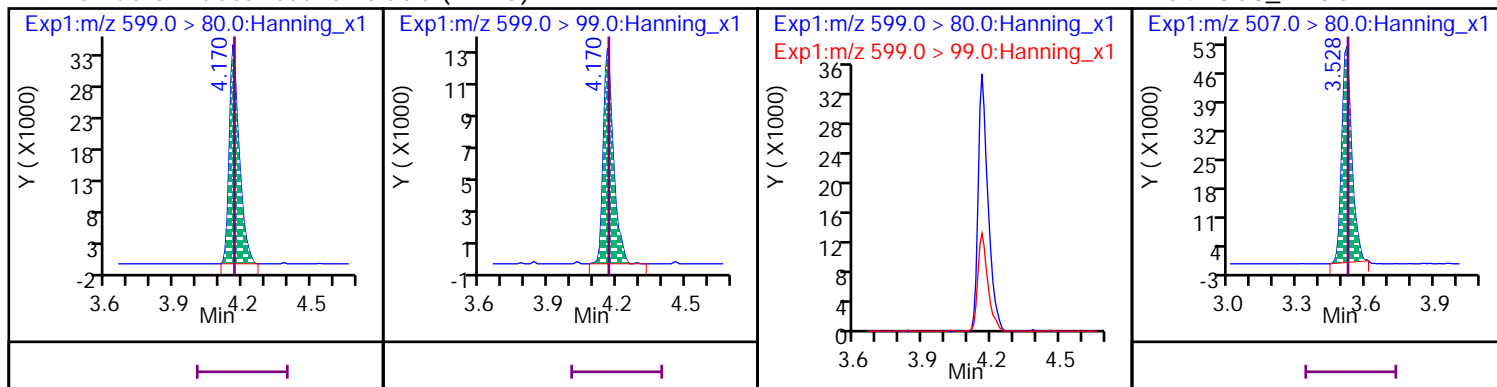
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



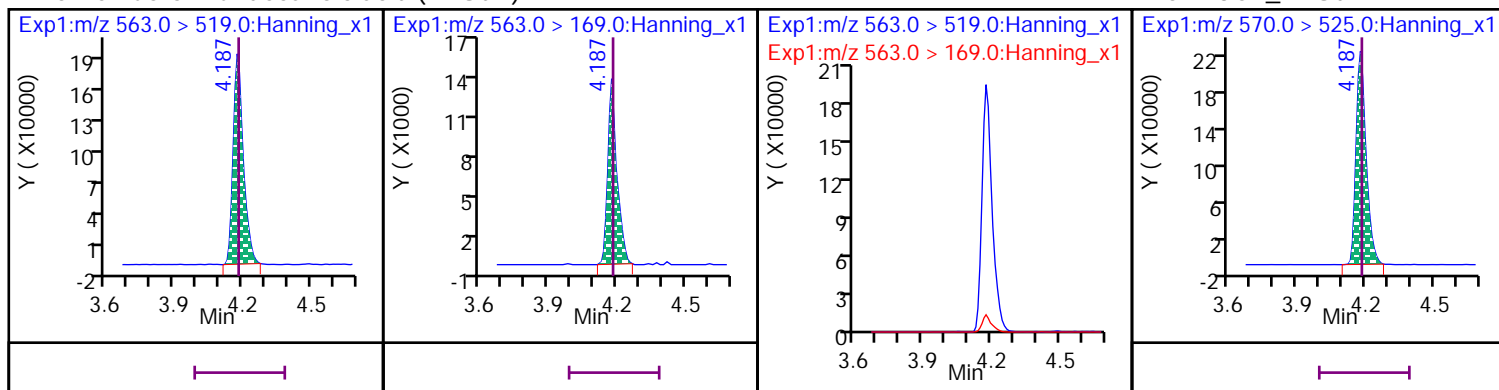
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



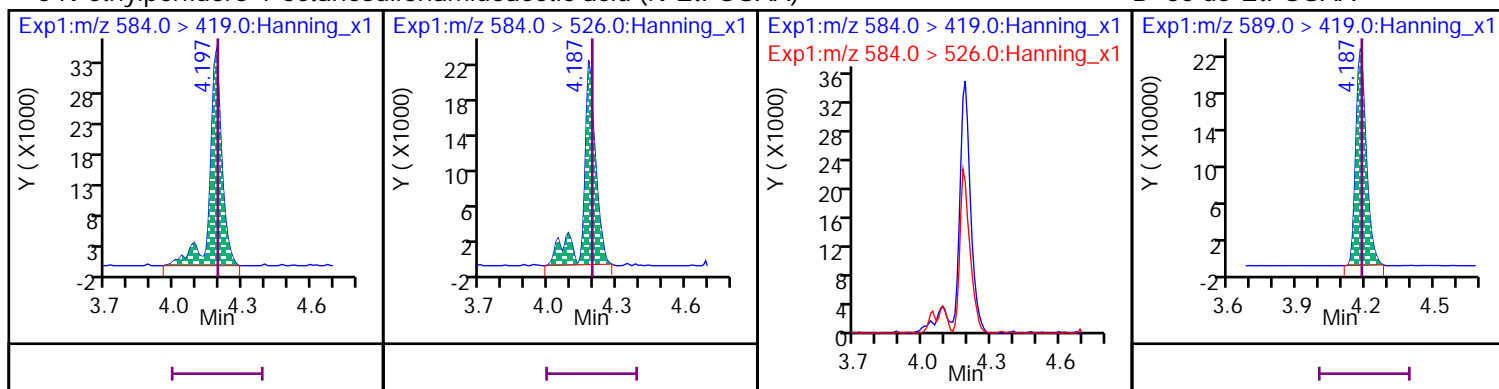
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



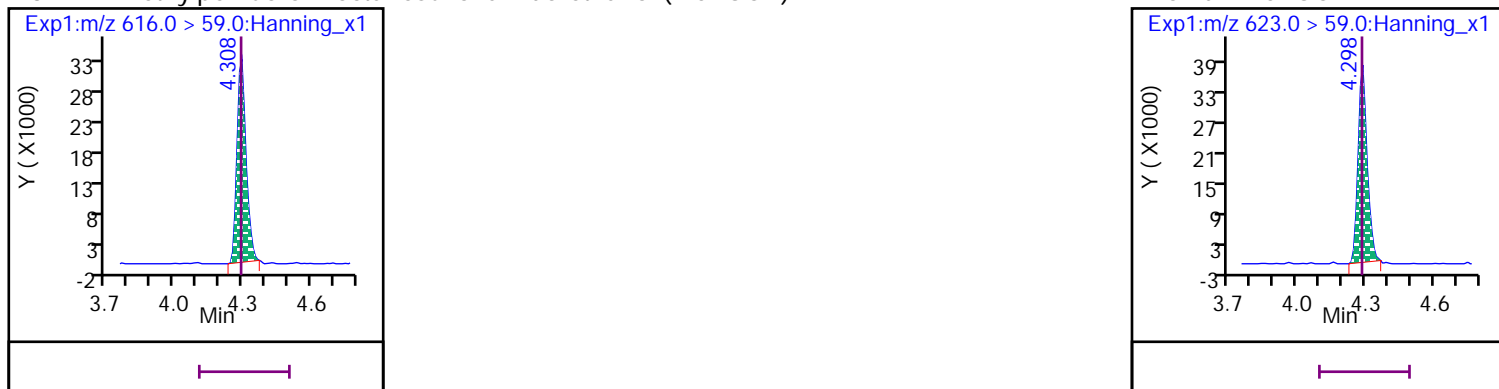
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



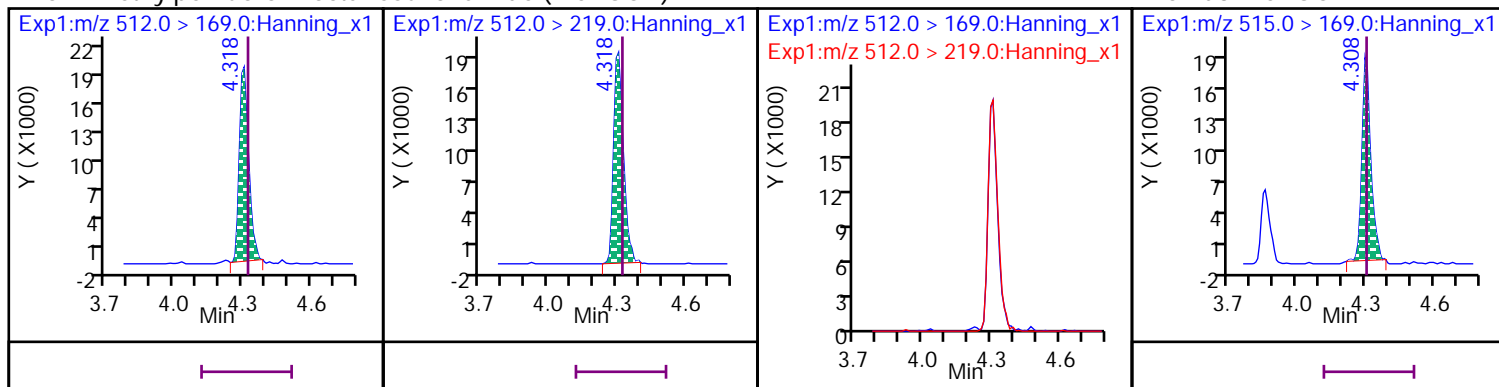
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

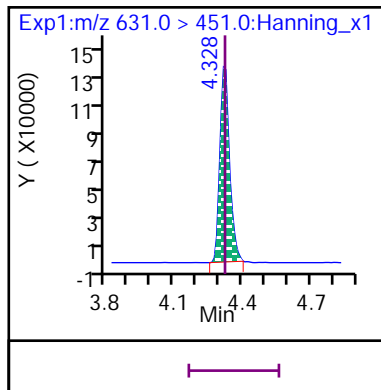


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

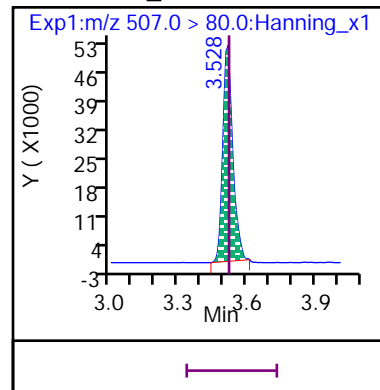
D 57 d3-MeFOSA



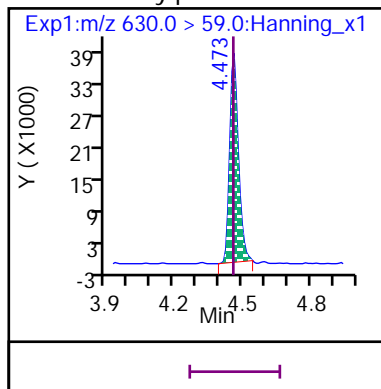
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



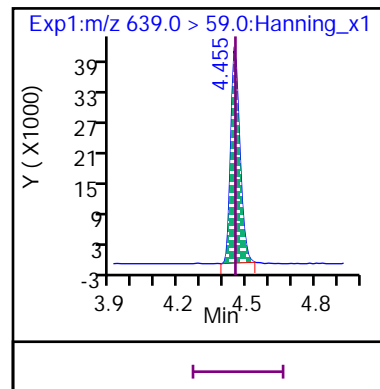
D 54 13C8\_PFOS



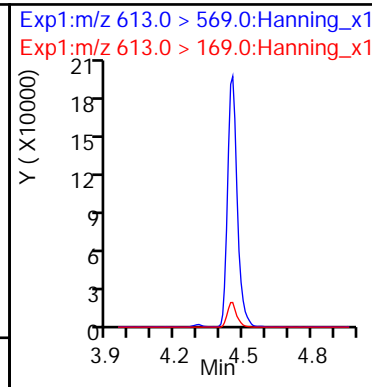
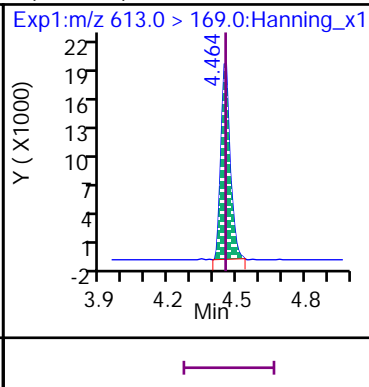
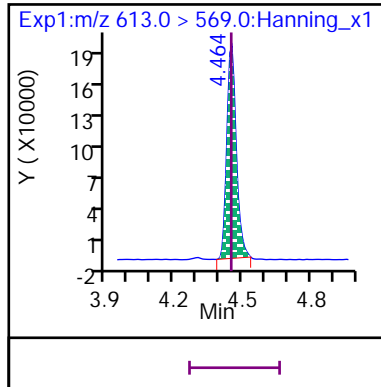
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



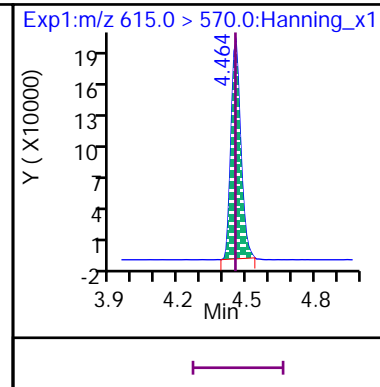
D 62 d9-EtFOSE



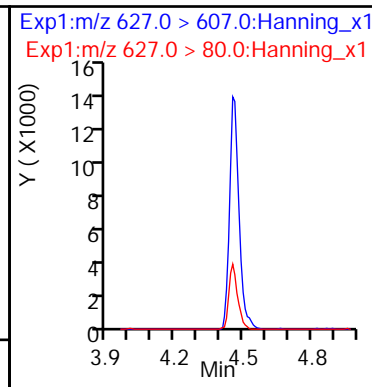
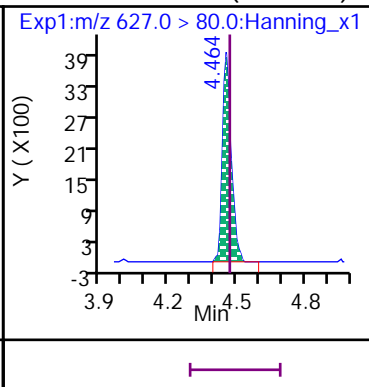
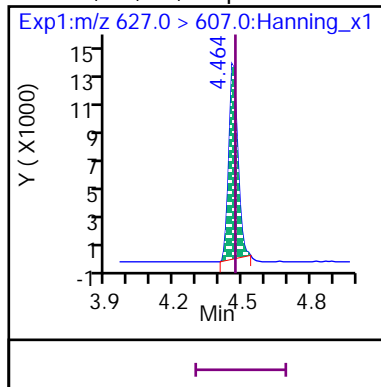
11 Perfluoro-n-dodecanoic acid (PFDoA)



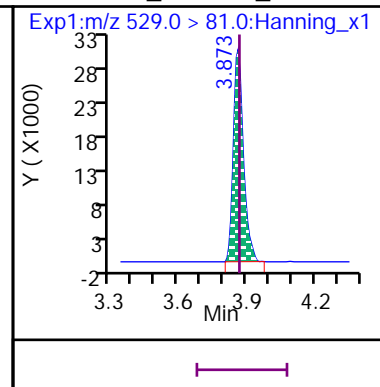
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

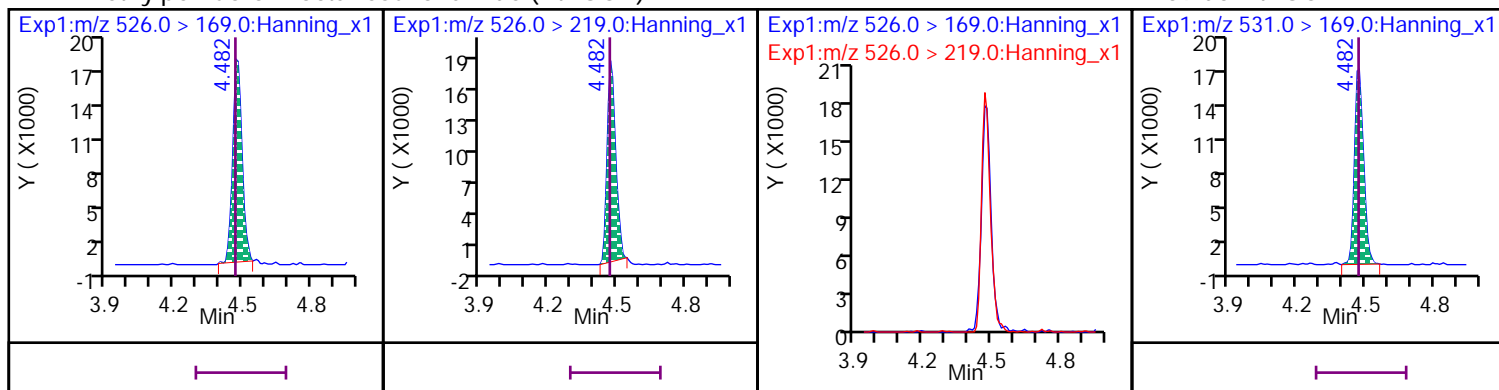


D 65 13C2\_8:2 FTS\_2



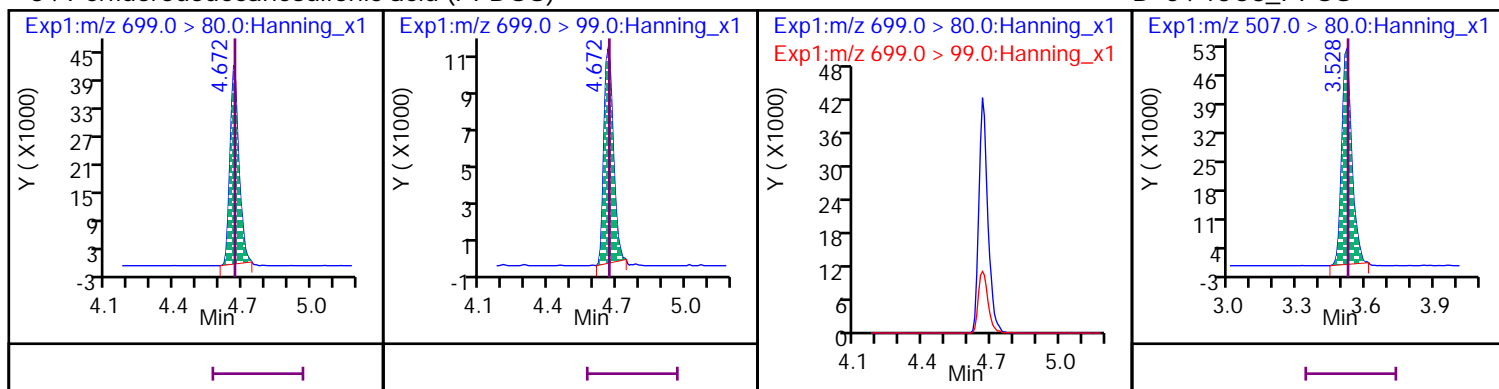
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



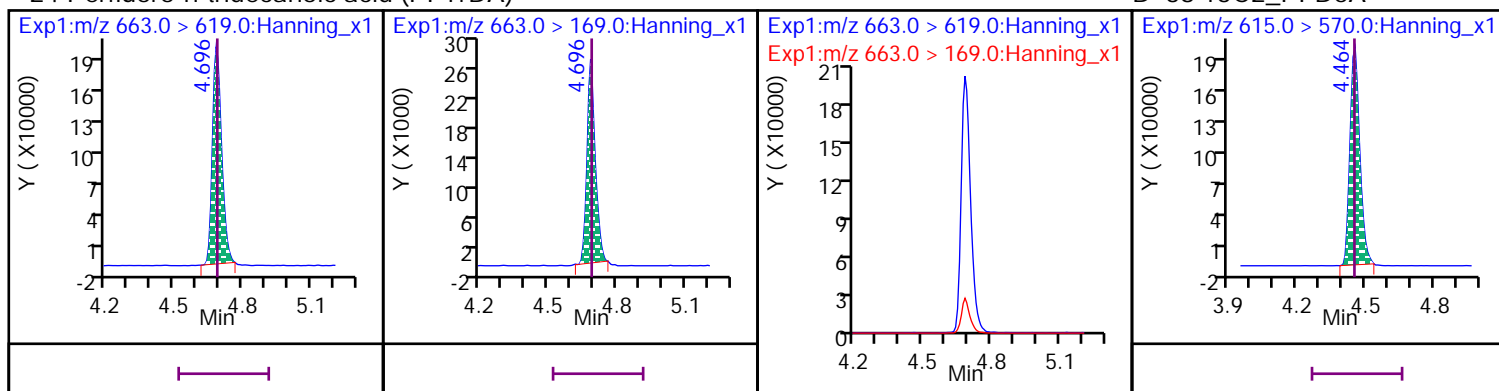
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



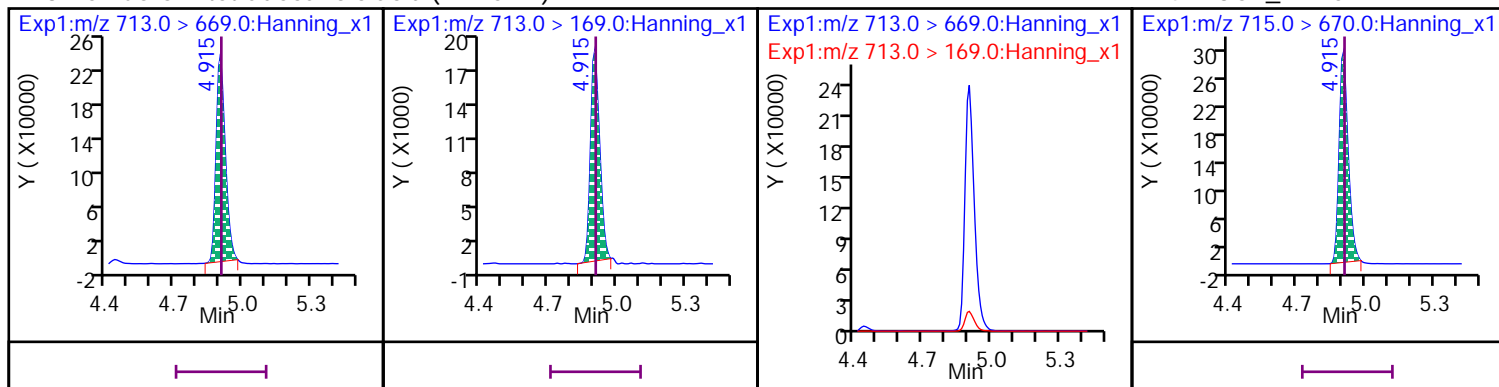
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



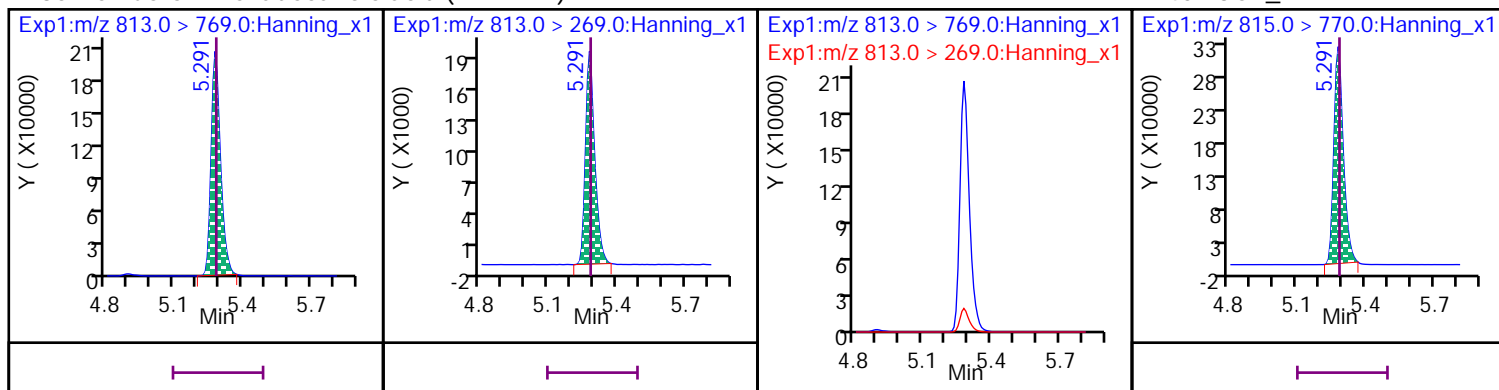
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



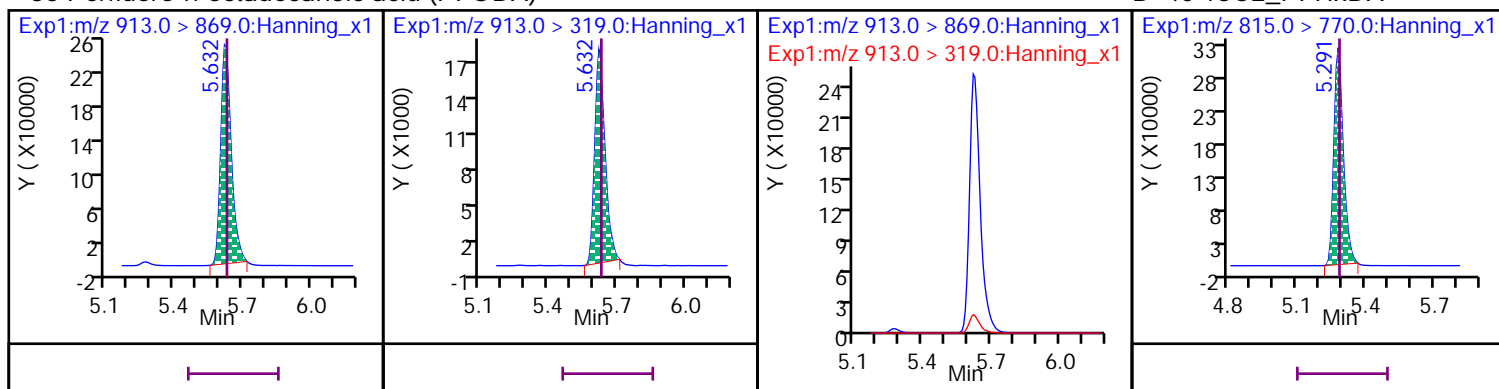
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

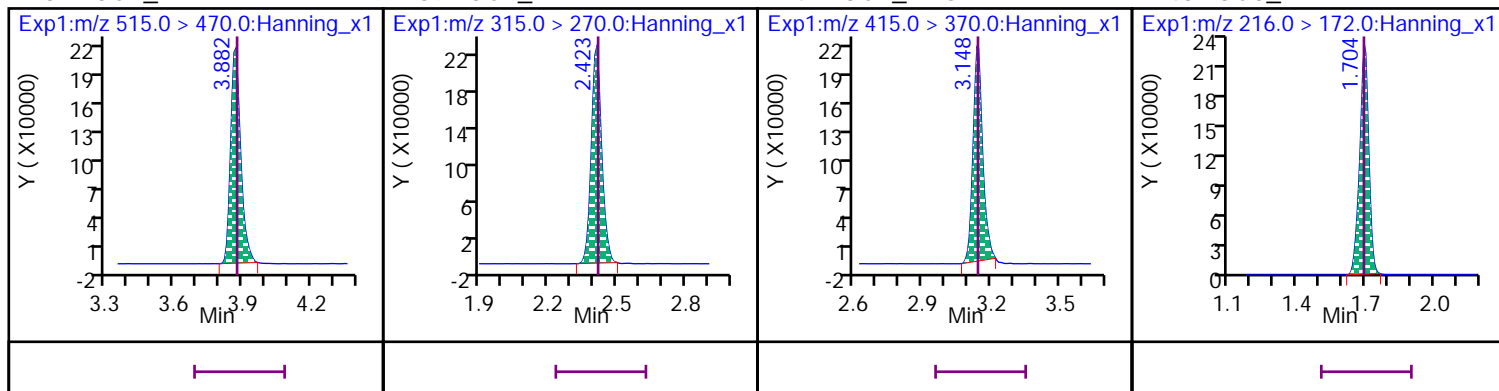


\* 37 13C2\_PFDA

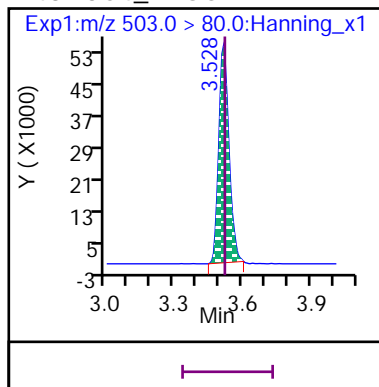
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# RAW QC DATA





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# SCIEX Triple Quad™ 4500/4500MD System

## Planned Maintenance Procedure



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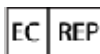
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# Introduction

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# 1

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**Note:** For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

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The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD system with the Turbo V™ ion source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

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**Note:** If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

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## Planned Maintenance Tasks

2

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**Note:** Perform all procedures using the Turbo V™ ion source, unless otherwise specified.

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## Pre-Planned Maintenance

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**Note:** Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

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### Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	●
Review the work to be performed with the customer.	✓	—

**Planned Maintenance Tasks**

Task	Complete	N/A
Inspect for front-end contamination. Refer to <a href="#">Inspect for Contamination</a> .	✓	—
Check the status of the RAID 1 hard drives.		—

**Vacuum System Tests**

Task	Complete												
Record the turbo pump operational values.													
<table border="1"> <thead> <tr> <th>Parameter</th> <th>Results</th> </tr> </thead> <tbody> <tr> <td>Temperature (°C)</td> <td>see notes</td> </tr> <tr> <td>Current (A)</td> <td>see notes</td> </tr> <tr> <td>Voltage (V)</td> <td>see notes</td> </tr> <tr> <td>Power (W)</td> <td>see notes</td> </tr> <tr> <td>Driving frequency (Hz)</td> <td>see notes</td> </tr> </tbody> </table>		Parameter	Results	Temperature (°C)	see notes	Current (A)	see notes	Voltage (V)	see notes	Power (W)	see notes	Driving frequency (Hz)	see notes
Parameter		Results											
Temperature (°C)		see notes											
Current (A)		see notes											
Voltage (V)		see notes											
Power (W)	see notes												
Driving frequency (Hz)	see notes												
Inspect the vacuum gauge filament using the Analyst <sup>®</sup> Service Diagnostics (ASD) software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1 <input type="radio"/>												
	2 <input type="radio"/>												

**Pre-PM Pressure Test**

Pre-PM Pressure Test is Complete		✓
Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	$0.4 \times 10^{-5} \text{ torr} \leq P_{\text{CAD } 0} \leq 1.1 \times 10^{-5} \text{ torr}$	0.8e-5
Pressure difference (CAD <sub>12</sub> minus CAD <sub>0</sub> )	$1.8 \times 10^{-5} \text{ torr} \leq (P_{\text{CAD } 12} - P_{\text{CAD } 0}) \leq 2.8 \times 10^{-5} \text{ torr}$	2.5e-5

Planned Maintenance Tasks

**Pre-PM System Tests**

Q1 Positive PPGs Test is Complete: Intensity and Peak Width				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	$\geq 8.0 \times 10^6$	2.1e7	0.6 to 0.8	0.80
500.380	$\geq 8.0 \times 10^6$	3.0e7	0.6 to 0.8	0.99
906.673	$\geq 2.0 \times 10^7$	4.3e7	0.6 to 0.8	0.98
1 952.427	$\geq 8.8 \times 10^5$	8.2e6	0.6 to 0.8	n/a



Planned Maintenance Tasks

Q3 Positive PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Guideline	Result	Guideline	Result	
175.133	$\geq 8.0 \times 10^6$	3.2e7	0.6 to 0.8	0.74	
500.380	$\geq 8.0 \times 10^6$	3.3e7	0.6 to 0.8	0.80	
906.673	$\geq 2.0 \times 10^7$	5.6e7	0.6 to 0.8	0.84	
1 952.427	$\geq 8.8 \times 10^5$	9.8e6	0.6 to 0.8	1.1	

**Planned Maintenance Tasks**

<b>Q1 Negative PPGs Test is Complete: Intensity and Peak Width</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	$\geq 1.8 \times 10^7$	1.7e7	0.6 to 0.8	0.66
1 863.306	$\geq 1.4 \times 10^6$	1.8e6	0.6 to 0.8	0.75

Planned Maintenance Tasks

Q3 Negative PPGs Test is Complete				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Guideline	Result	Guideline	Result	
933.636	$\geq 1.8 \times 10^7$	2.8e7	0.6 to 0.8	0.85	
1 863.306	$\geq 2.0 \times 10^6$	3.3e6	0.6 to 0.8	0.69	

**Planned Maintenance Tasks**

<b>Reserpine MS/MS Test is Complete</b>		✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> Reserpine solution 0.167 pmol/μL</li> <li>• <b>Flow rate:</b> 5 μL/min</li> <li>• <b>Scan rate:</b> 10 Da/s (both MS and MS/MS)</li> <li>• <b>Scan mode:</b> Product Ion (MS2)</li> <li>• <b>Product Of:</b> 609.3 (or as calibrated)</li> <li>• <b>Product Ion:</b> 195.1</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>		
<b>Guideline</b>		<b>Result</b>
Transmission efficiency	$\frac{\text{Intensity for ion at } m/z \text{ 195.1}}{\text{Intensity for ion at } m/z \text{ 609.3 (or as calibrated)}} \times 100 \geq 10\%$	4.3%

## Planned Maintenance

### Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
Verify the expiry date on the Powervar UPS battery system, and then recommend replacement of the battery tray, if required.	○	●
If required, replace the roughing pump oil. The recommended interval is every 3 years.  <b>Note:</b> If an oil change is not required, then inspect the oil level and top up, if necessary.  <b>CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.</b>	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	○	●
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	●
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	●	○
Inspect the mass spectrometer, components, and cabling, as required.	✓	—
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet <sup>®</sup> ion guide and IQ0 lens.	✓	—

### Planned Maintenance Tasks

Task	Complete	N/A
(If contamination is detected) Clean the Q0 region.	<input type="radio"/>	<input checked="" type="radio"/>
Start up the system.	✓	—

### Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurbolonSpray® and the APCI probe.	<input checked="" type="radio"/>	<input type="radio"/>
With the TurbolonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	<input type="radio"/>	<input checked="" type="radio"/>

### Software Maintenance

**Note:** This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes.	<input type="radio"/>	<input checked="" type="radio"/>

## Post-Planned Maintenance

Task	Complete
Inspect for front-end contamination. Refer to <a href="#">Inspect for Contamination</a> .	✓

## Voltage Tests

Task	Complete		
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.	✓		
Inspect the detector voltage. Optimize, if required.			
<table border="1" data-bbox="253 989 1224 1037"> <tr> <td>Detector voltage</td> <td>2100</td> </tr> </table>	Detector voltage	2100	
Detector voltage	2100		

Planned Maintenance Tasks

---

**Post-PM Pressure Test**

Post-PM Pressure Test is Complete		✓
Test	Specification	Result
Vacuum chamber pressure with CAD gas off	$0.4 \times 10^{-5} \text{ torr} \leq P_{CAD\ 0} \leq 1.1 \times 10^{-5} \text{ torr}$	0.8e-5
Pressure difference (CAD <sub>12</sub> minus CAD <sub>0</sub> )	$1.8 \times 10^{-5} \text{ torr} \leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5} \text{ torr}$	3.4e-5



## Post-PM System Tests

Q1 Positive PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 <math>\mu</math>L/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
175.133	$\geq 8.0 \times 10^6$	2.1e7	0.6 to 0.8	0.75	
500.380	$\geq 8.0 \times 10^6$	2.4e7	0.6 to 0.8	0.72	
906.673	$\geq 2.0 \times 10^7$	3.6e7	0.6 to 0.8	0.72	
1 952.427	$\geq 8.8 \times 10^5$	5.3e6	0.6 to 0.8	0.72	

**Planned Maintenance Tasks**

<b>Q1 Positive PPGs Test is Complete: Peak Width for Identified Masses</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul> <p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

Q3 Positive PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul> <p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
175.133	$\geq 8.0 \times 10^6$	2.7e7	0.6 to 0.8	0.72	
500.380	$\geq 8.0 \times 10^6$	3.0e7	0.6 to 0.8	0.76	
906.673	$\geq 2.0 \times 10^7$	4.9e7	0.6 to 0.8	0.70	
1 952.427	$\geq 8.8 \times 10^5$	5.4e6	0.6 to 0.8	0.74	

**Planned Maintenance Tasks**

Q3 Positive PPGs Test is Complete: Peak Width for Identified Masses				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

Q1 Negative PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
933.636	$\geq 1.8 \times 10^7$	2.2e7	0.6 to 0.8	0.76	
1 863.306	$\geq 1.4 \times 10^6$	3.0e6	0.6 to 0.8	0.72	

**Planned Maintenance Tasks**

Q1 Negative PPGs Test is Complete: Peak Width for Identified Masses				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

Q3 Negative PPGs Test is Complete: Intensity and Peak Width				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	$\geq 1.8 \times 10^7$	2.9e7	0.6 to 0.8	0.74
1 863.306	$\geq 2.0 \times 10^6$	4.5e6	0.6 to 0.8	0.74

**Planned Maintenance Tasks**

Q3 Negative PPGs Test is Complete: Peak Width for Identified Masses				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	



Planned Maintenance Tasks

<b>Reserpine MS/MS Test is Complete</b>		✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> Reserpine solution 0.167 pmol/μL</li> <li>• <b>Flow rate:</b> 5 μL/min</li> <li>• <b>Scan rate:</b> 10 Da/s (both MS and MS/MS)</li> <li>• <b>Scan mode:</b> Product Ion (MS2)</li> <li>• <b>Product Of:</b> 609.3 (or as calibrated)</li> <li>• <b>Product Ion:</b> 195.1</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>		
<b>Specification</b>		<b>Result</b>
Transmission efficiency	$\frac{\text{Intensity for ion at } m/z \text{ 195.1}}{\text{Intensity for ion at } m/z \text{ 609.3 (or as calibrated)}} \times 100 \geq 10\%$	11.9%

**Planned Maintenance Tasks**

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**Post-PM Tasks**

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	<input type="radio"/>	<input checked="" type="radio"/>
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: <ul style="list-style-type: none"> <li>(Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.</li> </ul>	<input checked="" type="radio"/>	<input type="radio"/>
(Not applicable for MD instrument families) Discuss warranty coverage for the StatusScope® Remote Monitoring Service. Determine whether the customer already has StatusScope® Remote Monitoring Service installed and, if not, whether it should be installed.  <b>Note:</b> Installation of the StatusScope® Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to <a href="http://sciex.com/instrument-service-and-support/statusscope-remote-monitoring">sciex.com/instrument-service-and-support/statusscope-remote-monitoring</a> for a list of eligible contracts.	<input type="radio"/>	<input checked="" type="radio"/>

**StatusScope® Remote Monitoring Service Tasks**

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**Note:** The StatusScope® remote monitoring service is not applicable for MD systems.

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## Planned Maintenance Tasks

Task	Complete	N/A
<p>If the StatusScope<sup>®</sup> Remote Monitoring Service is not installed, then perform these tasks:</p> <ol style="list-style-type: none"> <li>1. Make sure that the <i>StatusScope<sup>®</sup> Customer Remote Connectivity Authorization</i> and <i>Customer Remote Connectivity Registration</i> forms are both completed.</li> <li>2. Verify the connection to the server for the StatusScope<sup>®</sup> Remote Monitoring Service.</li> <li>3. Install the agent for the StatusScope<sup>®</sup> Remote Monitoring Service.</li> </ol>	<input type="radio"/>	<input checked="" type="radio"/>
Log on to the server for the StatusScope <sup>®</sup> Remote Monitoring Service using the FSE user name and then verify that the assets under the customer organization are connected to the server for the StatusScope <sup>®</sup> Remote Monitoring Service.	<input type="radio"/>	<input checked="" type="radio"/>
Perform the post-PM fault test to verify that the mass spectrometer fault generated is shown in the StatusScope <sup>®</sup> Remote Monitoring Service.	<input type="radio"/>	<input checked="" type="radio"/>


## Wrap Up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: <ul style="list-style-type: none"> <li>• Review the test results with the customer.</li> <li>• Provide the customer with the completed document and the test data.</li> <li>• If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.</li> </ul>	✓	—

# Signoff

3

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Organization	Shealy Environmental		
Mass spectrometer serial number	EB250231807	Service request number	4534266
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2020-03-09
FSE signature			

## Comments and Exceptions

Due to administrative restrictions, I was unable to use ASD to perform vacuum system test.  
Oil and filter changes were not performed during this PM because they were not due. LER 09Mar2020

## Inspect for Contamination

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**A**

1. Run the **Q1 Pos PPG** method for 10 minutes, monitoring the TIC for degradation of the signal or sensitivity drops.
2. Change the polarity to negative, and then scan for one minute.
3. Change the polarity to positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

If the signal sensitivity is restored temporarily but it starts to degrade again, then the charging effect is present.

## Guidelines for Identifying Components to be Cleaned

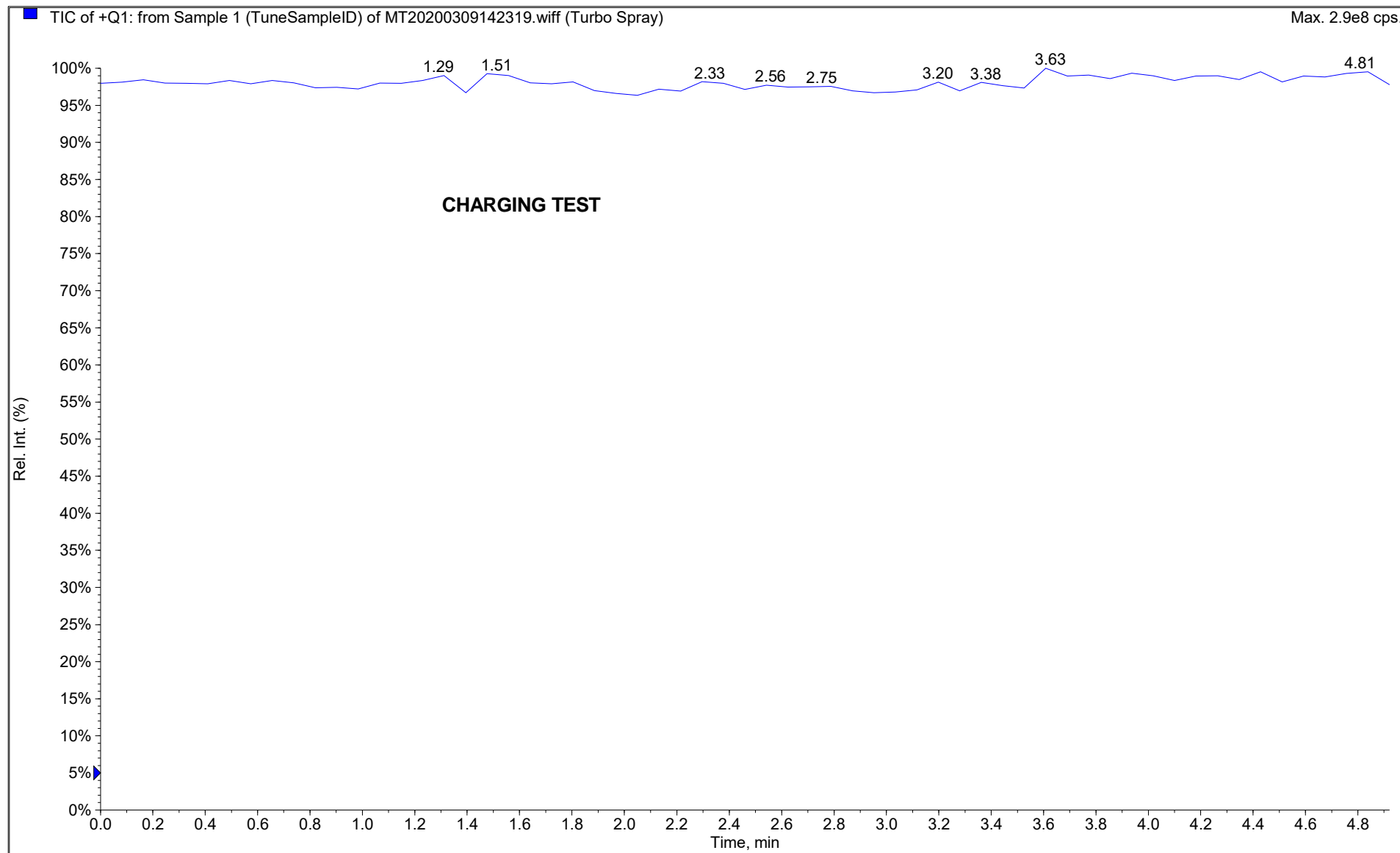
If the Q1 quadrupole is showing the charging effect and signal drop out, then clean the Q0 and the vacuum interface components (the curtain plate, orifice plate, the QJet<sup>®</sup> ion guide, and the Q0 side of the IQ0 and IQ1 lens) using the customer cleaning procedure, with the rod and tissues. In most cases, this will remove the contamination.

### Notes:

- Do not remove the ion optics during a PM. This is considered to be a repair activity and requires a separate service call to be opened.
- Consider cleaning the Q1 quadrupole as well as other components (the stubbies and the IQ1 lens), if cleaning the front end does not eliminate the contamination.
- This guideline does not provide complete troubleshooting for all possible technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurbolonSpray<sup>®</sup> probe or electrode, method parameters that are not optimized, and so on.

Acq. Time: 14:23  
Acq. Date: Monday, March 09, 2020

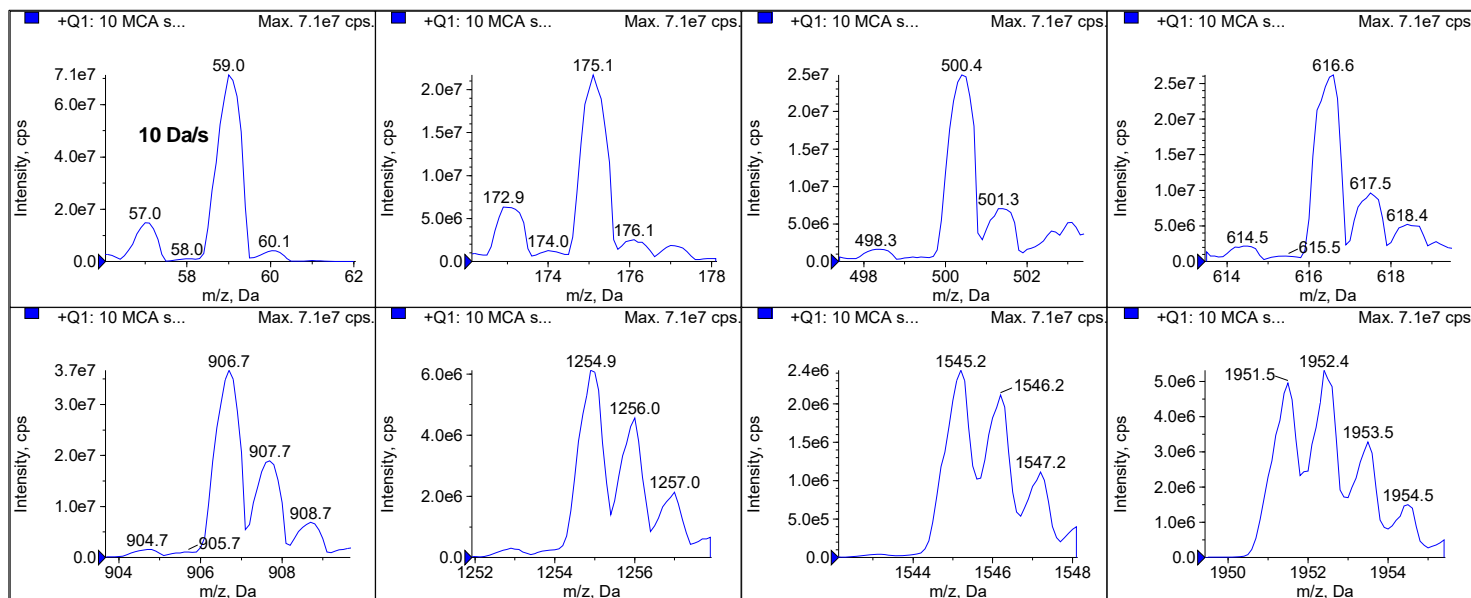
Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: 14:33  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



Peak List for "+Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309143328.wiff (Turbo Spray)"

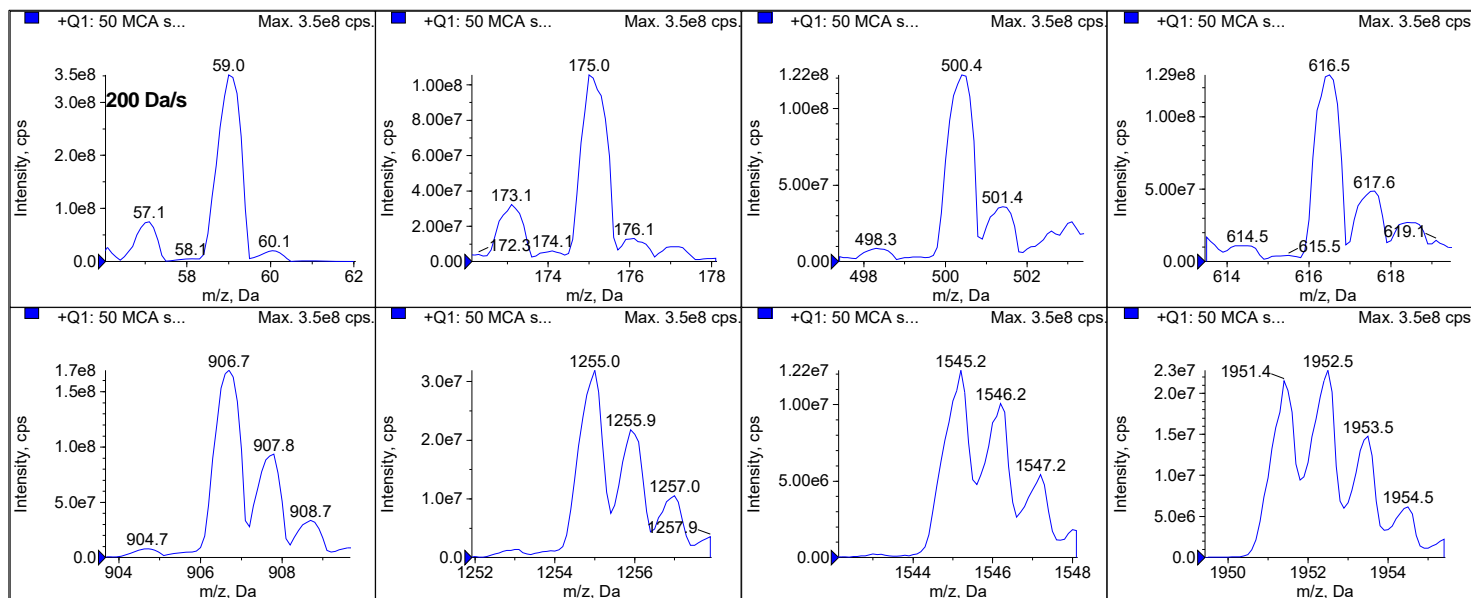
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0403	7.1359e7	0.6692	9.6940e-3
2	175.1330	175.1170	2.1686e7	0.7574	0.0160
3	500.3800	500.4049	2.4873e7	0.7296	-0.0249
4	616.4640	616.4564	2.6201e7	0.7194	7.6080e-3
5	906.6730	906.6762	3.6657e7	0.7211	-3.2397e-3
6	1254.9250	1254.9156	6.1174e6	0.7141	9.4336e-3
7	1545.1340	1545.1477	2.4373e6	0.7781	-0.0137
8	1952.4270	1952.4311	5.3103e6	0.7239	-4.1026e-3

\*Post-PM  
 \*FSE: Lynne Russell



Acq. Time: 14:40  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



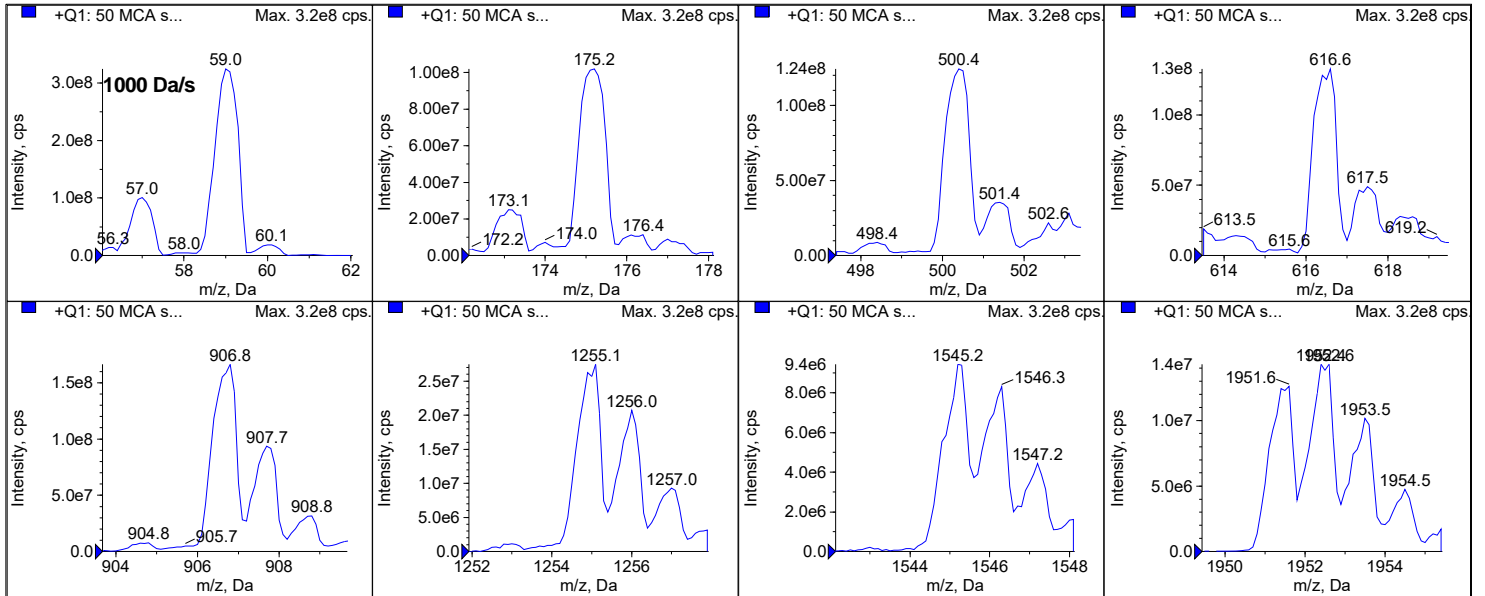
Peak List for "+Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309143958.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0426	3.5185e8	0.6526	7.3620e-3
2	175.1330	175.1285	1.0569e8	0.7634	4.4530e-3
3	500.3800	500.3824	1.2207e8	0.7427	-2.3841e-3
4	616.4640	616.4559	1.2884e8	0.7249	8.1053e-3
5	906.6730	906.6721	1.6932e8	0.7323	8.6040e-4
6	1254.9250	1254.9208	3.1914e7	0.6958	4.2190e-3
7	1545.1340	1545.1217	1.2244e7	0.7698	0.0123
8	1952.4270	1952.3998	2.2800e7	0.7075	0.0272

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:42  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



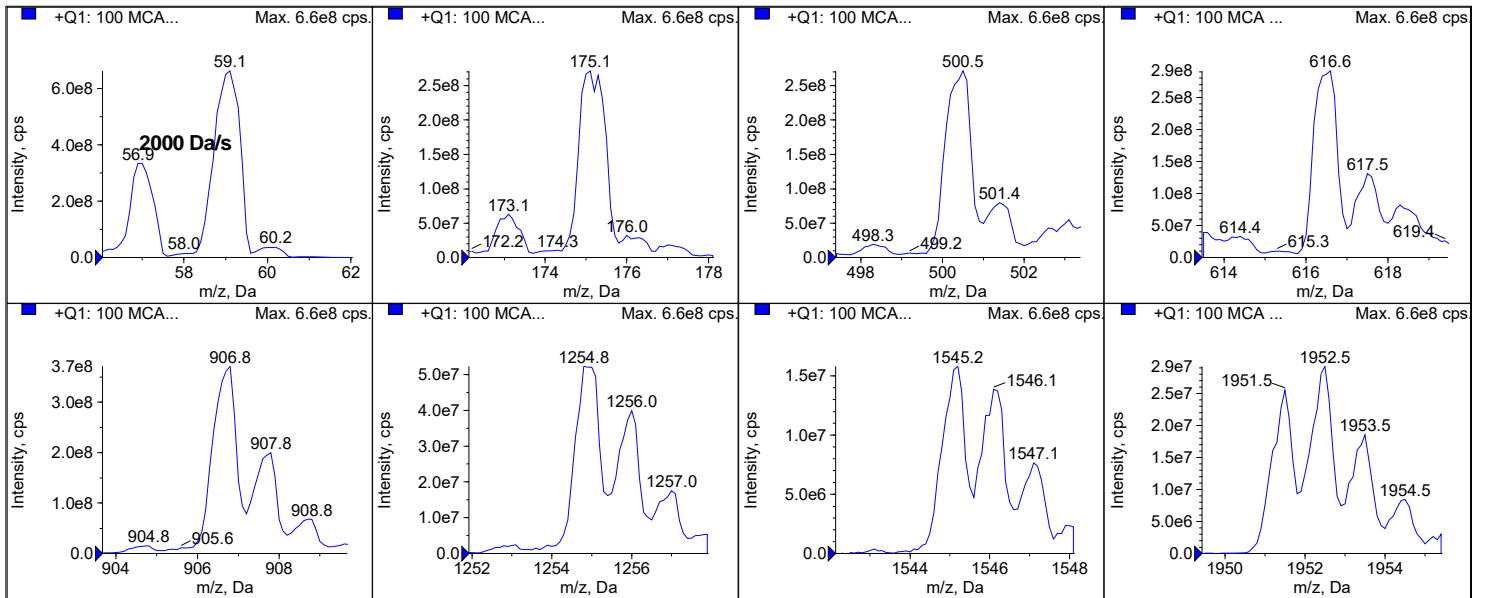
Peak List for "+Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309144214.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0447	3.2454e8	0.6334	5.2631e-3
2	175.1330	175.1572	1.0197e8	0.7487	-0.0242
3	500.3800	500.3686	1.2434e8	0.6955	0.0114
4	616.4640	616.4687	1.3271e8	0.6439	-4.7115e-3
5	906.6730	906.6772	1.6629e8	0.6655	-4.1937e-3
6	1254.9250	1254.9605	2.7440e7	0.6670	-0.0355
7	1545.1340	1545.1771	9.4300e6	0.7409	-0.0431
8	1952.4270	1952.4754	1.4280e7	0.6846	-0.0484

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:47  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



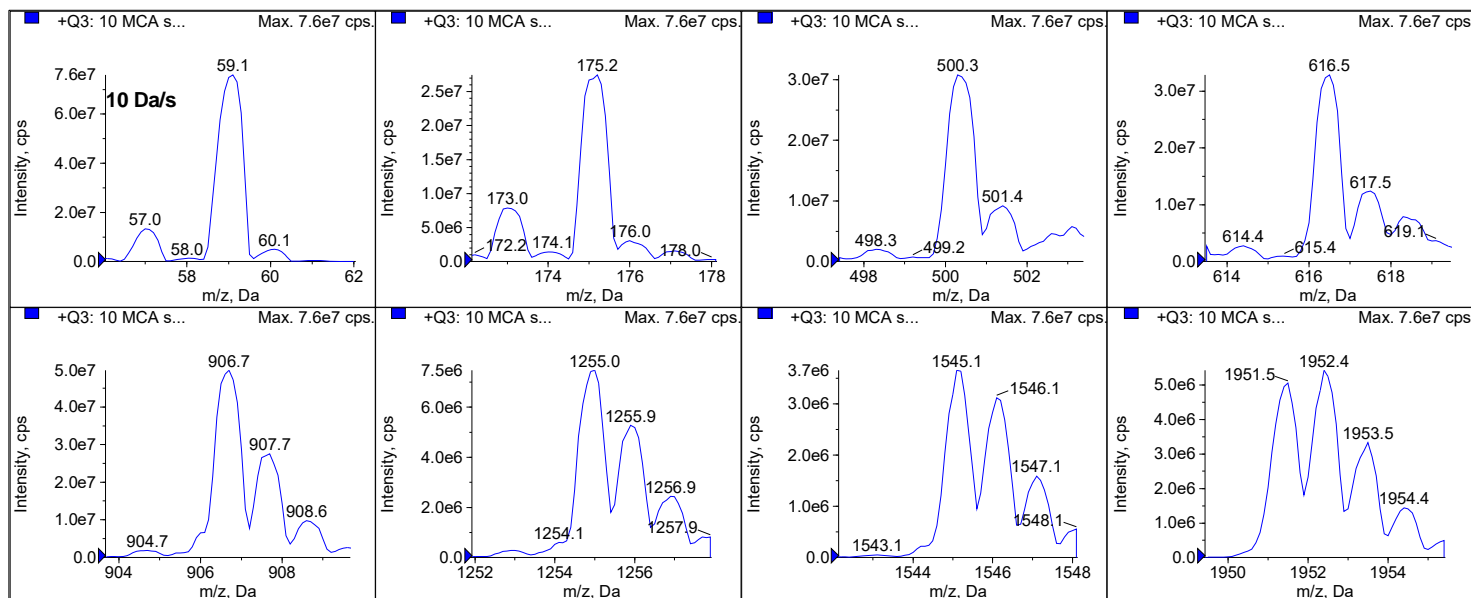
Peak List for "+Q1: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309144752.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0522	6.6290e8	0.7172	-2.2374e-3
2	175.1330	175.1580	2.7148e8	0.7493	-0.0250
3	500.3800	500.3949	2.7144e8	0.7271	-0.0149
4	616.4640	616.4704	2.9130e8	0.6476	-6.3561e-3
5	906.6730	906.6744	3.7100e8	0.6497	-1.3994e-3
6	1254.9250	1254.9073	5.2260e7	0.6858	0.0177
7	1545.1340	1545.1120	1.5800e7	0.6532	0.0220
8	1952.4270	1952.4295	2.9220e7	0.6414	-2.5268e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:53  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



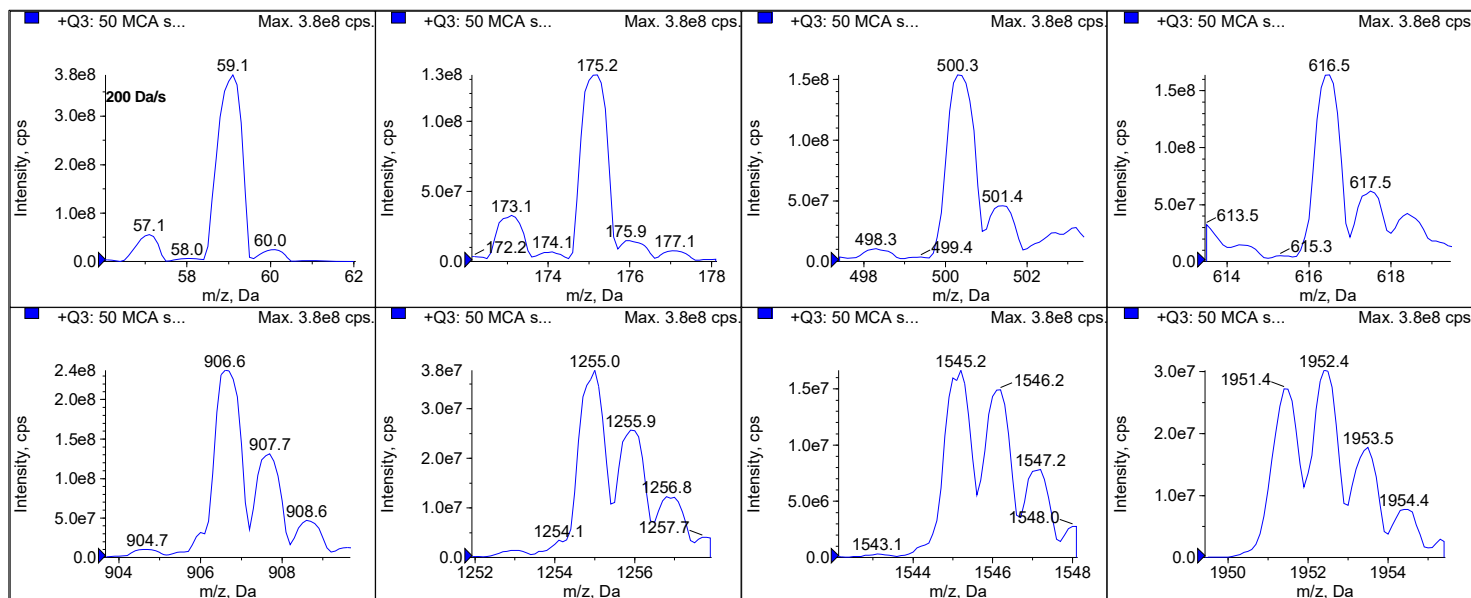
Peak List for "+Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309145335.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0513	7.5905e7	0.6954	-1.3188e-3
2	175.1330	175.1236	2.7460e7	0.7285	9.3617e-3
3	500.3800	500.3774	3.0791e7	0.7606	2.5750e-3
4	616.4640	616.4578	3.2865e7	0.6715	6.2175e-3
5	906.6730	906.6698	4.9688e7	0.7026	3.2171e-3
6	1254.9250	1254.9194	7.4667e6	0.7363	5.5598e-3
7	1545.1340	1545.1297	3.6516e6	0.7119	4.2899e-3
8	1952.4270	1952.4240	5.4222e6	0.7396	2.9901e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:59  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



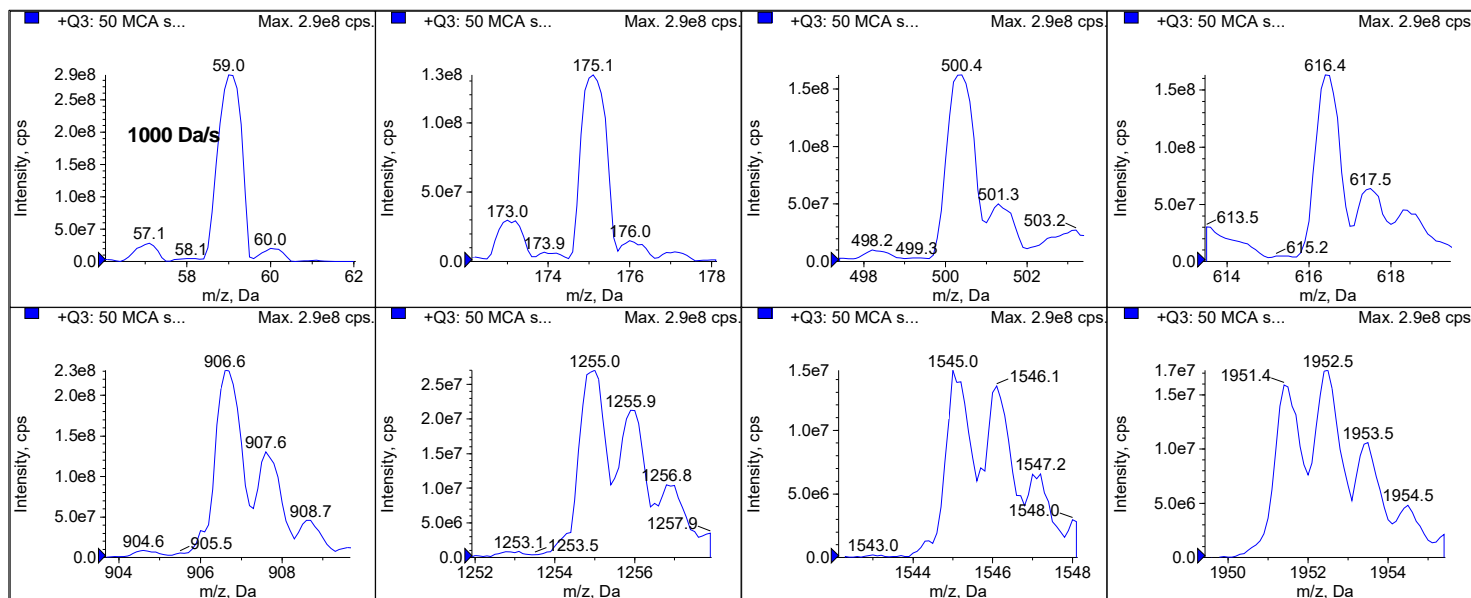
Peak List for "+Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309145908.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0417	3.8495e8	0.6883	8.2519e-3
2	175.1330	175.1206	1.3316e8	0.7429	0.0124
3	500.3800	500.3761	1.5378e8	0.7795	3.8903e-3
4	616.4640	616.4581	1.6392e8	0.6983	5.8954e-3
5	906.6730	906.6698	2.3689e8	0.7180	3.1950e-3
6	1254.9250	1254.9230	3.7754e7	0.7466	2.0402e-3
7	1545.1340	1545.1237	1.6638e7	0.7683	0.0103
8	1952.4270	1952.4323	3.0168e7	0.7410	-5.3377e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:01  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



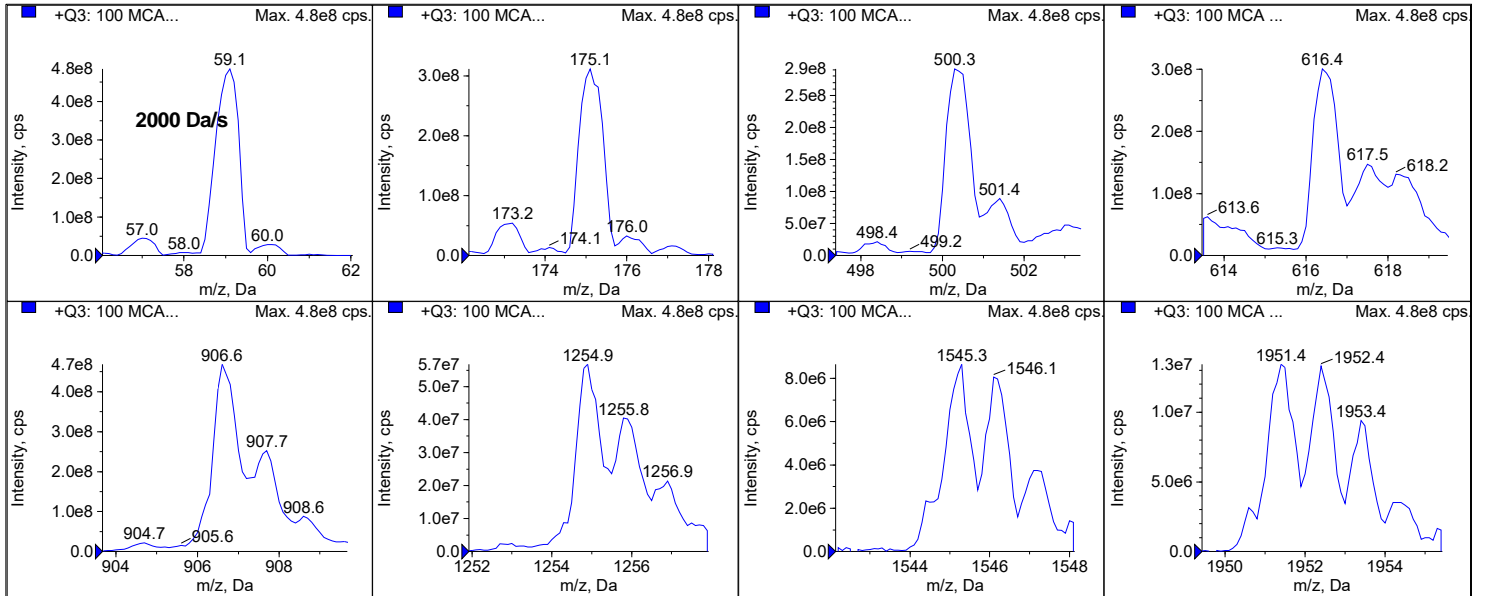
Peak List for "+Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309150124.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0456	2.8843e8	0.6720	4.3685e-3
2	175.1330	175.1080	1.3443e8	0.7289	0.0250
3	500.3800	500.3716	1.6225e8	0.7737	8.4217e-3
4	616.4640	616.4572	1.6319e8	0.6772	6.8124e-3
5	906.6730	906.6761	2.3076e8	0.7093	-3.1097e-3
6	1254.9250	1254.9430	2.7010e7	0.7649	-0.0180
7	1545.1340	1545.1274	1.4710e7	0.7307	6.5536e-3
8	1952.4270	1952.4675	1.7250e7	0.7893	-0.0405

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:08  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



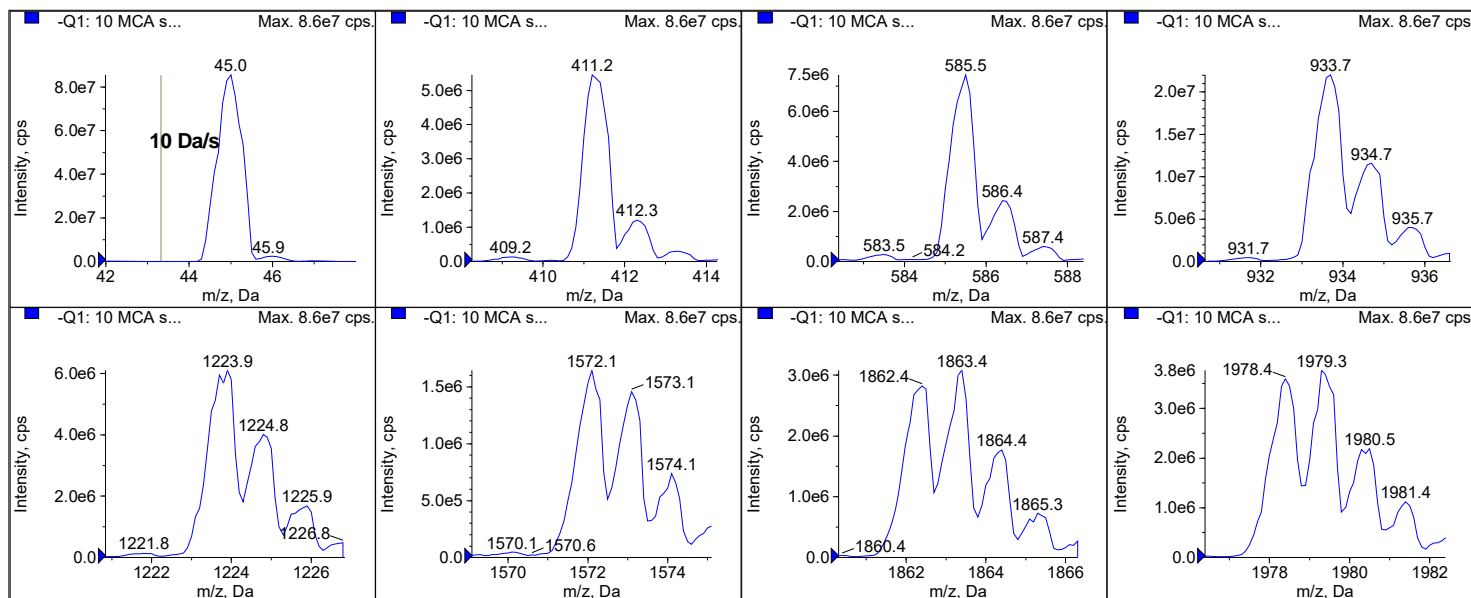
Peak List for "+Q3: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309150800.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0586	4.8450e8	0.6461	-8.6402e-3
2	175.1330	175.1219	3.1148e8	0.6940	0.0111
3	500.3800	500.3758	2.9134e8	0.6873	4.1700e-3
4	616.4640	616.4724	3.0084e8	0.7039	-8.3635e-3
5	906.6730	906.6726	4.6822e8	0.6683	4.4023e-4
6	1254.9250	1254.9151	5.6720e7	0.6771	9.9478e-3
7	1545.1340	1545.2148	8.6400e6	0.7237	-0.0808
8	1952.4270	1952.4301	1.3300e7	0.6979	-3.0947e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:28  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



Peak List for "-Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309152824.wiff (Turbo Spray)"

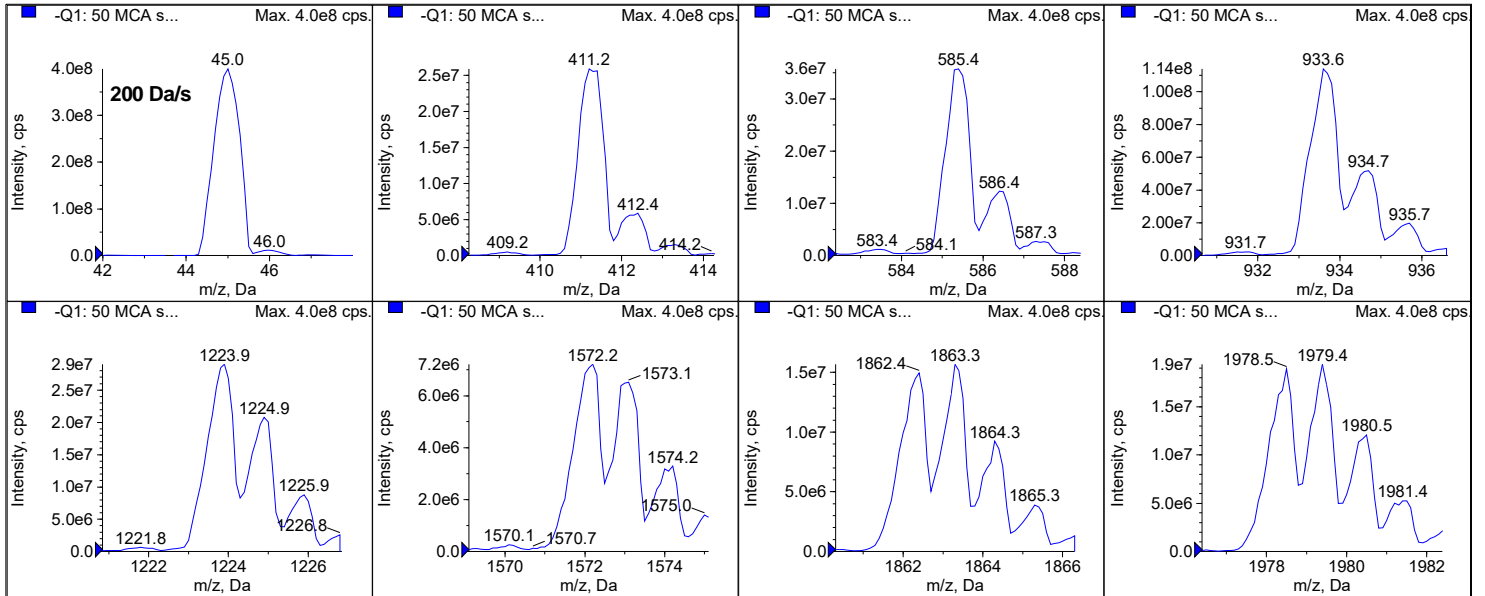
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9918	8.5579e7	0.7257	6.1756e-3
2	411.2590	411.2931	5.4518e6	0.7033	-0.0341
3	585.3850	585.4343	7.4578e6	0.6701	-0.0493
4	933.6360	933.6510	2.2008e7	0.7625	-0.0150
5	1223.8450	1223.7823	6.0980e6	0.7651	0.0627
6	1572.0970	1572.0645	1.6439e6	0.7243	0.0325
7	1863.3060	1863.3143	3.0768e6	0.7252	-8.3485e-3
8	1979.3890	1979.3712	3.7634e6	0.7084	0.0178

\*Post-PM  
 \*FSE: Lynne Russell



Acq. Time: 15:33  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



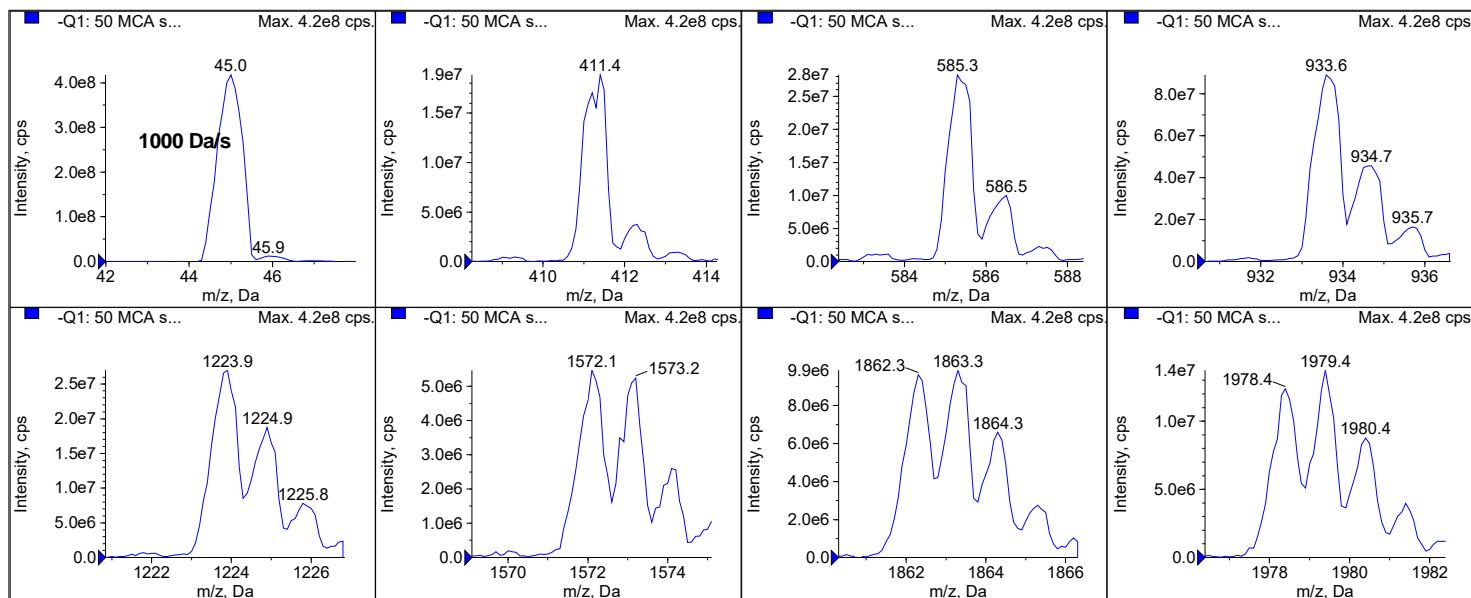
Peak List for "-Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309153334.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9917	3.9936e8	0.7353	6.3073e-3
2	411.2590	411.2565	2.5886e7	0.6981	2.5178e-3
3	585.3850	585.3937	3.5740e7	0.6784	-8.7106e-3
4	933.6360	933.6327	1.1394e8	0.7673	3.2736e-3
5	1223.8450	1223.8361	2.8978e7	0.7422	8.8585e-3
6	1572.0970	1572.1208	7.2060e6	0.7626	-0.0238
7	1863.3060	1863.3024	1.5666e7	0.6735	3.5534e-3
8	1979.3890	1979.3764	1.9374e7	0.7004	0.0126

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:35  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



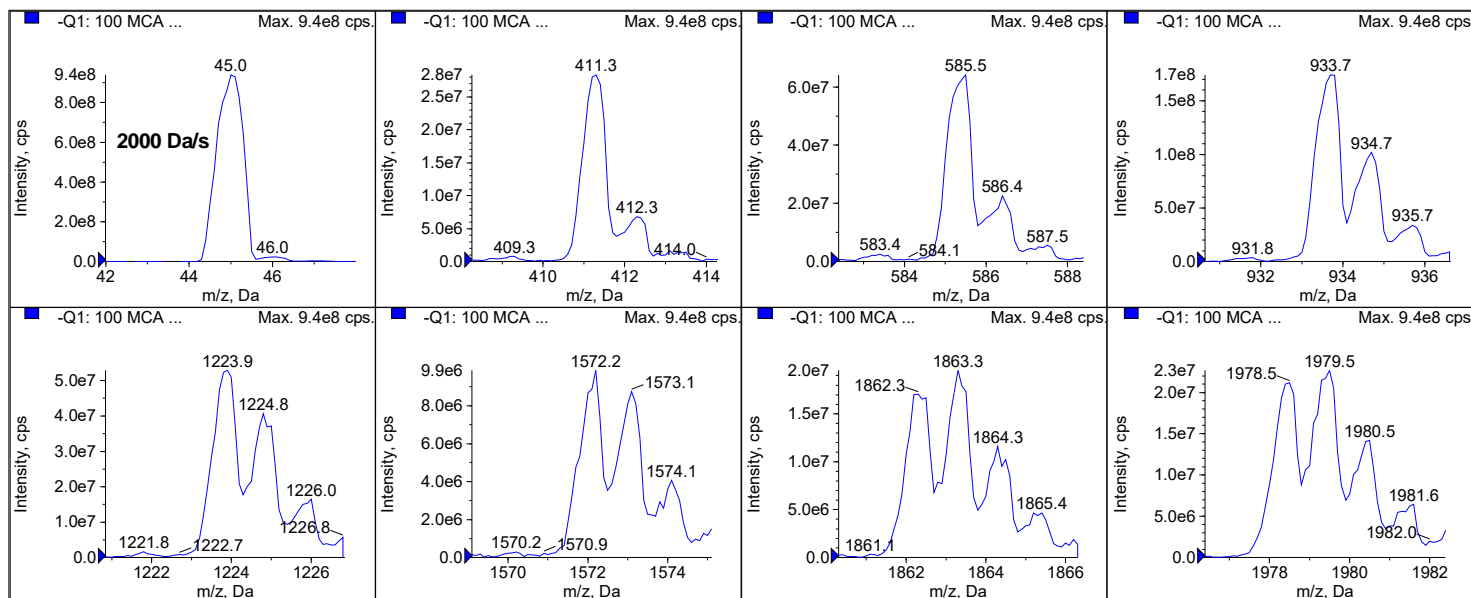
Peak List for "-Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309153557.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9936	4.1751e8	0.7157	4.4174e-3
2	411.2590	411.2776	1.8850e7	0.6512	-0.0186
3	585.3850	585.3771	2.8250e7	0.6670	7.8938e-3
4	933.6360	933.6294	8.9130e7	0.7626	6.5713e-3
5	1223.8450	1223.8444	2.6960e7	0.7422	6.2591e-4
6	1572.0970	1572.1041	5.4600e6	0.7252	-7.0655e-3
7	1863.3060	1863.2936	9.8500e6	0.7713	0.0124
8	1979.3890	1979.3925	1.3720e7	0.6952	-3.4915e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:40  
Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
\*SN: EB250231807



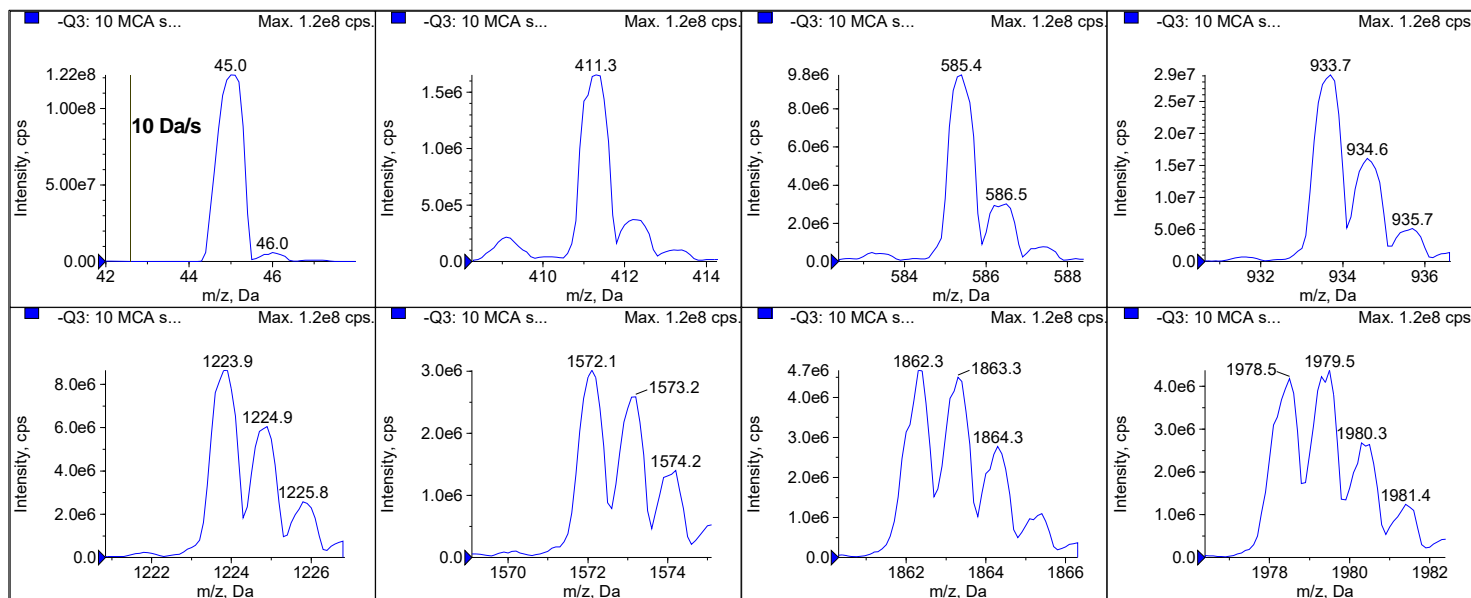
Peak List for "-Q1: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309154037.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0003	9.3880e8	0.7560	-2.2824e-3
2	411.2590	411.2703	2.8340e7	0.6287	-0.0113
3	585.3850	585.3487	6.4180e7	0.6800	0.0363
4	933.6360	933.6511	1.7412e8	0.6811	-0.0151
5	1223.8450	1223.8511	5.2840e7	0.6856	-6.0596e-3
6	1572.0970	1572.1135	9.8600e6	0.6499	-0.0165
7	1863.3060	1863.3165	1.9540e7	0.6589	-0.0105
8	1979.3890	1979.3944	2.2660e7	0.7319	-5.3568e-3

\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: 15:47  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



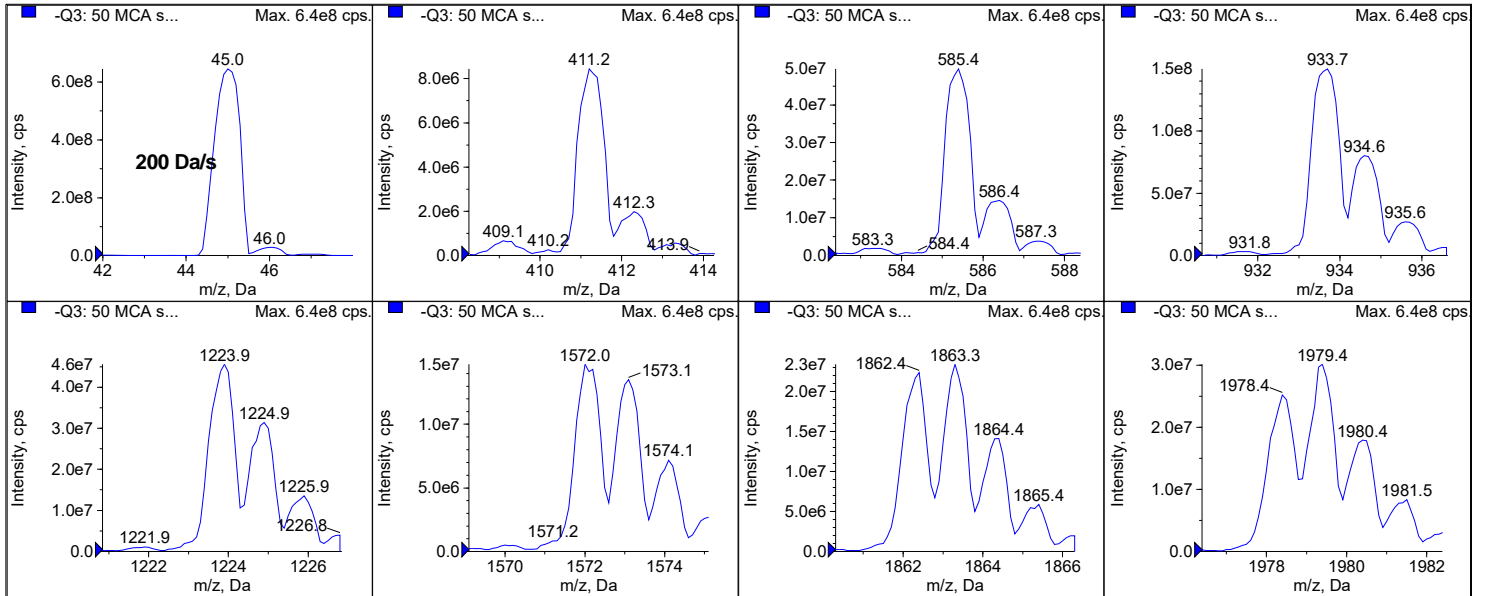
Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309154715.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0082	1.2180e8	0.7404	-0.0102
2	411.2590	411.2610	1.6539e6	0.7632	-2.0391e-3
3	585.3850	585.3872	9.7699e6	0.6984	-2.2009e-3
4	933.6360	933.6266	2.9123e7	0.7487	9.4038e-3
5	1223.8450	1223.8149	8.6389e6	0.7511	0.0301
6	1572.0970	1572.0850	3.0115e6	0.7067	0.0120
7	1863.3060	1863.2855	4.5025e6	0.7447	0.0205
8	1979.3890	1979.3871	4.3712e6	0.7716	1.9019e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:57  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



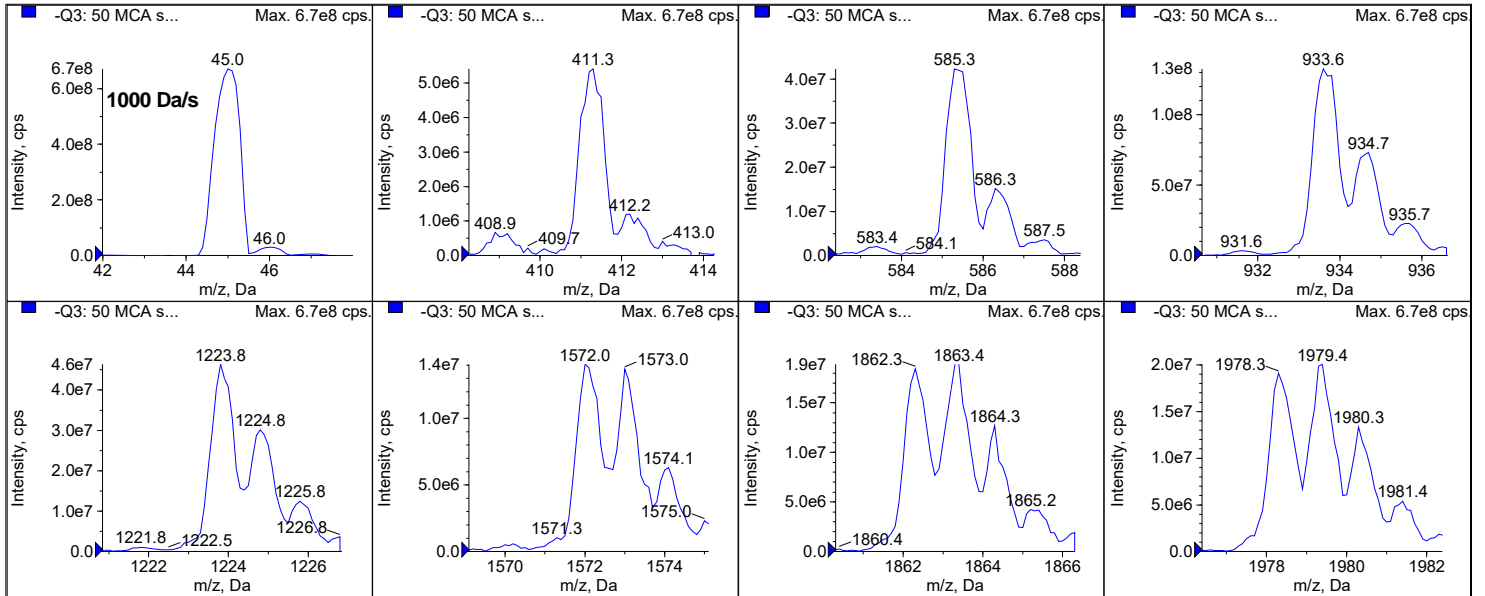
Peak List for "-Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309155701.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0060	6.4463e8	0.7254	-7.9934e-3
2	411.2590	411.2441	8.4440e6	0.7402	0.0149
3	585.3850	585.3776	4.9526e7	0.7000	7.4079e-3
4	933.6360	933.6448	1.4994e8	0.7558	-8.8291e-3
5	1223.8450	1223.8427	4.5540e7	0.7303	2.3178e-3
6	1572.0970	1572.0873	1.4708e7	0.7224	9.6943e-3
7	1863.3060	1863.3116	2.3372e7	0.6821	-5.6179e-3
8	1979.3890	1979.3871	3.0114e7	0.7684	1.9144e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:04  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



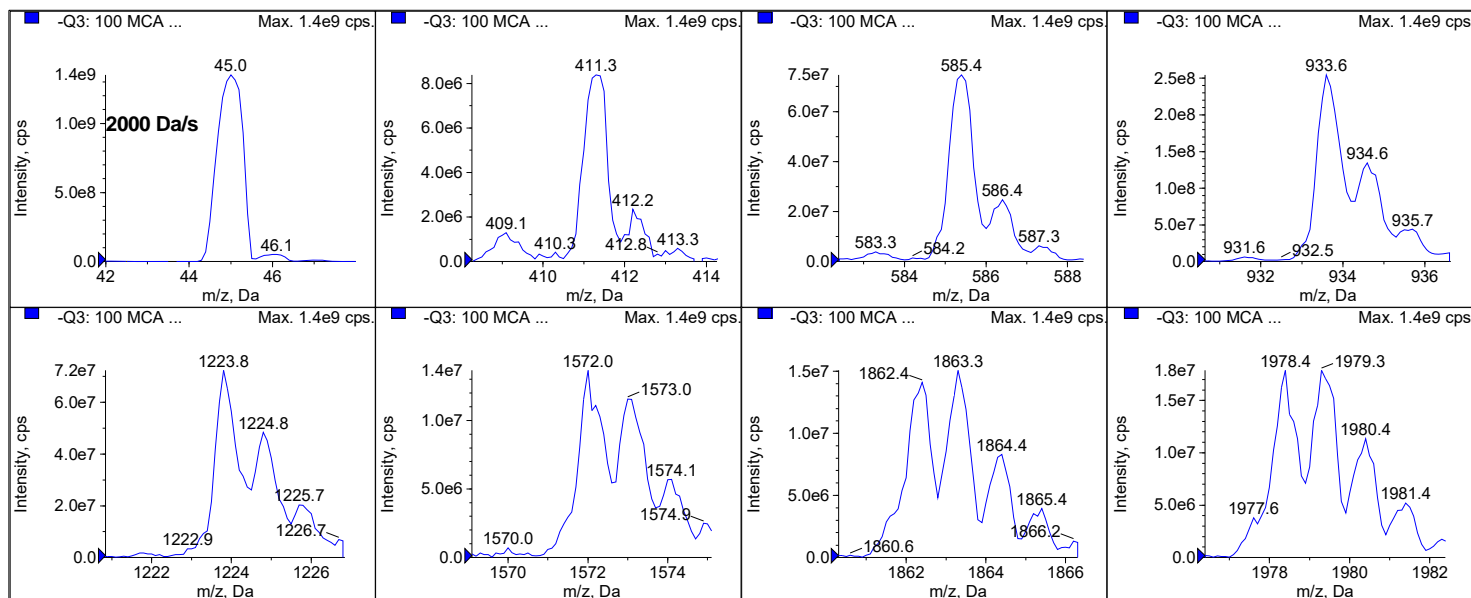
Peak List for "-Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309160443.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0043	6.7129e8	0.7277	-6.3300e-3
2	411.2590	411.2666	5.4100e6	0.6845	-7.6259e-3
3	585.3850	585.3966	4.2290e7	0.6976	-0.0116
4	933.6360	933.6496	1.3258e8	0.6805	-0.0136
5	1223.8450	1223.8557	4.6330e7	0.6552	-0.0107
6	1572.0970	1572.0882	1.4050e7	0.7080	8.8257e-3
7	1863.3060	1863.3356	1.8880e7	0.7932	-0.0296
8	1979.3890	1979.3810	2.0050e7	0.7797	7.9747e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:10  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



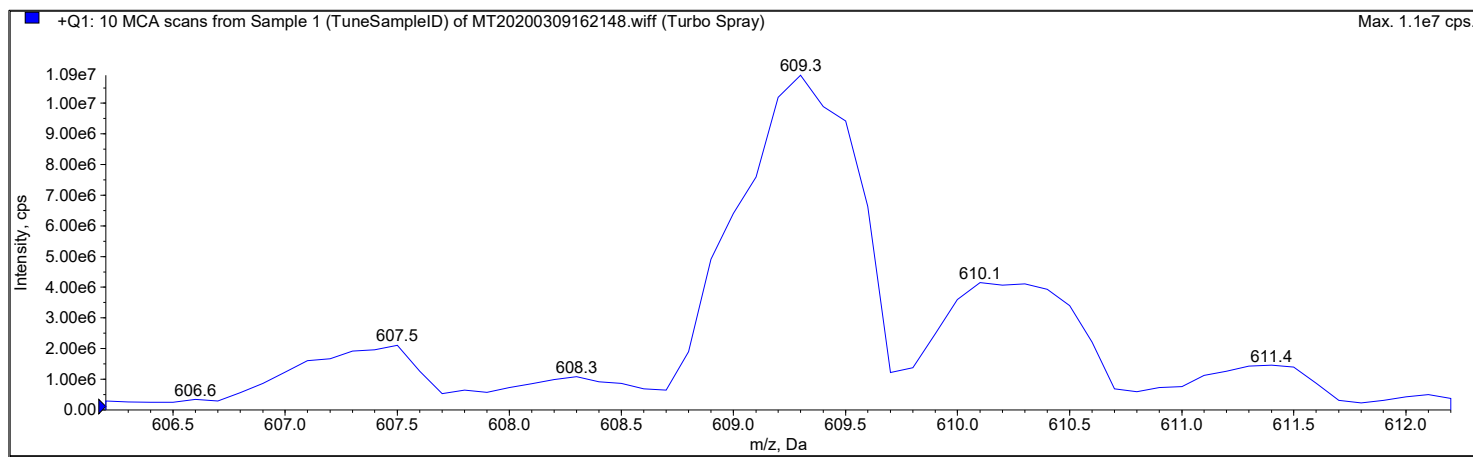
Peak List for "-Q3: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309161002.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0025	1.3512e9	0.7334	-4.5334e-3
2	411.2590	411.2920	8.3800e6	0.6384	-0.0330
3	585.3850	585.3849	7.4680e7	0.6377	5.1195e-5
4	933.6360	933.6396	2.5452e8	0.6599	-3.5625e-3
5	1223.8450	1223.8458	7.2340e7	0.6032	-7.8090e-4
6	1572.0970	1572.0918	1.3640e7	0.7449	5.2106e-3
7	1863.3060	1863.3134	1.5060e7	0.7096	-7.4095e-3
8	1979.3890	1978.4049	1.7860e7	0.7051	0.9841

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:21  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



Peak List for "+Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309162148.wiff (Turbo Spray)"

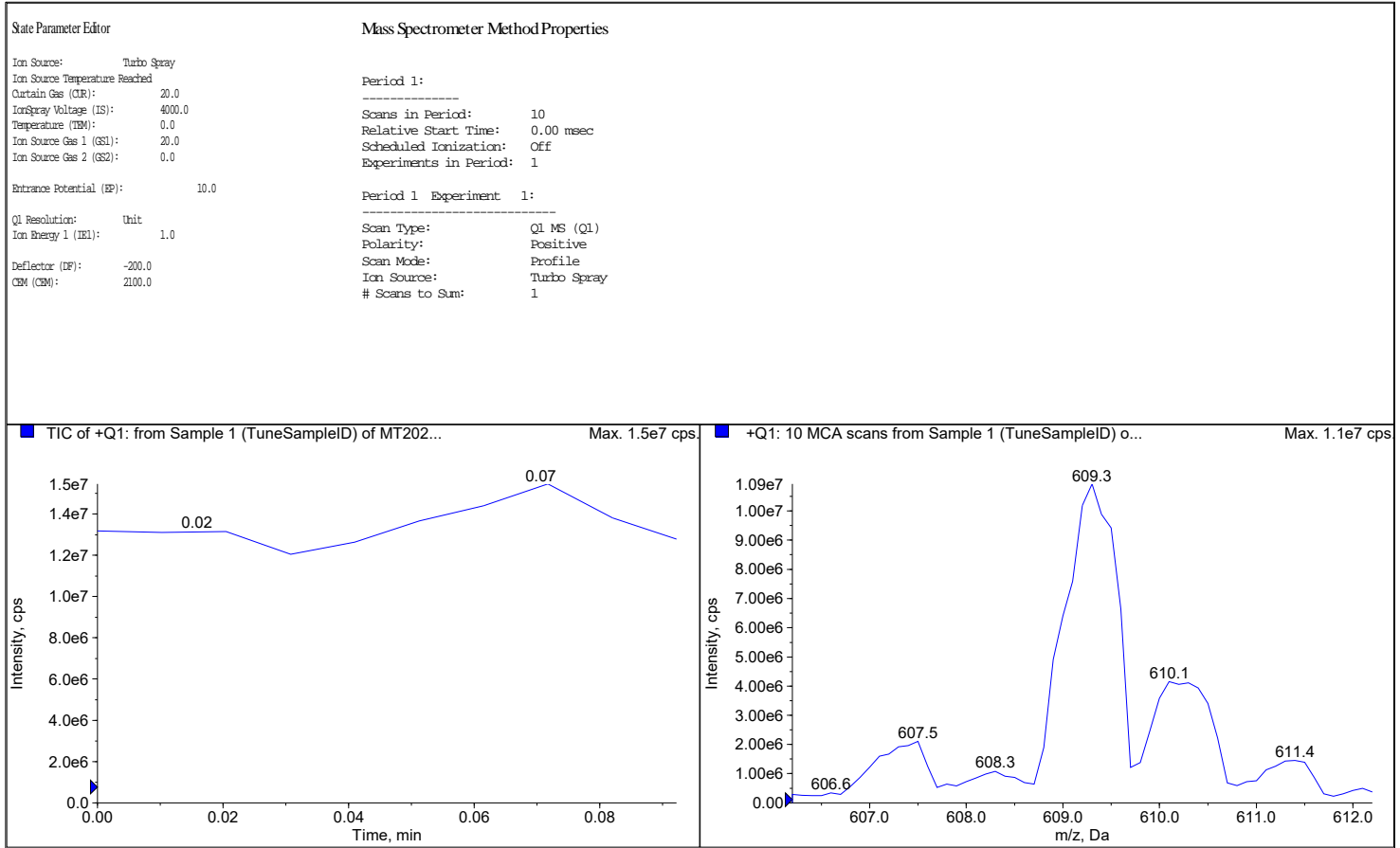
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	174.1000	n/a	n/a	n/a	n/a
2	195.1000	n/a	n/a	n/a	n/a
3	397.2000	n/a	n/a	n/a	n/a
4	448.1000	n/a	n/a	n/a	n/a
5	609.2810	609.3177	1.0915e7	0.6852	-0.0367

\*Post-PM  
 \*FSE: Lynne Russell



Acq. Time: N/A  
Acq. Date: N/A

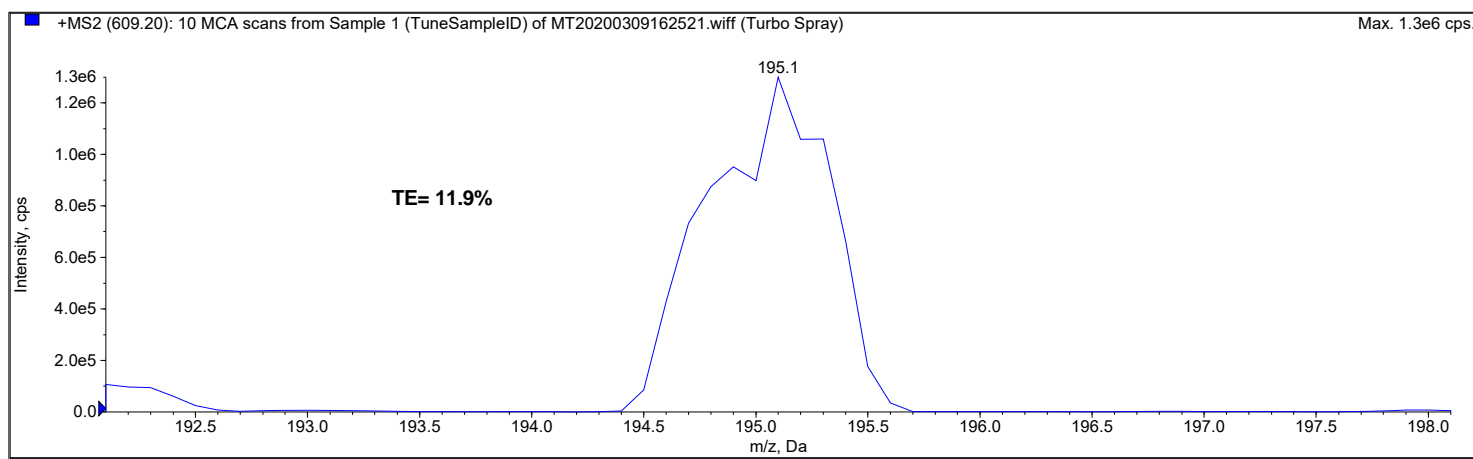
Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: 16:25  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



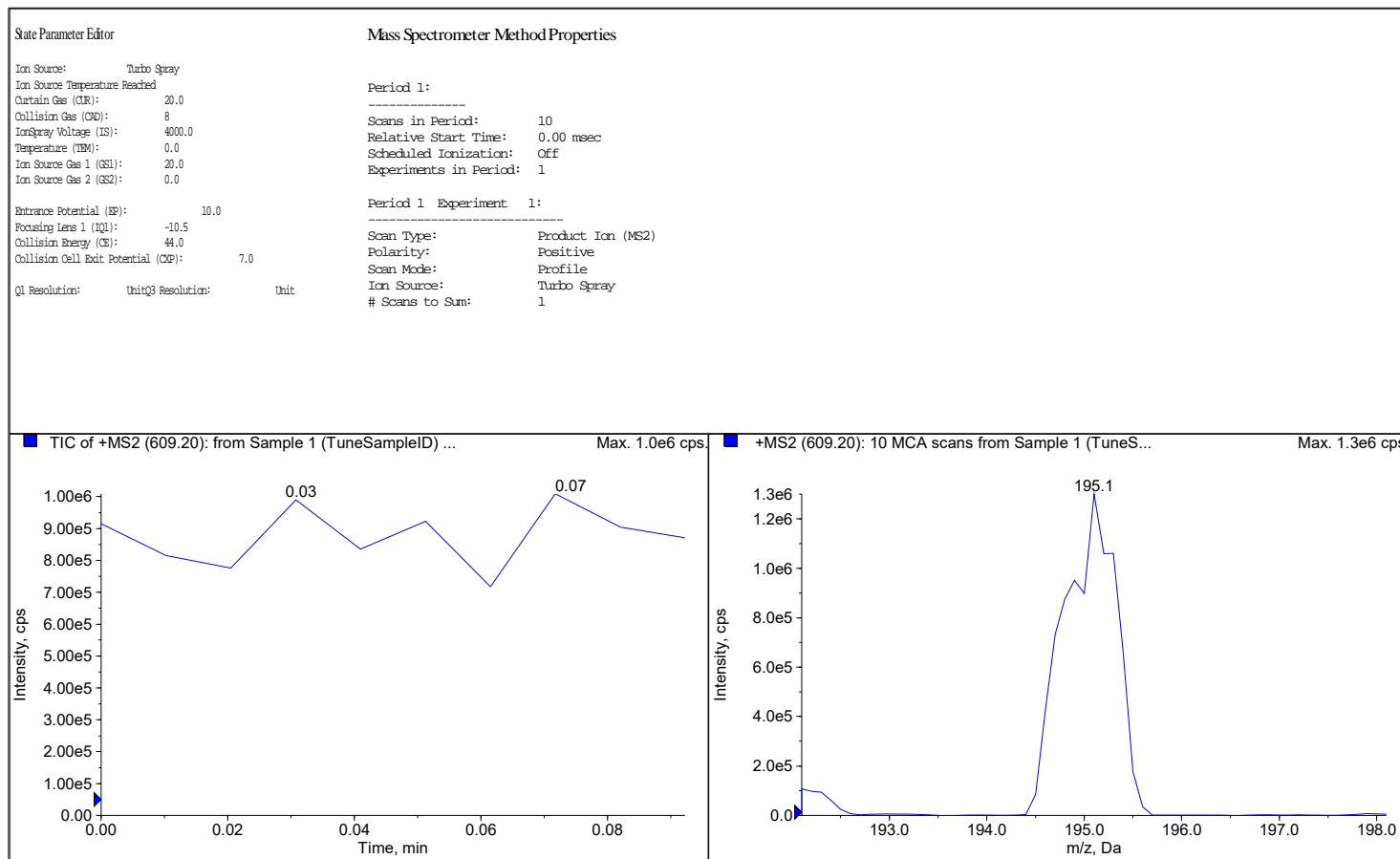
Peak List for "+MS2 (609.20): 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309162521.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	174.1000	n/a	n/a	n/a	n/a
2	195.1000	195.0747	1.3007e6	0.7298	0.0253
3	397.2000	n/a	n/a	n/a	n/a
4	448.1000	n/a	n/a	n/a	n/a
5	609.2810	n/a	n/a	n/a	n/a

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: N/A  
Acq. Date: N/A

Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320007.d  
 Injection Date: 23-Dec-2020 11:42:12 Injection Vol: 10.0 uL  
 Sample Type: InstBlk Auto Sampler: 97  
 Lab Sample ID: ID IBLK A Lab Prep. Batch:  
 Sample Info: ID IBLK A Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.704	1.705	0	674386	23	>100:1			1001.00	972.37	102	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46		1.705		ND								U
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.077	0	720176	17	>100:1			1001.00	1046.94	106	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.077		ND								U
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.140	2.130	1	249292	17	>100:1			1001.00	1082.79	106	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.141		ND								U
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44		2.461		ND								U
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.389	0	146705	19	>100:1			5005.00	6060.11	101	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63		2.398		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.425	0	753988	19	>100:1			1001.00	1022.95	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.425		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.532	0	1386912	19	>100:1			5005.00	5207.03	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.532		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.783	1	654925	20	>100:1			1001.00	1079.58	107	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.783		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.801	0	189134	19	>100:1			1001.00	1104.57	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.810		ND								U
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.828		ND								U
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45		3.169		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.142	0	112789	23	>100:1			5005.00	5856.61	95.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.162		ND								U

Data File: \\ORGANICS\ILL\LCMSMS02.1\122320-DOD.b\122320007.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.168	3.169	0	618587	23	>100:1			1001.00	1045.15	101	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.169		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.551	3.545	1	171304	23	>100:1			1001.00	1142.57	113	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.553		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.751		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54		3.883		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54		4.198		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54		4.349		ND								U
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54		4.698		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.551	3.553	0	788717	22	>100:1			1001.00	1050.27	108	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.553		ND								U
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.867	0	309018	20	>100:1			1001.00	998.24	95.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55		3.875		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.890	3.891	0	102225	21	>100:1			5005.00	5510.74	109	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.891		ND								U
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65		4.494		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.898	3.899	0	690416	22	>100:1			1001.00	1040.83	108	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.899		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.057	0	785994	18	>100:1			5005.00	5475.81	97	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.065		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.208	0	784164	18	>100:1			5005.00	5904.20	103	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.228		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.207	4.208	0	674480	17	>100:1			1001.00	1067.09	103	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.218		ND								U
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.308	4.309	0	109929	17	>100:1			1001.00	1015.91	106	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61		4.309		ND								U
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.319	0	54466	16	>100:1			1001.00	1029.27	109	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57		4.319		ND								U
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.474	4.467	1	126757	17	>100:1			1001.00	1010.86	108	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)</b>													U
630 > 59	62	4.476			ND								
<b>D 38 13C2_PFDaA</b>													
615 > 570		4.483	4.485	0	634388	18	>100:1			1001.00	1048.03	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA)</b>													U
613 > 569	38	4.476			ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA)</b>													U
663 > 619	38	4.719			ND								
<b>D 59 d5-EtFOA</b>													
531 > 169		4.483	4.485	0	54805	22	>100:1			1001.00	1116.32	104	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOA)</b>													U
526 > 169	59	4.494			ND								
<b>D 42 13C2_PFTeDA</b>													
715 > 670		4.932	4.933	0	817626	19	>100:1			1001.00	970.54	105	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA)</b>													U
713 > 669	42	4.933			ND								
<b>D 40 13C2_PFHxDA</b>													
815 > 770		5.309	5.318	0	919994	19	>100:1			1001.00	1015.26	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA)</b>													
813 > 769	40	5.317	5.318	0/0	5586	19	19:1	Target = 11.43		9.3020	9.3020		
813 > 269	40	5.309	5.318		436	14	11:1	12.81 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA)</b>													U
913 > 869	40	5.668			ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.898	3.899	0	694029	21	>100:1					95.7	
<b>* 39 13C2_PFHxA</b>													
315 > 270		2.424	2.425	0	706394	20	>100:1					96.8	
<b>* 41 13C2_PFOA</b>													
415 > 370		3.168	3.169	0	581809	24	>100:1					93.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.704	1.705	0	589684	23	>100:1					97.1	
<b>* 48 13C4_PFOS</b>													
503 > 80		3.543	3.545	0	166322	22	>100:1					104	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320007.d

Injection Date: 23-Dec-2020 11:42:12

Inst. ID: LCMSMS02

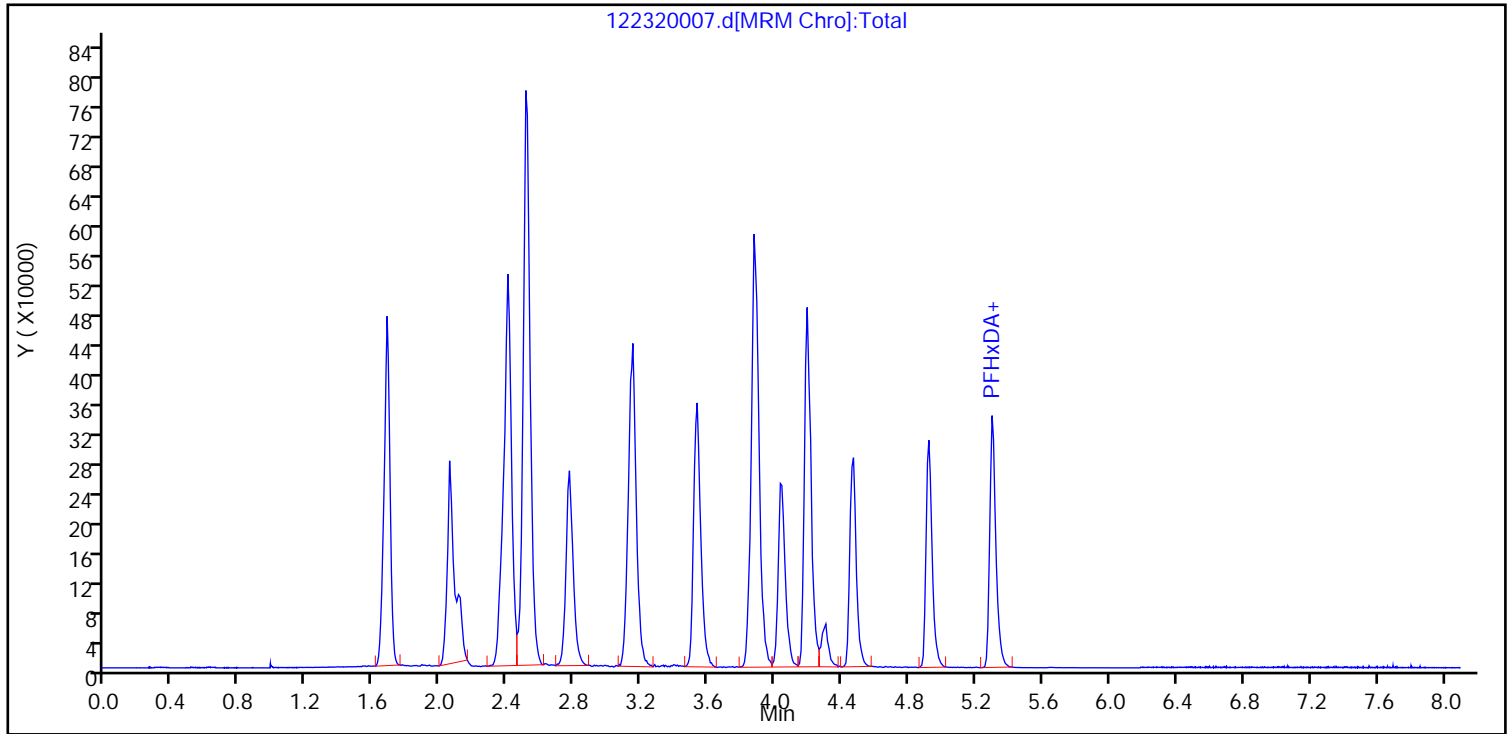
Client ID:

Lab ID: ID IBLK A

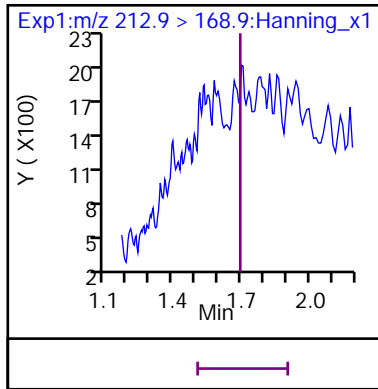
Sample Info: ID IBLK A

Dil. Factor: 1

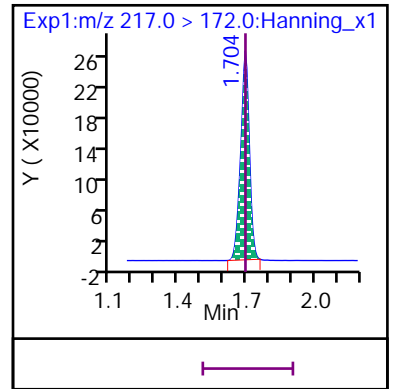
Operator: Stephen E. Somerville



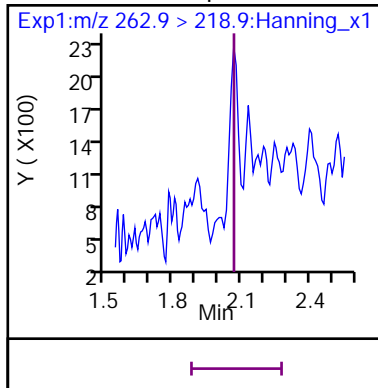
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



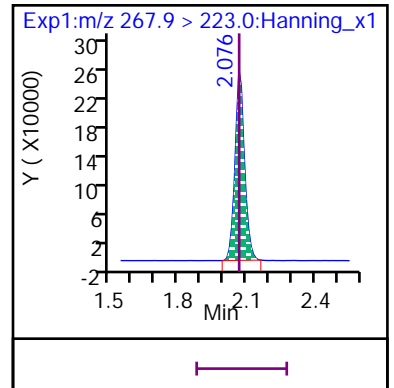
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

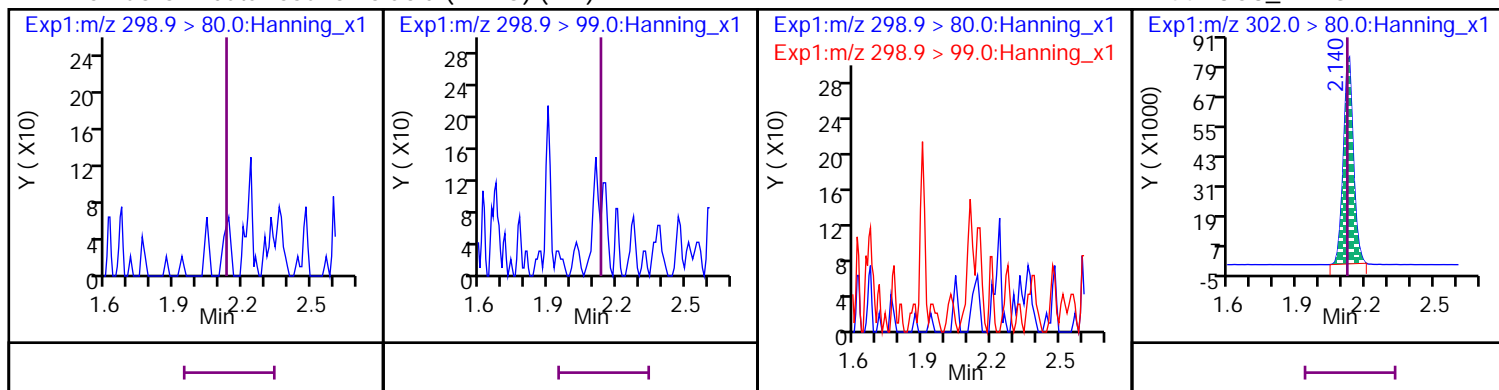


D 50 13C5\_PFPeA



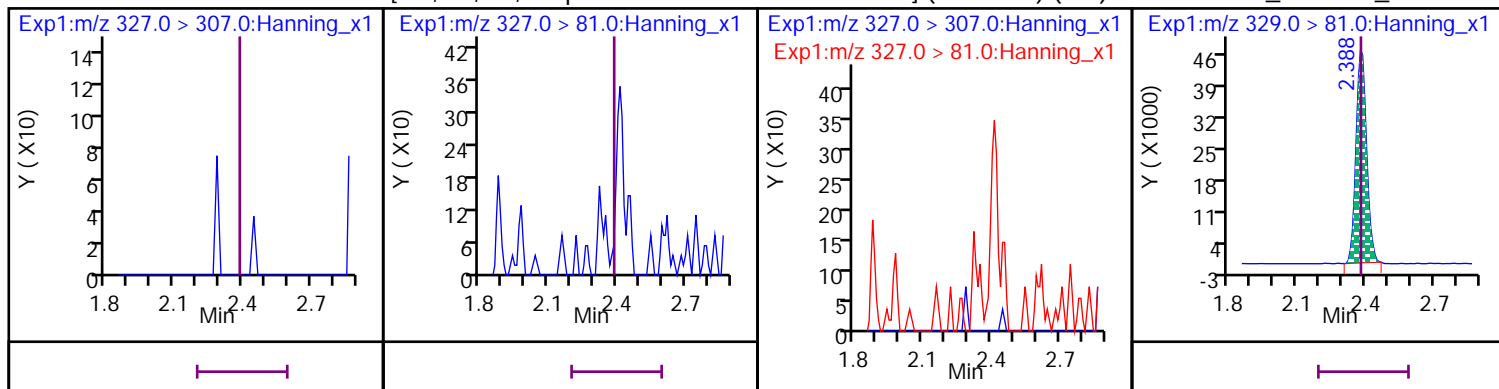
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



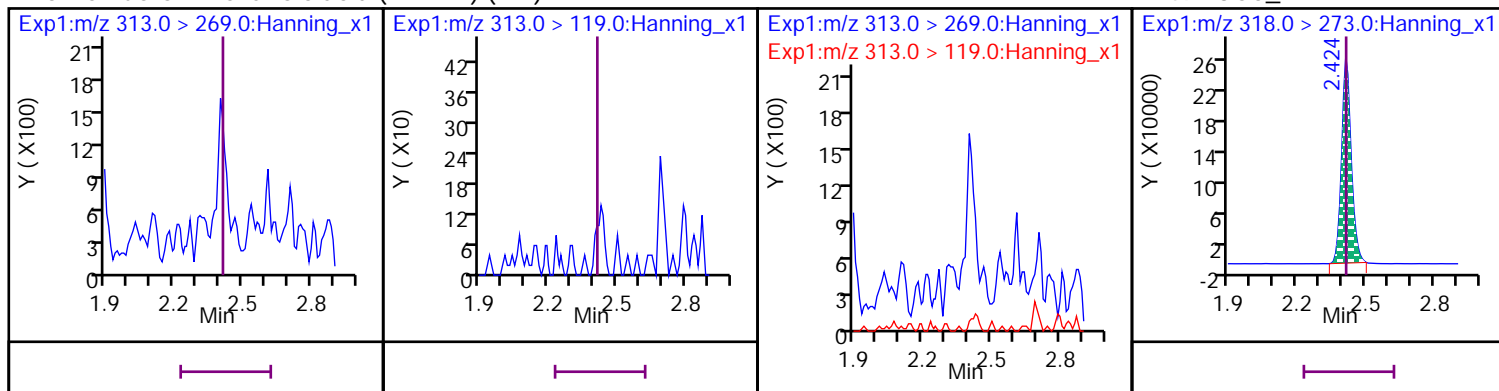
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS ) (ND)

D 63 13C2\_4:2 FTS\_2



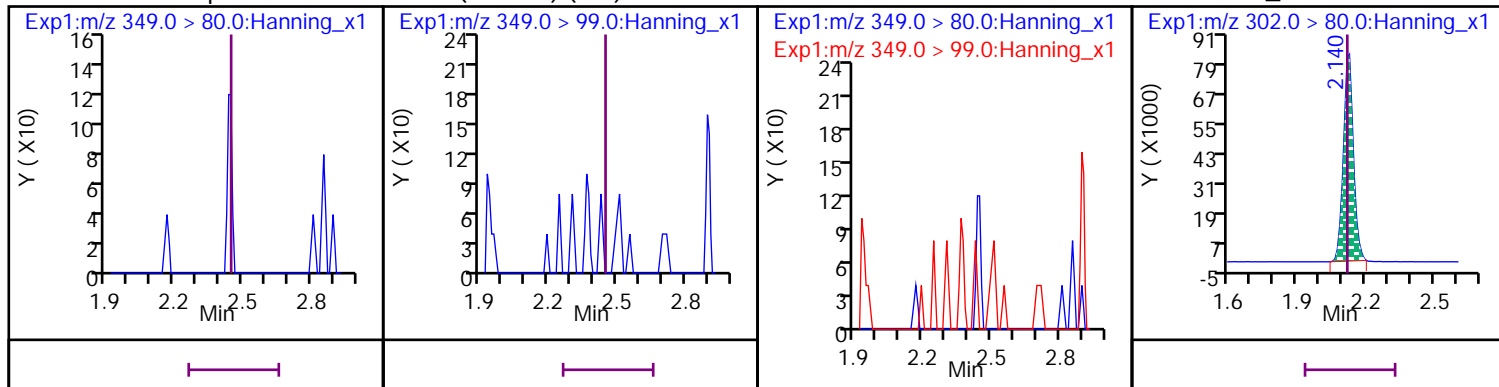
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

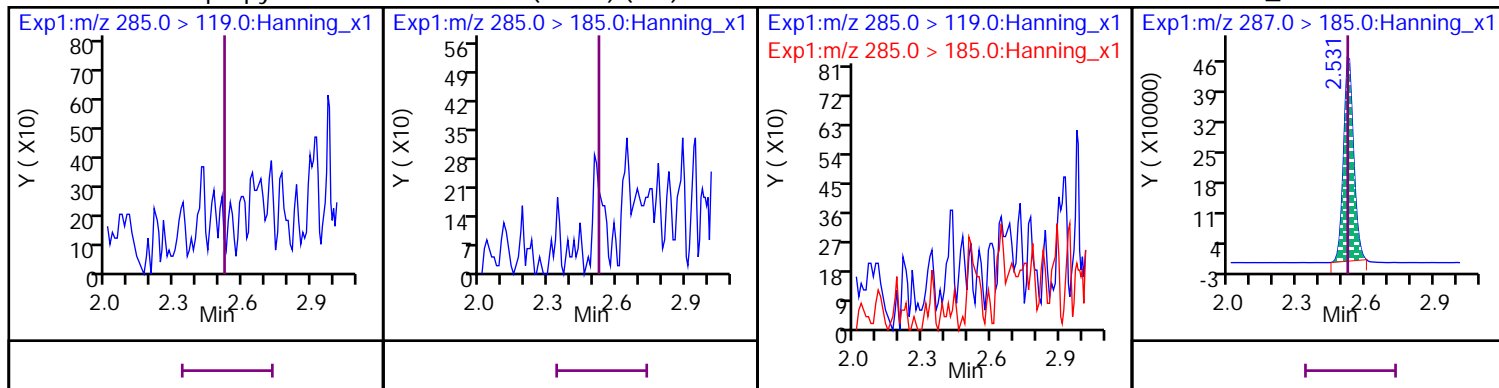
D 44 13C3\_PFBS





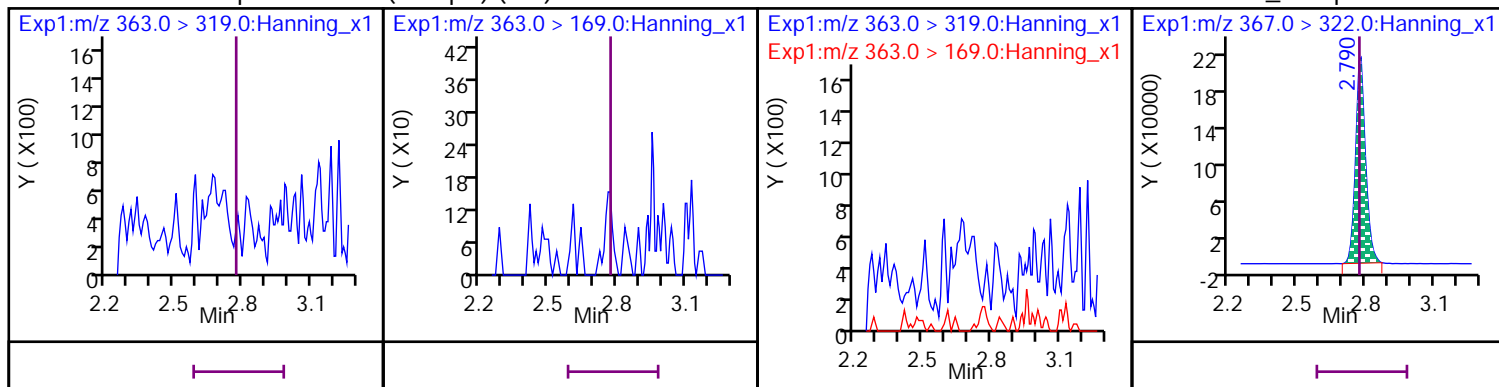
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



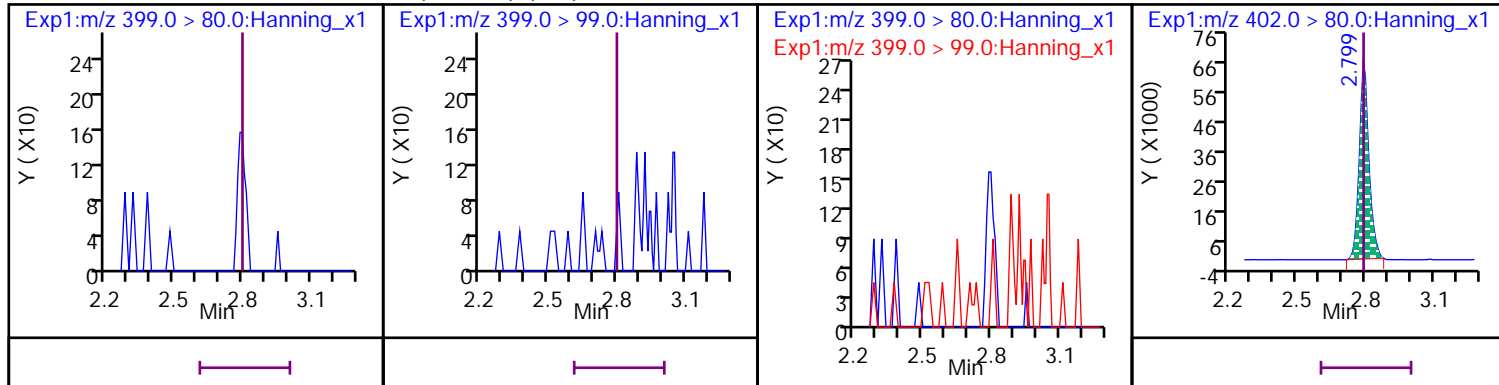
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



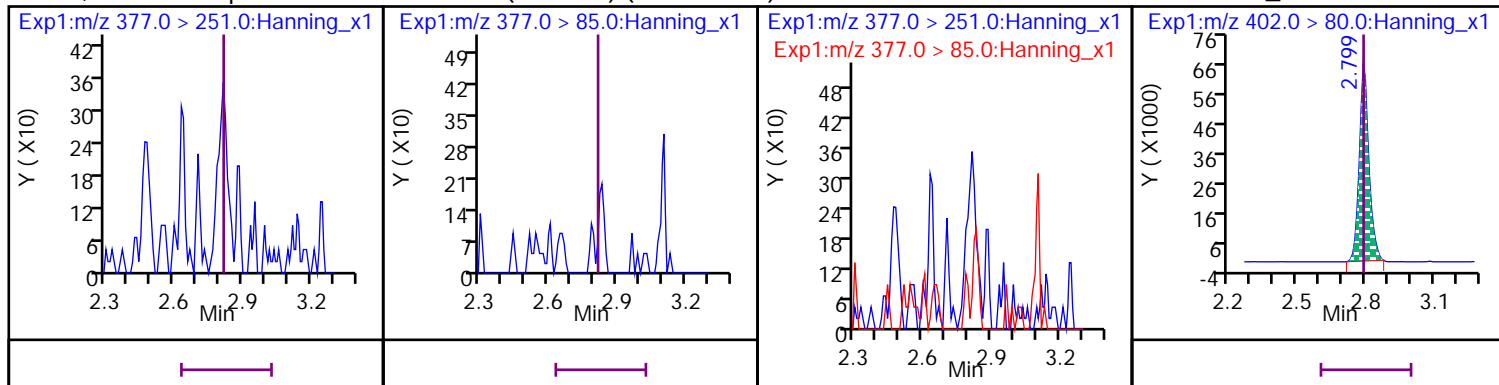
## 14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS

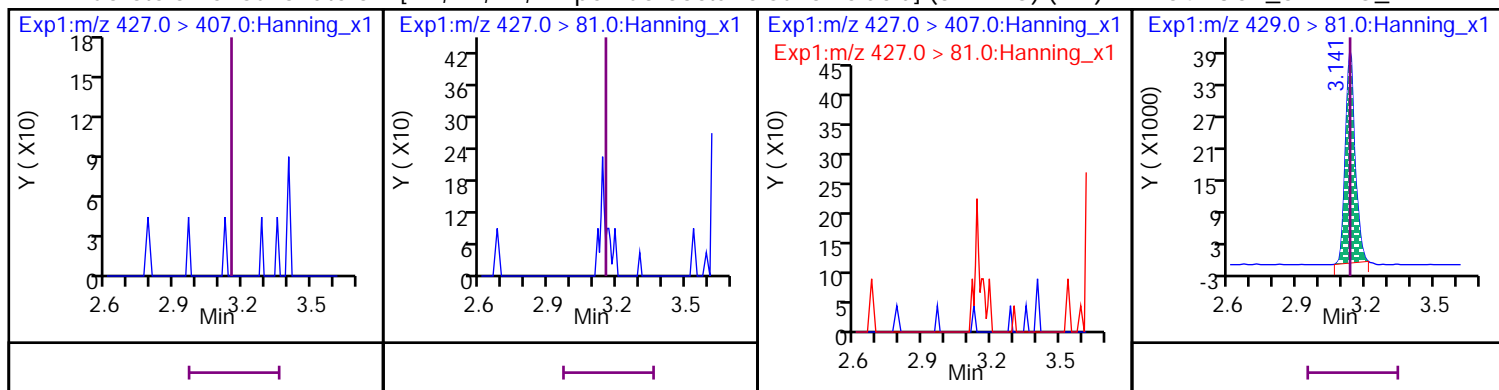


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (Marked ND)

D 45 13C3\_PFHxS

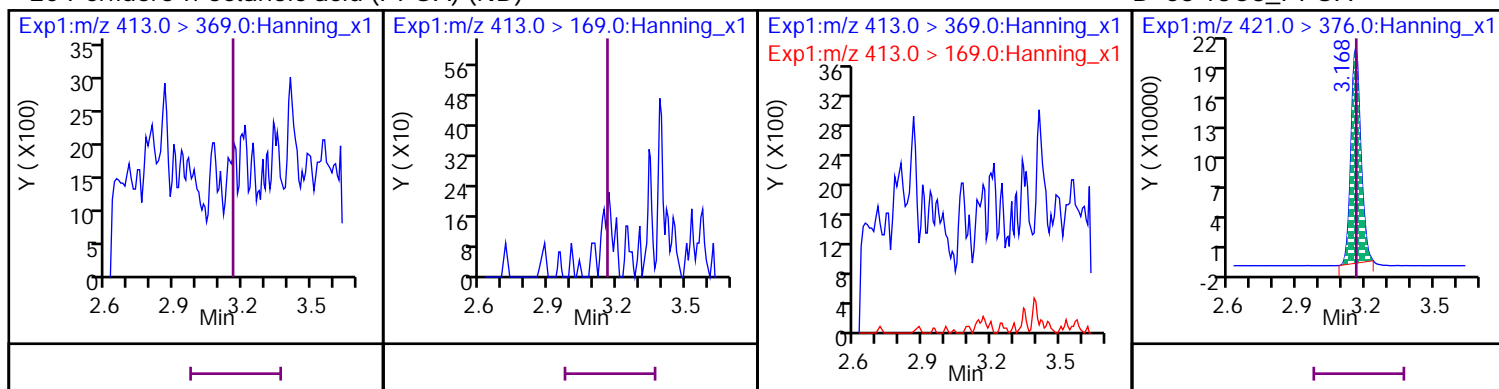


## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



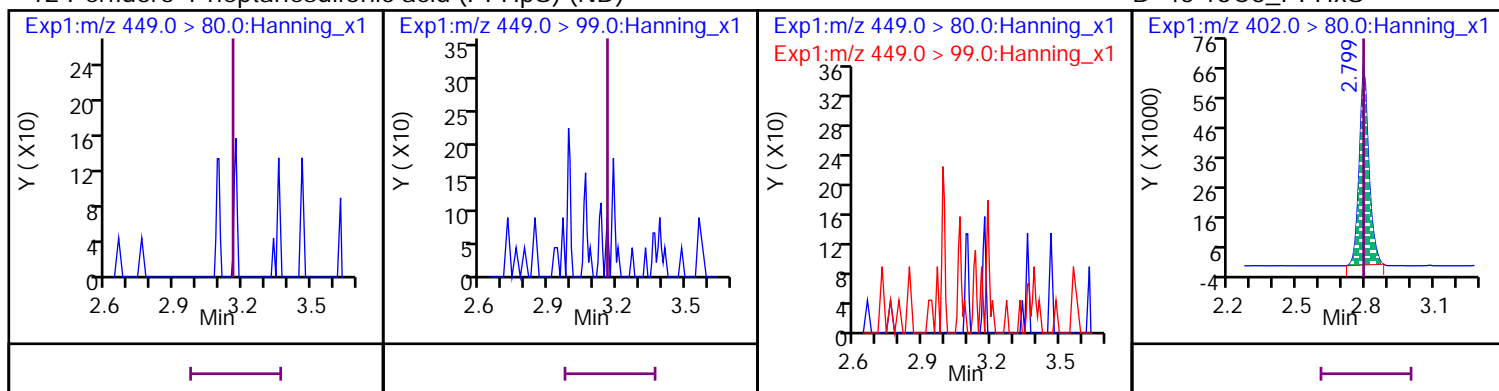
## 20 Perfluoro-n-octanoic acid (PFOA) (ND)

## D 53 13C8\_PFOA



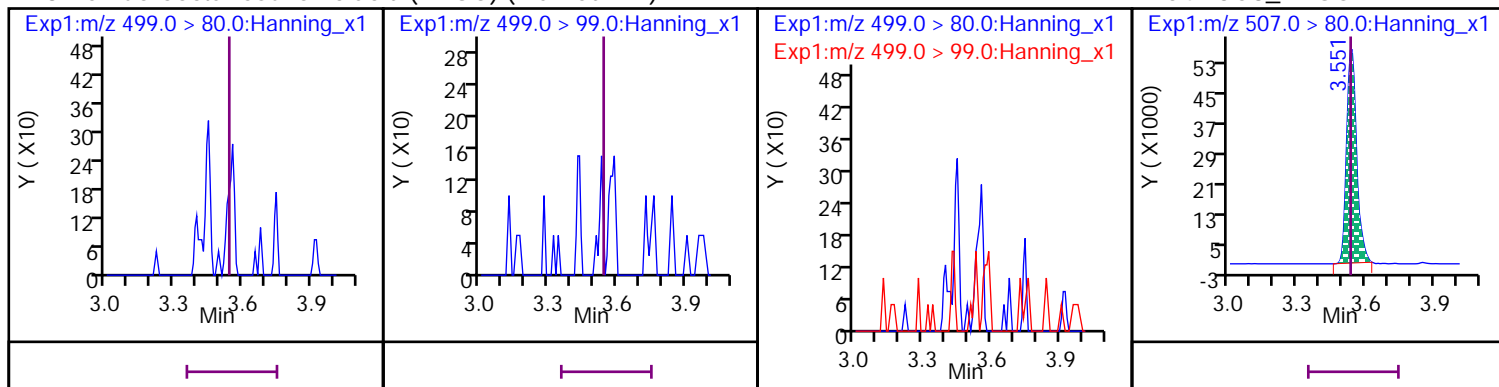
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

## D 45 13C3\_PFHxS



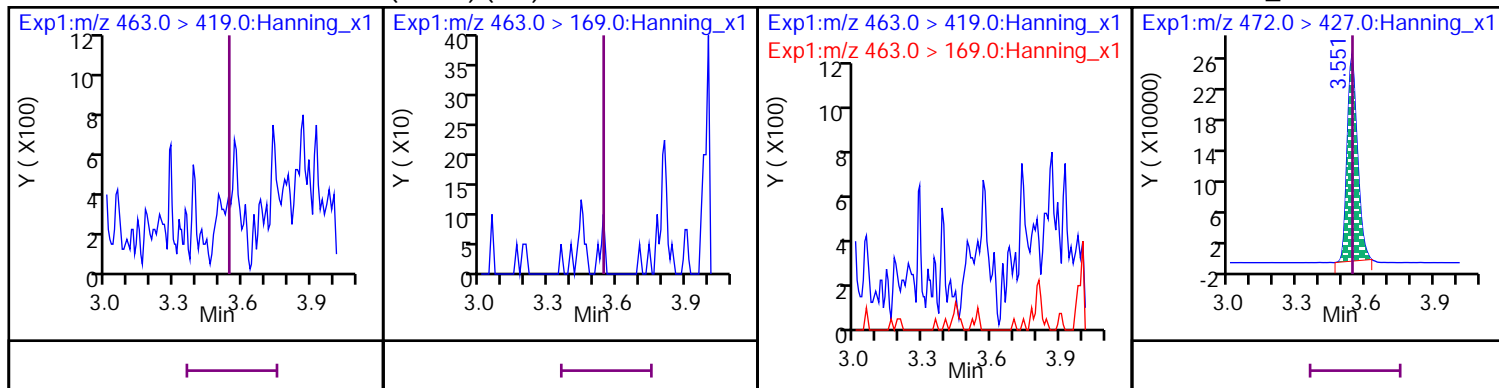
## 18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

## D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



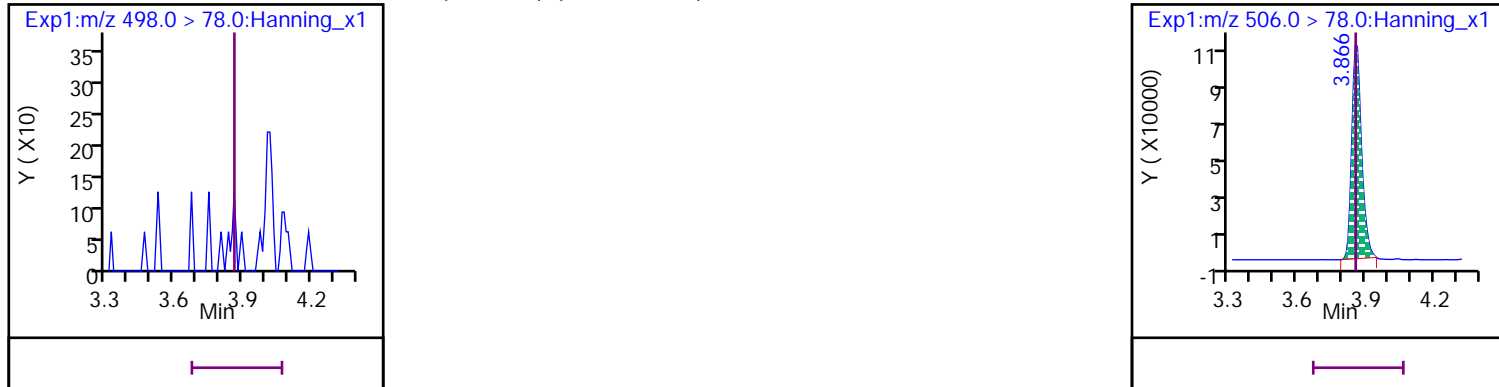
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



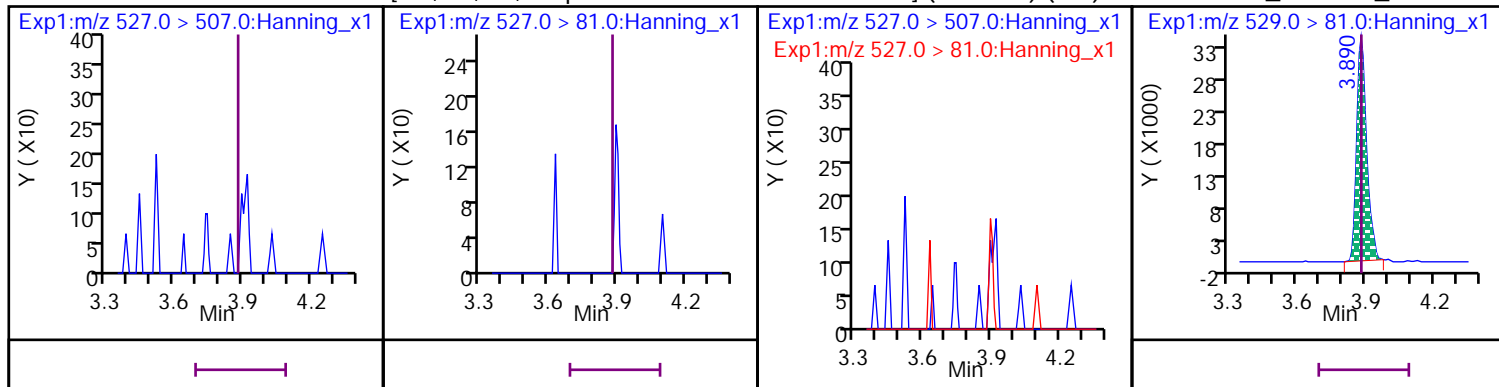
19 Perfluoro-1-octanesulfonamide (PFOSA) (Marked ND)

D 55 13C8\_PFOSA



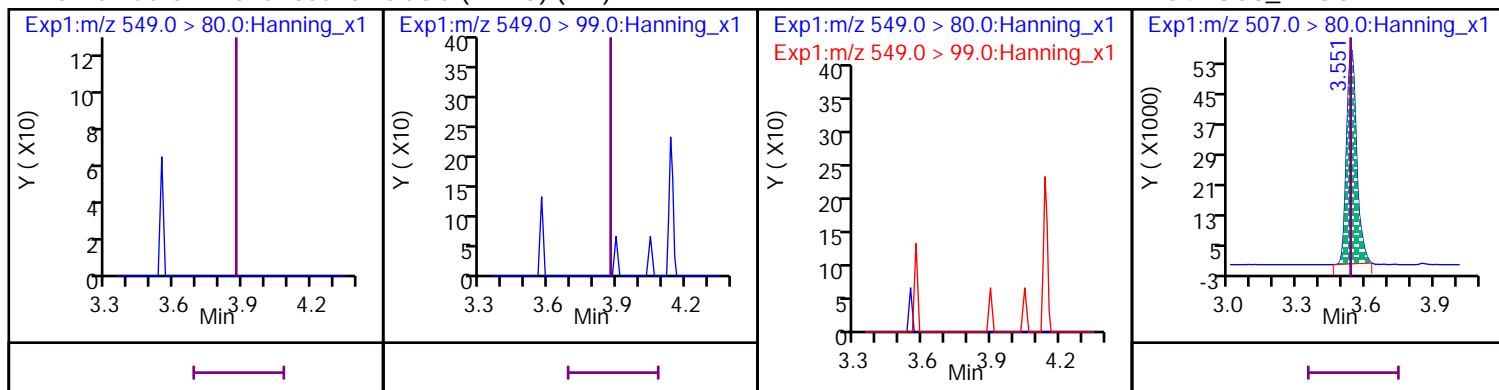
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



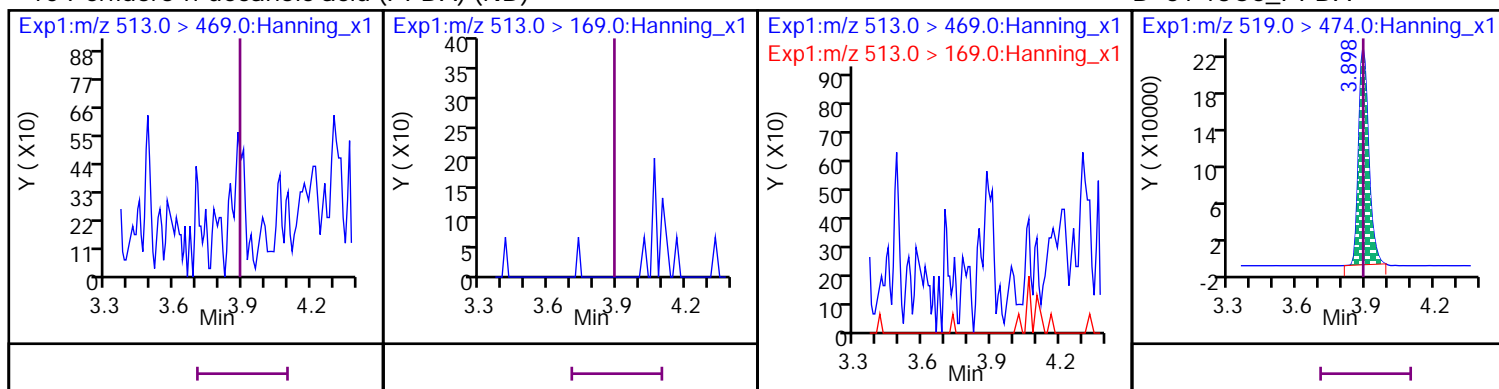
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



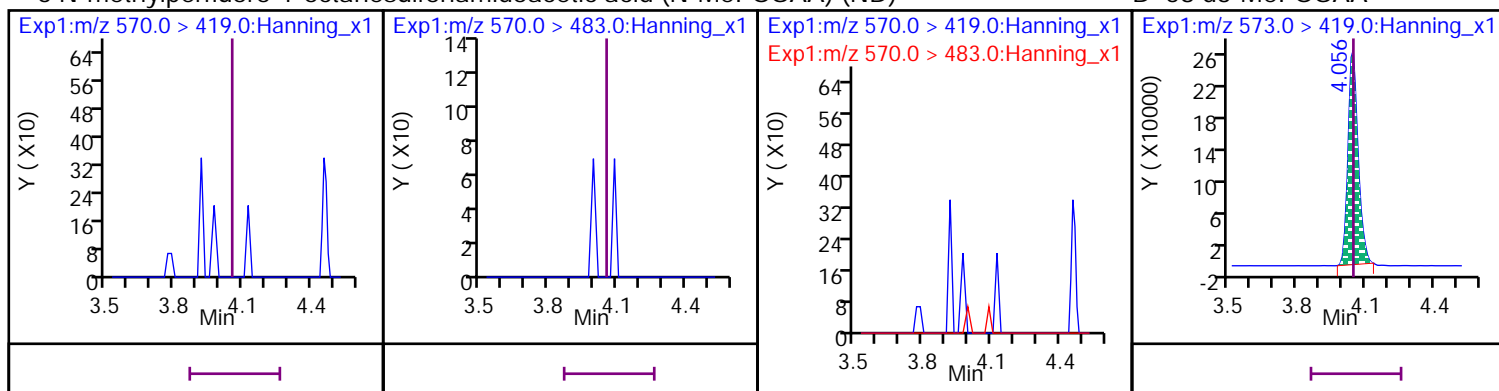
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



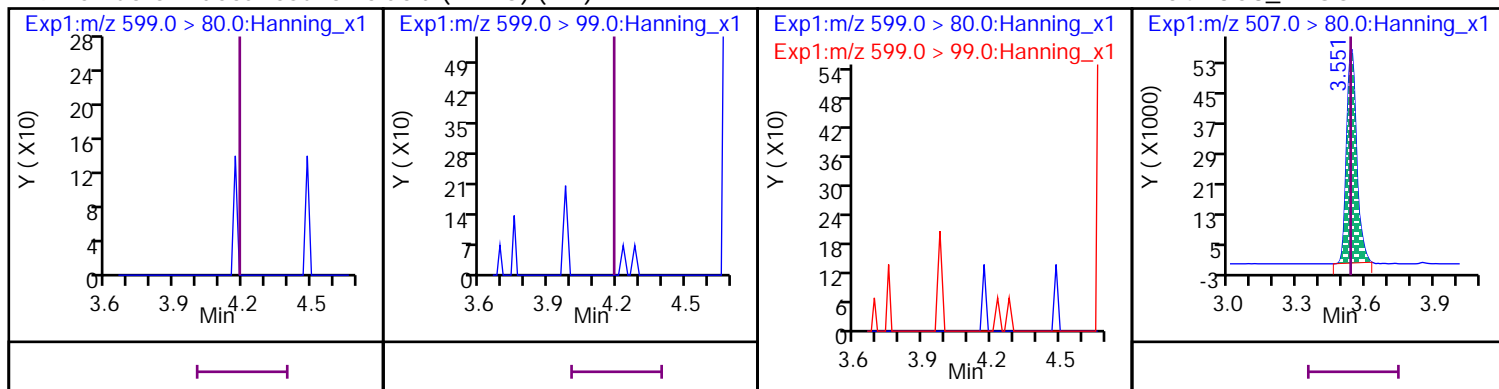
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



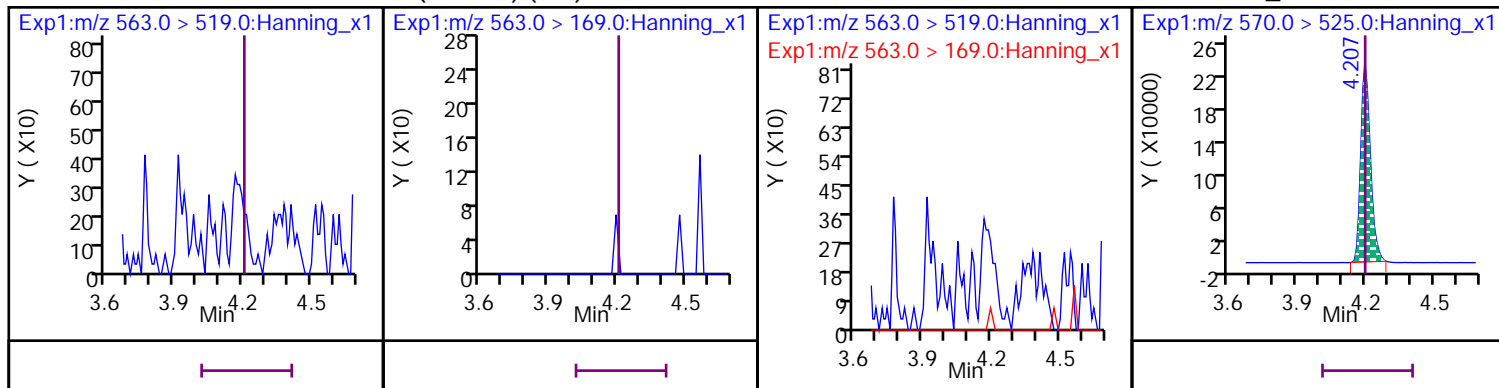
9 Perfluoro-1-decanesulfonic acid (PFDS) (ND)

D 54 13C8\_PFOS



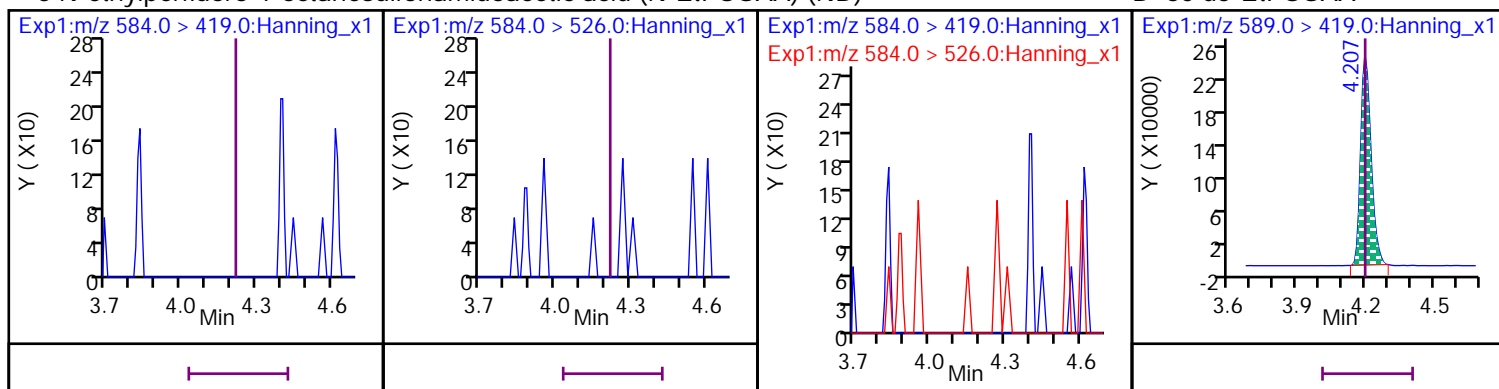
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



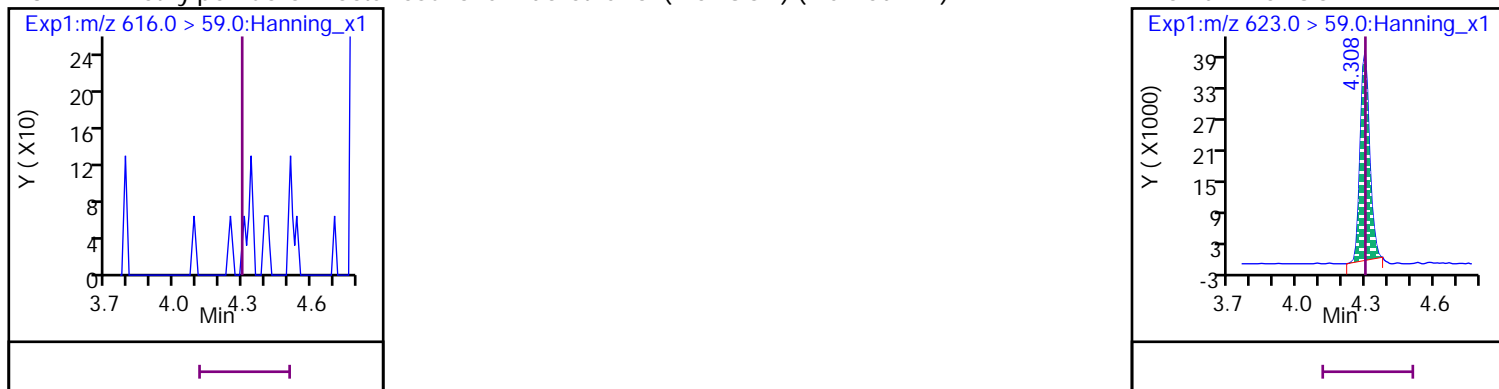
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



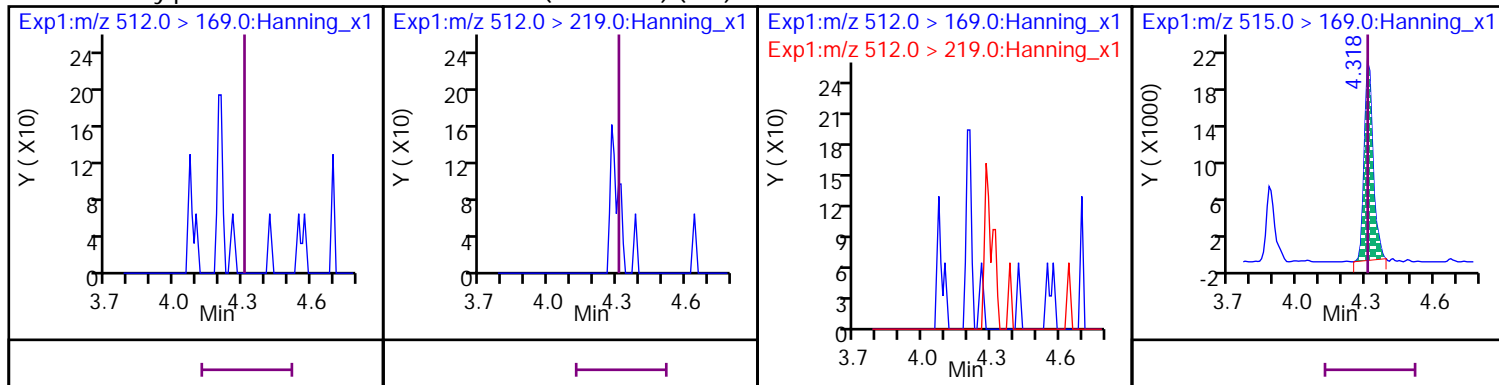
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

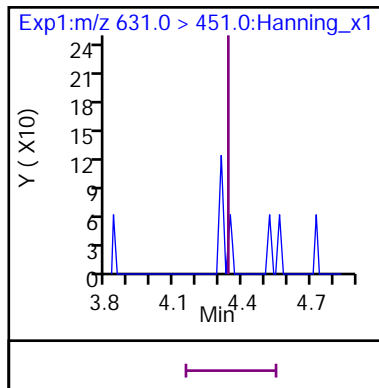


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (ND)

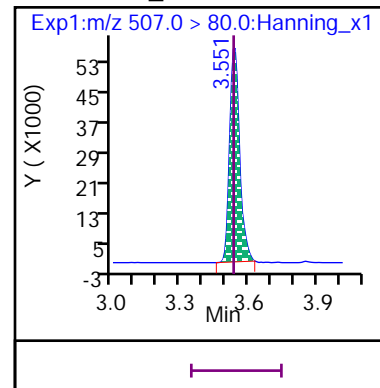
D 57 d3-MeFOSA



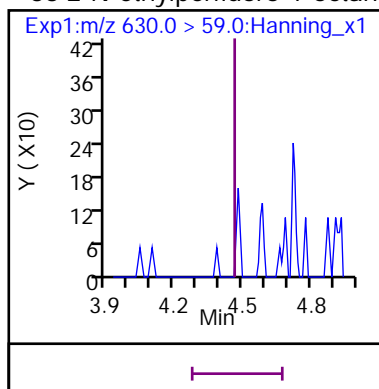
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



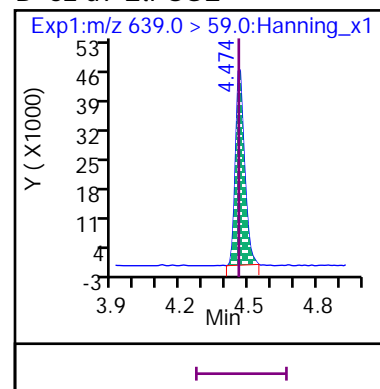
## D 54 13C8\_PFOS



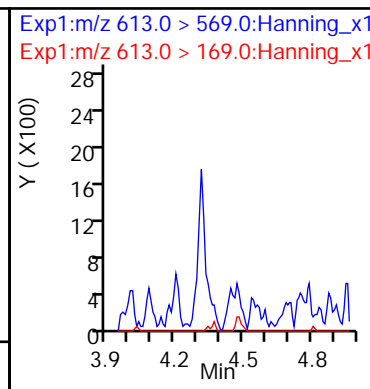
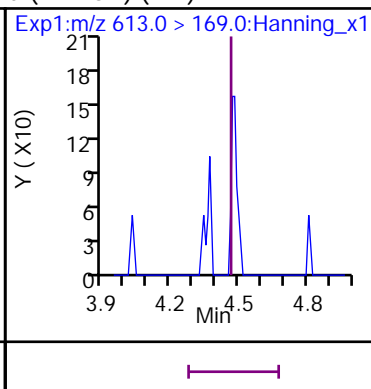
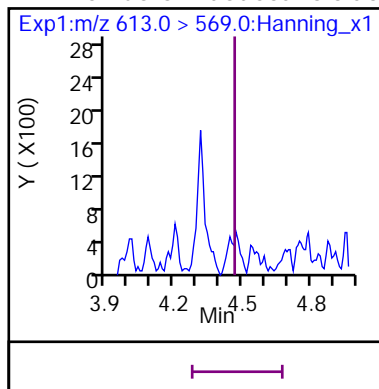
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (ND)



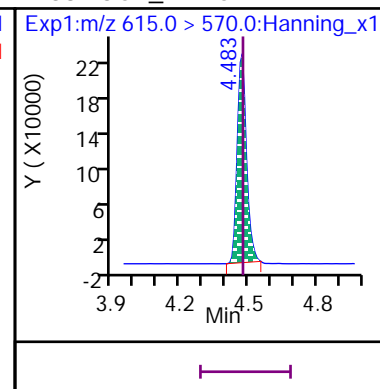
## D 62 d9-EtFOSE



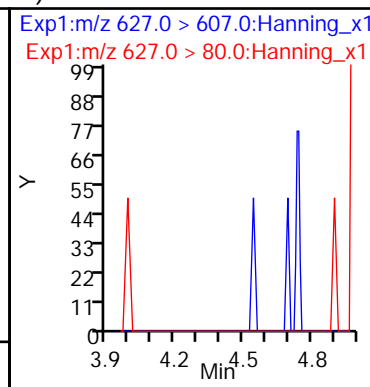
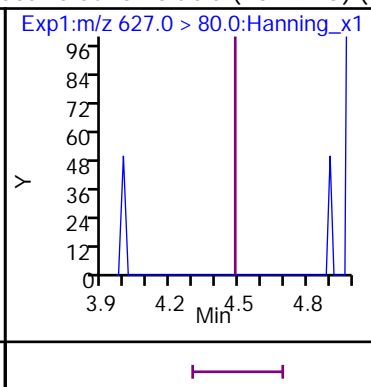
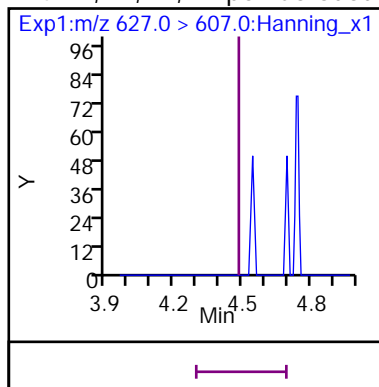
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



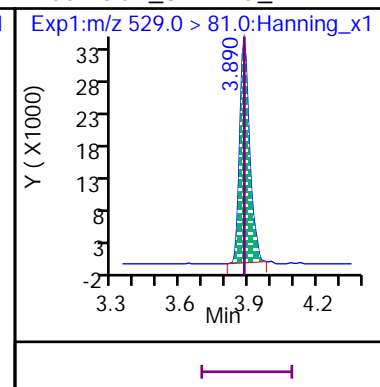
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

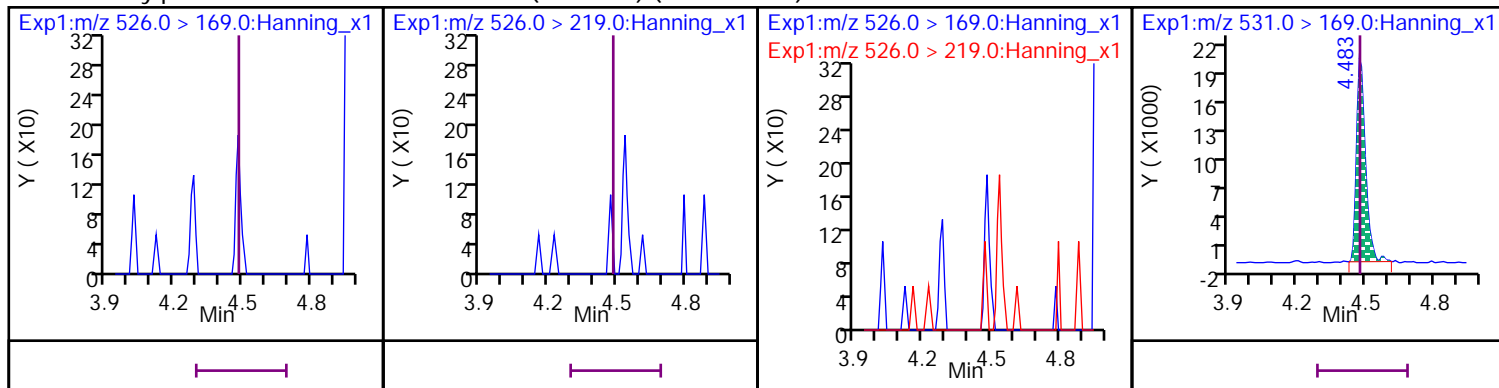


## D 65 13C2\_8:2 FTS\_2



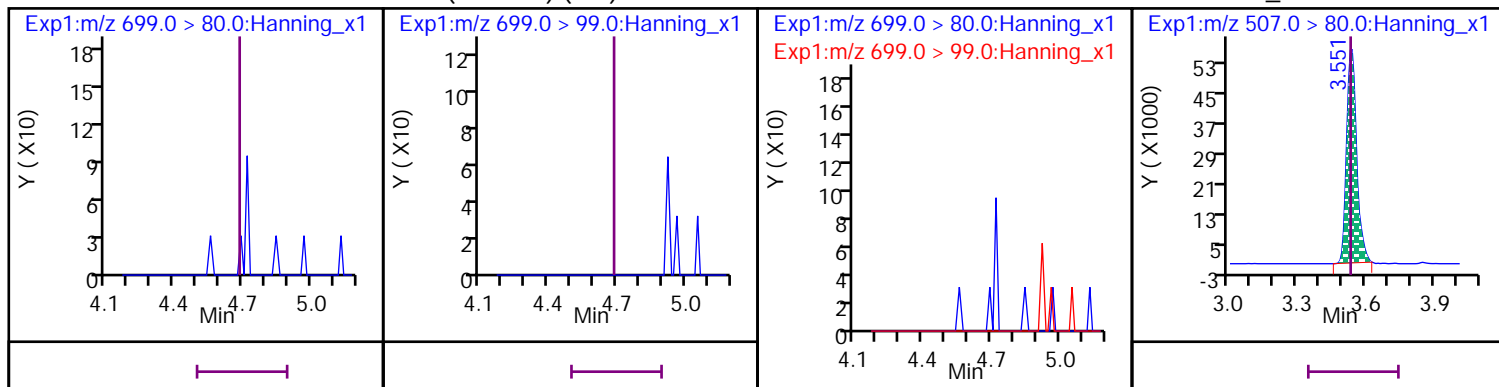
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (Marked ND)

## D 59 d5-EtFOSA



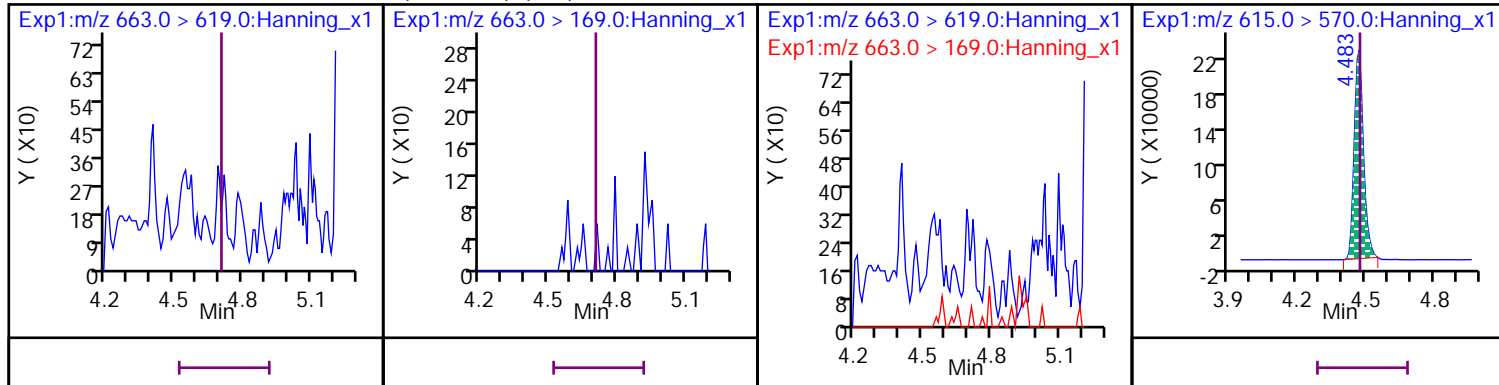
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

## D 54 13C8\_PFOS



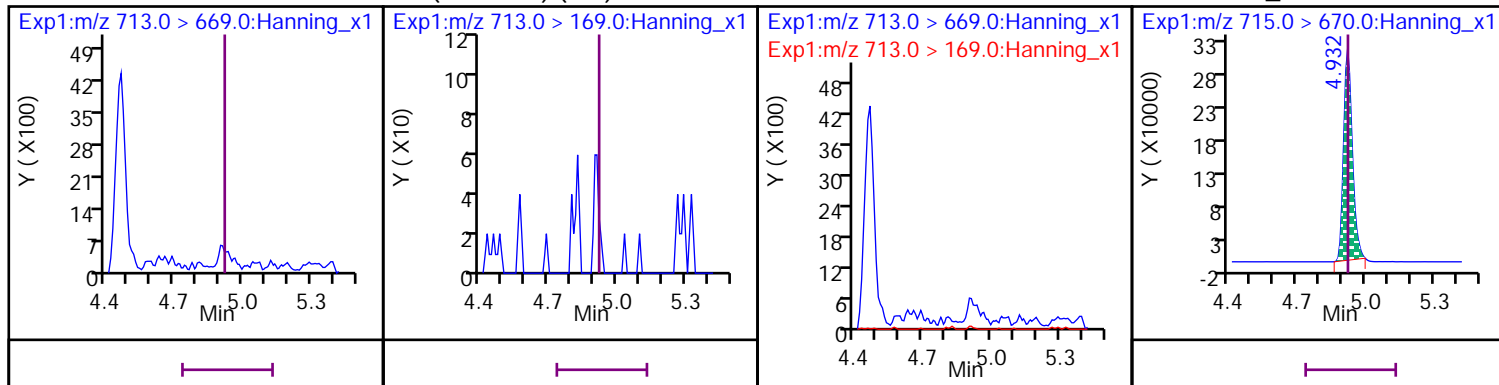
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

## D 38 13C2\_PFDaA



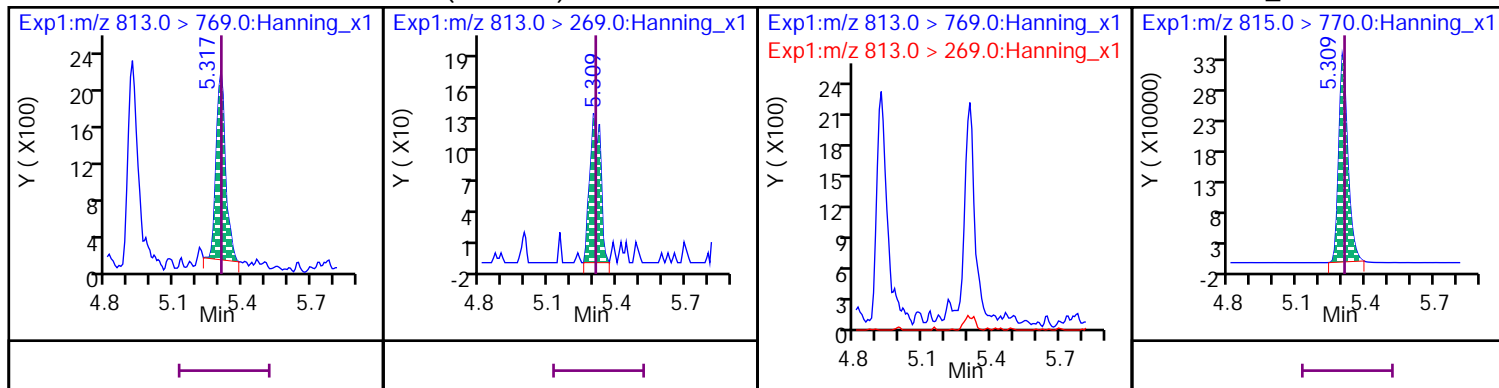
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

## D 42 13C2\_PFTeDA



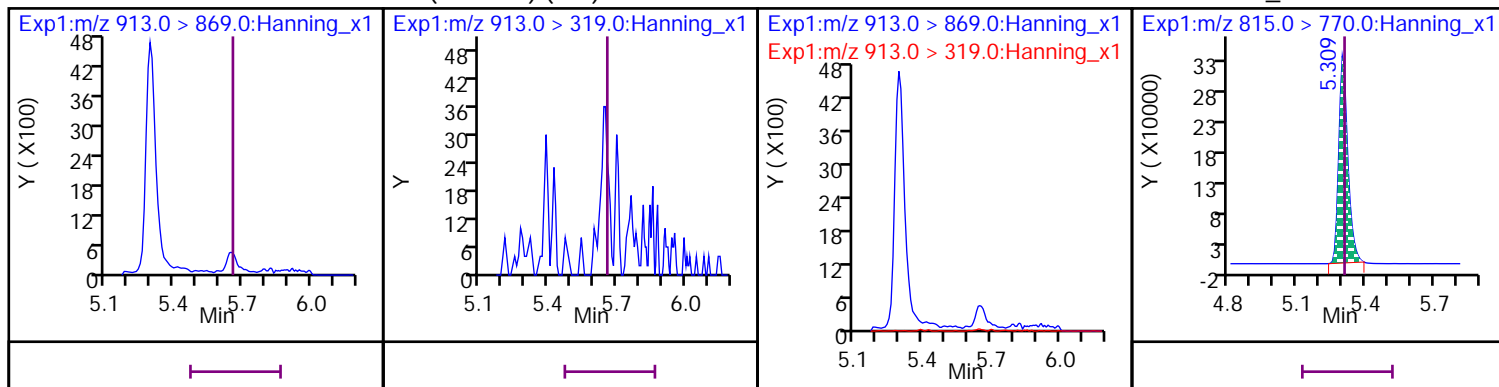
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

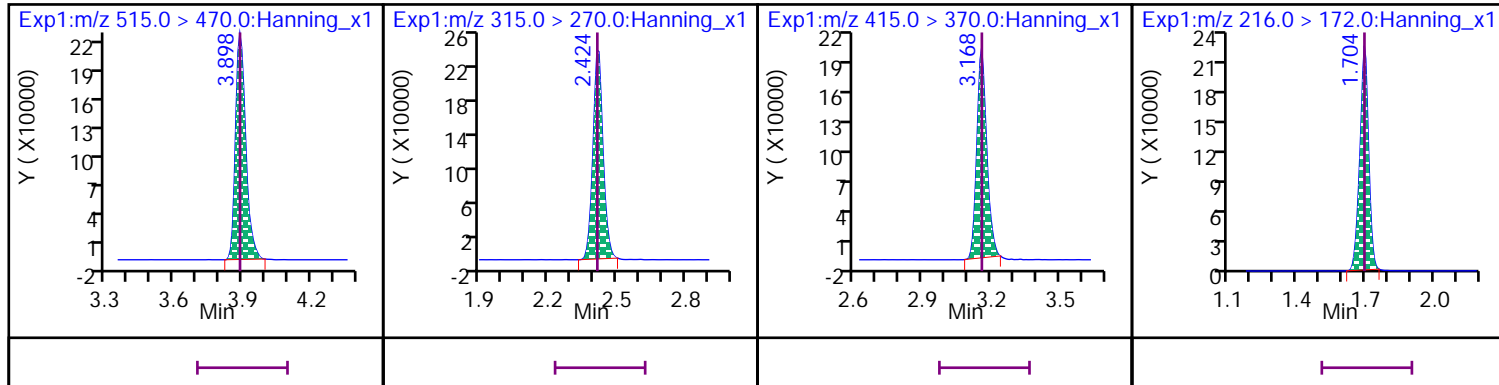


\* 37 13C2\_PFDA

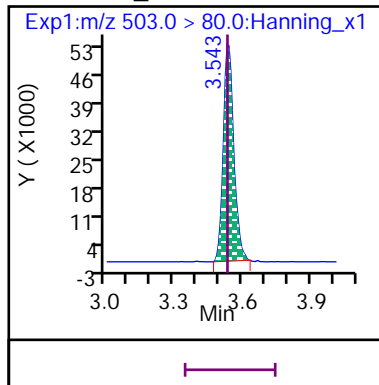
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS





Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720007.d  
Injection Date: 27-Dec-2020 10:40:20 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 97  
Lab Sample ID: ID IBLK A Lab Prep. Batch:  
Sample Info: ID IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA</b>													
217 > 172		1.692	1.698	0	605864	25	>100:1			1001.00	873.57	95	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>													U
212.9 > 168.9	46	1.698			ND								
<b>D 50 13C5_PFPeA</b>													
267.9 > 223		2.067	2.077	0	625695	19	>100:1			1001.00	909.59	95	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>													U
262.9 > 218.9	50	2.077			ND								
<b>D 44 13C3_PFBs</b>													
302 > 80		2.130	2.130	1	228593	17	>100:1			1001.00	992.89	95.3	
<b>7 Perfluoro-1-butanesulfonic acid (PFBs)</b>													U
298.9 > 80	44	2.130			ND								
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS)</b>													U
349 > 80	44	2.451			ND								
<b>D 63 13C2_4:2 FTS_2</b>													
329 > 81		2.380	2.380	1	124791	19	>100:1			5005.00	5154.88	90.8	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)</b>													U
327 > 307	63	2.380			ND								
<b>D 49 13C5_PFHxA</b>													
318 > 273		2.416	2.415	1	698885	19	>100:1			1001.00	948.19	97.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>													U
313 > 269	49	2.415			ND								
<b>D 66 13C3_GenX</b>													
287 > 185		2.523	2.522	1	1323689	21	>100:1			5005.00	4969.66	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>													U
285 > 119	66	2.522			ND								
<b>D 47 13C4_PFHpA</b>													
367 > 322		2.764	2.773	0	576566	20	>100:1			1001.00	950.41	98.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>													U
363 > 319	47	2.773			ND								
<b>D 45 13C3_PFHxS</b>													
402 > 80		2.782	2.782	1	165376	20	>100:1			1001.00	965.82	92.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>													U
399 > 80	45	2.782			ND								
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)</b>													U
377 > 251	45	2.809			ND								
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS)</b>													U
449 > 80	45	3.142			ND								
<b>D 64 13C2_6:2 FTS_2</b>													
429 > 81		3.115	3.108	1	93619	26	>100:1			5005.00	4861.20	83.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)</b>													U
427 > 407	64	3.115			ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA</b> CAS: SESI-0097													
421 > 376		3.135	3.135	1	578588	26	>100:1			1001.00	977.57	97.7	
<b>20 Perfluoro-n-octanoic acid (PFOA)</b> CAS: 335-67-1													U
413 > 369	53		3.135		ND								
<b>D 54 13C8_PFOS</b> CAS: SESI-0098													
507 > 80		3.507	3.507	0	143301	23				1001.00	955.79	91.1	
<b>18 Perfluorooctanesulfonic acid (PFOS)</b> CAS: 1763-23-1													U
499 > 80	54		3.500		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)</b> CAS: 756426-58-1													U
531 > 351	54		3.716		ND								
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS)</b> CAS: 68259-12-1													U
549 > 80	54		3.858		ND								
<b>9 Perfluoro-1-decanesulfonic acid (PFDS)</b> CAS: 335-77-3													U
599 > 80	54		4.153		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)</b> CAS: 763051-92-9													U
631 > 451	54		4.318		ND								
<b>34 Perfluorododecanesulfonic acid (PFDOS)</b> CAS: 79780-39-5													U
699 > 80	54		4.648		ND								
<b>D 56 13C9_PFNA</b> CAS: SESI-0099													
472 > 427		3.514	3.515	0	716278	23	>100:1			1001.00	953.81	94.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA)</b> CAS: 375-95-1													U
463 > 419	56		3.515		ND								
<b>D 55 13C8_PFOSA</b> CAS: SESI-0107													
506 > 78		3.850	3.850	0	297808	20	>100:1			1001.00	962.02	95.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA)</b> CAS: 754-91-6													U
498 > 78	55		3.858		ND								
<b>D 65 13C2_8:2 FTS_2</b> CAS: SESI-0106													
529 > 81		3.850	3.850	0	87942	20	>100:1			5005.00	4740.77	99.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)</b> CAS: 39108-34-4													U
527 > 507	65		3.850		ND								
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS)</b> CAS: 120226-60-0													U
627 > 607	65		4.447		ND								
<b>D 51 13C6_PFDA</b> CAS: SESI-0115													
519 > 474		3.866	3.858	1	631417	21	>100:1			1001.00	951.89	99.2	
<b>10 Perfluoro-n-decanoic acid (PFDA)</b> CAS: 335-76-2													U
513 > 469	51		3.866		ND								
<b>D 58 d3-MeFOSAA</b> CAS: SESI-0102													
573 > 419		4.019	4.019	0	711411	19	>100:1			5005.00	4956.21	98.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)</b> CAS: 2355-31-9													U
570 > 419	58		4.019		ND								
<b>D 60 d5-EtFOSAA</b> CAS: SESI-0110													
589 > 419		4.171	4.171	0	658251	18	>100:1			5005.00	4956.16	95.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)</b> CAS: 2991-50-6													U
584 > 419	60		4.180		ND								
<b>D 52 13C7_PFUdA</b> CAS: SESI-0117													
570 > 525		4.171	4.171	0	565462	18	>100:1			1001.00	894.61	90.3	
<b>25 Perfluoro-n-undecanoic acid (PFUdA)</b> CAS: 2058-94-8													U
563 > 519	52		4.171		ND								
<b>D 61 d7-MeFOSE</b> CAS: SESI-0129													
623 > 59		4.298	4.298	0	106908	17	>100:1			1001.00	987.99	93	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)</b> CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
<b>D 57 d3-MeFOSA</b> CAS: SESI-0109													
515 > 169		4.318	4.318	0	54611	16	>100:1			1001.00	1032.01	114	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)</b> CAS: 31506-32-8													U
512 > 169	57		4.318		ND								
<b>D 62 d9-EtFOSE</b> CAS: SESI-0130													
639 > 59		4.465	4.465	0	118698	18	>100:1			1001.00	946.59	96.9	

Data File: \\ORGANIS\ILL\LCMSMS02.1\122720-DOD.b\122720007.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62	4.474			ND								
<b>D 38 13C2_PFDa CAS: SESI-0118</b>													
615 > 570		4.438	4.438	0	589196	18	>100:1			1001.00	973.37	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38	4.438			ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38	4.673			ND								
<b>D 59 d5-EtFOA CAS: SESI-0108</b>													
531 > 169		4.474	4.483	0	54720	17	>100:1			1001.00	1114.59	115	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOA) CAS: 4151-50-2</b>													U
526 > 169	59	4.492			ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.890	4.890	0	775906	18	>100:1			1001.00	921.02	93.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42	4.890			ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.266	5.258	1	822985	19	>100:1			1001.00	908.21	95.1	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.266	5.266	0/-1	5493	20	24:1	Target = 11.43		10.225	10.225		
813 > 269	40	5.258	5.266		338	11	22:1	16.25 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													U
913 > 869	40	5.591			ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.858	1	678801	20	>100:1					100	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	714468	20	>100:1					99	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	1	609926	25	>100:1					101	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.698	0	612126	24	>100:1					101	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.507	1	164825	22	>100:1					101	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720007.d

Injection Date: 27-Dec-2020 10:40:20

Inst. ID: LCMSMS02

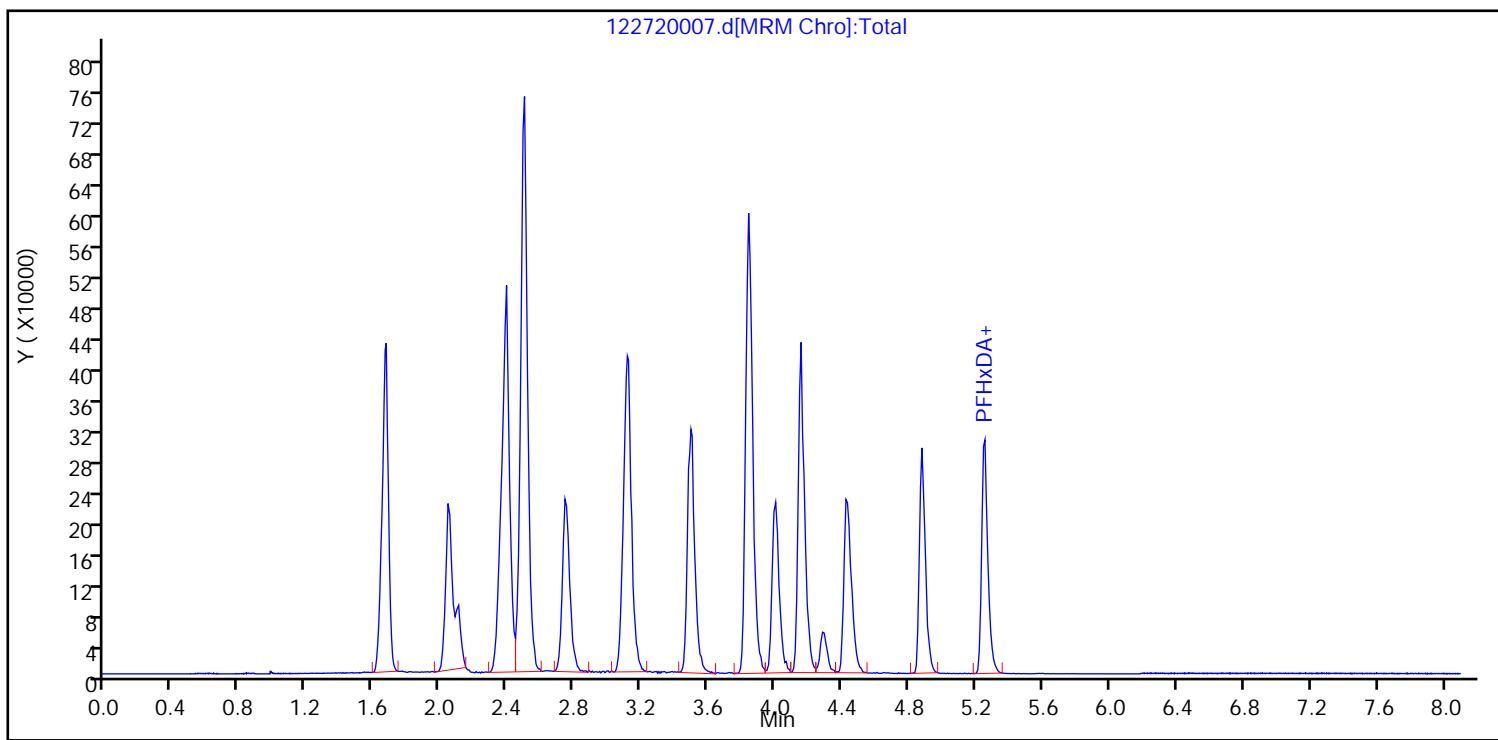
Client ID:

Lab ID: ID IBLK A

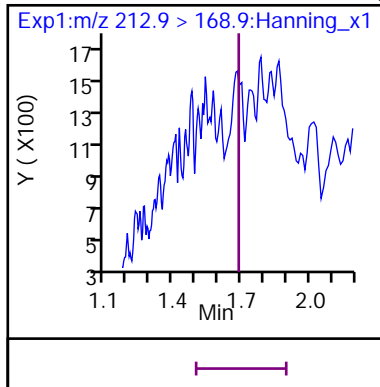
Sample Info: ID IBLK A

Dil. Factor: 1

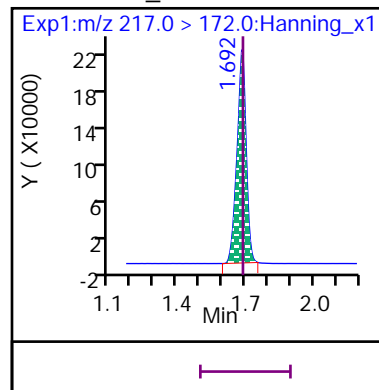
Operator: Matthew M. Miller



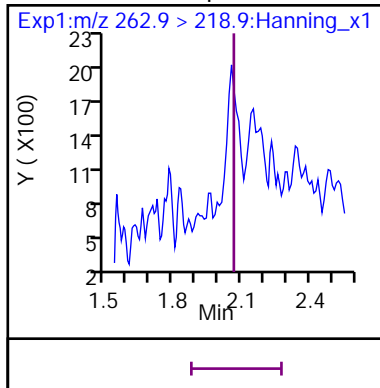
8 Perfluoro-n-butanoic acid (PFBA) (ND)



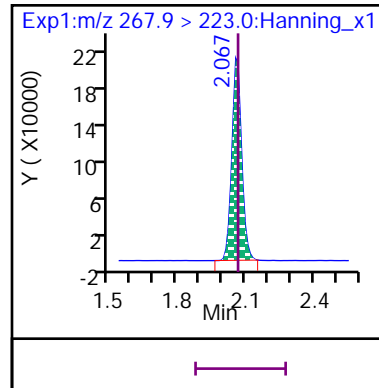
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

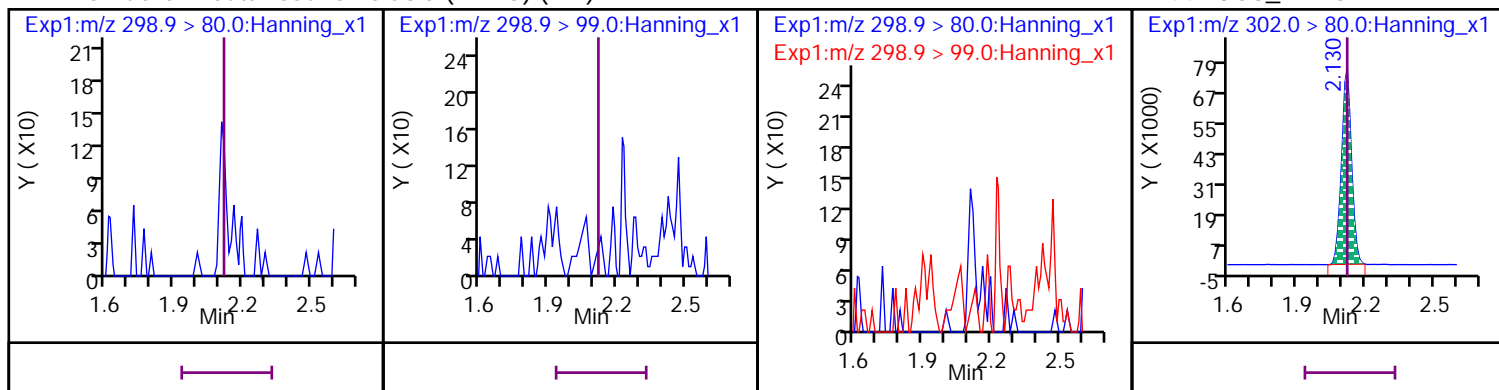


D 50 13C5\_PFPeA



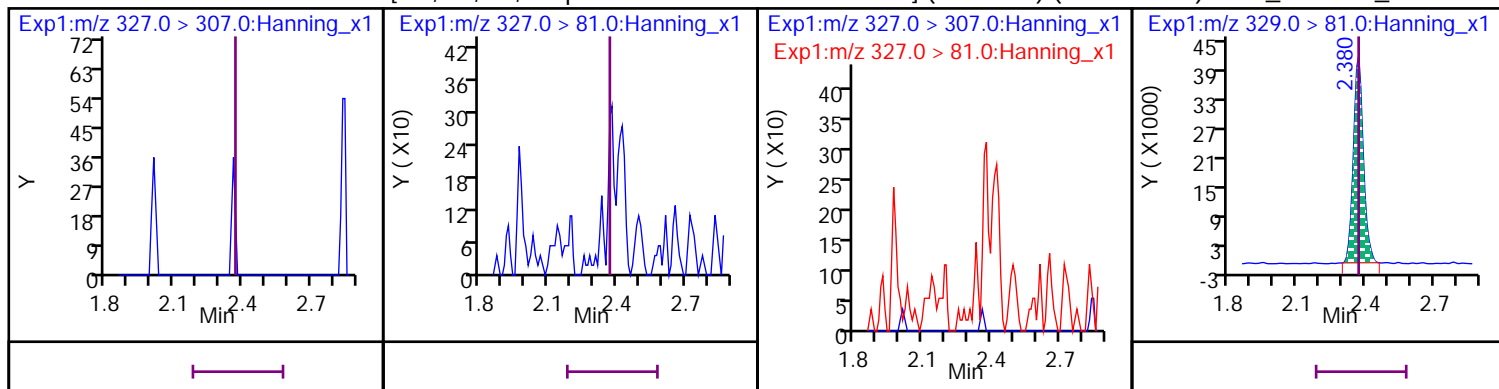
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



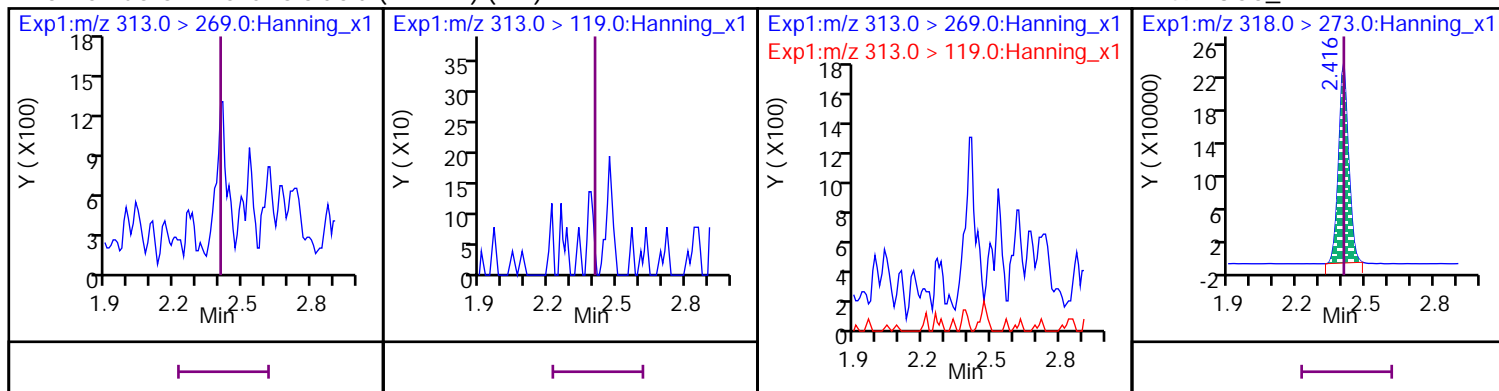
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (Marked ND)

D 44 13C2\_4:2 FTS\_2



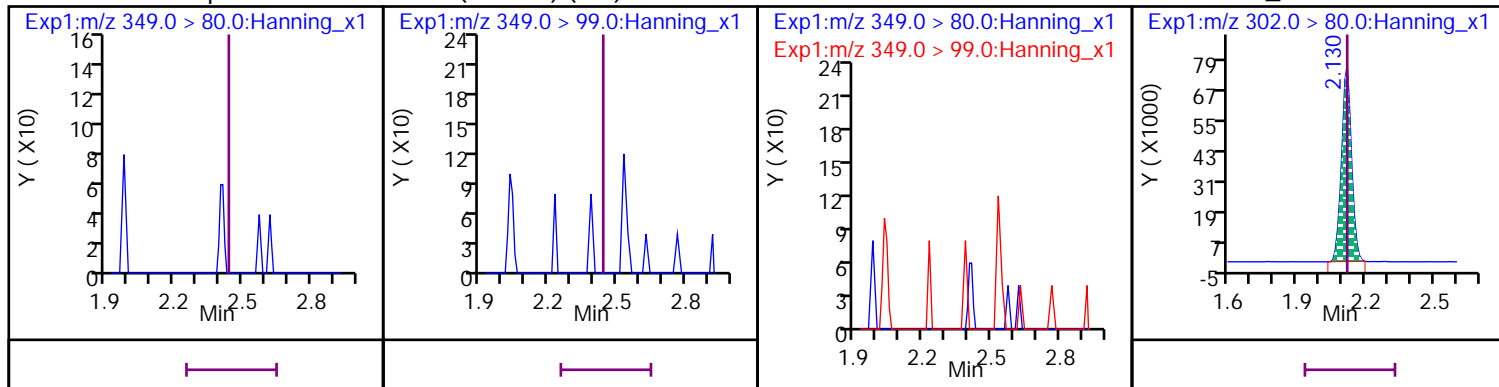
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



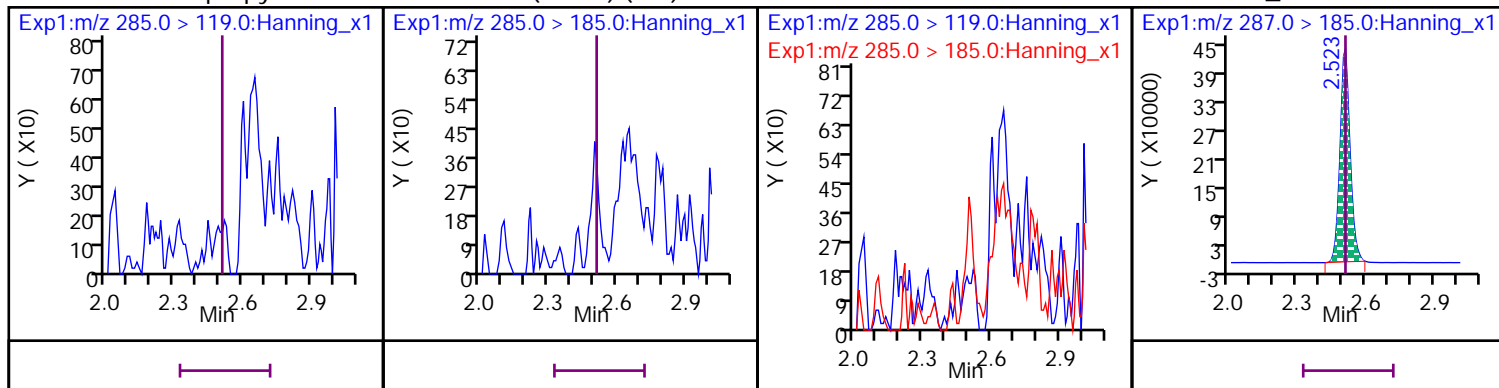
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

D 44 13C3\_PFBS



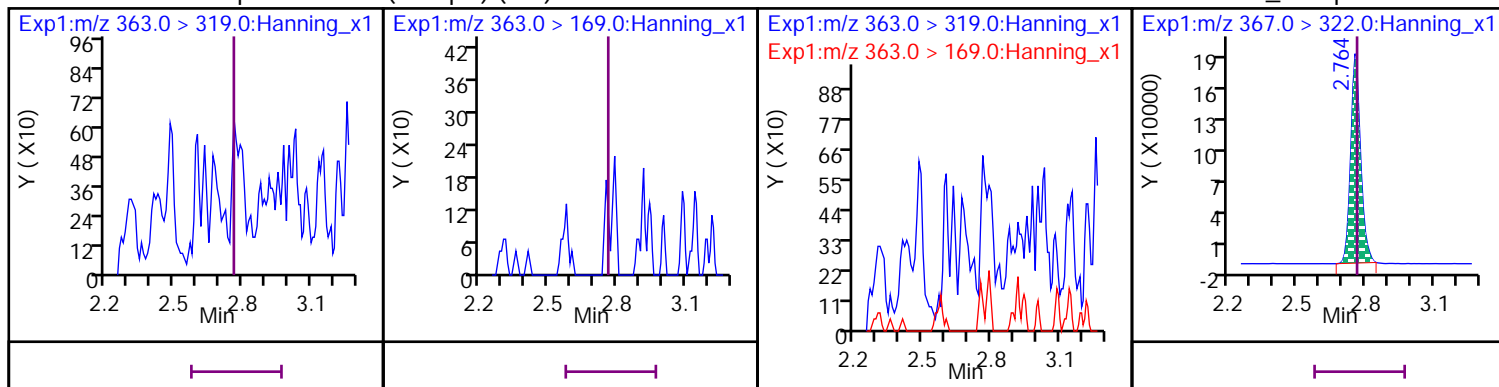
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



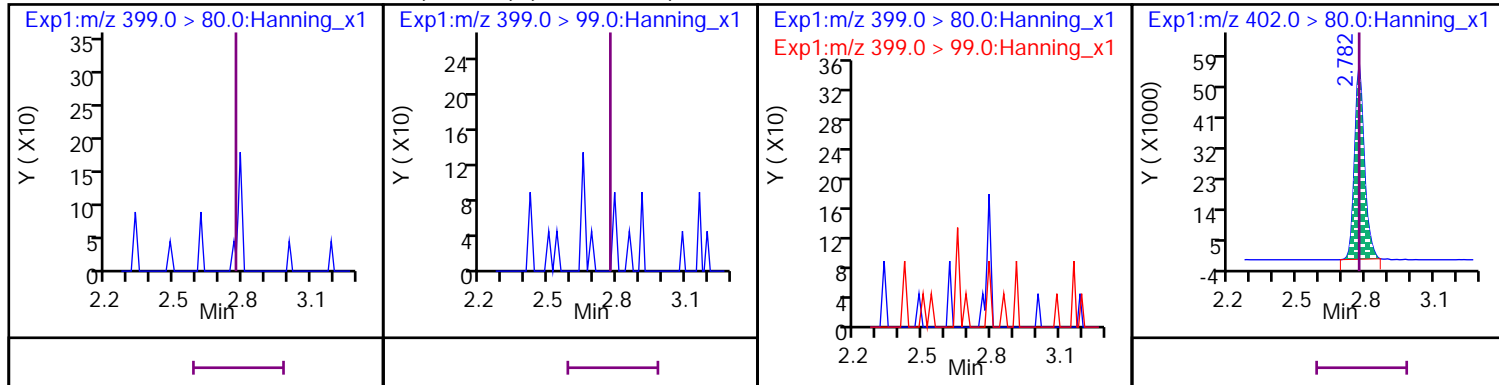
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



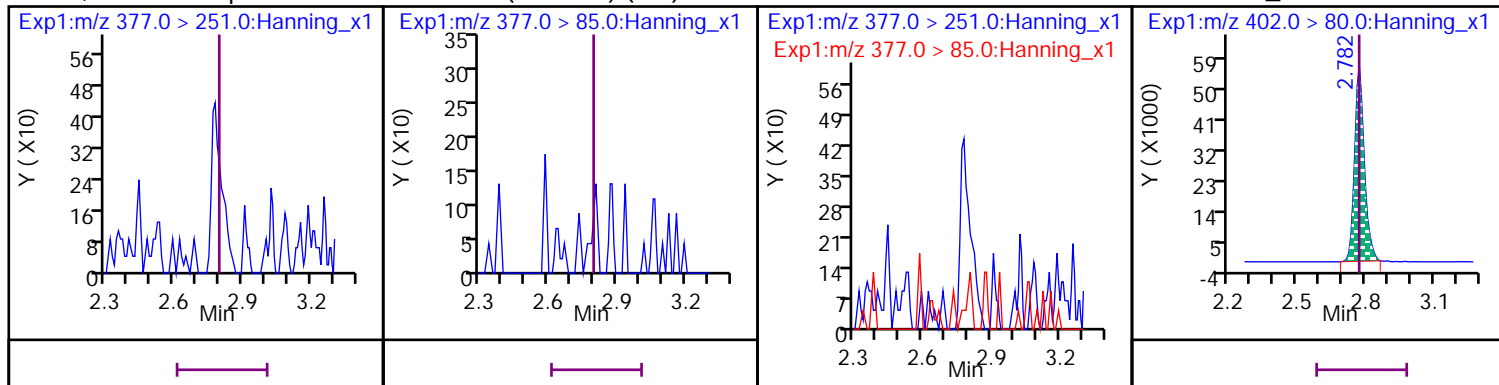
## 14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS

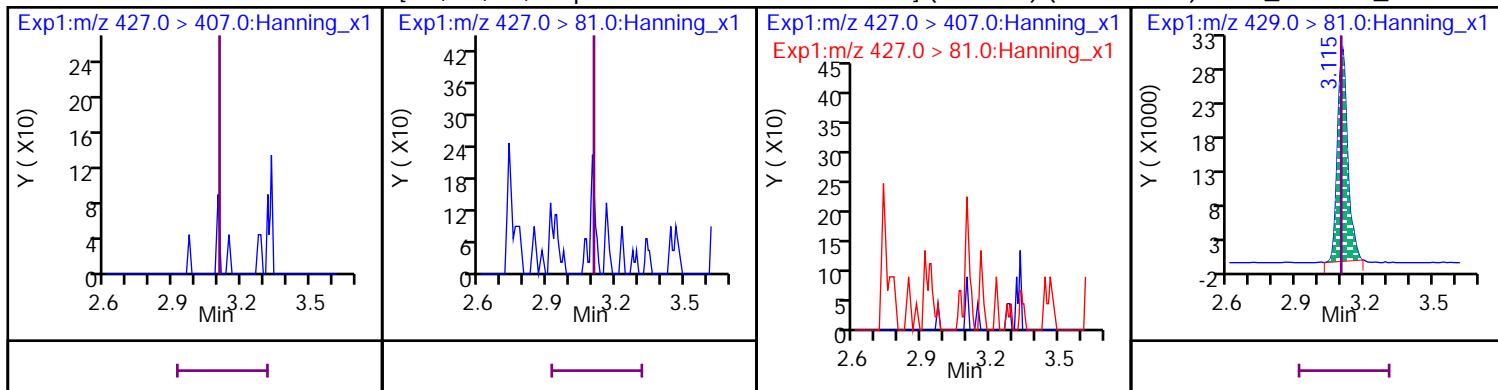


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS

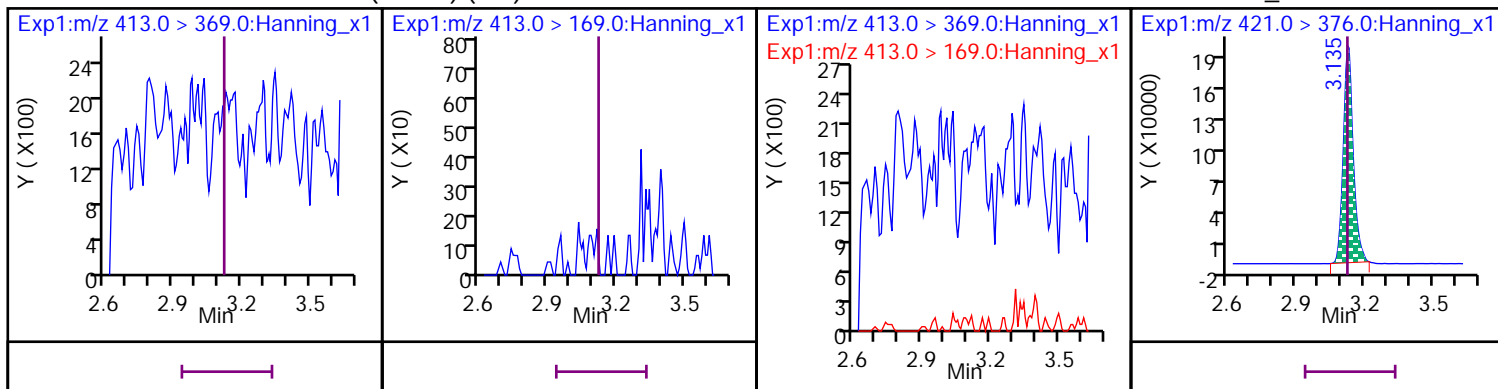


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (Marked) D 13C2\_6:2 FTS\_2



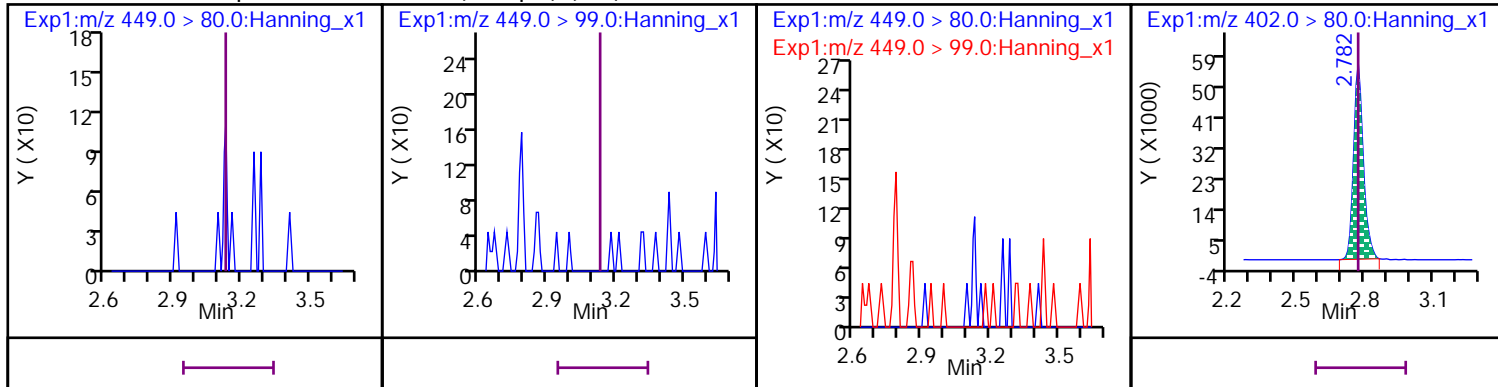
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



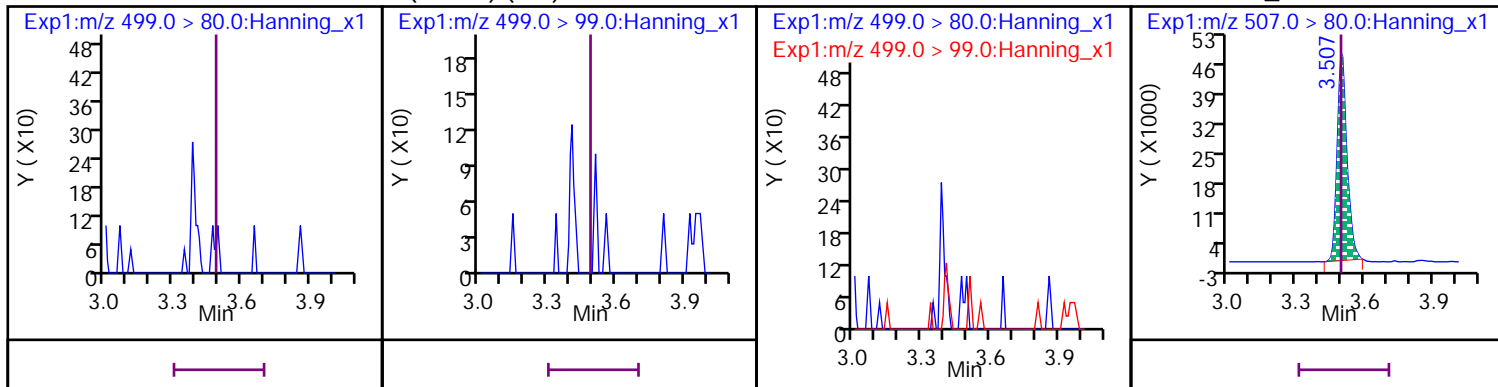
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



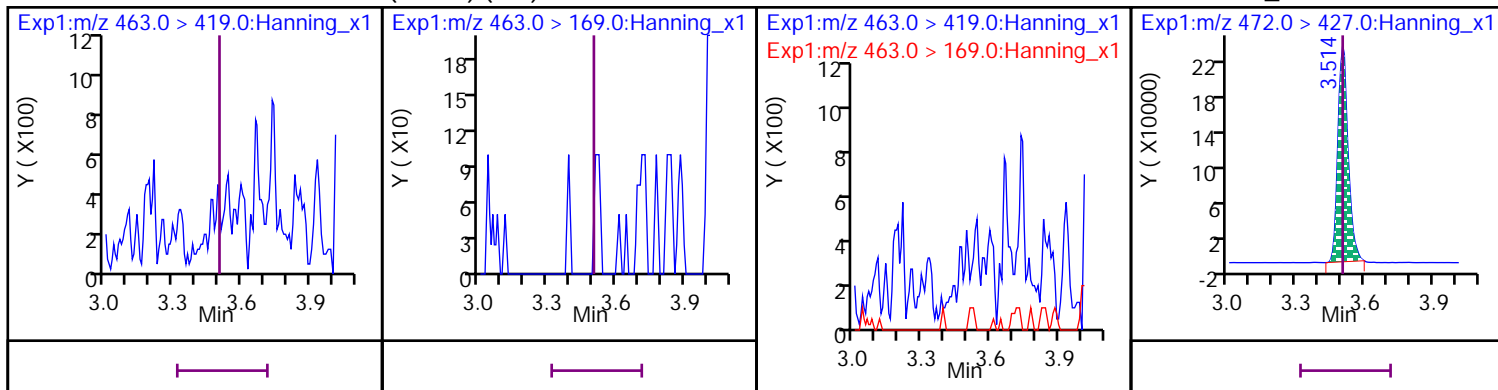
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



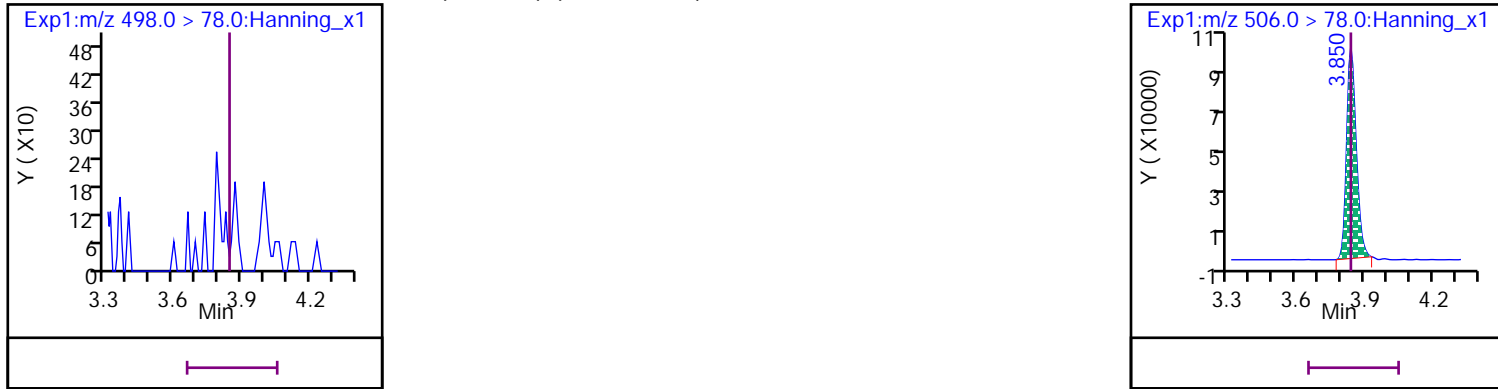
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



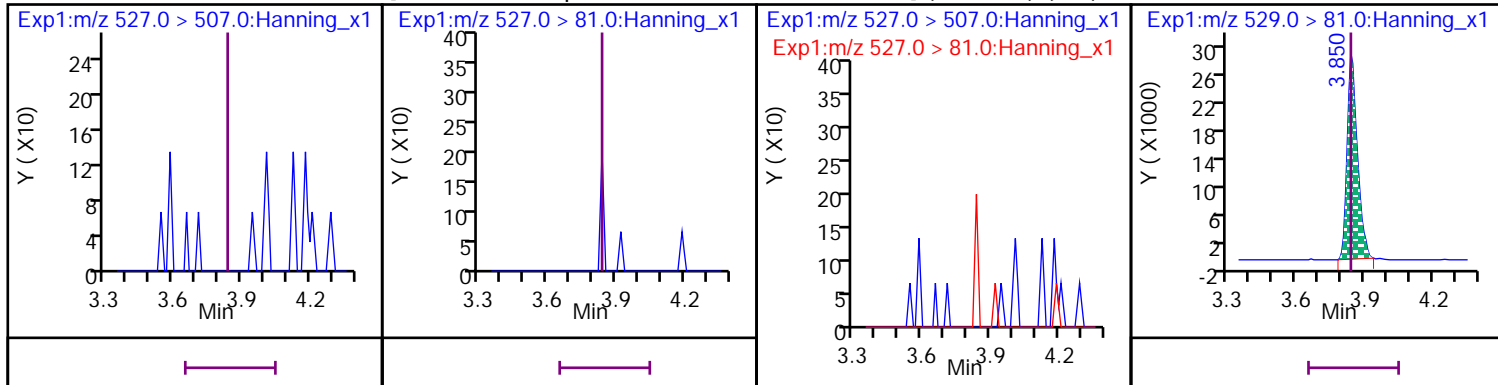
19 Perfluoro-1-octanesulfonamide (PFOSA) (Marked ND)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

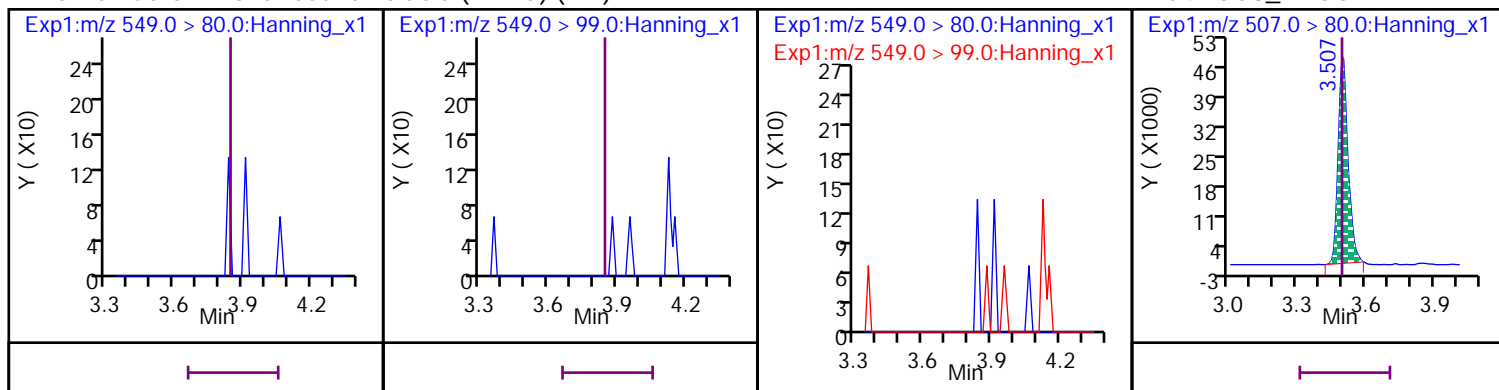
D 65 13C2\_8:2 FTS\_2





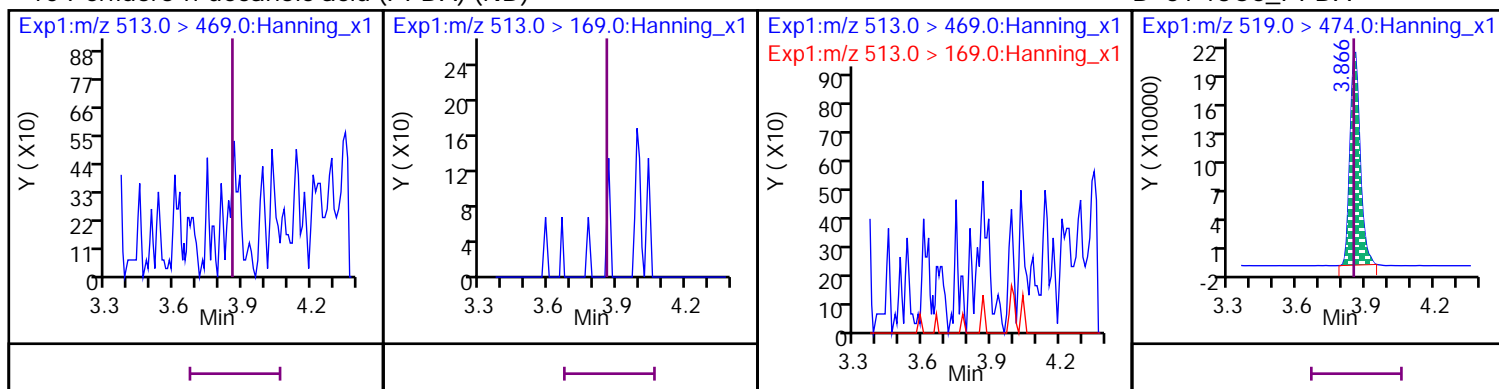
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



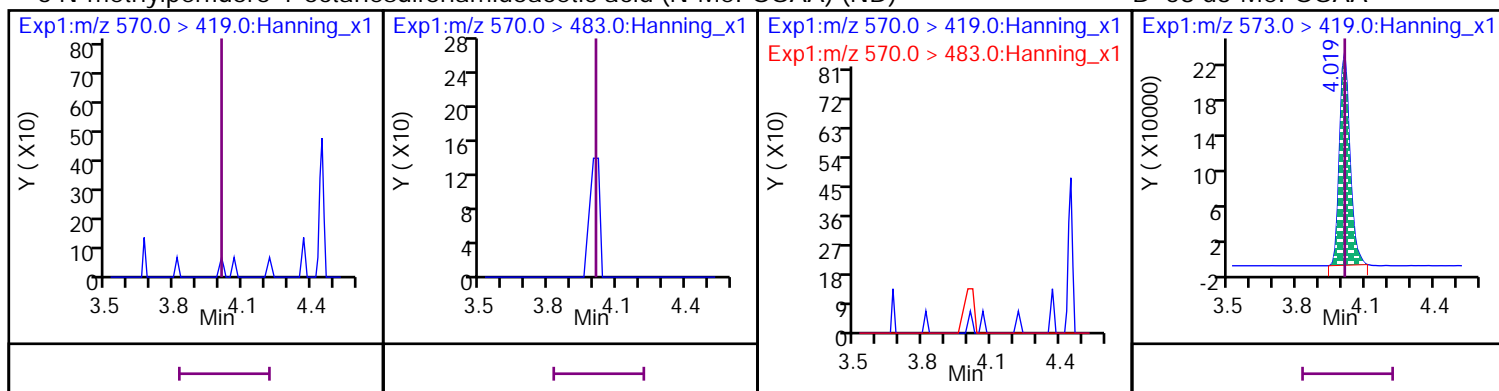
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



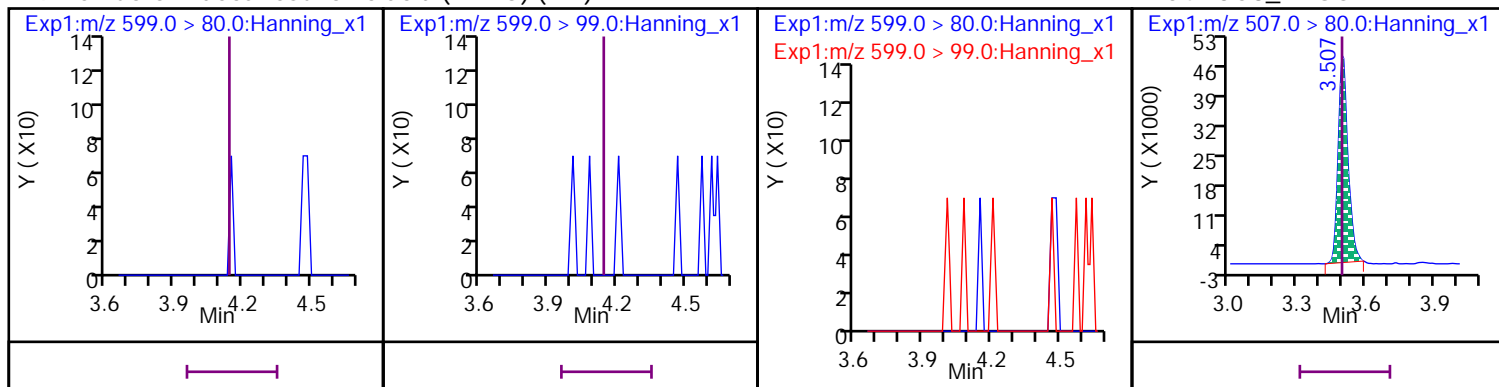
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



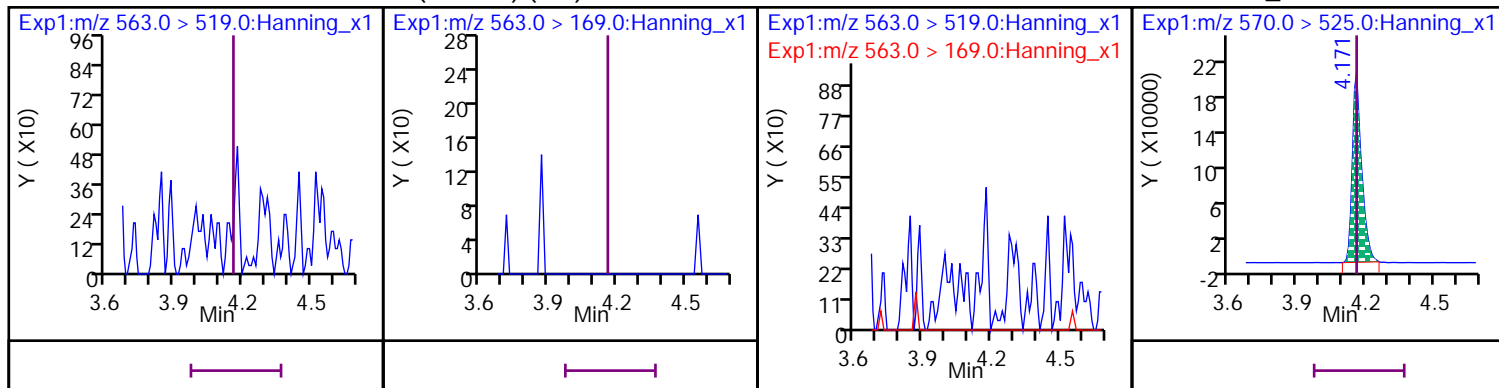
9 Perfluoro-1-decanesulfonic acid (PFDS) (ND)

D 54 13C8\_PFOS



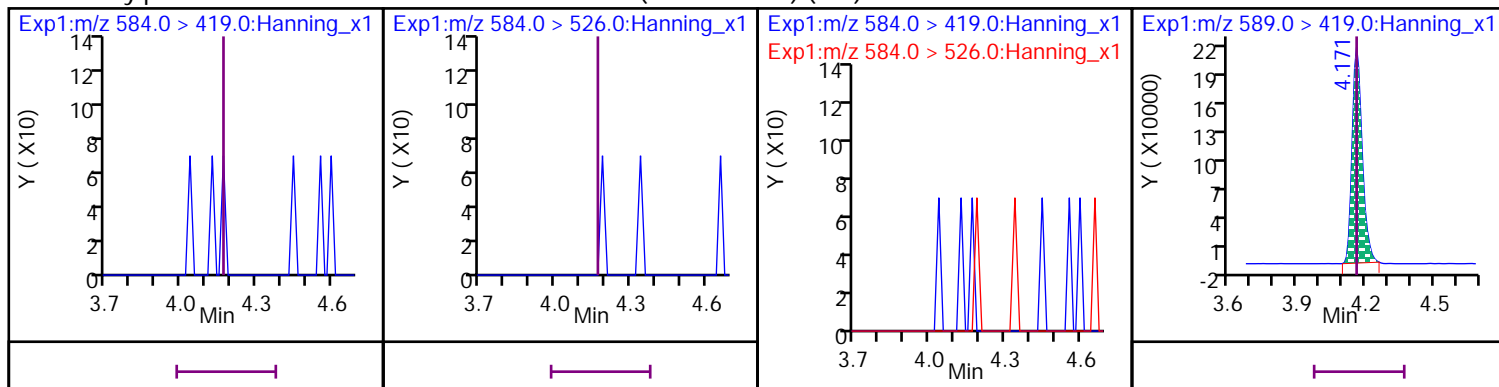
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



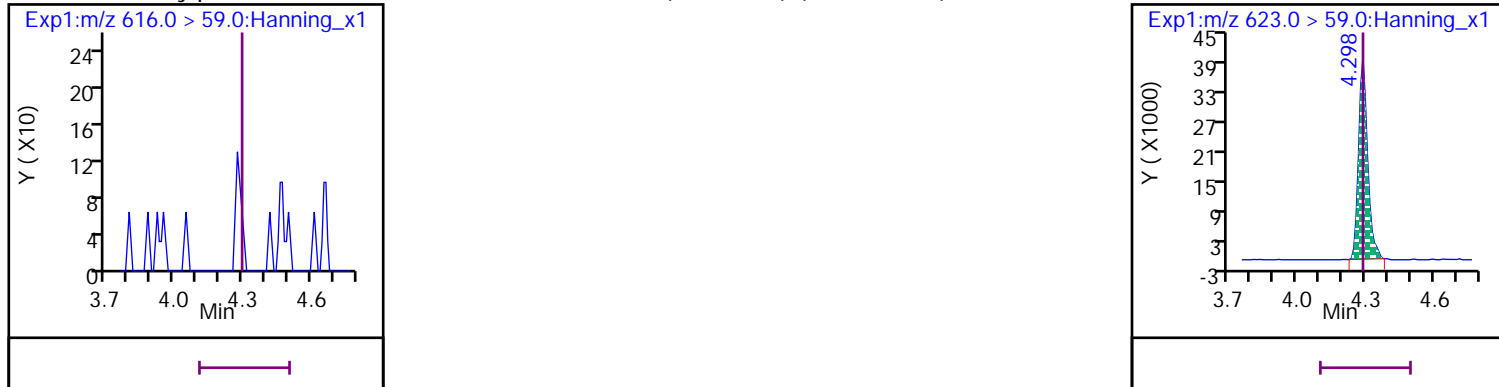
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



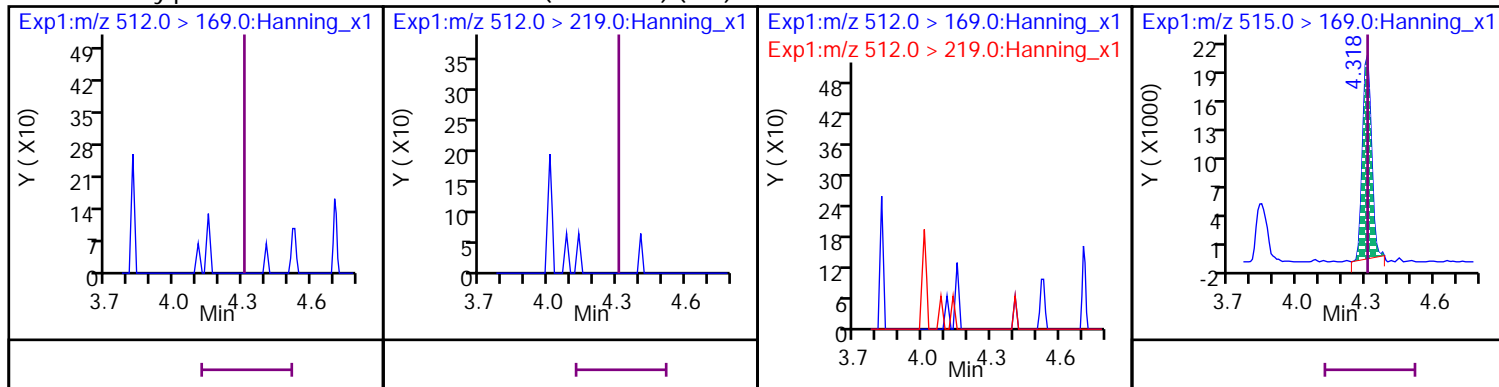
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

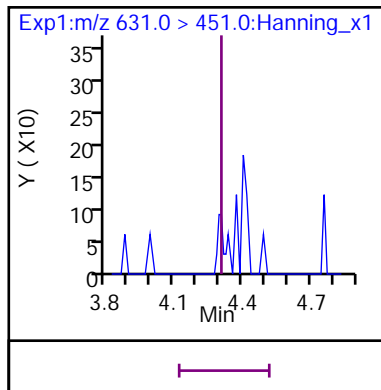


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (ND)

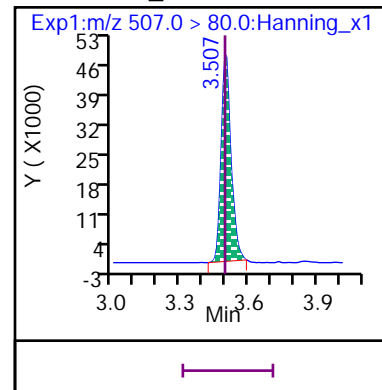
D 57 d3-MeFOSA



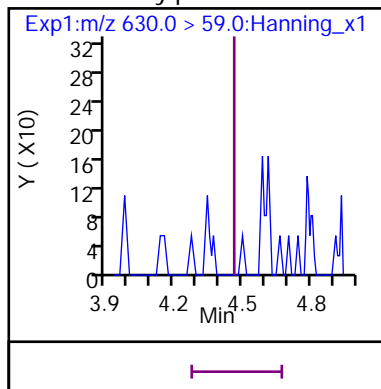
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



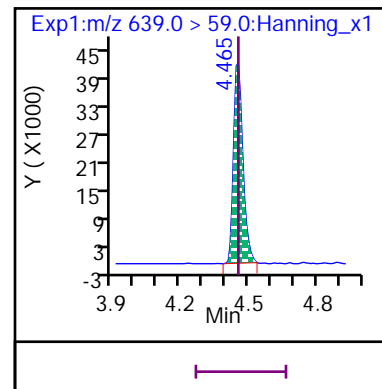
D 54 13C8\_PFOS



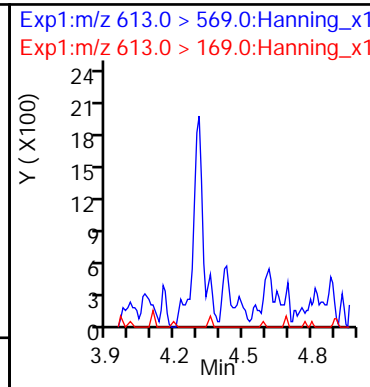
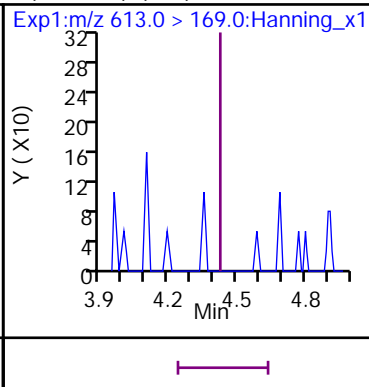
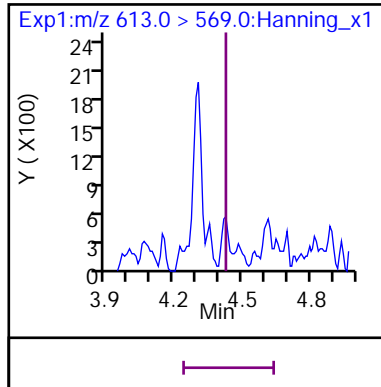
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (ND)



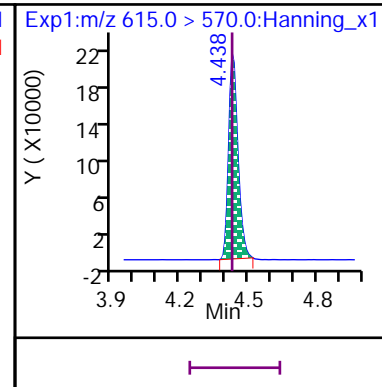
D 62 d9-EtFOSE



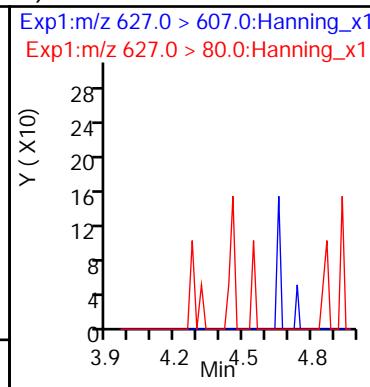
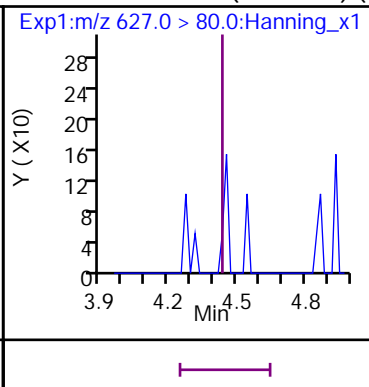
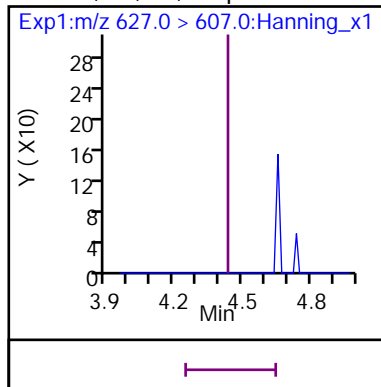
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



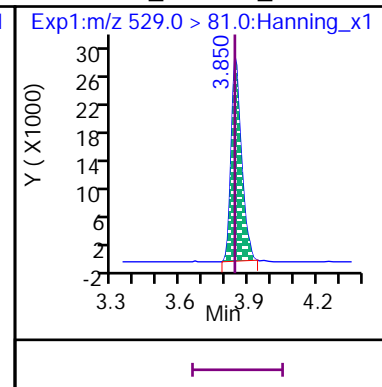
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

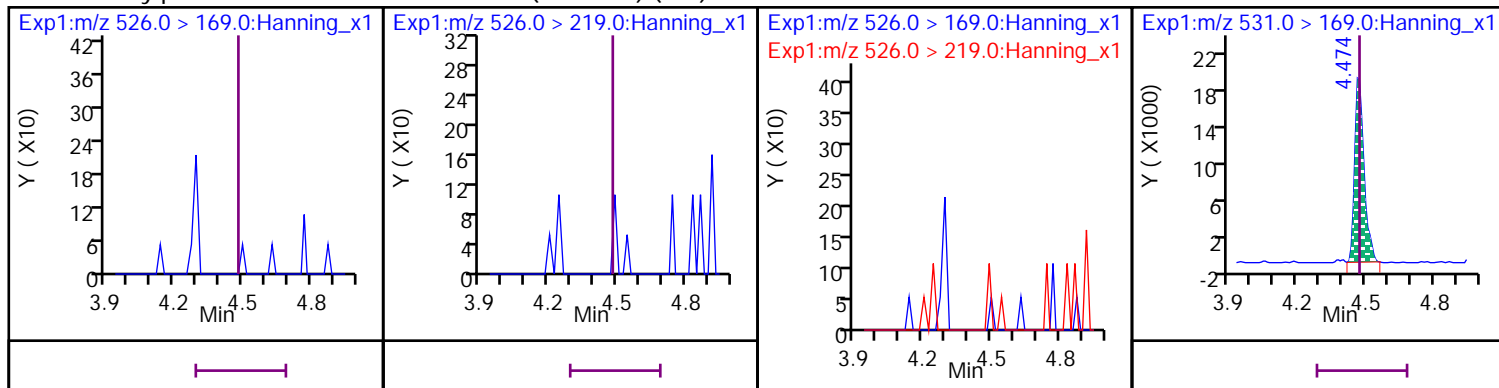


D 65 13C2\_8:2 FTS\_2



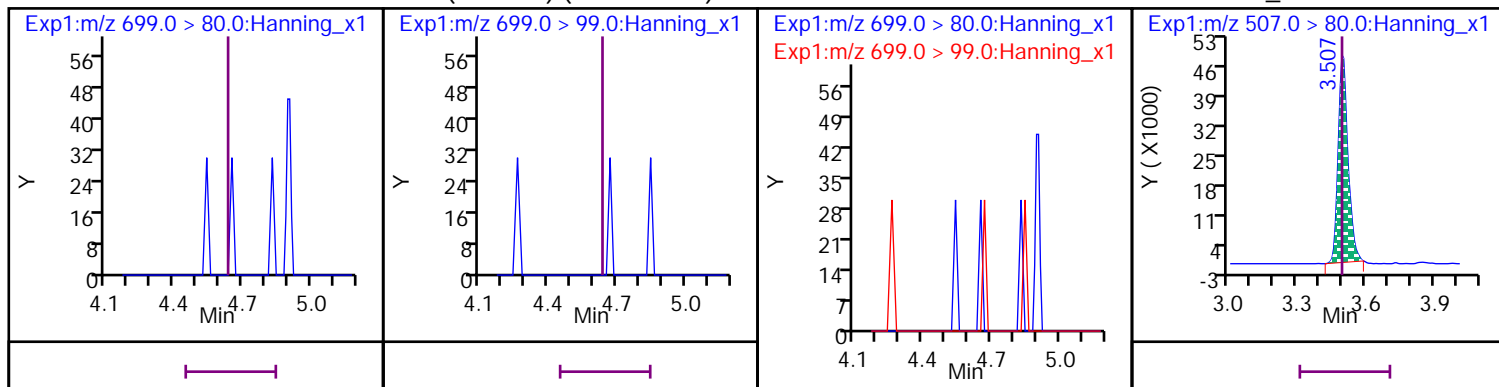
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (ND)

## D 59 d5-EtFOSA



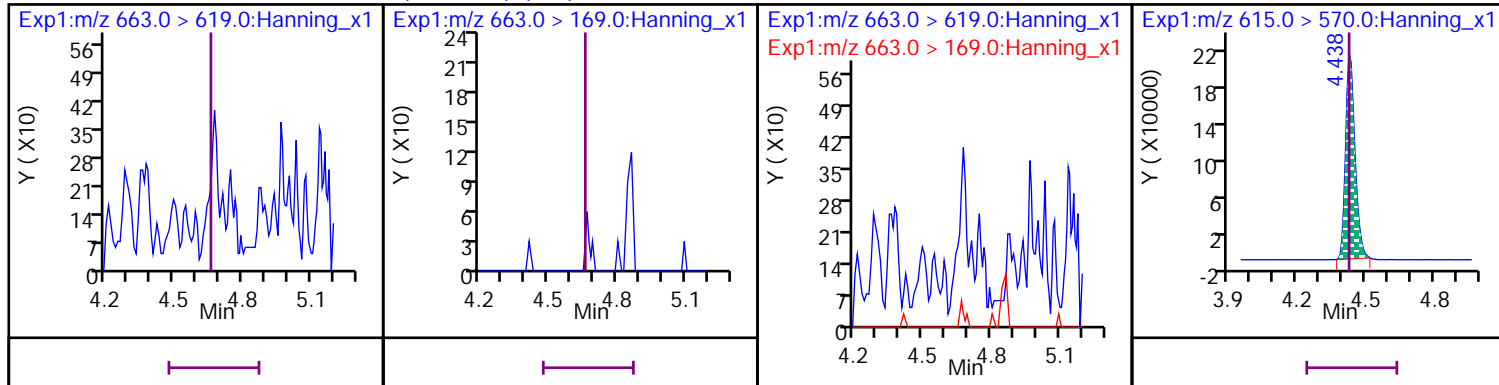
## 34 Perfluorododecanesulfonic acid (PFDOS) (Marked ND)

## D 54 13C8\_PFOS



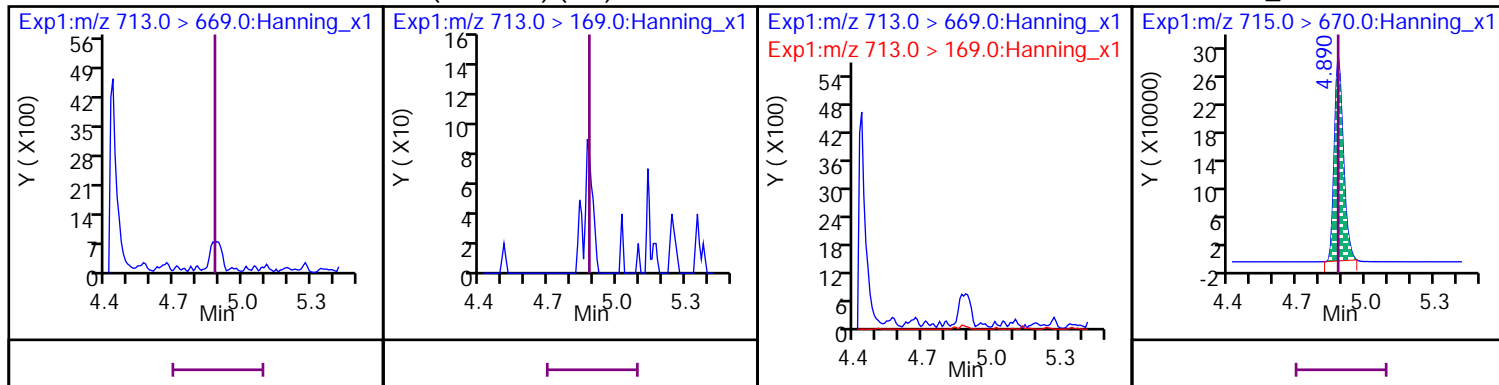
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

## D 38 13C2\_PFDaA



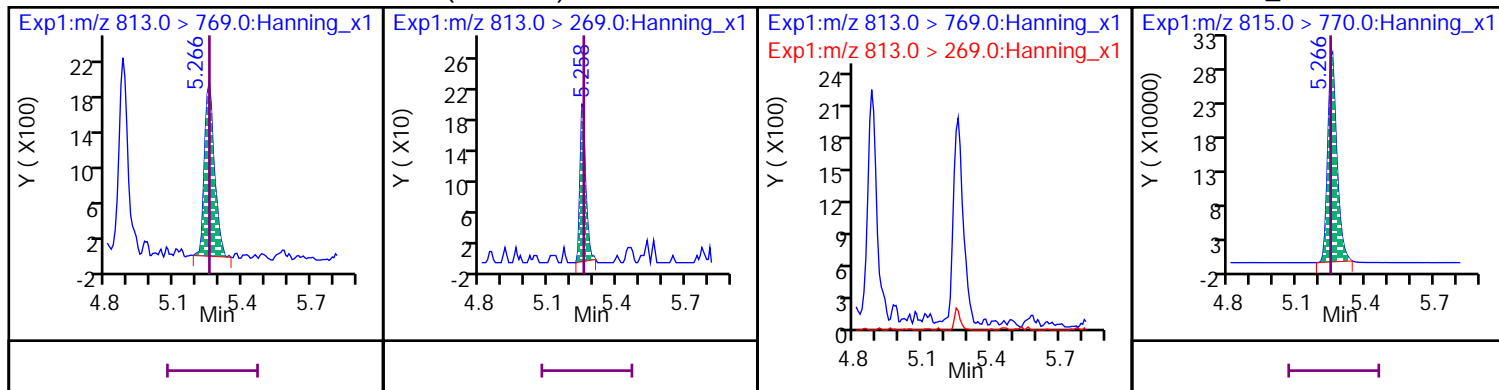
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

## D 42 13C2\_PFTeDA



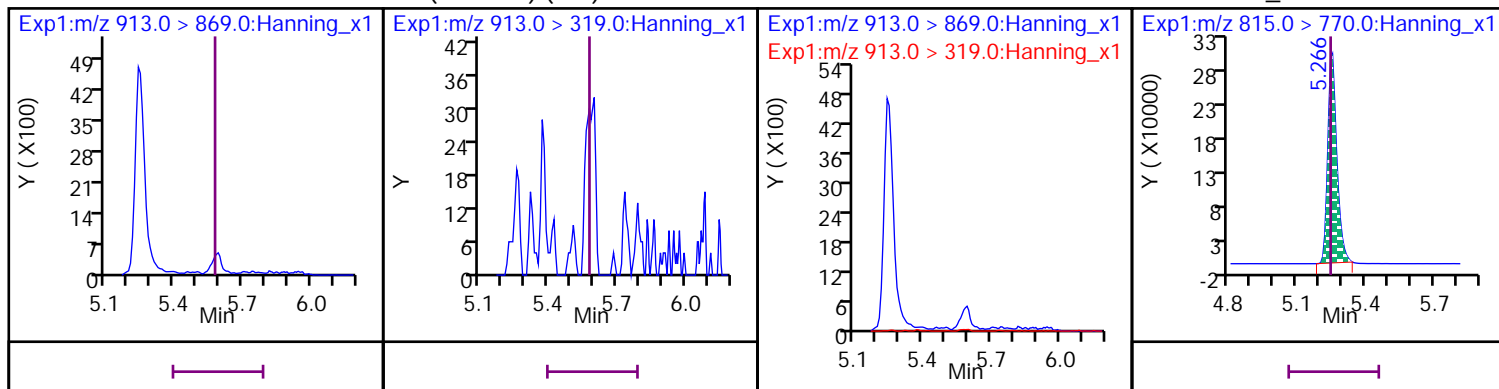
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

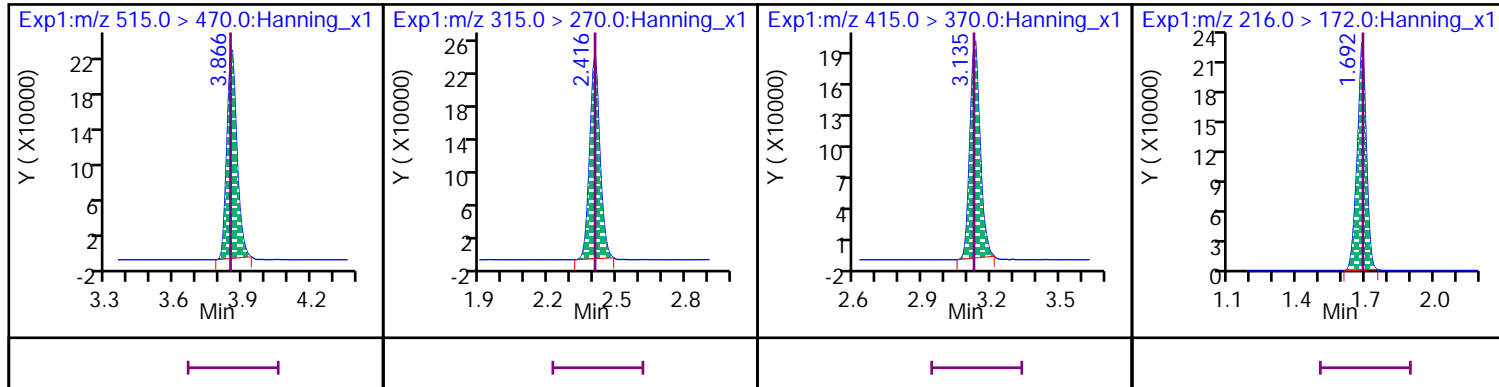


\* 37 13C2\_PFDA

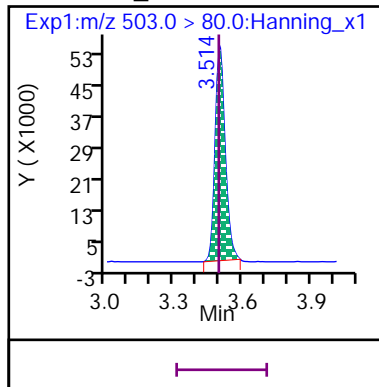
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820007.d  
Injection Date: 28-Dec-2020 10:17:01 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 97  
Lab Sample ID: ID IBLK A Lab Prep. Batch:  
Sample Info: ID IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA</b>													
217 > 172		1.699	1.696	1	623573	24	>100:1			1001.00	899.10	96	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>													U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>													
267.9 > 223		2.067	2.072	0	662325	17	>100:1			1001.00	962.84	99.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>													U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBs</b>													
302 > 80		2.130	2.125	1	225478	17	>100:1			1001.00	979.36	94.7	
<b>7 Perfluoro-1-butanesulfonic acid (PFBs)</b>													U
298.9 > 80	44		2.125		ND								
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS)</b>													U
349 > 80	44		2.450		ND								
<b>D 63 13C2_4:2 FTS_2</b>													
329 > 81		2.380	2.379	1	126304	20	>100:1			5005.00	5217.38	87.7	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)</b>													U
327 > 307	63		2.388		ND								
<b>D 49 13C5_PFHxA</b>													
318 > 273		2.416	2.423	0	728345	19	>100:1			1001.00	988.16	98	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>													U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>													
287 > 185		2.523	2.530	0	1381088	20	>100:1			5005.00	5185.16	98.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>													U
285 > 119	66		2.530		ND								
<b>D 47 13C4_PFHpA</b>													
367 > 322		2.773	2.772	1	580067	20	>100:1			1001.00	956.19	91.5	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>													U
363 > 319	47		2.772		ND								
<b>D 45 13C3_PFHxS</b>													
402 > 80		2.782	2.790	0	164128	21	>100:1			1001.00	958.53	94.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>													U
399 > 80	45		2.790		ND								
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)</b>													U
377 > 251	45		2.808		ND								
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS)</b>													U
449 > 80	45		3.154		ND								
<b>D 64 13C2_6:2 FTS_2</b>													
429 > 81		3.122	3.114	1	95819	24	>100:1			5005.00	4975.44	91.8	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)</b>													U
427 > 407	64		3.128		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	550452	24	>100:1			1001.00	930.03	87.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.148		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	155665	22	>100:1			1001.00	1038.26	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.520		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.722		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54		3.865		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54		4.169		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54		4.317		ND								U
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54		4.663		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.514	3.520	0	716227	23	>100:1			1001.00	953.74	93.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.520		ND								U
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.842	3.849	0	304692	20	>100:1			1001.00	984.26	98.7	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55		3.841		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	90194	21				5005.00	4862.17	89.8	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.873		ND								U
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65		4.455		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	630115	20	>100:1			1001.00	949.92	93.6	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.873		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.029	0	772875	19	>100:1			5005.00	5384.41	97.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.029		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	700086	19	>100:1			5005.00	5271.15	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.187		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	589472	18	>100:1			1001.00	932.60	91.6	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.178		ND								U
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.287	1	102472	17	>100:1			1001.00	946.99	97.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61		4.297		ND								U
<b>D 57 d3-MeFOA CAS: SESI-0109</b>													
515 > 169		4.308	4.307	1	51560	15	>100:1			1001.00	974.36	99.5	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOA) CAS: 31506-32-8</b>													
512 > 169	57		4.317		ND								U
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	130023	18	>100:1			1001.00	1036.90	94.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62		4.464		ND								
<b>D 38 13C2_PFDa CAS: SESI-0118</b>													
615 > 570		4.447	4.455	0	604373	19	>100:1			1001.00	998.44	98.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	52678	19	>100:1			1001.00	1072.99	105	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													U
526 > 169	59		4.482		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	779886	19	>100:1			1001.00	925.74	95.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	864210	19	>100:1			1001.00	953.70	92.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	6105	15	32:1	Target = 11.43		10.823	10.823		
813 > 269	40	5.275	5.282		535	18	21:1	11.41 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													U
913 > 869	40		5.625		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	710000	19	>100:1					97	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	733845	18	>100:1					100	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	630788	25	>100:1					105	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	627476	24	>100:1					103	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	174703	22	>100:1					107	

**Compound Type Legend**

D - Isotopic Dilution Std.

\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit



Pace Environmental Services, LLC

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820007.d

Injection Date: 28-Dec-2020 10:17:01

Inst. ID: LCMSMS02

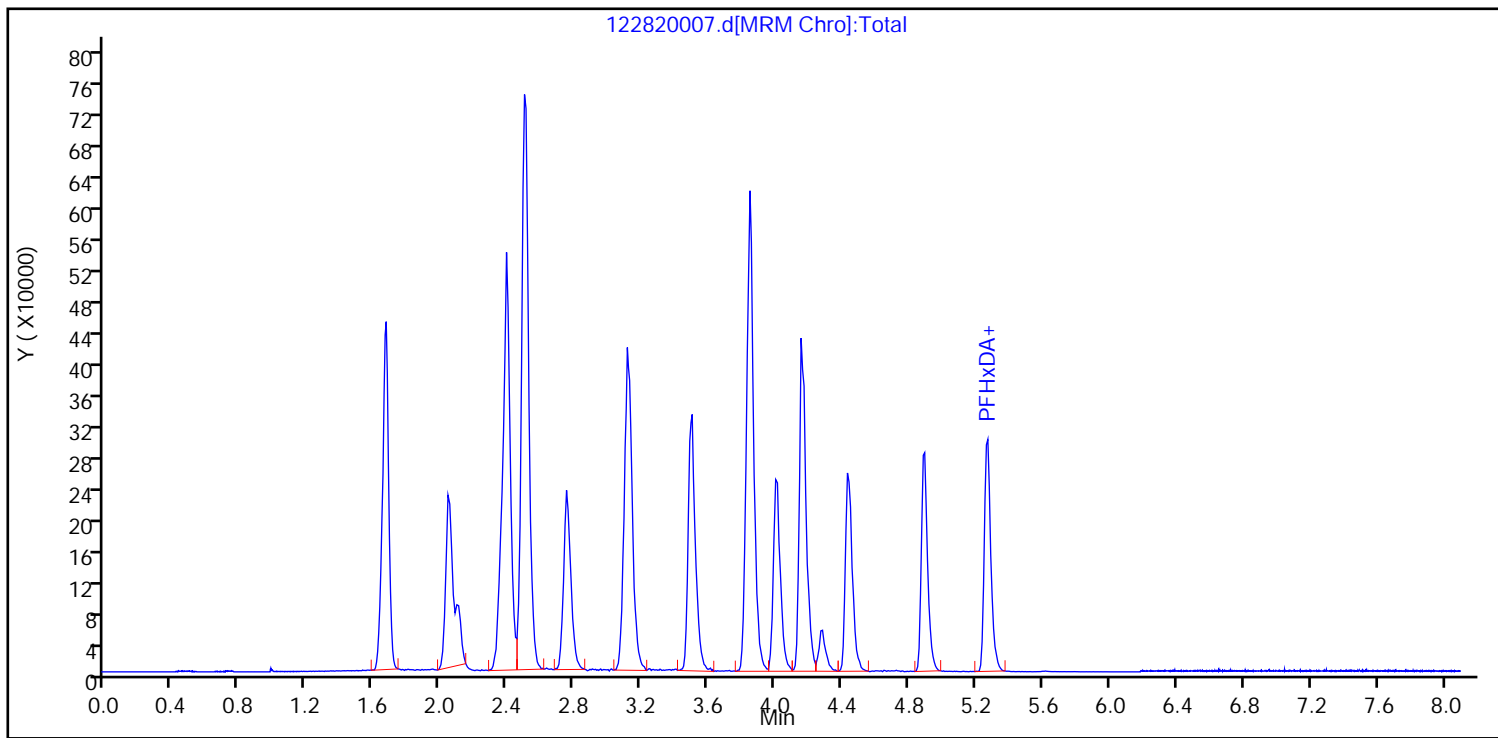
Client ID:

Lab ID: ID IBLK A

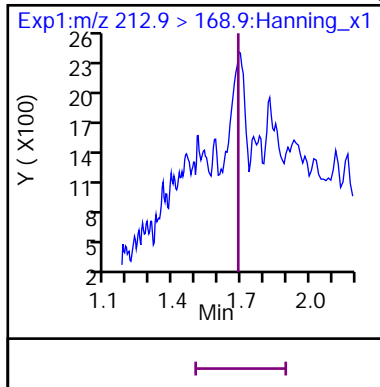
Sample Info: ID IBLK A

Dil. Factor: 1

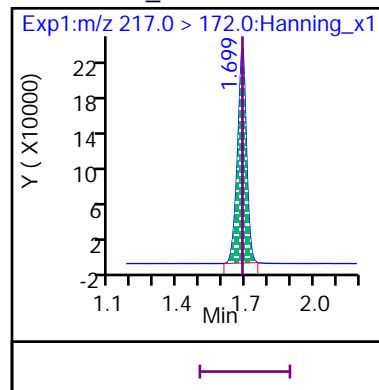
Operator: Matthew M. Miller



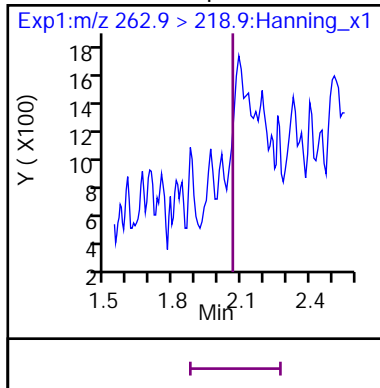
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



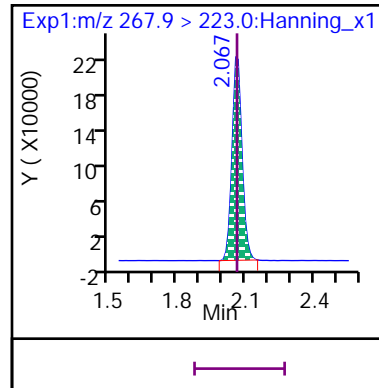
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

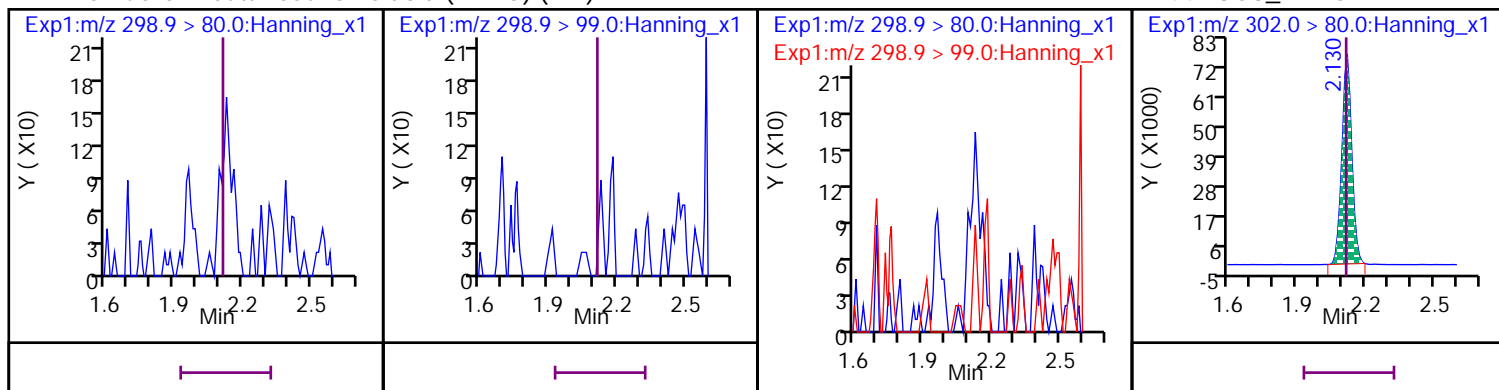


D 50 13C5\_PFPeA



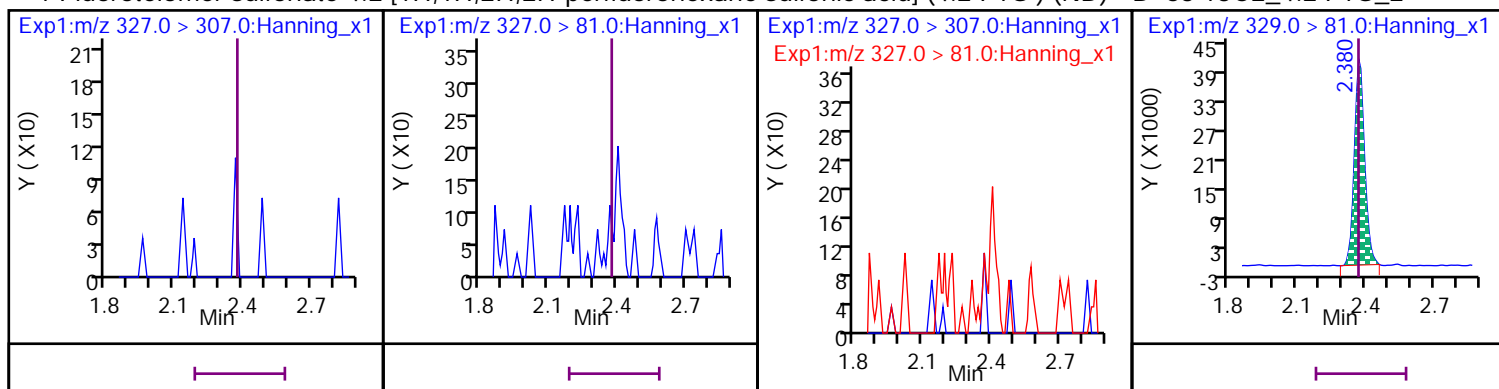
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



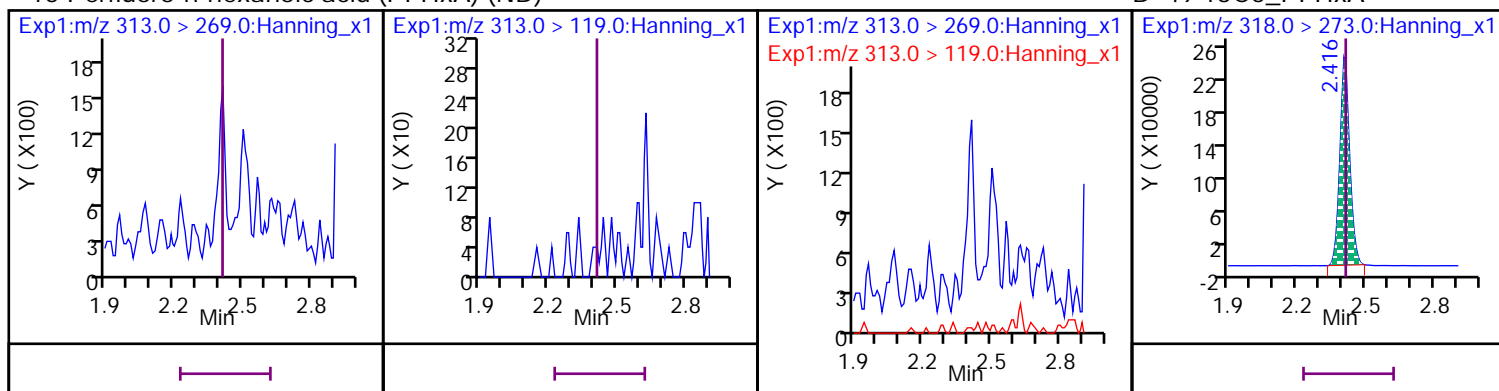
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



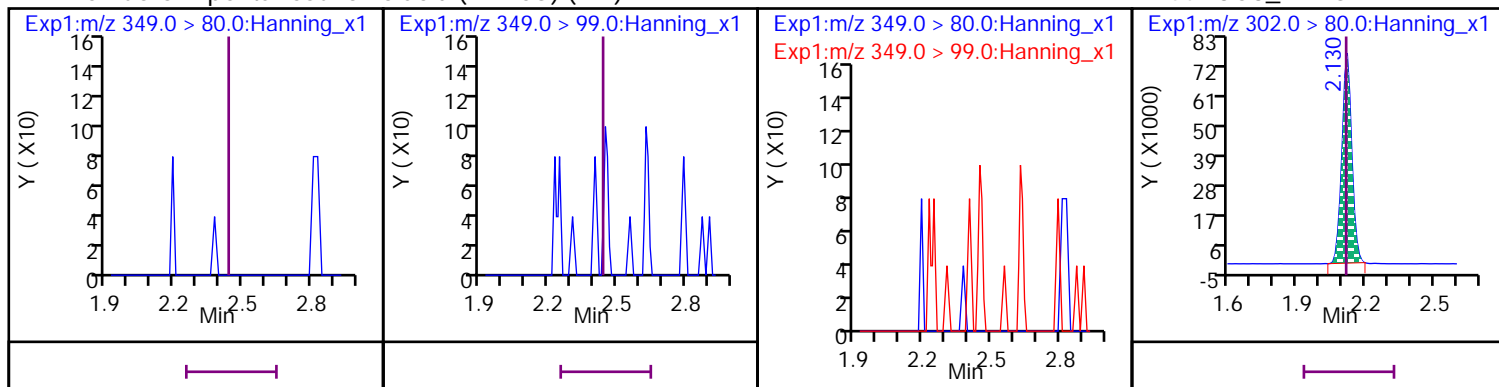
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



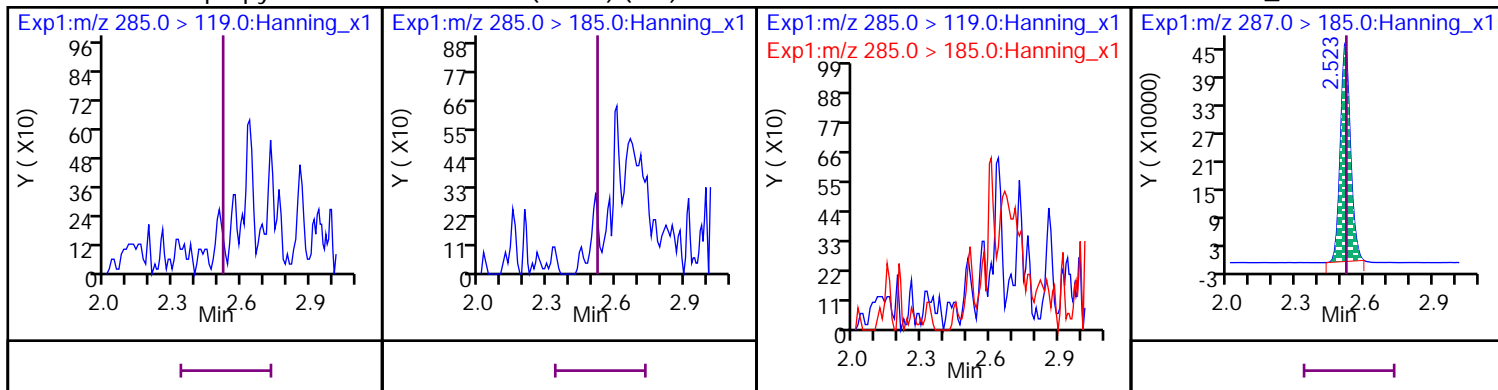
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

D 44 13C3\_PFBS



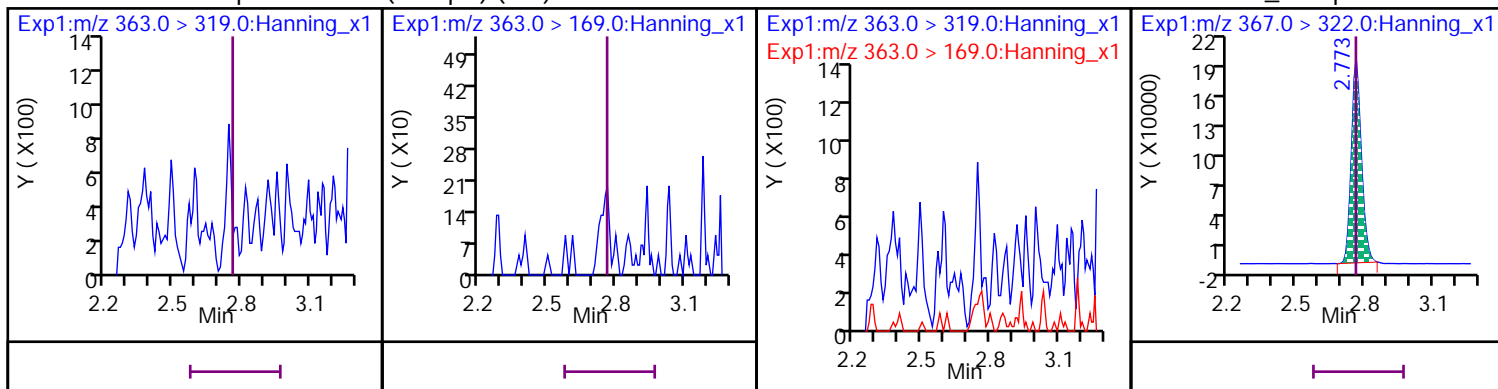
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



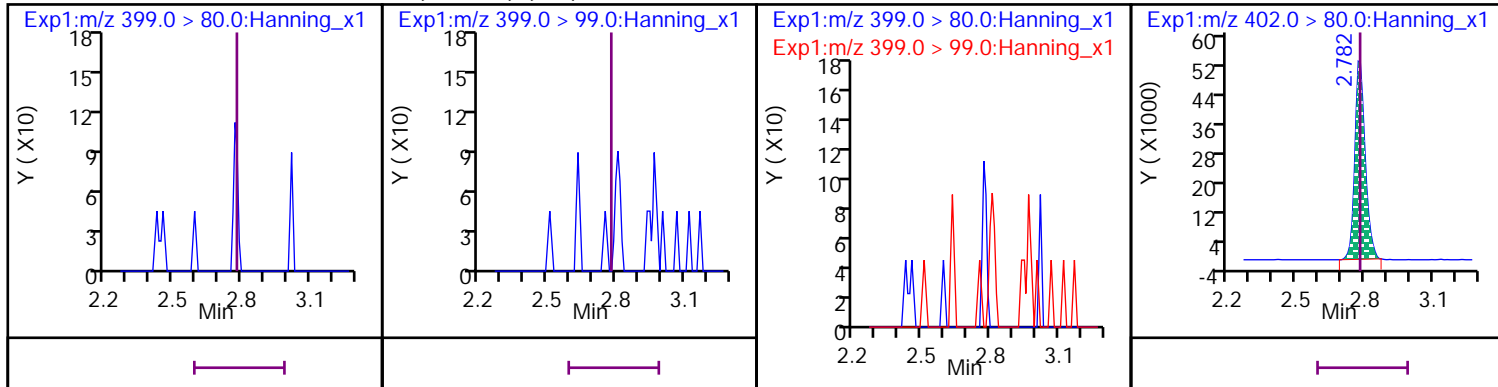
13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



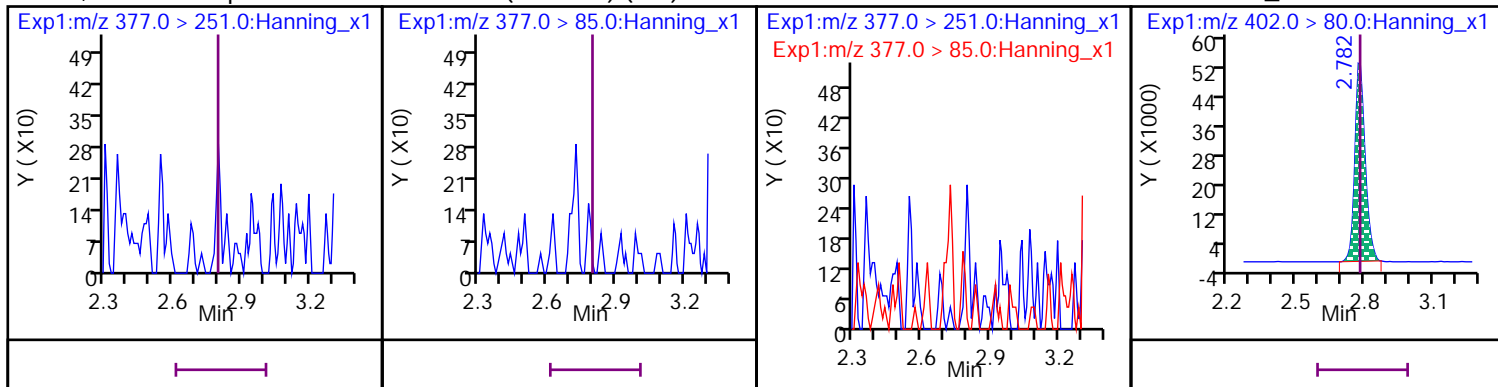
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS

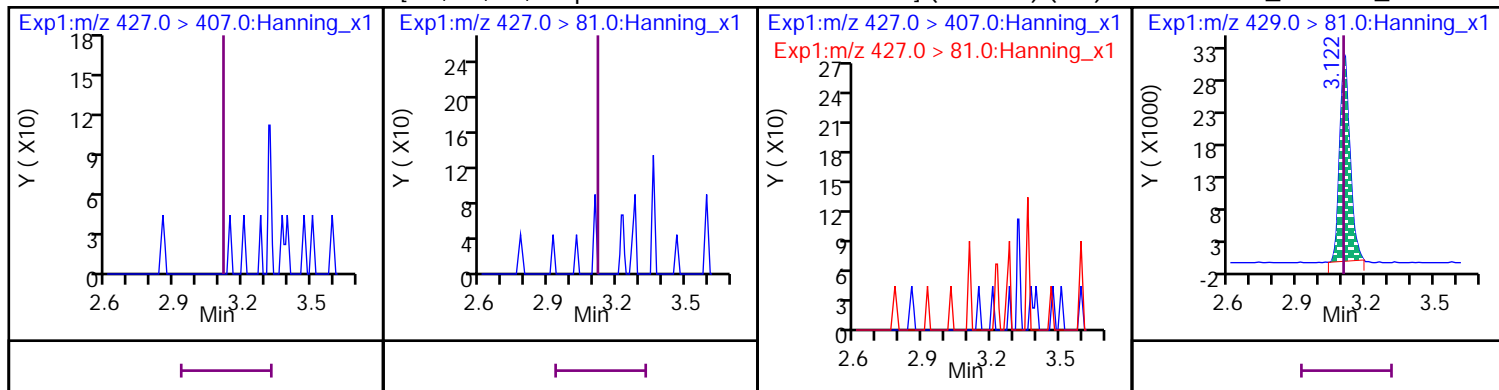


29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS

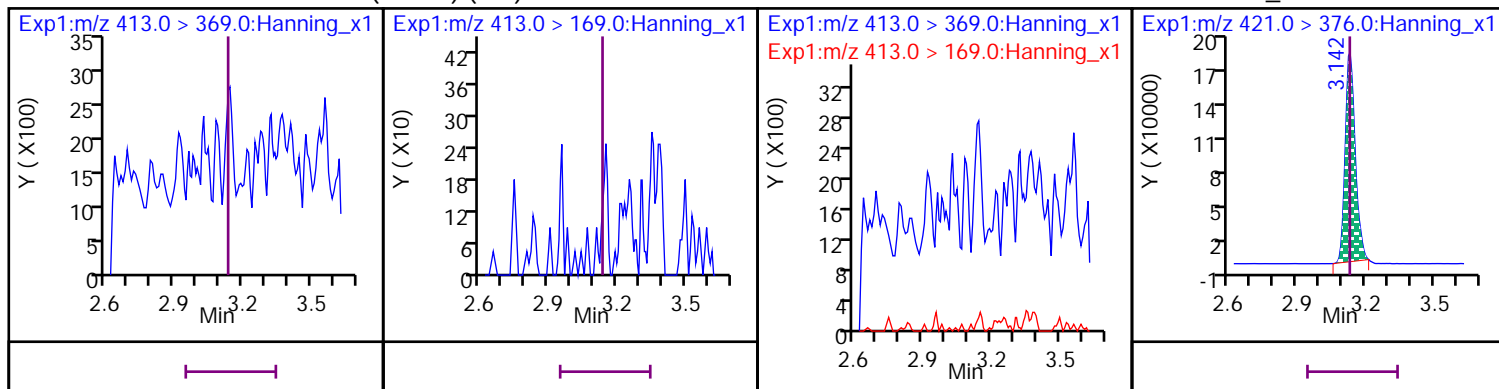


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



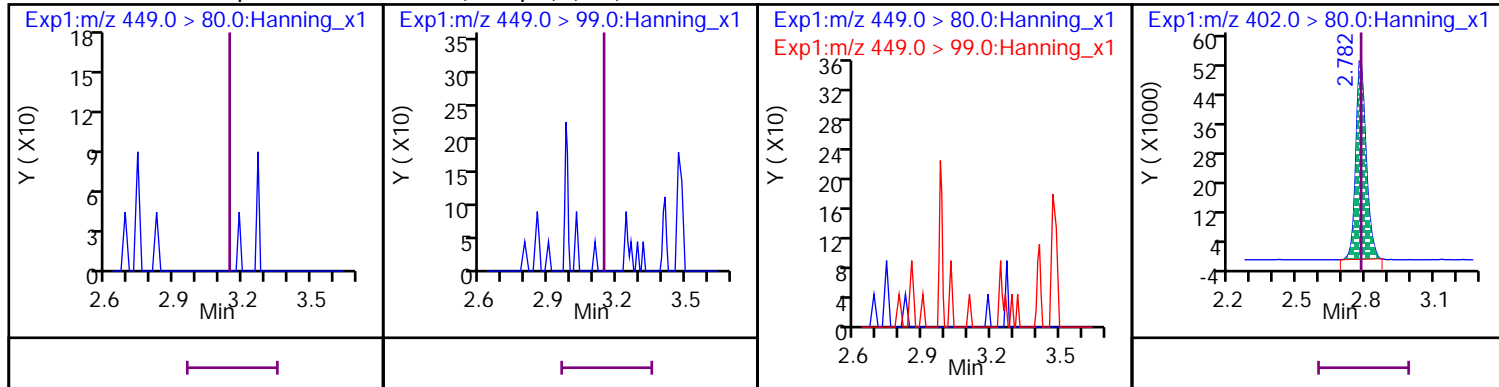
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



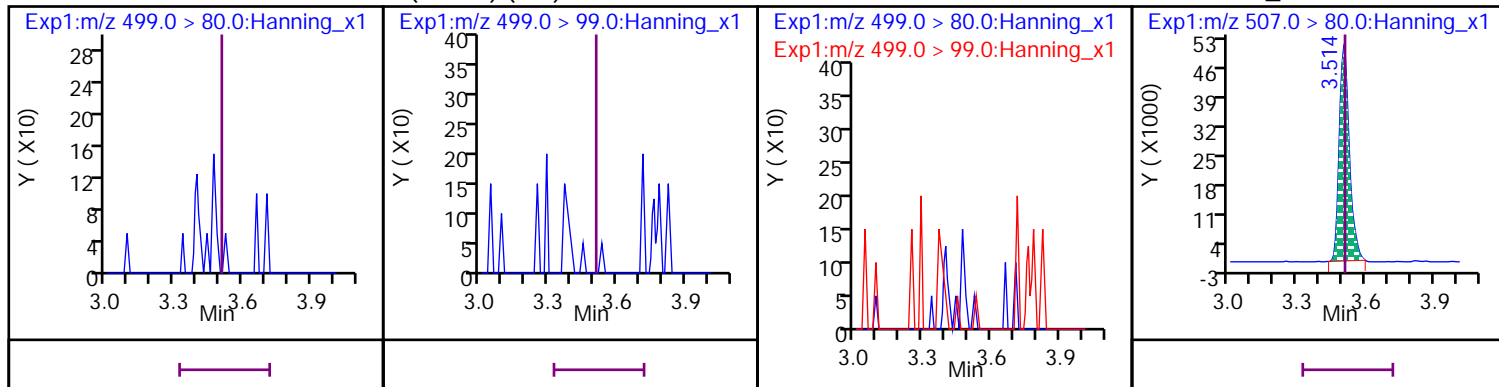
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



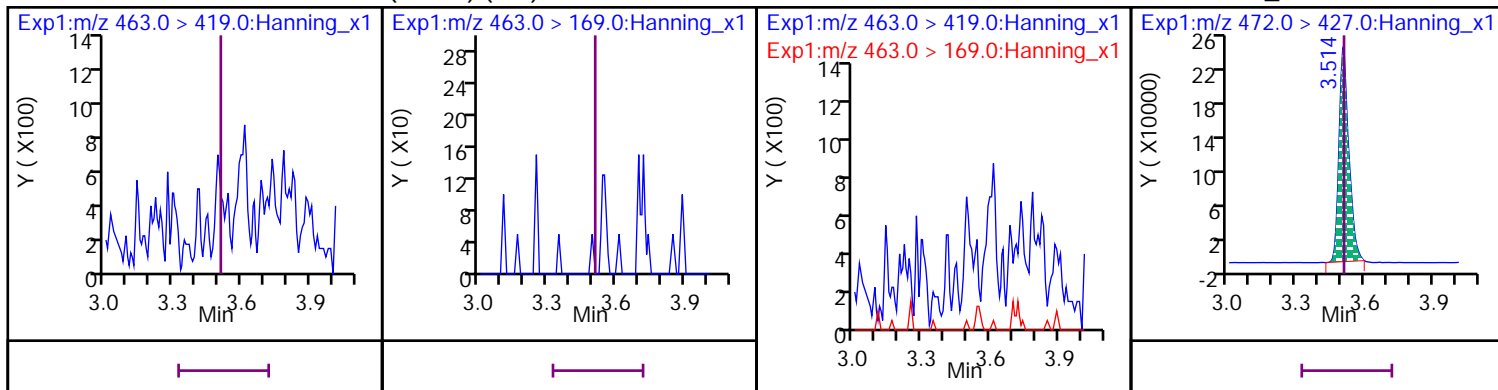
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



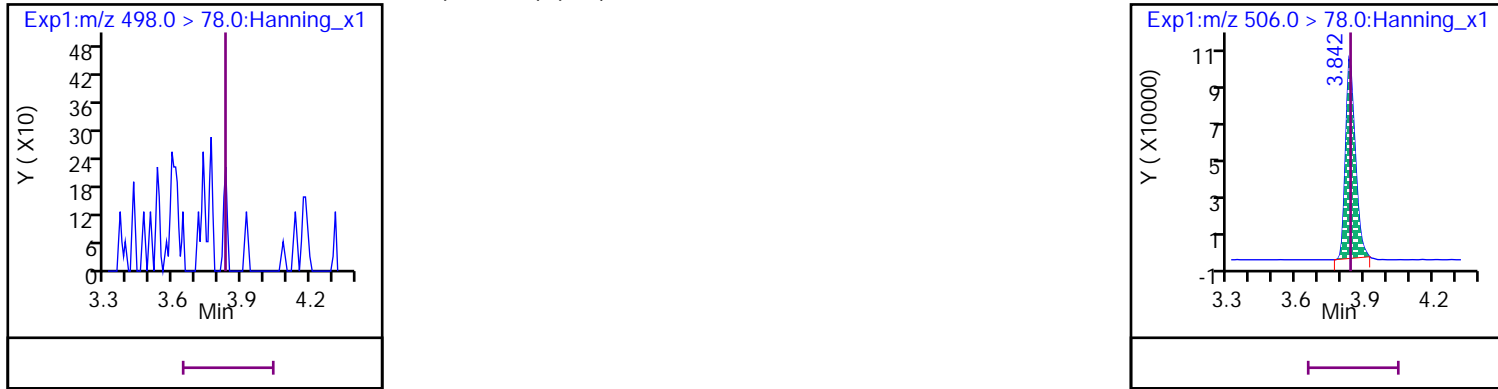
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



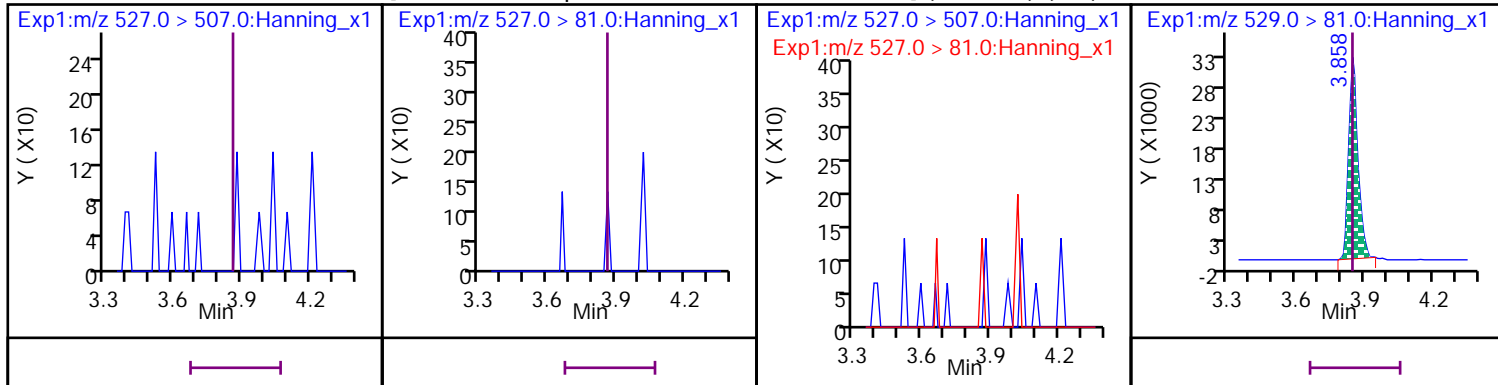
19 Perfluoro-1-octanesulfonamide (PFOSA) (ND)

D 55 13C8\_PFOSA



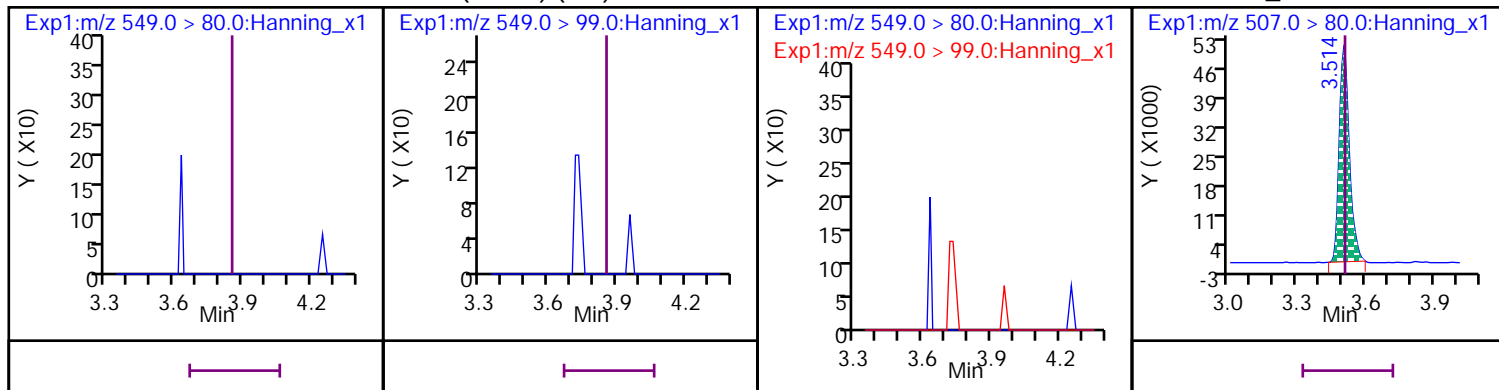
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



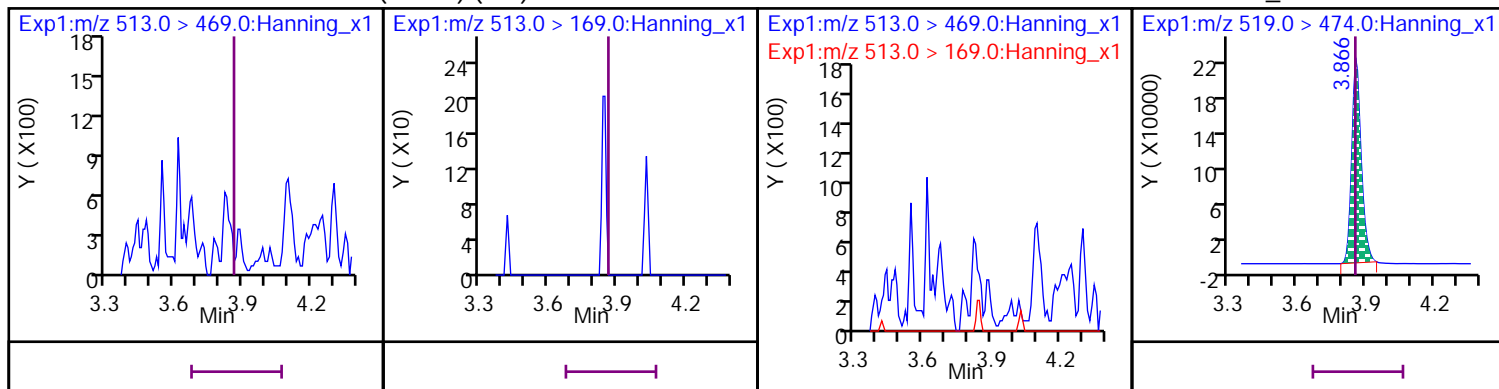
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



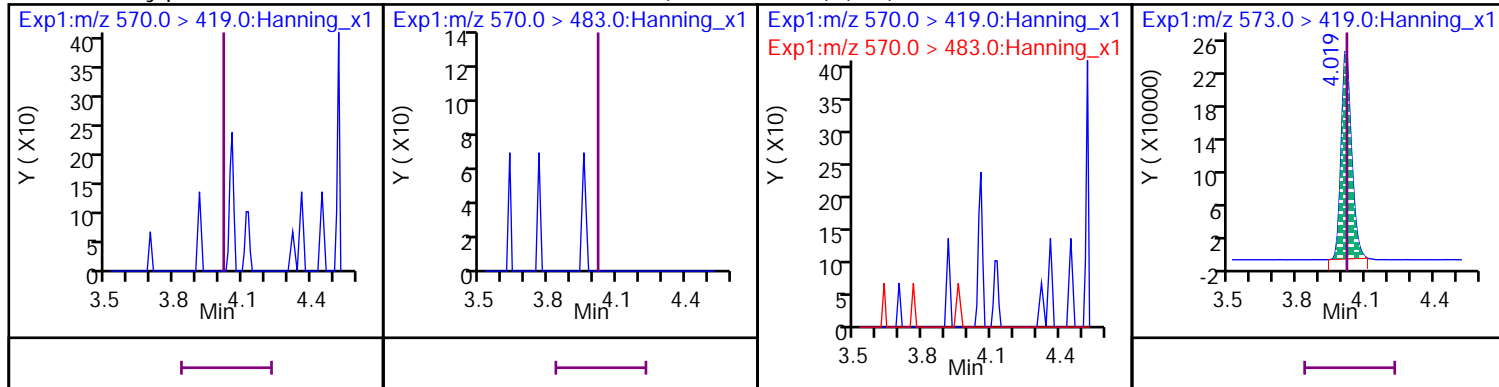
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



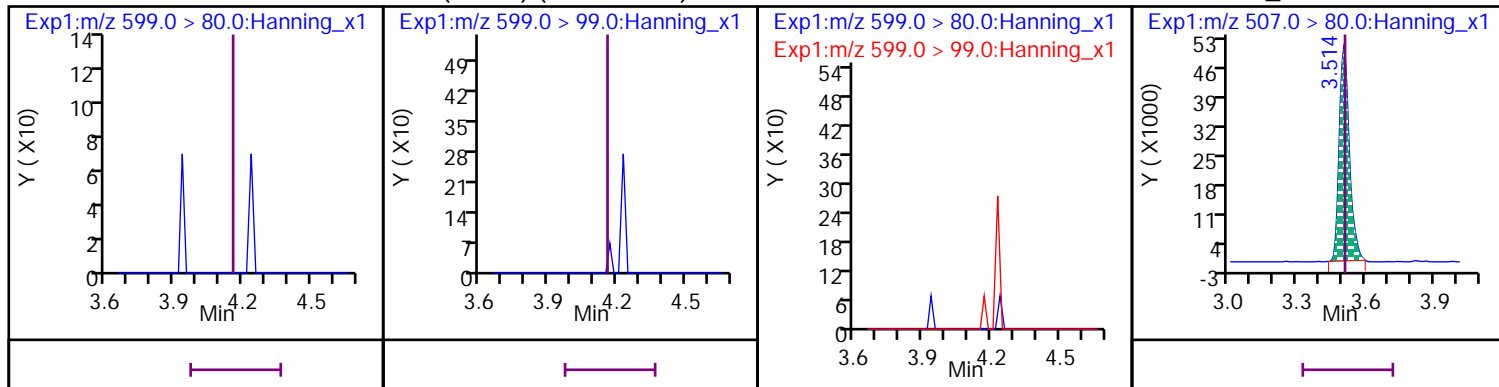
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



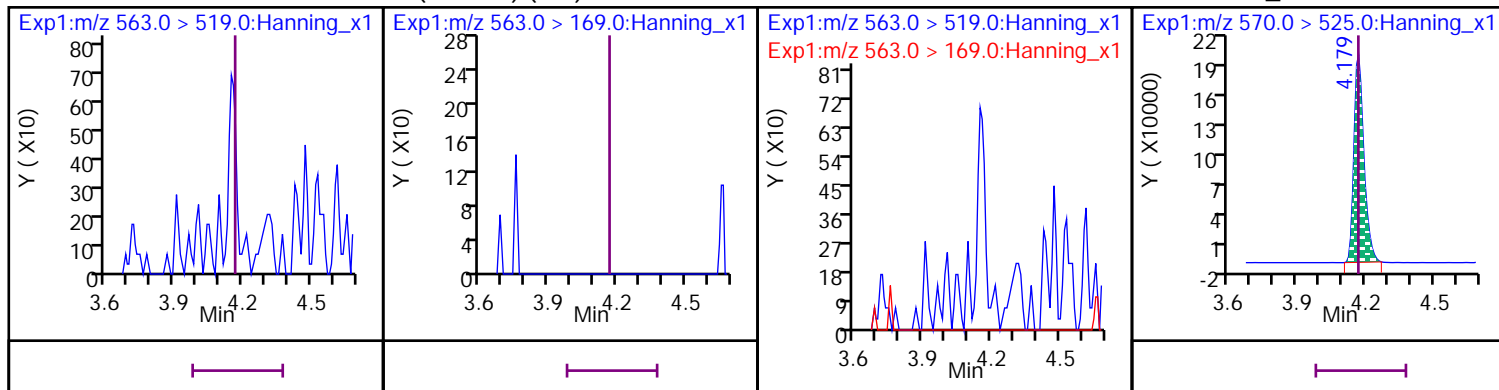
9 Perfluoro-1-decanesulfonic acid (PFDS) (Marked ND)

D 54 13C8\_PFOS



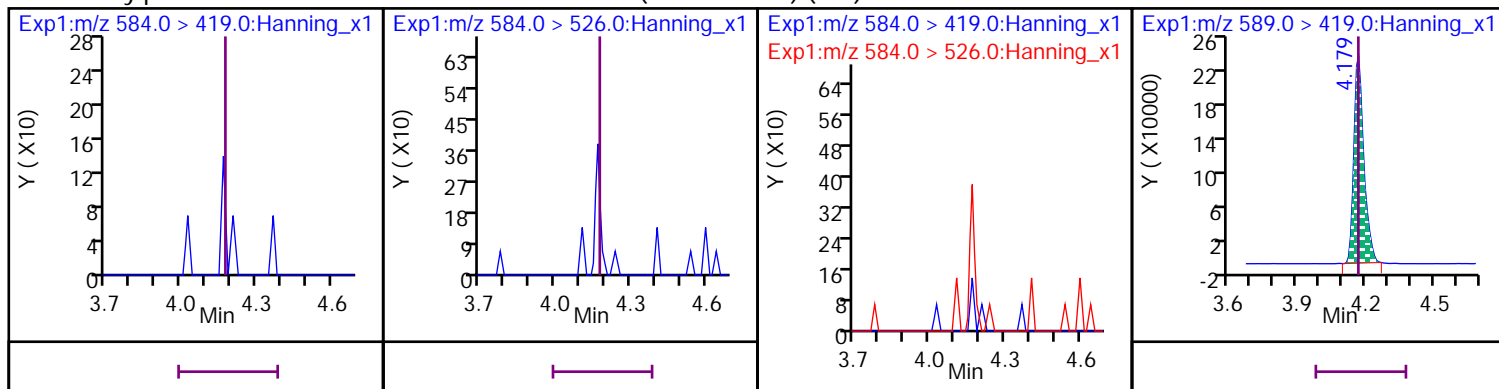
25 Perfluoro-n-undecanoic acid (PFUDa) (ND)

D 52 13C7\_PFUdA



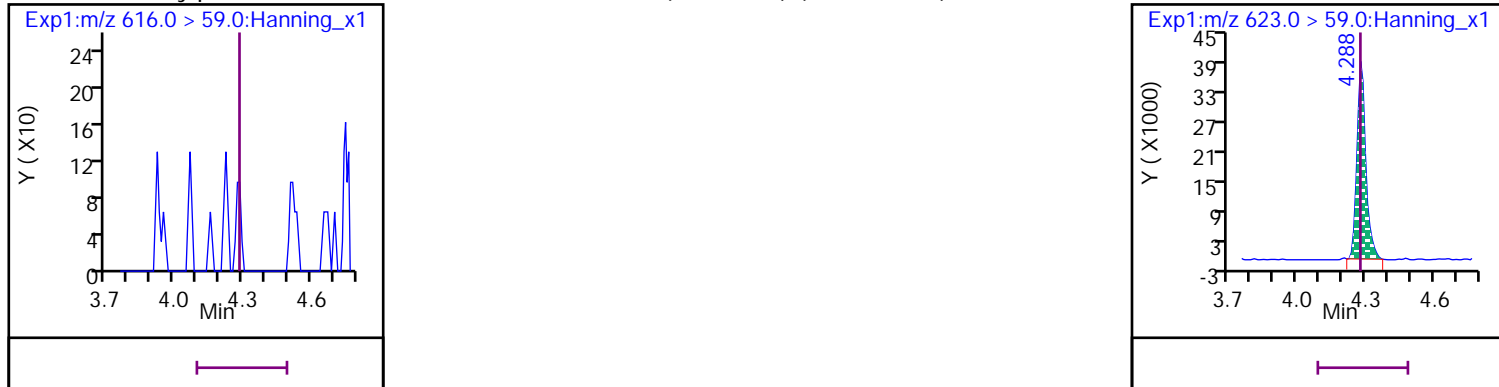
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



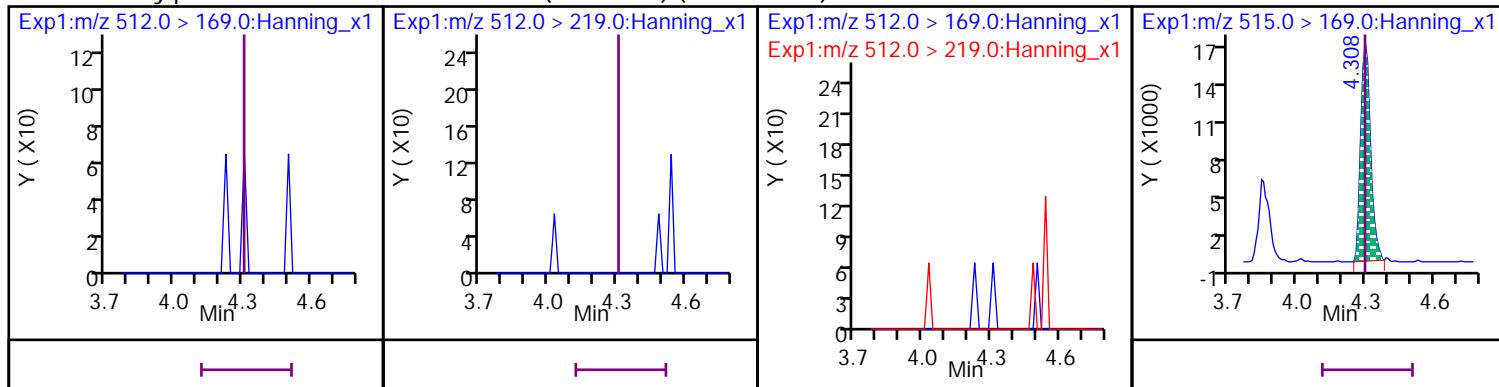
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

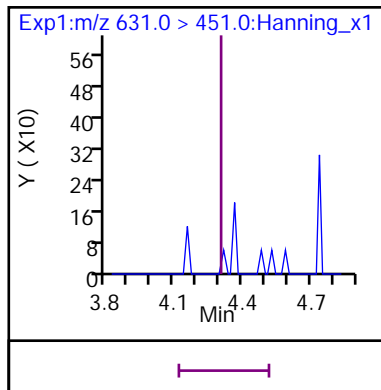


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (Marked ND)

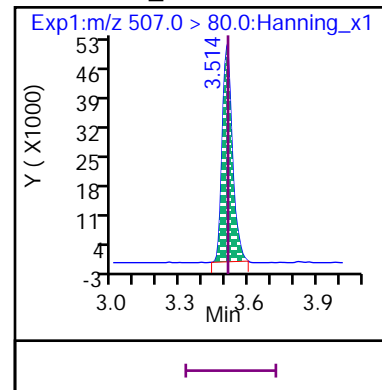
D 57 d3-MeFOSA



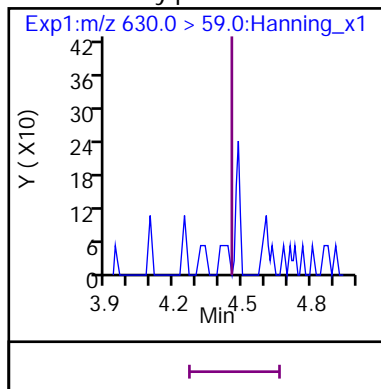
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



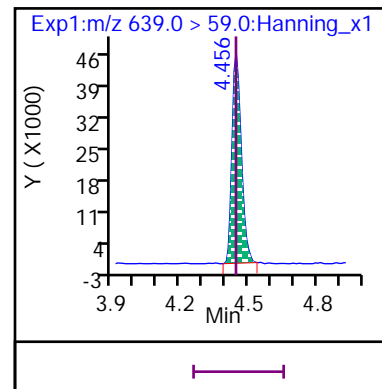
D 54 13C8\_PFOS



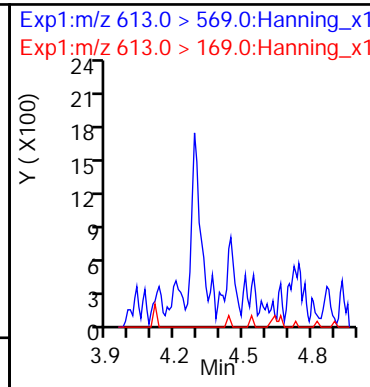
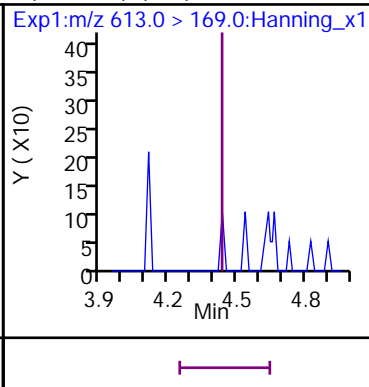
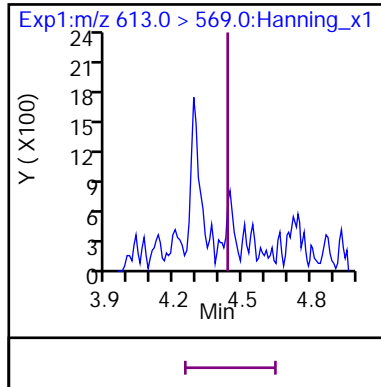
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (Marked ND)



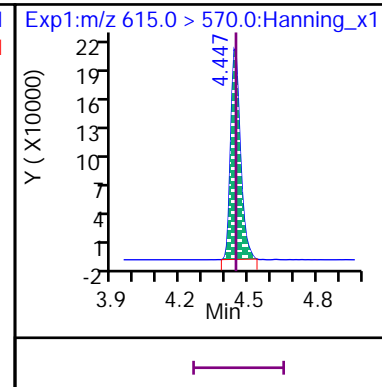
D 62 d9-EtFOSE



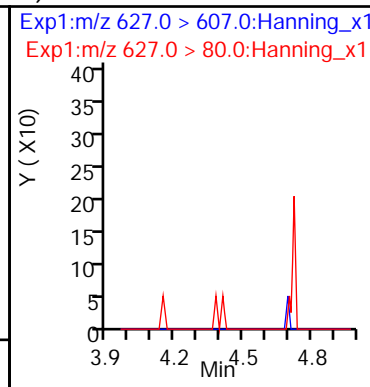
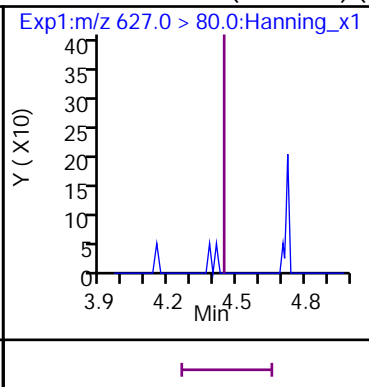
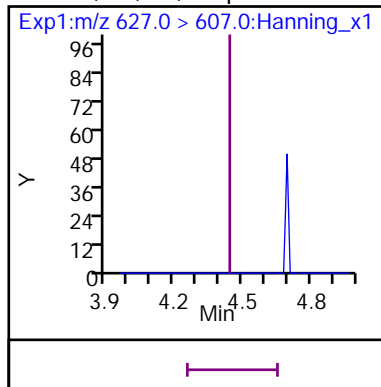
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



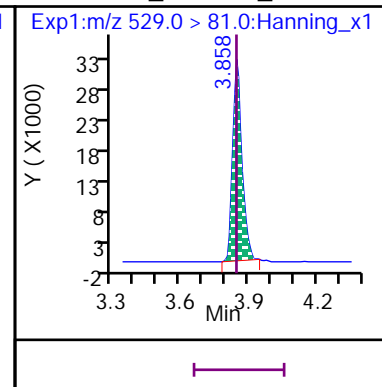
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)



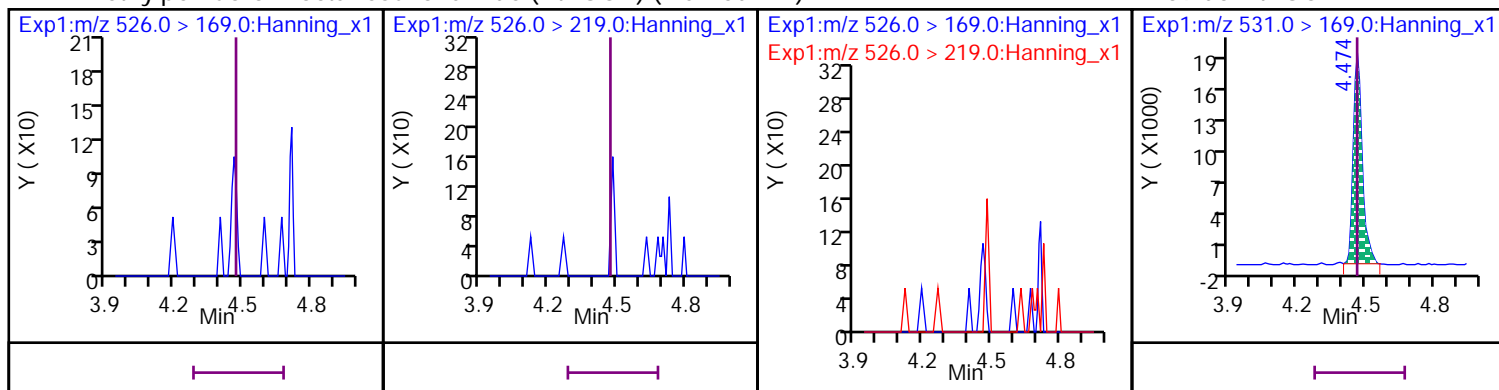
D 65 13C2\_8:2 FTS\_2





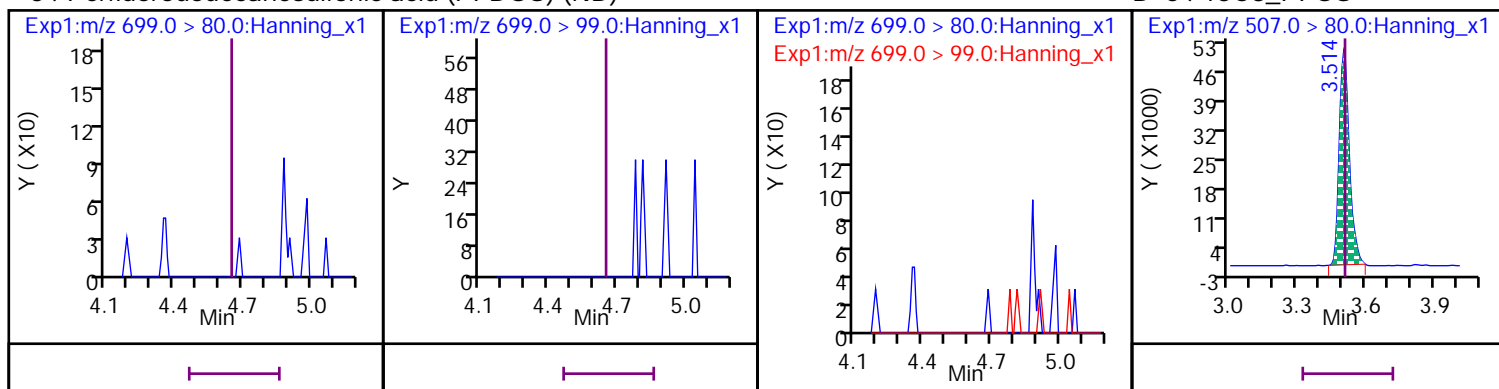
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (Marked ND)

D 59 d5-EtFOSA



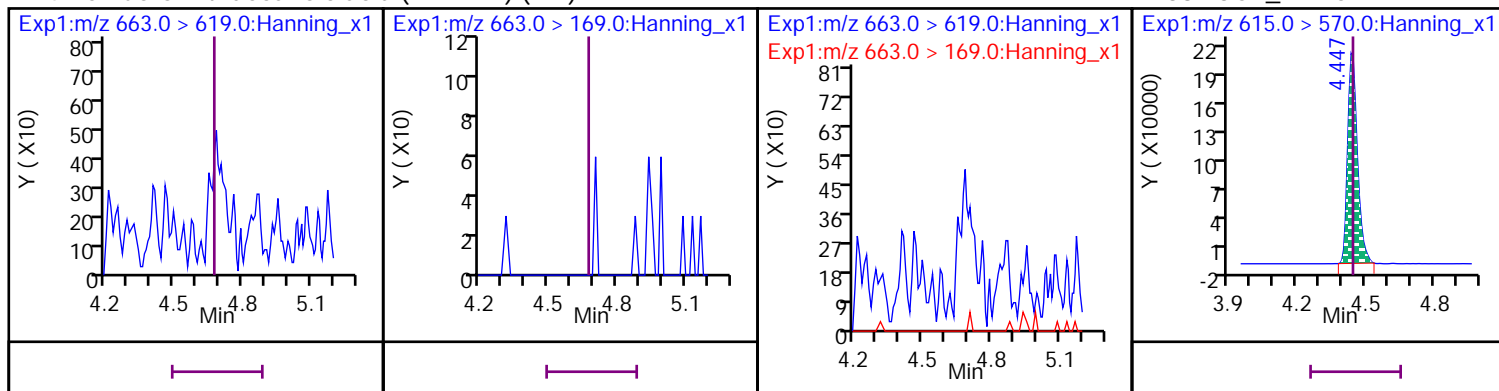
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

D 54 13C8\_PFOS



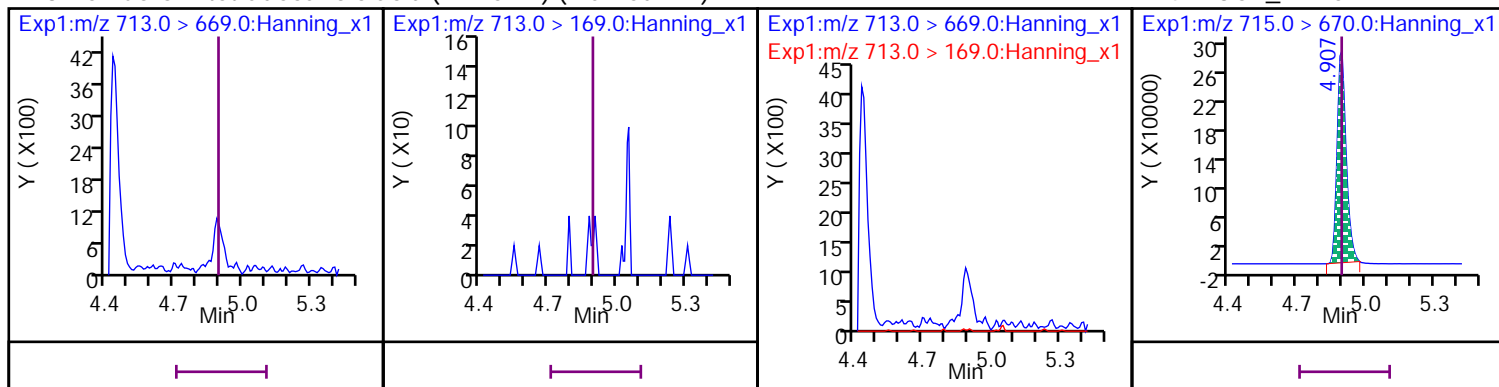
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

D 38 13C2\_PFDaA



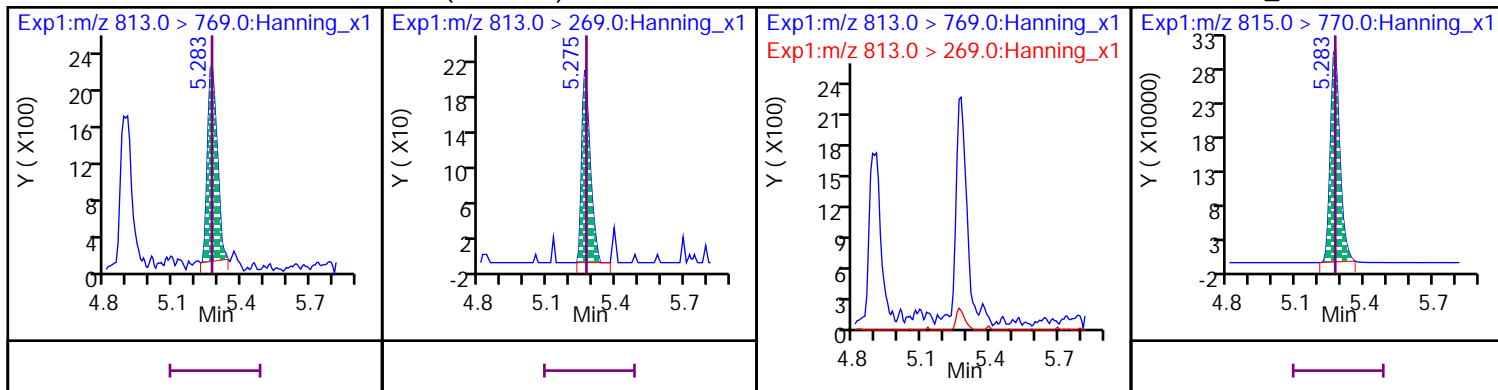
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)

D 42 13C2\_PFTeDA



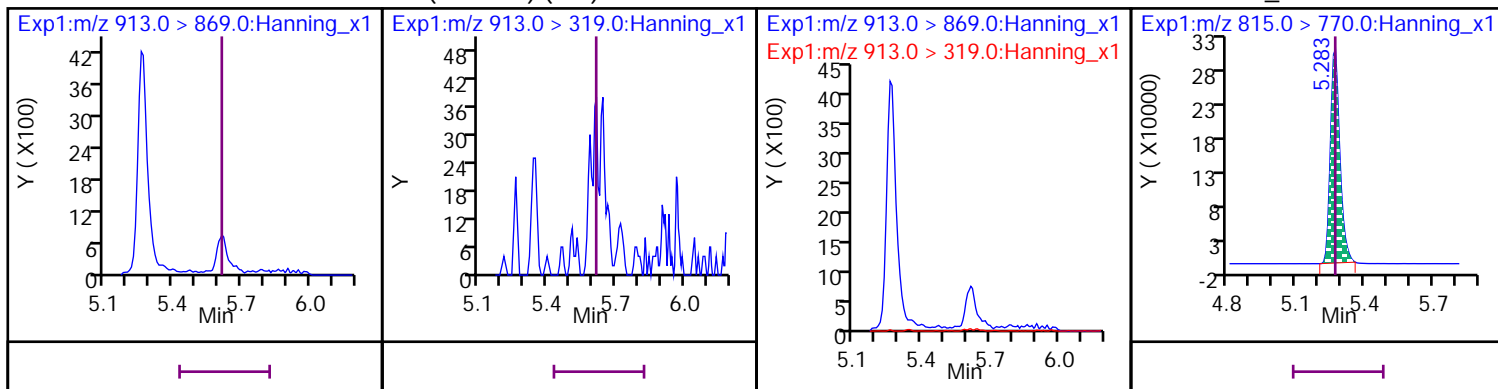
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

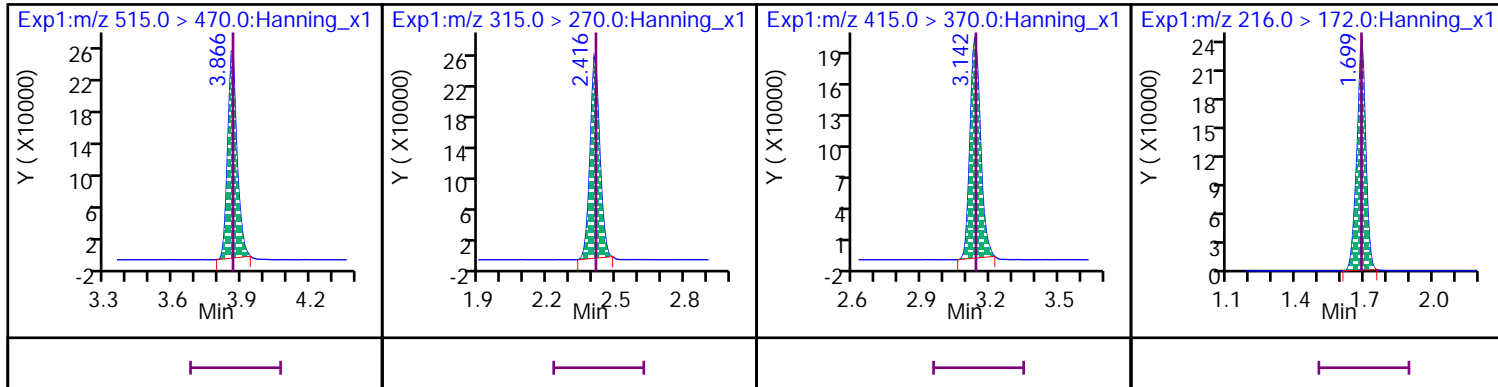


\* 37 13C2\_PFDA

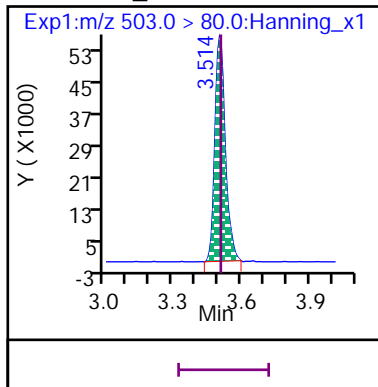
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920007.d  
 Injection Date: 29-Dec-2020 10:34:46 Injection Vol: 10.0 uL  
 Sample Type: InstBlk Auto Sampler: 97  
 Lab Sample ID: ID IBLK A Lab Prep. Batch:  
 Sample Info: ID IBLK A Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	638819	23	>100:1			1001.00	921.08	95.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46		1.709		ND								U
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.080	0	638871	17	>100:1			1001.00	928.75	92.8	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.080		ND								U
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	221882	18	>100:1			1001.00	963.74	92	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.133		ND								U
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44		2.446		ND								U
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.393	0	122115	20	>100:1			5005.00	5044.34	89.6	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63		2.393		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.429	0	714980	19	>100:1			1001.00	970.03	94.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.420		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.536	0	1379453	20	>100:1			5005.00	5179.02	97.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.536		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.777	0	586753	20	>100:1			1001.00	967.21	95.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.786		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	174078	19	>100:1			1001.00	1016.64	93.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.795		ND								U
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.823		ND								U
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45		3.166		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.132	0	93105	21	>100:1			5005.00	4834.51	88.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.139		ND								U

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA</b>	<b>CAS: SESI-0097</b>												
421 > 376		3.149	3.159	0	580424	24	>100:1			1001.00	980.67	95.6	
<b>20 Perfluoro-n-octanoic acid (PFOA)</b>	<b>CAS: 335-67-1</b>												
413 > 369	53		3.159		ND								U
<b>D 54 13C8_PFOS</b>	<b>CAS: SESI-0098</b>												
507 > 80		3.529	3.533	0	152225	21	>100:1			1001.00	1015.32	99.1	
<b>18 Perfluorooctanesulfonic acid (PFOS)</b>	<b>CAS: 1763-23-1</b>												
499 > 80	54		3.533		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)</b>	<b>CAS: 756426-58-1</b>												
531 > 351	54		3.740		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS)</b>	<b>CAS: 68259-12-1</b>												
549 > 80	54		3.879		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS)</b>	<b>CAS: 335-77-3</b>												
599 > 80	54		4.175		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)</b>	<b>CAS: 763051-92-9</b>												
631 > 451	54		4.334		ND								U
<b>34 Perfluorododecanesulfonic acid (PFDOS)</b>	<b>CAS: 79780-39-5</b>												
699 > 80	54		4.677		ND								U
<b>D 56 13C9_PFNA</b>	<b>CAS: SESI-0099</b>												
472 > 427		3.529	3.533	0	726557	22	>100:1			1001.00	967.50	92.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA)</b>	<b>CAS: 375-95-1</b>												
463 > 419	56		3.533		ND								U
<b>D 55 13C8_PFOA</b>	<b>CAS: SESI-0107</b>												
506 > 78		3.858	3.854	1	295957	20	>100:1			1001.00	956.04	92.8	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA)</b>	<b>CAS: 754-91-6</b>												
498 > 78	55		3.854		ND								U
<b>D 65 13C2_8:2 FTS_2</b>	<b>CAS: SESI-0106</b>												
529 > 81		3.874	3.879	0	811103	20	>100:1			5005.00	4372.10	77.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)</b>	<b>CAS: 39108-34-4</b>												
527 > 507	65		3.911		ND								U
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS)</b>	<b>CAS: 120226-60-0</b>												
627 > 607	65		4.479		ND								U
<b>D 51 13C6_PFDA</b>	<b>CAS: SESI-0115</b>												
519 > 474		3.882	3.887	0	636152	21	>100:1			1001.00	959.03	90.7	
<b>10 Perfluoro-n-decanoic acid (PFDA)</b>	<b>CAS: 335-76-2</b>												
513 > 469	51		3.887		ND								U
<b>D 58 d3-MeFOSAA</b>	<b>CAS: SESI-0102</b>												
573 > 419		4.038	4.034	1	720480	18	>100:1			5005.00	5019.39	99.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)</b>	<b>CAS: 2355-31-9</b>												
570 > 419	58		4.043		ND								U
<b>D 60 d5-EtFOSAA</b>	<b>CAS: SESI-0110</b>												
589 > 419		4.188	4.193	0	655689	19	>100:1			5005.00	4936.87	92.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)</b>	<b>CAS: 2991-50-6</b>												
584 > 419	60		4.203		ND								U
<b>D 52 13C7_PFUdA</b>	<b>CAS: SESI-0117</b>												
570 > 525		4.188	4.193	0	605392	17	>100:1			1001.00	957.79	94.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA)</b>	<b>CAS: 2058-94-8</b>												
563 > 519	52		4.193		ND								U
<b>D 61 d7-MeFOSE</b>	<b>CAS: SESI-0129</b>												
623 > 59		4.298	4.294	1	102814	17	>100:1			1001.00	950.15	106	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)</b>	<b>CAS: 24448-09-7</b>												
616 > 59	61		4.304		ND								U
<b>D 57 d3-MeFOA</b>	<b>CAS: SESI-0109</b>												
515 > 169		4.318	4.314	1	54151	16	>100:1			1001.00	1023.32	103	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOA)</b>	<b>CAS: 31506-32-8</b>												
512 > 169	57		4.334		ND								U
<b>D 62 d9-EtFOSE</b>	<b>CAS: SESI-0130</b>												
639 > 59		4.465	4.461	1	114941	16	>100:1			1001.00	916.63	93.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62		4.470		ND								
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.461	1	555212	18	>100:1			1001.00	917.23	91	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 59 d5-EtFOA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	48293	20	>100:1			1001.00	983.67	101	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOA) CAS: 4151-50-2</b>													U
526 > 169	59		4.479		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	749318	18	>100:1			1001.00	889.46	95.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	860084	20	>100:1			1001.00	949.15	94.6	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	5846	19	28:1	Target = 11.43		10.413	10.413		
813 > 269	40	5.300	5.296		563	22	22:1	10.38 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													U
913 > 869	40		5.643		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.887	0	660754	21	>100:1					96	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.429	0	698337	19	>100:1					95.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.152	0	592404	25	>100:1					96.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	607795	24	>100:1					95	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.529	3.533	0	160917	25	>100:1					93.5	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920007.d

Injection Date: 29-Dec-2020 10:34:46

Inst. ID: LCMSMS02

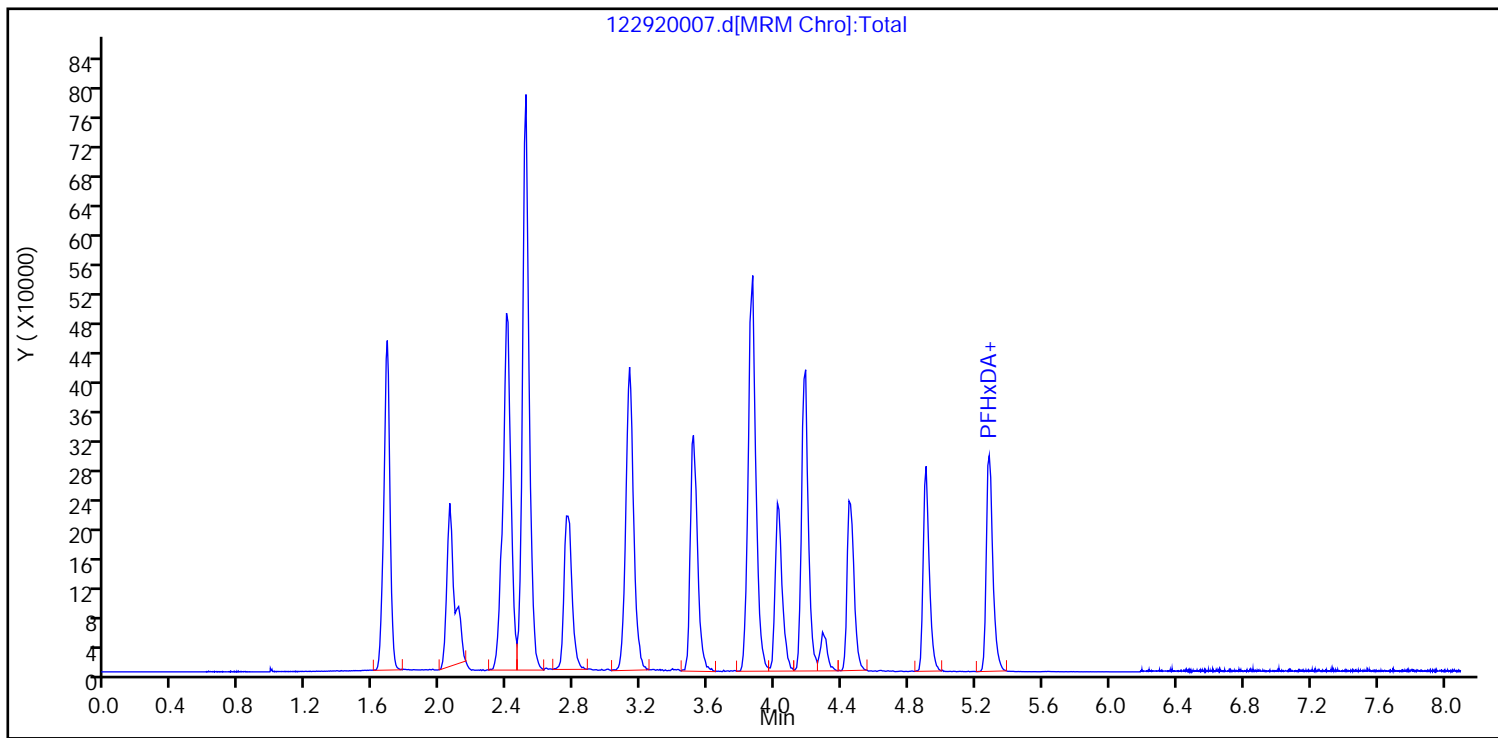
Client ID:

Lab ID: ID IBLK A

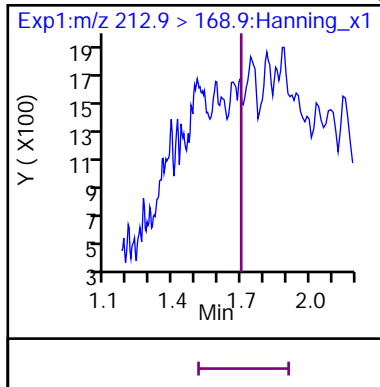
Sample Info: ID IBLK A

Dil. Factor: 1

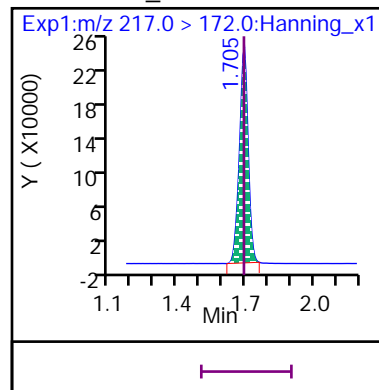
Operator: Matthew M. Miller



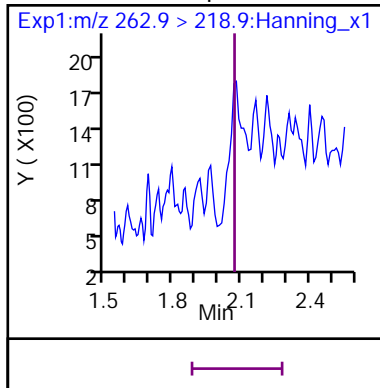
8 Perfluoro-n-butanoic acid (PFBA) (ND)



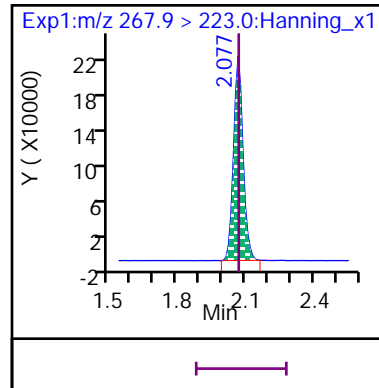
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

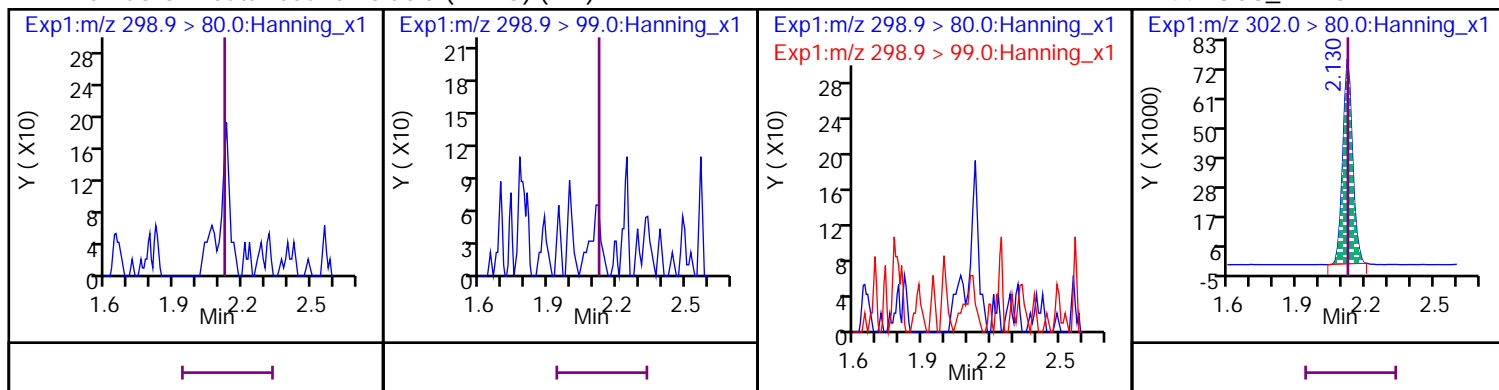


D 50 13C5\_PFPeA



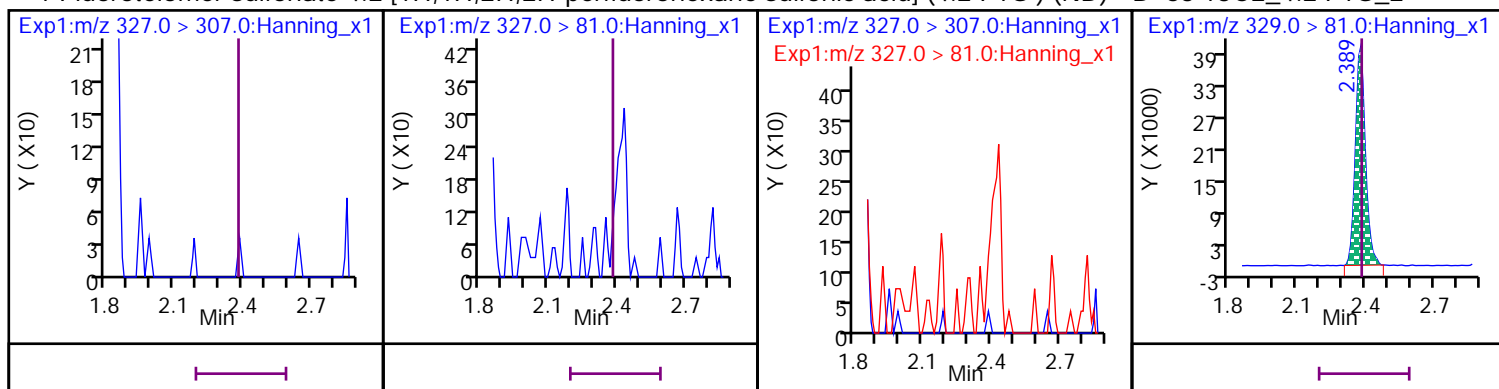
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



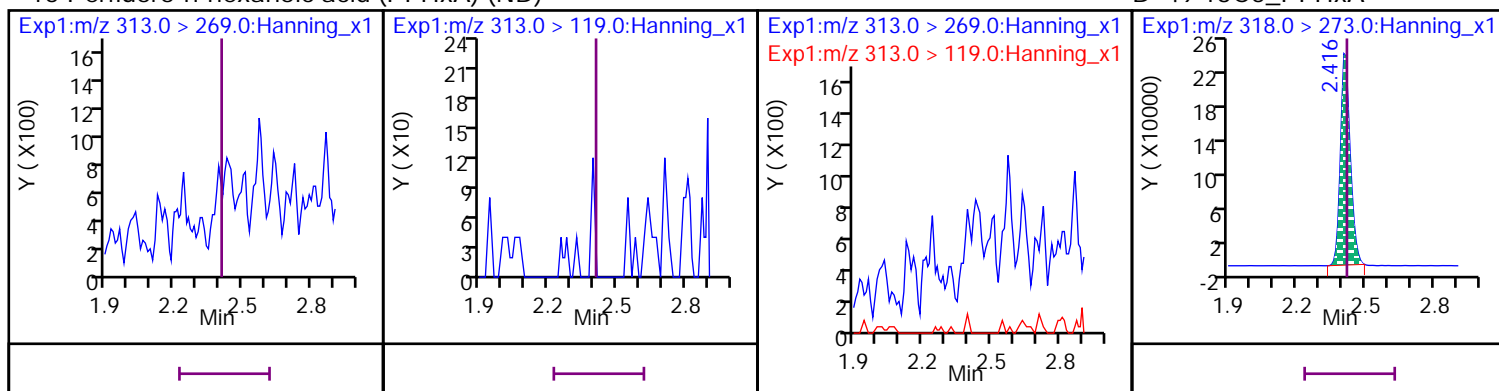
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



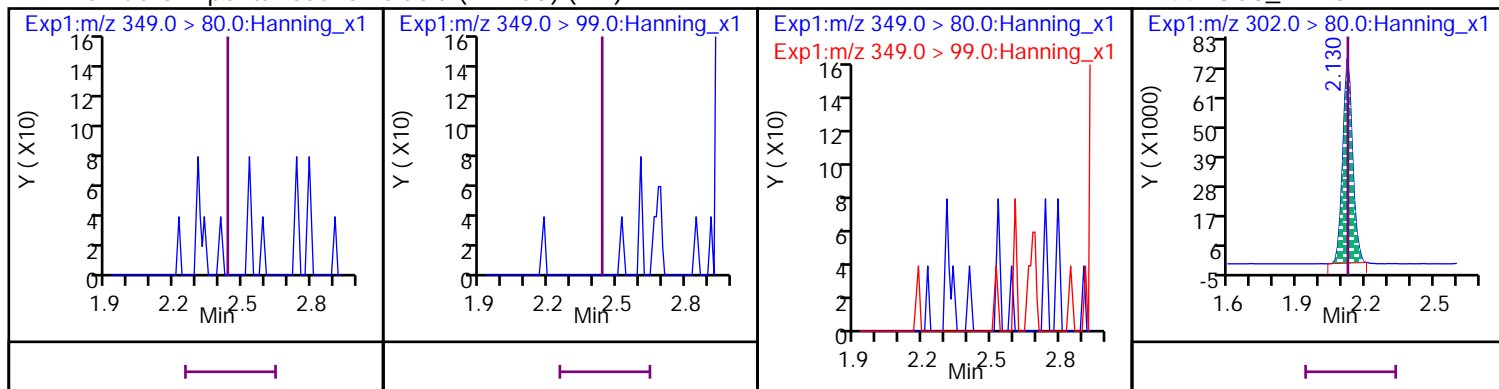
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



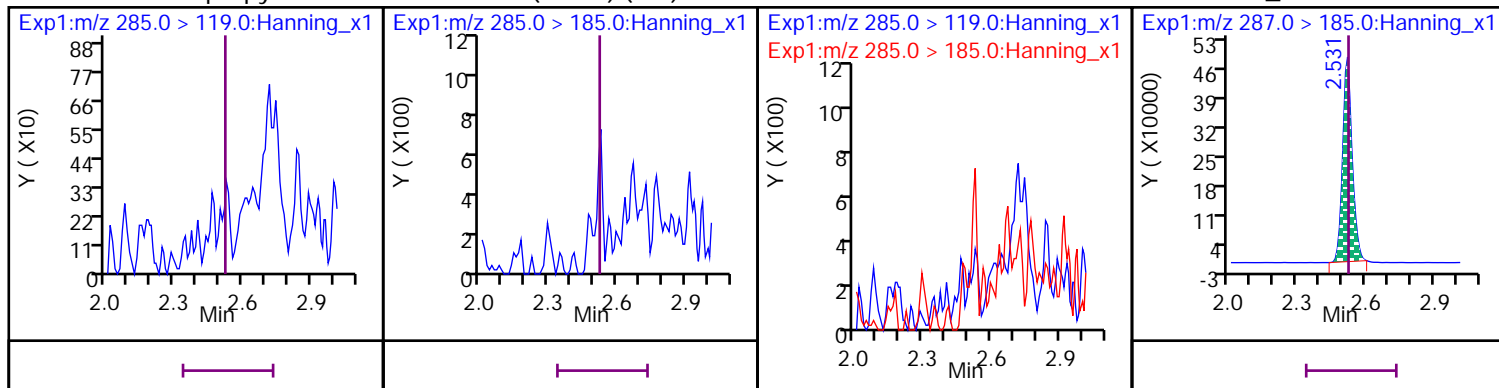
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

D 44 13C3\_PFBS



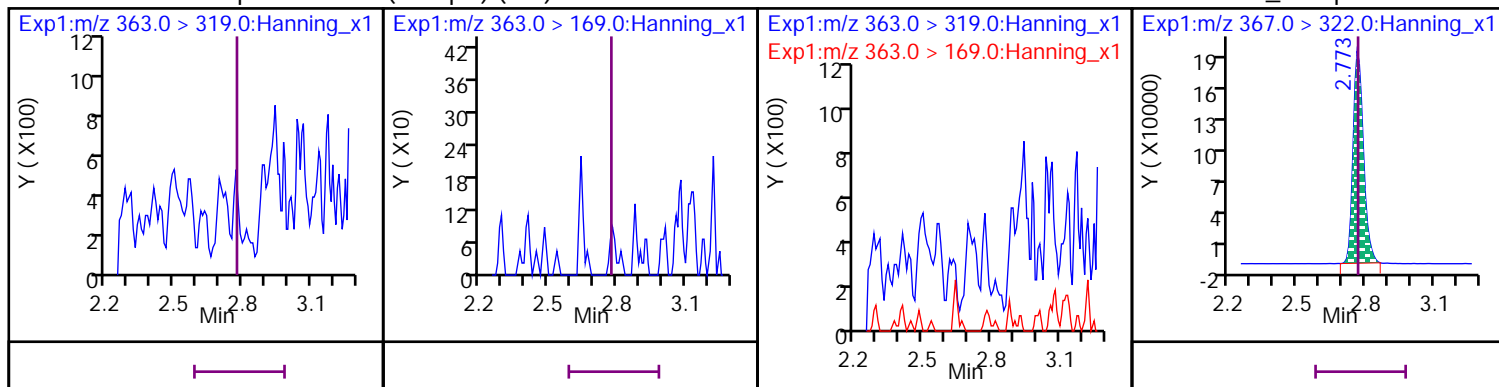
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



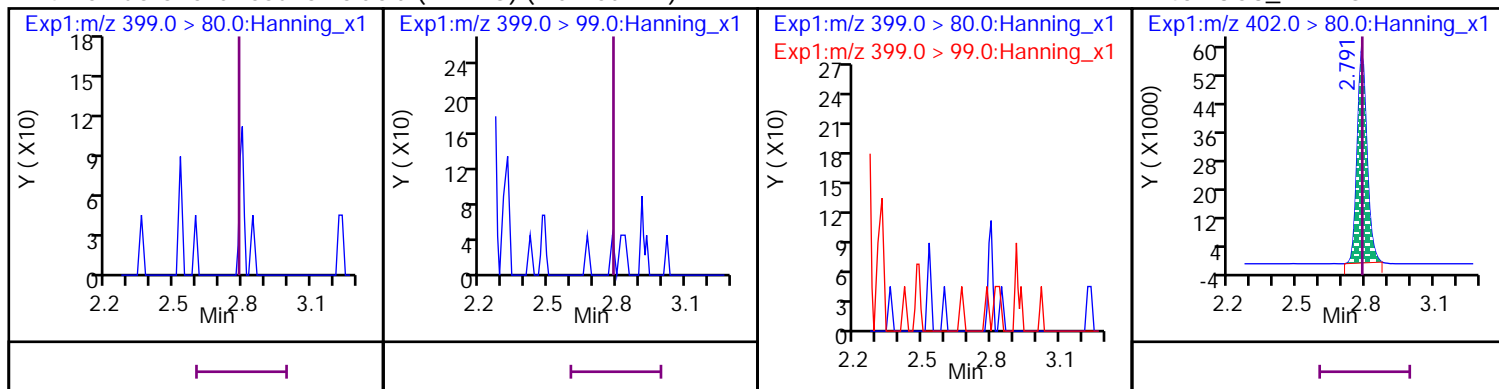
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



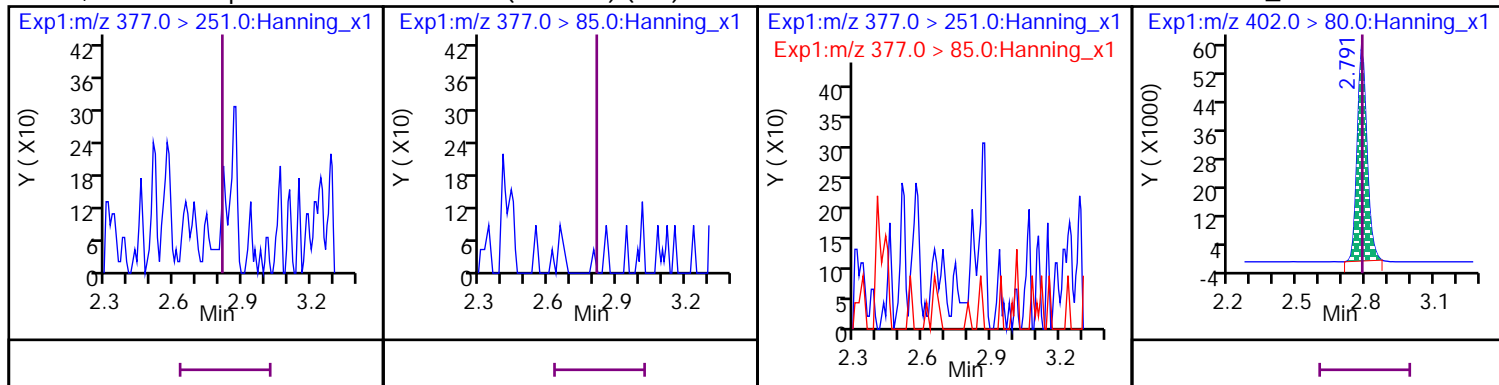
## 14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS



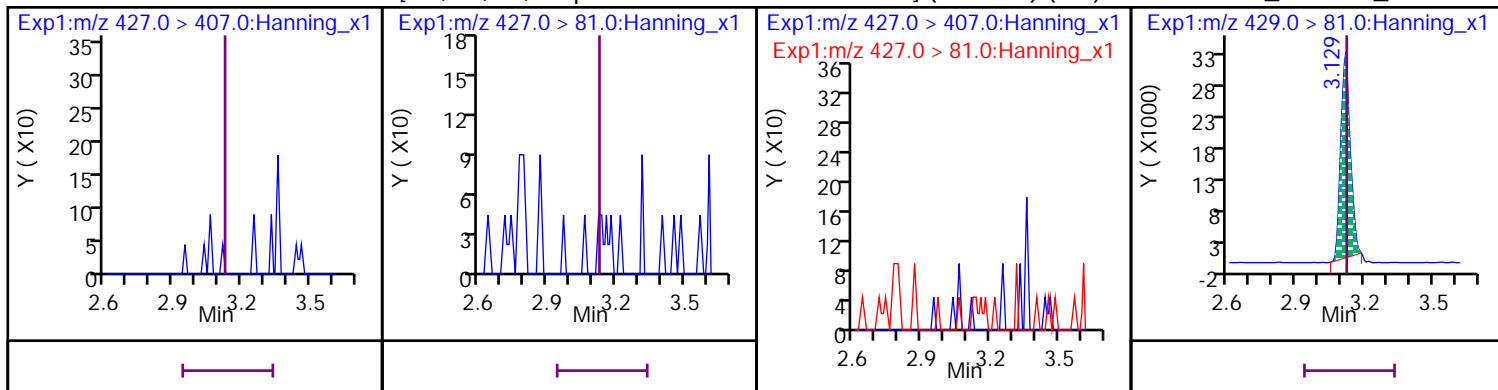
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



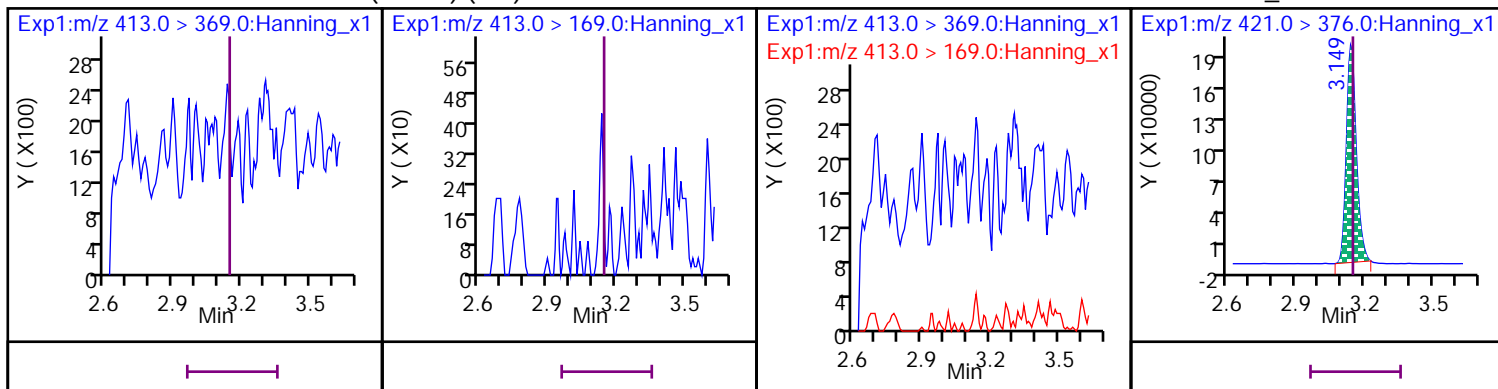


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



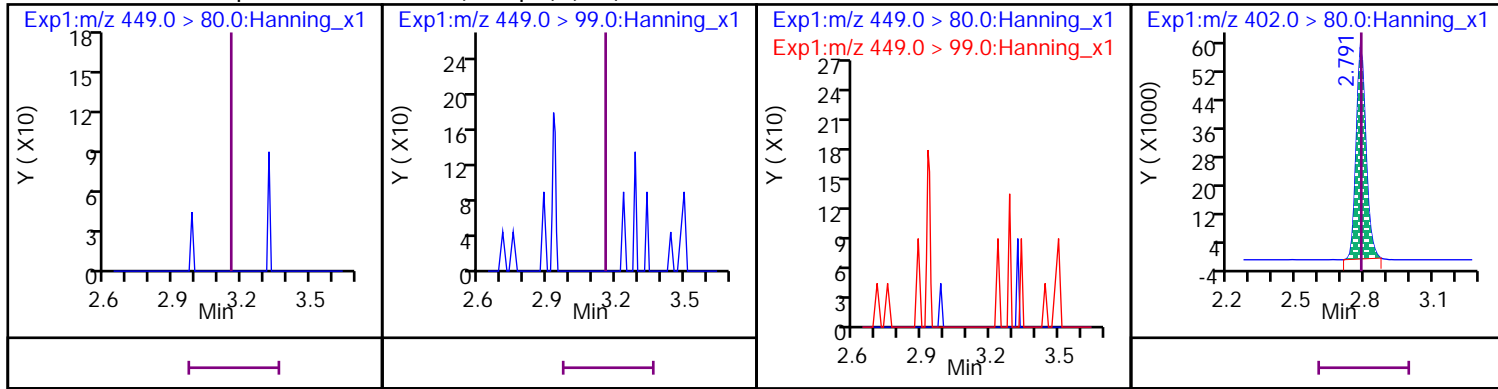
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



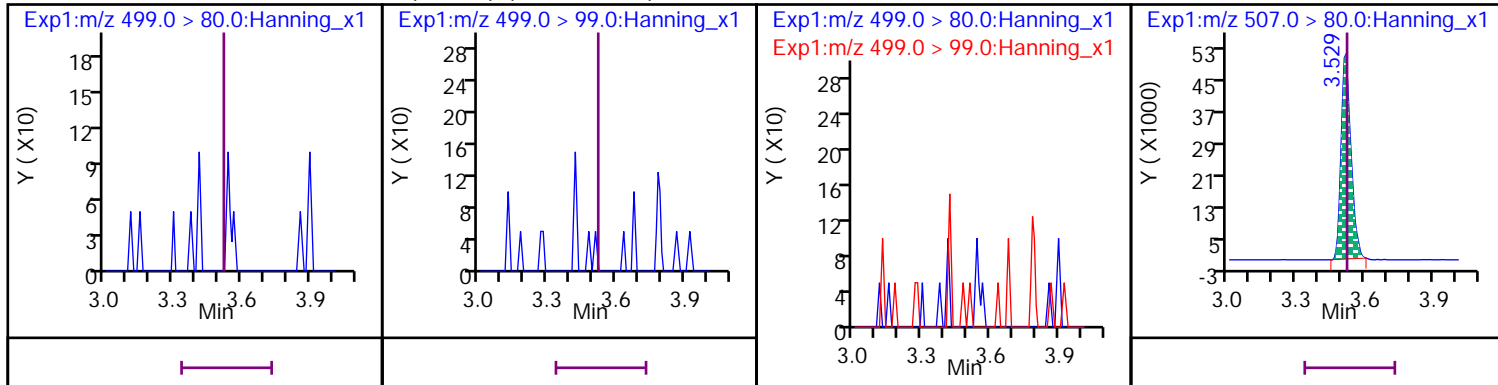
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



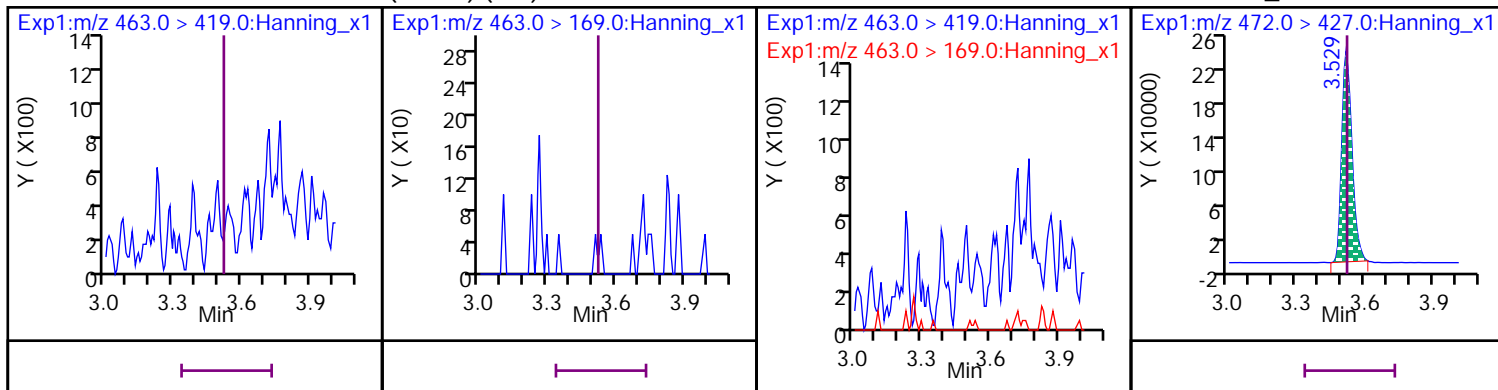
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



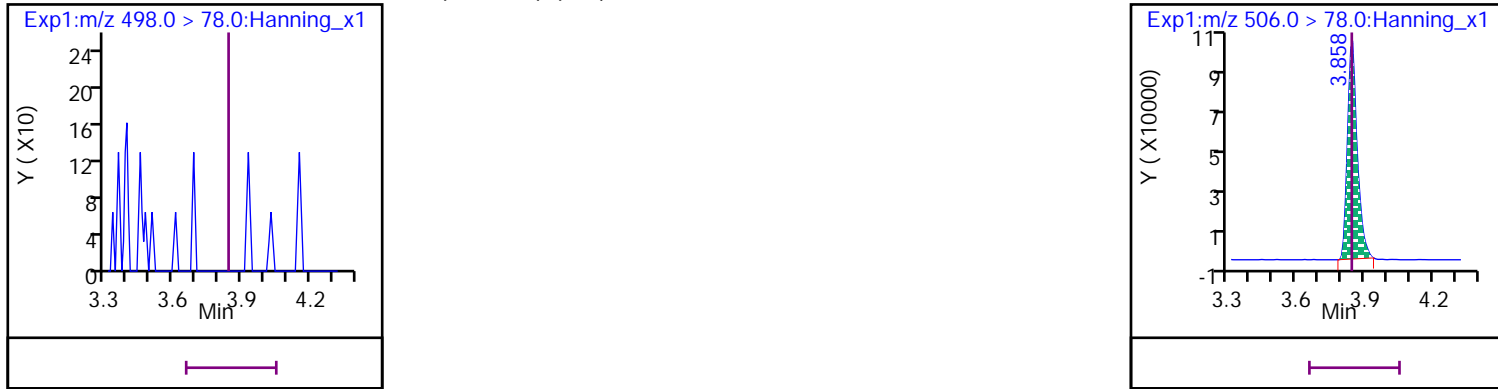
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



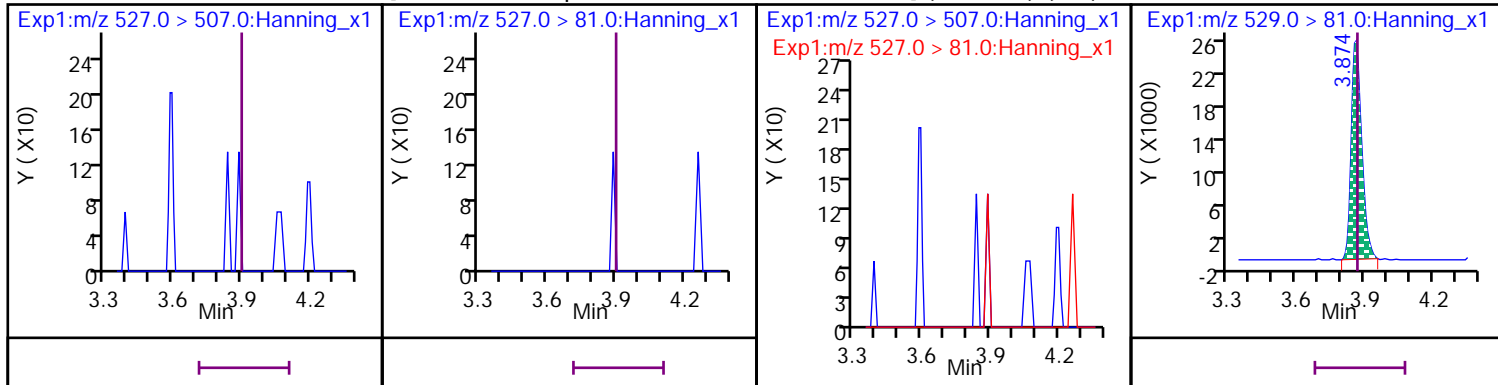
19 Perfluoro-1-octanesulfonamide (PFOSA) (ND)

D 55 13C8\_PFOSA



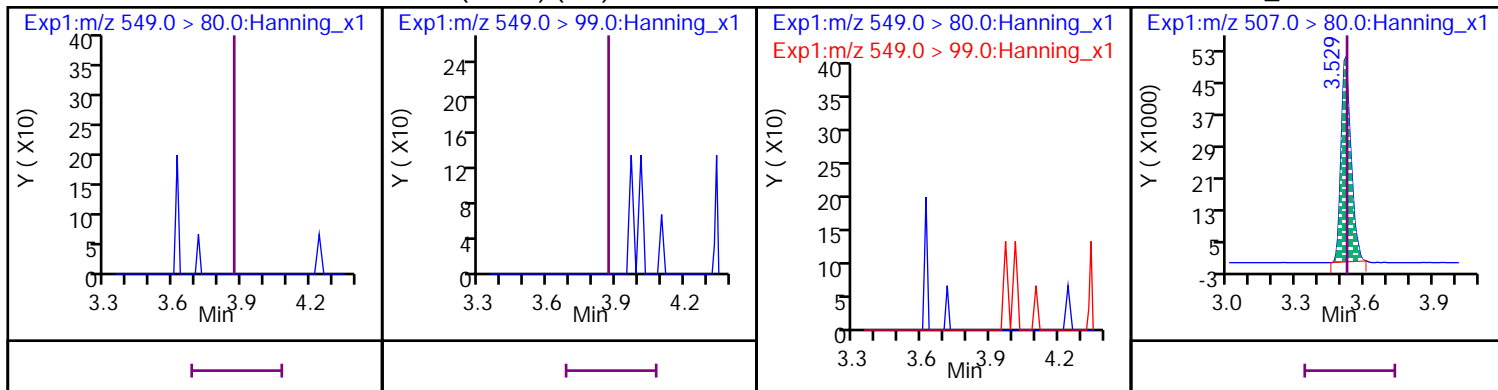
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



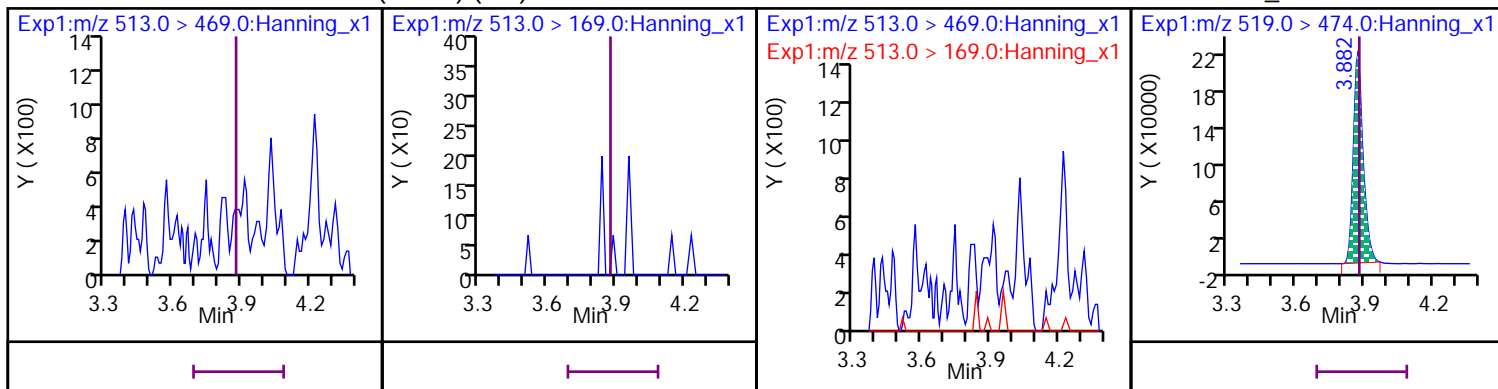
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



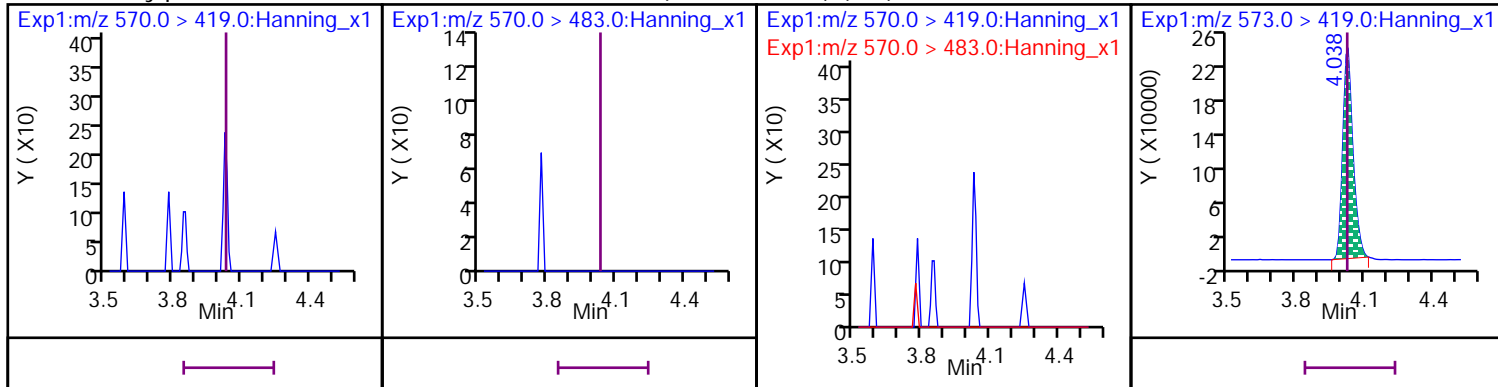
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



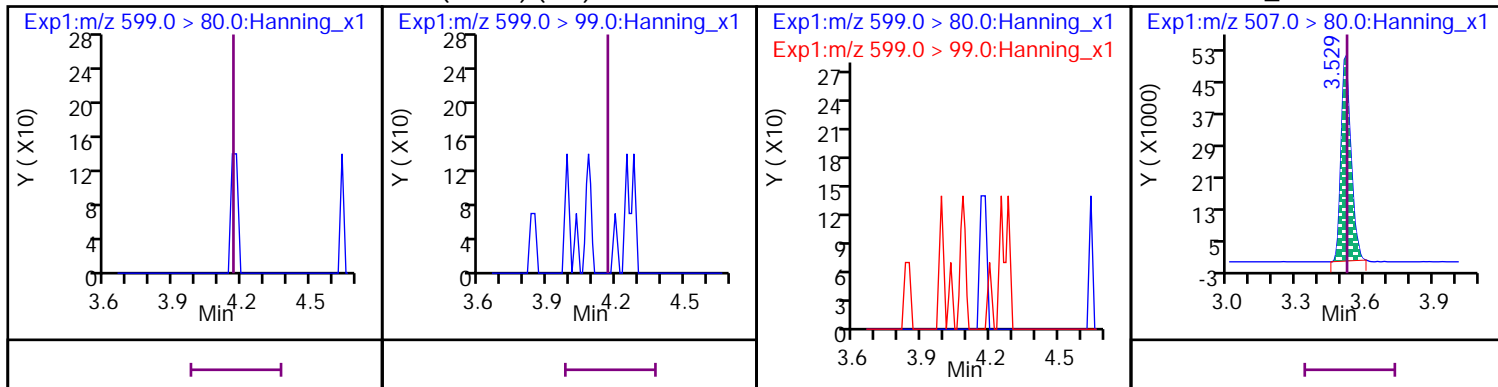
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



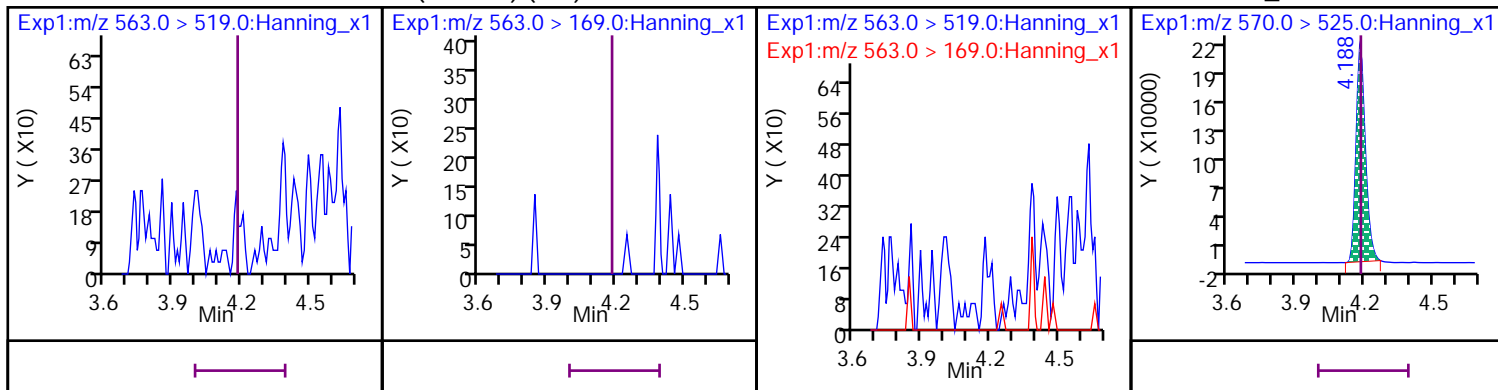
9 Perfluoro-1-decanesulfonic acid (PFDS) (ND)

D 54 13C8\_PFOS



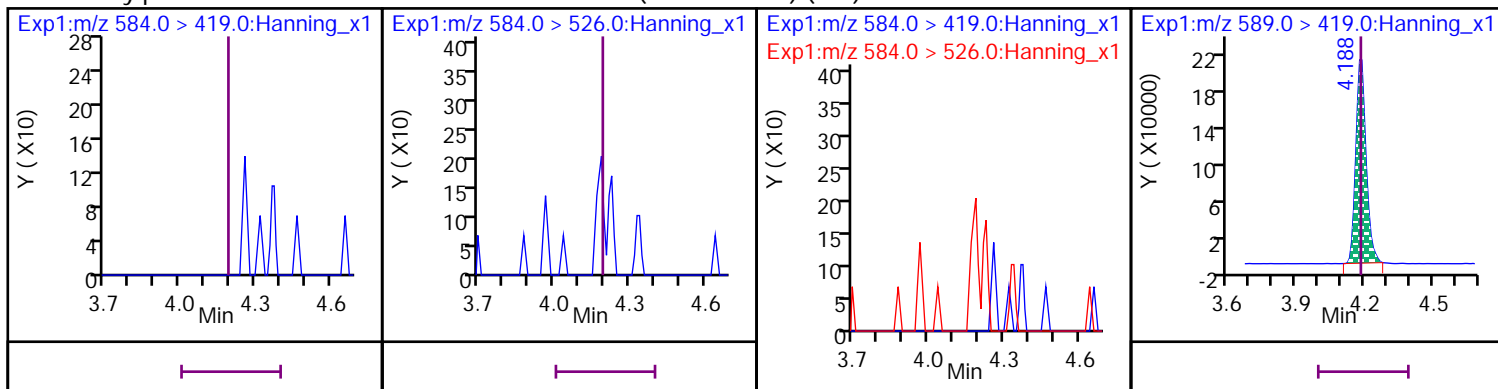
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



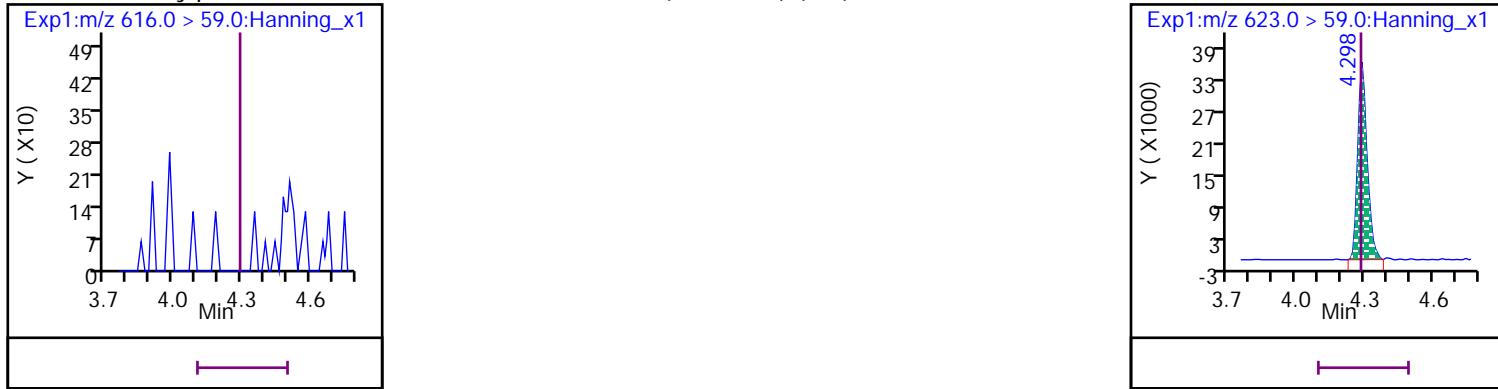
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



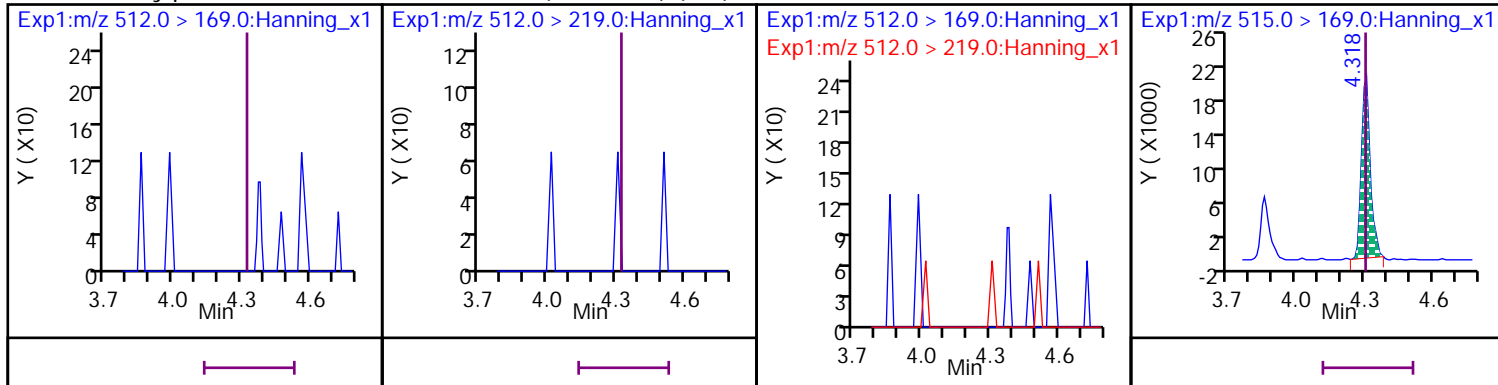
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (ND)

D 61 d7-MeFOSE

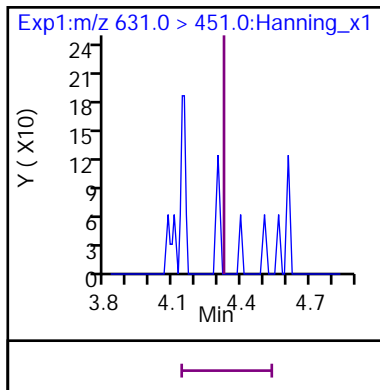


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (ND)

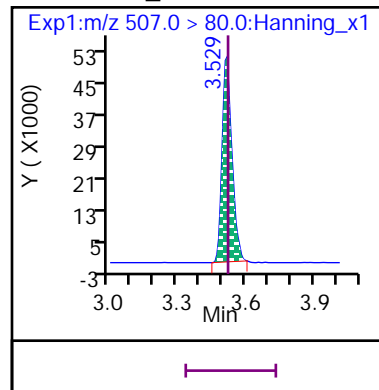
D 57 d3-MeFOSA



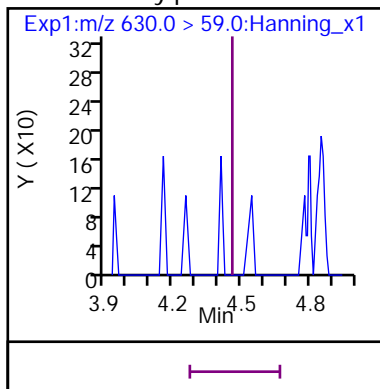
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



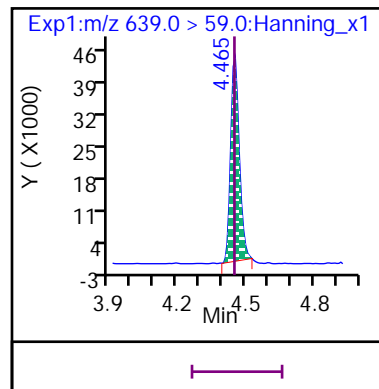
D 54 13C8\_PFOS



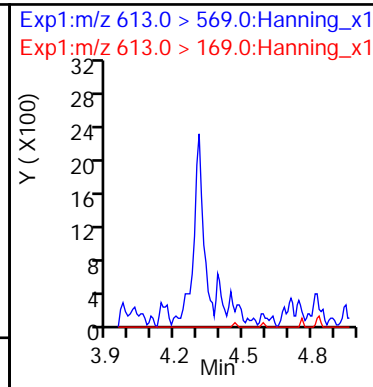
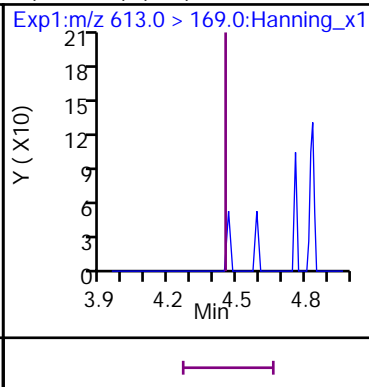
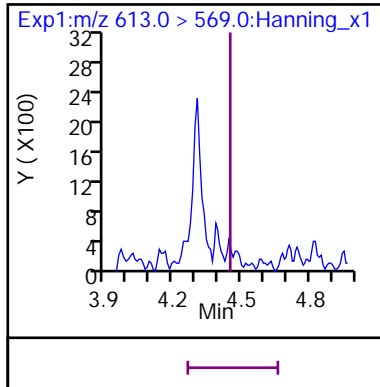
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (ND)



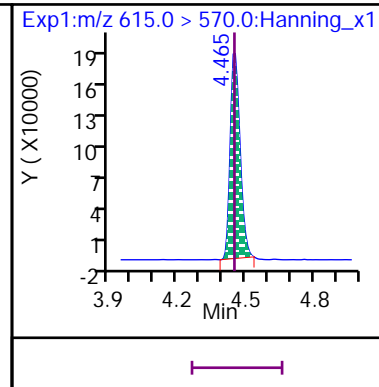
D 62 d9-EtFOSE



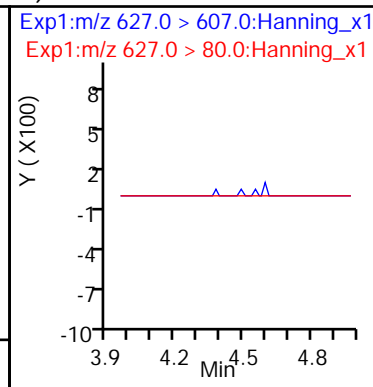
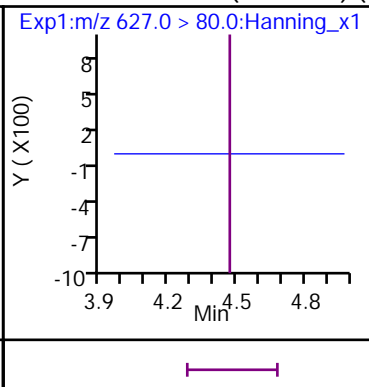
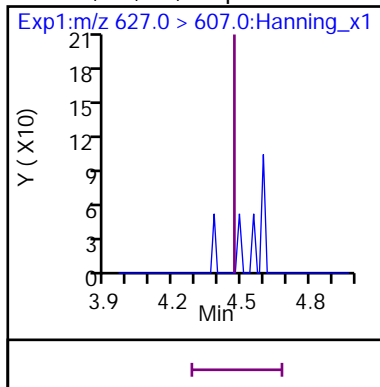
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



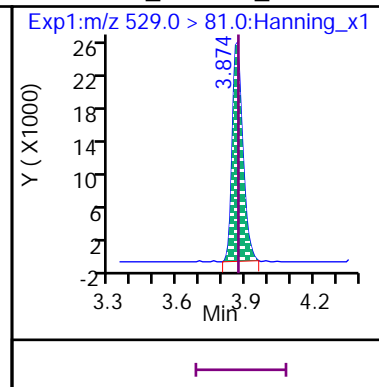
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

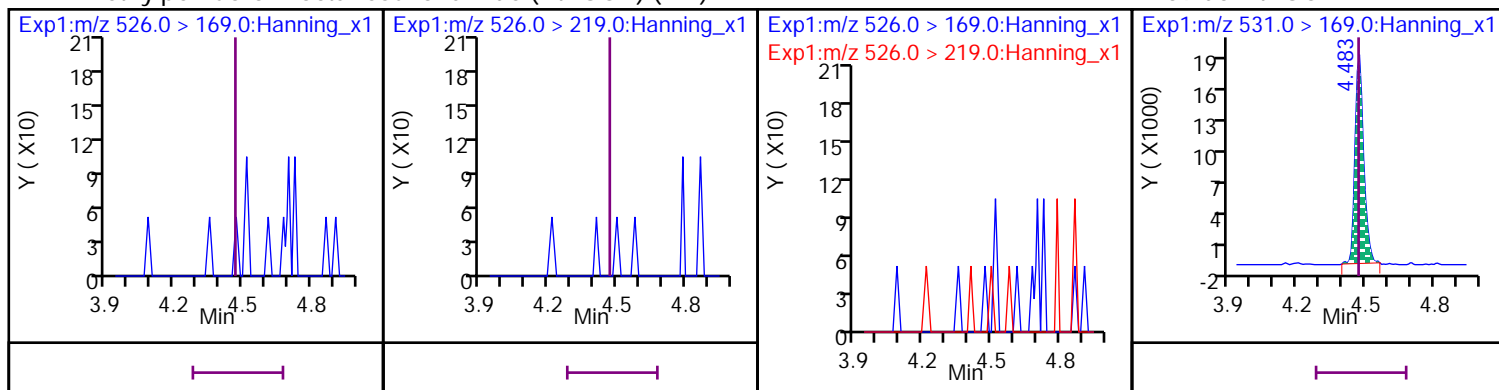


D 65 13C2\_8:2 FTS\_2



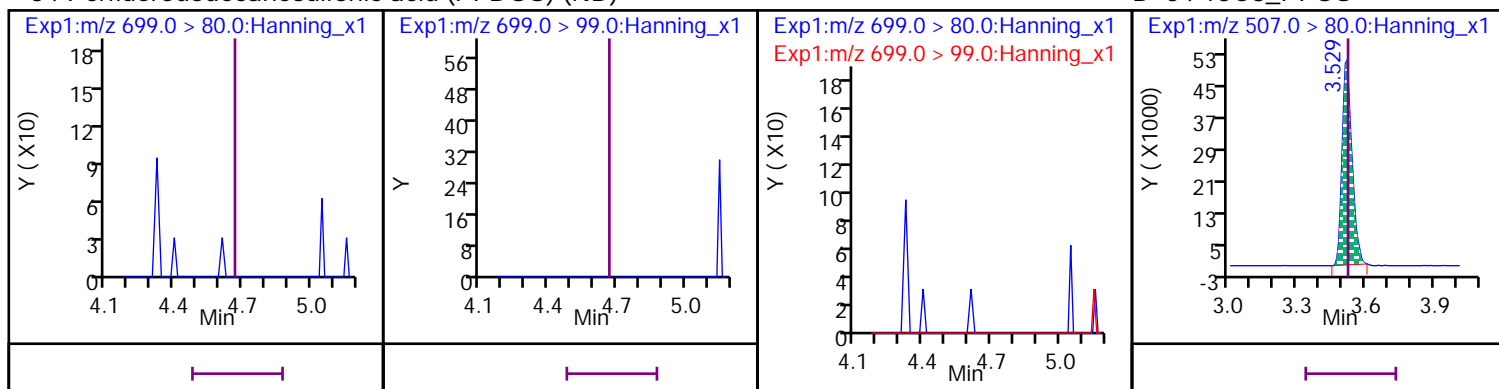
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (ND)

## D 59 d5-EtFOSA



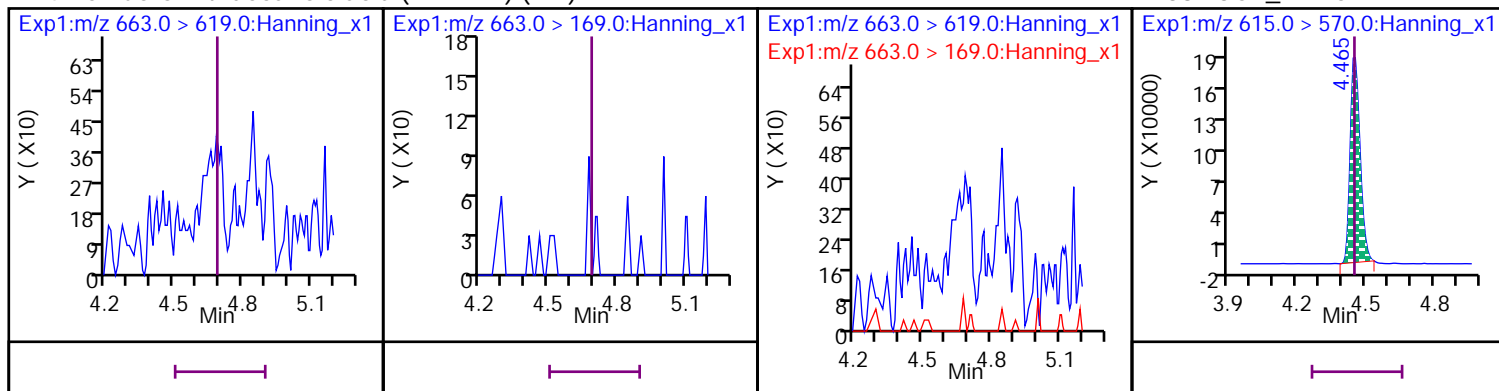
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

## D 54 13C8\_PFOS



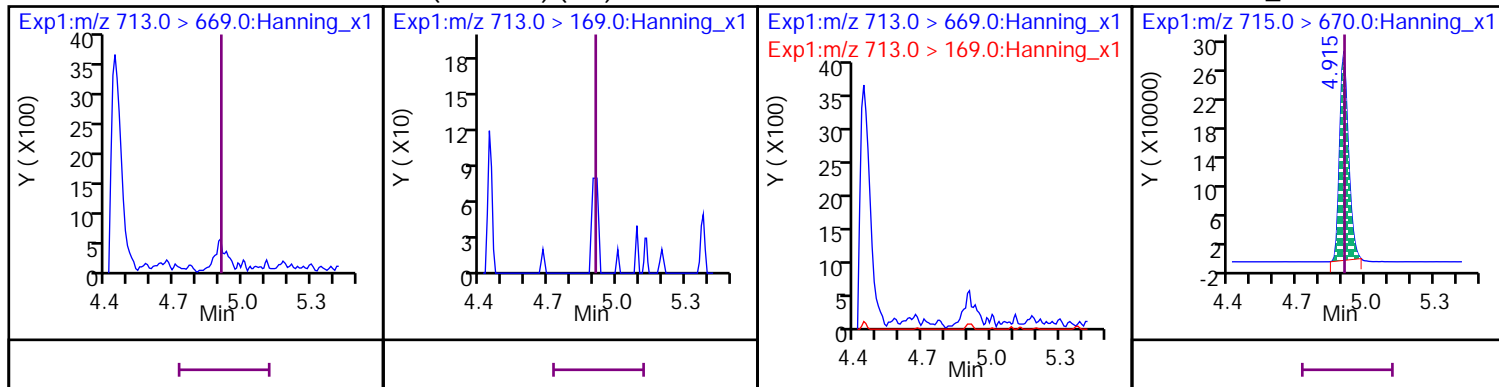
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

## D 38 13C2\_PFDaA



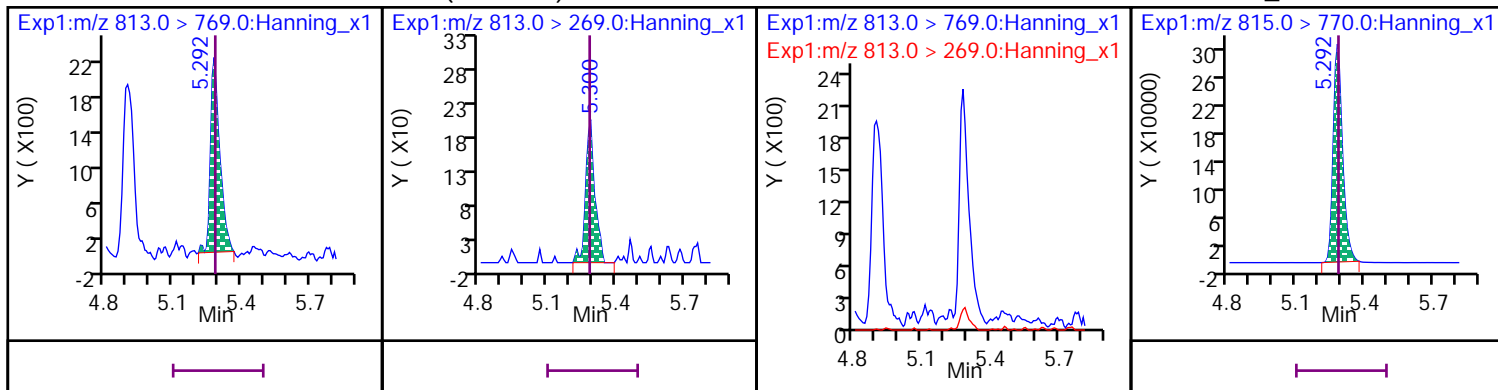
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

## D 42 13C2\_PFTeDA



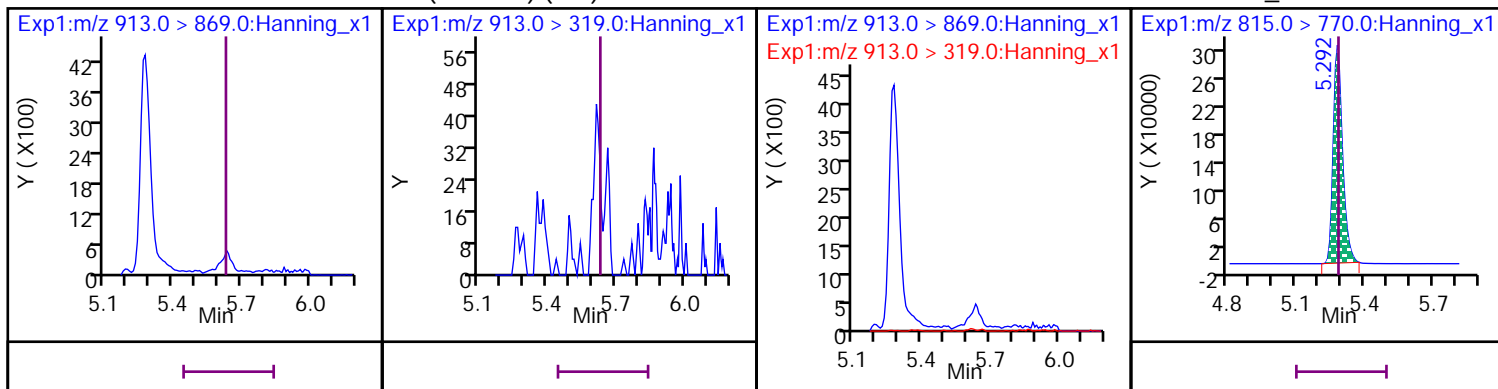
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

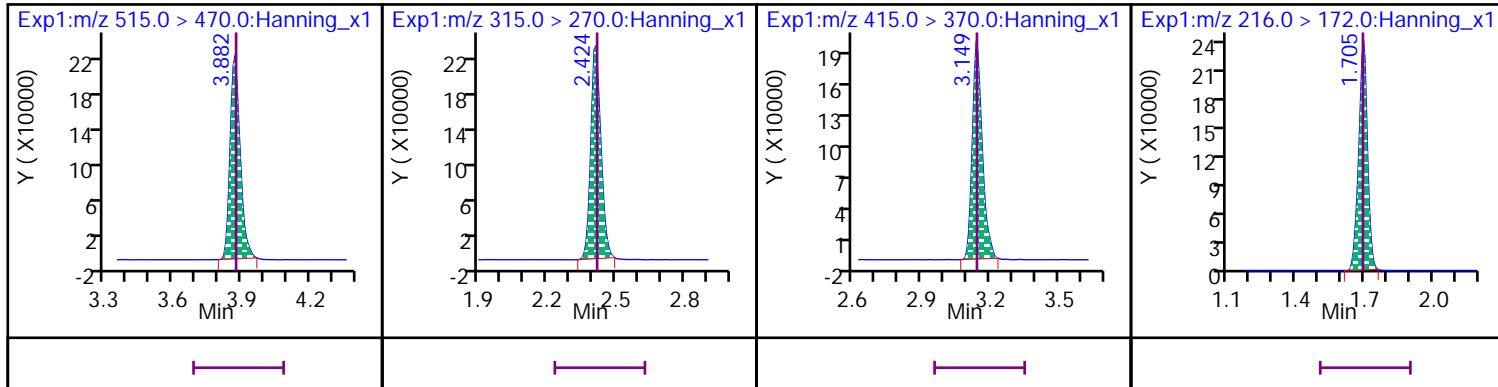


\* 37 13C2\_PFDA

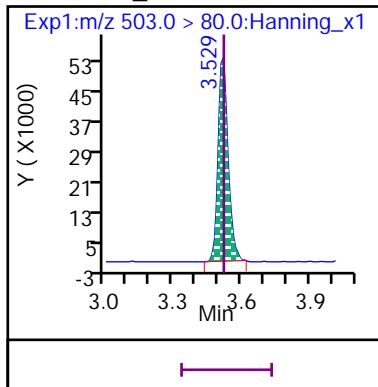
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/23/2020 1245
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/23/2020 1245

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		81	50-150
13C8_PFOS		86	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		79	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - MB

Sample ID: VQ77367-001

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320013.d  
 Injection Date: 23-Dec-2020 12:45:52 Injection Vol: 10.0 uL  
 Sample Type: MBik Auto Sampler: 5  
 Lab Sample ID: VQ77367-001 Lab Prep. Batch: 77367  
 Sample Info: VQ77367-001 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.705 1.705 1 555473 23 >100:1 1001.00 800.91 84.2

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.705 ND ND 8 U

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.077 2.077 0 585004 18 >100:1 1001.00 850.44 85.8

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 ND ND U

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.141 2.130 1 188723 18 >100:1 1001.00 819.71 80.3

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.141 ND ND U

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.389 2.389 0 122381 18 >100:1 5005.00 5055.33 84

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.425 2.425 0 628544 18 >100:1 1001.00 852.76 84.9

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.425 ND ND U

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.532 2.532 0 1255396 19 >100:1 5005.00 4713.26 90.8

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.532 ND ND U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.782 2.783 0 513094 21 >100:1 1001.00 845.79 83.8

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.783 ND ND U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.801 2.801 0 135898 20 >100:1 1001.00 793.66 73.2

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.810 ND ND U

**29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4**

377 > 251 45 2.828 ND ND U

**D 64 13C2\_6:2 FTS\_2 CAS: SESI-0105**

429 > 81 3.136 3.142 0 102737 25 >100:1 5005.00 5334.66 86.9

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.162		ND								U
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	498434	23	>100:1			1001.00	842.14	81.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.169		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	129302	21	>100:1			1001.00	862.42	85.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.553		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.751		ND								U
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													
631 > 451	54		4.349		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.545	3.553	0	651032	21	>100:1			1001.00	866.93	88.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.553		ND								U
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.867	0	260533	19				1001.00	841.61	80.6	
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.883	3.891	0	87716	20	>100:1			5005.00	4728.59	93.8	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.891		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.891	3.899	0	560651	20	>100:1			1001.00	845.20	87.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.899		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.047	4.057	0	722578	18	>100:1			5005.00	5034.01	89.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.065		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.208	0	603401	18	>100:1			5005.00	4543.18	79.1	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.228		ND								U
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.198	4.208	0	553405	17	>100:1			1001.00	875.54	84.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.218		ND								U
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.309	0	99815	18	>100:1			1001.00	922.44	96.1	
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.319	0	37133	17	26:1			1001.00	701.72	74.5	
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.474	4.467	1	107233	18	>100:1			1001.00	855.16	91.4	
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.474	4.485	0	509362	17	>100:1			1001.00	841.48	84.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38		4.476		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.719		ND								U
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.492	4.485	1	40988	18	>100:1			1001.00	834.88	78	
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.924	4.933	0	677830	19	>100:1			1001.00	804.60	86.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.933		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.300	5.318	-1	781363	20	>100:1			1001.00	862.28	87.5	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.891	3.899	0	592461	21	>100:1					81.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.425	0	617923	19	>100:1					84.7	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	516641	26	>100:1					83.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.705	1	521155	23	>100:1					85.9	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.537	3.545	0	144822	21	>100:1					90.6	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320013.d

Injection Date: 23-Dec-2020 12:45:52

Inst. ID: LCMSMS02

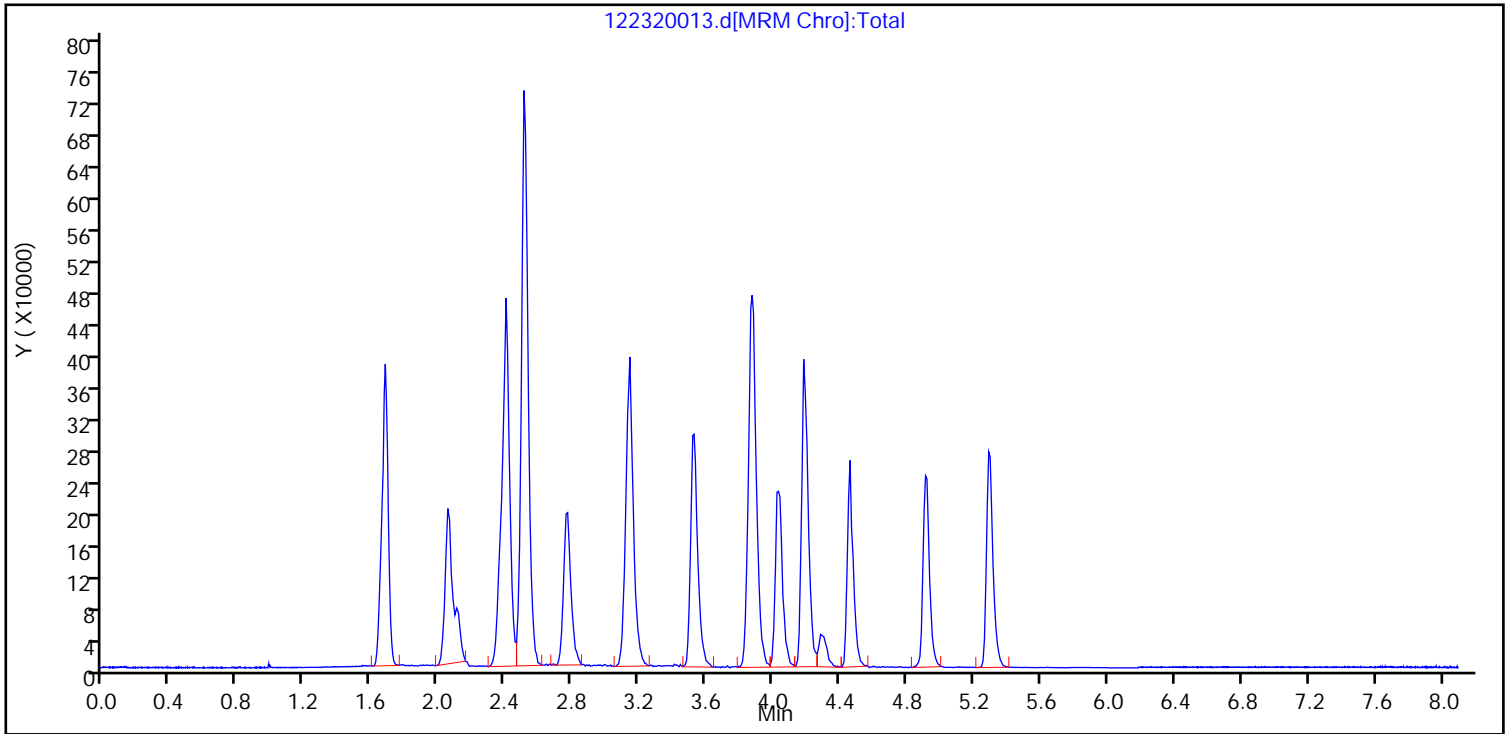
Client ID:

Lab ID: VQ77367-001

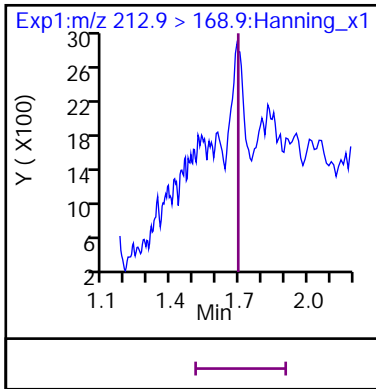
Sample Info: VQ77367-001

Dil. Factor: 1

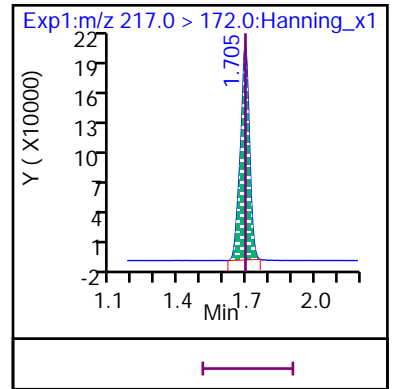
Operator: Stephen E. Somerville



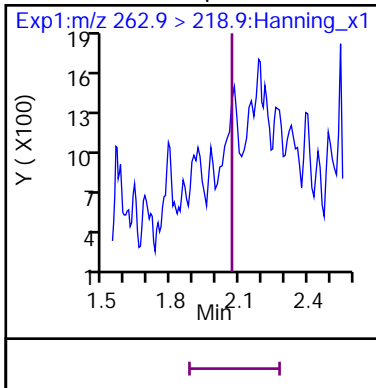
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



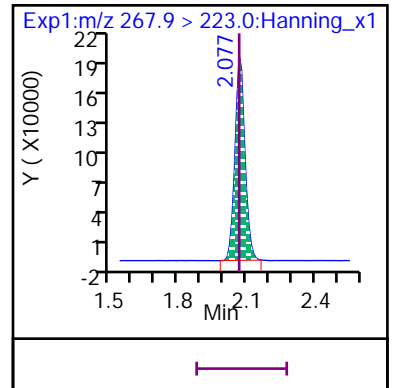
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

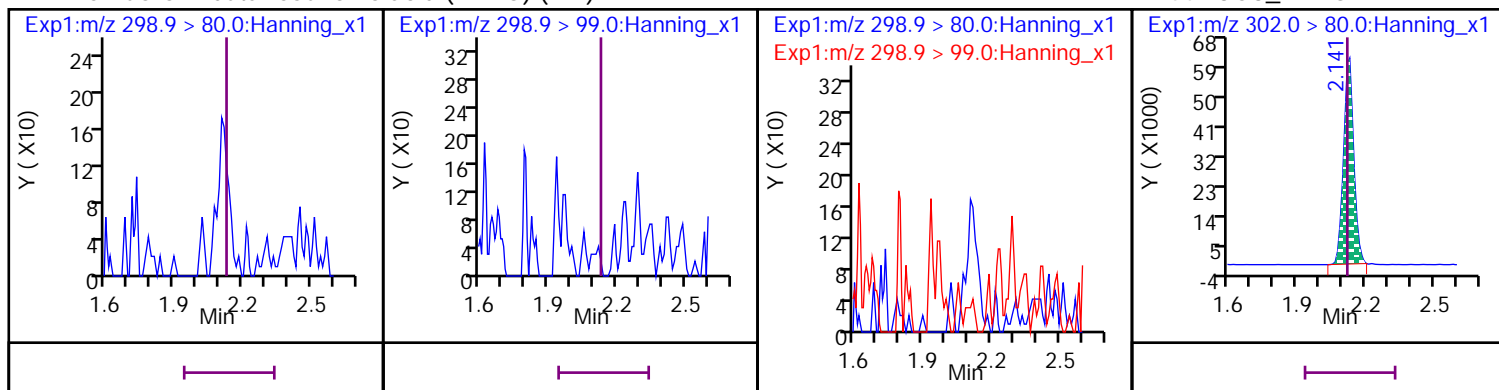


D 50 13C5\_PFPeA



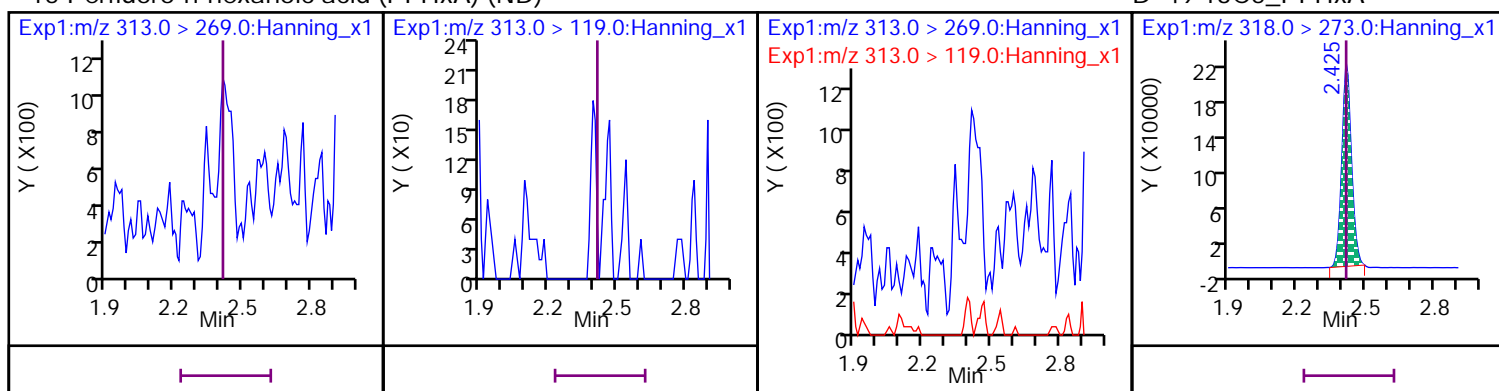
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



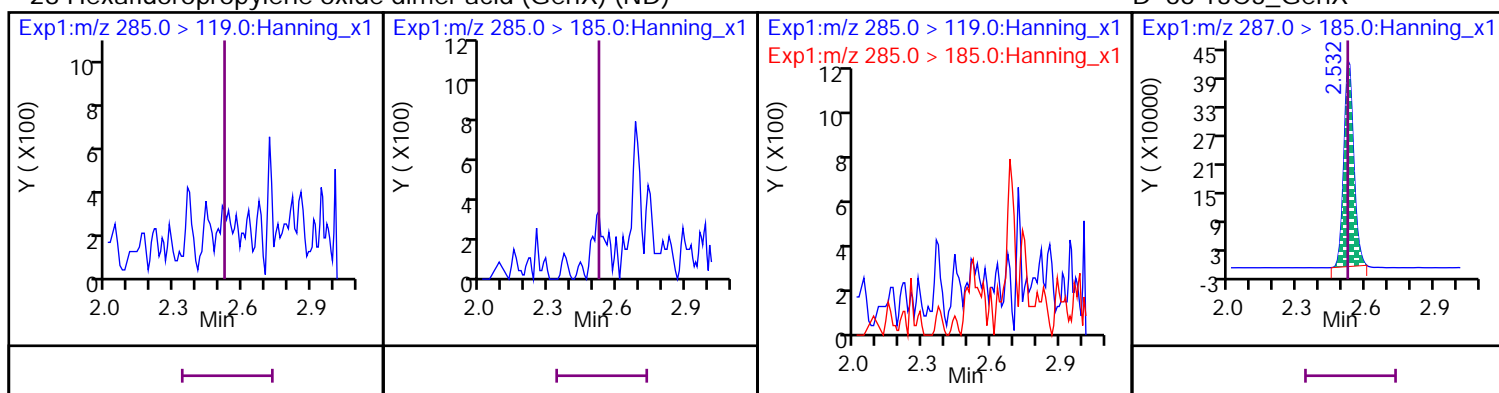
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



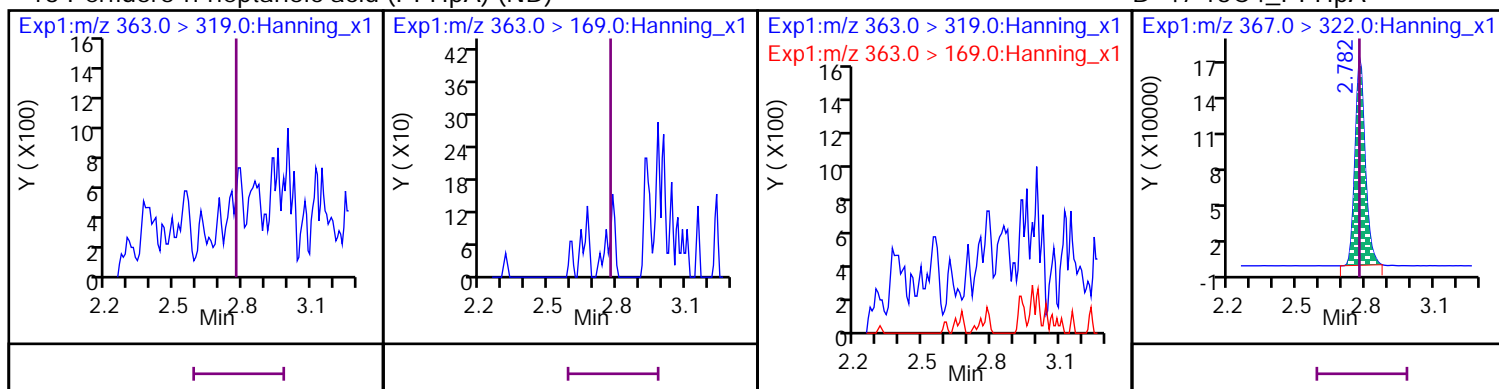
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



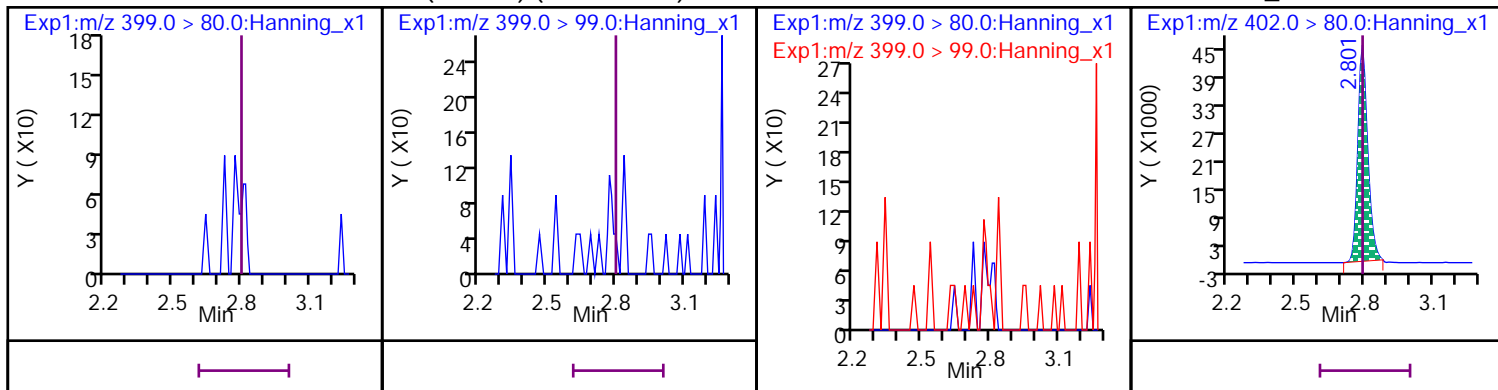
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



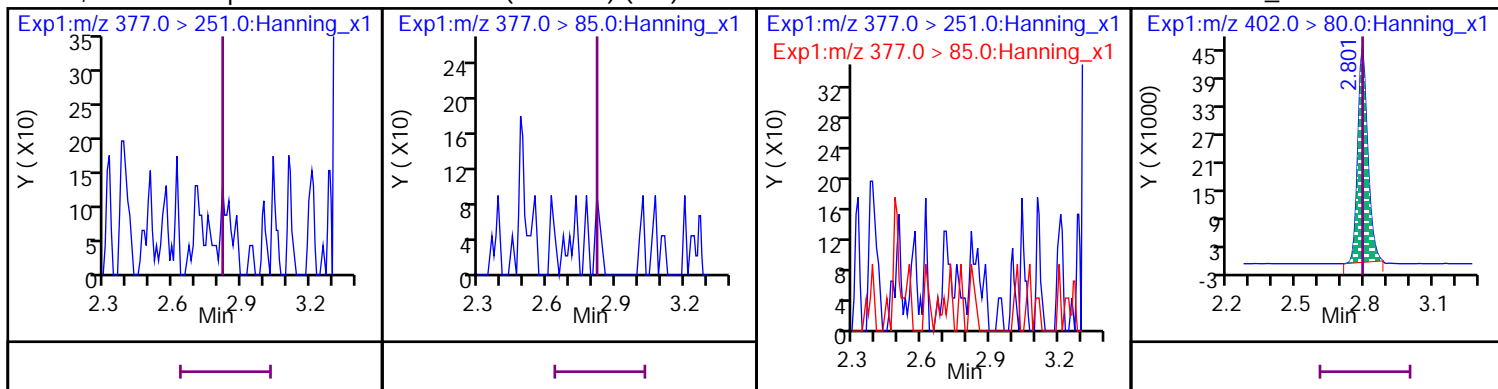
14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS



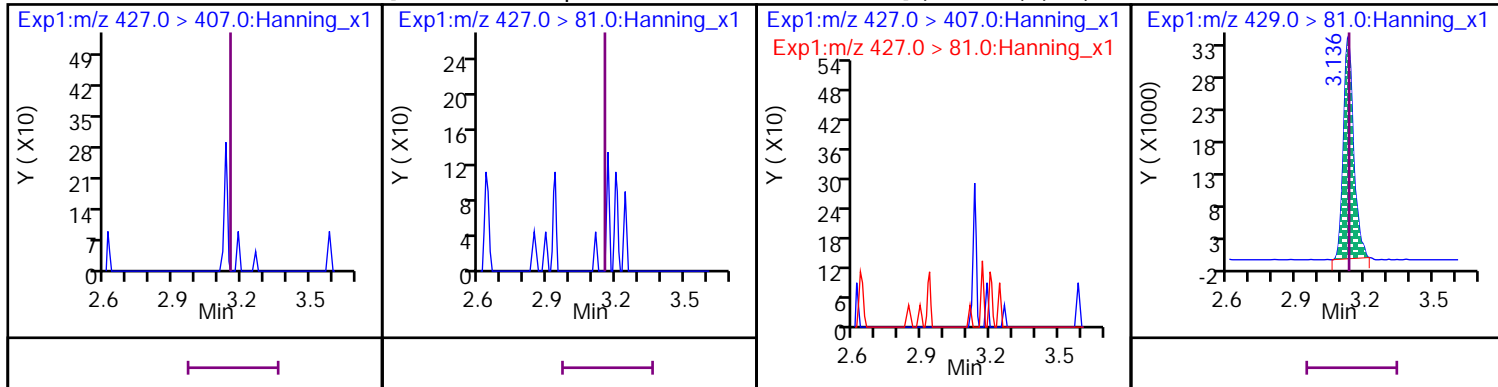
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



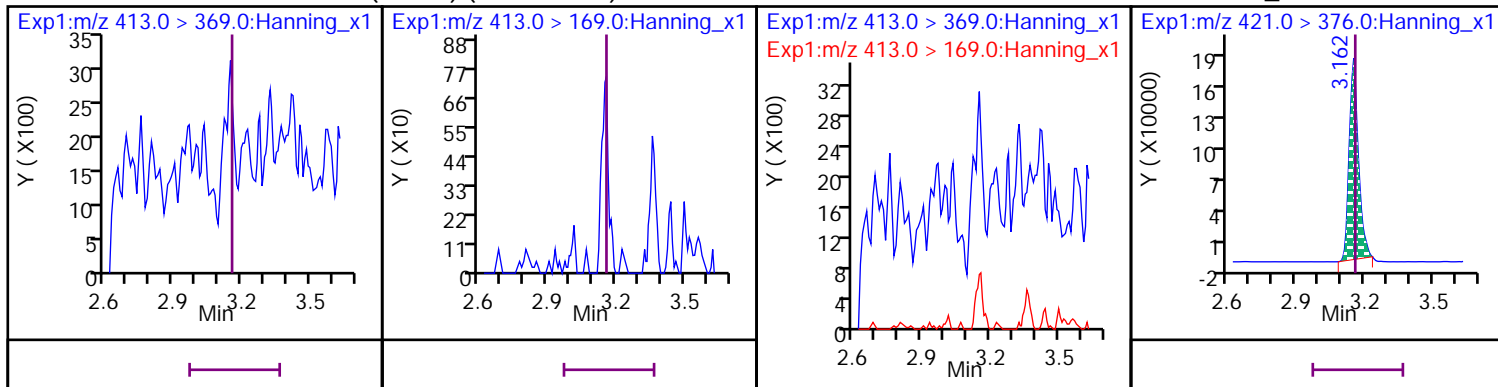
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



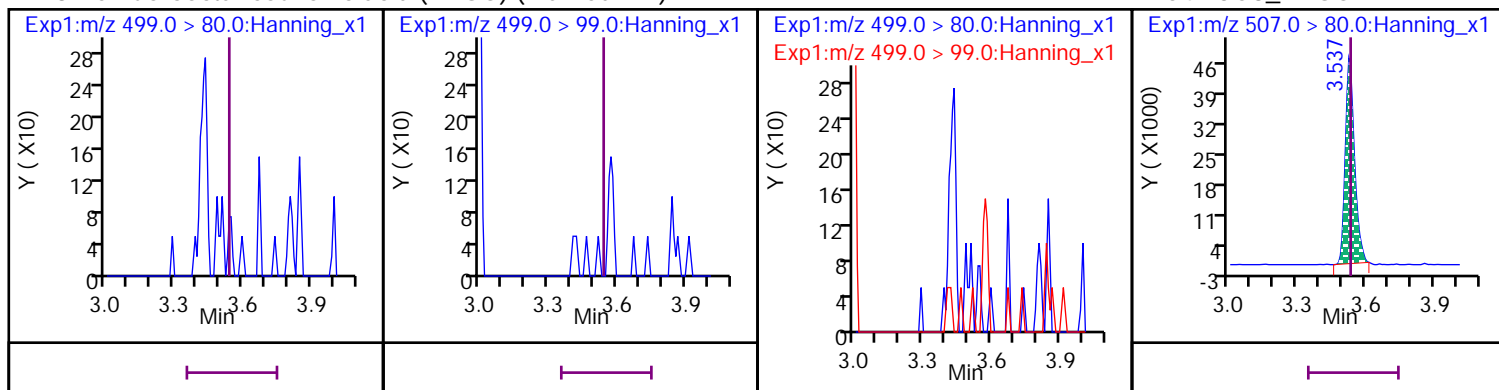
20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



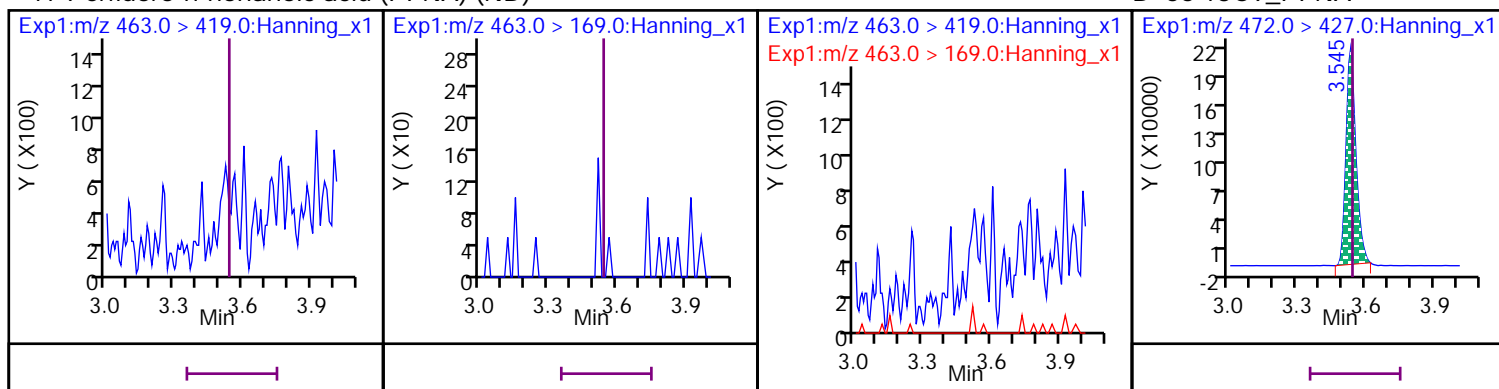
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



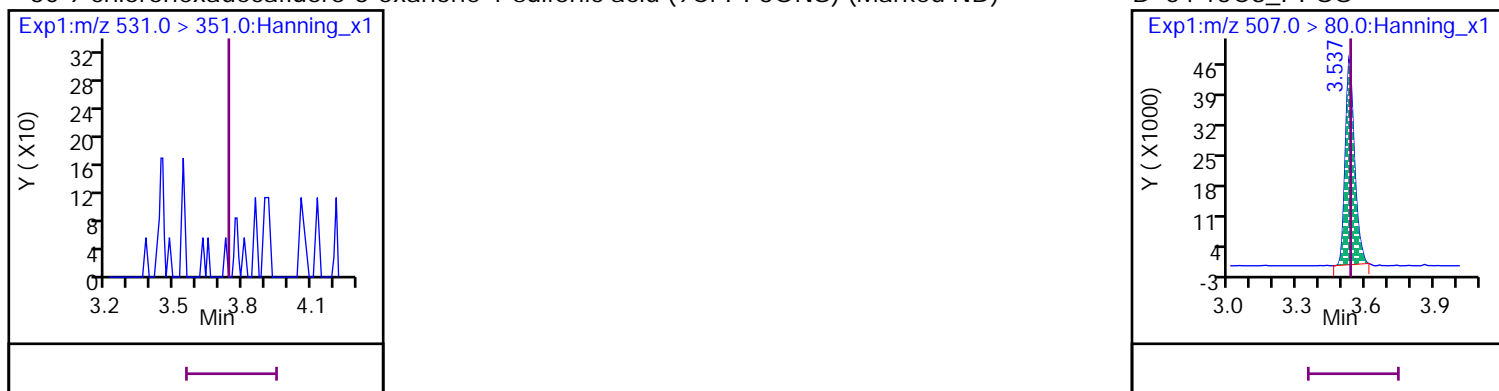
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



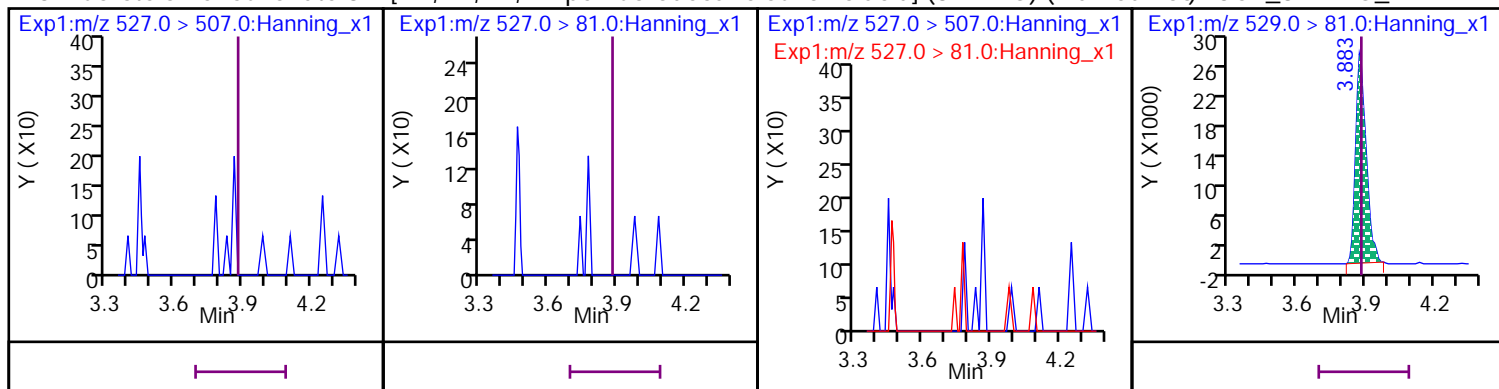
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ND)

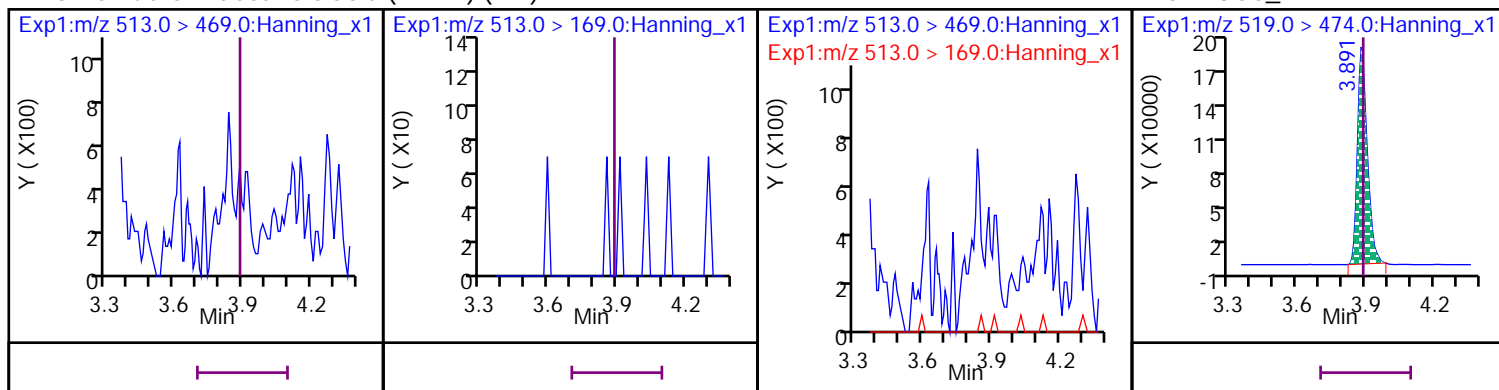
D 54 13C2\_8:2 FTS\_2





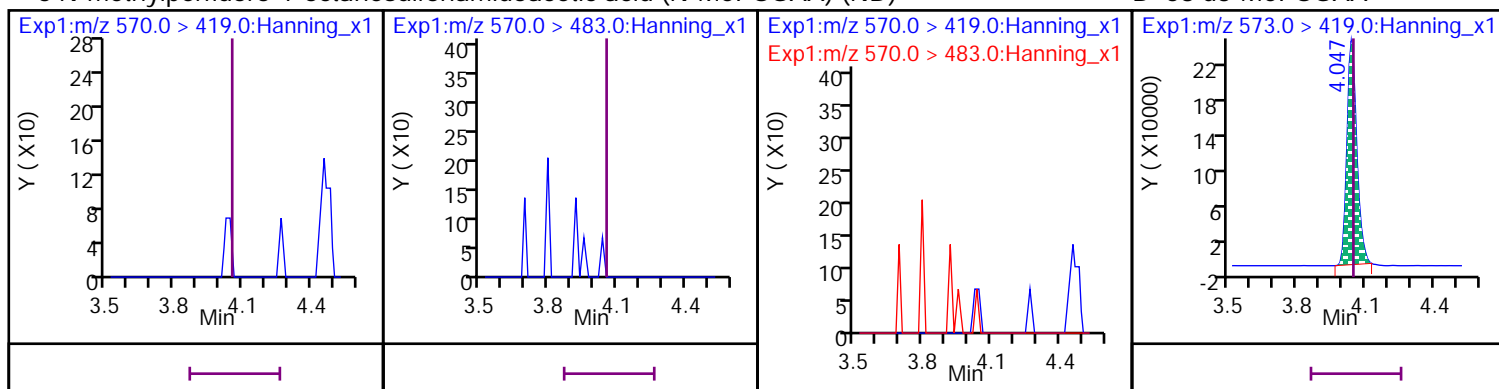
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



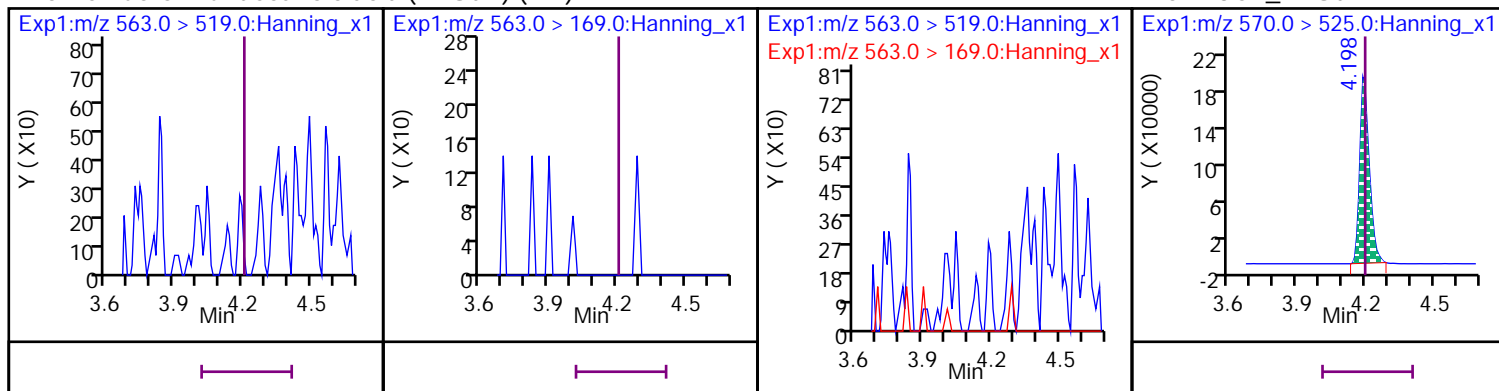
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



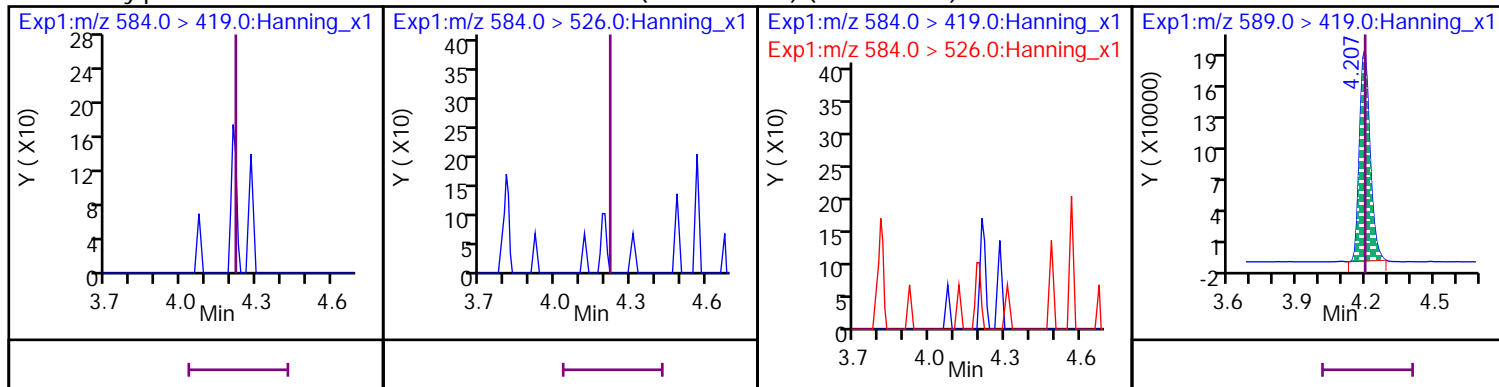
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

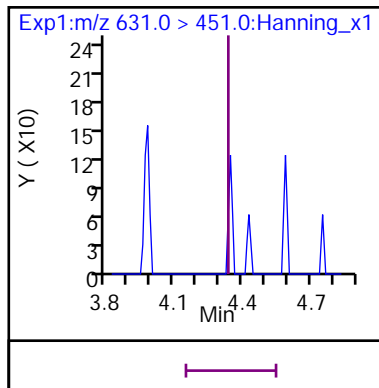


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

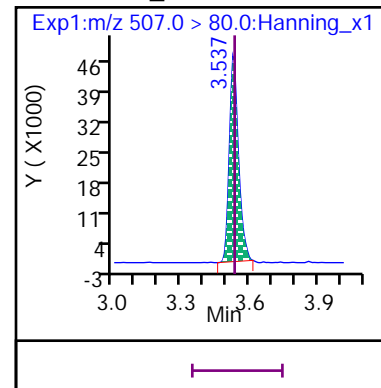
D 60 d5-EtFOSAA



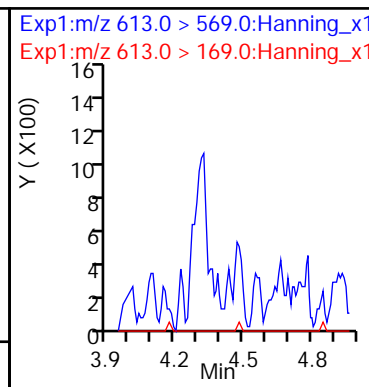
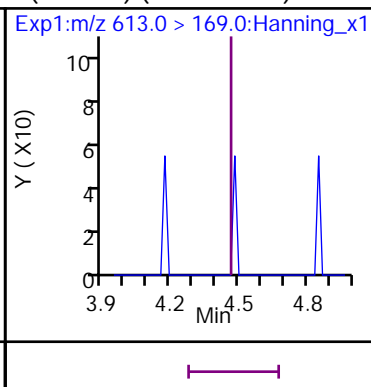
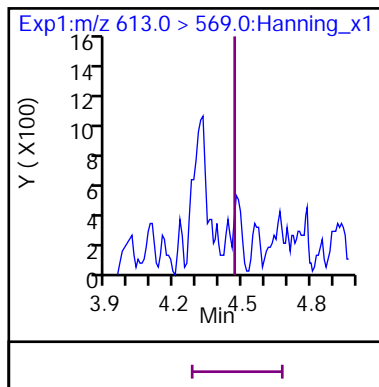
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



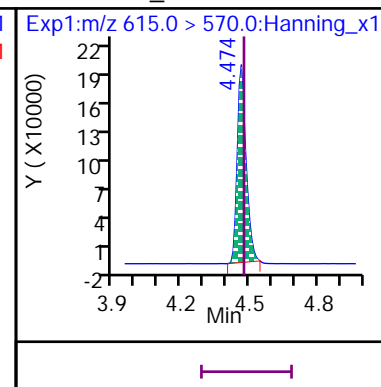
## D 54 13C8\_PFOS



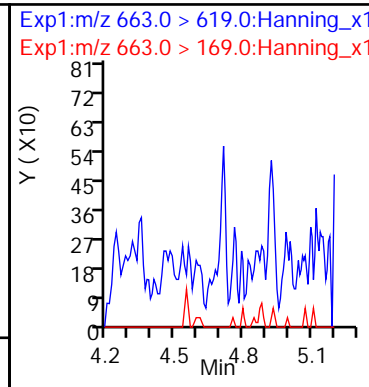
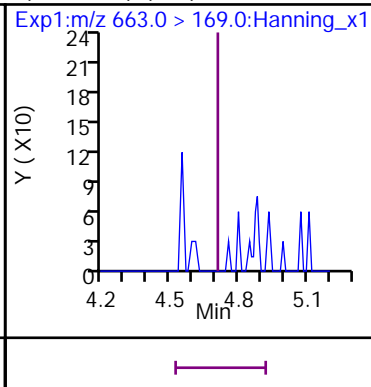
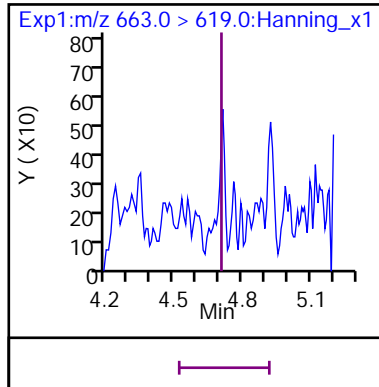
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



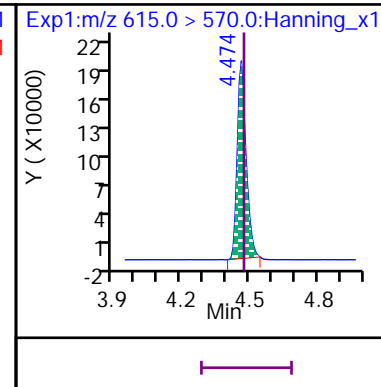
## D 38 13C2\_PFDoA



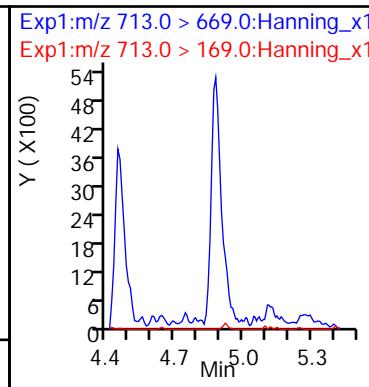
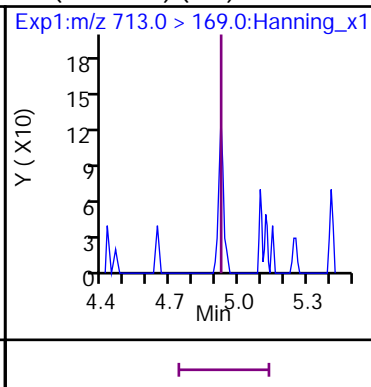
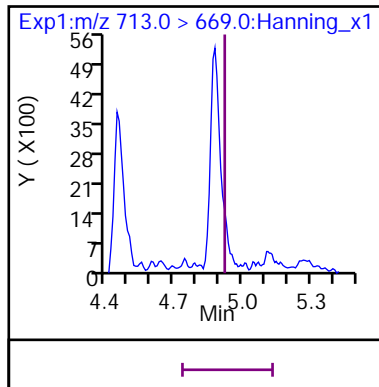
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



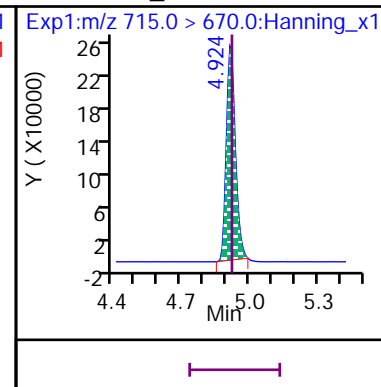
## D 38 13C2\_PFDoA



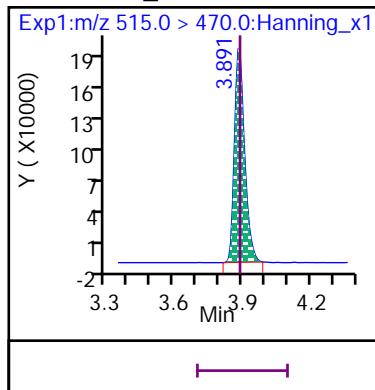
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



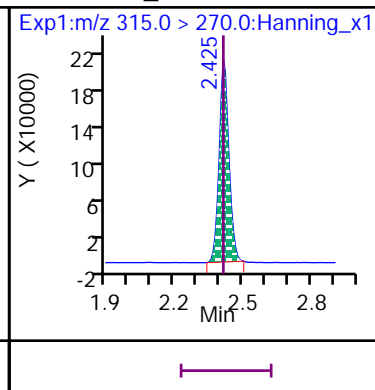
## D 42 13C2\_PFTeDA



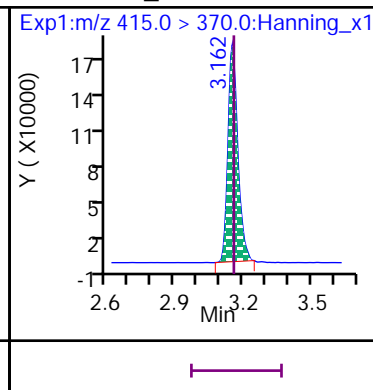
\* 37 13C2\_PFDA



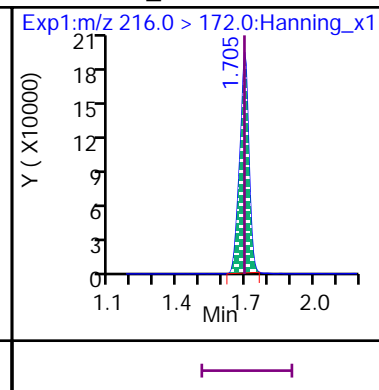
\* 39 13C2\_PFHxA



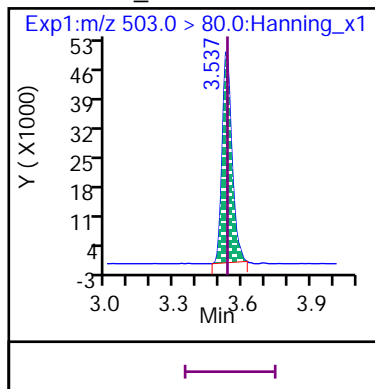
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820009.d  
Injection Date: 28-Dec-2020 10:38:17 Injection Vol: 10.0 uL  
Sample Type: MBik Auto Sampler: 1  
Lab Sample ID: VQ77741-001 Lab Prep. Batch: 77741  
Sample Info: VQ77741-001 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 624383 23 >100:1 1001.00 900.27 96.1

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.696 ND ND 1001.00 900.27 96.1 U

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.077 2.072 1 662143 17 >100:1 1001.00 962.58 99.4

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.072 ND ND 1001.00 962.58 99.4 U

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 213409 16 >100:1 1001.00 926.94 89.6

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.125 ND ND 1001.00 926.94 89.6 U

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.379 1 124651 20 >100:1 5005.00 5149.10 86.5

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.415 2.423 0 709136 19 >100:1 1001.00 962.10 95.4

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.423 ND ND 1001.00 962.10 95.4 U

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.531 2.530 1 1432072 20 >100:1 5005.00 5376.57 102

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND 1001.00 5376.57 102 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 596955 19 >100:1 1001.00 984.02 94.2

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 ND ND 1001.00 984.02 94.2 U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 153626 20 >100:1 1001.00 897.20 88.2

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.790 ND ND 1001.00 897.20 88.2 U

**29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4**

377 > 251 45 2.808 ND ND 1001.00 897.20 88.2 U

**D 64 13C2\_6:2 FTS\_2 CAS: SESI-0105**

429 > 81 3.122 3.114 1 103313 23 >100:1 5005.00 5364.57 99

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.128		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	582299	22	>100:1			1001.00	983.84	92.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													U
413 > 369	53		3.148		ND								
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	130102	21	>100:1			1001.00	867.76	85.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													U
499 > 80	54		3.520		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUs) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	746365	21	>100:1			1001.00	993.88	97.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.851	3.849	1	311458	20	>100:1			1001.00	1006.12	101	
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.859	3.857	1	87372	18				5005.00	4710.05	87	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.867	3.865	1	669340	20	>100:1			1001.00	1009.06	99.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.020	4.029	0	770662	19	>100:1			5005.00	5368.99	97.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	665043	19	>100:1			5005.00	5007.30	90.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	590298	20	>100:1			1001.00	933.91	91.7	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	100797	16	>100:1			1001.00	931.51	95.6	
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.309	4.307	1	41967	16	>100:1			1001.00	793.07	81	
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.458	4.455	1	123079	19	>100:1			1001.00	981.53	89.8	
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.449	4.455	0	574510	19	>100:1			1001.00	949.11	94	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.476	4.473	1	41291	20	>100:1			1001.00	841.05	82.1	
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.900	4.906	0	749903	18	>100:1			1001.00	890.15	92.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.284	5.282	1	821262	19	>100:1			1001.00	906.31	87.8	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.867	3.873	0	713455	20	>100:1					97.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	757700	19	>100:1					104	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	636826	24	>100:1					106	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	620234	23	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	169241	23	>100:1					104	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit



Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820009.d

Injection Date: 28-Dec-2020 10:38:17

Inst. ID: LCMSMS02

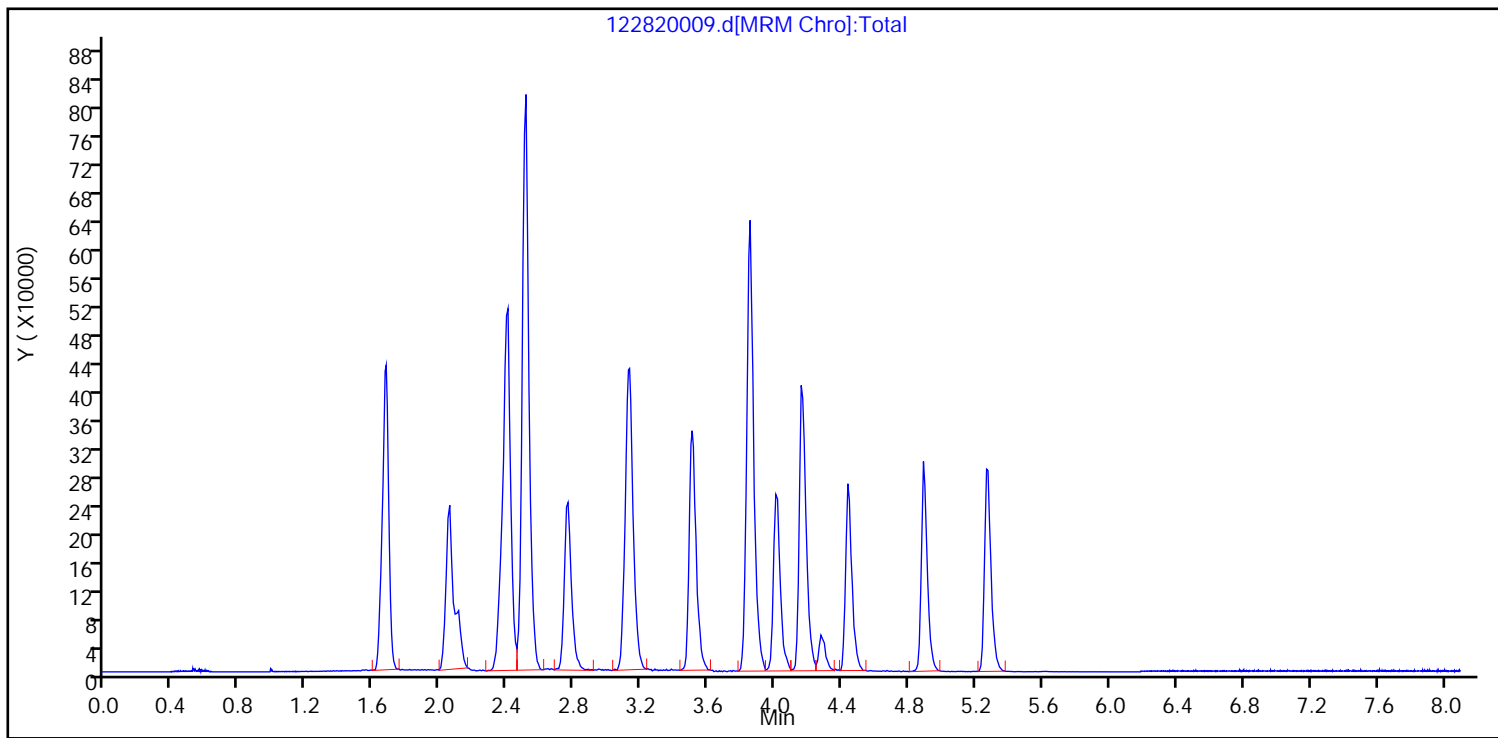
Client ID:

Lab ID: VQ77741-001

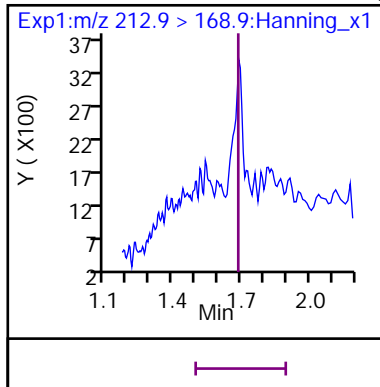
Sample Info: VQ77741-001

Dil. Factor: 1

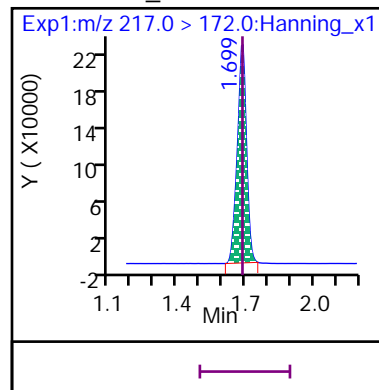
Operator: Matthew M. Miller



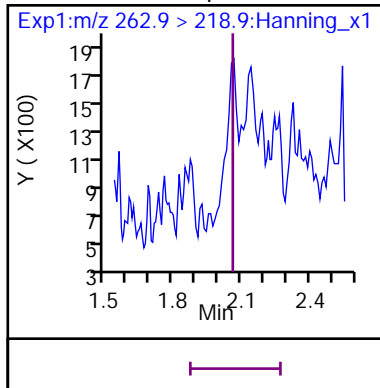
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



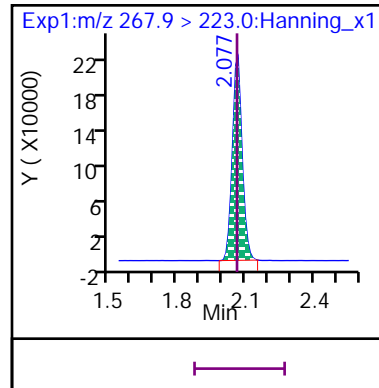
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

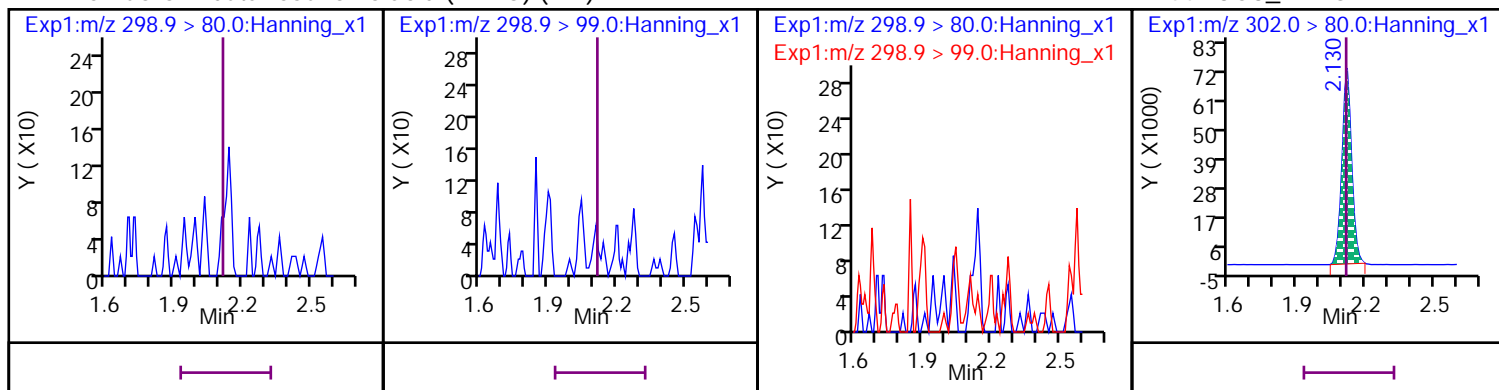


D 50 13C5\_PFPeA



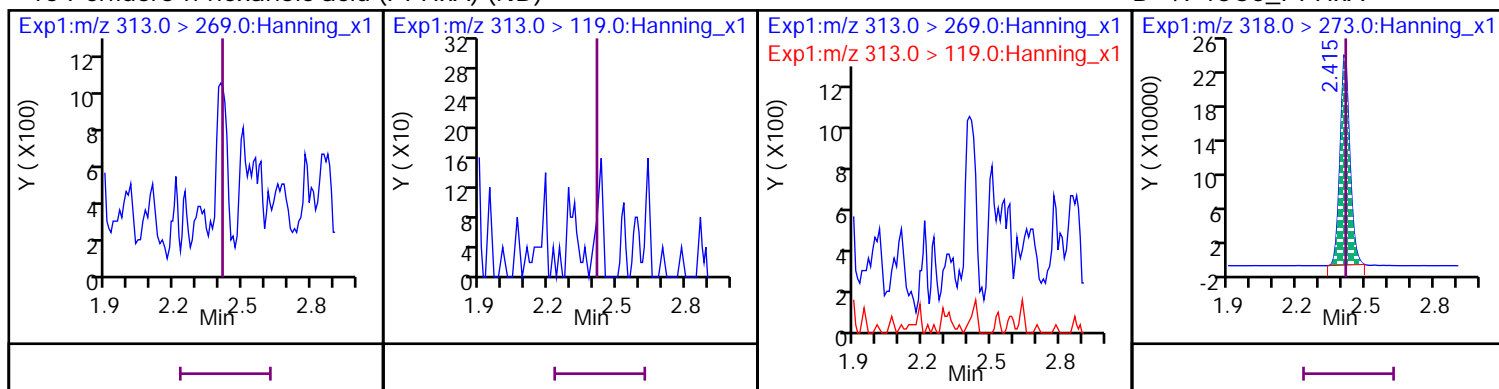
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



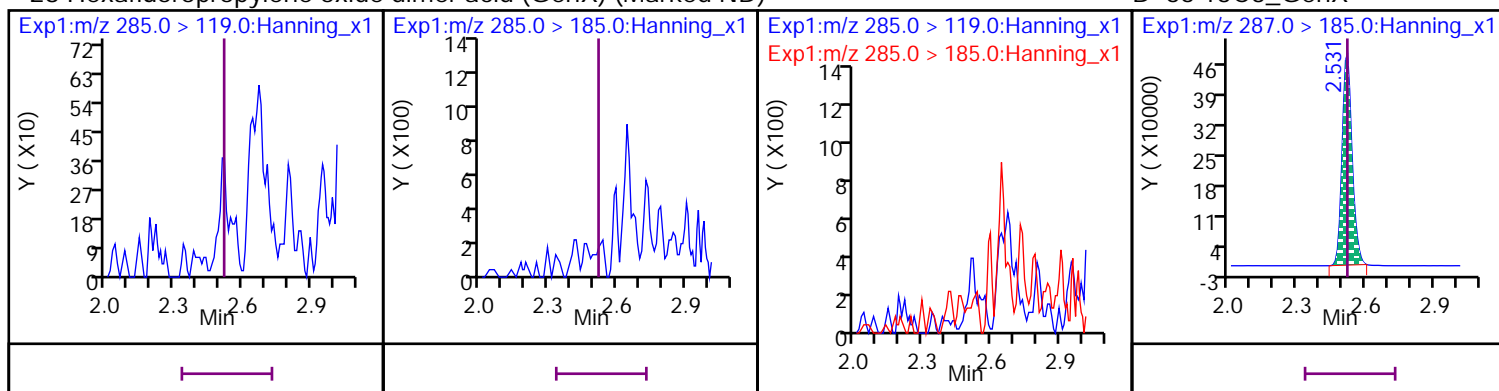
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



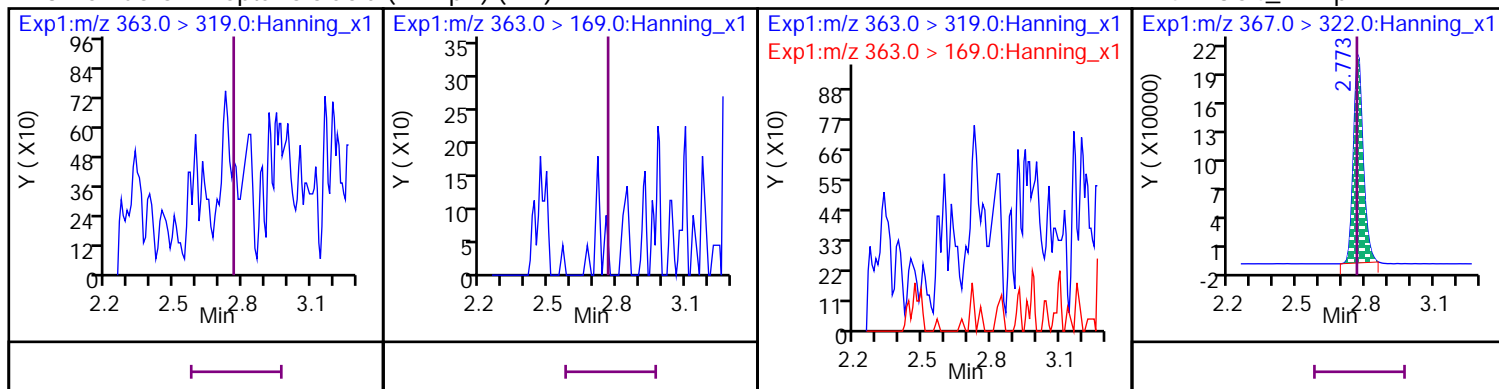
28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



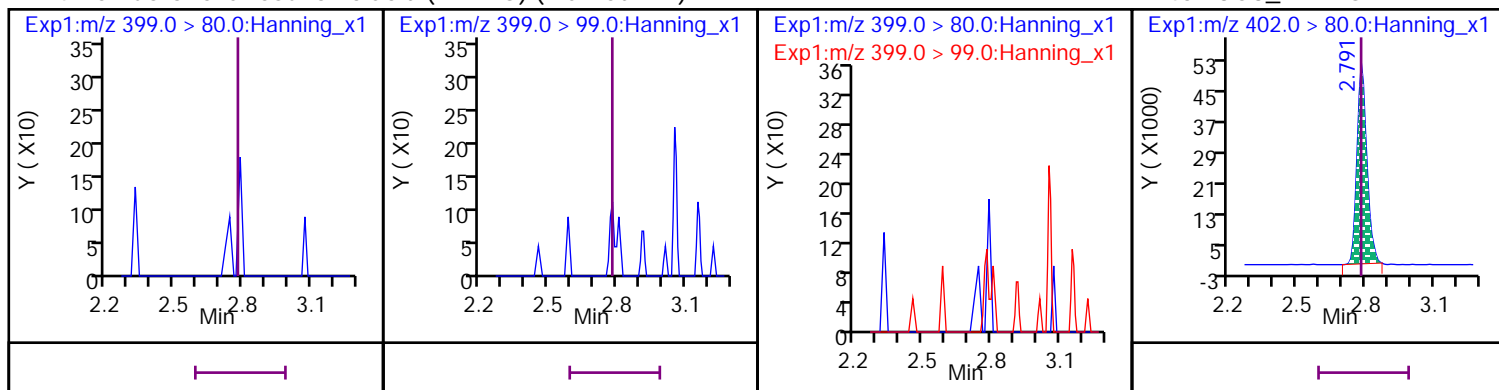
13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



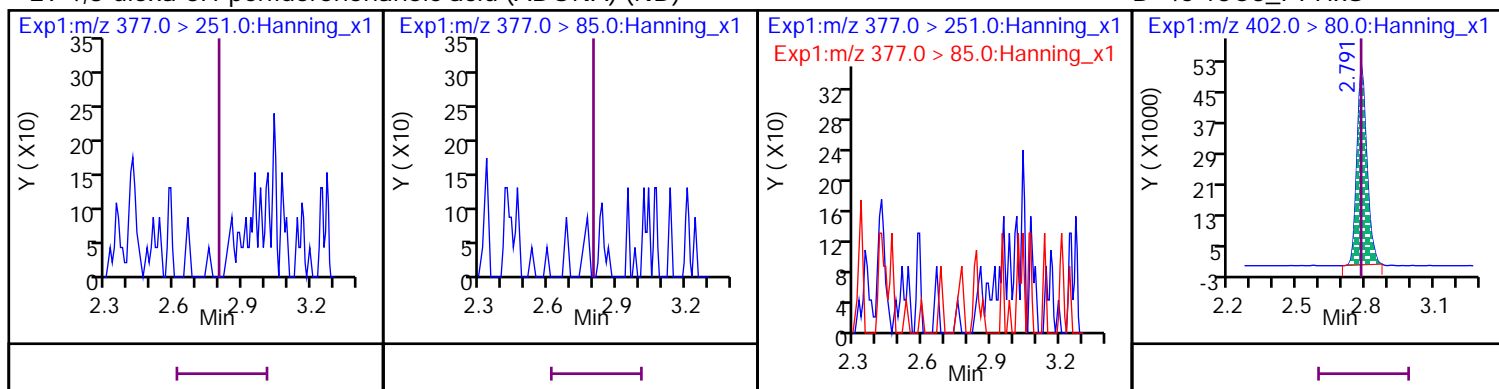
## 14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS



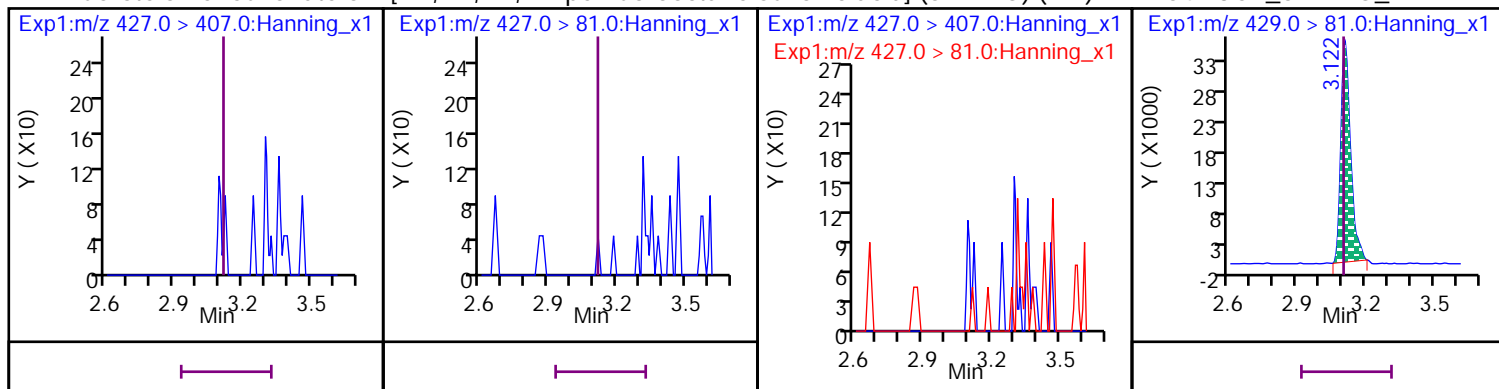
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



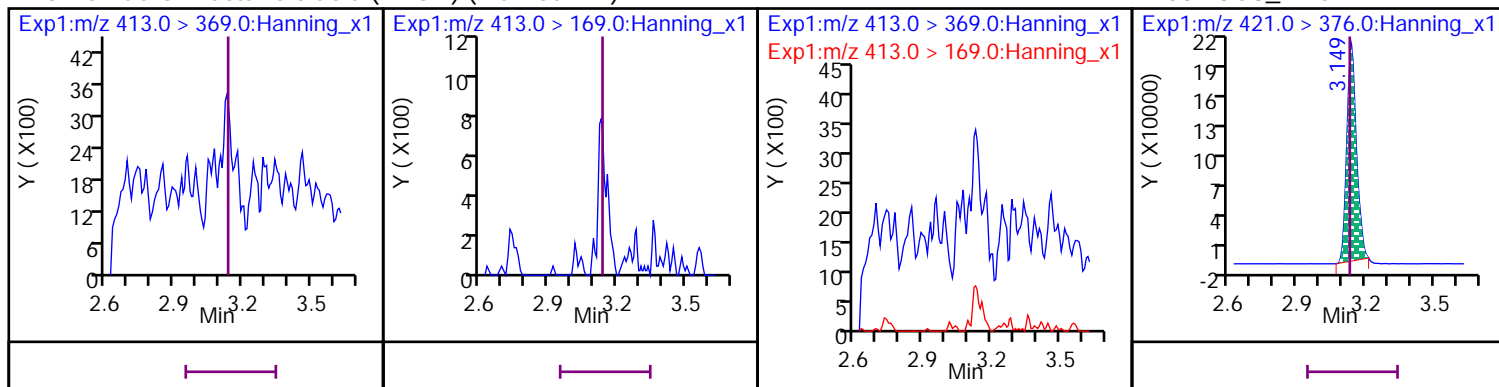
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



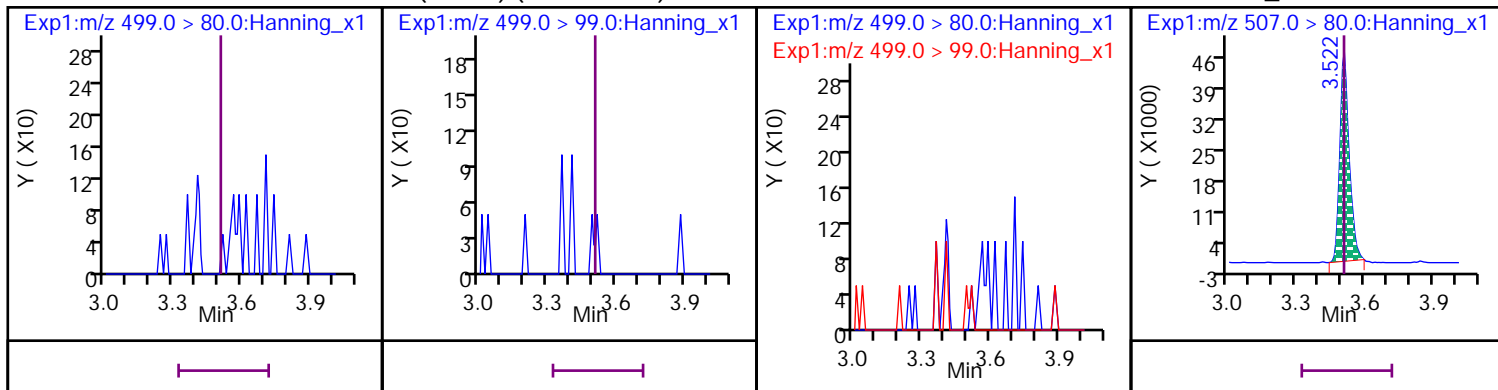
## 20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



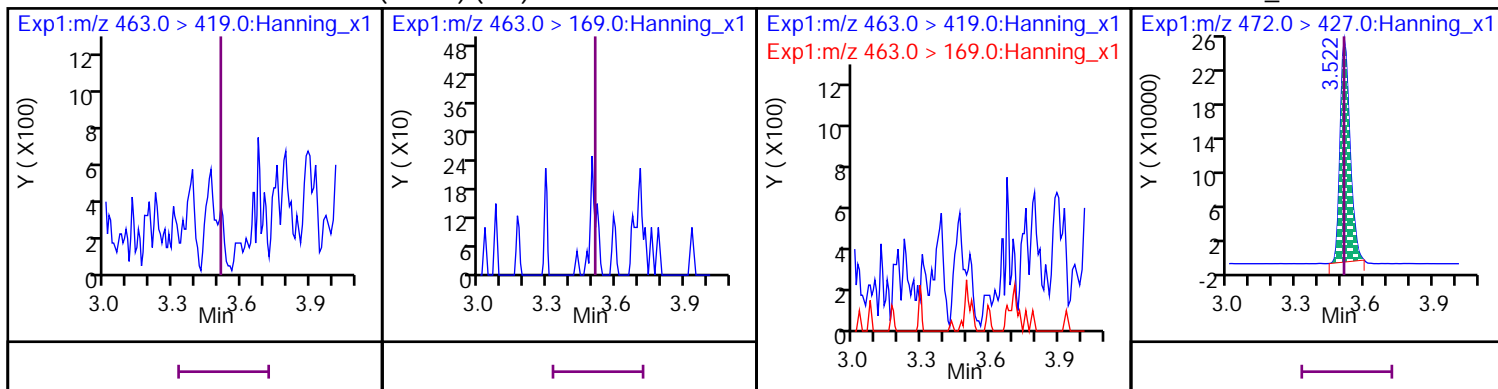
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



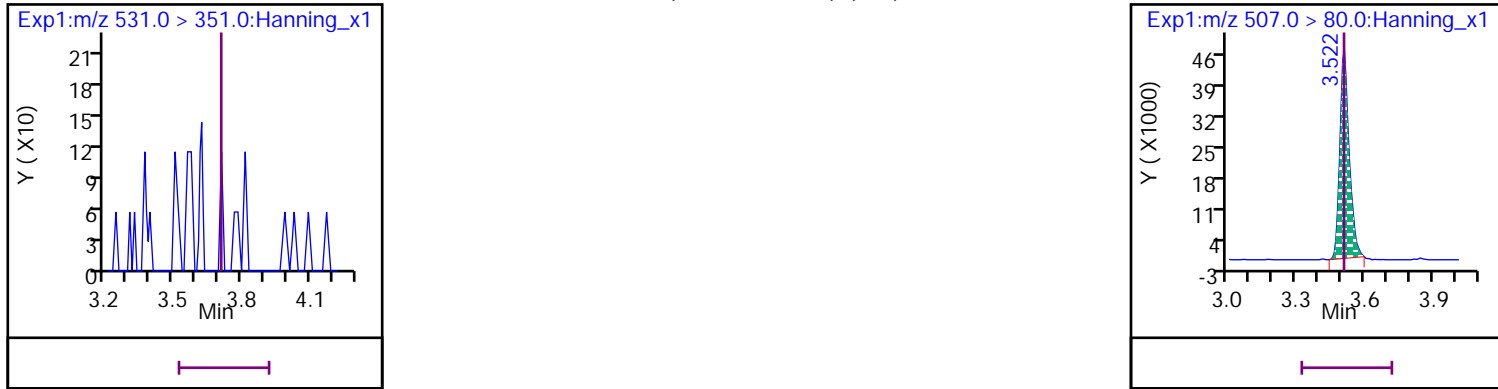
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



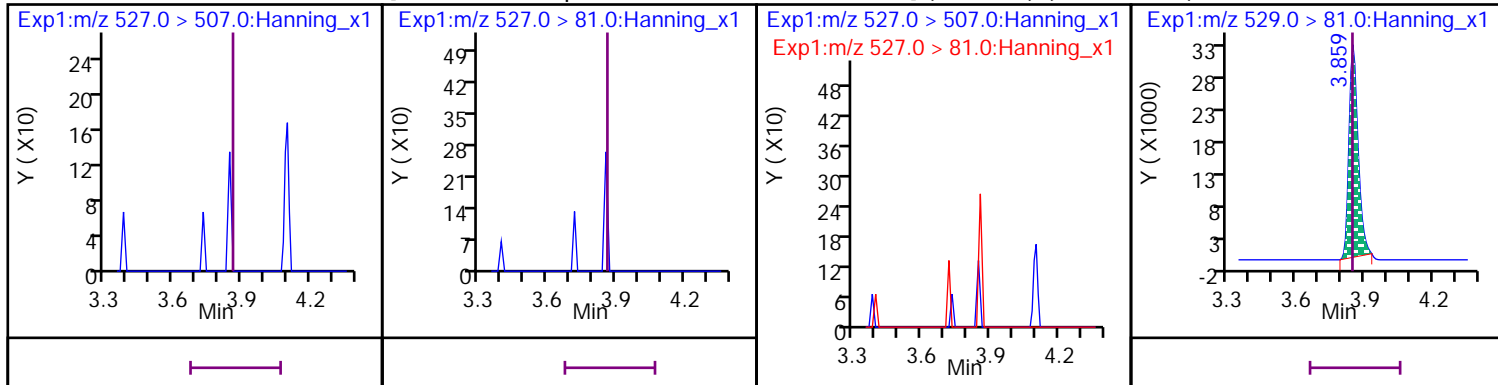
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



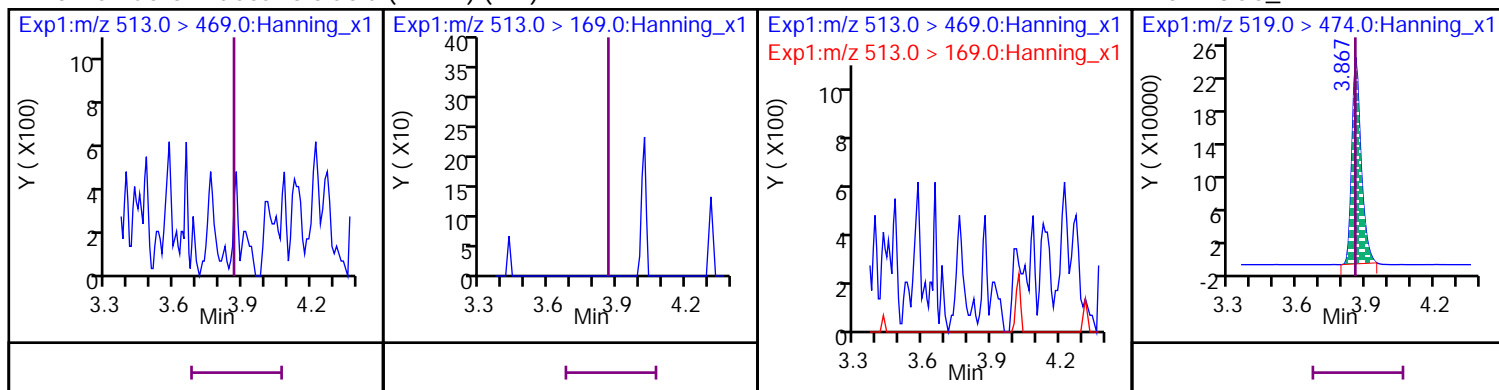
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ND)

D 54 13C2\_8:2 FTS\_2



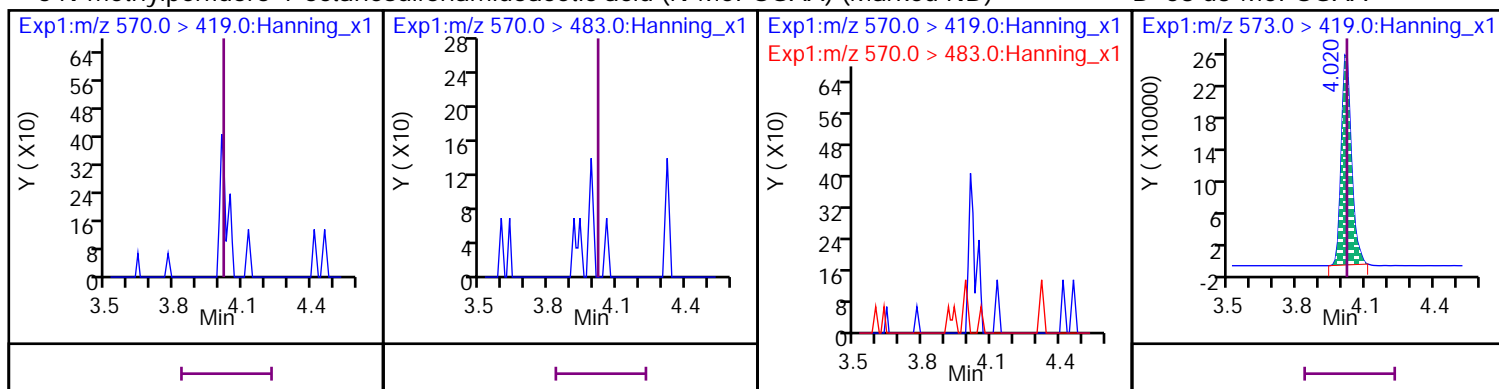
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



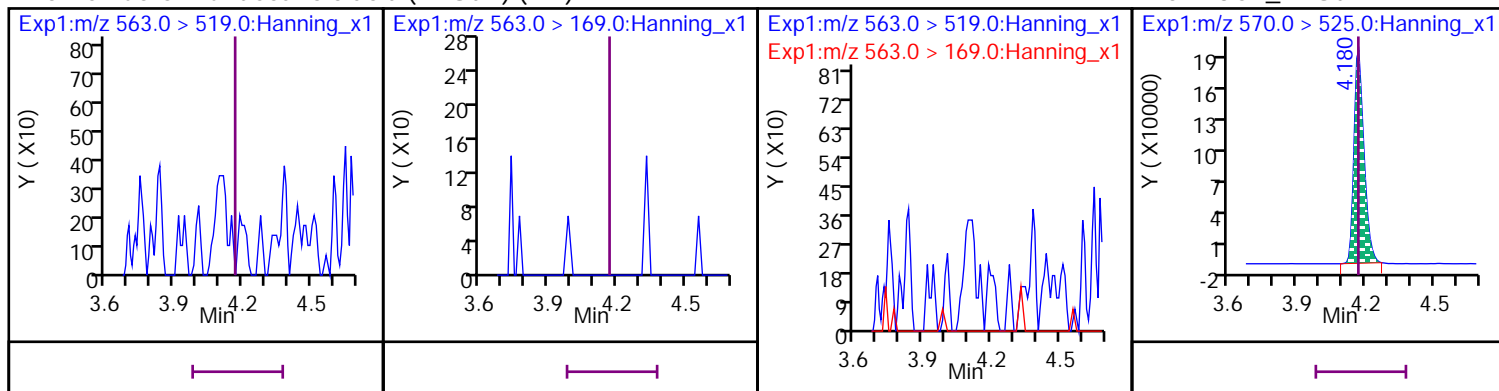
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



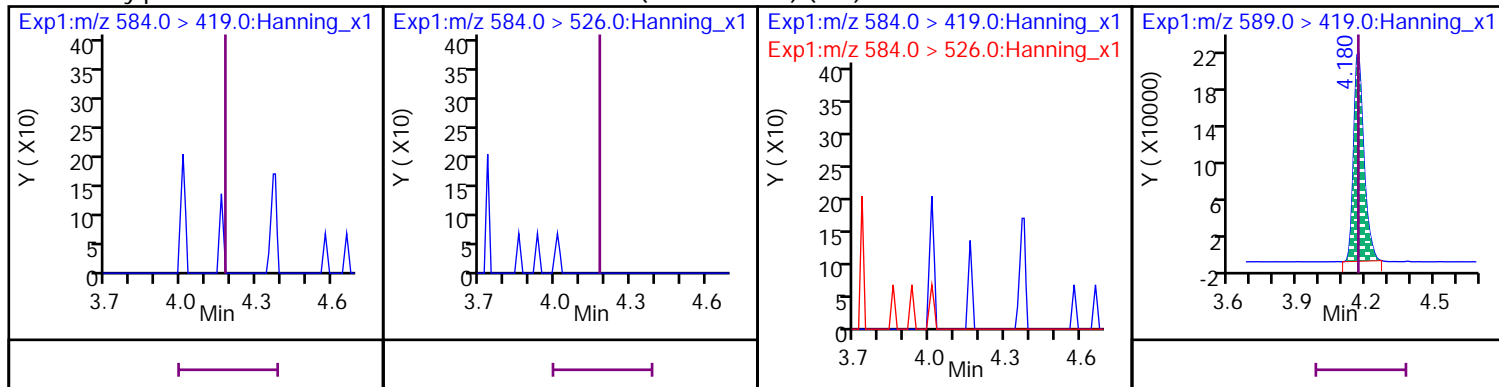
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

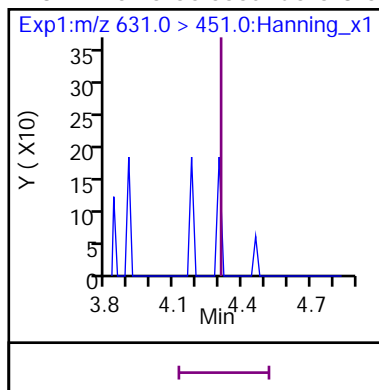


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

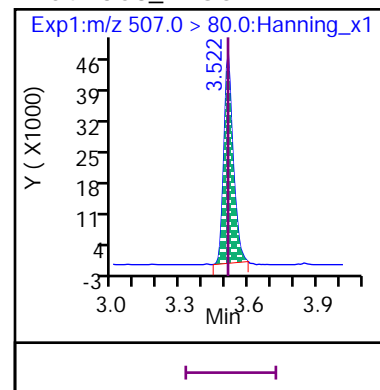
D 60 d5-EtFOSAA



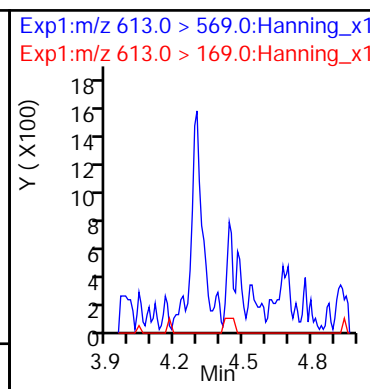
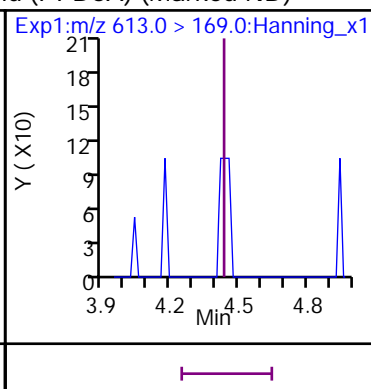
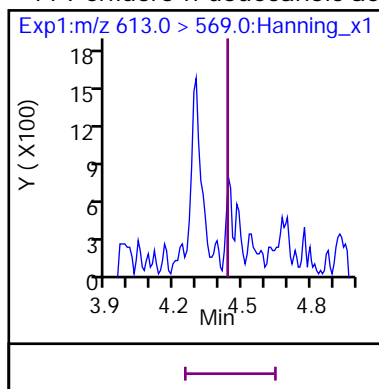
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



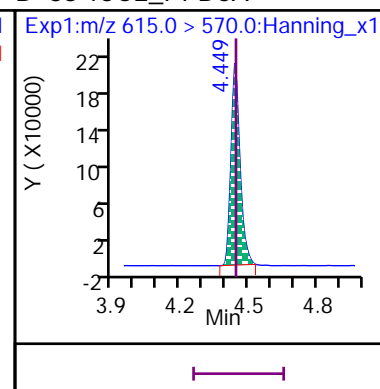
## D 54 13C8\_PFOS



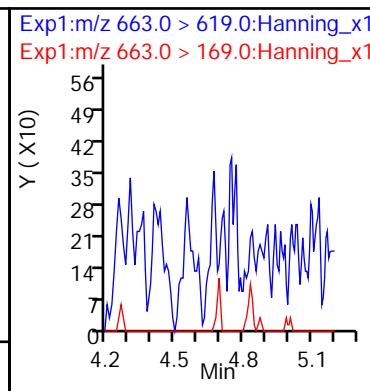
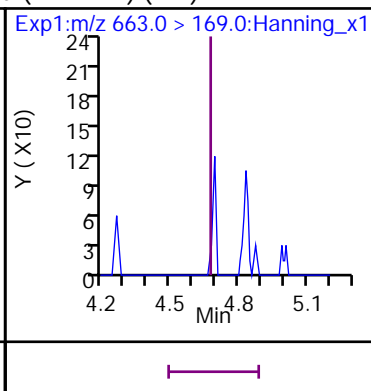
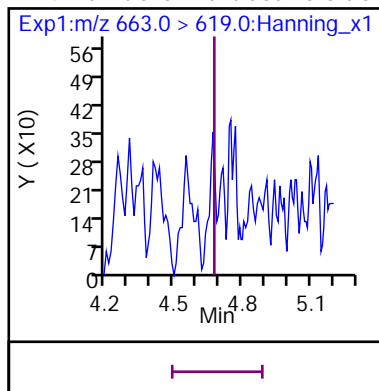
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



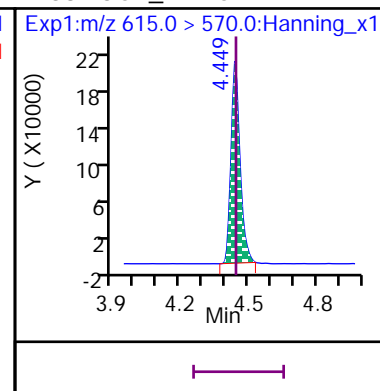
## D 38 13C2\_PFDoA



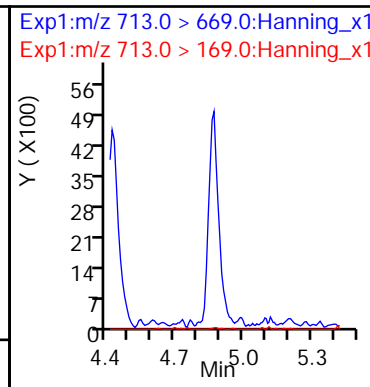
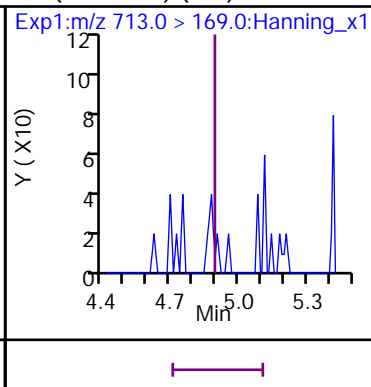
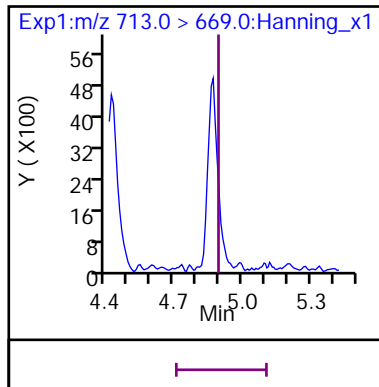
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



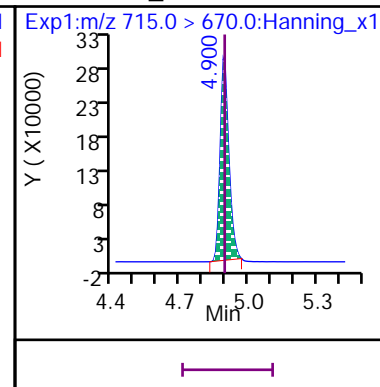
## D 38 13C2\_PFDoA



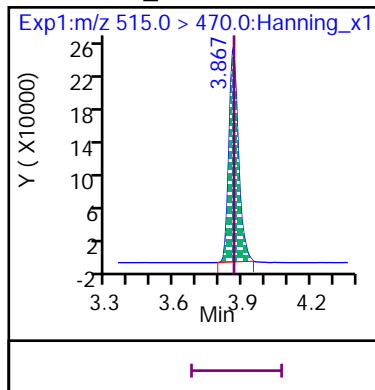
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



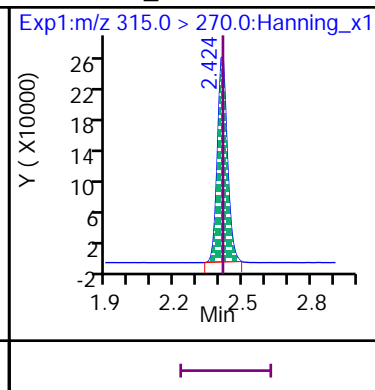
## D 42 13C2\_PFTeDA



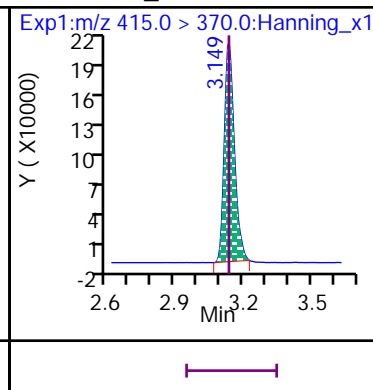
\* 37 13C2\_PFDA



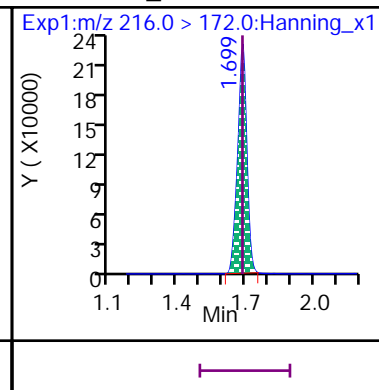
\* 39 13C2\_PFHxA



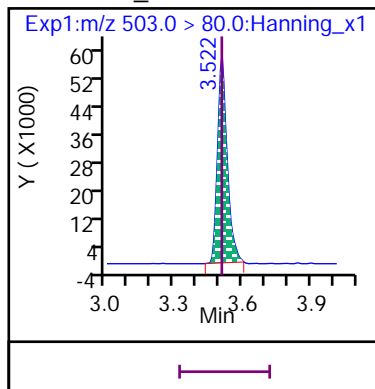
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	18		1	121	70-150	12/23/2020 1256
11CI-PF3OUdS	15	18		1	118	70-150	12/23/2020 1256
8:2 FTS	15	21		1	135	67-138	12/23/2020 1256
6:2 FTS	15	16		1	108	64-140	12/23/2020 1256
GenX	32	35		1	108	70-150	12/23/2020 1256
ADONA	15	17		1	116	70-150	12/23/2020 1256
EtFOSAA	16	17		1	106	61-135	12/23/2020 1256
MeFOSAA	16	19		1	121	65-136	12/23/2020 1256
PFBS	14	17		1	119	72-130	12/23/2020 1256
PFHxS	15	17		1	119	68-131	12/23/2020 1256
PFBA	16	19		1	116	73-129	12/23/2020 1256
PFDA	16	19		1	117	71-129	12/23/2020 1256
PFDaA	16	17		1	109	72-134	12/23/2020 1256
PFHpA	16	18		1	116	72-130	12/23/2020 1256
PFHxA	16	18		1	110	72-129	12/23/2020 1256
PFNA	16	18		1	114	69-130	12/23/2020 1256
PFOA	16	18		1	113	71-133	12/23/2020 1256
PFPeA	16	19		1	119	72-129	12/23/2020 1256
PFTeDA	16	20		1	123	71-132	12/23/2020 1256
PFTrDA	16	18		1	113	65-144	12/23/2020 1256
PFUdA	16	19		1	118	69-133	12/23/2020 1256
PFOS	15	18		1	123	65-140	12/23/2020 1256

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		79	50-150
13C2_8:2FTS		78	50-150
13C2_PFDaA		80	50-150
13C2_PFTeDA		83	50-150
13C3_PFBs		82	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBa		81	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		80	50-150
13C6_PFDa		81	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		84	50-150
13C8_PFOS		77	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		75	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



# PFAS by LC/MS/MS - LCS

Sample ID: VQ77367-002

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320014.d  
 Injection Date: 23-Dec-2020 12:56:27 Injection Vol: 10.0 uL  
 Sample Type: LCS Auto Sampler: 6  
 Lab Sample ID: VQ77367-002 Lab Prep. Batch: 77367  
 Sample Info: VQ77367-002 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
 Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.709 1.705 1 532302 24 >100:1 1001.00 767.50 80.7

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.709 1.705 1/0 224505 24 >100:1 423.88 18.632

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.083 2.077 1 541823 17 >100:1 1001.00 787.66 79.5

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.083 2.077 1/0 235173 18 >100:1 432.13 18.995

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.136 2.130 1 192031 16 >100:1 1001.00 834.08 81.7

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.136 2.141 0/-1 86915 18 >100:1 Target = 3.34 384.26 16.891

298.9 > 99 44 2.136 2.141 23356 19 >100:1 3.72 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.459 2.461 0/-1 66859 20 >100:1 Target = 3.09 401.77 17.660

349 > 99 44 2.459 2.461 22311 18 >100:1 2.99 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.388 2.389 0 121128 19 >100:1 5005.00 5003.57 83.2

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.388 2.398 0/0 18243 17 >100:1 Target = 1.64 377.71 16.603

327 > 81 63 2.388 2.398 12250 24 97:1 1.48 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.423 2.425 0 611465 18 >100:1 1001.00 829.59 82.6

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.423 2.425 0/0 242004 18 >100:1 Target = 17.01 401.28 17.639

313 > 119 49 2.423 2.425 14201 27 80:1 17.04 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.530 2.532 0 1177455 20 >100:1 5005.00 4420.64 85.2

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 2.532 0/0 132975 20 >100:1 Target = 0.79 786.73 34.582

285 > 185 66 2.530 2.532 161628 18 >100:1 0.82 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.781 2.783 0 483460 19 >100:1 1001.00 796.94 78.9

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.783	0/0	210729	27	>100:1	Target = 3.79		420.64	18.490		
363 > 169	47	2.781	2.783		57896	19	>100:1	3.63 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.801	0	139845	20				1001.00	816.71	75.3	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.810	0/0	58608	26	>100:1	Target = 3.80	0.16	395.66	17.392		
399 > 99	45	2.799	2.810		18741	26	>100:1	3.12 (1.90-5.71)	0.15				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.828	0/0	352581	19	>100:1	Target = 2.97		397.51	17.473		
377 > 85	45	2.818	2.828		115432	19	>100:1	3.05 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.169	0/0	52006	23	>100:1	Target = 3.09		409.78	18.012		
449 > 99	45	3.168	3.169		17202	28	>100:1	3.02 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.134	3.142	0	93330	24	>100:1			5005.00	4846.20	79	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.134	3.162	-1/-1	15099	44	>100:1	Target = 1.77		373.59	16.422		
427 > 81	64	3.141	3.162		8752	17	>100:1	1.72 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.161	3.169	0	516698	24	>100:1			1001.00	873.00	84.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.169	0/0	215553	29	>100:1	Target = 2.85		409.62	18.005		
413 > 169	53	3.161	3.169		75241	24	>100:1	2.86 (1.42-4.28)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.535	3.545	0	116582	20	>100:1			1001.00	777.58	77.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.553	0/0	57455	39	>100:1	Target = 6.80	0.26	416.31	18.299		
499 > 99	54	3.535	3.553		15995	45	99:1	3.59 (3.40-10.20)	0.10				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.743	3.751	0/0	161190	23	>100:1			411.12	18.071		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.881	3.883	0/0	32760	15		Target = 3.03		367.56	16.157		
549 > 99	54	3.890	3.883		13107	24	43:1	2.49 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.178	4.198	-1/-1	35445	24		Target = 2.74		419.35	18.433		
599 > 99	54	4.178	4.198		14442	15	>100:1	2.45 (1.37-4.11)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.347	4.349	0/0	133524	17	>100:1			403.69	17.745		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.688	4.698	0/0	40711	19	>100:1	Target = 3.16		435.40	19.139		
699 > 99	54	4.680	4.698		12233	20	>100:1	3.32 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.543	3.553	0	589987	23	>100:1			1001.00	785.64	80.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.543	3.553	0/0	245575	23	>100:1	Target = 6.19		416.64	18.314		
463 > 169	56	3.543	3.553		36530	23	>100:1	6.72 (3.09-9.28)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.867	0	265244	20	>100:1			1001.00	856.83	82.1	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.875	0/0	108420	19	>100:1			415.21	18.251		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.881	3.891	0	73116	17	>100:1			5005.00	3941.53	78.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.890	3.891	0/0	14034	20	30:1	Target = 2.11		469.21	20.624		
527 > 81	65	3.873	3.891		4762	14		2.94 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.482	4.494	0/0	13858	17	>100:1	Target = 3.05		410.50	18.044		
627 > 80	65	4.491	4.494		3485	22		3.97 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.890	3.899	0	518450	20	>100:1			1001.00	781.58	80.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.890	3.899	0/0	216754	20	>100:1	Target = 13.22		425.91	18.721		
513 > 169	51	3.890	3.899		17481	25	92:1	12.39 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.046	4.057	0	681883	19	>100:1			5005.00	4750.49	84.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.055	4.065	0/0	45912	35	>100:1	Target = 1.34	0.06	438.71	19.284		M
570 > 483	58	4.046	4.065		30174	36		1.52 (0.67-2.02)	0.29				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.206	4.208	0	573472	19	>100:1			5005.00	4317.84	75.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.206	4.228	-1/-1	44164	34	>100:1	Target = 1.71	0.12	387.15	17.018		
584 > 526	60	4.206	4.228		29473	36	85:1	1.49 (0.85-2.57)	0.24				M
<b>D 52 13C7_PFDuA CAS: SESI-0117</b>													
570 > 525		4.197	4.208	0	510435	19	>100:1			1001.00	807.55	78.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.206	4.218	0/0	205434	20	>100:1	Target = 16.05		428.64	18.841		
563 > 169	52	4.197	4.218		15193	24	59:1	13.52 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.307	4.309	0	90646	19	>100:1			1001.00	837.70	87.3	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.317	4.309	1/1	32065	18	>100:1			376.85	16.565		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.319	0	30768	14	88:1			1001.00	581.44	61.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.319	1/1	14665	22	>100:1	Target = 1.18		422.89	18.589		
512 > 219	57	4.327	4.319		15174	21	92:1	0.96 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.473	4.467	1	103129	19	>100:1			1001.00	822.43	87.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.476	1/0	35483	16	>100:1			387.12	17.016		
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.473	4.485	0	481886	18	>100:1			1001.00	796.09	79.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													
613 > 569	38	4.473	4.476	0/0	193345	17	>100:1	Target = 10.35		396.60	17.433		
613 > 169	38	4.482	4.476		18478	19	>100:1	10.46 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.710	4.719	0/0	195593	19	>100:1	Target = 8.56		412.51	18.132		
663 > 169	38	4.717	4.719		25080	22	>100:1	7.79 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.491	4.485	1	31322	19	>100:1			1001.00	637.99	59.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.500	4.494	1/0	15064	18	>100:1	Target = 1.08		440.65	19.369		
526 > 219	59	4.500	4.494		12638	14	>100:1	1.19 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.931	4.933	0	651231	19	>100:1			1001.00	773.03	83.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.923	4.933	0/0	253172	22	40:1	Target = 11.29		449.13	19.742		
713 > 169	42	4.931	4.933		20266	24	>100:1	12.49 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.308	5.318	0	740792	19	>100:1			1001.00	817.50	82.9	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.308	5.318	0/0	197184	20	84:1	Target = 11.43		407.79	17.925		
813 > 269	40	5.308	5.318		16807	18	>100:1	11.73 (5.71-17.16)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.653	5.668	0/0	280411	26	48:1	Target = 13.84		428.04	18.815		
913 > 319	40	5.653	5.668		19296	24	>100:1	14.53 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.890	3.899	0	630168	20	>100:1					86.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.425	0	650584	20	>100:1					89.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.161	3.169	0	556339	25	>100:1					89.8	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.709	1.705	1	560307	24	>100:1					92.3	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.543	3.545	0	150314	21	>100:1					94	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320014.d

Injection Date: 23-Dec-2020 12:56:27

Inst. ID: LCMSMS02

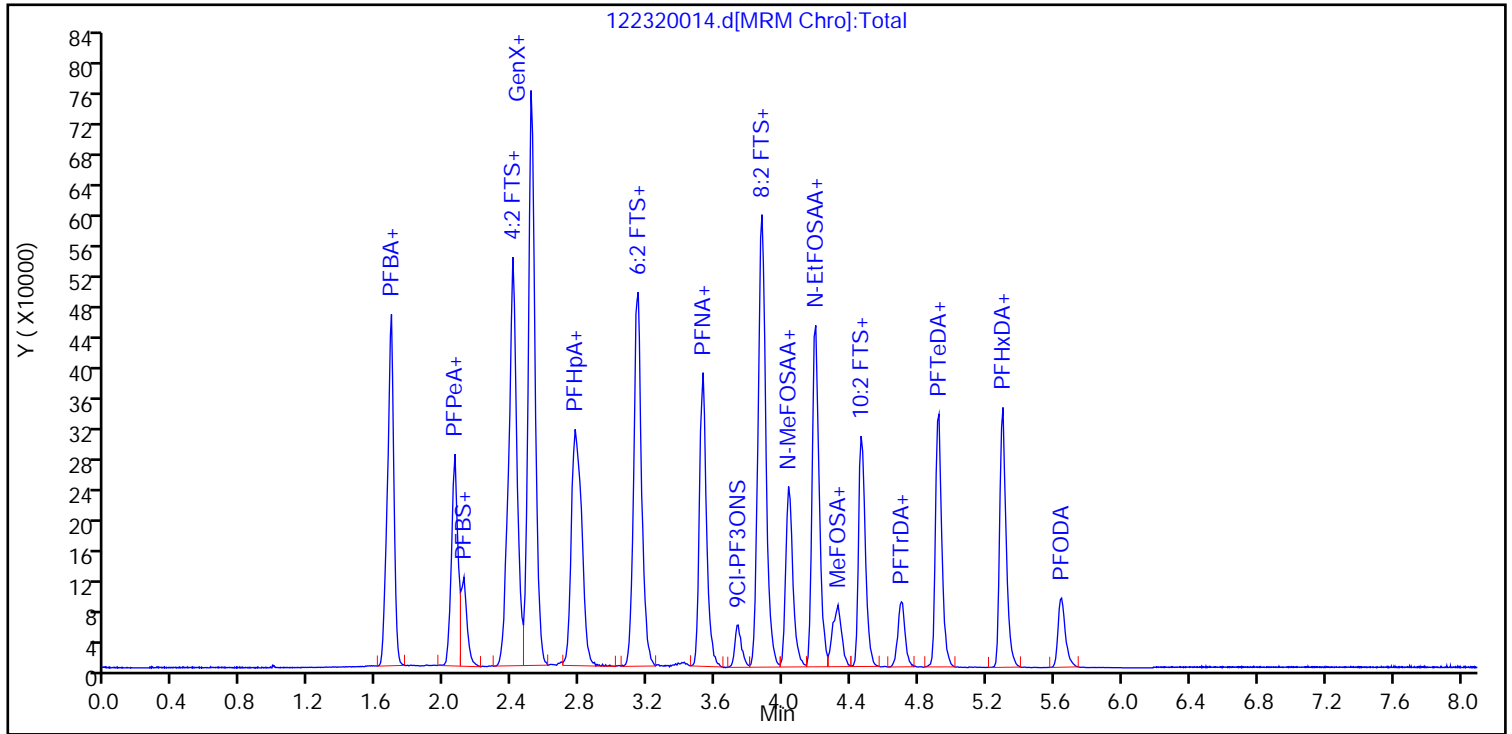
Client ID:

Lab ID: VQ77367-002

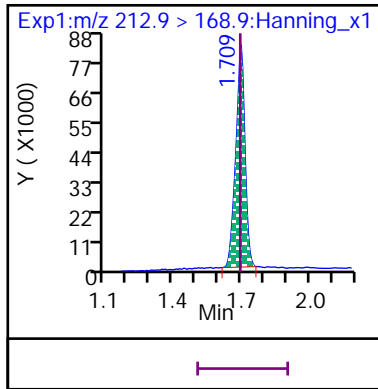
Sample Info: VQ77367-002

Dil. Factor: 1

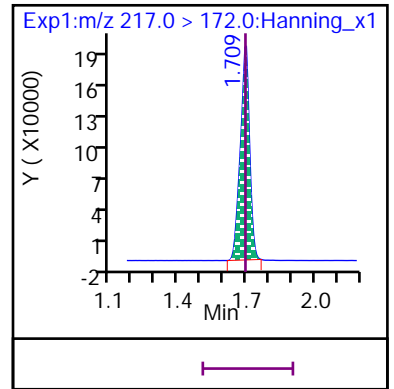
Operator: Stephen E. Somerville



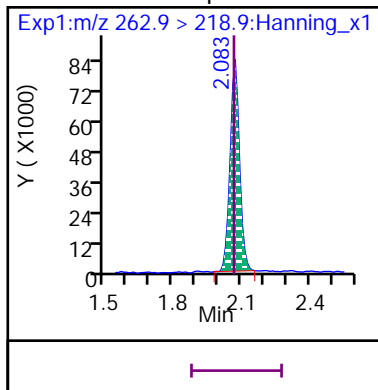
8 Perfluoro-n-butanoic acid (PFBA)



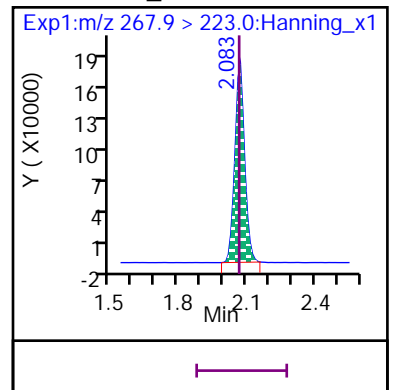
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

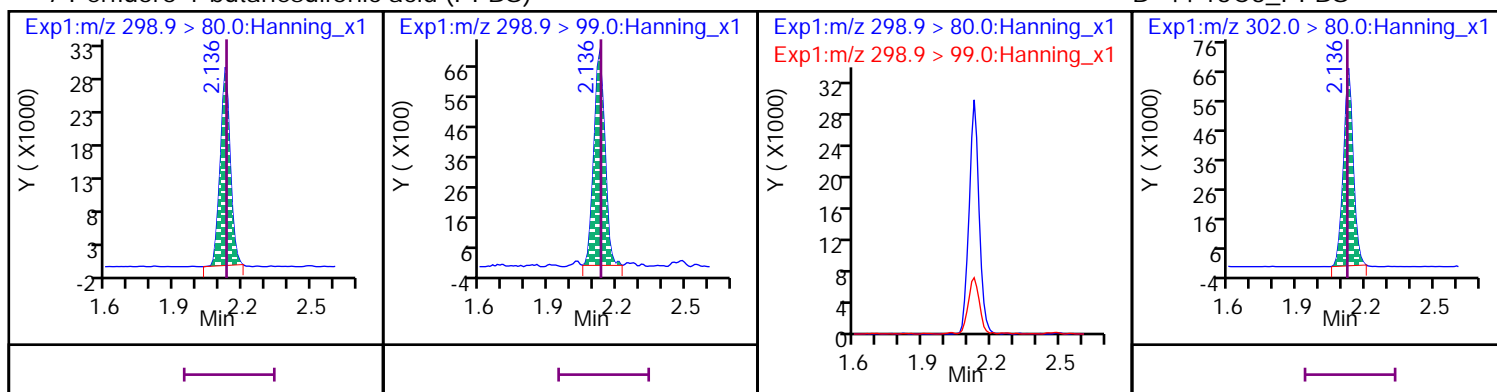


D 50 13C5\_PFPeA



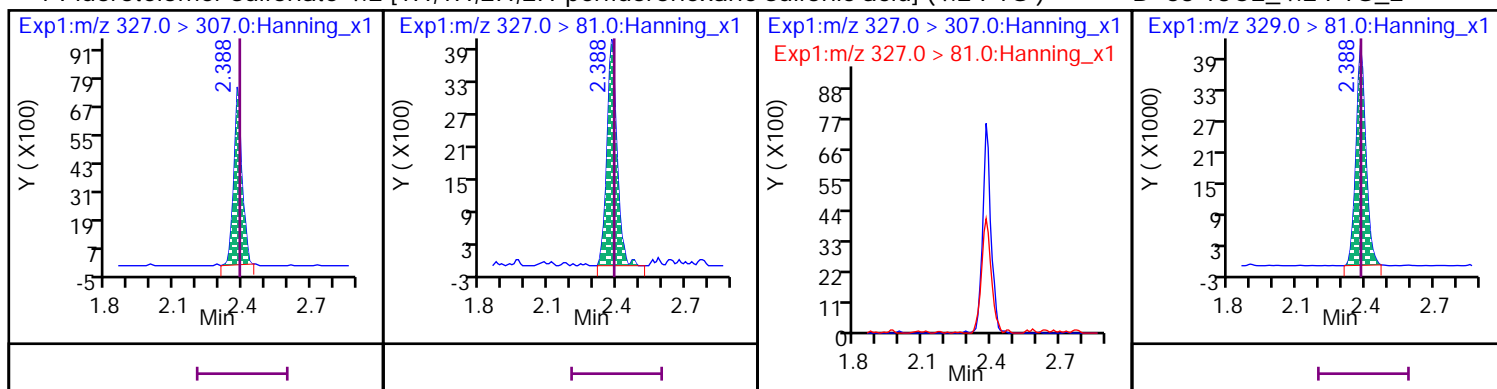
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



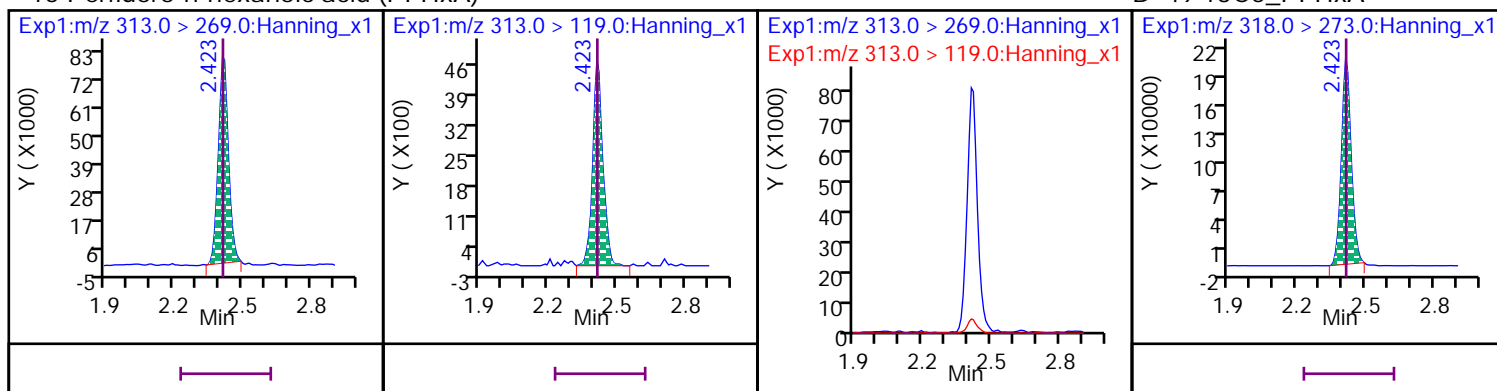
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



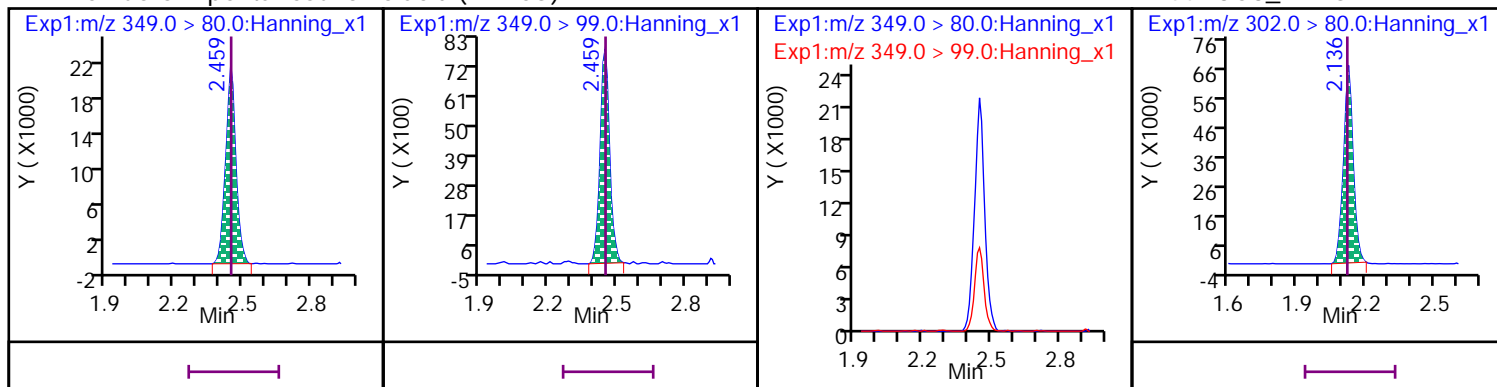
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



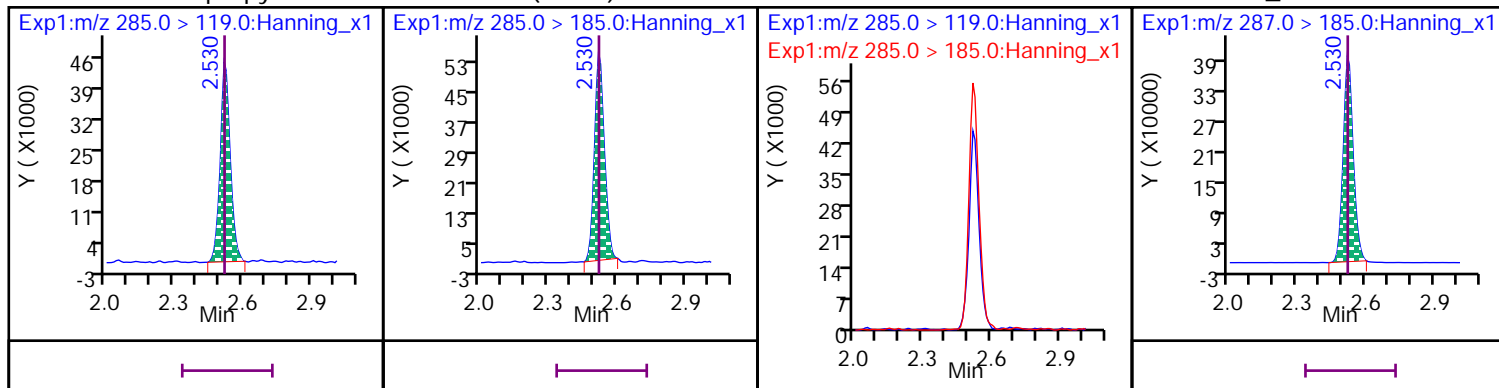
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



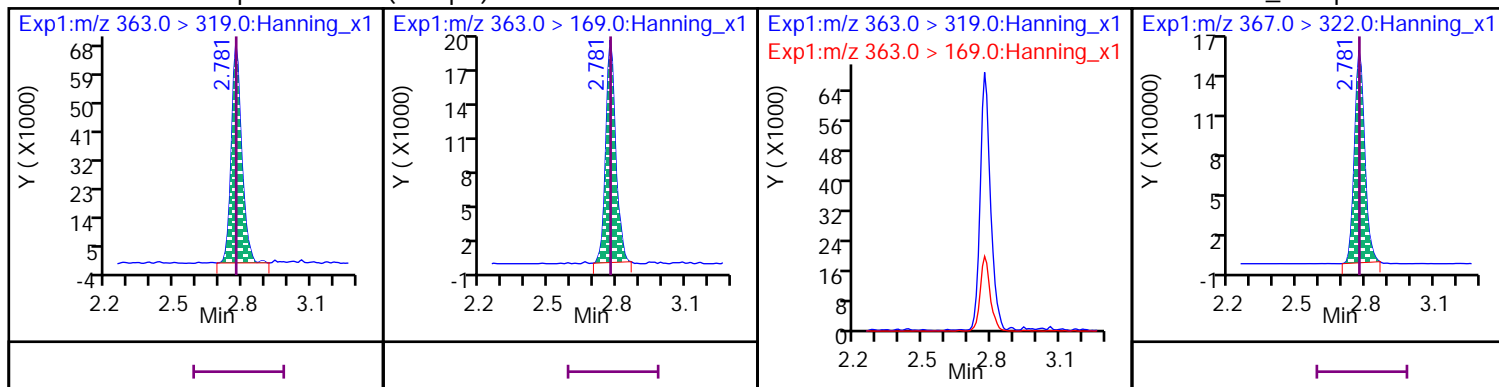
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



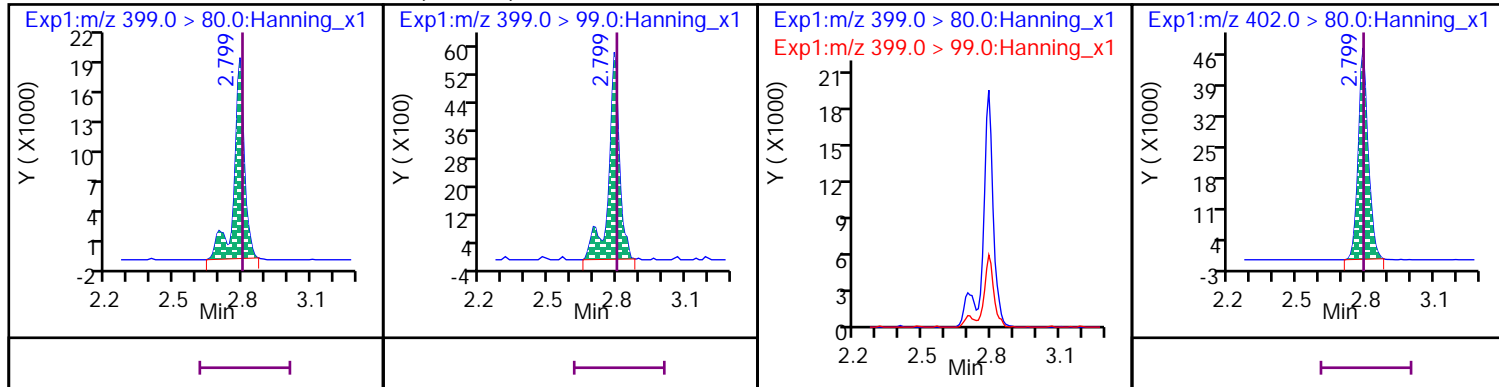
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



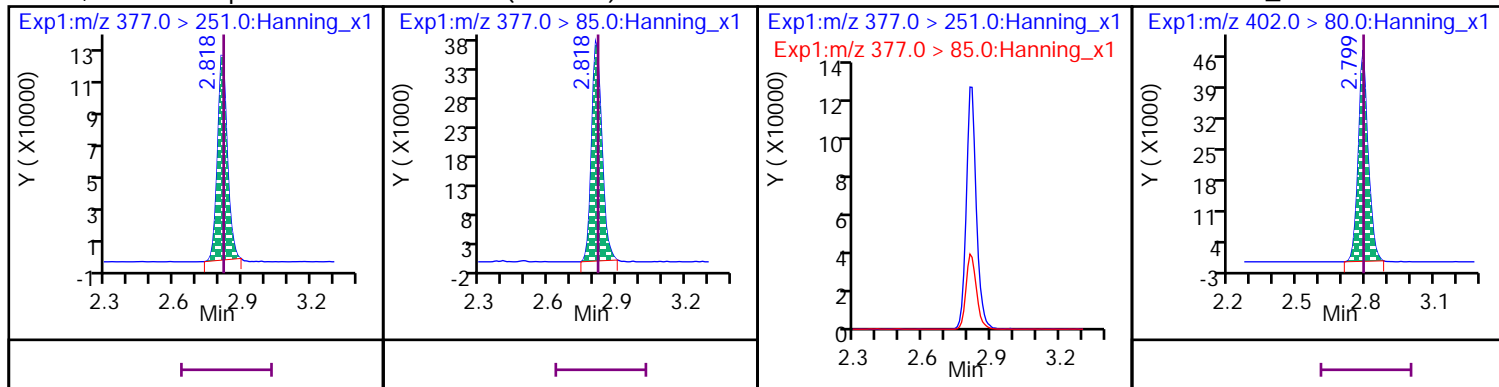
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

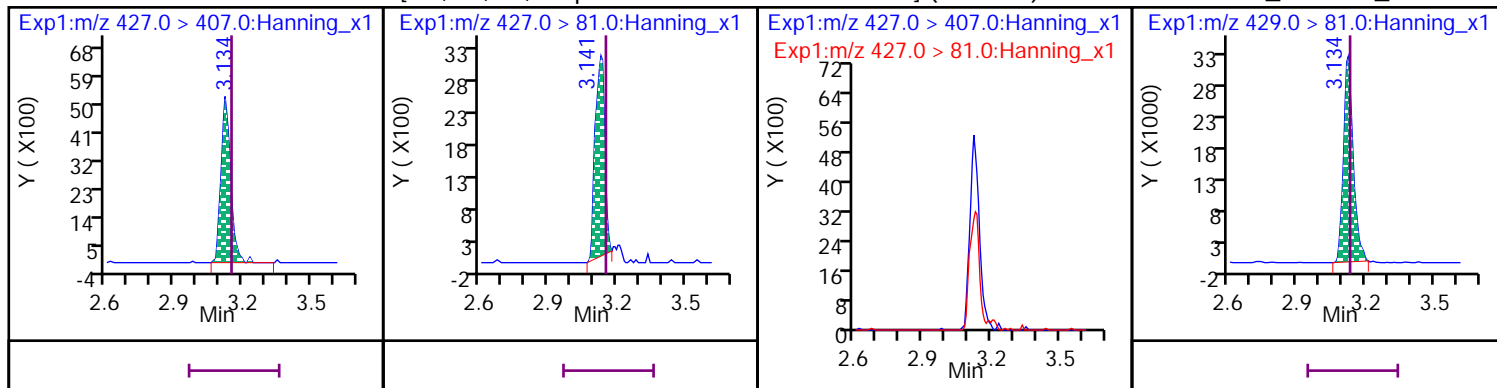
D 45 13C3\_PFHxS





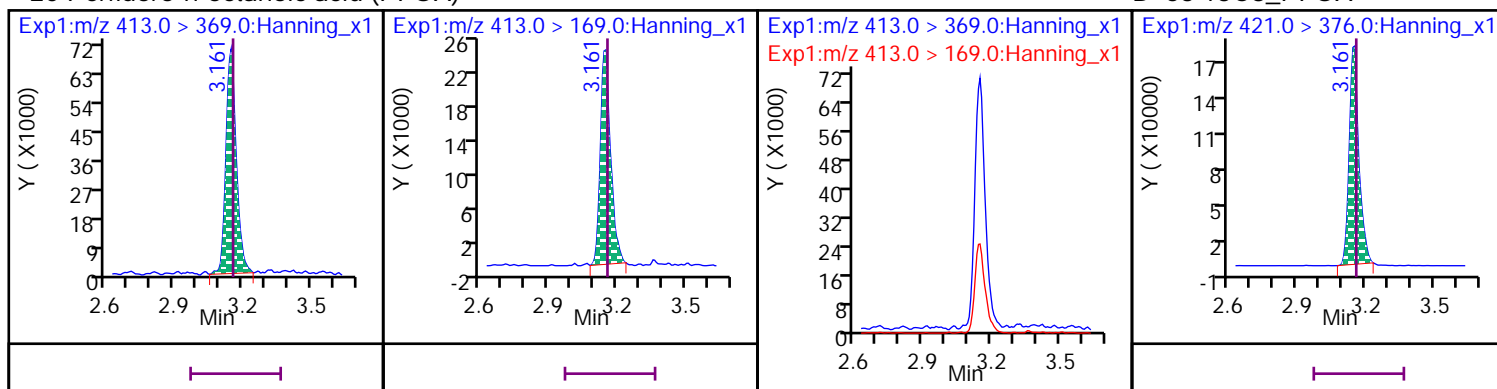
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

## D 64 13C2\_6:2 FTS\_2



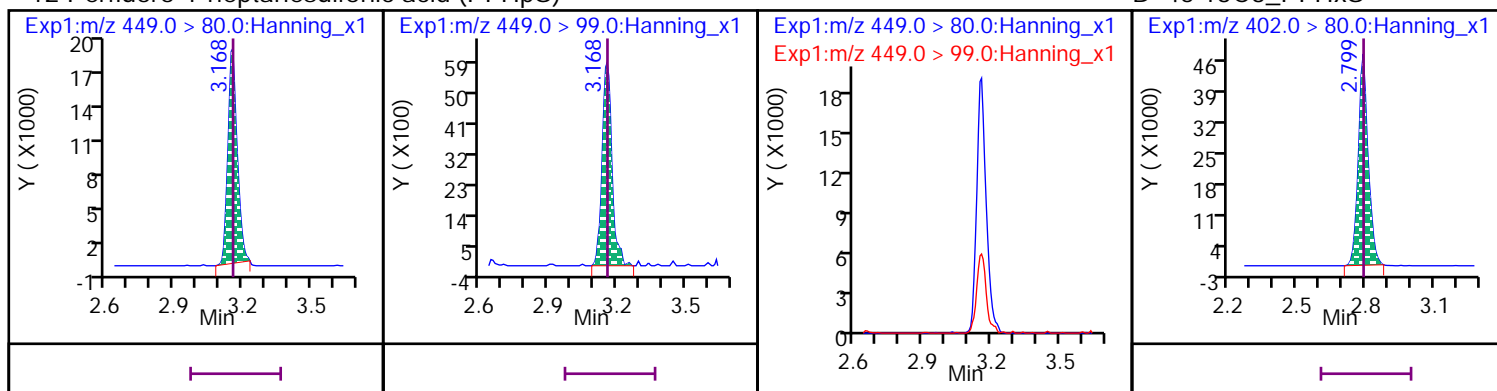
## 20 Perfluoro-n-octanoic acid (PFOA)

## D 53 13C8\_PFOA



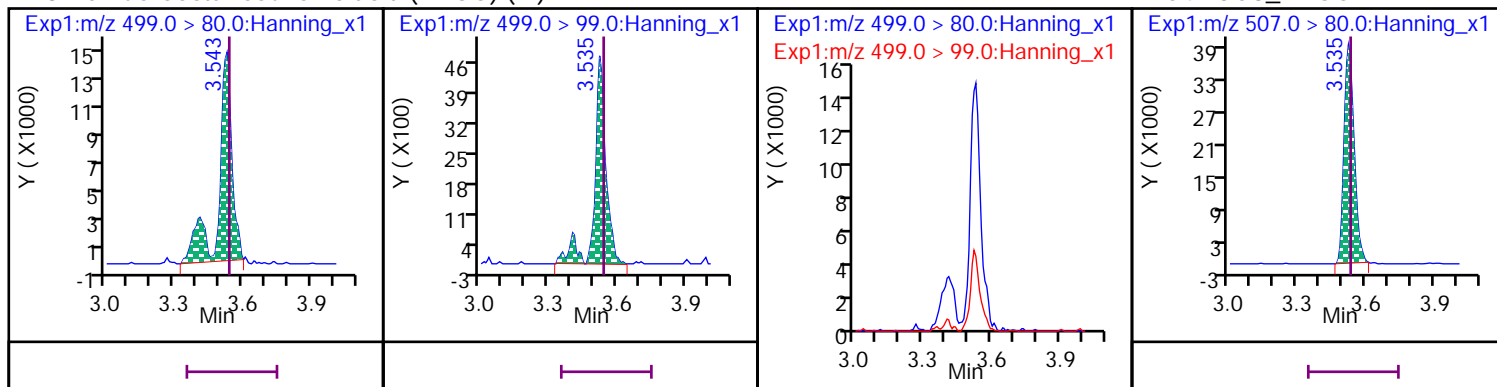
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

## D 45 13C3\_PFHxS



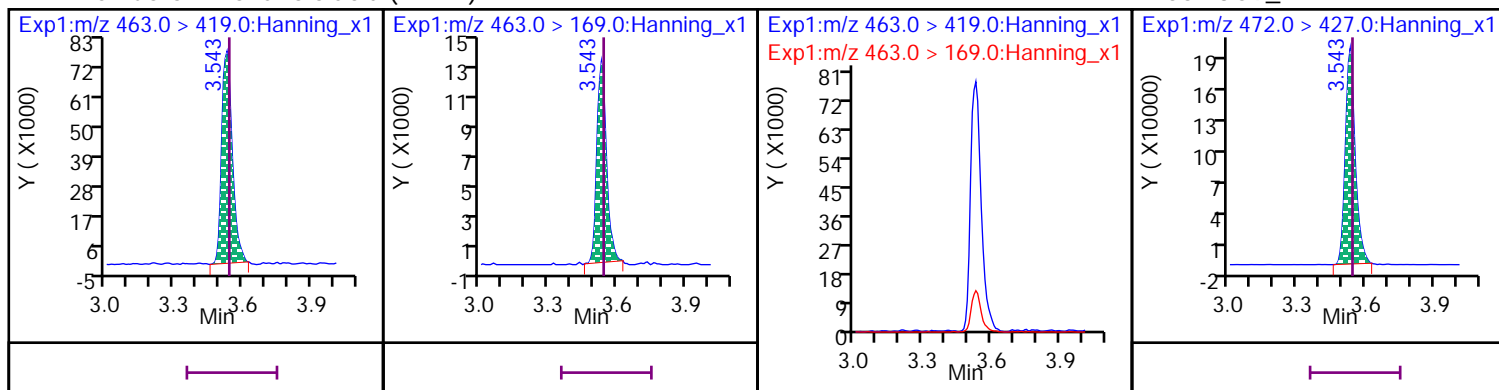
## 18 Perfluorooctanesulfonic acid (PFOS) (M)

## D 54 13C8\_PFOS



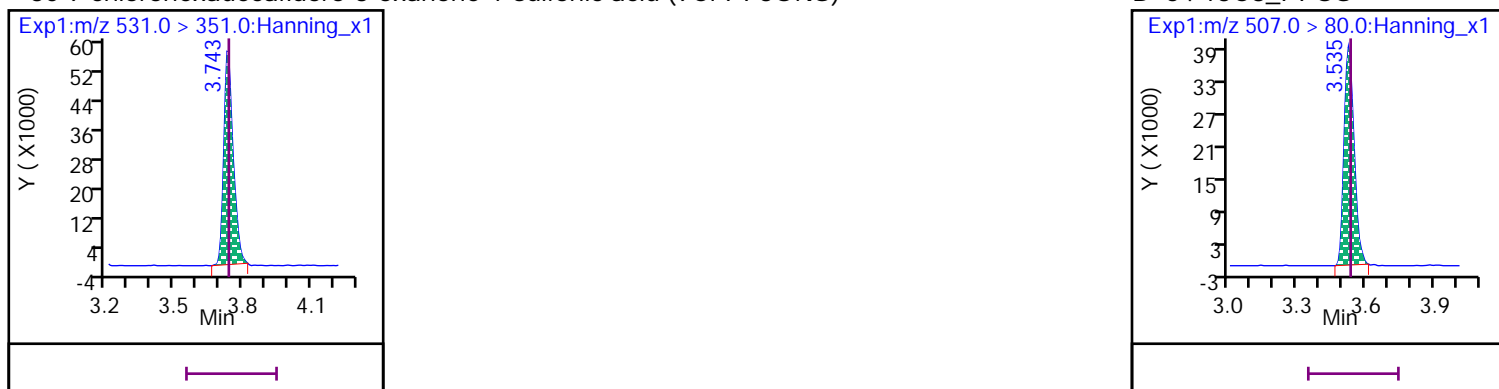
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



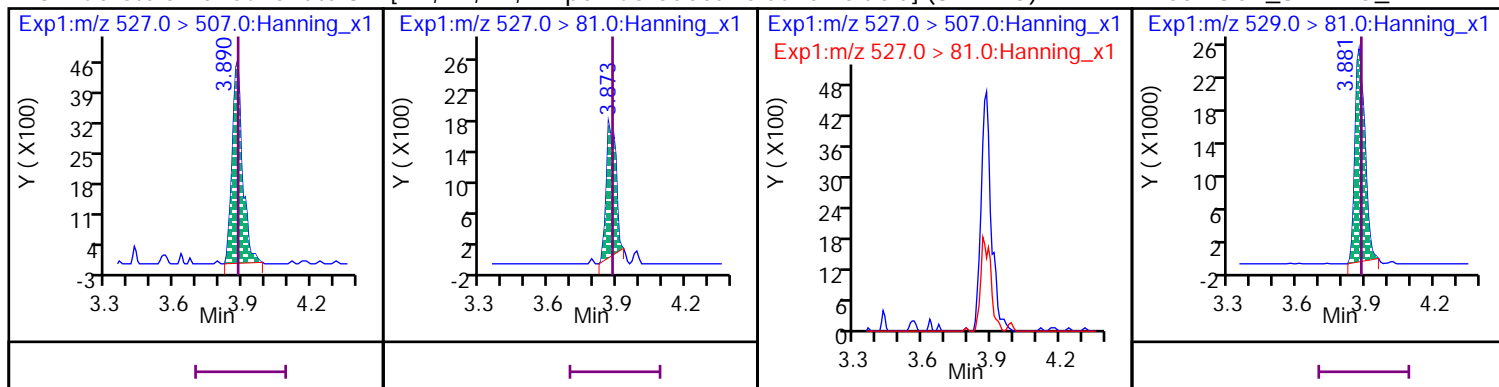
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



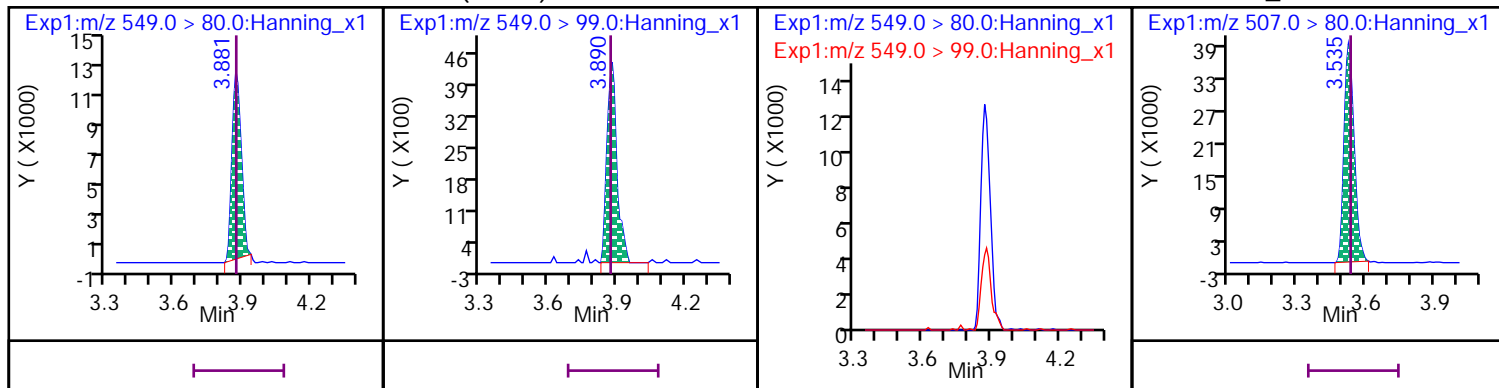
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



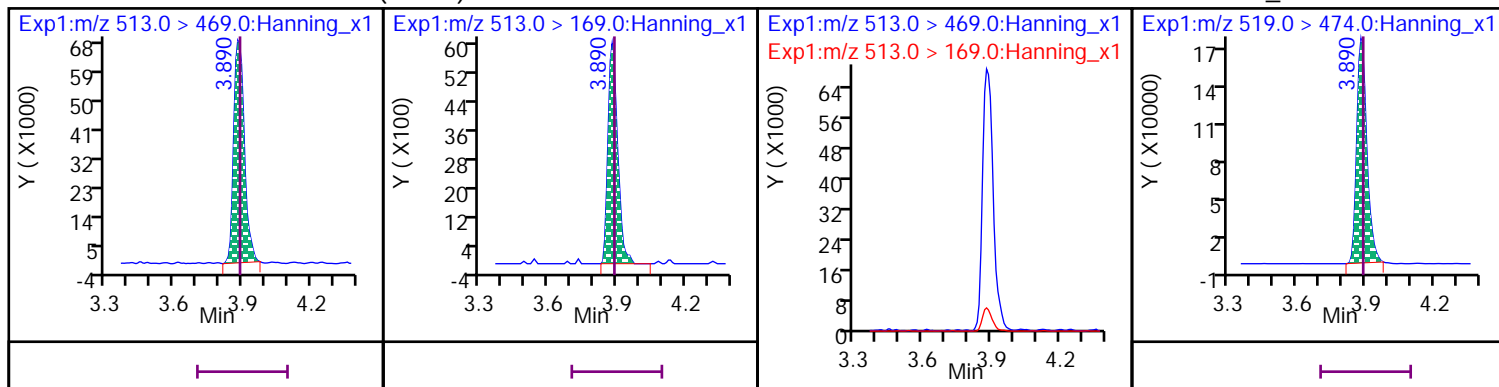
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



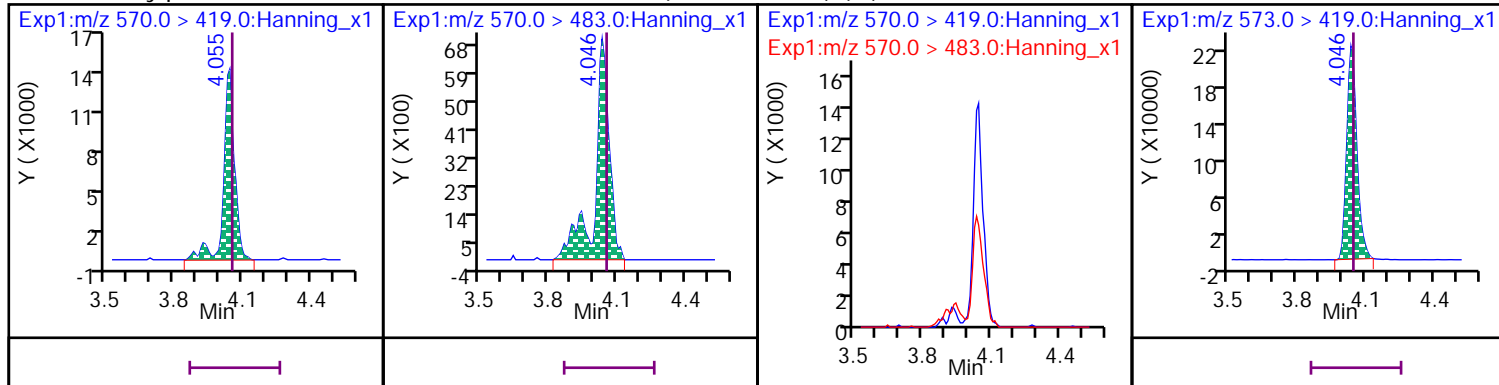
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



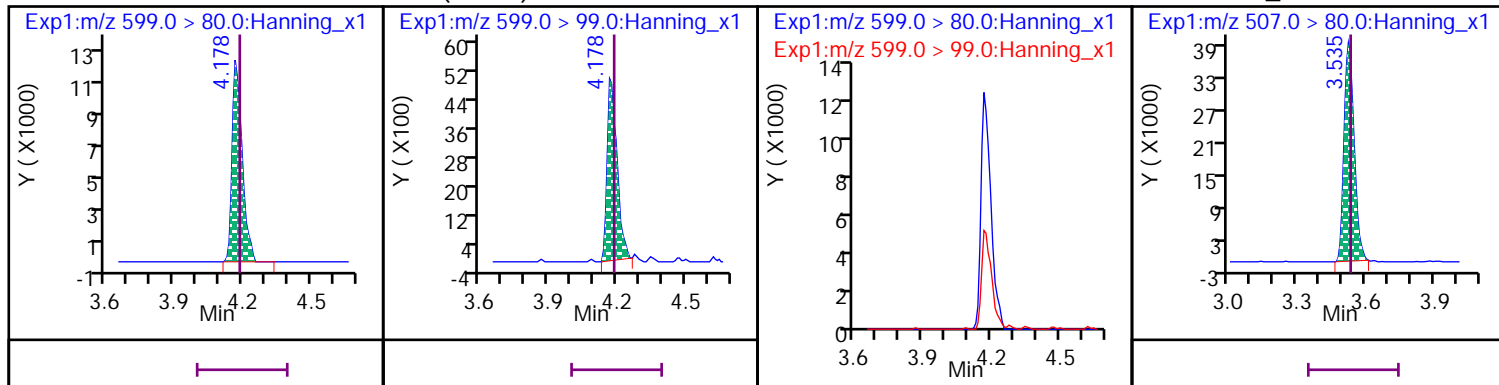
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



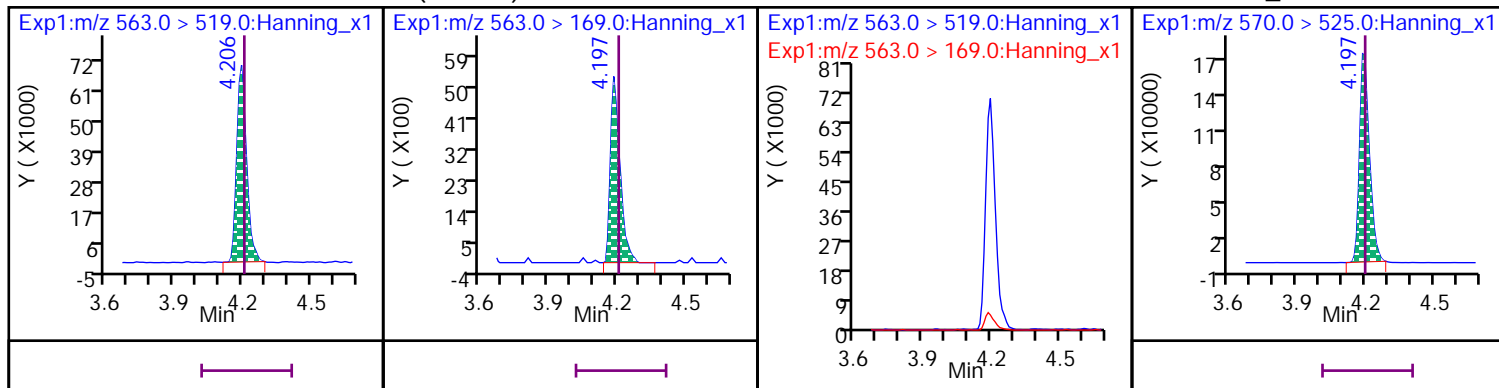
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



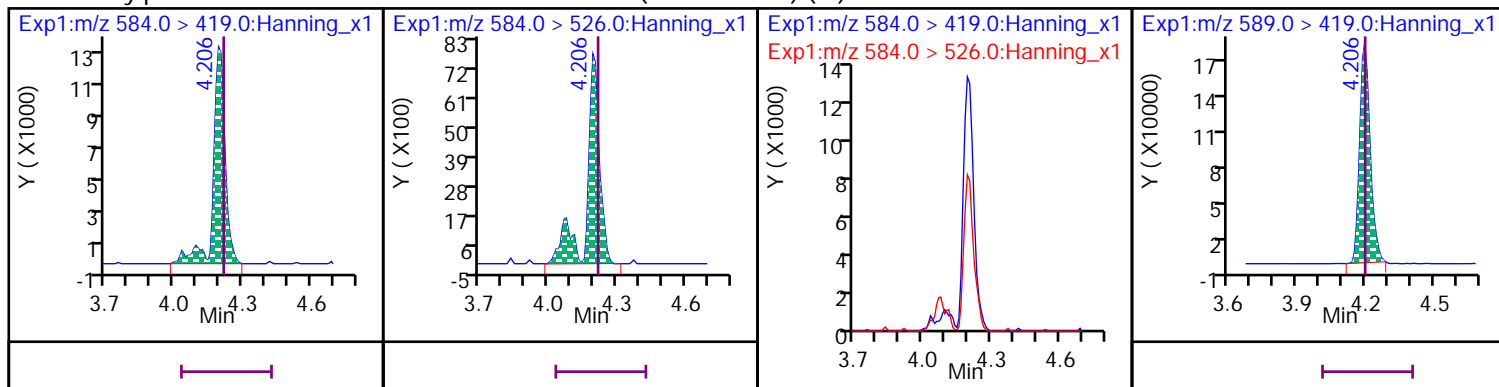
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



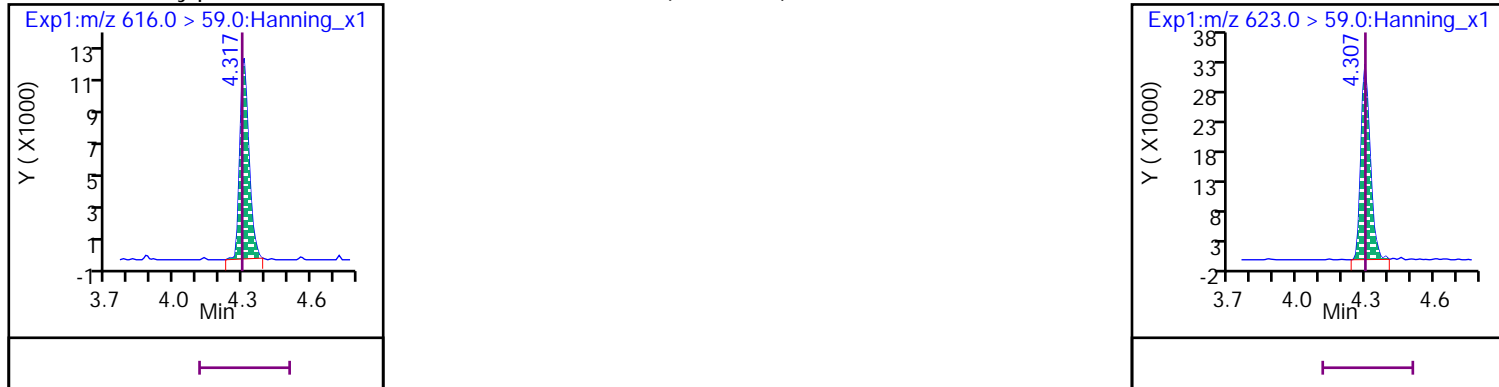
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



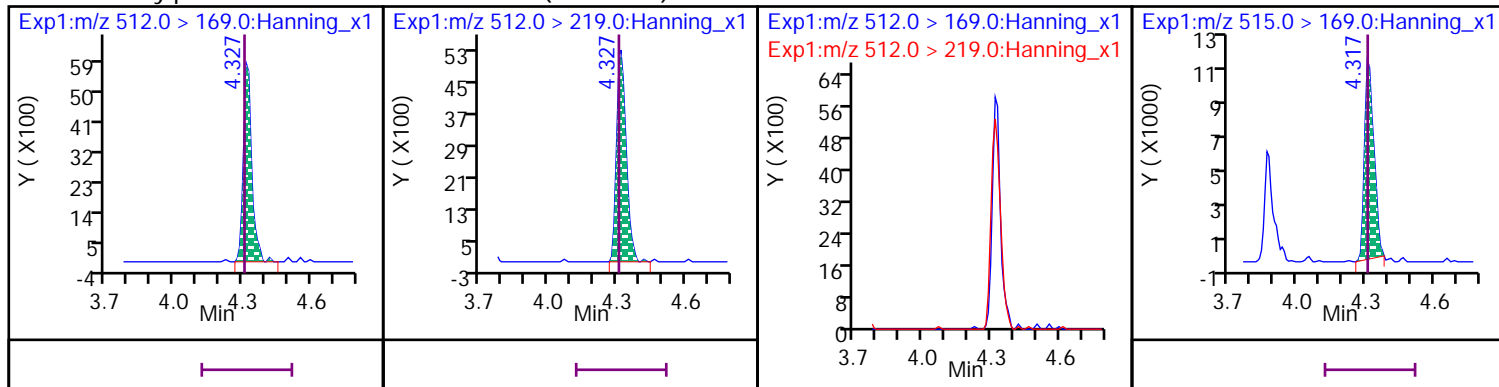
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

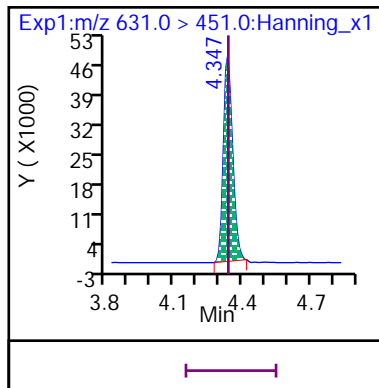


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

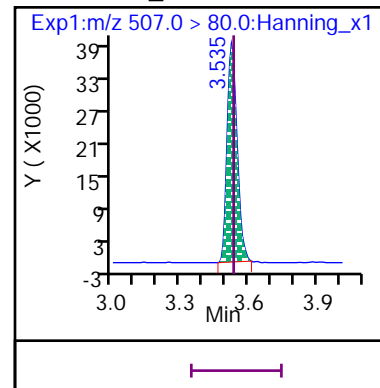
D 57 d3-MeFOSA



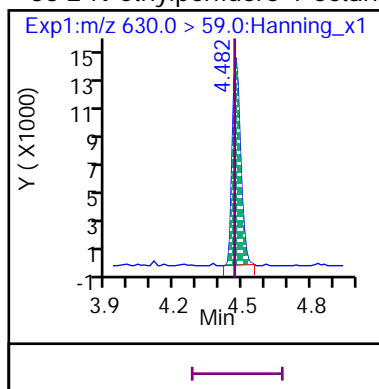
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



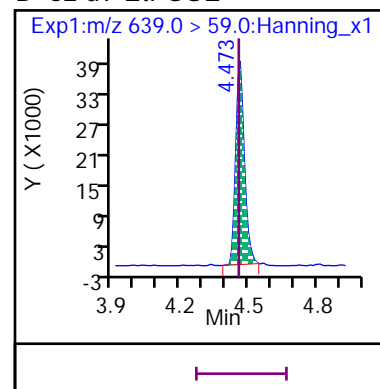
## D 54 13C8\_PFOS



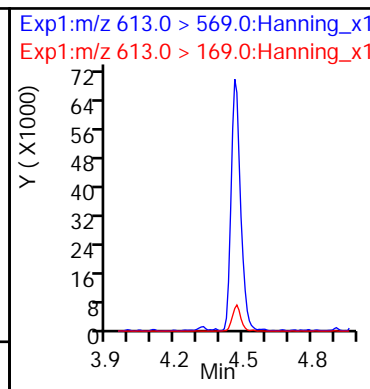
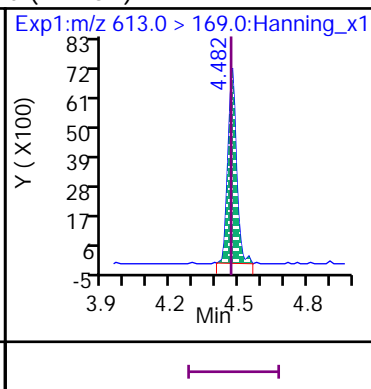
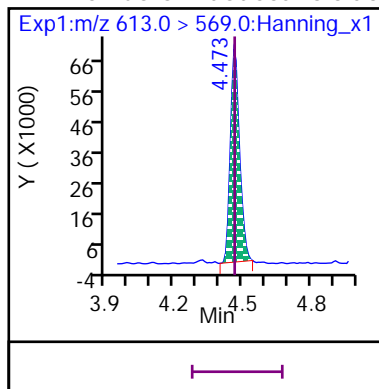
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



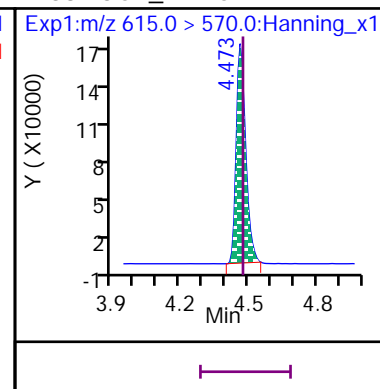
## D 62 d9-EtFOSE



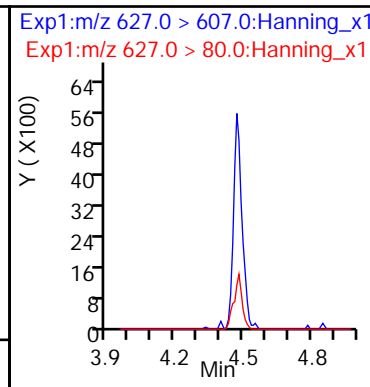
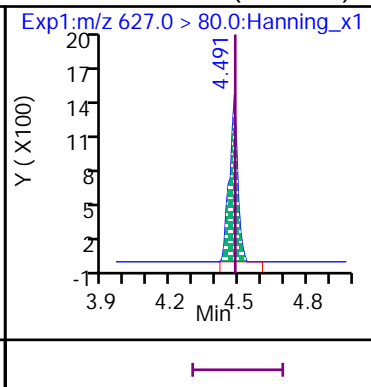
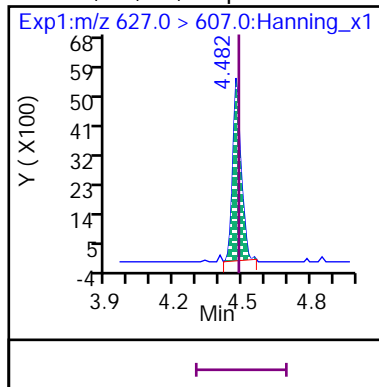
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



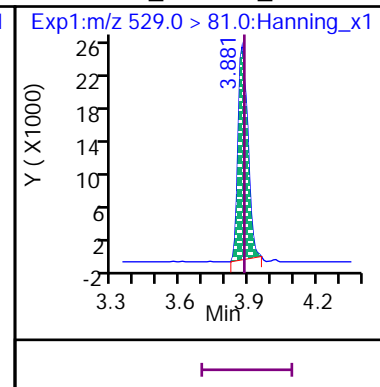
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

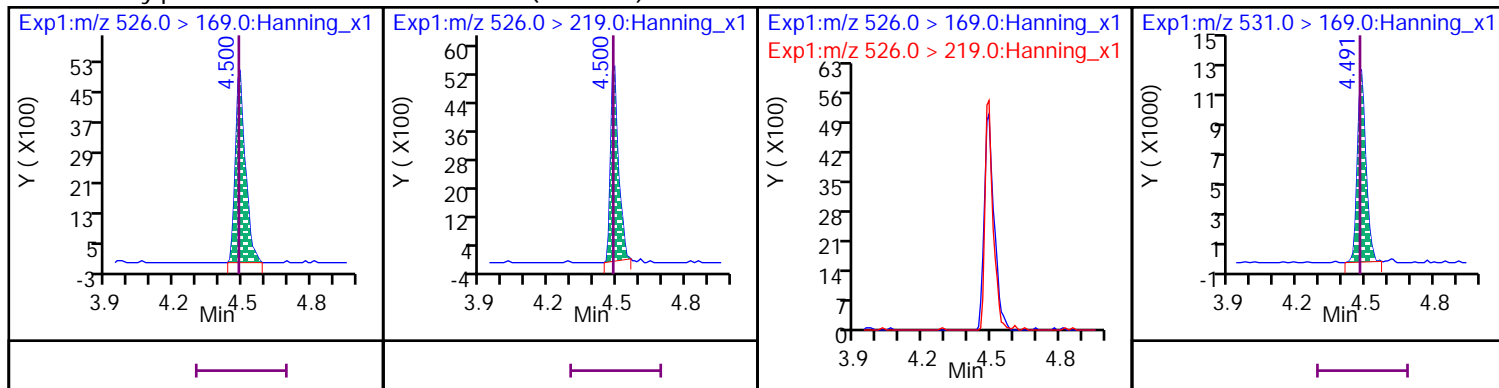


## D 65 13C2\_8:2 FTS\_2



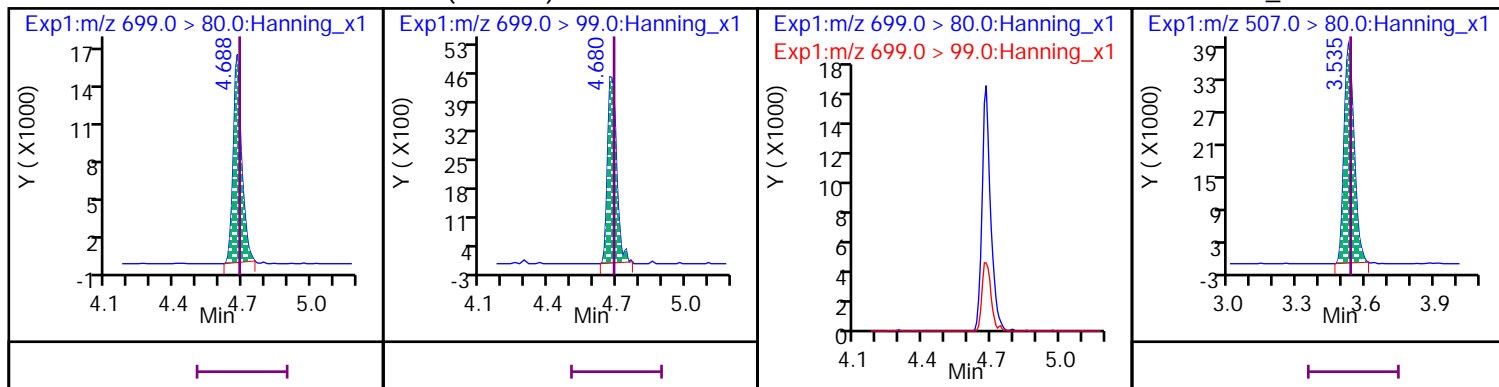
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



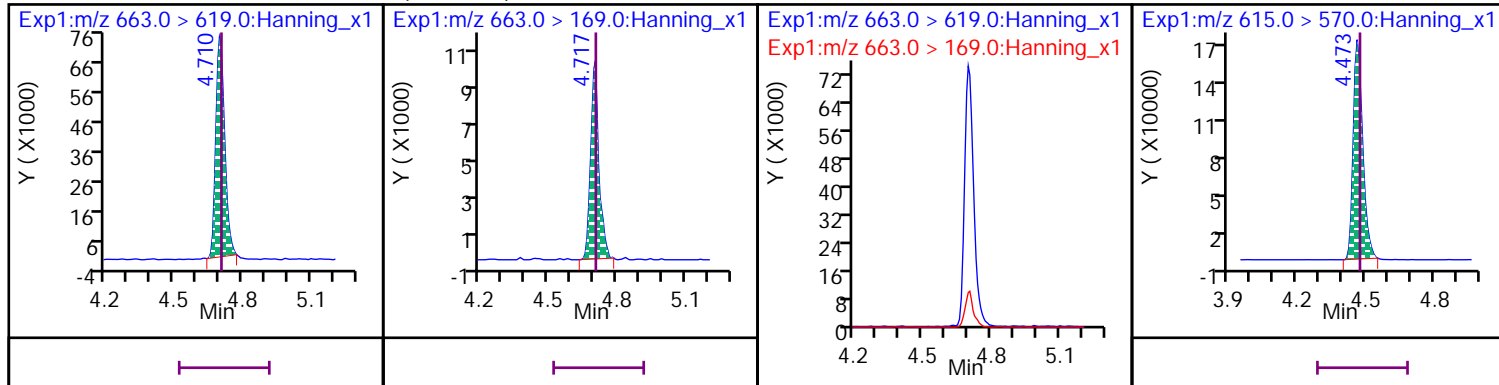
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



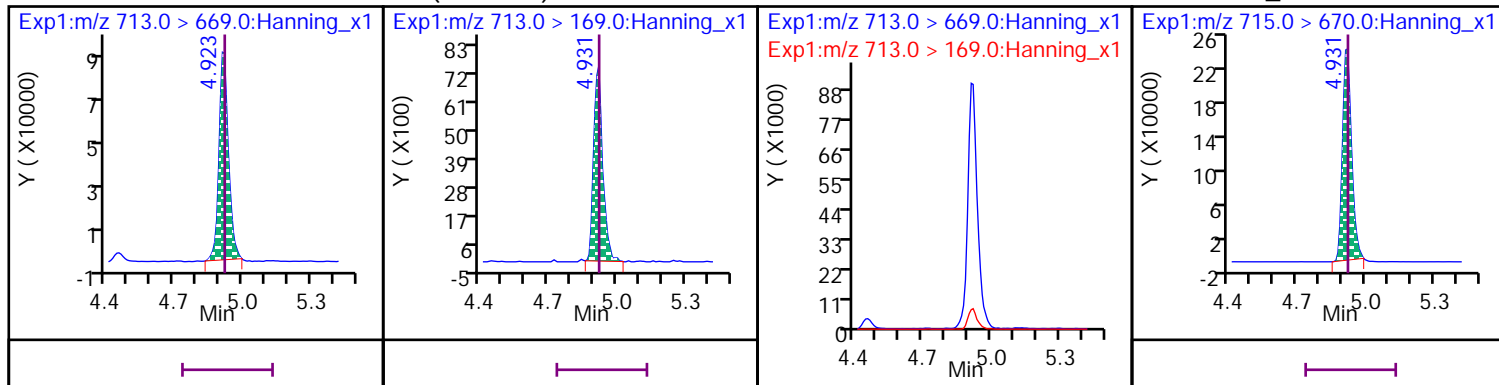
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



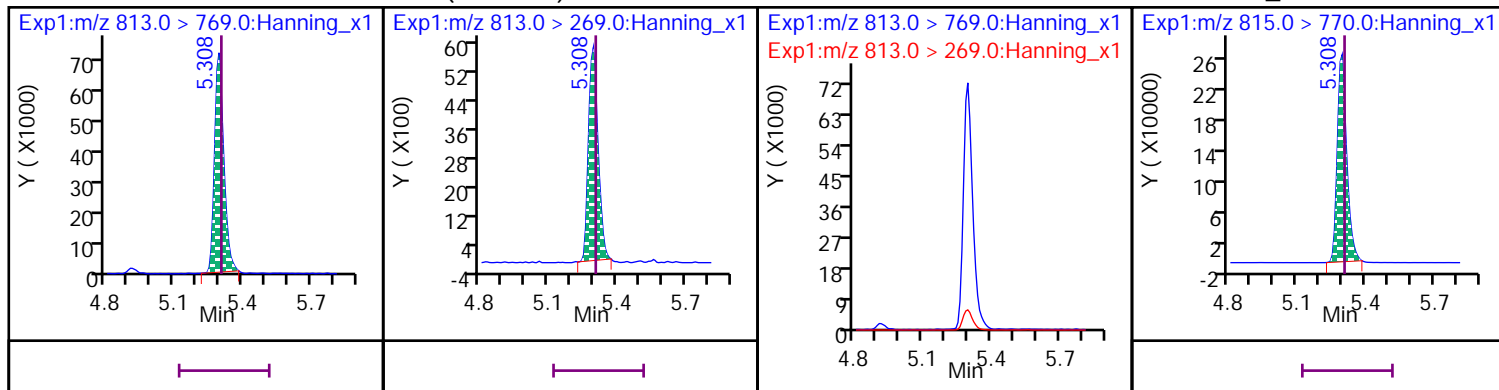
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



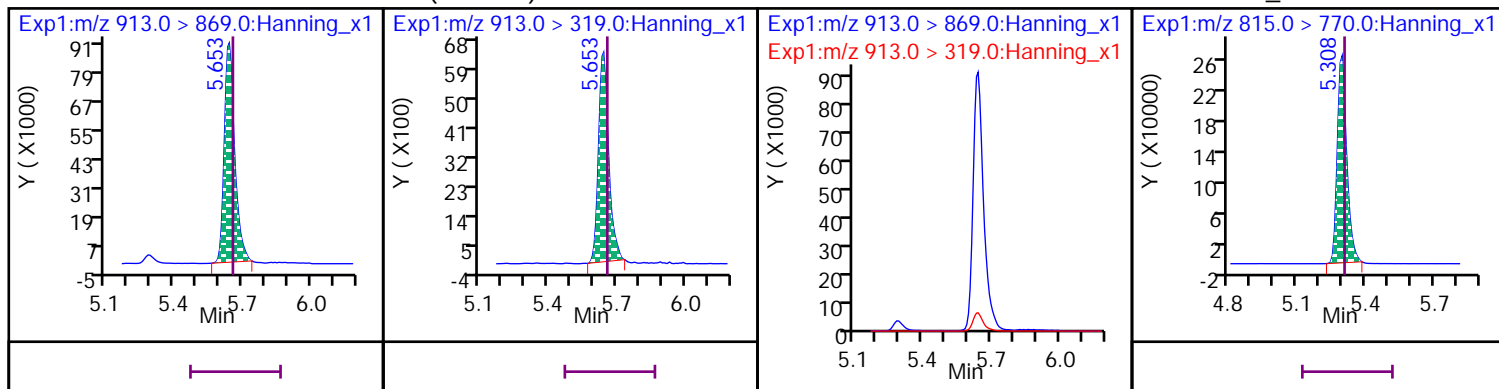
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

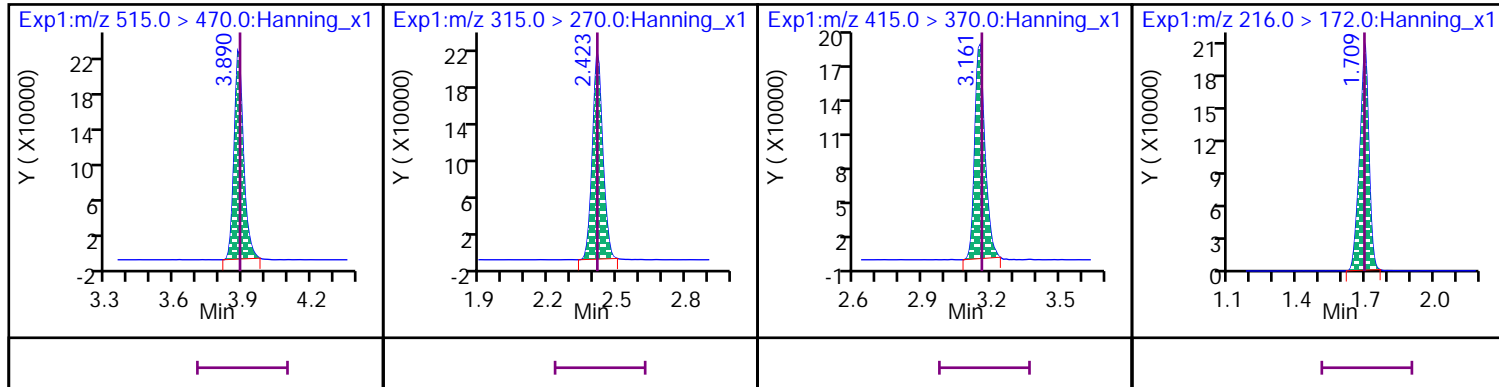


\* 37 13C2\_PFDA

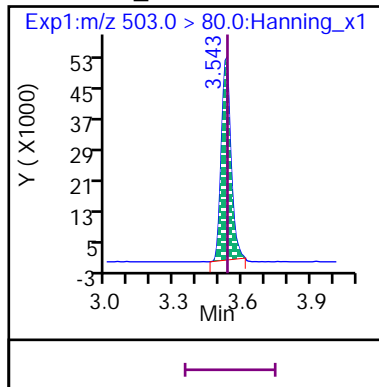
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320014.d

Injection Date: 23-Dec-2020 12:56:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: VQ77367-002

Sample Info: VQ77367-002

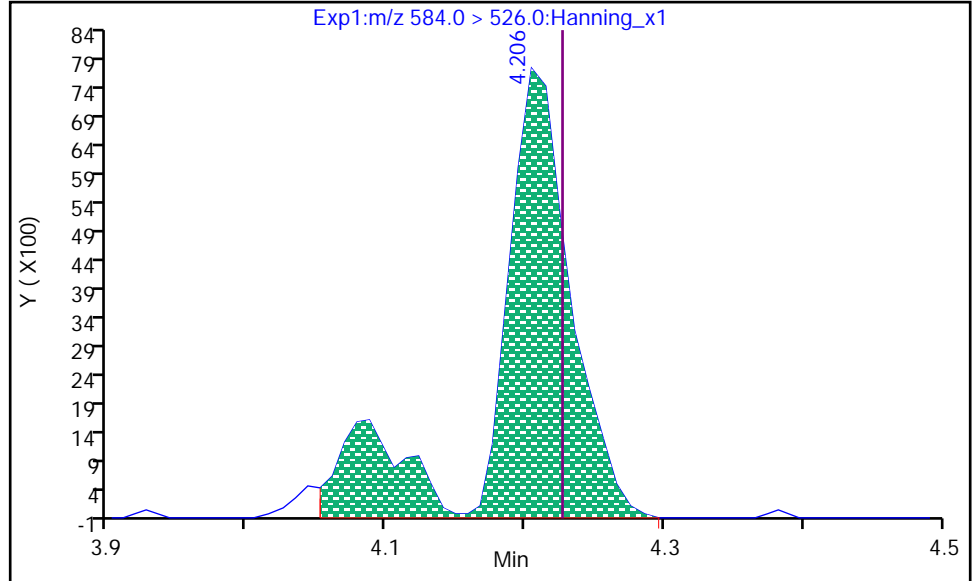
Dil. Factor: 1

Operator: Stephen E. Somerville

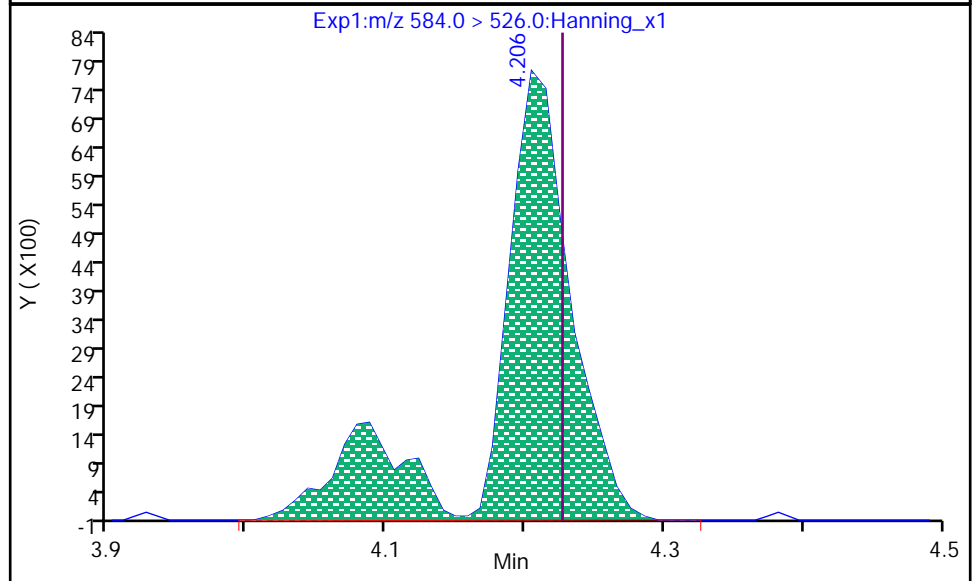
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.206  
Area: 28688  
Conc: 17.018  
Conc Units: ng/L



RT: 4.206  
Area: 29473  
Conc: 17.018  
Conc Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:53:24

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320014.d

Injection Date: 23-Dec-2020 12:56:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: VQ77367-002

Sample Info: VQ77367-002

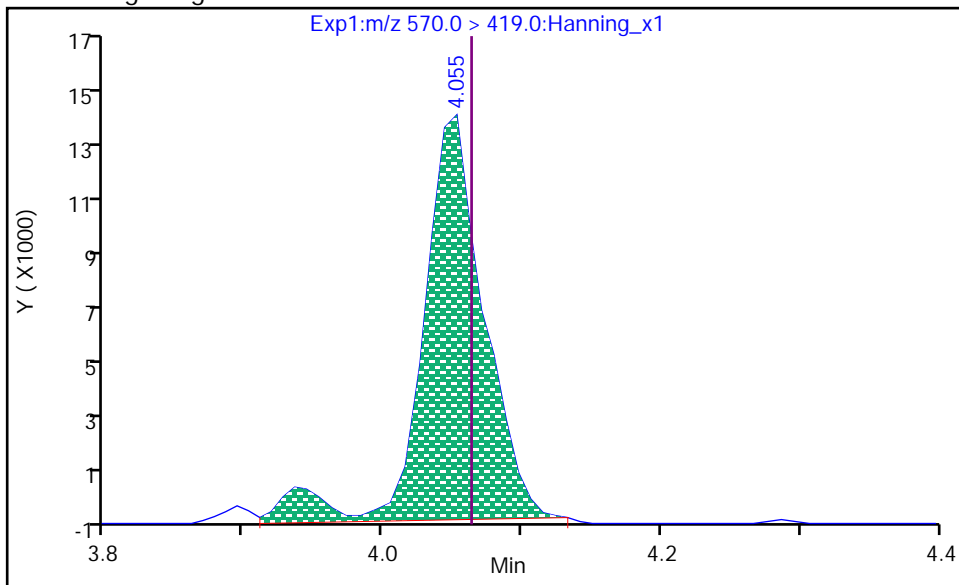
Dil. Factor: 1

Operator: Stephen E. Somerville

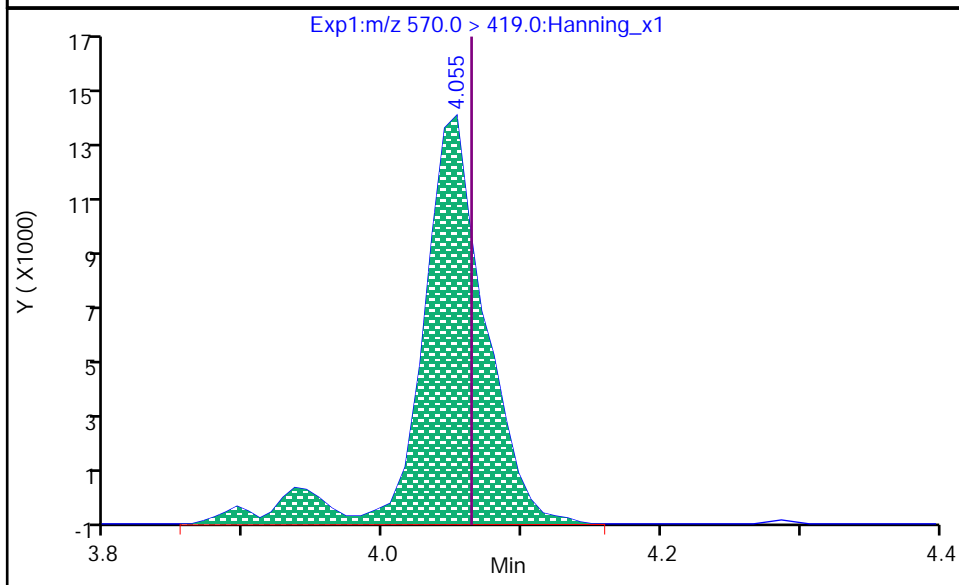
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.055  
Area: 43047  
Conc: 18.080  
Conc Units: ng/L



RT: 4.055  
Area: 45912  
Conc: 19.284  
Conc Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:53:16

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b\122320014.d

Injection Date: 23-Dec-2020 12:56:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: VQ77367-002

Sample Info: VQ77367-002

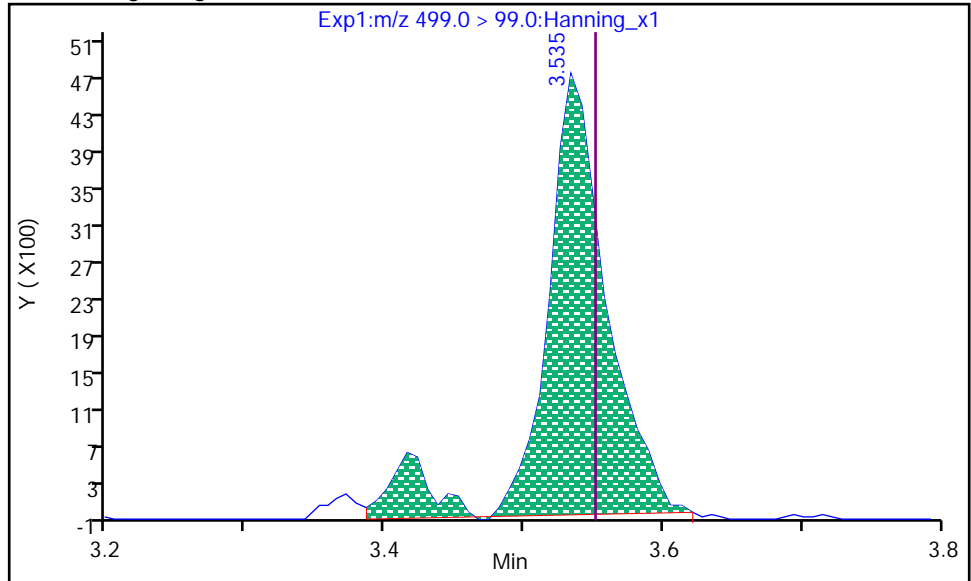
Dil. Factor: 1

Operator: Stephen E. Somerville

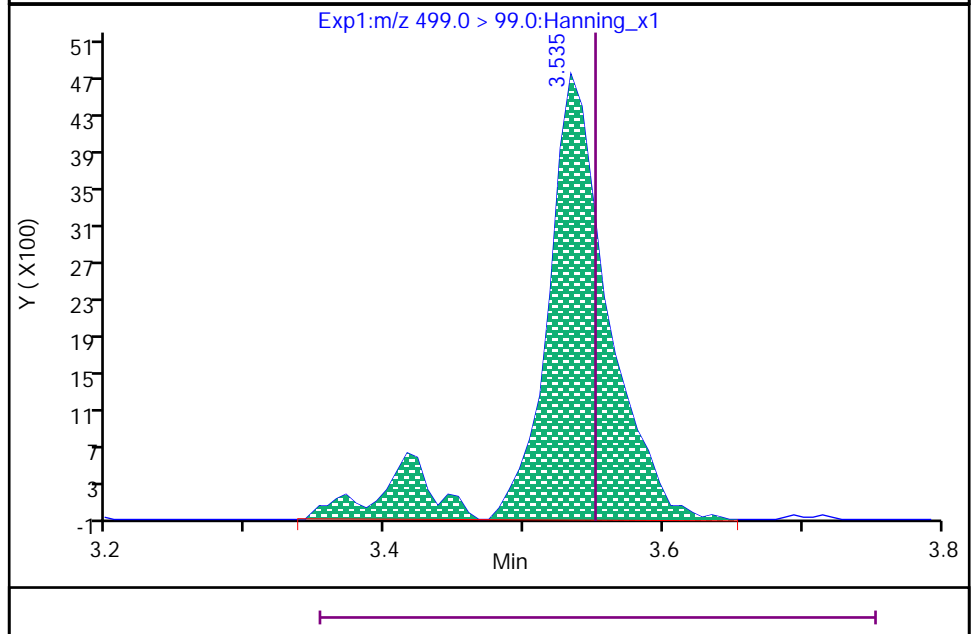
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.535  
Area: 14937  
Conc: 18.299  
Conc Units: ng/L



RT: 3.535  
Area: 15995  
Conc: 18.299  
Conc Units: ng/L



Data Editor: matthew.miller, 27-Dec-2020 14:53:07

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDaA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		85	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		86	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBa		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		90	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		86	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		83	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d  
 Injection Date: 28-Dec-2020 10:48:51 Injection Vol: 10.0 uL  
 Sample Type: LCS Auto Sampler: 2  
 Lab Sample ID: VQ77741-002 Lab Prep. Batch: 77741  
 Sample Info: VQ77741-002 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
 Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 584162 24 >100:1 1001.00 842.28 89.9

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/0 208974 24 >100:1 359.53 15.804

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.077 2.072 1 598149 17 >100:1 1001.00 869.55 89.8

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/0 208586 16 >100:1 347.19 15.261

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 204996 17 >100:1 1001.00 890.39 86.1

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 73217 16 >100:1 Target = 3.34 303.23 13.329

298.9 > 99 44 2.130 2.125 19690 16 >100:1 3.71 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.460 2.450 1/0 58830 20 >100:1 Target = 3.09 331.16 14.557

349 > 99 44 2.451 2.450 19956 21 >100:1 2.94 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.379 1 116364 21 >100:1 5005.00 4806.78 80.8

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.380 2.388 0/-1 18870 18 >100:1 Target = 1.64 406.68 17.876

327 > 81 63 2.380 2.388 9745 19 58:1 1.93 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.415 2.423 0 666661 20 >100:1 1001.00 904.47 89.7

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.424 2.423 1/1 226693 19 >100:1 Target = 17.01 344.77 15.155

313 > 119 49 2.415 2.423 11688 19 >100:1 19.39 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.531 2.530 1 1265137 20 >100:1 5005.00 4749.83 90.3

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.531 2.530 1/0 127037 20 >100:1 Target = 0.79 699.51 30.748

285 > 185 66 2.531 2.530 157020 21 >100:1 0.80 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 560783 20 >100:1 1001.00 924.40 88.5

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.772	1/0	196642	19	>100:1	Target = 3.79		338.40	14.875		
363 > 169	47	2.782	2.772		55820	21	>100:1	3.52 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	156371	20	>100:1			1001.00	913.23	89.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	52381	27	>100:1	Target = 3.80	0.17	316.25	13.901		
399 > 99	45	2.791	2.790		16635	25	>100:1	3.14 (1.90-5.71)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.808	1/0	344889	19	>100:1	Target = 2.97		347.75	15.286		
377 > 85	45	2.819	2.808		117100	20	>100:1	2.94 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.154	1/0	47675	21	>100:1	Target = 3.09		335.95	14.767		
449 > 99	45	3.155	3.154		14431	20	93:1	3.30 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	90418	21	>100:1			5005.00	4694.99	86.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	14671	29	>100:1	Target = 1.77		374.78	16.474		
427 > 81	64	3.129	3.128		9850	27	>100:1	1.48 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	542508	23	>100:1			1001.00	916.61	86.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	198462	22	>100:1	Target = 2.85		359.20	15.789		
413 > 169	53	3.149	3.148		63325	22	>100:1	3.13 (1.42-4.28)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	124373	21	>100:1			1001.00	829.55	81.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	51170	38	>100:1	Target = 6.80	0.29	347.54	15.277		
499 > 99	54	3.529	3.520		13738	45	88:1	3.72 (3.40-10.20)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/0	149731	23	>100:1			357.97	15.735		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/-1	33618	20		Target = 3.03		353.56	15.541		
549 > 99	54	3.858	3.865		12970	18	90:1	2.59 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	32182	18	>100:1	Target = 2.74		356.90	15.688		
599 > 99	54	4.162	4.169		14166	15	69:1	2.27 (1.37-4.11)					
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.317	1/0	128417	15	>100:1			363.93	15.997		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.663	1/0	34089	19	>100:1	Target = 3.16		341.74	15.022		
699 > 99	54	4.656	4.663		9103	17	69:1	3.74 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	675290	21	>100:1			1001.00	899.23	88	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	242297	22	>100:1	Target = 6.19		359.15	15.787		
463 > 169	56	3.522	3.520		37088	20	>100:1	6.53 (3.09-9.28)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	269071	20				1001.00	869.19	87.1	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	94483	19	>100:1			356.69	15.679		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	84871	26	>100:1			5005.00	4575.22	84.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-1	12294	38	47:1	Target = 2.11		349.97	15.383		
527 > 81	65	3.866	3.873		6717	22	53:1	1.83 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.455	1/0	16088	15	>100:1	Target = 3.05		410.55	18.046		
627 > 80	65	4.465	4.455		4038	26		3.98 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	618003	19	>100:1			1001.00	931.66	91.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.873	0/-1	219934	19	>100:1	Target = 13.22		362.54	15.936		
513 > 169	51	3.866	3.873		14311	26	84:1	15.36 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.029	0	678929	18	>100:1			5005.00	4729.92	85.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.029	1/1	37378	29	>100:1	Target = 1.34	0.09	358.71	15.768		
570 > 483	58	4.030	4.029		28161	36		1.32 (0.67-2.02)	0.18				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	606722	19	>100:1			5005.00	4568.18	82.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.188	4.187	1/0	42849	35	>100:1	Target = 1.71	0.13	355.04	15.606		M
584 > 526	60	4.179	4.187		24943	31	>100:1	1.71 (0.85-2.57)	0.20				
<b>D 52 13C7_PFDuA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	549831	17	>100:1			1001.00	869.88	85.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.178	1/0	182663	20	>100:1	Target = 16.05		353.82	15.553		
563 > 169	52	4.170	4.178		13553	15	86:1	13.47 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.287	1	85533	17	>100:1			1001.00	790.45	81.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.297	1/0	29797	17	>100:1			371.13	16.314		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.307	1	34543	17	>100:1			1001.00	652.78	66.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.317	0/-1	14735	18	>100:1	Target = 1.18		378.47	16.636		
512 > 219	57	4.308	4.317		14841	20	>100:1	0.99 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	107210	17	>100:1			1001.00	854.98	78.2	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.464	1/0	35266	16	>100:1			370.10	16.268		
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	548164	20	>100:1			1001.00	905.58	89.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	189460	20	>100:1	Target = 10.35		341.64	15.017		
613 > 169	38	4.456	4.446		16320	23	95:1	11.60 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	185572	18	>100:1	Target = 8.56		344.05	15.123		
663 > 169	38	4.689	4.688		21880	22	>100:1	8.48 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	39394	17	>100:1			1001.00	802.41	78.3	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	12386	15	>100:1	Target = 1.08		288.08	12.663		
526 > 219	59	4.483	4.482		13300	24		0.93 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	708398	19	>100:1			1001.00	840.89	87.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	226612	20	40:1	Target = 11.29		369.57	16.245		
713 > 169	42	4.907	4.906		18507	18	>100:1	12.24 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	812791	19	>100:1			1001.00	896.96	86.9	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	191203	21	75:1	Target = 11.43		360.39	15.842		
813 > 269	40	5.283	5.282		16184	16	>100:1	11.81 (5.71-17.16)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.626	5.625	1/0	256113	25	40:1	Target = 13.84		356.32	15.662		
913 > 319	40	5.619	5.625		17145	22	>100:1	14.93 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	716350	20	>100:1					97.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	769824	20	>100:1					105	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	612735	25	>100:1					102	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	623700	23	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	171360	20	>100:1					105	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d

Injection Date: 28-Dec-2020 10:48:51

Inst. ID: LCMSMS02

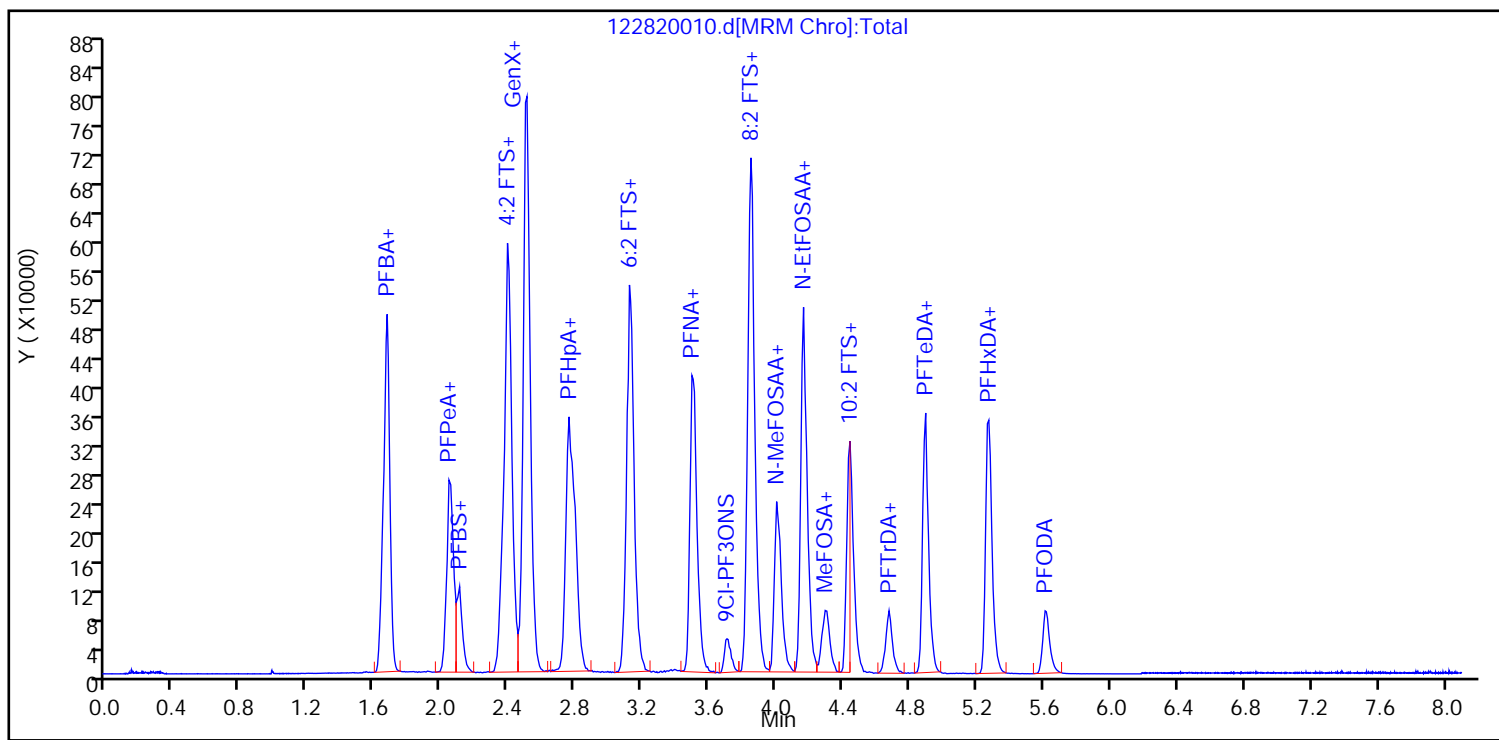
Client ID:

Lab ID: VQ77741-002

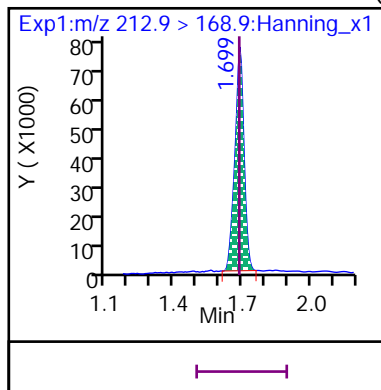
Sample Info: VQ77741-002

Dil. Factor: 1

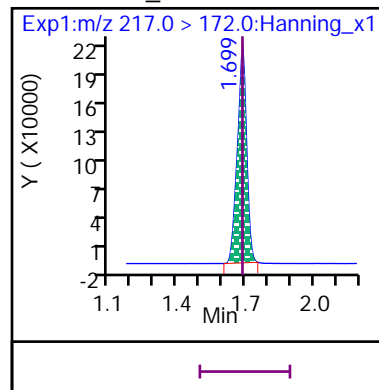
Operator: Matthew M. Miller



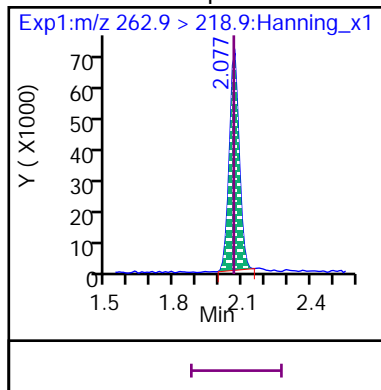
8 Perfluoro-n-butanoic acid (PFBA)



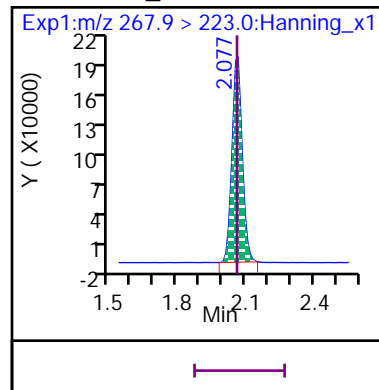
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

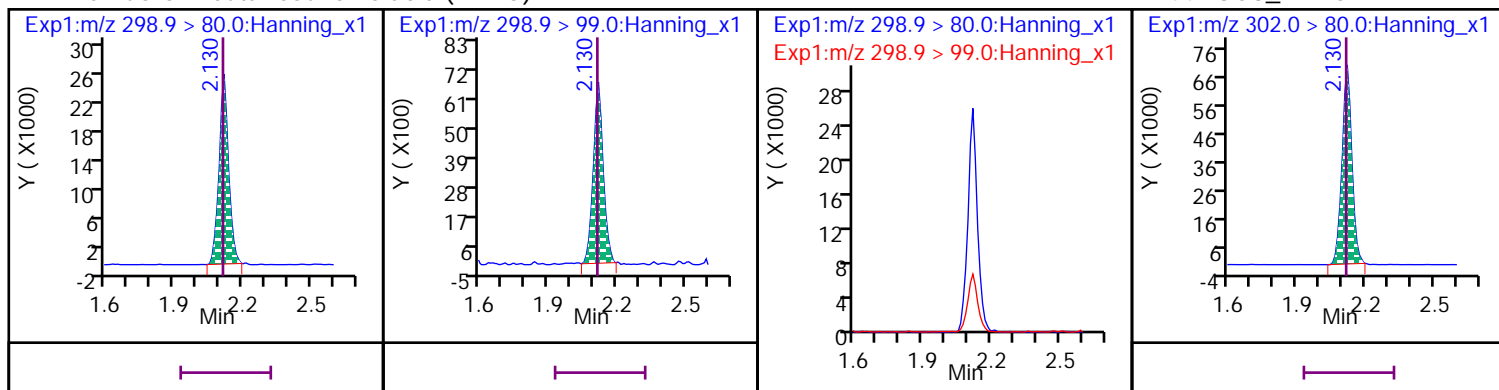


D 50 13C5\_PFPeA



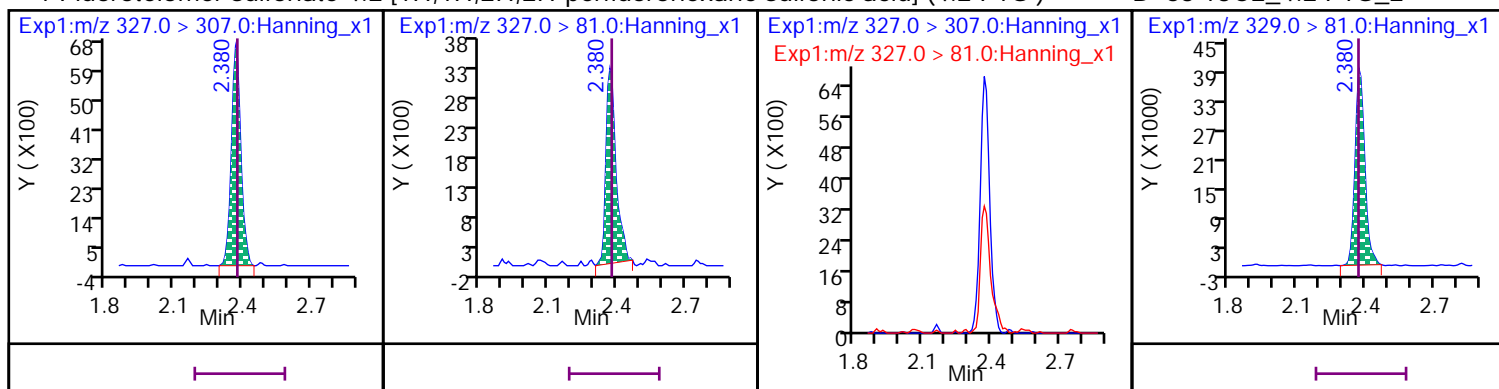
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



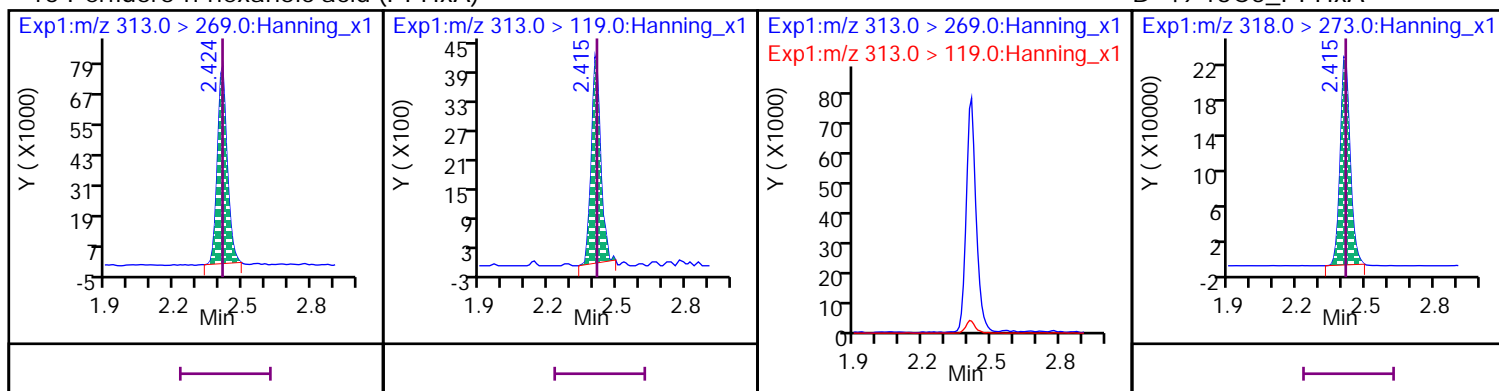
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



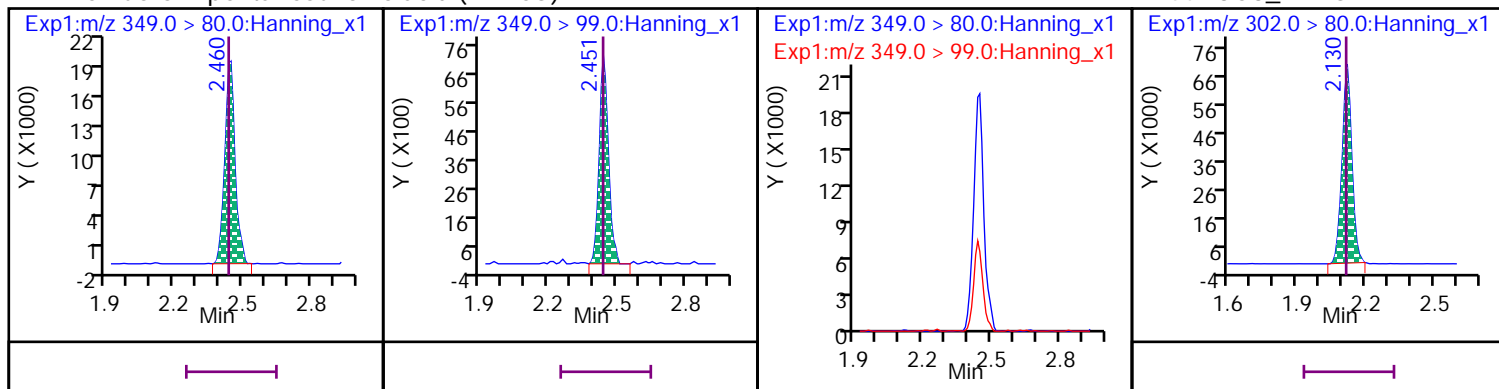
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



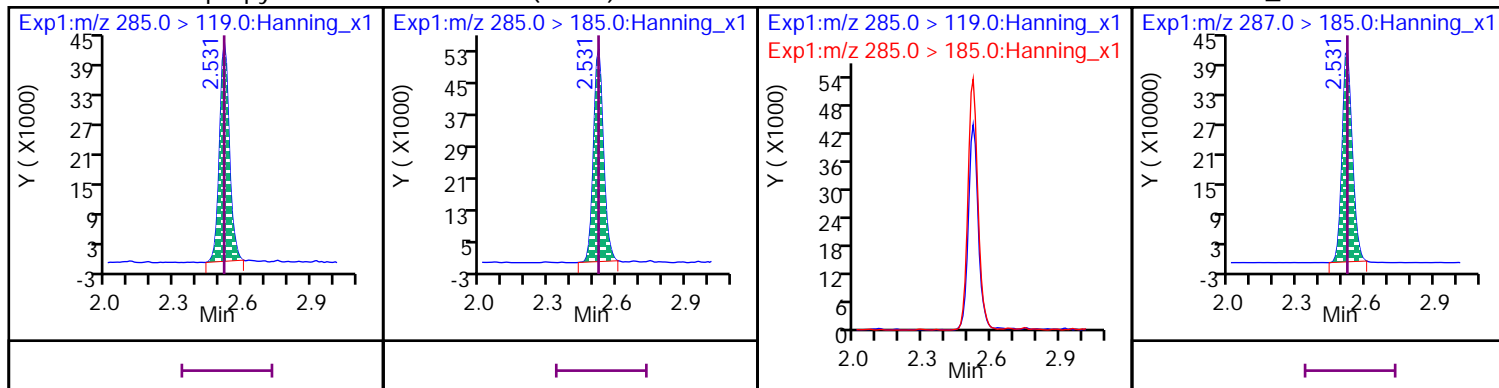
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



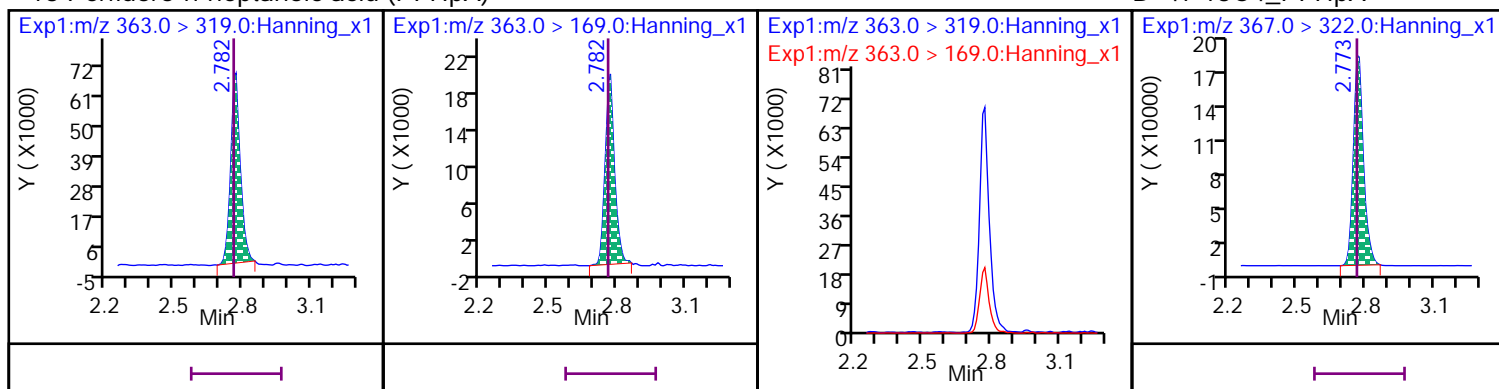
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



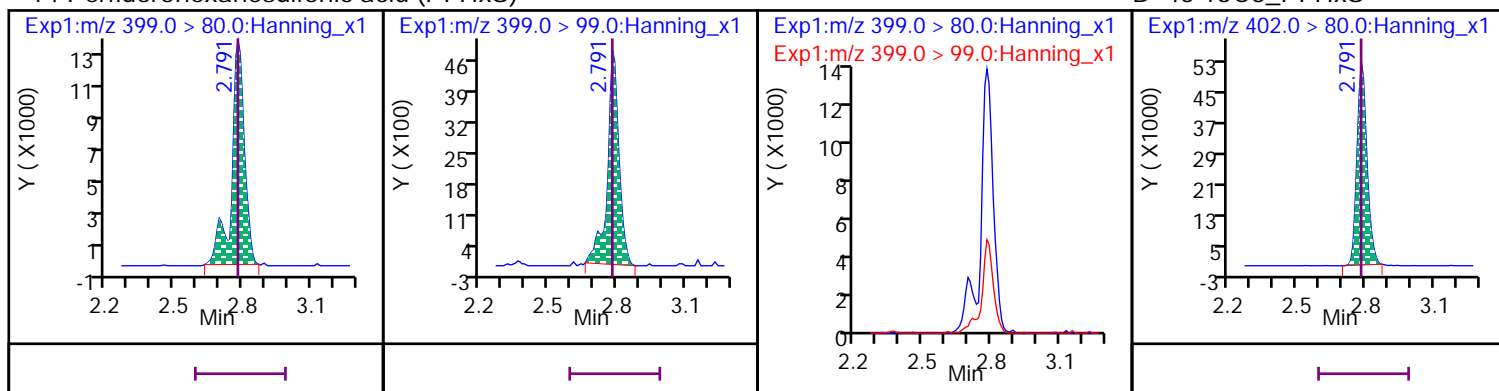
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



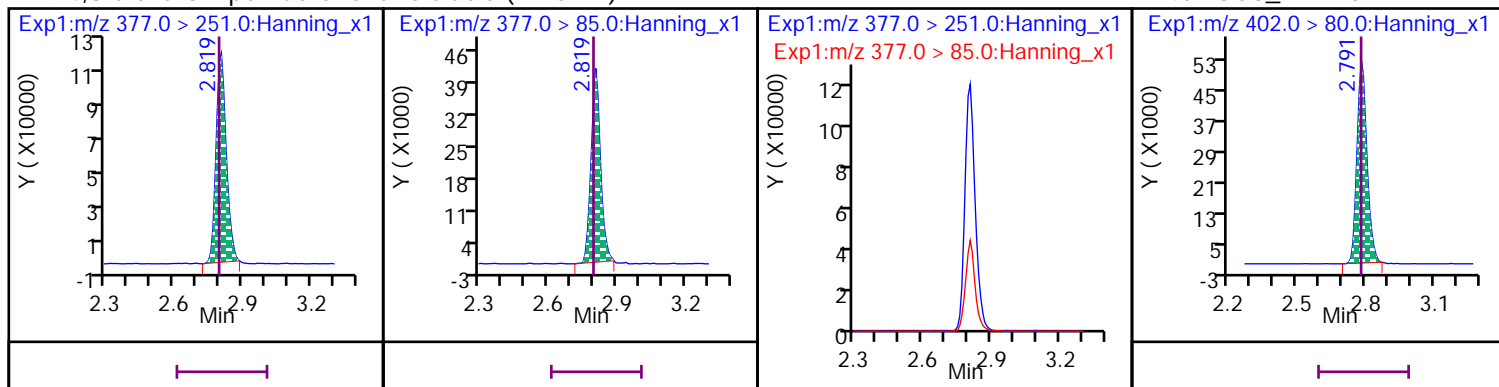
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



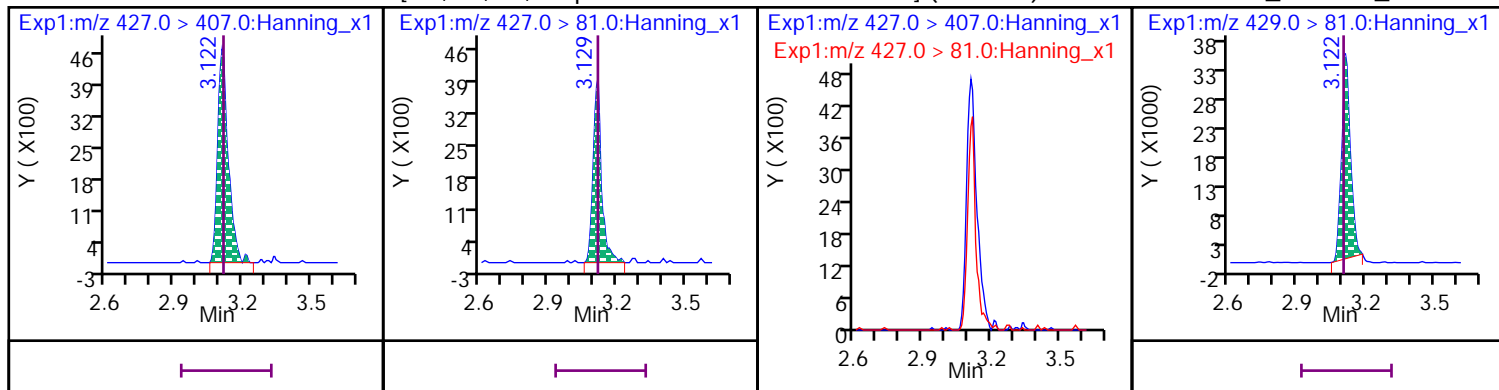
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



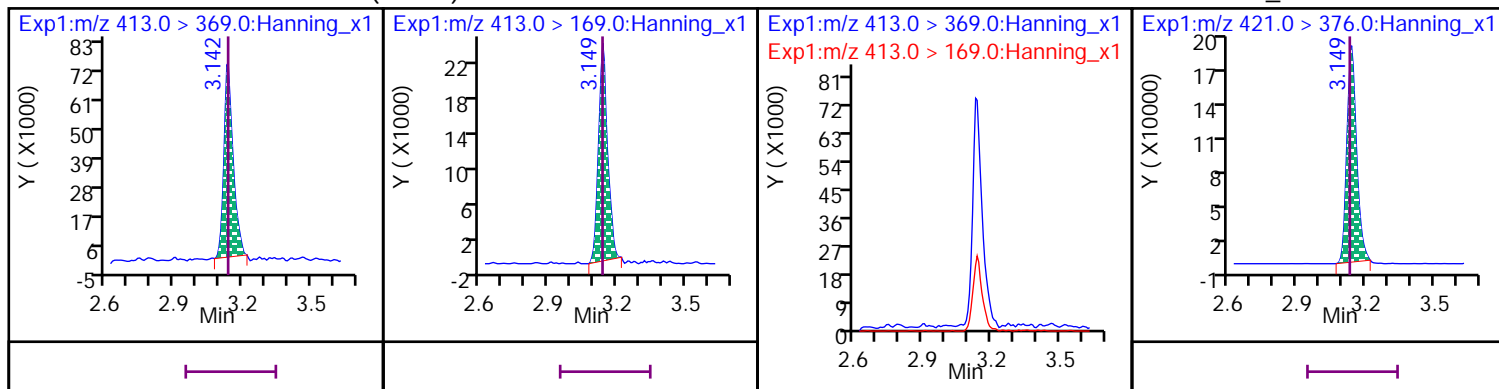
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



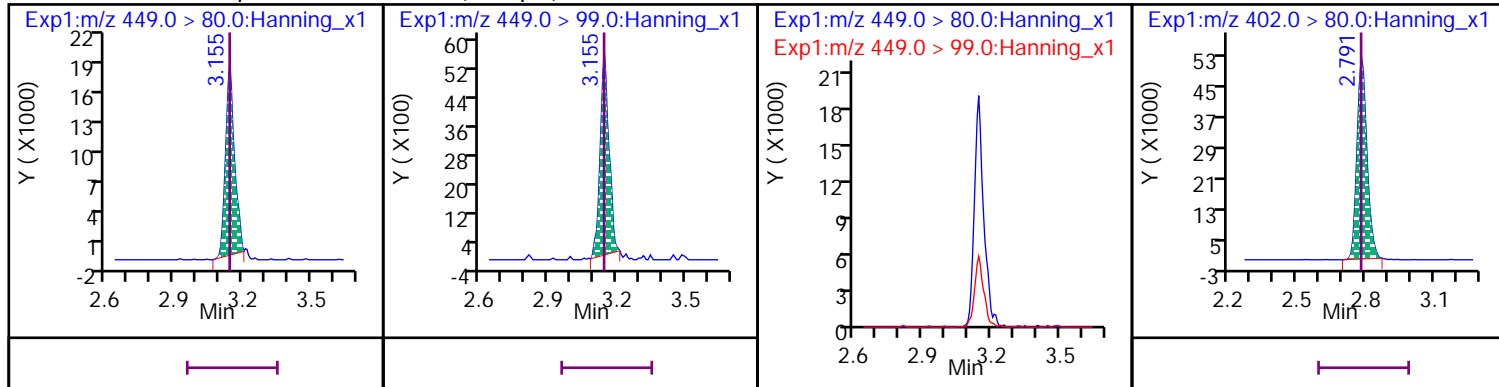
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



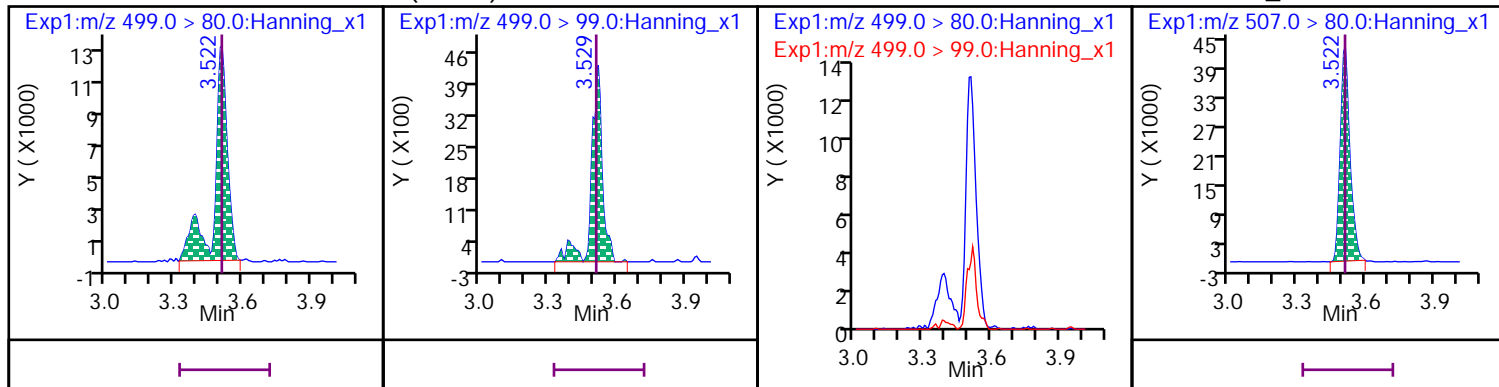
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



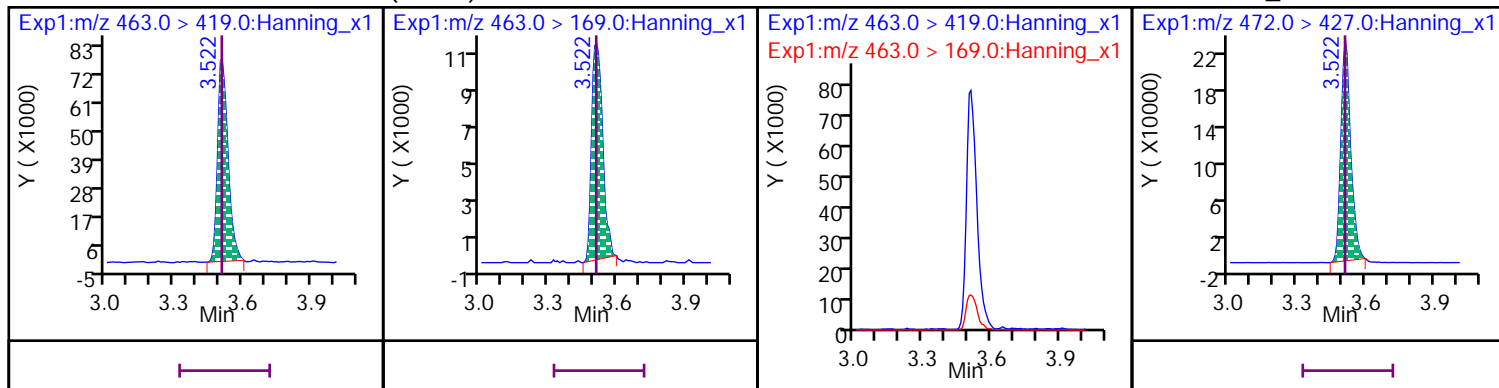
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



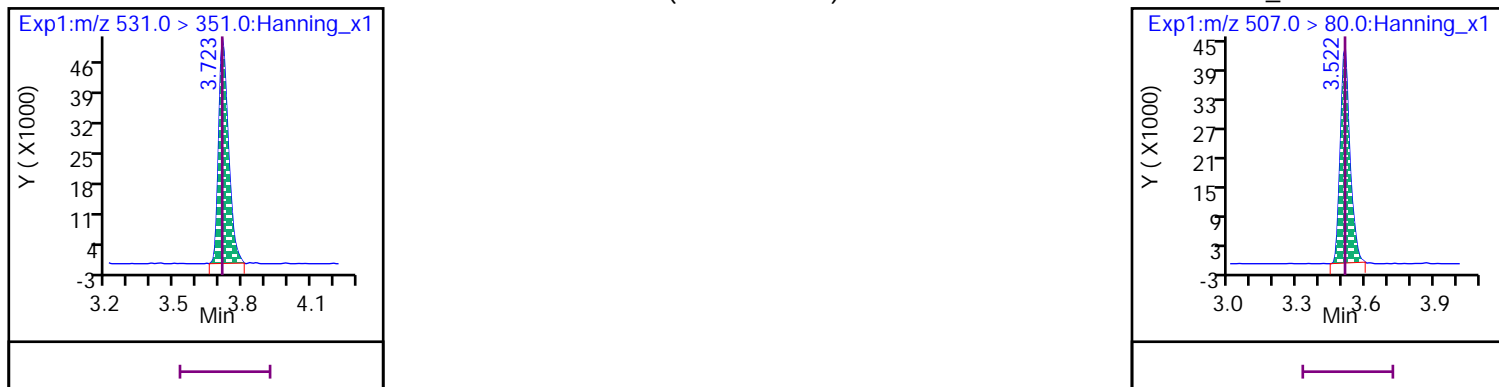
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



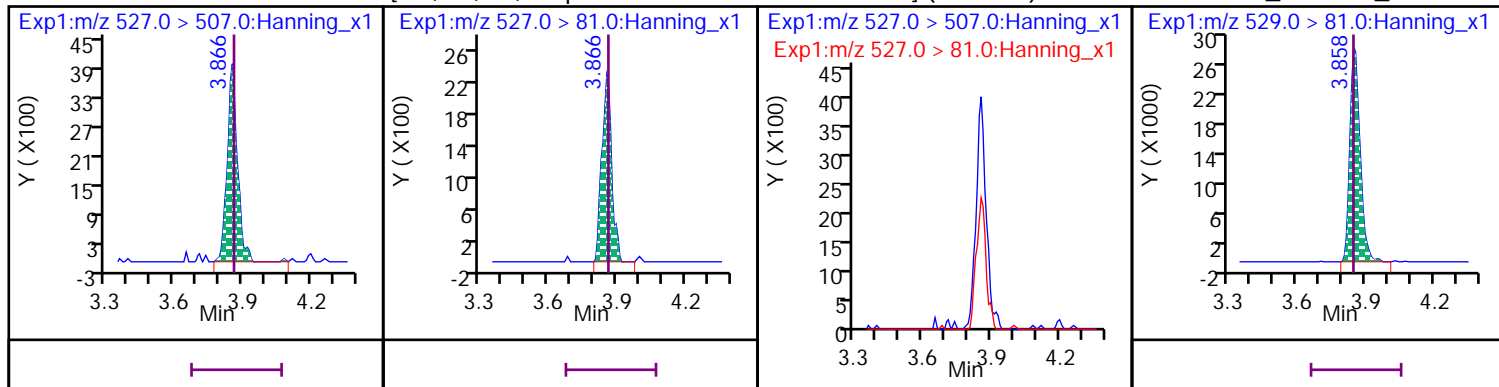
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



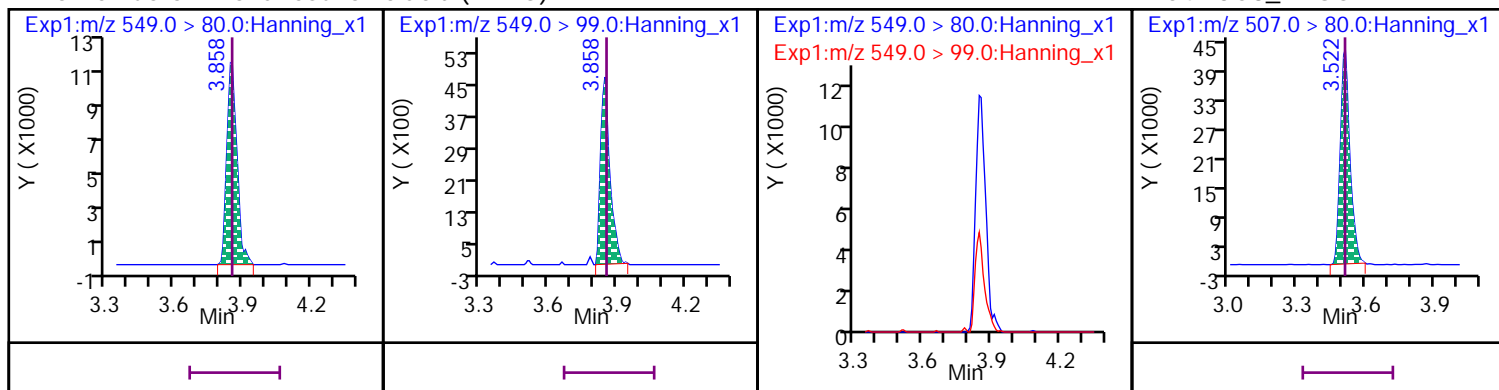
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



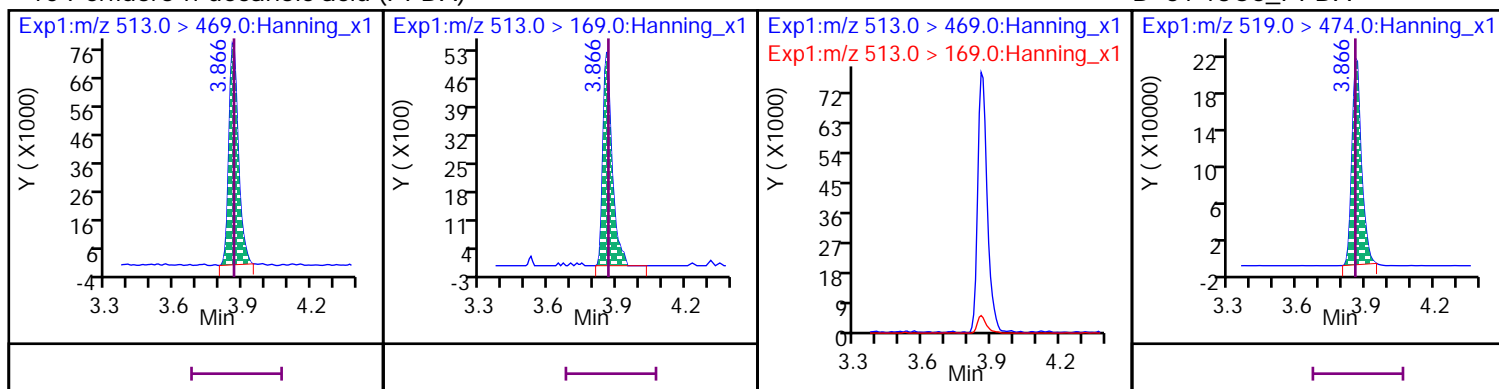
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



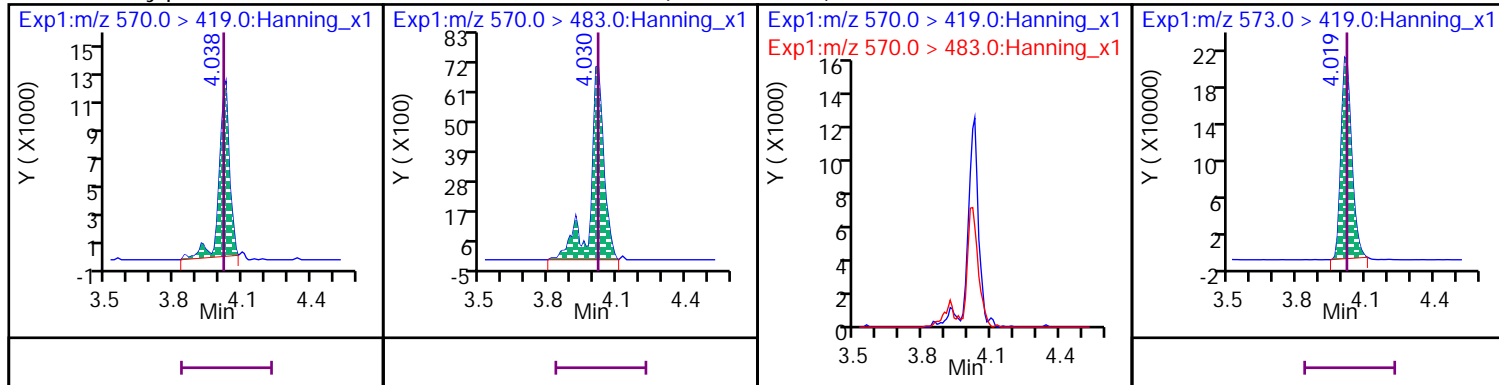
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



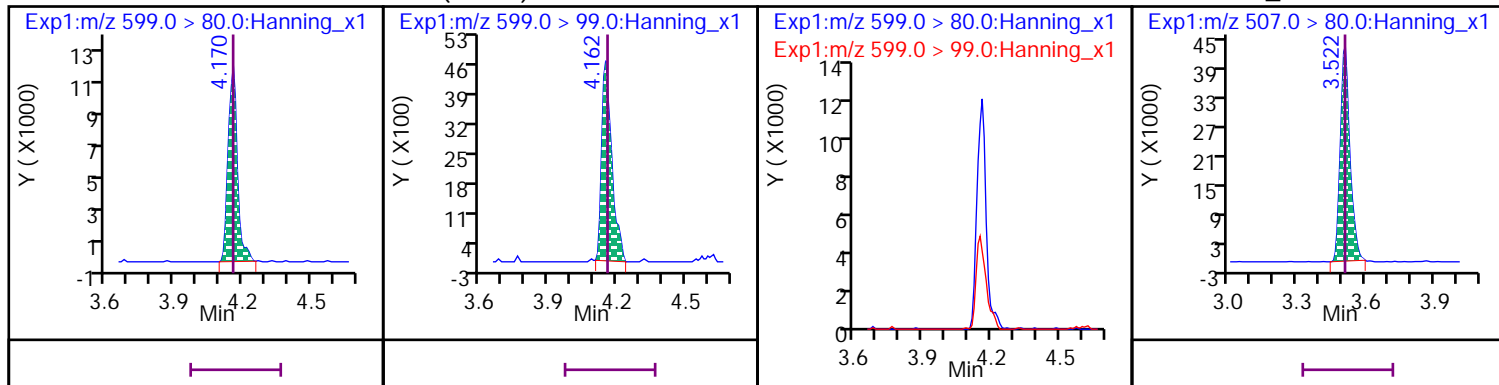
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



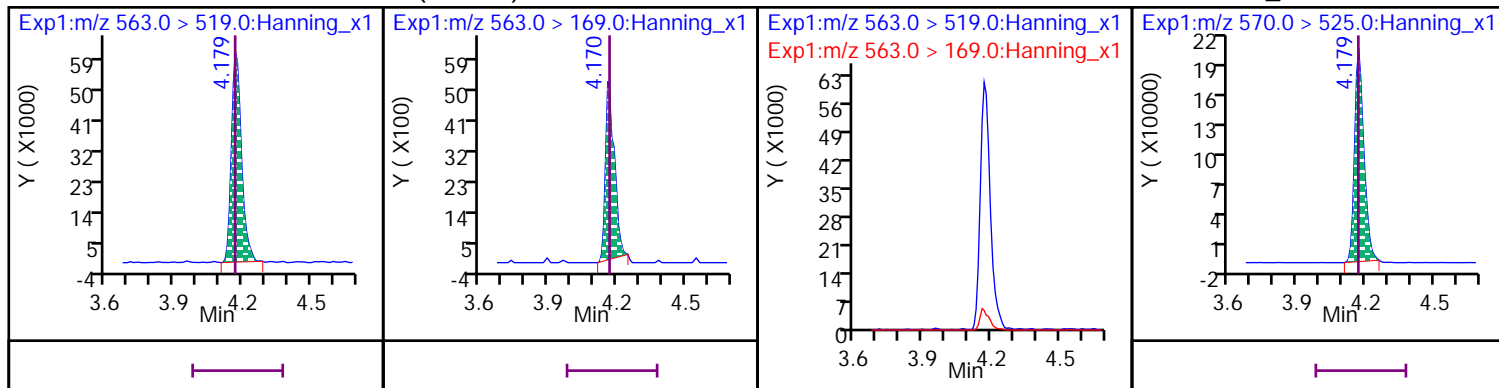
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



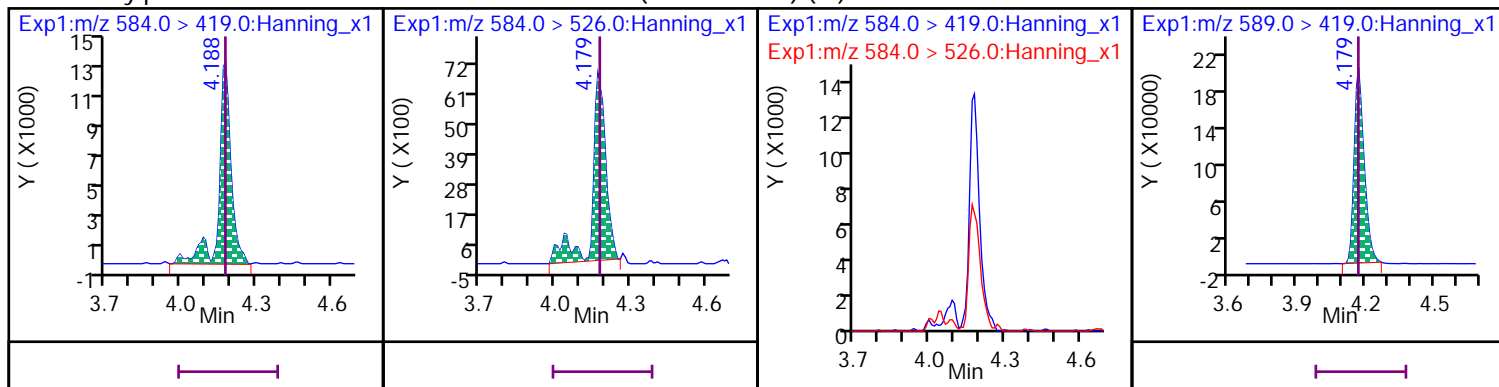
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



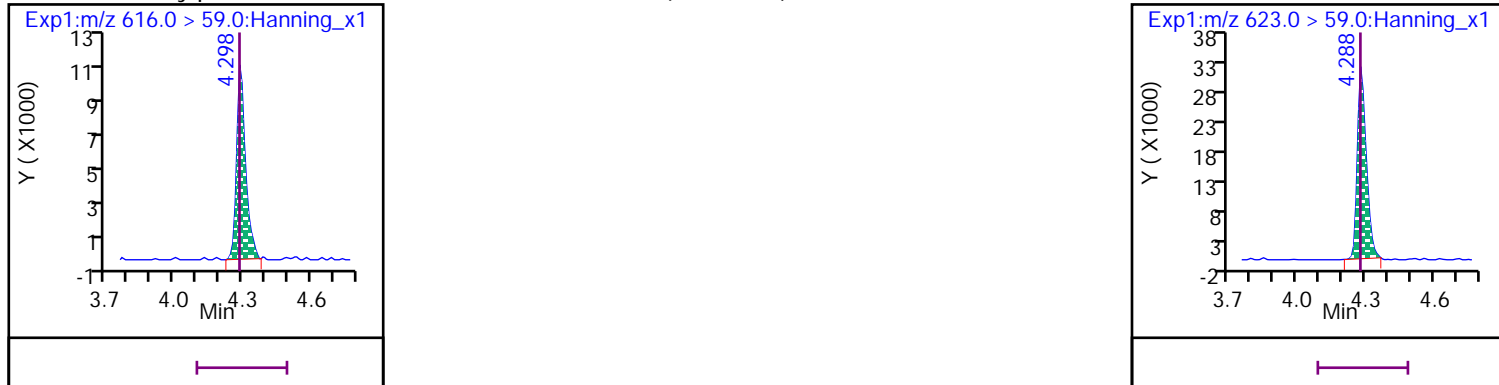
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



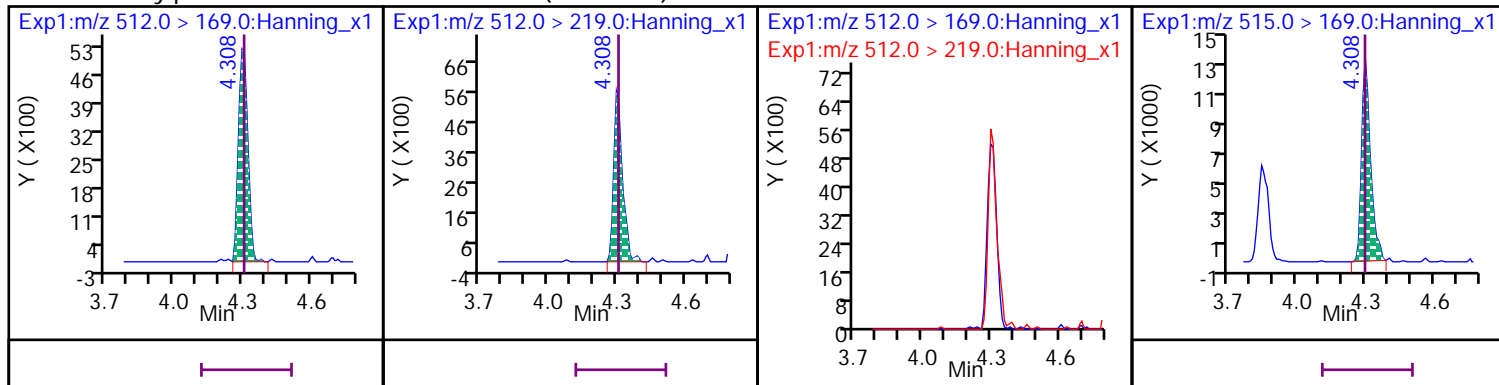
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

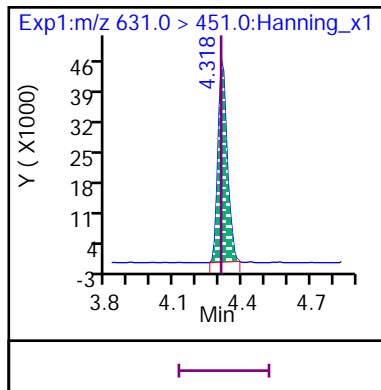


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

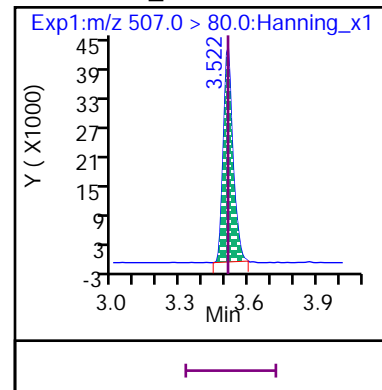
D 57 d3-MeFOSA



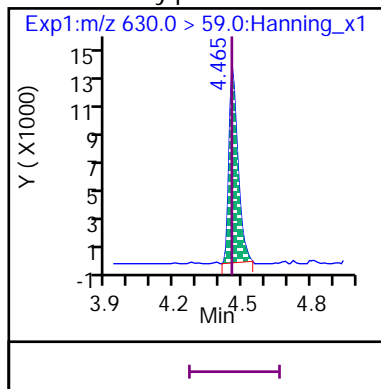
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



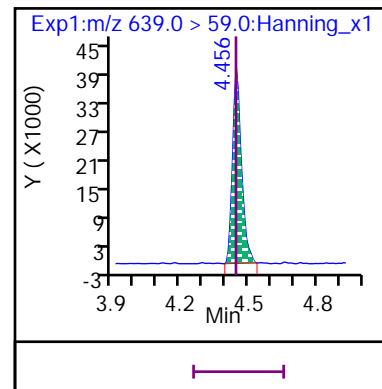
D 54 13C8\_PFOS



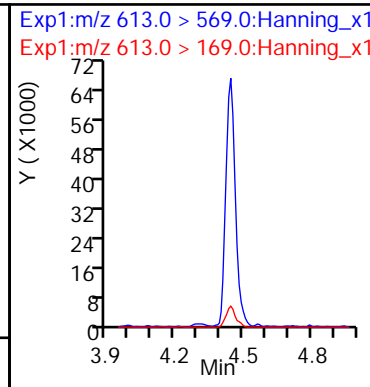
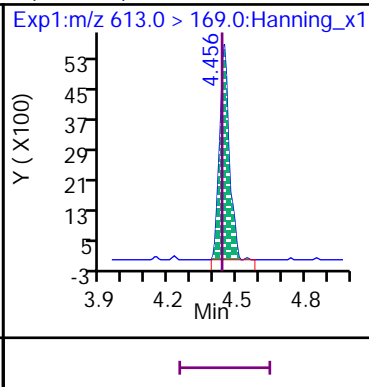
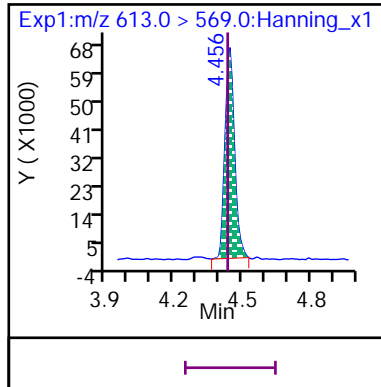
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



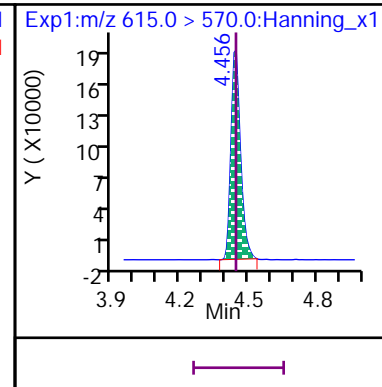
D 62 d9-EtFOSE



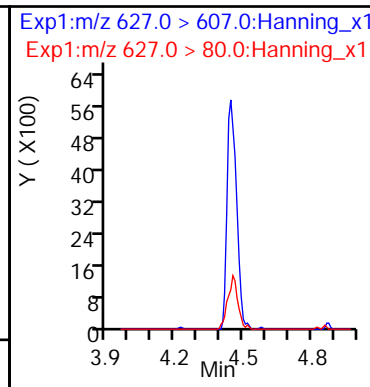
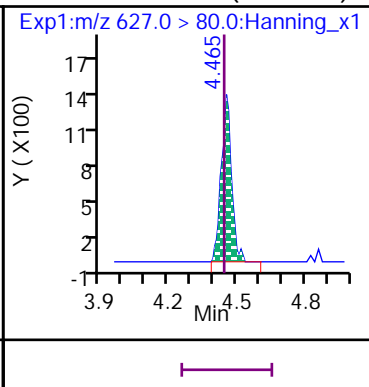
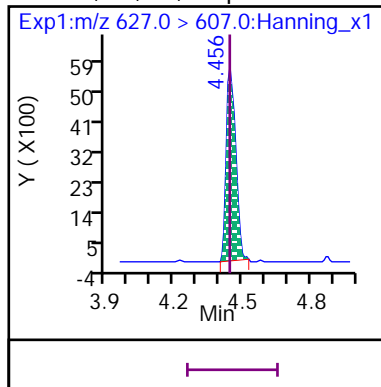
11 Perfluoro-n-dodecanoic acid (PFDaA)



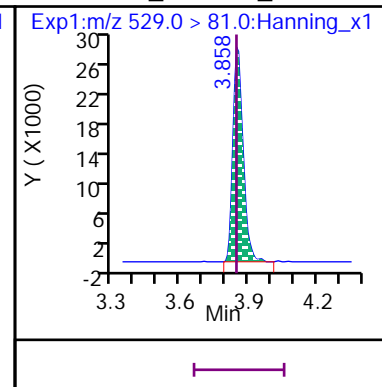
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



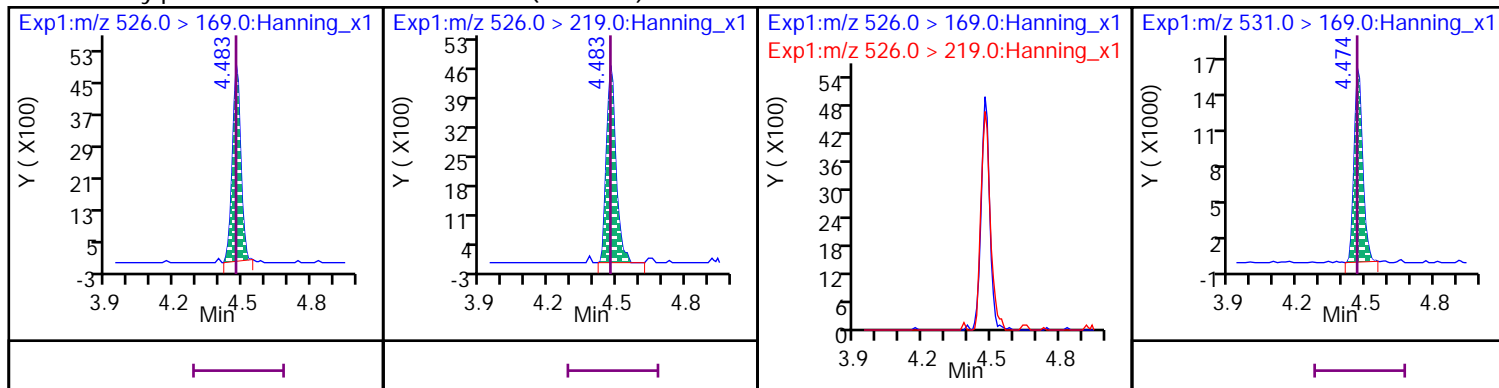
D 65 13C2\_8:2 FTS\_2





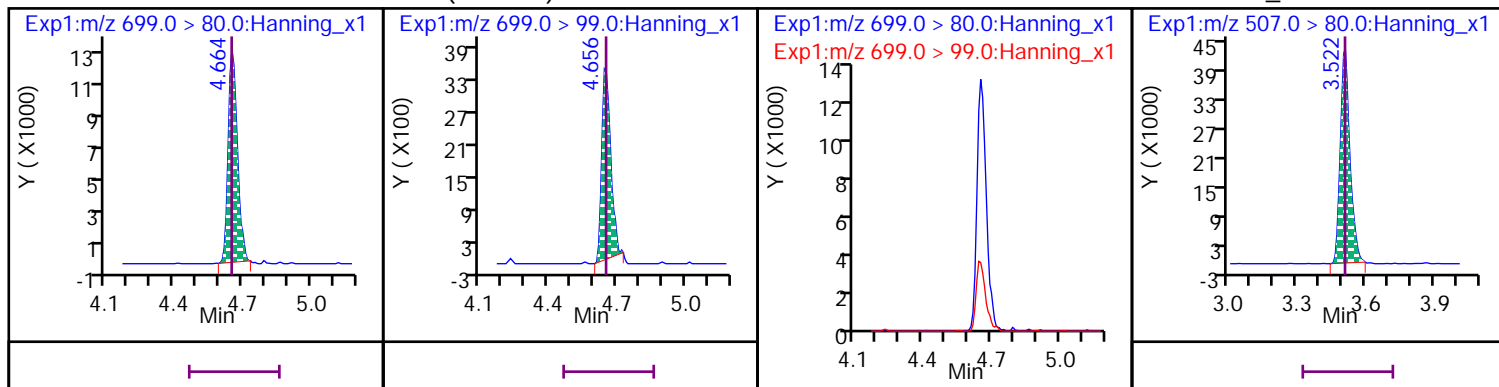
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



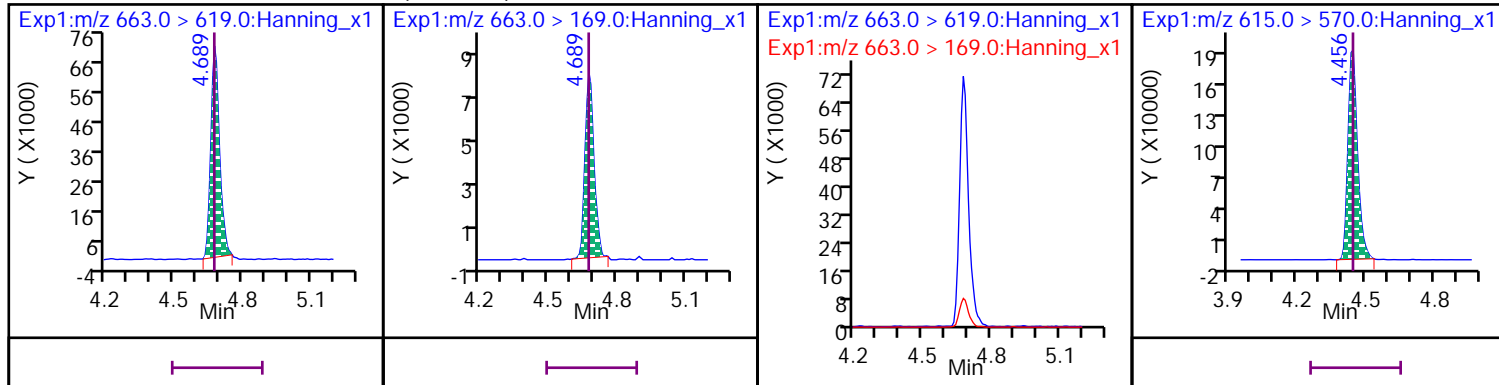
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



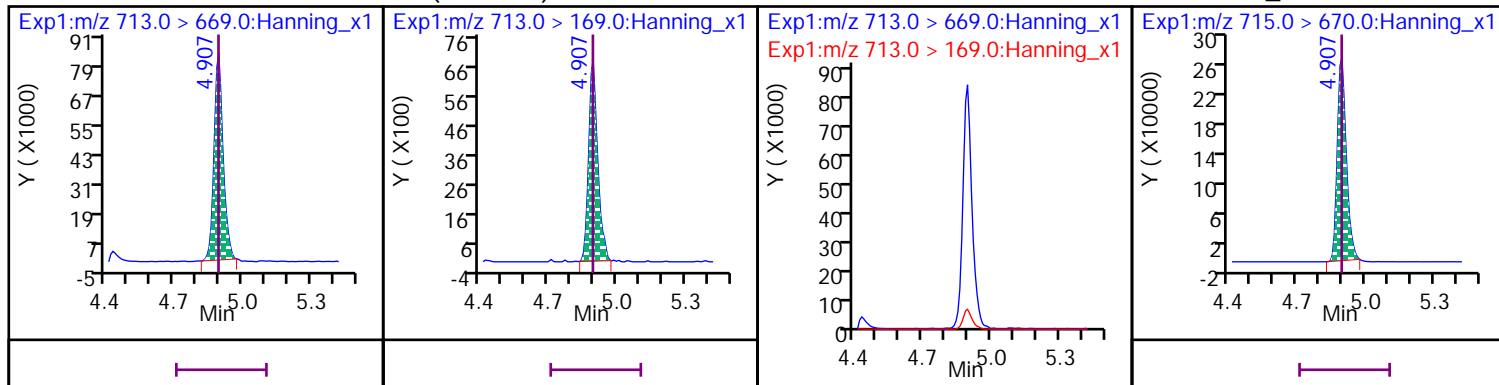
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



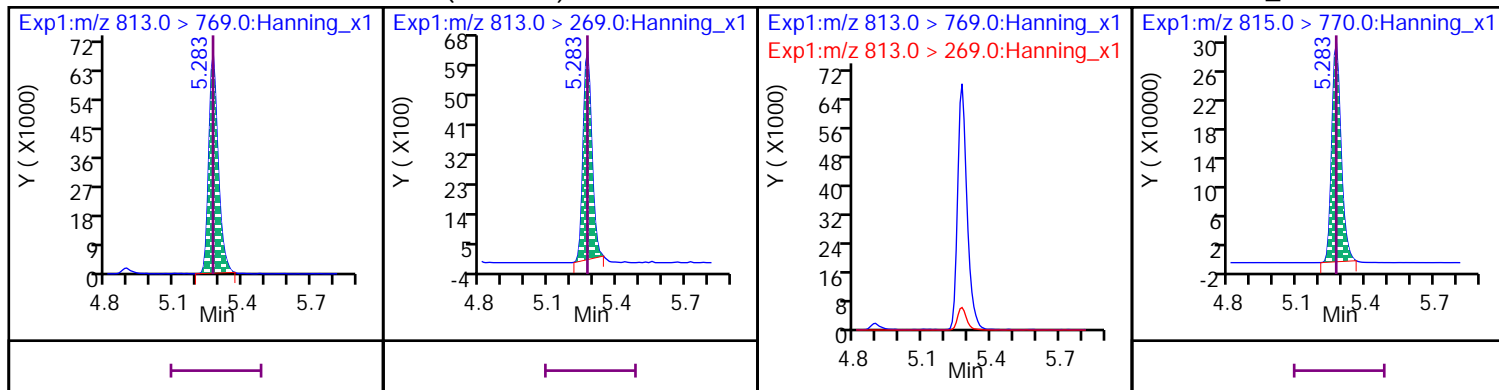
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



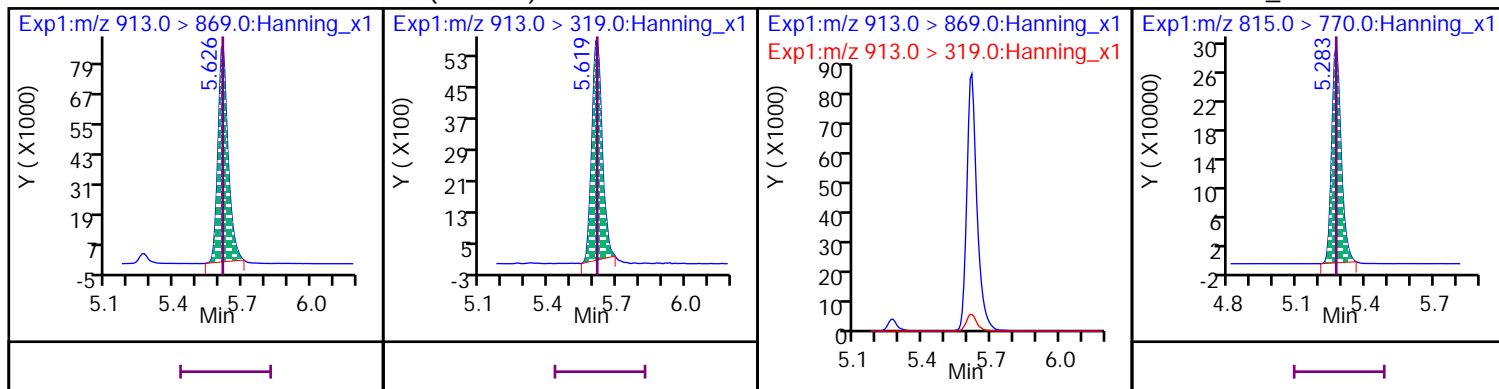
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

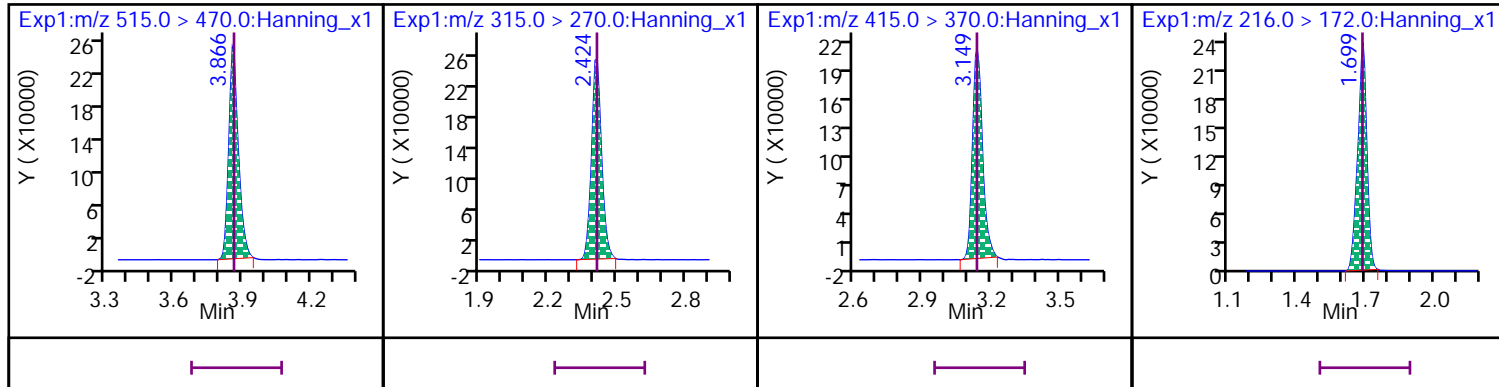


\* 37 13C2\_PFDA

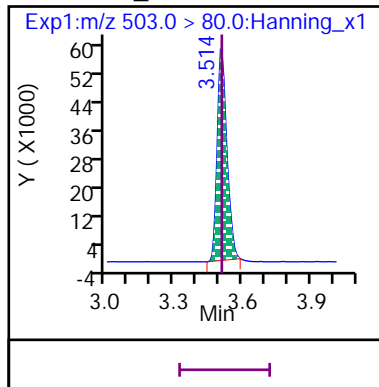
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d

Injection Date: 28-Dec-2020 10:48:51

Inst. ID: LCMSMS02

Client ID:

Lab ID: VQ77741-002

Sample Info: VQ77741-002

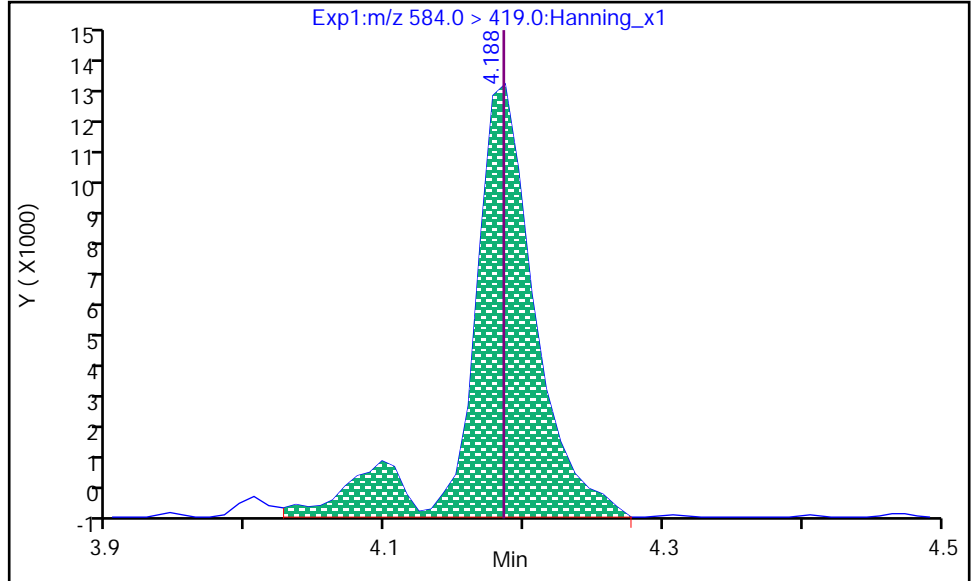
Dil. Factor: 1

Operator: Matthew M. Miller

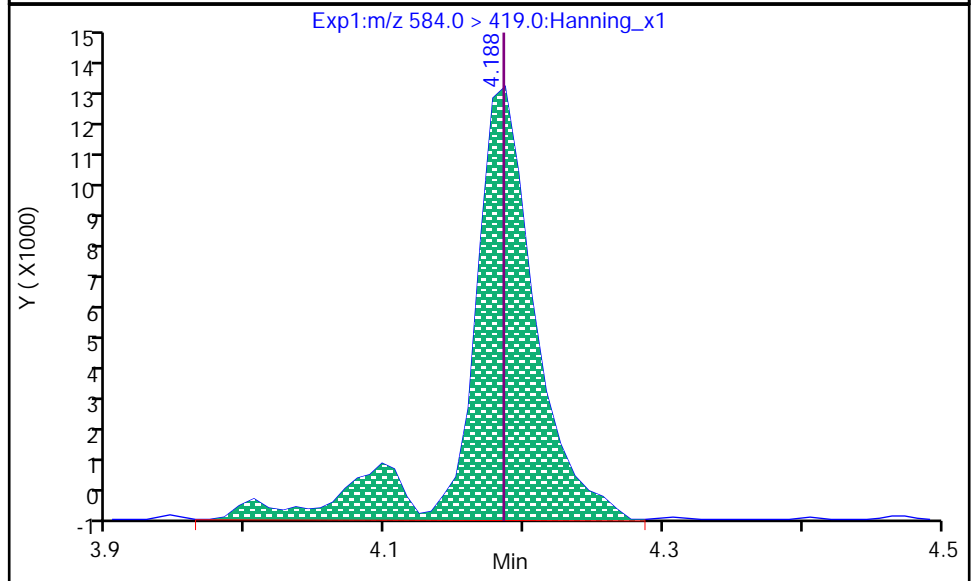
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.188  
Area: 41350  
Conc: 15.060  
Conc Units: ng/L



RT: 4.188  
Area: 42849  
Conc: 15.606  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:27:34

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	13	11		1	87	70-150	12/27/2020 1112
11CI-PF3OUdS	ND	13	12		1	88	70-150	12/27/2020 1112
8:2 FTS	ND	13	12		1	86	67-138	12/27/2020 1112
6:2 FTS	ND	13	13		1	96	64-140	12/27/2020 1112
GenX	ND	28	25		1	90	70-150	12/27/2020 1112
ADONA	ND	13	14		1	105	70-150	12/27/2020 1112
EtFOSAA	ND	14	13		1	92	61-135	12/27/2020 1112
MeFOSAA	ND	14	15		1	104	65-136	12/27/2020 1112
PFBS	4.9	12	16		1	93	72-130	12/27/2020 1112
PFHxS	1.8	13	15		1	102	68-131	12/27/2020 1112
PFBA	9.4	14	23		1	94	73-129	12/27/2020 1112
PFDA	ND	14	15		1	107	71-129	12/27/2020 1112
PFDoA	ND	14	14		1	97	72-134	12/27/2020 1112
PFHpA	ND	14	14		1	99	72-130	12/27/2020 1112
PFHxA	ND	14	14		1	98	72-129	12/27/2020 1112
PFNA	ND	14	13		1	96	69-130	12/27/2020 1112
PFOA	ND	14	15		1	105	71-133	12/27/2020 1112
PFPeA	ND	14	15		1	106	72-129	12/27/2020 1112
PFTeDA	ND	14	14		1	97	71-132	12/27/2020 1112
PFTrDA	ND	14	13		1	95	65-144	12/27/2020 1112
PFUdA	ND	14	14		1	97	69-133	12/27/2020 1112
PFOS	ND	13	13		1	96	65-140	12/27/2020 1112

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		85	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		81	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBa		99	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		92	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11001-001MS

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720010.d  
Injection Date: 27-Dec-2020 11:12:06 Injection Vol: 10.0 uL  
Sample Type: MS Auto Sampler: 3  
Lab Sample ID: VL11001-001MS Lab Prep. Batch: 77367  
Sample Info: VL11001-001MS Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0385579$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	285	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.692 1.698 0 628453 23 >100:1 1001.00 906.14 98.5

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.698 1/1 367742 22 >100:1 588.09 22.676

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.078 2.077 1 608259 17 >100:1 1001.00 884.24 92.4

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.078 2.077 1/0 236626 18 31:1 387.31 14.934

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.130 1 214688 17 >100:1 1001.00 932.49 89.5

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.130 1/0 107305 16 >100:1 Target = 3.34 424.34 16.362

298.9 > 99 44 2.130 2.130 29213 15 40:1 3.67 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.452 2.451 1/0 62543 17 >100:1 Target = 3.09 336.17 12.962

349 > 99 44 2.452 2.451 21924 19 >100:1 2.85 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.380 1 140913 17 >100:1 5005.00 5820.85 103

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.380 2.380 1/0 19842 16 >100:1 Target = 1.64 353.13 13.616

327 > 81 63 2.389 2.380 10794 14 22:1 1.83 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.415 1 678592 18 >100:1 1001.00 920.66 94.4

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.415 1/0 238488 19 >100:1 Target = 17.01 356.33 13.739

313 > 119 49 2.416 2.415 13326 22 60:1 17.89 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.522 1 1320113 19 >100:1 5005.00 4956.24 99.8

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.523 2.522 1/0 124848 21 >100:1 Target = 0.79 658.83 25.403

285 > 185 66 2.523 2.522 158563 19 >100:1 0.78 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.764 2.773 0 539335 19 >100:1 1001.00 889.04 92.1

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.764	2.773	0/0	201127	18	>100:1	Target = 3.79		359.88	13.876		
363 > 169	47	2.773	2.773		58646	20	>100:1	3.42 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.782	1	145493	17	>100:1			1001.00	849.70	81.6	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.792	2.782	1/0	59254	25	>100:1	Target = 3.80	0.17	384.49	14.825		
399 > 99	45	2.782	2.782		16857	26	71:1	3.51 (1.90-5.71)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.810	2.809	1/0	331068	20	>100:1	Target = 2.97		358.77	13.833		
377 > 85	45	2.810	2.809		111798	17	>100:1	2.96 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.142	1/0	51637	22	>100:1	Target = 3.09		391.08	15.079		
449 > 99	45	3.142	3.142		16714	21	98:1	3.08 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	95026	27	>100:1			5005.00	4934.26	85	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.115	1/0	13813	22	>100:1	Target = 1.77		332.72	12.829		
427 > 81	64	3.109	3.115		7164	17	35:1	1.92 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.135	1	550302	24	>100:1			1001.00	929.78	92.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.136	3.135	1/0	214023	36	>100:1	Target = 2.85	0.03	381.88	14.725		
413 > 169	53	3.142	3.135		76795	37	>100:1	2.78 (1.42-4.28)	0.04				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.515	3.507	1	138512	21	>100:1			1001.00	923.85	88	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.507	3.500	1/0	53220	45	>100:1	Target = 6.80	0.40	324.57	12.515		
499 > 99	54	3.515	3.500		16155	41	>100:1	3.29 (3.40-10.20)	0.15				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.716	3.716	1/0	136982	22	>100:1			294.06	11.338		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.859	3.858	1/0	31721	23	>100:1	Target = 3.03		299.56	11.550		
549 > 99	54	3.859	3.858		11839	19	>100:1	2.67 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.154	4.153	1/0	32683	17	>100:1	Target = 2.74		325.46	12.549		
599 > 99	54	4.154	4.153		8586	21		3.80 (1.37-4.11)					
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.309	4.318	0/-1	118197	14	>100:1			300.78	11.597		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.658	4.648	1/0	34523	19	>100:1	Target = 3.16		310.76	11.982		
699 > 99	54	4.658	4.648		11353	17	>100:1	3.04 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.515	3.515	1	677506	20	>100:1			1001.00	902.18	89	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.515	3.515	1/0	235849	22	>100:1	Target = 6.19		348.45	13.436		
463 > 169	56	3.515	3.515		40551	28	>100:1	5.81 (3.09-9.28)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.851	3.850	1	287076	21	>100:1			1001.00	927.36	92	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.851	3.858	0/-1	96081	19	>100:1			339.97	13.109		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.851	3.850	1	94403	19	>100:1			5005.00	5089.07	107	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.859	3.850	1/0	11766	18	63:1	Target = 2.11		298.77	11.520		
527 > 81	65	3.851	3.850		7467	17	71:1	1.57 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.449	4.447	1/0	12397	23	>100:1	Target = 3.05		284.42	10.967		
627 > 80	65	4.449	4.447		3285	21	21:1	3.77 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.867	3.858	1	581406	20	>100:1			1001.00	876.49	91.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.867	3.866	1/0	222407	24	>100:1	Target = 13.22		389.70	15.026		
513 > 169	51	3.859	3.866		13882	18	93:1	16.02 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.020	4.019	1	712772	17	>100:1			5005.00	4965.69	98.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.020	4.019	1/0	41469	36	>100:1	Target = 1.34	0.09	379.08	14.617		
570 > 483	58	4.020	4.019		30995	34		1.33 (0.67-2.02)	0.20				M
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	1	628224	19	>100:1			5005.00	4730.08	91	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.180	4.180	1/0	41647	33		Target = 1.71	0.13	333.27	12.850		
584 > 526	60	4.180	4.180		25642	30	85:1	1.62 (0.85-2.57)	0.18				
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	1	516106	18	>100:1			1001.00	816.53	82.5	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													
563 > 519	52	4.171	4.171	1/0	171080	17	>100:1	Target = 16.05		353.04	13.613		
563 > 169	52	4.180	4.171		13238	14	64:1	12.92 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.299	4.298	1	95950	15	>100:1			1001.00	886.72	83.5	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.309	4.308	1/0	30561	13	>100:1			339.32	13.084		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.319	4.318	1	48152	14	>100:1			1001.00	909.96	101	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.318	1/0	15121	22	>100:1	Target = 1.18		278.62	10.743		
512 > 219	57	4.319	4.318		13899	14	64:1	1.08 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.458	4.465	0	111122	18	>100:1			1001.00	886.17	90.7	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.467	4.474	0/0	30868	18	>100:1			312.54	12.051		M
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.440	4.438	1	521642	19	>100:1			1001.00	861.77	91.3	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.440	4.438	1/0	186822	18	>100:1	Target = 10.35		354.02	13.650		
613 > 169	38	4.440	4.438		18944	19		9.86 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.675	4.673	1/0	178339	17	>100:1	Target = 8.56		347.46	13.397		
663 > 169	38	4.675	4.673		21267	21	>100:1	8.38 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.485	4.483	1	42383	16	>100:1			1001.00	863.29	89.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.494	4.492	1/0	11633	16	66:1	Target = 1.08		251.48	9.6966		
526 > 219	59	4.485	4.492		13876	15	87:1	0.83 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.891	4.890	1	674242	19	>100:1			1001.00	800.34	81.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.891	4.890	1/0	205039	20	28:1	Target = 11.29		351.33	13.546		
713 > 169	42	4.891	4.890		17741	20	>100:1	11.55 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.259	5.258	1	757915	19	>100:1			1001.00	836.40	87.6	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.267	5.266	1/0	174916	18	67:1	Target = 11.43		353.57	13.633		
813 > 269	40	5.259	5.266		17516	19	>100:1	9.98 (5.71-17.16)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.599	5.591	1/0	239689	25	35:1	Target = 13.84		357.61	13.789		
913 > 319	40	5.599	5.591		17967	25	>100:1	13.34 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.859	3.858	1	678607	21	>100:1					100	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	737683	19	>100:1					102	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.135	1	573070	23	>100:1					95.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	643161	23	>100:1					107	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.515	3.507	1	163801	21	>100:1					100	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720010.d

Injection Date: 27-Dec-2020 11:12:06

Inst. ID: LCMSMS02

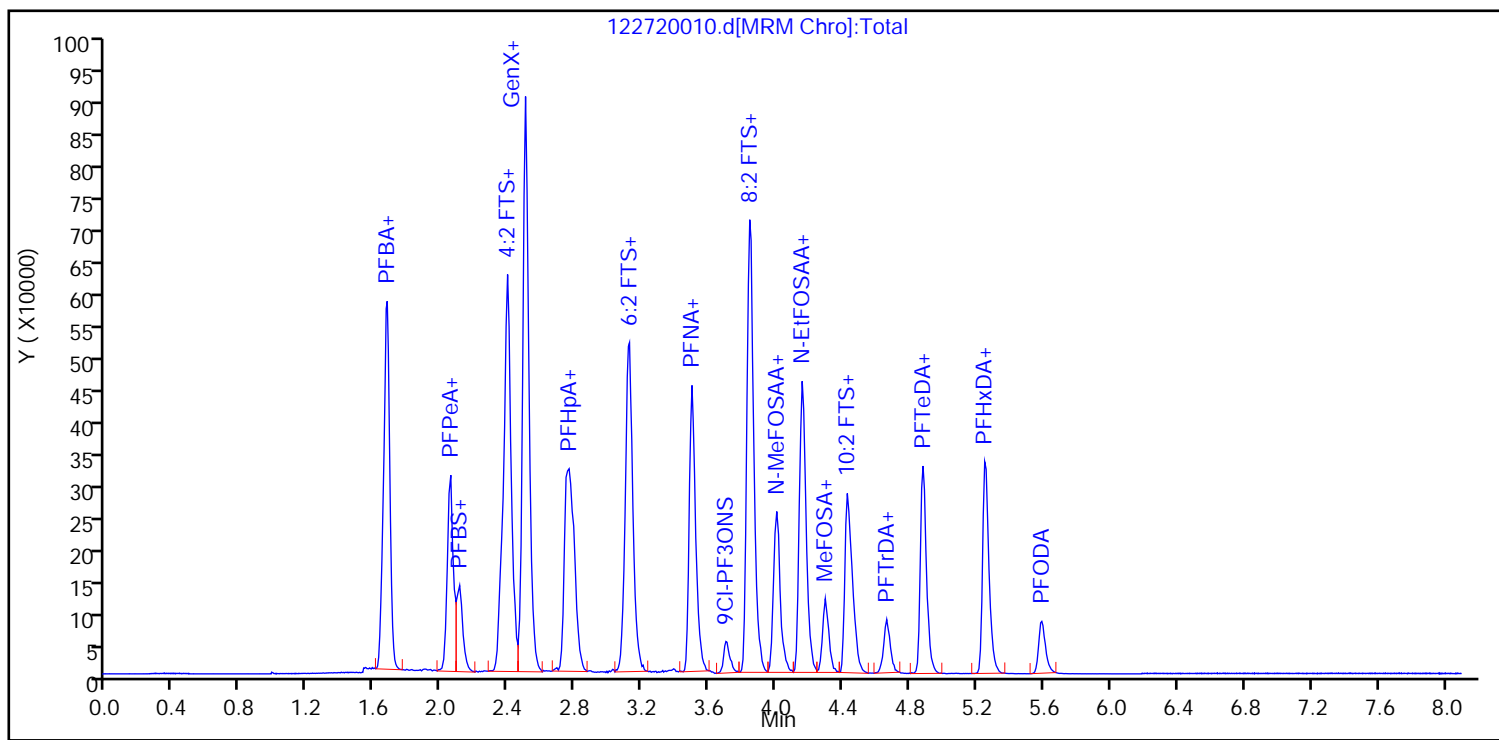
Client ID:

Lab ID: VL11001-001MS

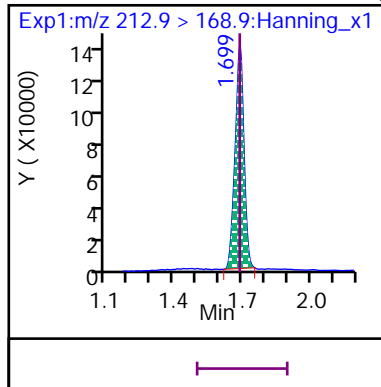
Sample Info: VL11001-001MS

Dil. Factor: 1

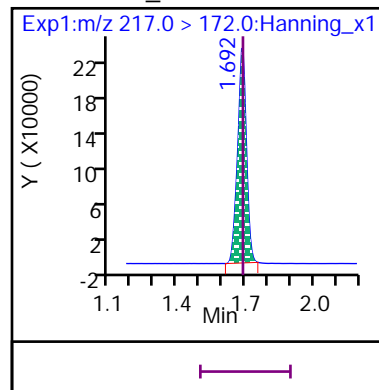
Operator: Matthew M. Miller



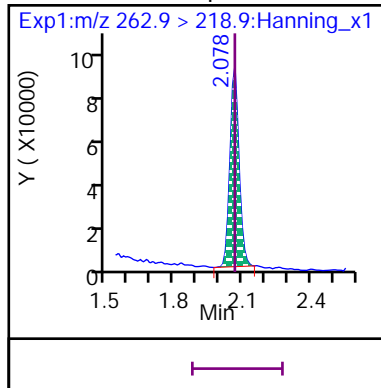
8 Perfluoro-n-butanoic acid (PFBA)



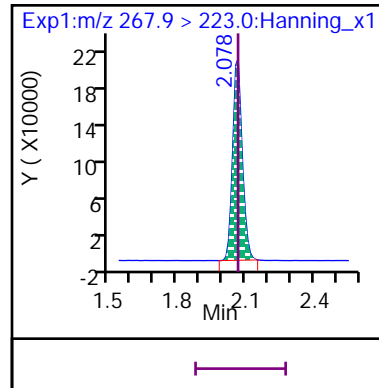
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

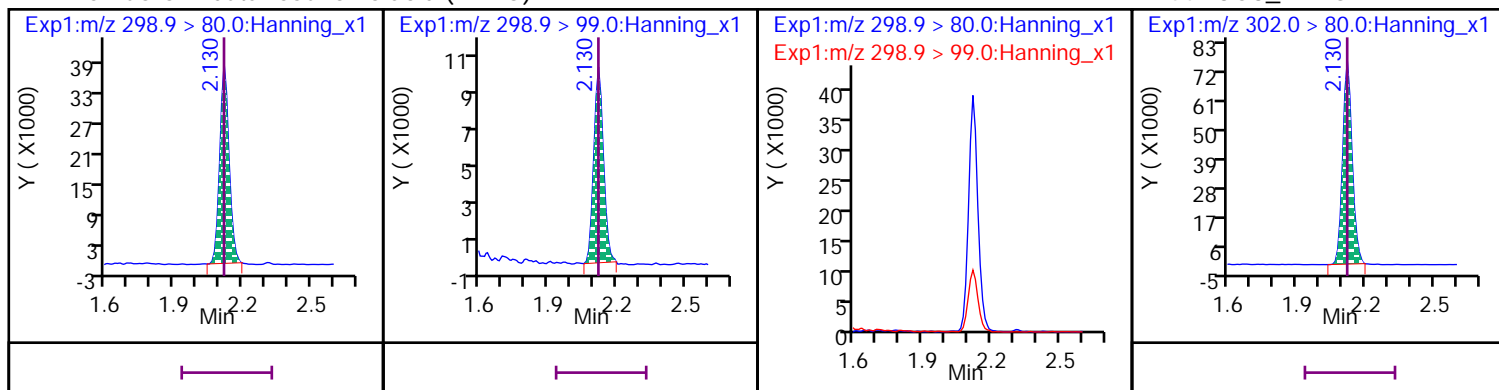


D 50 13C5\_PFPeA



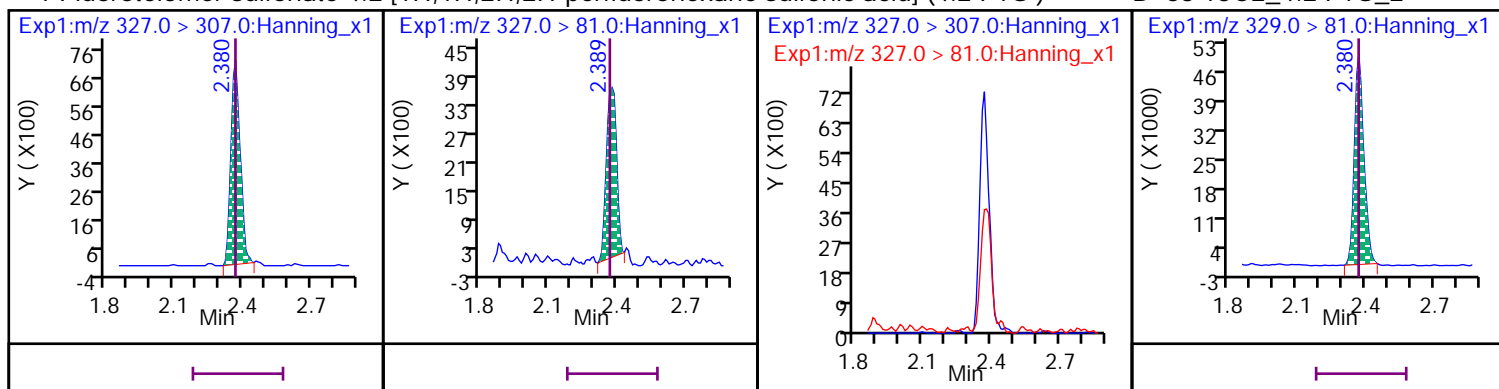
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



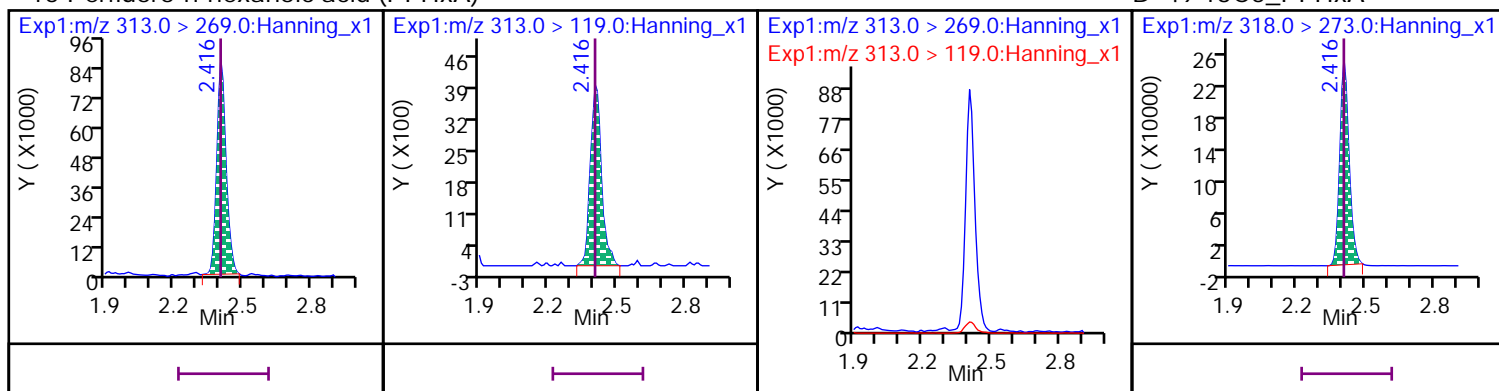
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



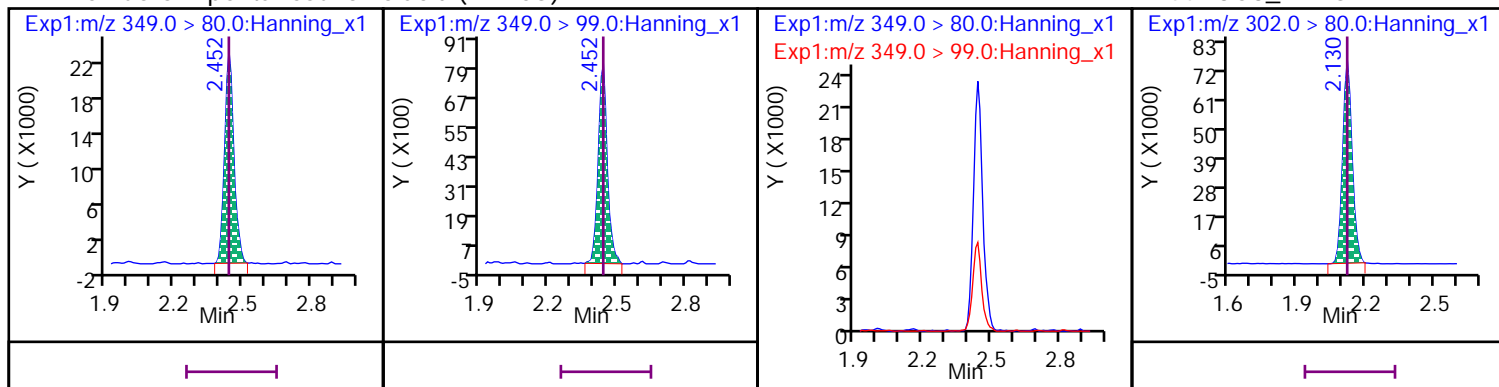
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



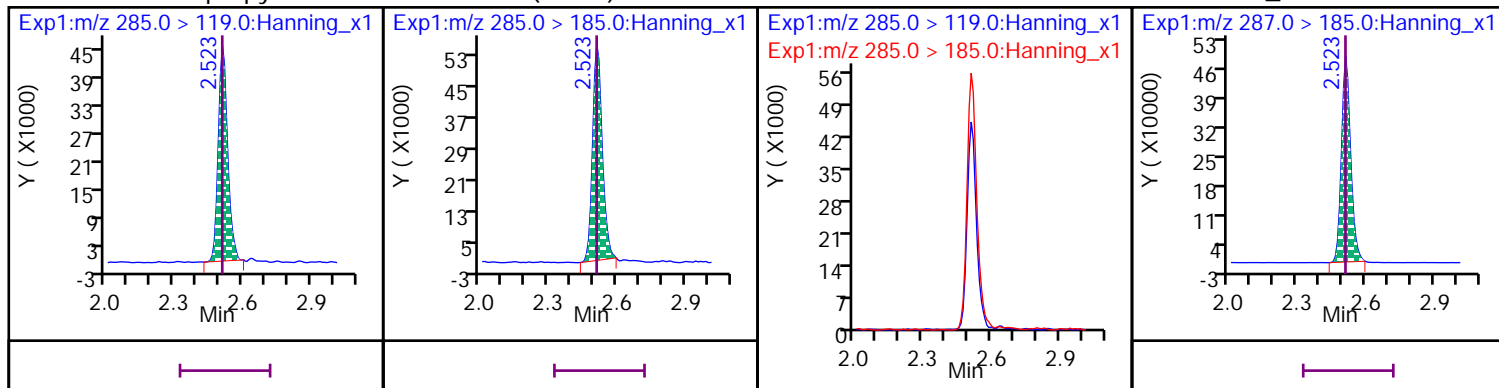
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



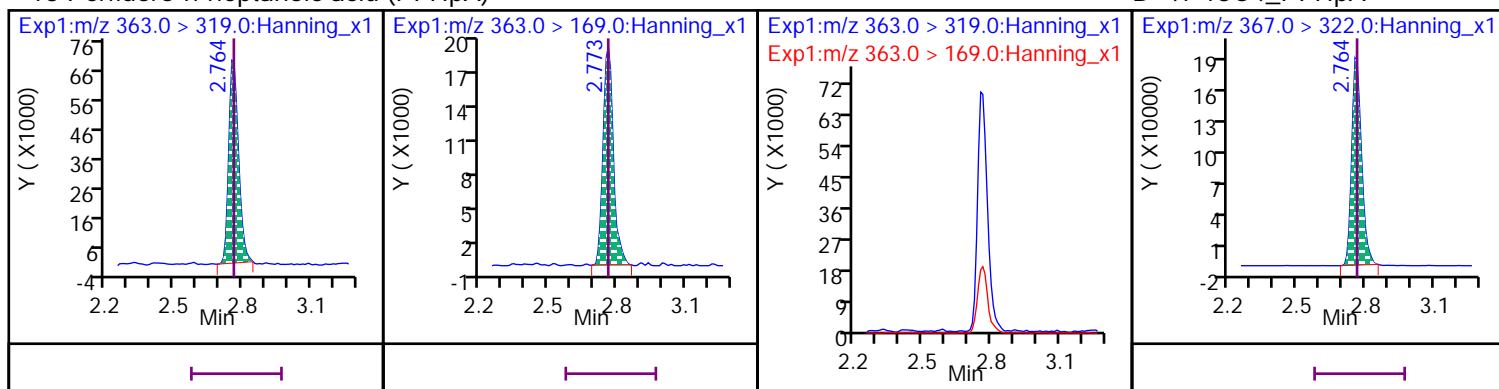
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



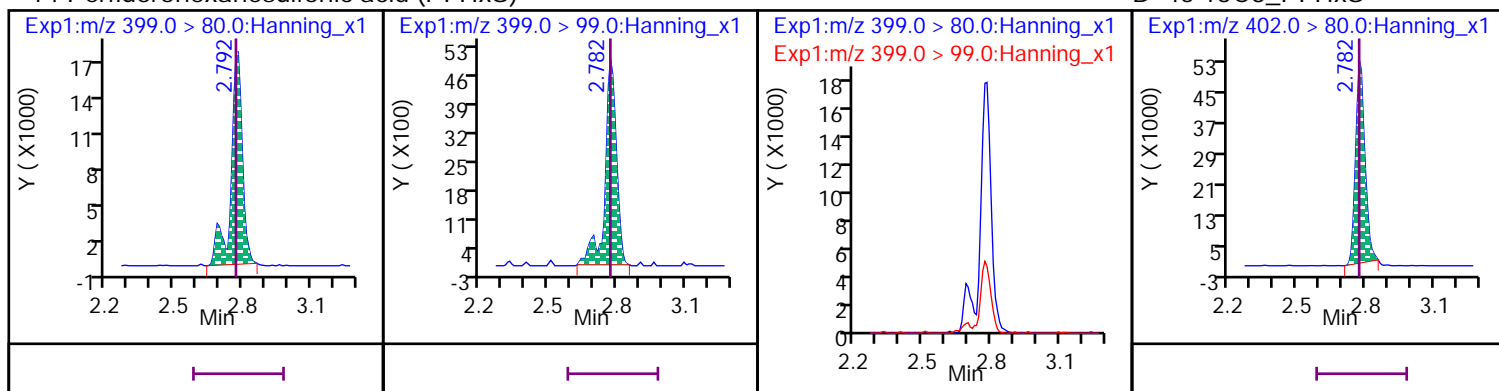
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



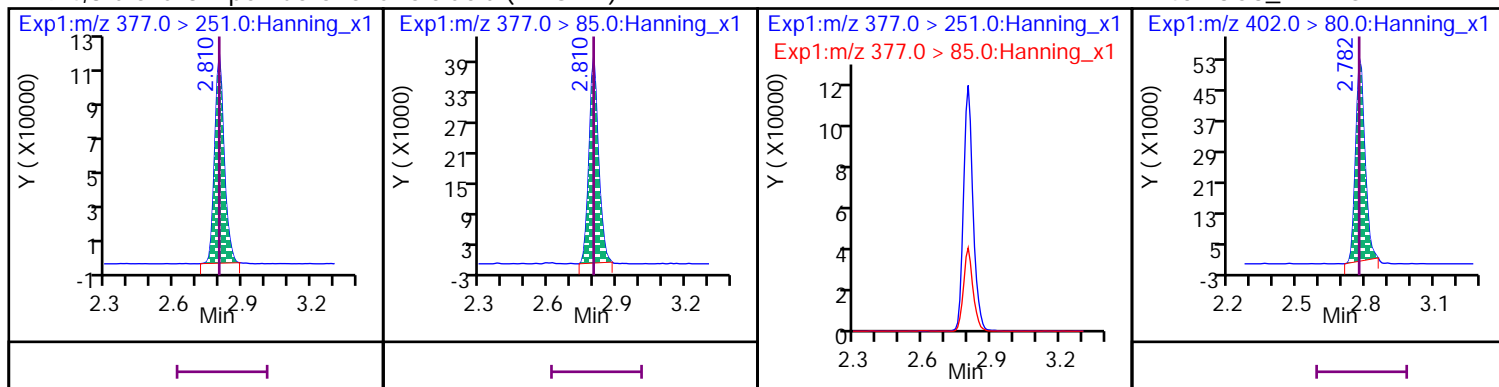
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



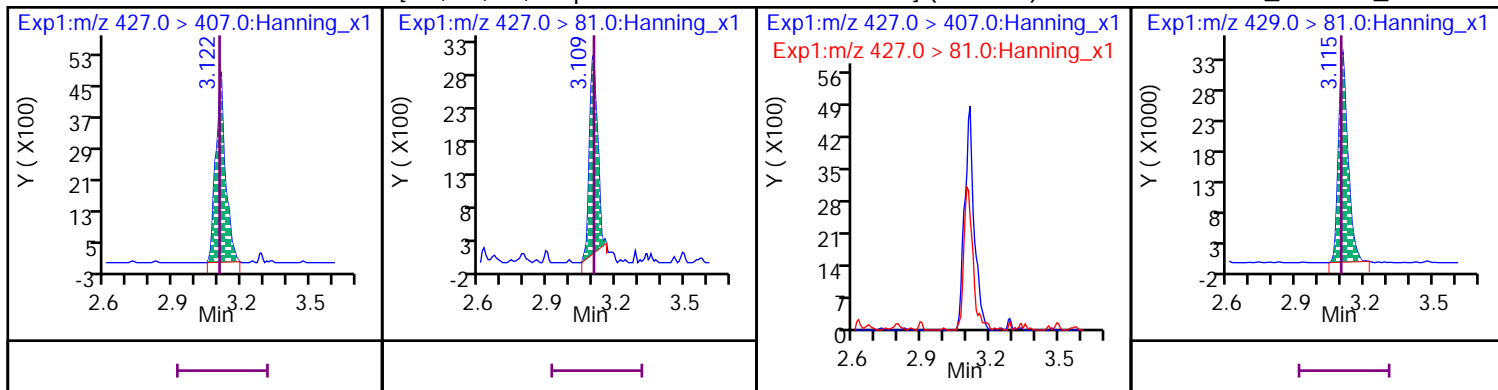
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



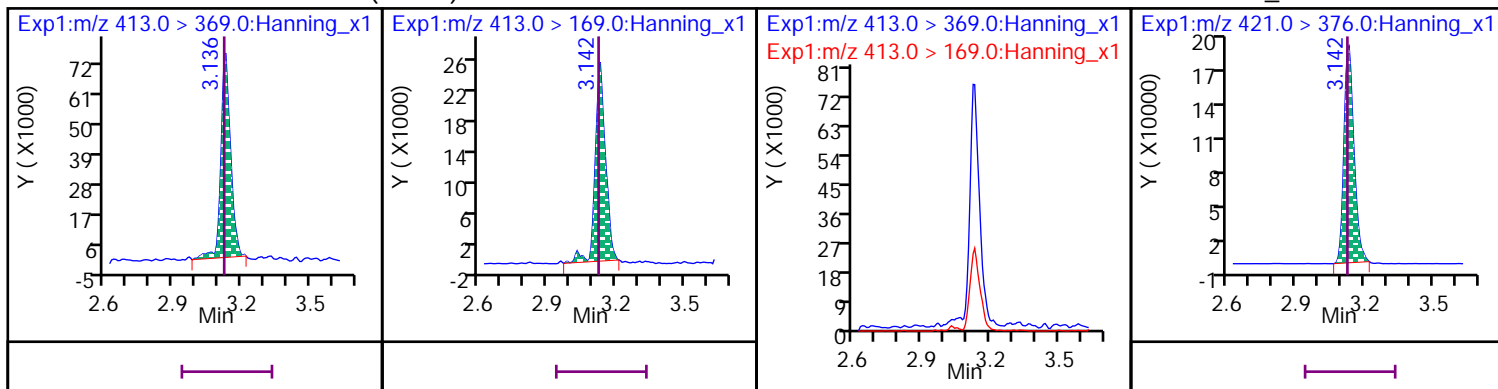
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



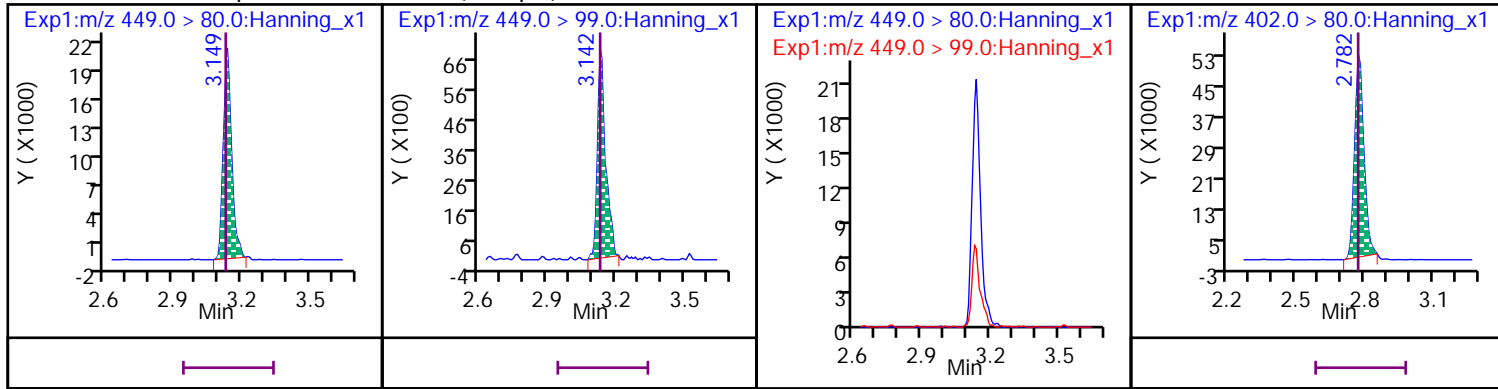
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



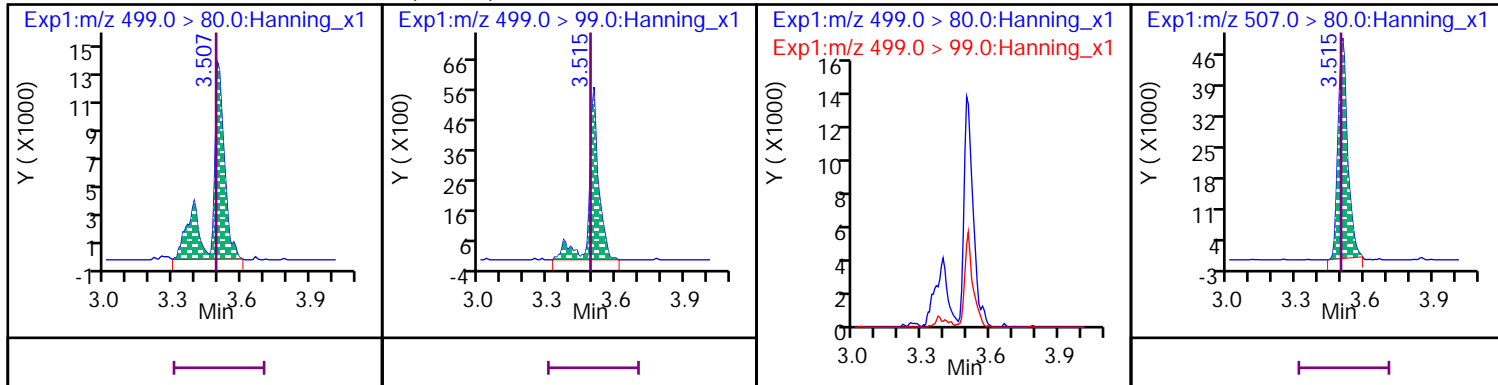
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



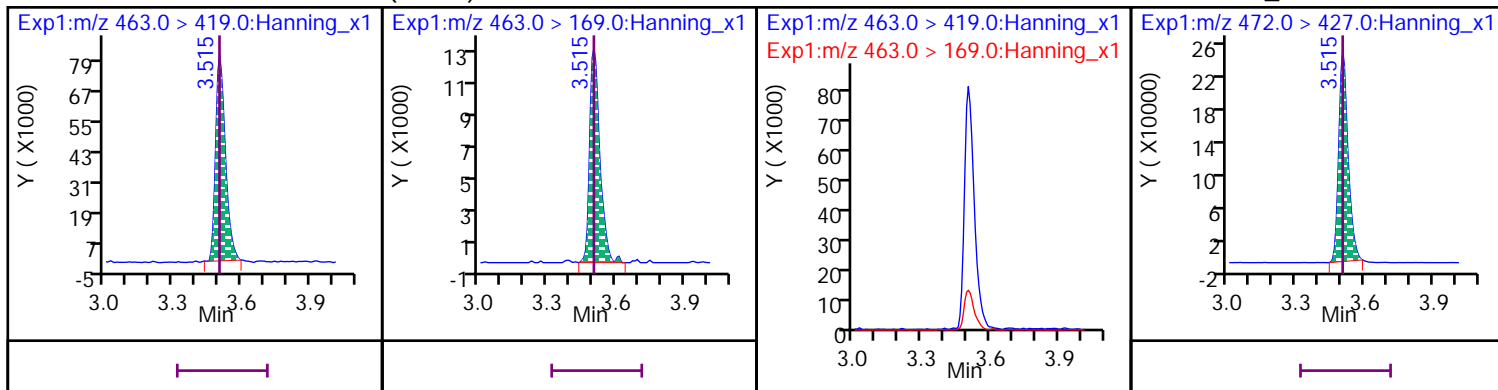
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



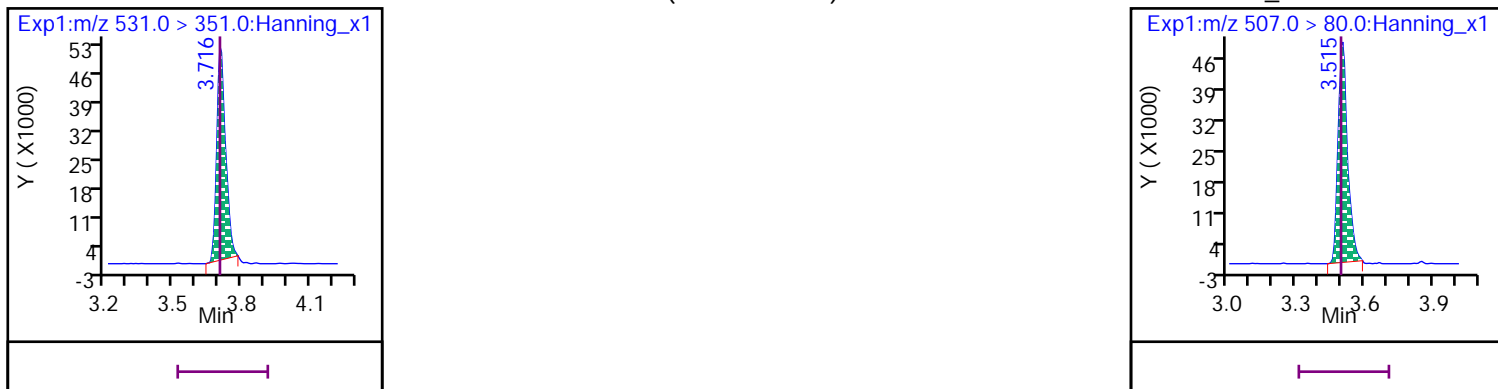
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



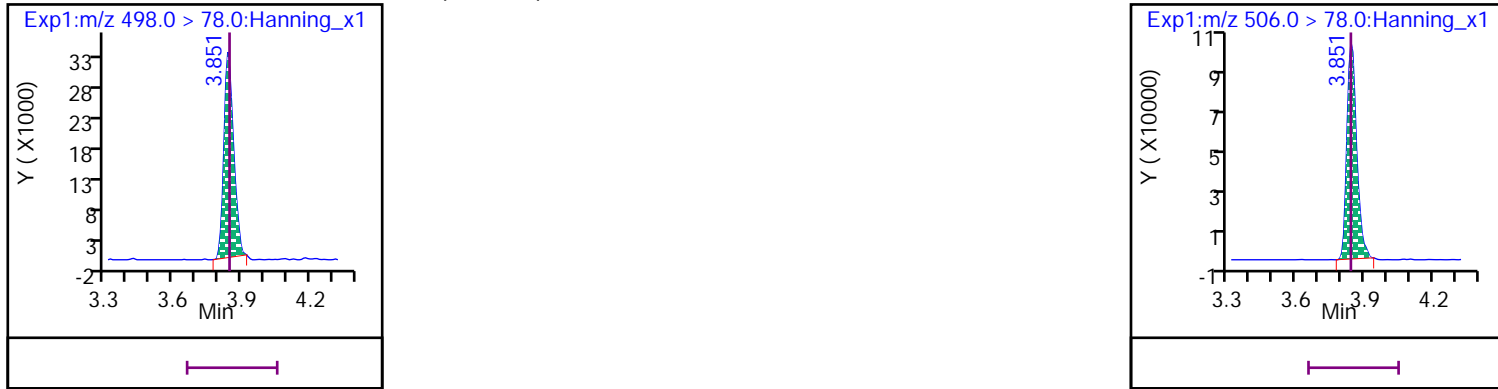
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



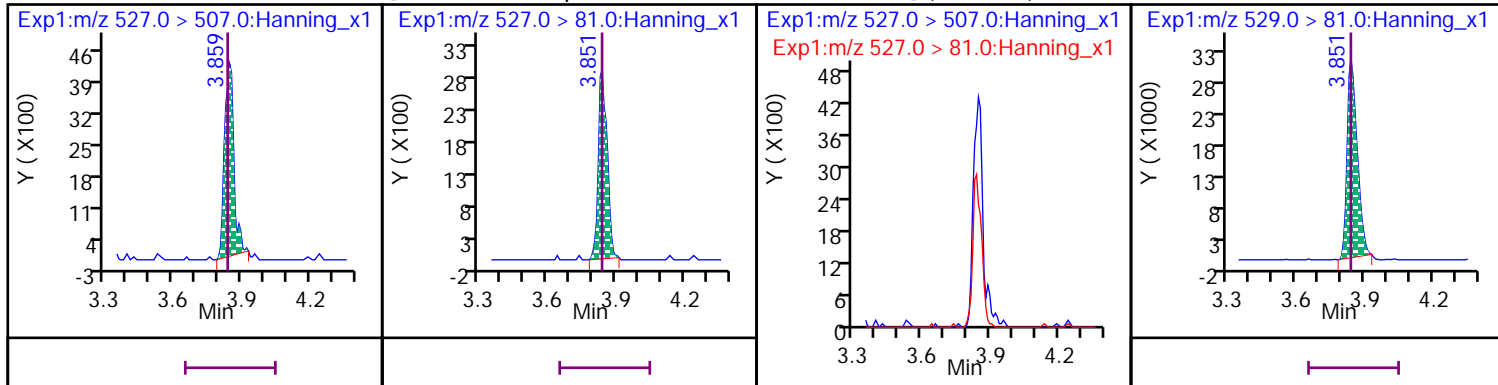
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



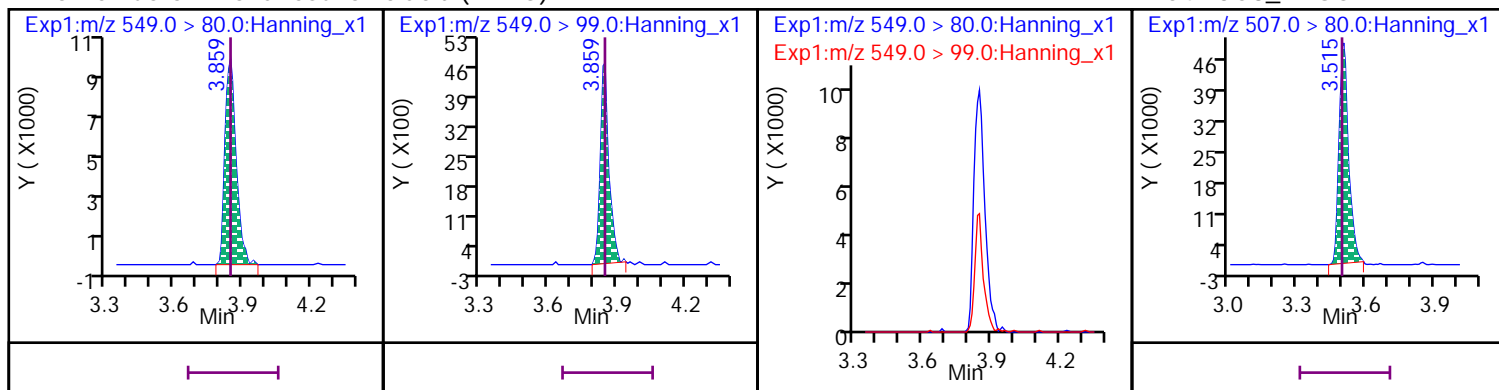
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



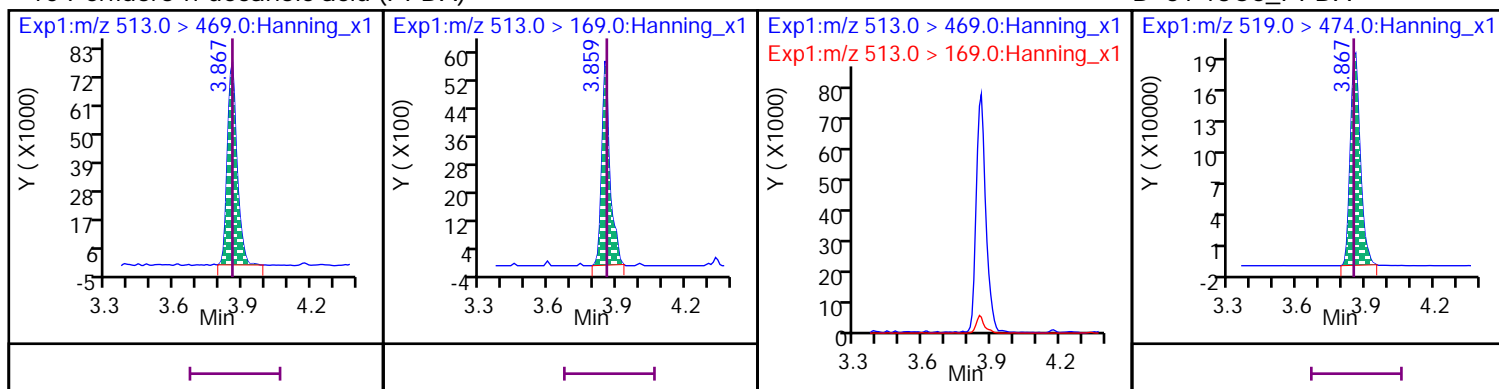
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



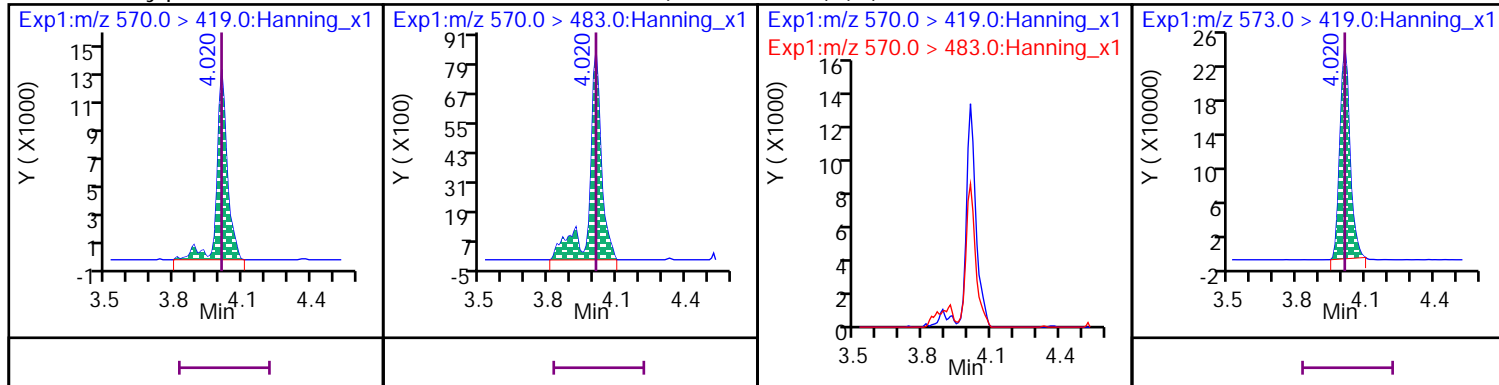
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



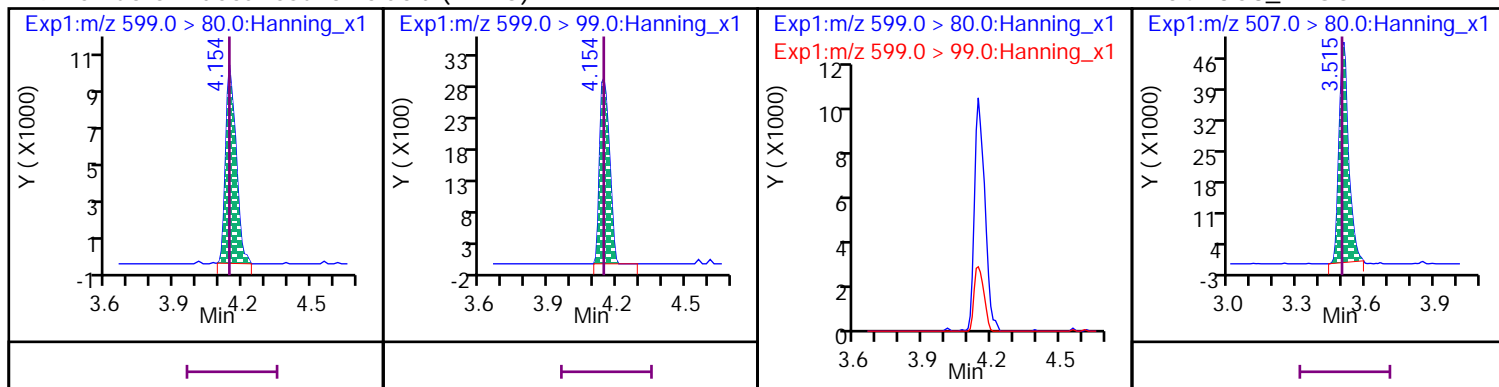
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



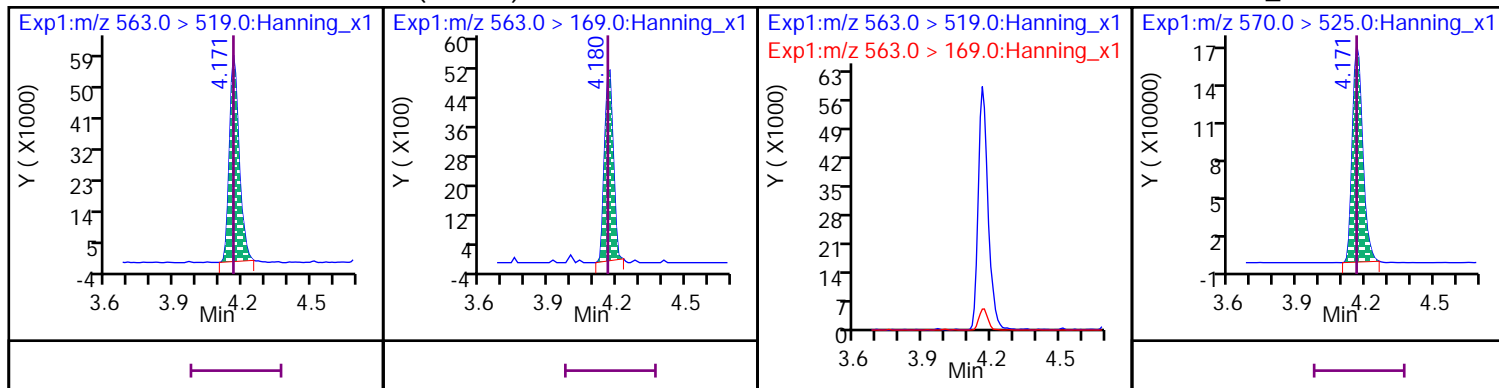
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



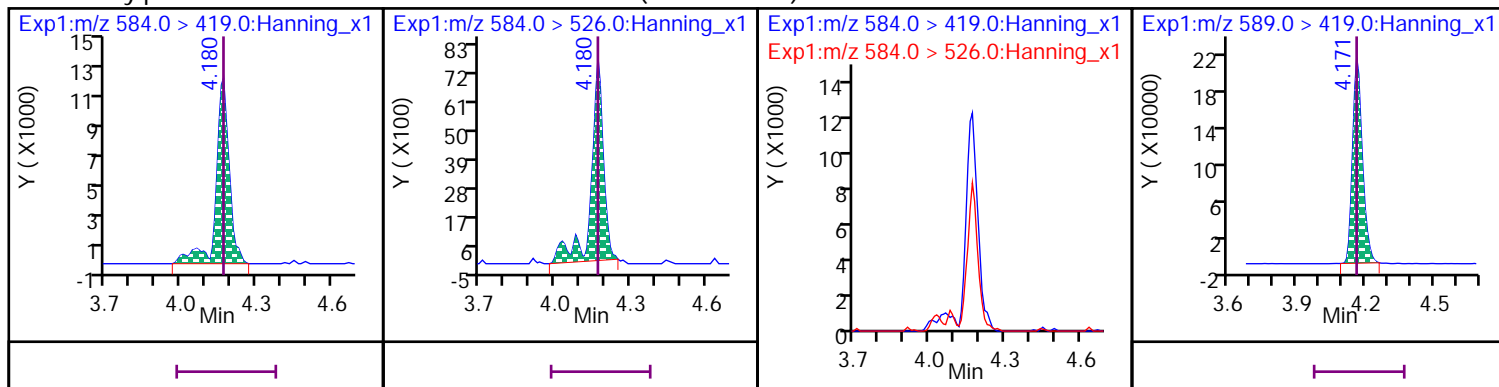
## 25 Perfluoro-n-undecanoic acid (PFUDa)

## D 52 13C7\_PFUdA



## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

## D 60 d5-EtFOSAA



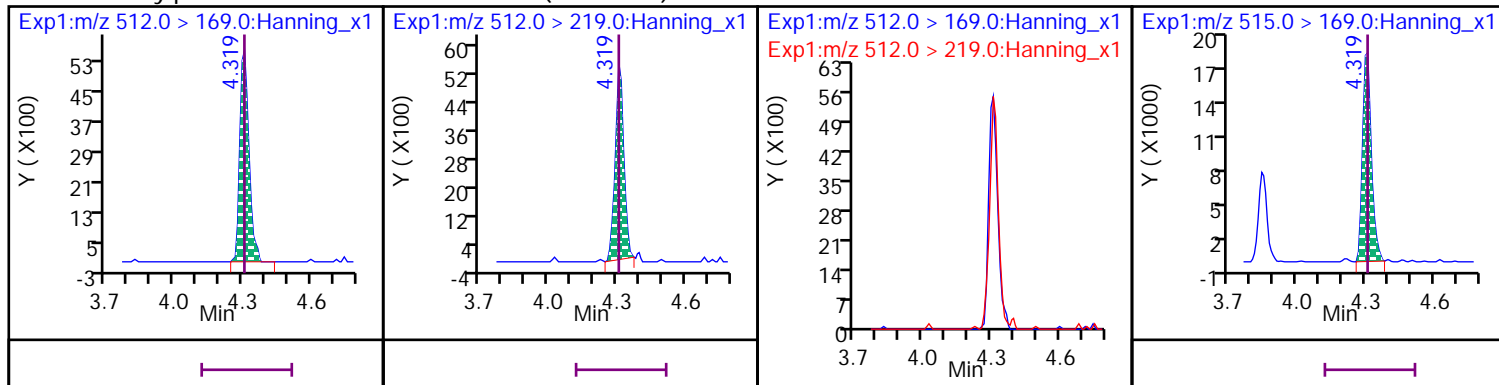
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

## D 61 d7-MeFOSE



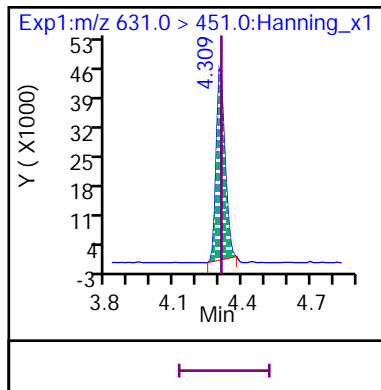
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

## D 57 d3-MeFOSA

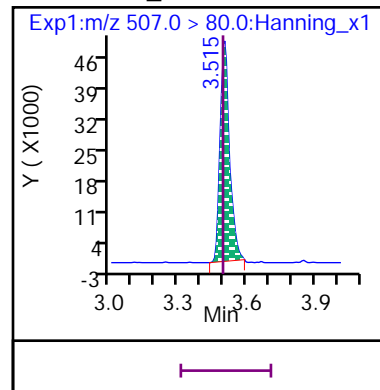




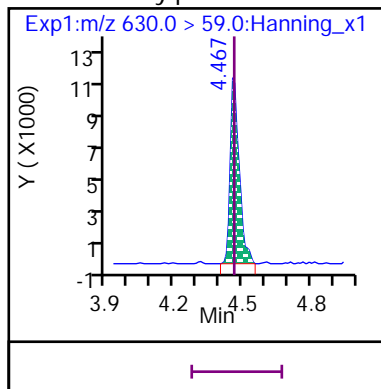
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



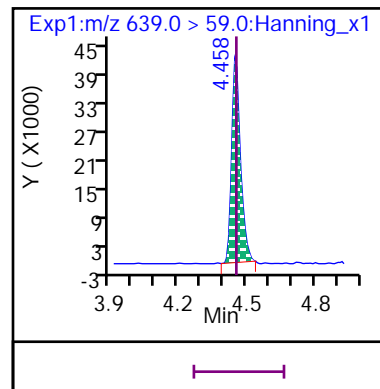
D 54 13C8\_PFOS



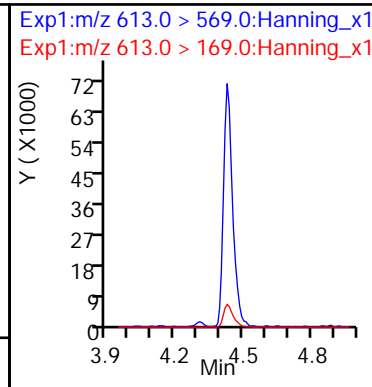
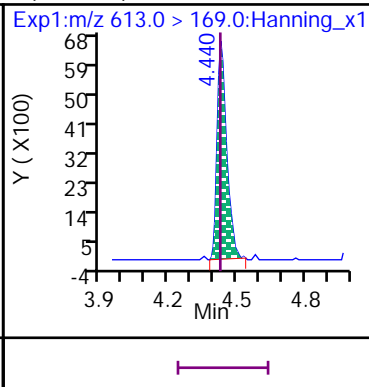
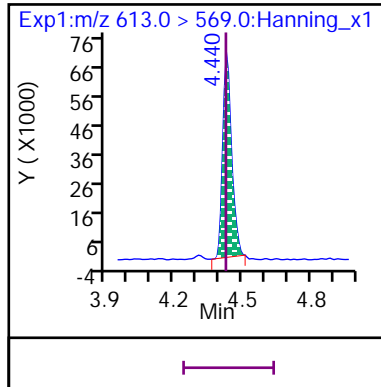
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (M)



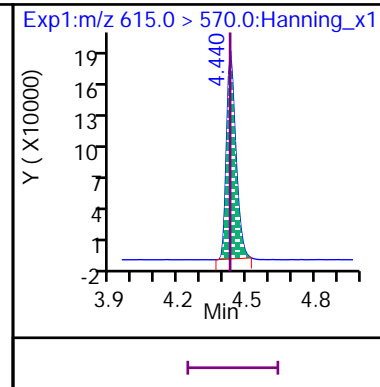
D 62 d9-EtFOSE



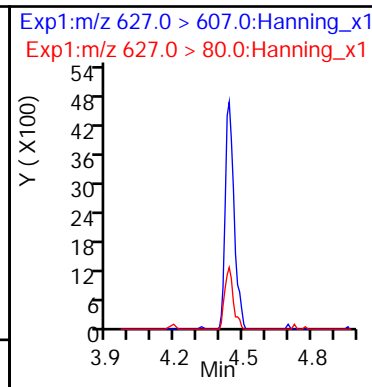
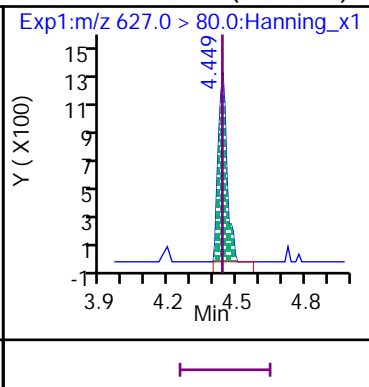
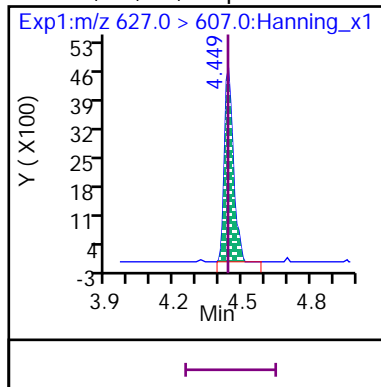
11 Perfluoro-n-dodecanoic acid (PFDoA)



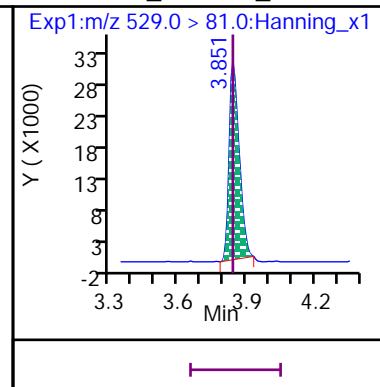
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

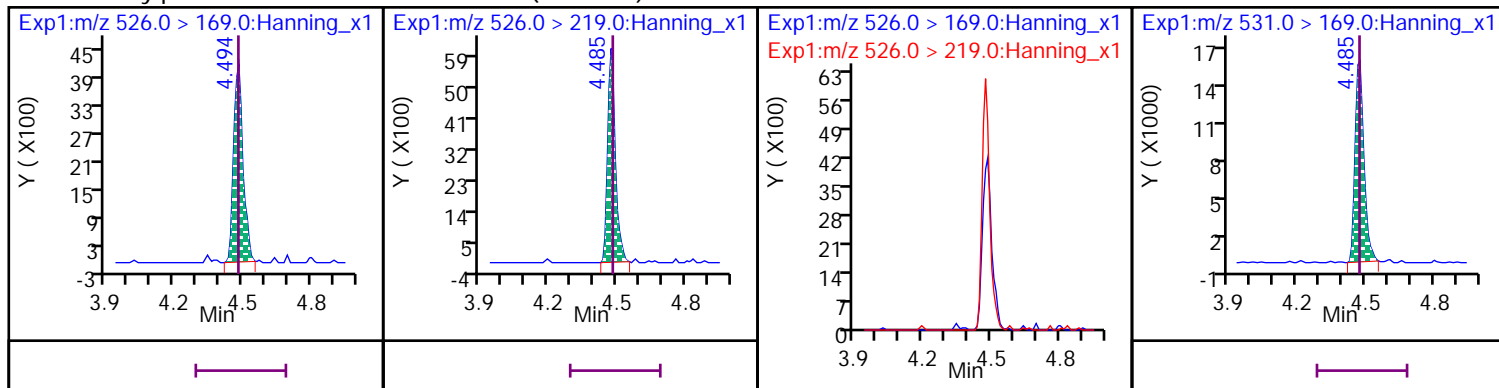


D 65 13C2\_8:2 FTS\_2



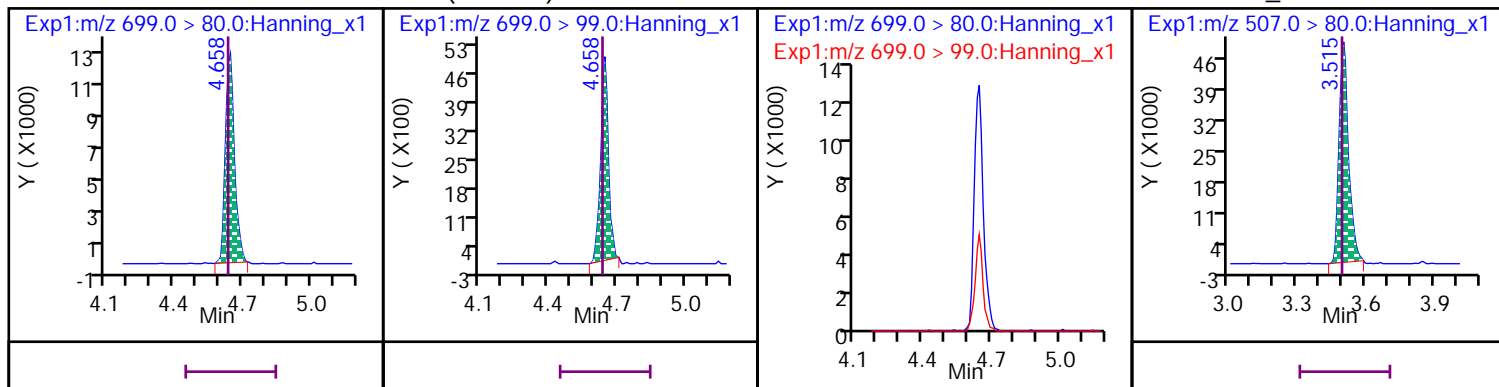
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



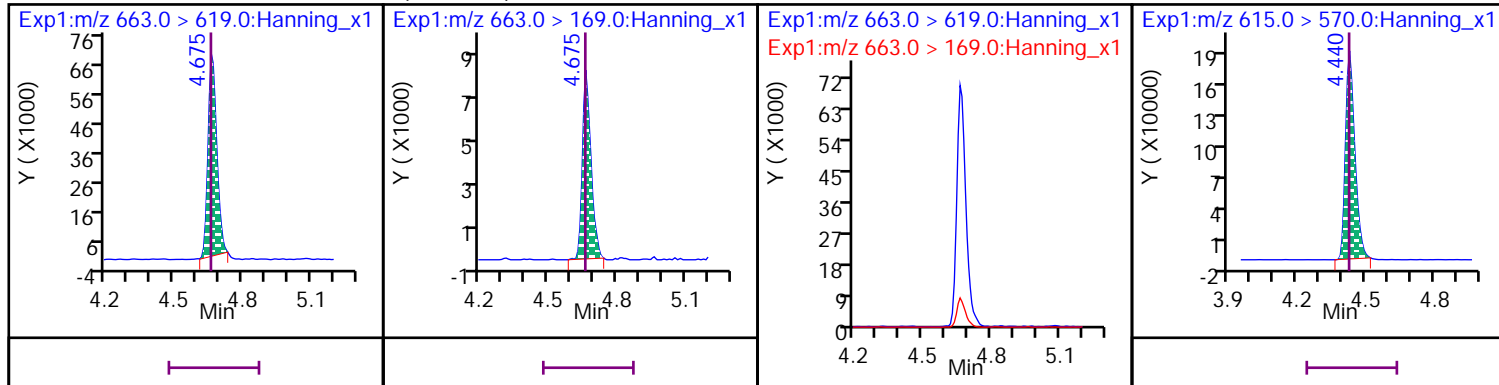
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



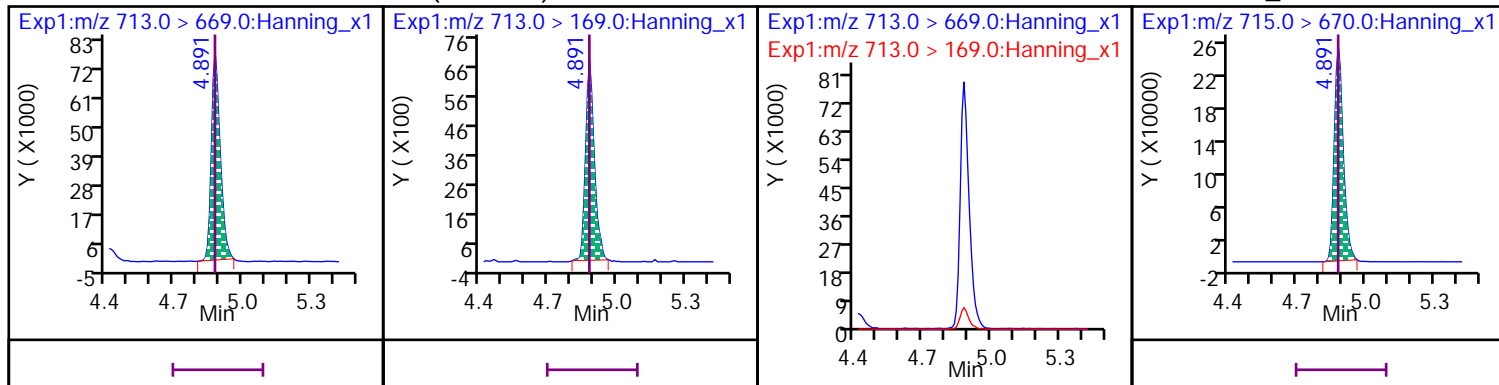
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



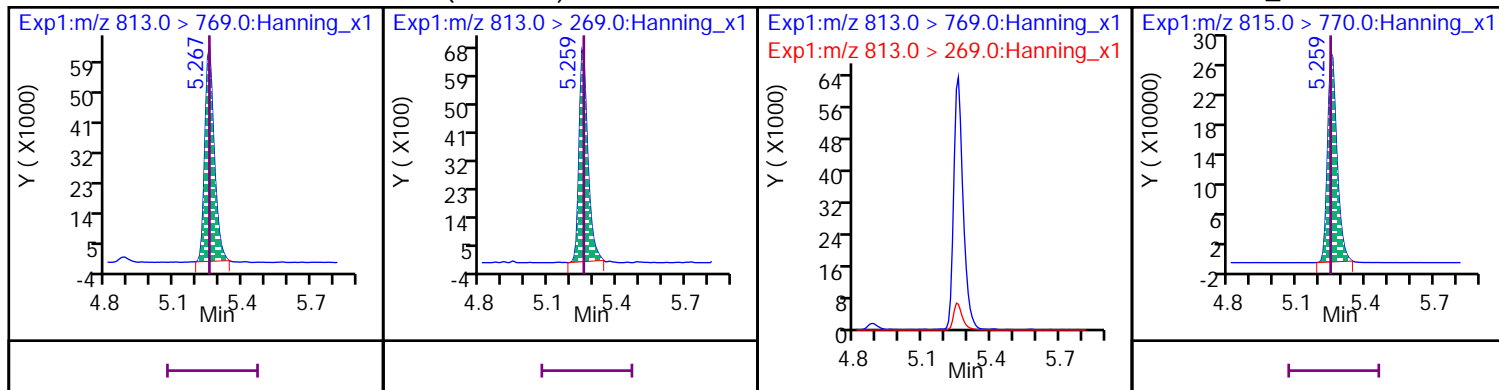
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



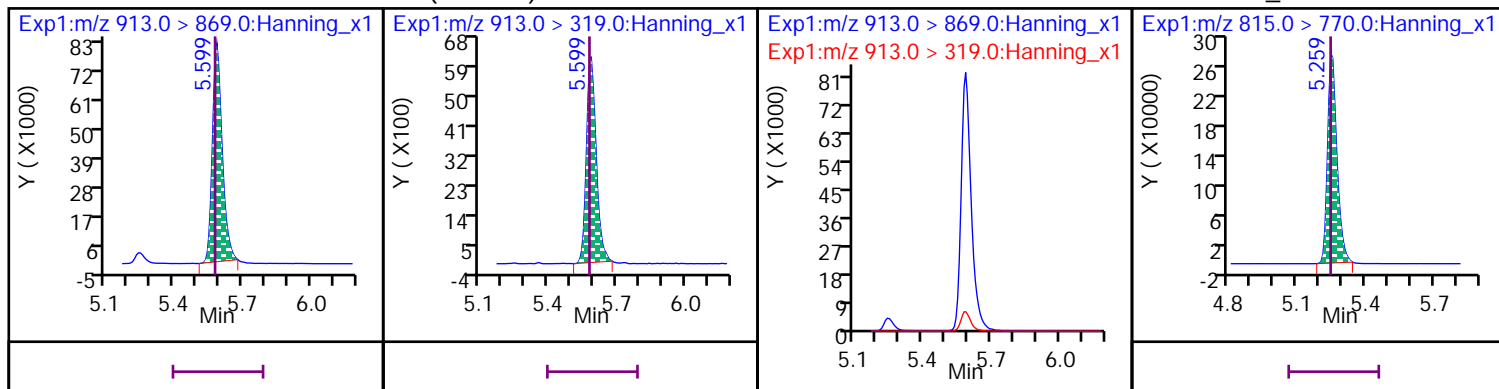
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

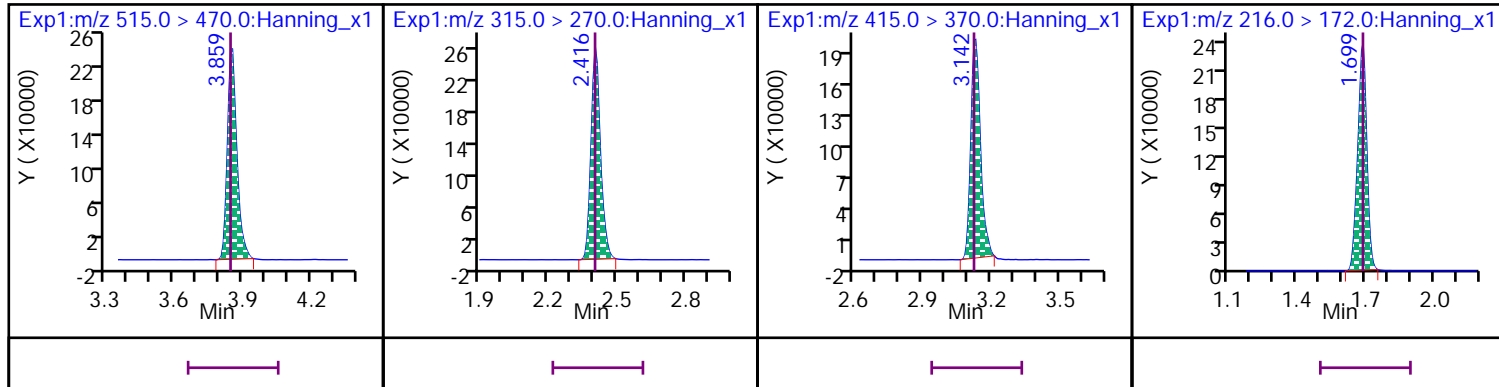


\* 37 13C2\_PFDA

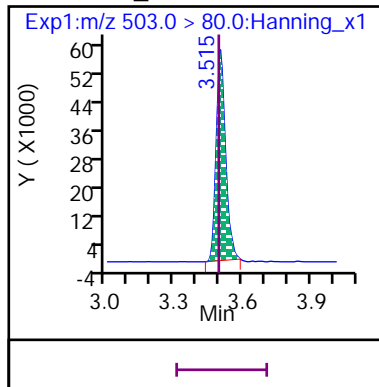
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720010.d

Injection Date: 27-Dec-2020 11:12:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-001MS

Sample Info: VL11001-001MS

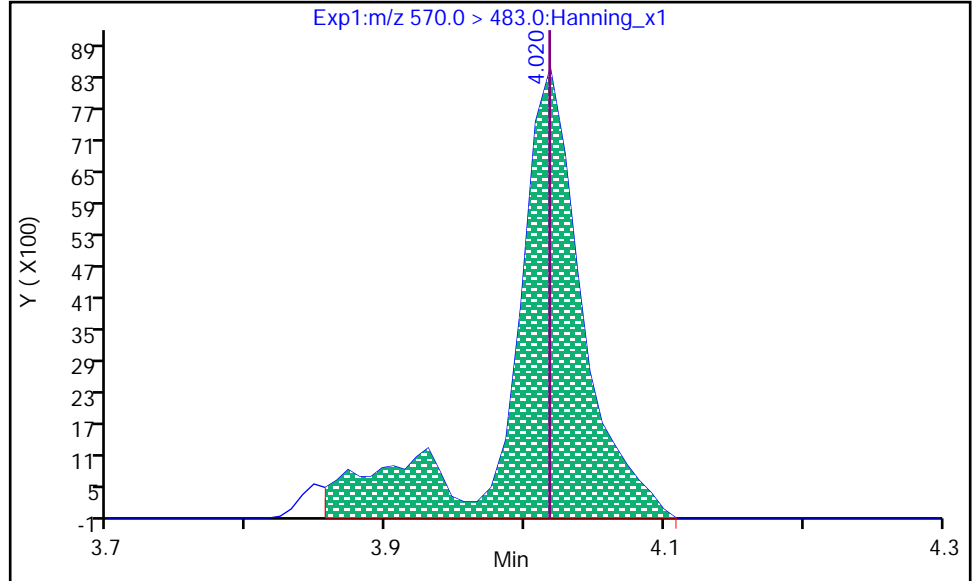
Dil. Factor: 1

Operator: Matthew M. Miller

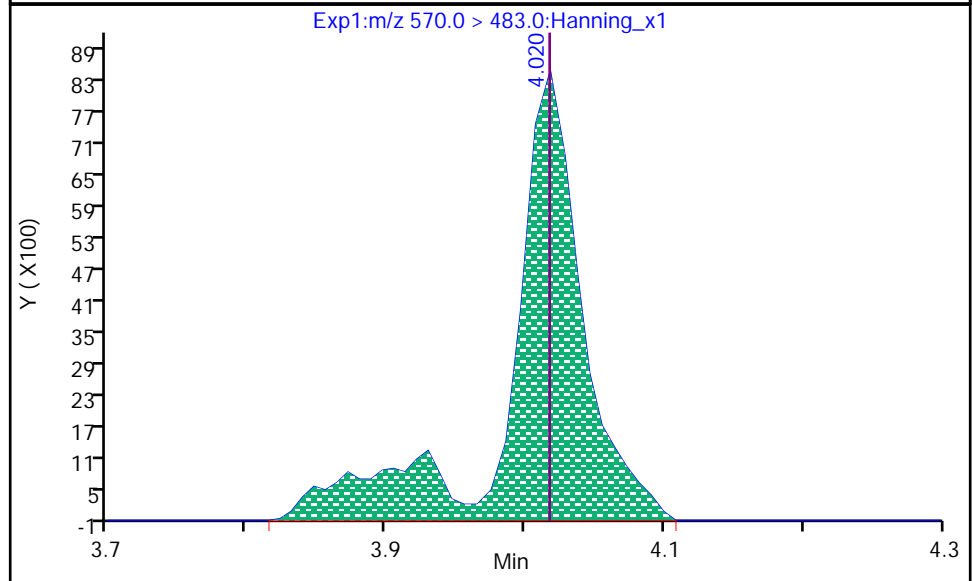
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.020  
Area: 30142  
Conc: 14.617  
Conc Units: ng/L

Processing Integration Results



RT: 4.020  
Area: 30995  
Conc: 14.617  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:45:25

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720010.d

Injection Date: 27-Dec-2020 11:12:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-001MS

Sample Info: VL11001-001MS

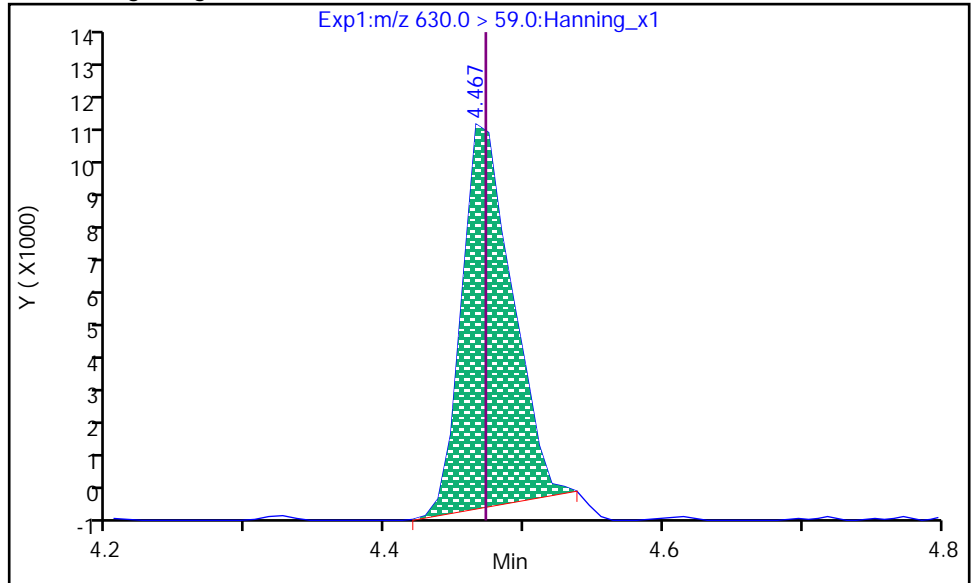
Dil. Factor: 1

Operator: Matthew M. Miller

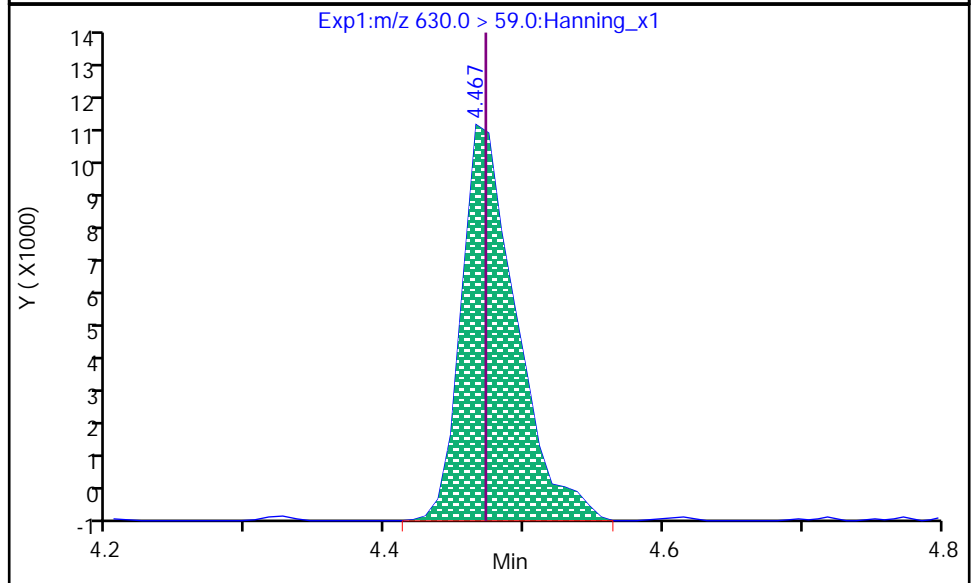
33 EtFOSE, CAS: 1691-99-2

Processing Integration Results

RT: 4.467  
Area: 27428  
Conc: 10.708  
Conc Units: ng/L



RT: 4.467  
Area: 30868  
Conc: 12.051  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:45:36

Audit Action: Mint

Audit Reason: Invalid Integration

## PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	ND		1	0.00	20	12/27/2020 1133
11CI-PF3OUdS	ND	ND		1	0.00	20	12/27/2020 1133
8:2 FTS	ND	ND		1	0.00	20	12/27/2020 1133
6:2 FTS	140	110	+	1	24	20	12/27/2020 1133
GenX	ND	ND		1	0.00	20	12/27/2020 1133
ADONA	ND	ND		1	0.00	20	12/27/2020 1133
EtFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
MeFOSAA	ND	ND		1	0.00	20	12/27/2020 1133
PFBS	15	20	+	1	26	20	12/27/2020 1133
PFHxS	45	57	+	1	22	20	12/27/2020 1133
PFBA	34	30		1	11	20	12/27/2020 1133
PFDA	ND	ND		1	0.00	20	12/27/2020 1133
PFDoA	ND	ND		1	0.00	20	12/27/2020 1133
PFHpA	1.4	1.2	J	1	9.7	20	12/27/2020 1133
PFHxA	1.7	1.4	J	1	14	20	12/27/2020 1133
PFNA	ND	ND		1	0.00	20	12/27/2020 1133
PFOA	1.8	1.6	J	1	13	20	12/27/2020 1133
PFPeA	1.6	1.6	J	1	2.5	20	12/27/2020 1133
PFTeDA	ND	ND		1	0.00	20	12/27/2020 1133
PFTrDA	ND	ND		1	0.00	20	12/27/2020 1133
PFUdA	ND	ND		1	0.00	20	12/27/2020 1133
PFOS	5.9	8.2	+	1	34	20	12/27/2020 1133

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		108	50-150
13C2_8:2FTS		114	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		102	50-150
13C8_PFOS		91	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		101	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - Duplicate

Sample ID: VL11001-002DU

Matrix: Aqueous

Batch: 77367

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/22/2020 1149

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d  
Injection Date: 27-Dec-2020 11:33:18 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 5  
Lab Sample ID: VL11001-002DU Lab Prep. Batch: 77367  
Client ID: Sample Group:  
Sample Info: VL11001-002DU Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0405499$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	271	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.692 1.698 0 667824 23 >100:1 1001.00 962.90 105

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.724 1.698 2/2 494892 34 46:1 744.78 30.201

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.077 0 651217 18 >100:1 1001.00 946.69 98.9

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.067 2.077 0/0 25586 12 15:1 39.117 1.5862 J

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.130 1 223349 16 >100:1 1001.00 970.11 93.1

**7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.130 1/0 129928 18 >100:1 Target = 3.34 493.88 20.027  
298.9 > 99 44 2.130 2.130 39642 16 >100:1 3.27 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.415 1 726276 18 >100:1 1001.00 985.35 101

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.415 1/0 25367 17 11:1 Target = 17.01 35.413 1.4360 J  
313 > 119 49 2.416 2.415 1310 12 5.5:1 19.36 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.522 1 1349721 18 >100:1 5005.00 5067.40 102

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.522 ND 1001.00 962.04 99.6 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.764 2.773 0 583617 19 >100:1 1001.00 962.04 99.6

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.764 2.773 0/0 18478 14 13:1 Target = 3.79 30.554 1.2390 J  
363 > 169 47 2.764 2.773 3708 15 8.9:1 4.98 (1.89-5.69)

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.782 2.782 1 164901 18 >100:1 1001.00 963.05 92.4

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.782 2.782 1/0 243614 27 >100:1 Target = 3.80 0.52 1394.73 56.556  
399 > 99 45 2.782 2.782 67877 25 >100:1 3.58 (1.90-5.71) 0.33



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.809		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.108	1	120281	19	>100:1			5005.00	6245.64	108	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.115	1/0	130076	25	>100:1	Target = 1.77		2662.39	107.96		
427 > 81	64	3.115	3.115		74643	29	>100:1	1.74 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.135	3.135	1	604529	21	>100:1			1001.00	1021.40	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													J
413 > 369	53	3.135	3.135	1/0	24637	17	16:1	Target = 2.85	0.07	40.016	1.6227		M
413 > 169	53	3.135	3.135		9524	23	56:1	2.58 (1.42-4.28)	0.11				M
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.507	3.507	0	143829	22	>100:1			1001.00	959.32	91.4	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.383	3.500	-7/-7	34503	58	>100:1	Target = 6.80	0.10	202.64	8.2171		M
499 > 99	54	3.398	3.500		7982	37	23:1	4.32 (3.40-10.20)					M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.716		ND								
<b>31 11-chloroicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.318		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.507	3.515	0	756440	21	>100:1			1001.00	1007.29	99.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.515		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.850	3.850	1	100313	17	>100:1			5005.00	5407.67	114	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.850		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.858	3.858	1	652652	20	>100:1			1001.00	983.90	103	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.866		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.019	1	798302	18	>100:1			5005.00	5561.55	110	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.019		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.171	4.171	0	698150	19	>100:1			5005.00	5256.57	101	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.180		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.171	4.171	0	554897	18	>100:1			1001.00	877.90	88.6	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.171		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.438	4.438	0	587694	18	>100:1			1001.00	970.89	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.438		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.673		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.890	4.890	0	713270	19	>100:1			1001.00	846.67	86	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.890		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.858	3.858	1	693644	20	>100:1					102	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.415	1	755448	18	>100:1					105	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.135	3.135	1	673870	25	>100:1					112	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.698	1	671651	22	>100:1					111	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.507	3.507	0	166947	21	>100:1					102	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d

Injection Date: 27-Dec-2020 11:33:18

Inst. ID: LCMSMS02

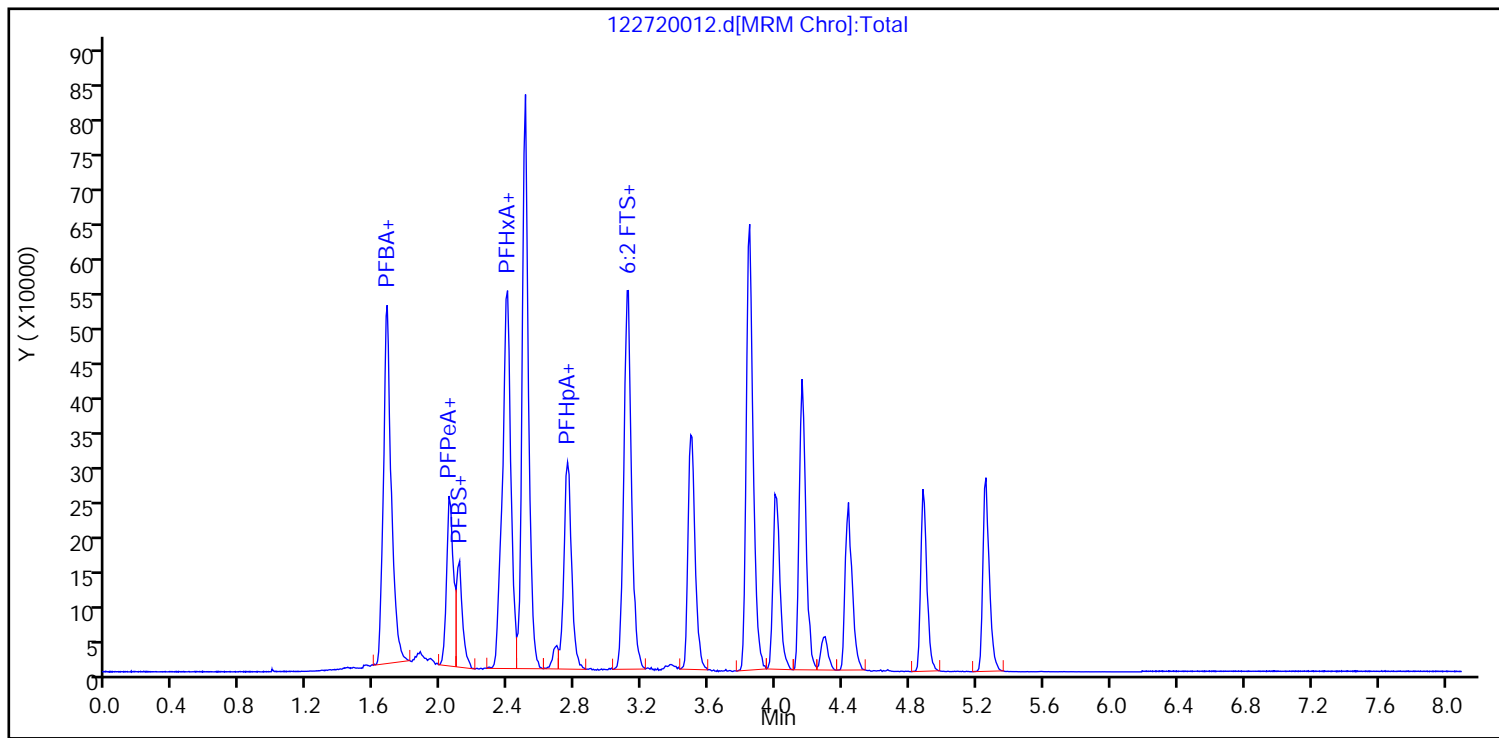
Client ID:

Lab ID: VL11001-002DU

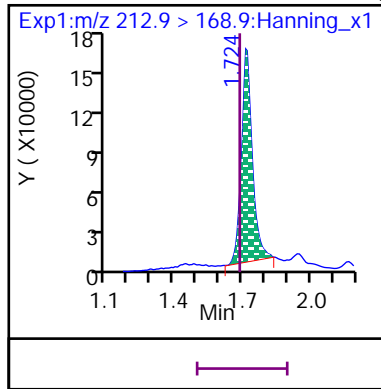
Sample Info: VL11001-002DU

Dil. Factor: 1

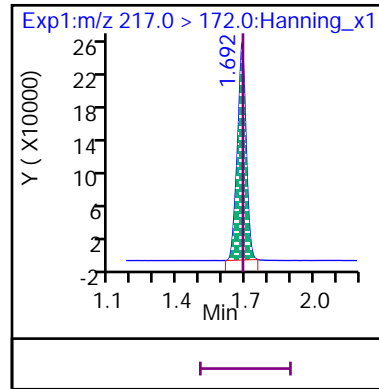
Operator: Matthew M. Miller



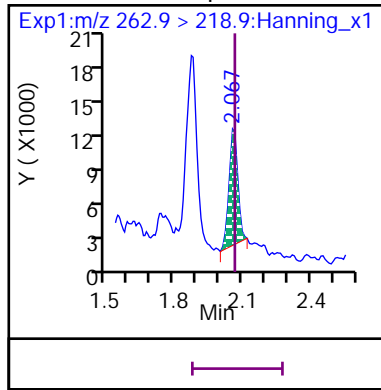
8 Perfluoro-n-butanoic acid (PFBA)



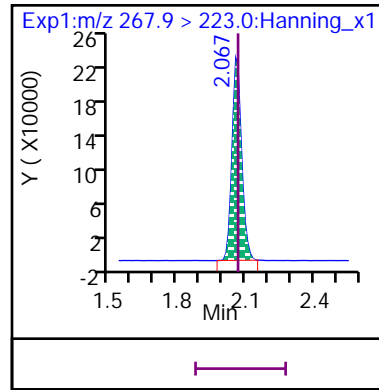
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

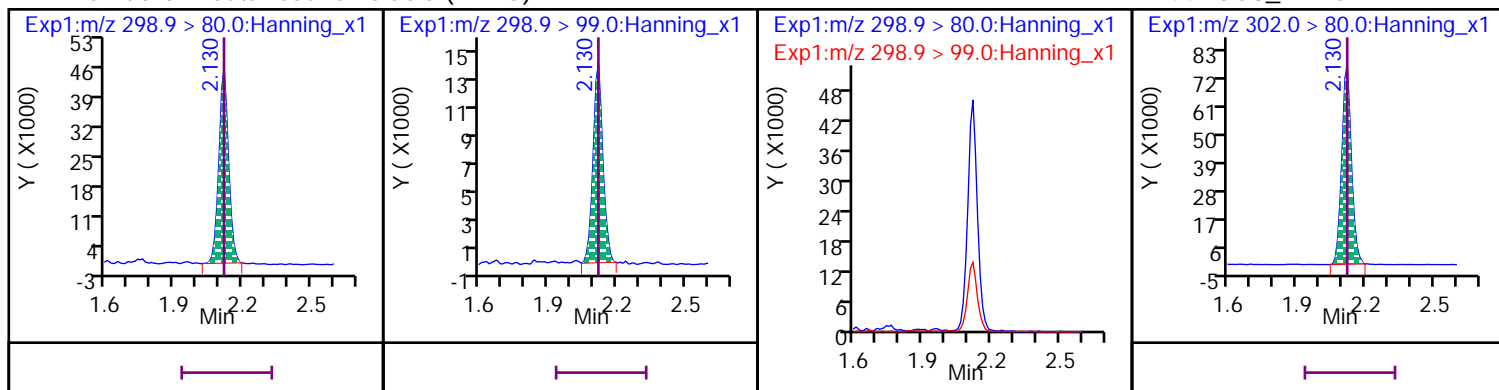


D 50 13C5\_PFPeA



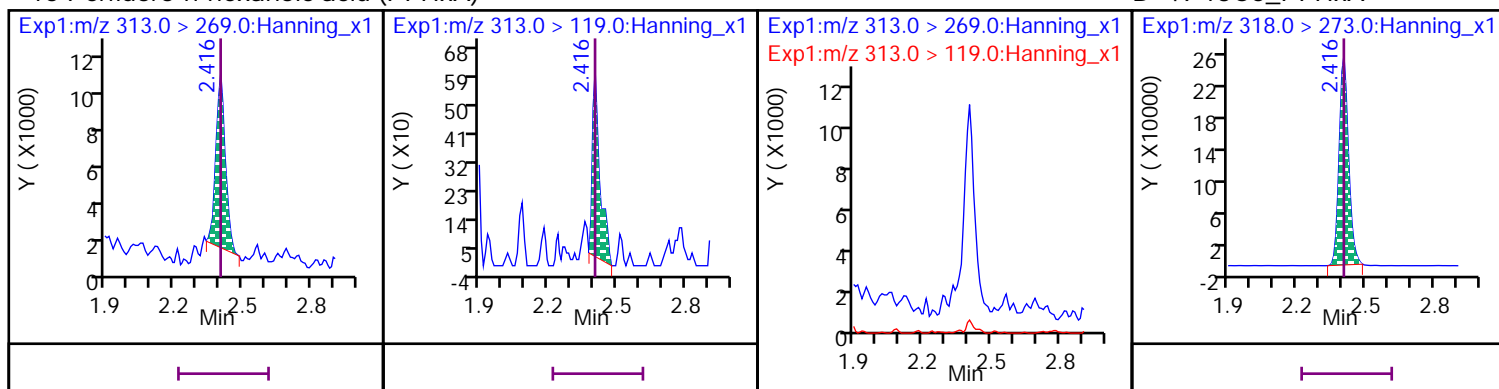
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



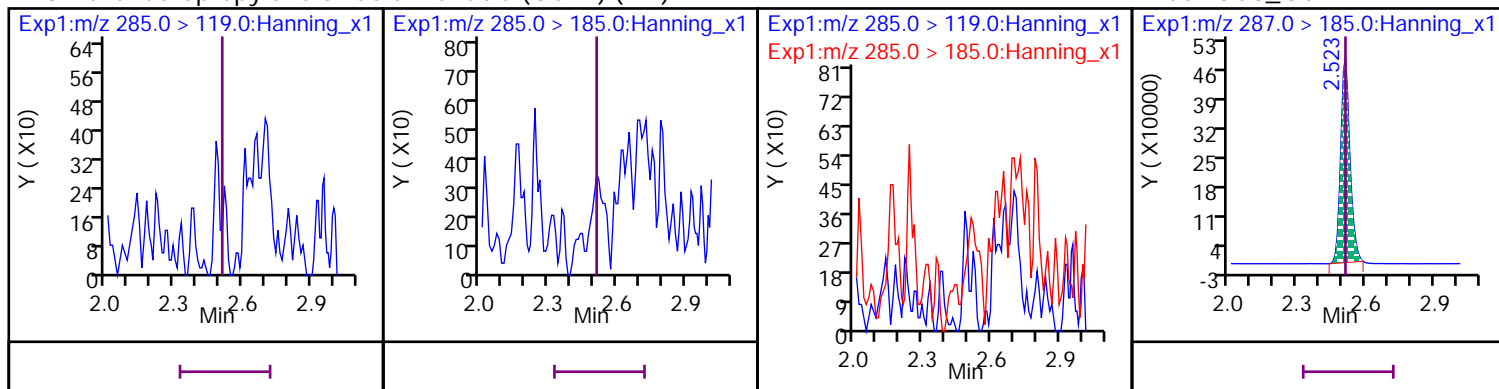
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



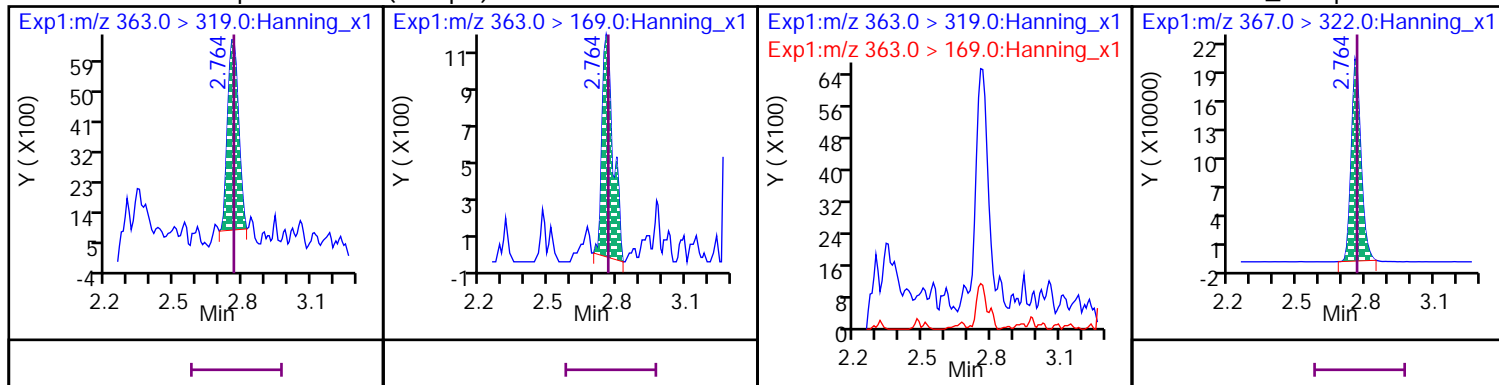
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



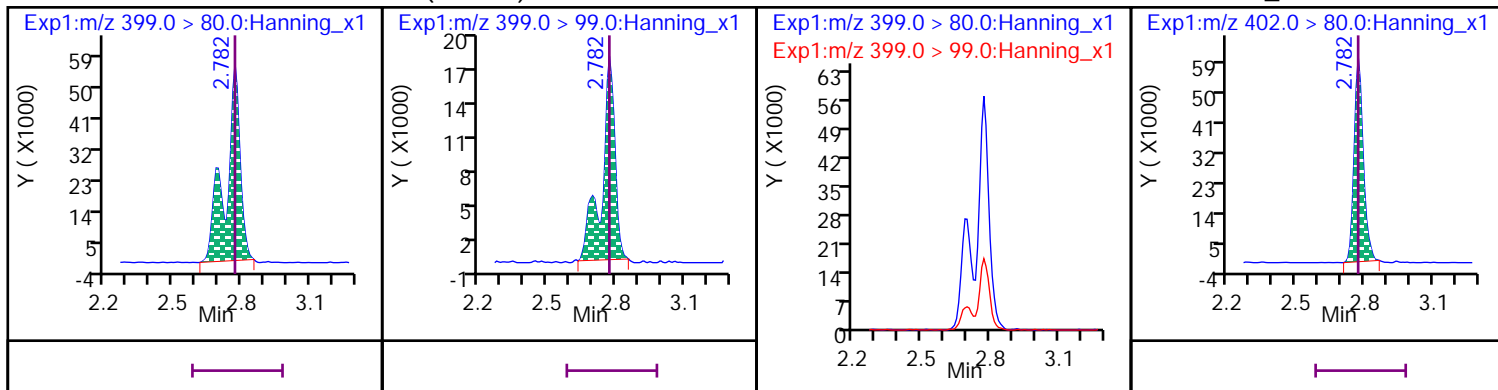
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



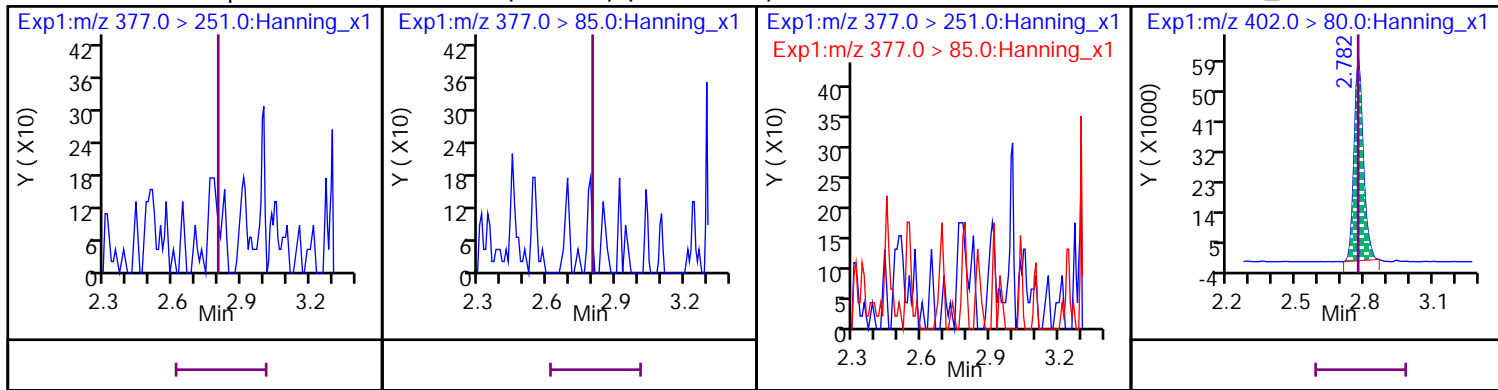
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



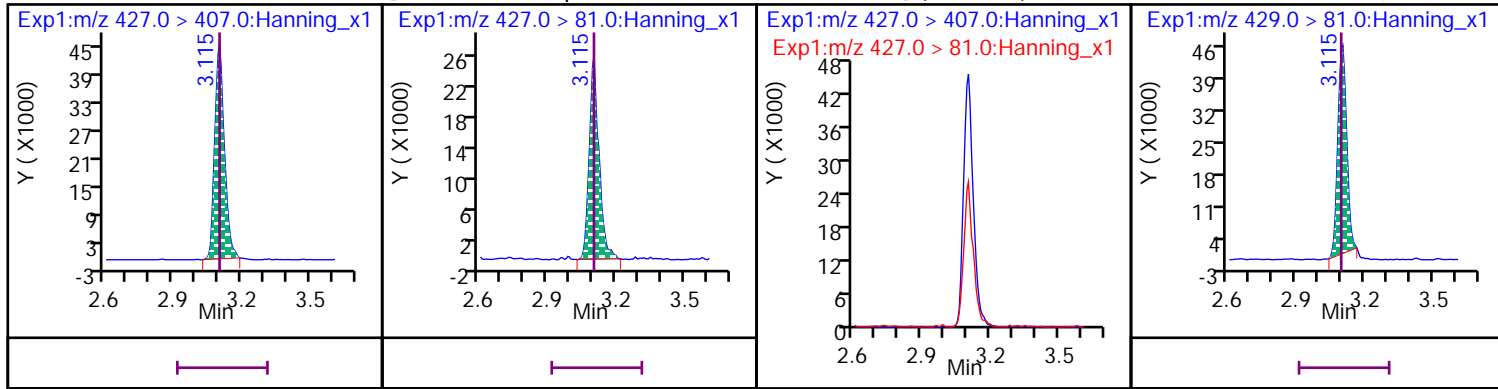
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (Marked ND)

D 45 13C3\_PFHxS



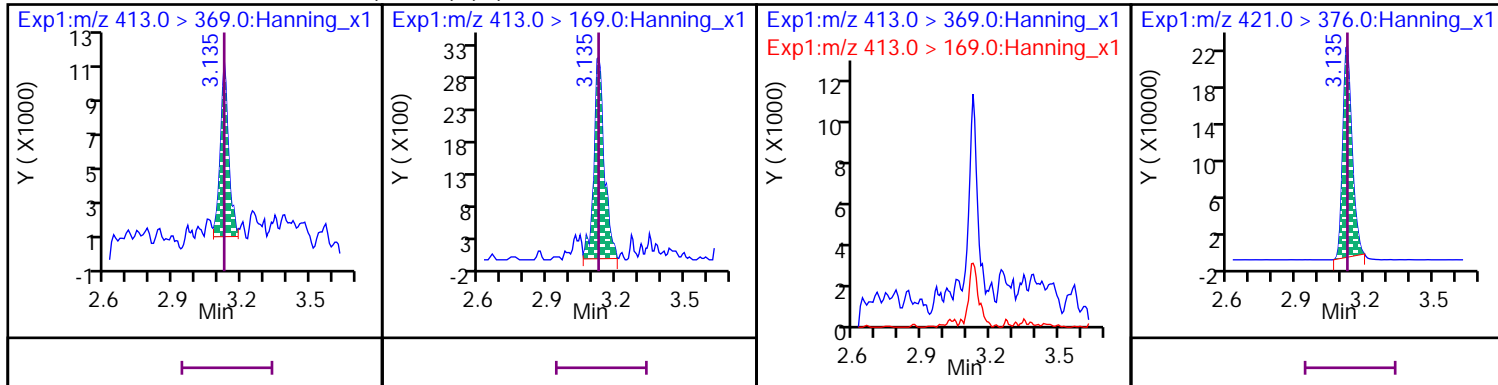
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



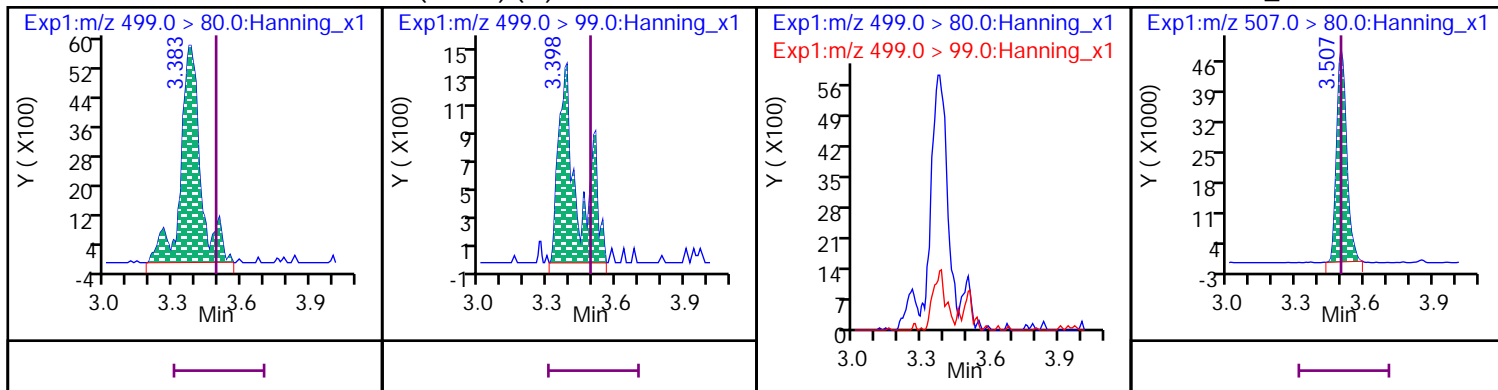
20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



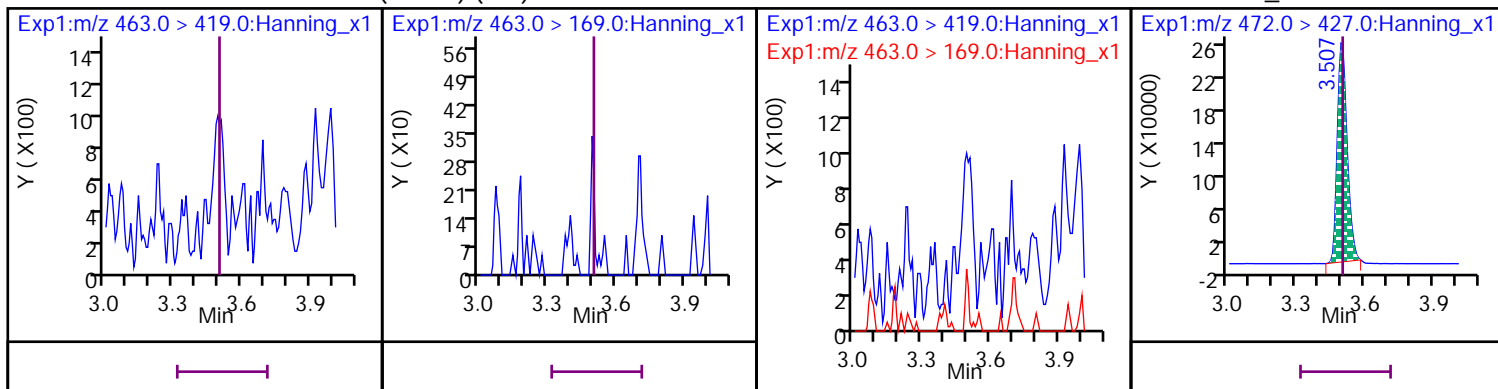
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



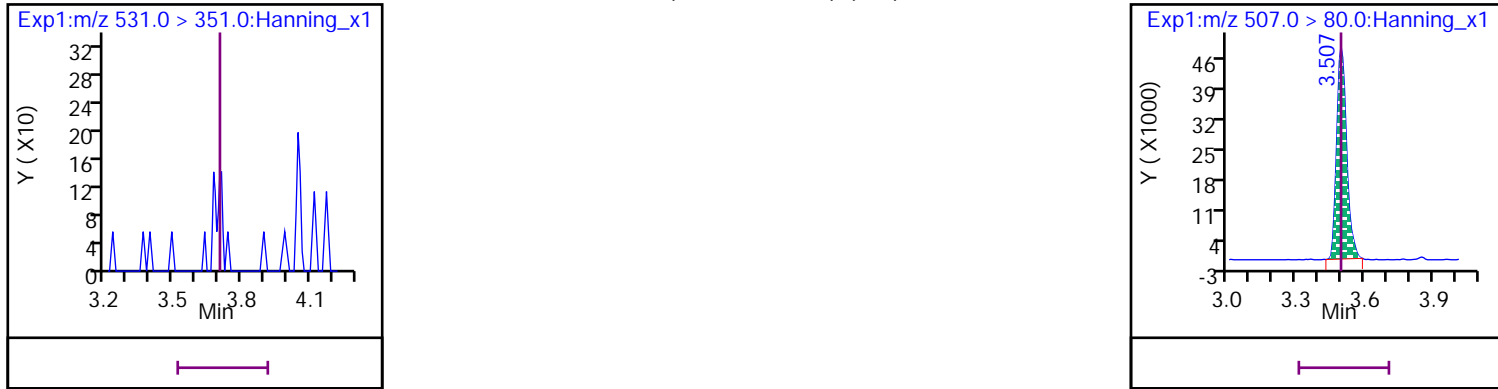
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



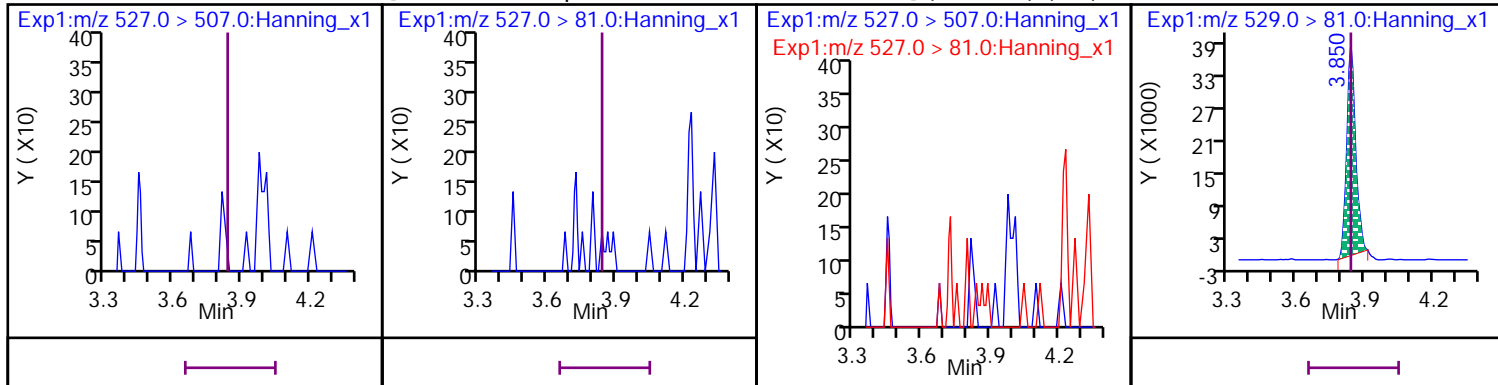
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



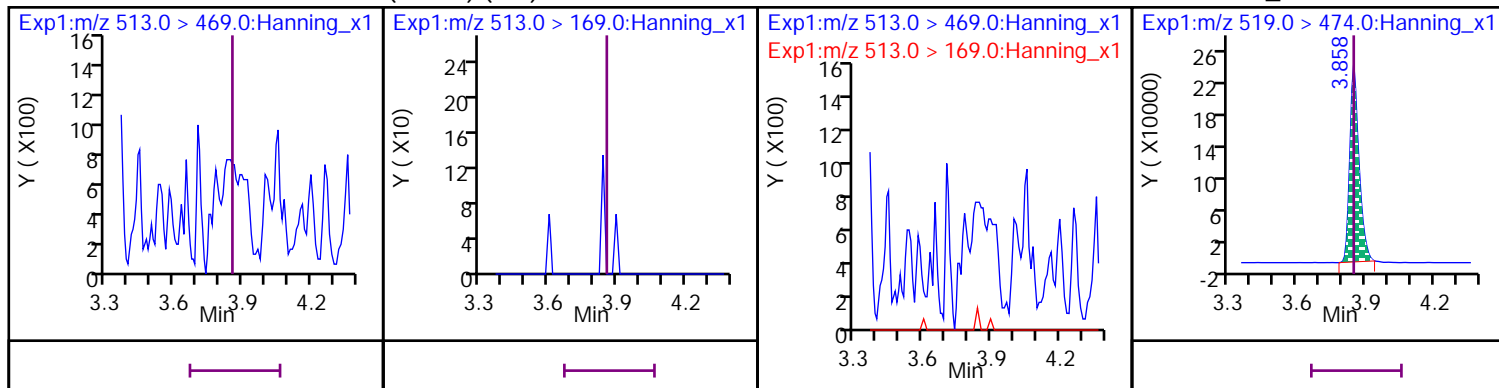
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



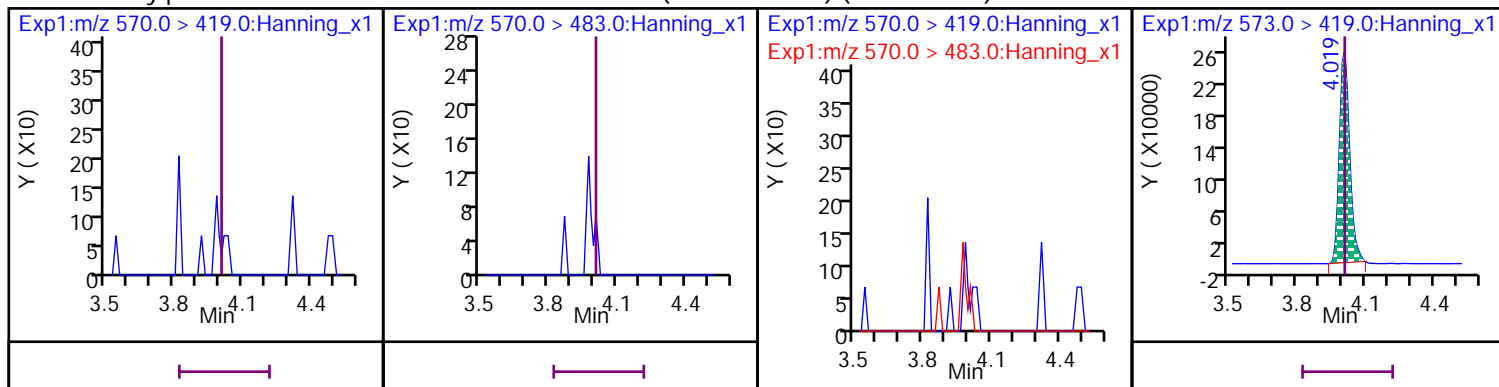
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



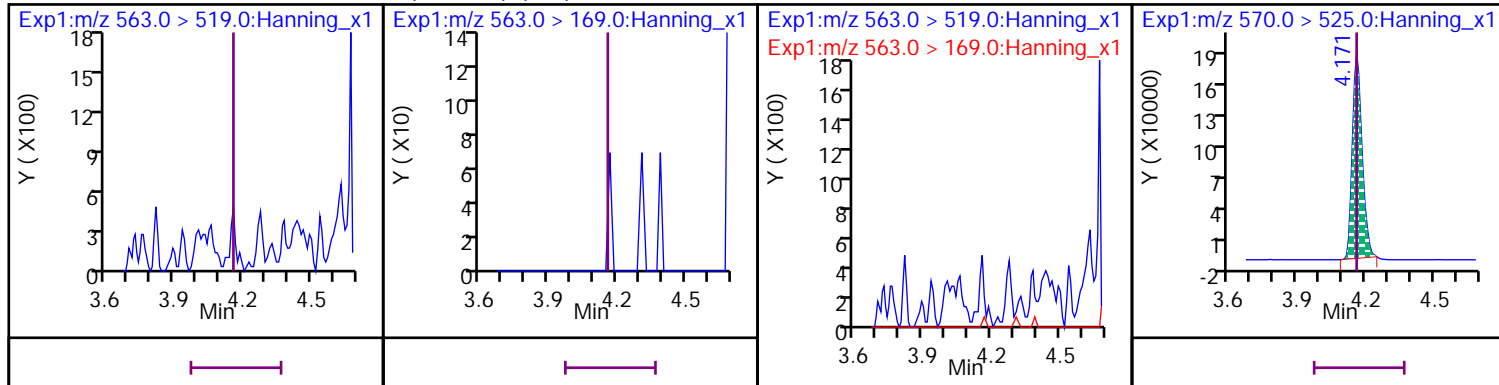
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



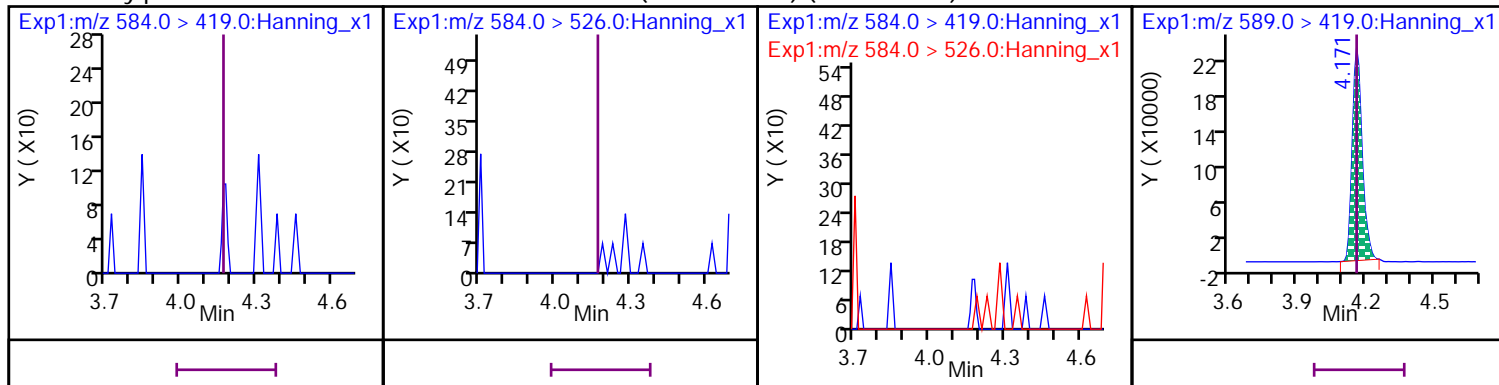
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

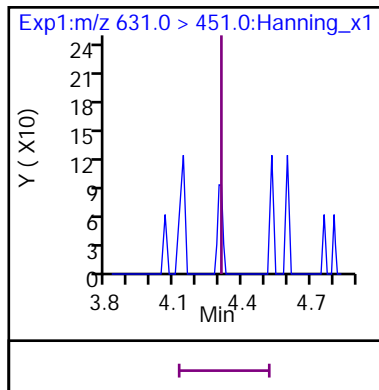


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

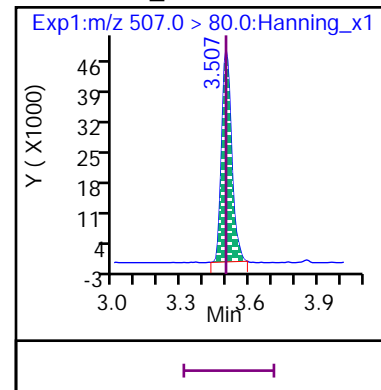
D 60 d5-EtFOSAA



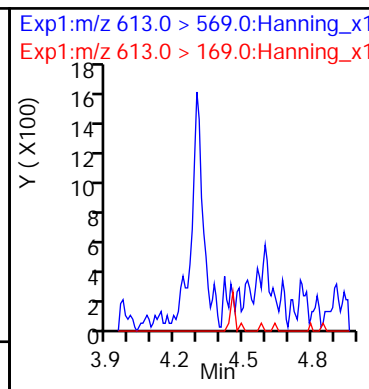
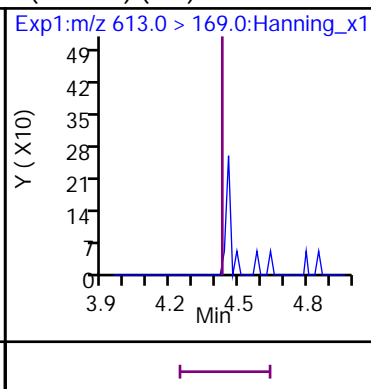
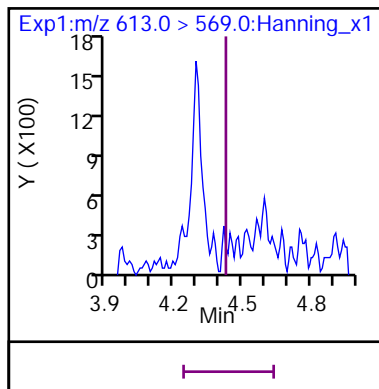
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



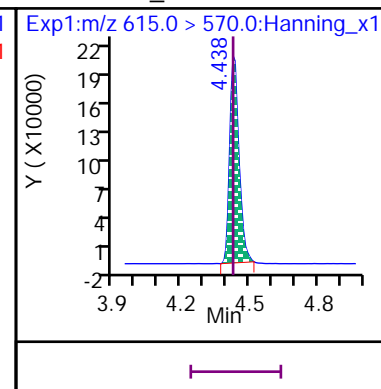
## D 54 13C8\_PFOS



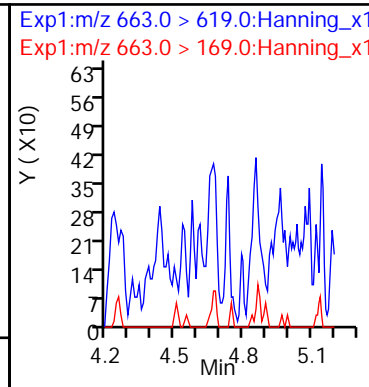
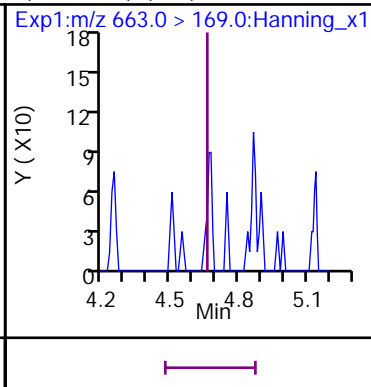
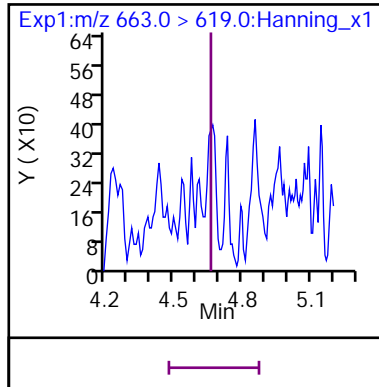
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



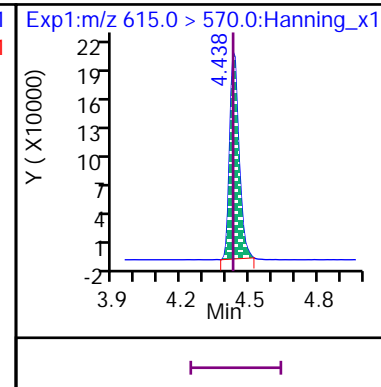
## D 38 13C2\_PFDoA



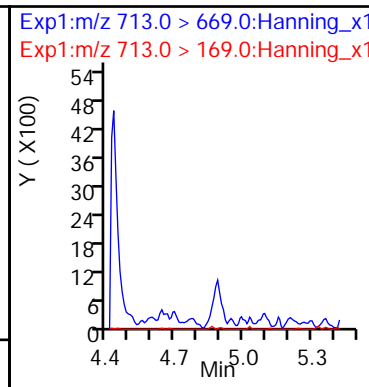
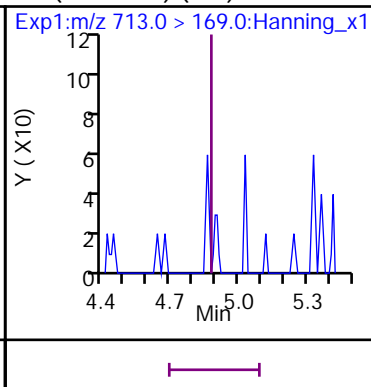
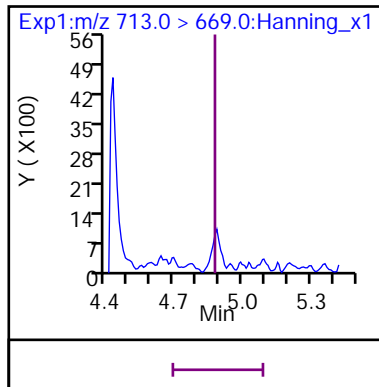
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



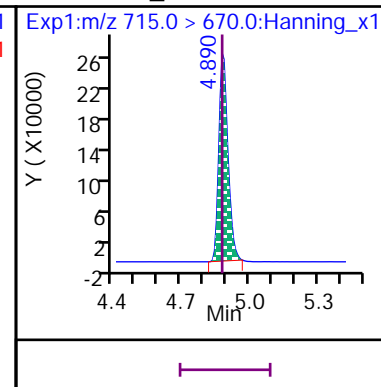
## D 38 13C2\_PFDoA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

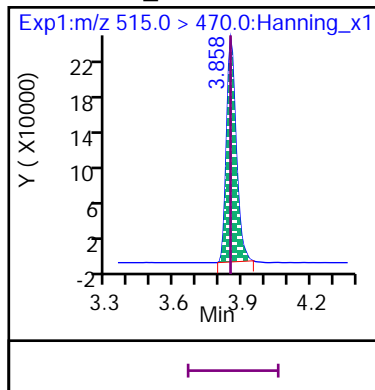


## D 42 13C2\_PFTeDA

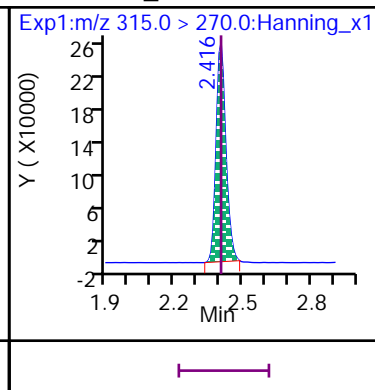




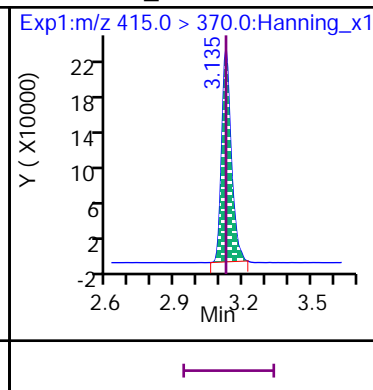
\* 37 13C2\_PFDA



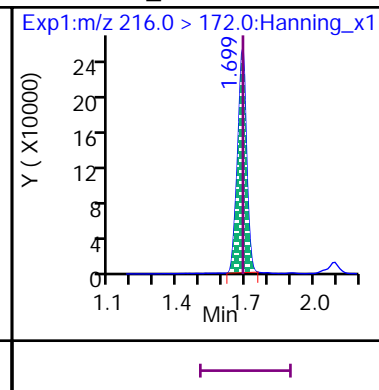
\* 39 13C2\_PFHxA



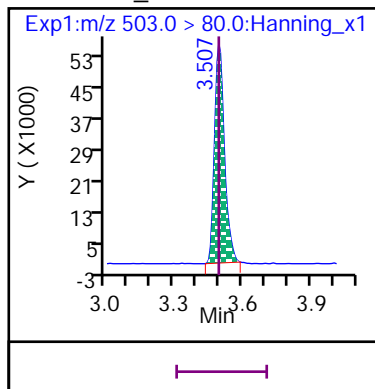
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d

Injection Date: 27-Dec-2020 11:33:18

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-002DU

Sample Info: VL11001-002DU

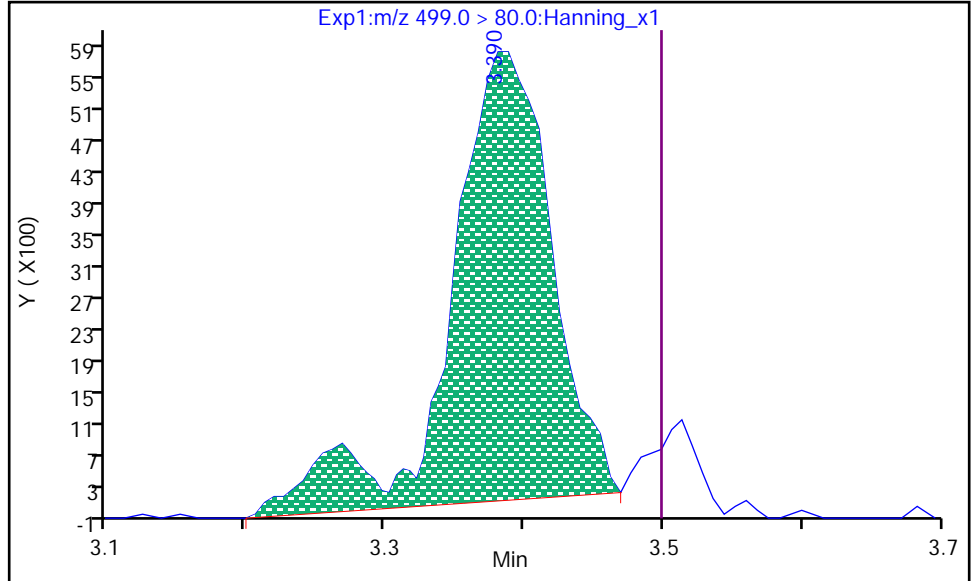
Dil. Factor: 1

Operator: Matthew M. Miller

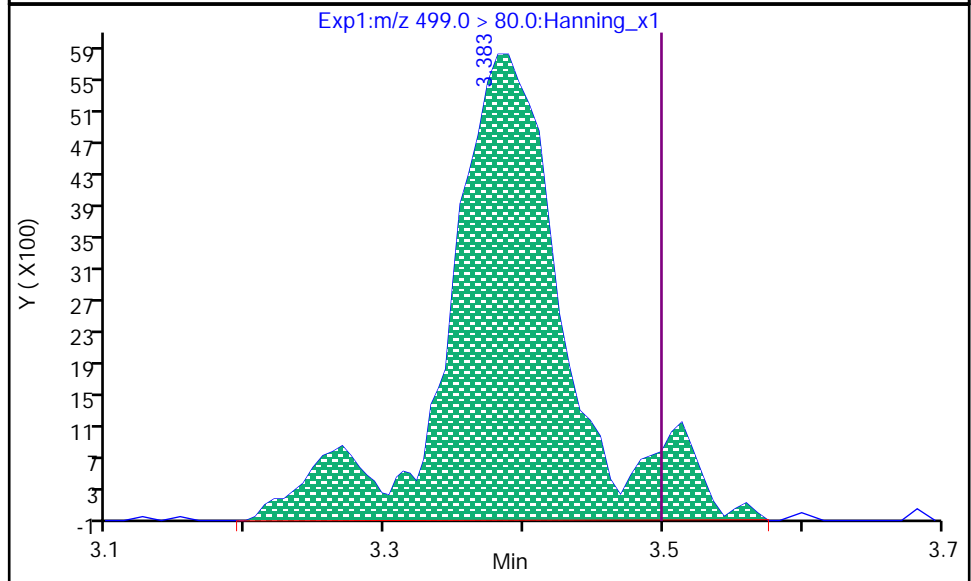
18 PFOS, CAS: 1763-23-1

RT: 3.390  
Area: 28602  
Conc: 6.8118  
Conc Units: ng/L

Processing Integration Results



RT: 3.383  
Area: 34503  
Conc: 8.2171  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:47:06

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d

Injection Date: 27-Dec-2020 11:33:18

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-002DU

Sample Info: VL11001-002DU

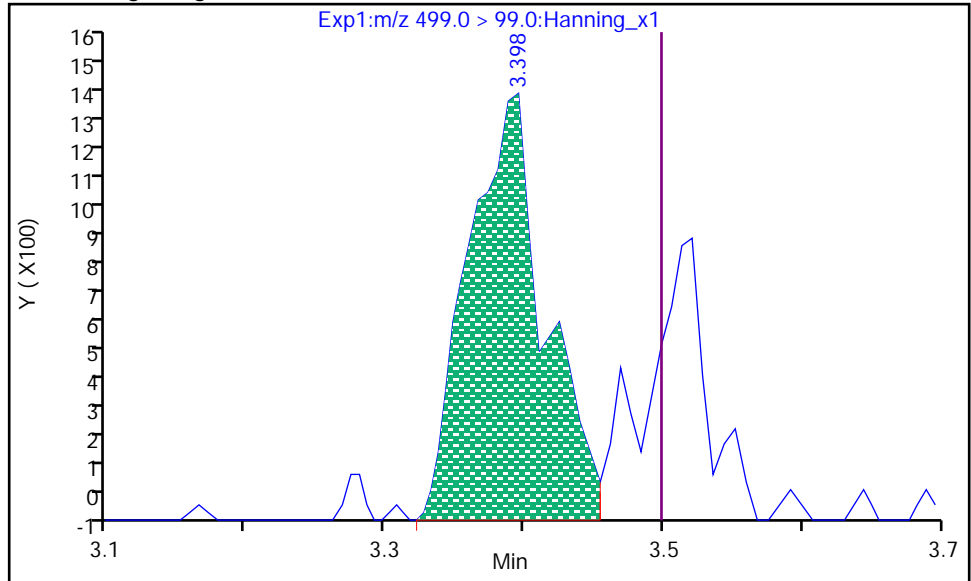
Dil. Factor: 1

Operator: Matthew M. Miller

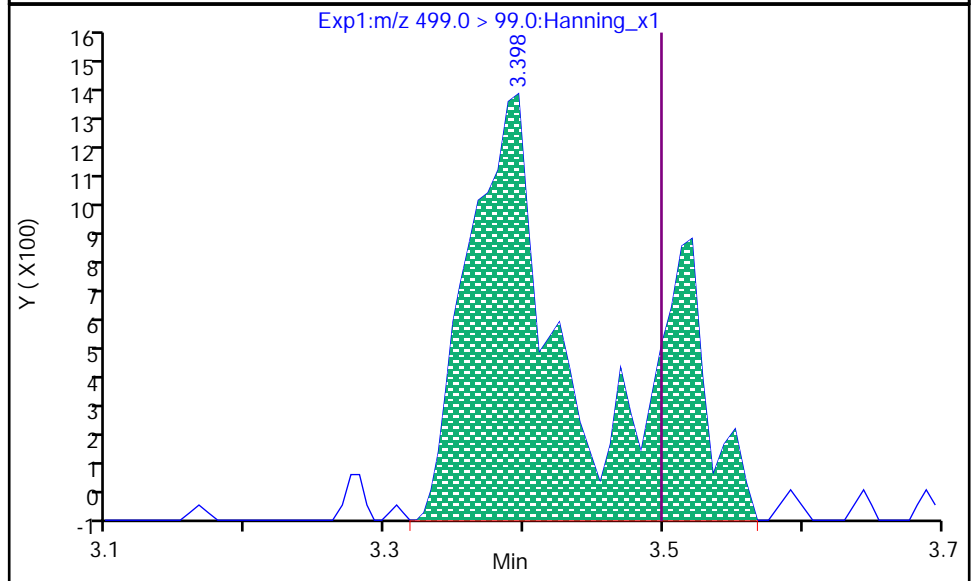
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.398  
Area: 5254  
Conc: 8.2171  
Conc Units: ng/L



RT: 3.398  
Area: 7982  
Conc: 8.2171  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:47:10

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d

Injection Date: 27-Dec-2020 11:33:18

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-002DU

Sample Info: VL11001-002DU

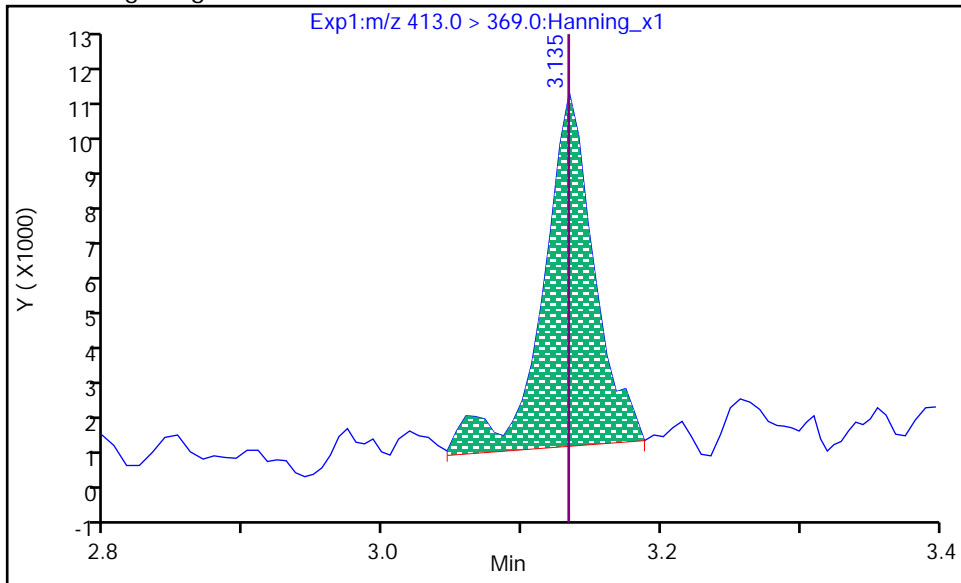
Dil. Factor: 1

Operator: Matthew M. Miller

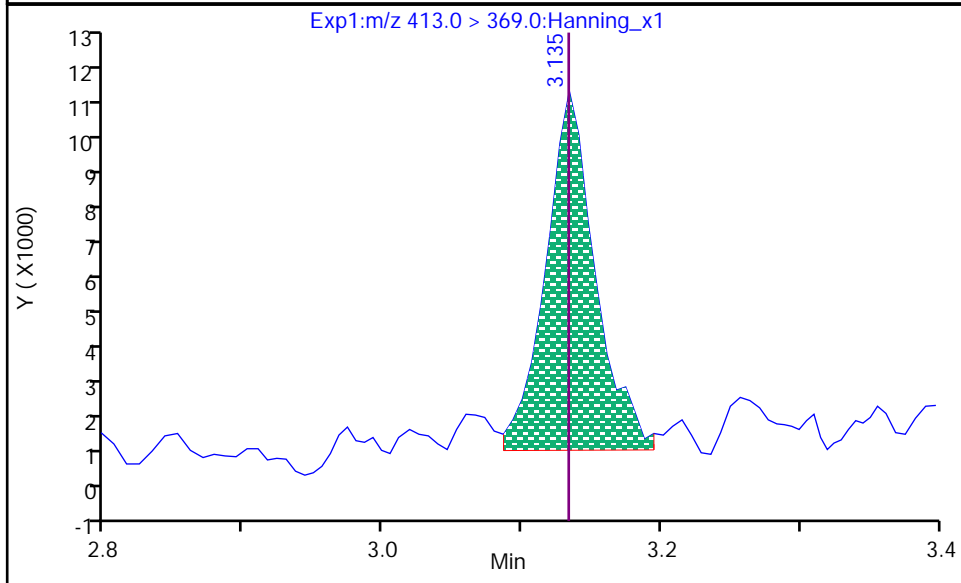
20 PFOA, CAS: 335-67-1

RT: 3.135  
Area: 25314  
Conc: 1.6672  
Conc Units: ng/L

Processing Integration Results



RT: 3.135  
Area: 24637  
Conc: 1.6227  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:53

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b\122720012.d

Injection Date: 27-Dec-2020 11:33:18

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11001-002DU

Sample Info: VL11001-002DU

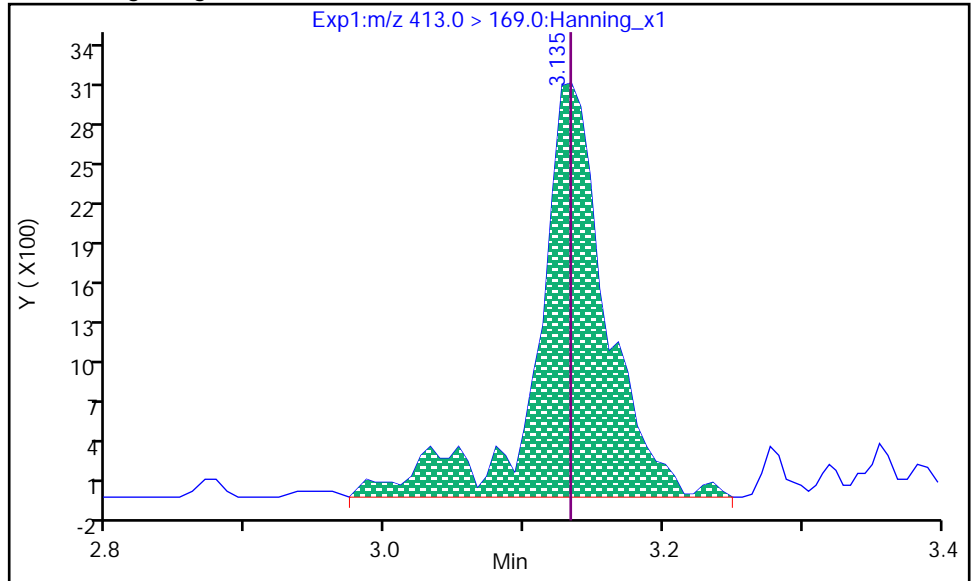
Dil. Factor: 1

Operator: Matthew M. Miller

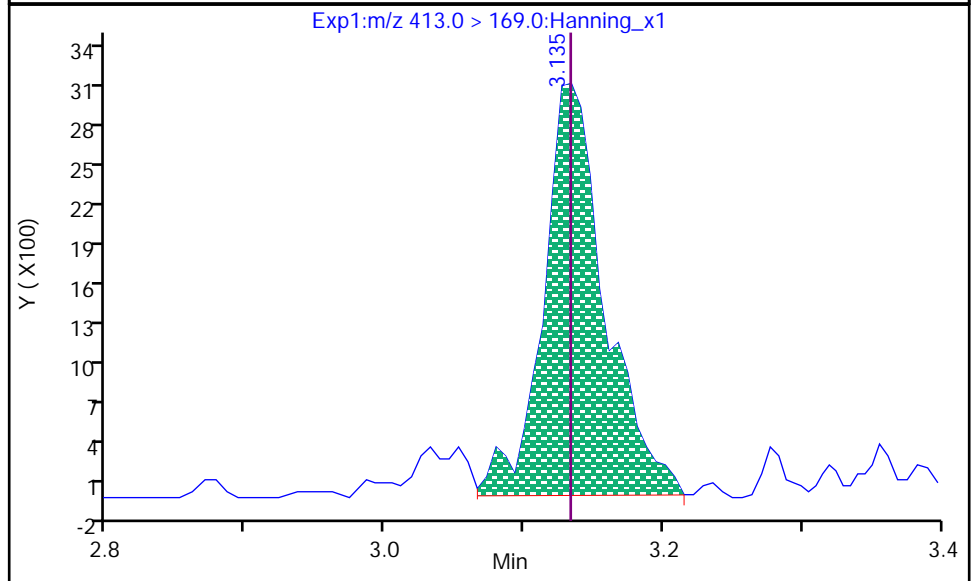
20 PFOA, CAS: 335-67-1

Processing Integration Results

RT: 3.135  
Area: 10875  
Conc: 1.6227  
Conc Units: ng/L



RT: 3.135  
Area: 9524  
Conc: 1.6227  
Conc Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 12:46:59

Audit Action: Mint

Audit Reason: Invalid Integration

# MISC. DATA

### Extract Dilution Preparations

<b>537</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
<b>ID Aq</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V <sub>o</sub> )	5* (FV/V <sub>o</sub> )	10* (FV/V <sub>o</sub> )	20* (FV/V <sub>o</sub> )	50* (FV/V <sub>o</sub> )	100* (FV/V <sub>o</sub> )	200* (FV/V <sub>o</sub> )	500* (FV/V <sub>o</sub> )	1000* (FV/V <sub>o</sub> )	2000* (FV/V <sub>o</sub> )
<b>DAI</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
<b>ID Solid</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V <sub>E</sub> /(M*S))/ 0.91)/1000	((V <sub>E</sub> /(M*S))/ 0.2)/1000	((V <sub>E</sub> /(M*S))/ 0.1)/1000	((V <sub>E</sub> /(M*S))/ 0.05)/1000	((V <sub>E</sub> /(M*S))/ 0.02)/1000	((V <sub>E</sub> /(M*S))/ 0.01)/1000	((V <sub>E</sub> /(M*S))/ 0.005)/1000	((V <sub>E</sub> /(M*S))/ 0.002)/1000	((V <sub>E</sub> /(M*S))/ 0.001)/1000	((V <sub>E</sub> /(M*S))/ 0.0005)/1000

**NOTE:** Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFA5-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFA5-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20	121720006.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59	121720007.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32	121720008.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06	121720009.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45	121720010.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20	121720011.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55	121720012.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34	121720013.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15	121720014.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55	121720015.d	ICal					Analytes	L-10	1.00		
11	IBLK A	17-Dec-2020 14:08:35	121720016.d	InstBlk					Surrogates	Smp	0.1100		
12	ICV 500_SVLC-1202	17-Dec-2020 14:19:09	121720017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1189	17-Dec-2020 14:29:42	121720018.d	CheckStd					IsomerCheck	Smp	1.00		
22	537.1 CCV 1000_SVLC-1248	17-Dec-2020 16:37:01	121720030.d	CCV					Analytes	L-5	1.00		
23	VQ76684-001	17-Dec-2020 16:47:37	121720031.d	MBIk		Soil		76684	Surrogates	Smp	0.1100		
24	VQ76684-002	17-Dec-2020 16:58:12	121720032.d	LCS		Soil		76684	Analytes	100x PDS	0.1000		
25	VQ76697-001	17-Dec-2020 17:08:54	121720033.d	MBIk		Soil		76697	Surrogates	Smp	0.1100		
26	VQ76697-002	17-Dec-2020 17:19:30	121720034.d	LCS		Soil		76697	Analytes	100x PDS	0.1000		
27	VQ77059-001	17-Dec-2020 17:30:06	121720035.d	MBIk		Aqueous		77059	Surrogates	Smp	0.1100		
28	VQ77059-002	17-Dec-2020 17:40:48	121720036.d	LCS		Aqueous		77059	Analytes	100x PDS	0.2000		
29	VQ77059-003	17-Dec-2020 17:51:26	121720037.d	LCS		Aqueous		77059	Analytes	100x PDS	0.2000		
31	VL02035-001	17-Dec-2020 18:12:47	121720039.d	Client	TT017 P+T1 GAC	Soil		50	76547	Surrogates	Smp	0.1100	
32	VL02035-003	17-Dec-2020 18:23:22	121720040.d	Client	TT017 VPGAC 1	Soil			76547	Surrogates	Smp	0.1100	
33	VL02035-004	17-Dec-2020 18:33:58	121720041.d	Client	TT017 VPGAC 2	Soil			76547	Surrogates	Smp	0.1100	
34	VL02035-007	17-Dec-2020 18:44:34	121720042.d	Client	Area H VPGAC 1	Soil			76543	Surrogates	Smp	0.1100	
35	VL02035-008	17-Dec-2020 18:55:14	121720043.d	Client	Area H VPGAC 2	Soil			76543	Surrogates	Smp	0.1100	
36	VL03019-002	17-Dec-2020 19:05:53	121720044.d	Client	MCAAP-IDW-2-SO-120220	Soil			76543	Surrogates	Smp	0.1100	
37	ID CCV 1000A_SVLC-1248	17-Dec-2020 19:16:32	121720045.d	CCV					Analytes	L-5	1.00		
39	VL03003-001	17-Dec-2020 19:37:48	121720047.d	Client	Thinx-Super-Hiphugger-Du	Soil			76547	Surrogates	Smp	0.1100	
40	VL03003-001MS	17-Dec-2020 19:48:27	121720048.d	MS		Soil			76547	Analytes	100x PDS	0.1000	
41	VL03003-001MD	17-Dec-2020 19:59:08	121720049.d	MSD		Soil			76547	Analytes	100x PDS	0.1000	
42	VL03003-002	17-Dec-2020 20:09:42	121720050.d	Client	Thinx-Moderate-Sport-Bei	Soil			76547	Surrogates	Smp	0.1100	SUR, RR
43	VL03003-003	17-Dec-2020 20:20:17	121720051.d	Client	Thinx-Moderate-Hiphugger	Soil			76547	Surrogates	Smp	0.1100	SUR, ND - NCM
44	VL03020-006	17-Dec-2020 20:30:54	121720052.d	Client	MCAAP-B34-2-SO-120120	Soil			76543	Surrogates	Smp	0.1100	
45	VL03020-006MS	17-Dec-2020 20:41:36	121720053.d	MS		Soil			76543	Analytes	100x PDS	0.1000	
46	VL03020-006MD	17-Dec-2020 20:52:13	121720054.d	MSD		Soil			76543	Analytes	100x PDS	0.1000	
47	VL03020-007	17-Dec-2020 21:02:50	121720055.d	Client	MCAAP-FD-2-SO-120120	Soil			76543	Surrogates	Smp	0.1100	
48	VL03020-009	17-Dec-2020 21:13:33	121720056.d	Client	MCAAP-B34-3-SO-120120	Soil			76543	Surrogates	Smp	0.1100	
49	VL06027-001	17-Dec-2020 21:24:12	121720057.d	Client	SB023-0.5	Soil			76543	Surrogates	Smp	0.1100	
50	VL06027-002	17-Dec-2020 21:34:50	121720058.d	Client	SB023-2	Soil			76543	Surrogates	Smp	0.1100	
51	VL06027-003	17-Dec-2020 21:45:29	121720059.d	Client	SB023-4	Soil			76543	Surrogates	Smp	0.1100	
52	ID CCV 1000B_SVLC-1248	17-Dec-2020 21:56:04	121720060.d	CCV					Analytes	L-5	1.00		
53	VL06027-004	17-Dec-2020 22:06:41	121720061.d	Client	SB023-6	Soil			76543	Surrogates	Smp	0.1100	
54	VL06027-005	17-Dec-2020 22:17:16	121720062.d	Client	SB024-0.5	Soil			76543	Surrogates	Smp	0.1100	



ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
55	VL06027-006	17-Dec-2020 22:27:55	121720063.d	Client	SB024-2	Soil	1	76543	Surrogates	Smp	0.1100		
56	VL06027-007	17-Dec-2020 22:38:36	121720064.d	Client	SB024-3	Soil	1	76543	Surrogates	Smp	0.1100		
57	VL06027-008	17-Dec-2020 22:49:17	121720065.d	Client	SB025-0.5	Soil	1	76543	Surrogates	Smp	0.1100		
58	VL06027-009	17-Dec-2020 22:59:55	121720066.d	Client	SB025-2	Soil	1	76543	Surrogates	Smp	0.1100		
59	VL06027-010	17-Dec-2020 23:10:40	121720067.d	Client	SB025-4	Soil	1	76543	Surrogates	Smp	0.1100		
60	VL06027-011	17-Dec-2020 23:21:20	121720068.d	Client	SB025-6	Soil	1	76543	Surrogates	Smp	0.1100		
61	VL06027-012	17-Dec-2020 23:32:00	121720069.d	Client	SB025-7	Soil	1	76543	Surrogates	Smp	0.1100		
62	VL06027-013	17-Dec-2020 23:42:40	121720070.d	Client	SB026-0.5	Soil	1	76543	Surrogates	Smp	0.1100		
63	ID CCV 1000C_SVLC-1248	17-Dec-2020 23:53:18	121720071.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\ORGANICS\LL\LCMSMS02.i\122320-DOD.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	23-Dec-2020 11:20:59	122320005.d	CCV					Analytes	L-2	1.00		All dilutions refortified with EIS SVLC-1239
96	ID CCV 200_SVLC-1221	23-Dec-2020 11:31:37	122320006.d	CCV					Analytes	L-3	1.00		8:2 FTS HIGH,NCM#45886,45888,45889
97	ID IBLK A	23-Dec-2020 11:42:12	122320007.d	InstBlk					Surrogates	Smp	0.1100		
98	20ppb SUR -1264 TEST	23-Dec-2020 11:52:49	122320008.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
1	VQ77344-001	23-Dec-2020 12:03:29	122320009.d	MBlk		Aqueous	1	77344	Surrogates	Smp	0.1100		62FTS NCM#45882,45883
2	VQ77344-002	23-Dec-2020 12:14:04	122320010.d	LCS		Aqueous	1	77344	Analytes	100x PDS	0.2000		
3	20-2872 CARTRIDGE BLK	23-Dec-2020 12:24:39	122320011.d	InstBlk					Surrogates	Smp	0.1100		RR-6:2 FTS
4	20-2872 CARTRIDGE LCS	23-Dec-2020 12:35:13	122320012.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		
5	VQ77367-001	23-Dec-2020 12:45:52	122320013.d	MBlk		Aqueous	1	77367	Surrogates	Smp	0.1100		
6	VQ77367-002	23-Dec-2020 12:56:27	122320014.d	LCS		Aqueous	1	77367	Analytes	100x PDS	0.2000		
7	VQ77368-001	23-Dec-2020 13:07:02	122320015.d	MBlk		Soil	1	77368	Surrogates	Smp	0.1100		
8	VQ77368-002	23-Dec-2020 13:17:41	122320016.d	LCS		Soil	1	77368	Analytes	100x PDS	0.1000		
9	VL10038-028	23-Dec-2020 13:28:21	122320017.d	Client	SB065-0.5	Soil	1	77215	Surrogates	Smp	0.1100		
10	VL10038-025	23-Dec-2020 13:39:00	122320018.d	Client	SB064-0.5	Soil	5	77215	Surrogates	Smp	0.1100		
11	VL10038-027	23-Dec-2020 13:49:41	122320019.d	Client	SB064-4	Soil	5	77215	Surrogates	Smp	0.1100		
12	VL02035-002	23-Dec-2020 14:00:14	122320020.d	Client	TT017 P+T2 GAC	Soil	20	77368	Surrogates	Smp	0.1100		RR-82FTS DETECT
13	VL02035-005	23-Dec-2020 14:10:48	122320021.d	Client	Area H LPGAC 1	Soil	50	76697	Surrogates	Smp	0.1100		RR-100X, 82FTS DETECT
14	ID CCV 1000_SVLC-1248	23-Dec-2020 14:21:21	122320022.d	CCV					Analytes	L-5	1.00		
15	VL06026-022	23-Dec-2020 14:31:57	122320023.d	Client	EBWL-03 (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
16	VL06030-019	23-Dec-2020 14:42:38	122320024.d	Client	EBHA-02	Aqueous	1	77344	Surrogates	Smp	0.1100		
17	VL06026-005	23-Dec-2020 14:53:15	122320025.d	Client	TW015 (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
18	VL06026-006	23-Dec-2020 15:03:50	122320026.d	Client	TW016 (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X
19	VL06026-007	23-Dec-2020 15:14:28	122320027.d	Client	TW017 (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		SUR NCM/MTX#45884
20	VL06026-008	23-Dec-2020 15:25:08	122320028.d	Client	32MW0030 (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
21	VL06026-008DU	23-Dec-2020 15:35:48	122320029.d	Client		Aqueous	1	77344	Surrogates	Smp	0.1100		
22	VL06026-010	23-Dec-2020 15:46:23	122320030.d	Client	17MW0033A (12032020)	Aqueous	1	77344	Surrogates	Smp	0.1100		SUR NCM/ND#45885
23	VL06026-010MS	23-Dec-2020 15:56:58	122320031.d	MS		Aqueous	1	77344	Analytes	100x PDS	0.2000		
24	VL06026-011	23-Dec-2020 16:07:35	122320032.d	Client	32MW0033 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-SUR
25	VL06026-012	23-Dec-2020 16:18:17	122320033.d	Client	15MW0005 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X, 82FTS DETECT,ncm6:2
26	VL06026-013	23-Dec-2020 16:28:53	122320034.d	Client	15MW003 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-1X-C/O, SUR
27	ID CCV 1000A_SVLC-1248	23-Dec-2020 16:39:30	122320035.d	CCV					Analytes	L-5	1.00		
97	BLK A2	23-Dec-2020 16:54:29	122320036.d	InstBlk					Surrogates	Smp	0.1100		
97	BLK A3	23-Dec-2020 17:05:04	122320037.d	InstBlk					Surrogates	Smp	0.1100		
28	VL06026-014	23-Dec-2020 17:15:41	122320038.d	Client	36MW0005 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
29	VL06026-015	23-Dec-2020 17:26:17	122320039.d	Client	36MW0002 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-82FTS DETECT
30	VL06026-016	23-Dec-2020 17:36:56	122320040.d	Client	25MW0004 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-100X, SUR, 8:2 FTS DETECT/CCV,ncm 6:2
31	VL06026-017	23-Dec-2020 17:47:35	122320041.d	Client	TW007 (12022020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X,+82FTS DETECT
32	VL06026-018	23-Dec-2020 17:58:10	122320042.d	Client	TW010 (12022020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X, 82FTS DETECT, RX6:2fts MBlk
33	VL06026-019	23-Dec-2020 18:08:46	122320043.d	Client	TW009 (12022020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X, -82FTS DETECT,RX6:2fts MBlk
34	VL06026-020	23-Dec-2020 18:19:21	122320044.d	Client	TW008 (12022020)	Aqueous	1	77344	Surrogates	Smp	0.1100		RR-5X, 82FTS DETECT,ncm 6:2
35	VL06026-021	23-Dec-2020 18:29:58	122320045.d	Client	SB-02 (12042020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
36	VL02035-003	23-Dec-2020 18:40:39	122320046.d	Client	TT017 VPGAC 1	Soil	1	77368	Surrogates	Smp	0.1100		RR-82FTS DETECT
37	VL02035-004	23-Dec-2020 18:51:17	122320047.d	Client	TT017 VPGAC 2	Soil	1	77368	Surrogates	Smp	0.1100		RR-82FTS DETECT
38	ID CCV 1000B_SVLC-1248	23-Dec-2020 19:01:55	122320048.d	CCV					Analytes	L-5	1.00		1104 of 1131

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
39	VL10041-022	23-Dec-2020 19:12:35	122320049.d	Client	SB078-0.5	Soil	1	77368	Surrogates	Smp	0.1100		
40	VL10041-023	23-Dec-2020 19:23:14	122320050.d	Client	SB078-2	Soil	1	77368	Surrogates	Smp	0.1100		
41	VL10041-026	23-Dec-2020 19:33:54	122320051.d	Client	SB066-4	Soil	1	77368	Surrogates	Smp	0.1100		
42	VL11008-001	23-Dec-2020 19:44:33	122320052.d	Client	RFAAP-RW-SO-(1-2)-120820	Soil	1	77368	Surrogates	Smp	0.1100		
43	VL11008-001MS	23-Dec-2020 19:55:11	122320053.d	MS		Soil	1	77368	Analytes	100x PDS	0.1000		
44	VL11008-001MD	23-Dec-2020 20:05:47	122320054.d	MSD		Soil	1	77368	Analytes	100x PDS	0.1000		
45	VL11008-002	23-Dec-2020 20:16:30	122320055.d	Client	RFAAP-FD-1-SO-120820	Soil	1	77368	Surrogates	Smp	0.1100		
46	VL11008-003	23-Dec-2020 20:27:07	122320056.d	Client	RFAAP-TEF-SO-1-(0-2)-120	Soil	1	77368	Surrogates	Smp	0.1100		
47	VL11008-007	23-Dec-2020 20:37:44	122320057.d	Client	RFAAP-TEF-SO-3-(0-2)-120	Soil	1	77368	Surrogates	Smp	0.1100		
48	VL11008-008	23-Dec-2020 20:48:22	122320058.d	Client	RFAAP-TEF-SO-2-(0-2)-120	Soil	1	77368	Surrogates	Smp	0.1100		
49	VL11041-005	23-Dec-2020 20:59:00	122320059.d	Client	SB074-0.5	Soil	1	77368	Surrogates	Smp	0.1100		
50	VL11041-006	23-Dec-2020 21:09:39	122320060.d	Client	SB074-2	Soil	1	77368	Surrogates	Smp	0.1100		
51	ID CCV 1000C_SVLC-1248	23-Dec-2020 21:20:19	122320061.d	CCV					Analytes	L-5	1.00		
52	VL11041-007	23-Dec-2020 21:30:55	122320062.d	Client	SB075-0.5	Soil	1	77368	Surrogates	Smp	0.1100		
53	VL11041-008	23-Dec-2020 21:41:30	122320063.d	Client	SB075-2	Soil	1	77368	Surrogates	Smp	0.1100		
54	VL11041-009	23-Dec-2020 21:52:06	122320064.d	Client	SB-076-0.5	Soil	1	77368	Surrogates	Smp	0.1100		
55	VL11041-010	23-Dec-2020 22:02:44	122320065.d	Client	SB-076-2	Soil	1	77368	Surrogates	Smp	0.1100		
56	VL11041-011	23-Dec-2020 22:13:25	122320066.d	Client	SB-077-0.5	Soil	1	77368	Surrogates	Smp	0.1100		
57	VL11041-012	23-Dec-2020 22:24:06	122320067.d	Client	SB-077-2	Soil	1	77368	Surrogates	Smp	0.1100		
58	ID CCV 1000D_SVLC-1248	23-Dec-2020 22:34:46	122320068.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\ORGANICS\LL\LCMSMS02.i\122720-DOD.b  
Method: LCMSMS02\_PFA5-ID.M Instrument: LCMSMS02  
Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
Method Lock: Unlocked Lock Date:  
No. Compounds: 66 Integrator: picker  
Calib Method: PFA5-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	27-Dec-2020 10:19:11	122720005.d	CCV					Analytes	L-2	1.00		All dilutions reformed with EIS-SVLC-1264
96	ID CCV 200_SVLC-1221	27-Dec-2020 10:29:45	122720006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	27-Dec-2020 10:40:20	122720007.d	InstBlk					Surrogates	Smp	0.1100		
1	VL06030-020	27-Dec-2020 10:50:57	122720008.d	Client	SB01	Aqueous	1	77367	Surrogates	Smp	0.1100		
2	VL11001-001	27-Dec-2020 11:01:32	122720009.d	Client	G-5-1220	Aqueous	1	77367	Surrogates	Smp	0.1100		
3	VL11001-001MS	27-Dec-2020 11:12:06	122720010.d	MS		Aqueous	1	77367	Analytes	100x PDS	0.2000		
4	VL11001-002	27-Dec-2020 11:22:43	122720011.d	Client	FFS-MW03-1220	Aqueous	1	77367	Surrogates	Smp	0.1100		
5	VL11001-002DU	27-Dec-2020 11:33:18	122720012.d	Client		Aqueous	1	77367	Surrogates	Smp	0.1100		
6	VL11001-003	27-Dec-2020 11:43:53	122720013.d	Client	FFS-MW02-1220	Aqueous	1	77367	Surrogates	Smp	0.1100		
7	VL11001-004	27-Dec-2020 11:54:28	122720014.d	Client	FD01-1220	Aqueous	1	77367	Surrogates	Smp	0.1100		
8	VL11001-005	27-Dec-2020 12:05:06	122720015.d	Client	C-00-3-1220	Aqueous	1	77367	Surrogates	Smp	0.1100		
9	VL11041-001	27-Dec-2020 12:15:43	122720016.d	Client	17MW0034 (12072020)	Aqueous	1	77367	Surrogates	Smp	0.1100		SUR NCM/ND#45767
10	VL11041-002	27-Dec-2020 12:26:23	122720017.d	Client	17MW0031 (12072020)	Aqueous	1	77367	Surrogates	Smp	0.1100		
11	VL11041-003	27-Dec-2020 12:37:03	122720018.d	Client	32MW0027 (12092020)	Aqueous	1	77367	Surrogates	Smp	0.1100		
12	VL11041-004	27-Dec-2020 12:47:37	122720019.d	Client	EBWL-04 (12092020)	Aqueous	1	77367	Surrogates	Smp	0.1100		
13	ID CCV 1000_SVLC-1248	27-Dec-2020 12:58:11	122720020.d	CCV					Analytes	L-5	1.00		
14	VL10041-024	27-Dec-2020 13:08:44	122720021.d	Client	EBTL-02	Aqueous	1	77367	Surrogates	Smp	0.1100		
15	VL10041-025	27-Dec-2020 13:19:19	122720022.d	Client	EBHA-03	Aqueous	1	77367	Surrogates	Smp	0.1100		
16	VL11008-004	27-Dec-2020 13:29:59	122720023.d	Client	RFAAP-RW-GW-1-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		SUR NCM/MTX#45769
17	VL11008-005	27-Dec-2020 13:40:37	122720024.d	Client	RFAAP-FB-1-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		
18	VL11008-006	27-Dec-2020 13:51:12	122720025.d	Client	RFAAP-TEF-GW-1-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		
19	VL11008-009	27-Dec-2020 14:01:47	122720026.d	Client	RFAAP-EB-1-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		
20	VL11008-010	27-Dec-2020 14:12:26	122720027.d	Client	RFAAP-EB-2-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		
21	VL11008-011	27-Dec-2020 14:23:10	122720028.d	Client	RFAAP-EB-3-120820	Aqueous	1	77367	Surrogates	Smp	0.1100		
22	VL11008-012	27-Dec-2020 14:33:49	122720029.d	Client	RFAAP-TEF-GW-3-120920	Aqueous	1	77367	Surrogates	Smp	0.1100		SUR NCM/MTX#45769
23	VL11078-001	27-Dec-2020 14:44:25	122720030.d	Client	FLW-IDW-GW-121020	Aqueous	1	77367	Surrogates	Smp	0.1100		RR-SUR
24	ID CCV 1000A_SVLC-1248	27-Dec-2020 14:55:00	122720031.d	CCV					Analytes	L-5	1.00		
25	VL02035-002	27-Dec-2020 15:05:42	122720032.d	Client	TT017 P+T2 GAC	Soil	20	77368	Surrogates	Smp	0.1100		
26	VL02035-003	27-Dec-2020 15:16:18	122720033.d	Client	TT017 VPGAC 1	Soil	1	77368	Surrogates	Smp	0.1100		
27	VL02035-004	27-Dec-2020 15:26:54	122720034.d	Client	TT017 VPGAC 2	Soil	1	77368	Surrogates	Smp	0.1100		
28	VL02035-005	27-Dec-2020 15:37:34	122720035.d	Client	Area H LPGAC 1	Soil	100	76697	Surrogates	Smp	0.1100		REPREP DILN, doesnt agree w/50x
29	VL06026-006	27-Dec-2020 15:48:11	122720036.d	Client	TW016 (12032020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
30	VL06026-011	27-Dec-2020 15:58:50	122720037.d	Client	32MW0033 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		SUR NCM#45770
31	VL06026-012	27-Dec-2020 16:09:30	122720038.d	Client	15MW0005 (12012020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
32	VL06026-013	27-Dec-2020 16:20:05	122720039.d	Client	15MW003 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		SUR NCM#45770
33	VL06026-015	27-Dec-2020 16:30:41	122720040.d	Client	36MW0002 (12012020)	Aqueous	1	77344	Surrogates	Smp	0.1100		
34	VL06026-016	27-Dec-2020 16:41:16	122720041.d	Client	25MW0004 (12012020)	Aqueous	100	77344	Surrogates	Smp	0.1100		
35	ID CCV 1000B_SVLC-1248	27-Dec-2020 16:51:56	122720042.d	CCV					Analytes	L-5	1.00		
36	VL06026-017	27-Dec-2020 17:02:39	122720043.d	Client	TW007 (12022020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
37	VL06026-018	27-Dec-2020 17:13:17	122720044.d	Client	TW010 (12022020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
38	VL06026-019	27-Dec-2020 17:23:54	122720045.d	Client	TW009 (12022020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
39	VL06026-020	27-Dec-2020 17:34:33	122720046.d	Client	TW008 (12022020)	Aqueous	5	77344	Surrogates	Smp	0.1100		
46	ID CCV 1000C_SVLC-1248	27-Dec-2020 18:49:02	122720053.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	28-Dec-2020 09:55:50	122820005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1221	28-Dec-2020 10:06:27	122820006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Dec-2020 10:17:01	122820007.d	InstBlk					Surrogates	Smp	0.1100		
98	ID IS 20_SVLC-1267	28-Dec-2020 10:27:37	122820008.d	InstBlk					Surrogates	Smp	0.1100		
1	VQ77741-001	28-Dec-2020 10:38:17	122820009.d	MBlk		Aqueous	1	77741	Surrogates	Smp	0.1100		
2	VQ77741-002	28-Dec-2020 10:48:51	122820010.d	LCS		Aqueous	1	77741	Analytes	100x PDS	0.2000		
3	VL11001-006	28-Dec-2020 10:59:26	122820011.d	Client	FFS-MW01-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
4	VL11001-007	28-Dec-2020 11:10:00	122820012.d	Client	T-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
5	VL11001-008	28-Dec-2020 11:20:38	122820013.d	Client	JAW-60-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-5X
6	VL11001-009	28-Dec-2020 11:31:12	122820014.d	Client	ET-3-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR+C/O
7	VL11001-010	28-Dec-2020 11:41:48	122820015.d	Client	FD02-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
8	VL11001-011	28-Dec-2020 11:52:30	122820016.d	Client	EB01-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
9	VL11001-012	28-Dec-2020 12:03:09	122820017.d	Client	EB02-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
10	VL11001-013	28-Dec-2020 12:13:48	122820018.d	Client	TB01-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
11	VL11043-001	28-Dec-2020 12:24:27	122820019.d	Client	FFS-MW05-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-62F5 SUR
12	VL11043-001MS	28-Dec-2020 12:35:00	122820020.d	MS		Aqueous	1	77741	Analytes	100x PDS	0.2000		
13	VL11043-001MD	28-Dec-2020 12:45:33	122820021.d	MSD		Aqueous	1	77741	Analytes	100x PDS	0.2000		
14	VL11043-002	28-Dec-2020 12:56:08	122820022.d	Client	FFS-MW04-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
15	ID CCV 1000_SVLC-1248	28-Dec-2020 13:06:43	122820023.d	CCV					Analytes	L-5	1.00		
16	VL11043-003	28-Dec-2020 13:17:18	122820024.d	Client	JAW-63-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
17	VL11043-004	28-Dec-2020 13:27:56	122820025.d	Client	C-00-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
18	VL11043-005	28-Dec-2020 13:38:33	122820026.d	Client	FTA-TT-MW-03-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-5X
19	VL11043-006	28-Dec-2020 13:49:08	122820027.d	Client	FTP-MWS-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-1X-C/O
20	VL11043-007	28-Dec-2020 13:59:47	122820028.d	Client	FTA-99-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
21	VL11043-008	28-Dec-2020 14:10:27	122820029.d	Client	TB01-121020	Aqueous	1	77741	Surrogates	Smp	0.1100		
22	VL11044-002	28-Dec-2020 14:21:06	122820030.d	Client	IDW-L-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
23	VL15017-007	28-Dec-2020 14:31:41	122820031.d	Client	FTHU-MW-POC2-DEB-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
24	VL15017-009	28-Dec-2020 14:42:15	122820032.d	Client	FTHU-MW-POC2-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
25	VL15017-010	28-Dec-2020 14:52:56	122820033.d	Client	FTHU-MW-POC1-DEB-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1248	28-Dec-2020 15:03:32	122820034.d	CCV					Analytes	L-5	1.00		
27	VQ77740-001	28-Dec-2020 15:14:10	122820035.d	MBlk		Soil	1	77740	Surrogates	Smp	0.1100		
28	VQ77740-002	28-Dec-2020 15:24:51	122820036.d	LCS		Soil	1	77740	Analytes	100x PDS	0.1000		
29	VL11044-001	28-Dec-2020 15:35:28	122820037.d	Client	IDW-S-1220	Soil	1	77740	Surrogates	Smp	0.1100		
30	ID CCV 1000B_SVLC-1248	28-Dec-2020 15:46:06	122820038.d	CCV					Analytes	L-5	1.00		
31	VL11077-001	28-Dec-2020 15:56:46	122820039.d	Client	FLW-IDW-SO-121020	Soil	1	77740	Surrogates	Smp	0.1100		
32	VL15017-001	28-Dec-2020 16:07:20	122820040.d	Client	FTHU-WWTP1-01-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
33	VL15017-002	28-Dec-2020 16:17:56	122820041.d	Client	FTHU-WWTP1-02-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
34	VL15017-003	28-Dec-2020 16:28:32	122820042.d	Client	FTHU-WWTP1-03-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
35	VL15017-004	28-Dec-2020 16:39:08	122820043.d	Client	FTHU-WWTP1-04-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
36	VL15017-005	28-Dec-2020 16:49:49	122820044.d	Client	FTHU-WWTP1-05-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
37	VL15017-006	28-Dec-2020 17:00:27	122820045.d	Client	FTHU-WWTP1-06-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
38	VL15017-006MS	28-Dec-2020 17:11:04	122820046.d	MS		Soil	1	77740	Analytes	100x PDS	0.1000		
39	VL15017-006MD	28-Dec-2020 17:21:41	122820047.d	MSD		Soil	1	77740	Analytes	100x PDS	0.1000		
40	ID CCV 1000C_SVLC-1248	28-Dec-2020 17:32:21	122820048.d	CCV					Analytes	L-5	1.00		

Batch Path: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
41	VL11078-001	28-Dec-2020 17:43:00	122820049.d	Client	FLW-IDW-GW-121020	Aqueous	1	77367	Surrogates	Smp	0.1100		SUR CONFIRMS, NEED RX
42	VL02035-005	28-Dec-2020 17:53:38	122820050.d	Client	Area H LPGAC 1	Soil	100	76697	Surrogates	Smp	0.1100		REPORT 10X
43	VL02035-005	28-Dec-2020 18:04:16	122820051.d	Client	Area H LPGAC 1	Soil	10	76697	Surrogates	Smp	0.1100		REPORT THIS
94	ID BLK B2	28-Dec-2020 18:14:52	122820052.d	InstBlk					Surrogates	Smp	0.1100		
52	ID CCV 1000D_SVLC-1248	28-Dec-2020 19:50:36	122820061.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\122920-DOD.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	29-Dec-2020 10:13:38	122920005.d	CCV					Analytes	L-2	1.00		All dilutions refortified w/EIS SVLC-1264
96	ID CCV 200_SVLC-1221	29-Dec-2020 10:24:12	122920006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	29-Dec-2020 10:34:46	122920007.d	InstBlk					Surrogates	Smp	0.1100		
1	VL11001-006	29-Dec-2020 10:45:23	122920008.d	Client	FFS-MW01-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
2	VL11001-008	29-Dec-2020 10:55:58	122920009.d	Client	JAW-60-1220	Aqueous	5	77741	Surrogates	Smp	0.1100		
3	VL11001-009	29-Dec-2020 11:06:35	122920010.d	Client	ET-3-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
4	VL11001-010	29-Dec-2020 11:17:10	122920011.d	Client	FD02-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
5	VL11043-001	29-Dec-2020 11:27:47	122920012.d	Client	FFS-MW05-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
6	VL11043-005	29-Dec-2020 11:38:23	122920013.d	Client	FTA-TT-MW-03-1220	Aqueous	5	77741	Surrogates	Smp	0.1100		
7	VL11043-006	29-Dec-2020 11:49:02	122920014.d	Client	FTP-MW5-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
8	VL11044-002	29-Dec-2020 11:59:40	122920015.d	Client	IDW-L-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
9	ID CCV 1000_SVLC-1248	29-Dec-2020 12:10:17	122920016.d	CCV					Analytes	L-5	1.00		
10	VQ77766-001	29-Dec-2020 12:20:56	122920017.d	MBlk		Aqueous	1	77766	Surrogates	Smp	0.1100		
11	VQ77766-002	29-Dec-2020 12:31:36	122920018.d	LCS		Aqueous	1	77766	Analytes	100x PDS	0.2000		
15	VL09008-003	29-Dec-2020 13:13:53	122920022.d	Client	Secondary Effluent Blank	Aqueous	1	77766	Surrogates	Smp	0.1100		
16	VL09008-004	29-Dec-2020 13:24:34	122920023.d	Client	Landfill Leachate	Aqueous	1	77766	Surrogates	Smp	0.1100		RX - MB 6:2 FTS; SUR - MATRIX
22	ID CCV 1000_SVLC-1248	29-Dec-2020 14:28:22	122920029.d	CCV					Analytes	L-5	1.00		

Analyst: MBR

Level 2 Analyst: NA

Printed: 01/18/21 08:27

Prep Batch: 77367

Status: Level 1 review released

Matrix: Aqueous

## PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/22/2020 11:49

Conc Analyst: MBR

End Date: 12/22/2020 16:20

Conc Start Date: 12/22/2020 16:20

Conc End Date: 12/22/2020 16:20

Surrogate: SMLG-1249B

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%(MECH+4%+H2O)

Reagents Vol. (mL): 10

Chem ID: 20-2645&gt;20-2645/20-2564

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VQ77367-001	MB		1	PFAS by ID SOP QSMB-15	280	30	250		0.000	10.0	MB init: 299.35g, fin: 31.31g, LCS init: 305.9g, fin: 31.41g, Sorbent dry start/end: 1st: 1317/1322, 2nd: 1532/1537, Buf 321
VQ77367-002	LCS		1	PFAS by ID SOP QSMB-15	280	30	250	SVLC-1247	0.200	10.0	Arm: MeCHSV/20-343(4mL); QC Water: 20- 2564; Bottletop#329; Pipettes: 20- 2535, 383; Bottles: M0-266-03BB; XL-AW 20-2546
VL06030-020	Sample	SE01	1	PFAS by ID SOP QSMB-15	286.38	31.96	254		0.000	10.0	Reservoirs: 20-2623; Filter cartridges: 20- 2752; Elution tubes: 20-2654; Falcon tubes: 20-2756; Centrifuge tubes: 20-2012
VL10041-024	Sample	EBTL-02	1	PFAS by ID SOP QSMB-15	281.33	33.34	248		0.000	10.0	Sample might have been spiked with SUR at a lower volume because pipette tip was not fully on pipette
VL10041-025	Sample	EBHA-03	1	PFAS by ID SOP QSMB-15	281.31	33.36	248		0.000	10.0	Sample might have been spiked with SUR at a lower volume because pipette tip was not fully on pipette
VL11008-004	Sample	RFAAP-RW-GW-1-120820	1	PFAS by ID SOP QSMB-15	316.54	32.41	284		0.000	10.0	Sample might have been spiked with SUR at a lower volume because pipette tip was not fully on pipette; NCV#45605
VL11008-005	Sample	RFAAP-FB-1-120820	1	PFAS by ID SOP QSMB-15	264.77	31.04	234		0.000	10.0	Storage bottles: 20-2252; MeCH Ext: 4mL, Fil: 2mL; IS: SVLC-1250(0.010mL); ASV/Caps: 20-2670/20-2671
VL11008-006	Sample	RFAAP-TEF-GW-1-120820	1	PFAS by ID SOP QSMB-15	309.6	31.62	278		0.000	10.0	
VL11008-009	Sample	RFAAP-EB-1-120820	1	PFAS by ID SOP QSMB-15	330.12	31.73	298		0.000	10.0	
VL11008-010	Sample	RFAAP-EB-2-120820	1	PFAS by ID SOP QSMB-15	314.46	32.16	282		0.000	10.0	
VL11008-011	Sample	RFAAP-EB-3-120820	1	PFAS by ID SOP QSMB-15	270.04	31.98	238		0.000	10.0	



Analyst: MBR

Level 2 Analyst: NA

Printed: 01/18/21 08:27

Prep Batch: 77367

Status: Level 1 review released

Matrix: Aqueous

## PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/22/2020 11:49

Conc Analyst: MBR

End Date: 12/22/2020 16:20

Conc Start Date: 12/22/2020 16:20

Conc End Date: 12/22/2020 16:20

Surrogate: SMLG-1249B

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%/MECH4%/H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645-20-2645/20-2564

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VL11008-012	Sample	RFAAP-TEF-GW-3-120920	1	FFAS by ID SOPQSM B-15	244.18	32.25	212		0.000	10.0	
VL11041-001	Sample	17MA0034 (12072020)	1	FFAS by ID SOPQSM B-15	307.73	32.83	275		0.000	10.0	
VL11041-002	Sample	17MA0031 (12072020)	1	FFAS by ID SOPQSM B-15	281	31.76	249		0.000	10.0	
VL11041-003	Sample	32MA0027 (12092020)	1	FFAS by ID SOPQSM B-15	284.63	32.55	252		0.000	10.0	
VL11041-004	Sample	EBWL-04 (12092020)	1	FFAS by ID SOPQSM B-15	264.24	32.79	231		0.000	10.0	
VL11078-001	Sample	FLWHDW-GW-121020	1	FFAS by ID SOPQSM B-15	314.94	31.52	283		0.000	10.0	Sample was foamy
VL11001-001	Sample	G-5-1220	1	FFAS by ID SOPQSM B-15	327.37	32.01	295		0.000	10.0	
VL11001-001MSMS			1	FFAS by ID SOPQSM B-15	316.78	31.86	285	SMLG-1247	0.200	10.0	
VL11001-002	Sample	FFS-MA03-1220	1	FFAS by ID SOPQSM B-15	291.98	32.19	260		0.000	10.0	
VL11001-002DU Duplicate			1	FFAS by ID SOPQSM B-15	302.97	31.84	271		0.000	10.0	
VL11001-003	Sample	FFS-MA02-1220	1	FFAS by ID SOPQSM B-15	297.47	32.32	265		0.000	10.0	
VL11001-004	Sample	FDD1-1220	1	FFAS by ID	291.11	32.06	259		0.000	10.0	

Analyst: MBR

Level 2 Analyst: NA

Prep Batch: 77367

Printed: 01/18/21 08:27

Status: Level 1 review released

Matrix: Aqueous

### PFAS Prep by ID SOP QSM B-15 - PFAS Aqueous Preparation

Start Date: 12/22/2020 11:49

Conc Analyst: MBR

End Date: 12/22/2020 16:20

Conc Start Date: 12/22/2020 16:20

Conc End Date: 12/22/2020 16:20

Surrogate: SMLG-1249B

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%/MECH4%/H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645>20-2645/20-2564

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
				SOPQSM B-15							
VL11001-005	Sample	G00-3-1220	1	PFAS by ID SOPQSM B-15	310.39	31.53	279		0.000	10.0	

(end of report)

Total Samples: 20

Analyst: MBR

Level 2 Analyst: NA

Printed: 01/18/21 0826

Prep Batch: 77741

Status: Level 1 review released

Matrix: Aqueous

## PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 1725

Conc Analyst: MBR

End Date: 12/27/2020 2204

Conc Start Date: 12/27/2020 2204

Conc End Date: 12/27/2020 2204

Surrogate: SMLG-1252A

Surrogate Vol. (mL): 0.110

Ext Solvent: MeOH:96%(MeOH:4%/H<sub>2</sub>O

Reagents Vol. (mL): 10

Chem ID: 20-2645&gt;20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VQ77741-001	MB		1	FFAS by ID SOP QSM B-15	280	30	250		0.000	10.0	MB init: 305.6g, fin: 31.26g, LCS init: 296.17g, fin: 31.86g, Sorbent dry start/end: 1st: 1909/1914, 2nd: 2048/2053, Buf 332
VQ77741-002	LCS		1	FFAS by ID SOP QSM B-15	280	30	250	SVLG-1247	0.200	10.0	Arm: MeCHSV/20-343(4mL); QC Water: 20- 2823; Bottletop#329; Pipettes: 20- 2533, 374, 393; QC Bottles: M0-266- 03BB; XL-AW: 20-2546
VL11001-006	Sample	FFS-MA01-1220	1	FFAS by ID SOP QSM B-15	305.92	31.67	274		0.000	10.0	Reservoirs: 20-2623; Filter cartridges: 20- 2752; Elution tubes: 20-2654; Falcon tubes: 20-2756; Centrifuge tubes: 20-2012
VL11001-007	Sample	T-1-1220	1	FFAS by ID SOP QSM B-15	327.04	31.1	296		0.000	10.0	Storage bottles: 20-2252; MeCH Ext: 4mL, Filtr: 2mL; IS: SVLG-1250(0.010mL); ASV/Caps: 20-2670/20-2671
VL11001-008	Sample	JAW-60-1220	1	FFAS by ID SOP QSM B-15	309.21	31.92	277		0.000	10.0	
VL11001-009	Sample	ET-3-1220	1	FFAS by ID SOP QSM B-15	322.35	31.21	291		0.000	10.0	NCM#45740
VL11001-010	Sample	FD02-1220	1	FFAS by ID SOP QSM B-15	326.29	31.68	295		0.000	10.0	
VL11001-011	Sample	EB01-120820	1	FFAS by ID SOP QSM B-15	291.19	31.76	259		0.000	10.0	
VL11001-012	Sample	EB02-120820	1	FFAS by ID SOP QSM B-15	296.25	31.87	264		0.000	10.0	
VL11001-013	Sample	TB01-120820	1	FFAS by ID SOP QSM B-15	311.16	45.82	265		0.000	10.0	
VL11043-001	Sample	FFS-MA05-1220	1	FFAS by ID SOP QSM B-15	309.49	31.77	278		0.000	10.0	

Analyst: MBR

Level 2 Analyst: NA

Printed: 01/18/21 0826

Prep Batch: 77741

Status: Level 1 review released

Matrix: Aqueous

## PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 1725

Conc Analyst: MBR

End Date: 12/27/2020 2204

Conc Start Date: 12/27/2020 2204

Conc End Date: 12/27/2020 2204

Surrogate: SMLG-1252A

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%/MECH4%/H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645-20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VL11043-001MSMS			1	FFAS by ID SOP QSM B-15	306.26	32	274	SMLG-1247	0.200	10.0	
VL11043-001MDMSD			1	FFAS by ID SOP QSM B-15	318.91	32.26	287	SMLG-1247	0.200	10.0	
VL11043-002	Sample	FFS-MW04-1220	1	FFAS by ID SOP QSM B-15	320.71	32.21	289		0.000	10.0	
VL11043-003	Sample	JAW-63-1220	1	FFAS by ID SOP QSM B-15	317.82	31.86	286		0.000	10.0	
VL11043-004	Sample	G00-1-1220	1	FFAS by ID SOP QSM B-15	317.45	32.03	285		0.000	10.0	
VL11043-005	Sample	FTA-TT-MW03-1220	1	FFAS by ID SOP QSM B-15	328.3	31.48	297		0.000	10.0	
VL11043-006	Sample	FTPMA5-1220	1	FFAS by ID SOP QSM B-15	310.67	32.01	279		0.000	10.0	
VL11043-007	Sample	FTA-99-1-1220	1	FFAS by ID SOP QSM B-15	315.95	32.34	284		0.000	10.0	
VL11043-008	Sample	TB01-121020	1	FFAS by ID SOP QSM B-15	315.88	45.08	271		0.000	10.0	
VL11044-002	Sample	IDWL-1220	1	FFAS by ID SOP QSM B-15	307.91	32.09	276		0.000	10.0	
VL15017-007	Sample	FTHJ-MW-FOC2-DEB-120820	1	FFAS by ID SOP QSM B-15	300.98	32.55	268		0.000	10.0	
VL15017-009	Sample	FTHJ-MW-FOC2-120820	1	FFAS by ID	289.65	32.83	257		0.000	10.0	

Analyst: MBR

Level 2 Analyst: NA

Prep Batch: 77741

Printed: 01/18/21 0826

Status: Level 1 review released

Matrix: Aqueous

### PFAS Prep by ID SOP QSM B-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 1725

Conc Analyst: MBR

End Date: 12/27/2020 2204

Conc Start Date: 12/27/2020 2204

Conc End Date: 12/27/2020 2204

Surrogate: SMLG-1252A

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH496%/MECH494-H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645-20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
				SOPQSM B-15							
VL15017-010	Sample	FTHJMW/FOCI-DEB-120820	1	PFAS by ID SOPQSM B-15	292.88	32.55	260		0.000	10.0	

(end of report)

Total Samples: 20

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: KMM2  
Prep. Date: 10/24/2020  
Exp. Date: 6/10/2021  
Pipet ID: 317,393

Mix ID #: SVLC- 1189  
Mix Name: ISOMER CHECK STD  
Solvent ID #: 20-2143/20-1948  
Solvent Name: Methanol/Water

Level 2 Reviewed by: ARC2  
Date: 10/29/2020

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume mL	Final Conc. ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		ng/mL	uL					Date Opened	Date Expired
Isomer Check 50X Mix	SVLC-0588	1,000	20	2	10	1	-	3/11/2019	2/7/2020
ID IS 20ppb	SVLC-1182	20	100		1	1	-	10/16/2020	7/8/2021
ID SUR 20ppb	SVLC-1166	20	100		1	1	-	10/8/2020	6/10/2021
96% Methanol	SV20-259	pure	1,780		#VALUE!	1	-	10/13/2020	10/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>KMM2</u>	Mix ID #: <u>SVLC-1202</u>	Level 2 Reviewed by: <u>ARC2</u>
Prep. Date: <u>11/11/2020</u>	Mix Name: <u>PFAS Full List ICV, 500ppt</u>	Date: <u>11/12/2020</u>
Exp. Date: <u>7/8/2021</u>	Solvent ID #: <u>20-2394/20-1948</u>	
Pipet ID: <u>317,393</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.		Aliquoted Volume	Dilution Volume	Final Conc.	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/mL	uL						Date Opened	Date Expired
PFAS ICV 100X Mix	SVLC-1025	20,000.0	50	2	500	1,2	-	6/8/2020	9/20/2022	
ID SUR 20ppb	SVLC-1181	20,000.0	100		1000	1	-	10/16/2020	8/24/2021	
ID IS 20ppb	SVLC-1192	20,000.0	100		1000	1	-	10/27/2020	7/8/2021	
Methanol	20-2394	pure	1,680		#VALUE!	1	5/31/2025	11/10/2020	5/31/2025	
Water	20-1948	pure	70		#VALUE!	1	8/31/2025	9/18/2020	8/31/2025	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at a final concentration of 2500 pg/mL

### Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1219</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>50 ppt PFAS FL ICAL (L1)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume	Final Conc.	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
		pg/ml	ul	ml	pg/ml				
Full List 1000X PDS	SVLC-1218	2,000	125	5	50	1,2	-	11/20/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	4,375		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed



## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1220</u>	Level 2 Reviewed by: <u>KMM2</u>	
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>100 ppt PFAS FL ICAL (L2)</u>	Date: <u>11/23/2020</u>	
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>		
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>		

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
Full List 1000X PDS	SVLC-1218	2,000	500	10	100	1,2	-	11/20/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	500		1000	1	-	11/16/2020	8/27/2021	
ID IS 20ppb	SVLC-1208	20,000.0	500		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	8,500		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1221</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>200 ppt PFAS FL ICAL (L3)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.		Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/ml	ul						Date Opened	Date Expired
Full List 1000X PDS	SVLC-1218	2,000	1,000		10	200	1,2	-	11/20/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	500			1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	500			1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	8,000			#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1153</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>500 ppt PFAS FL ICAL (L4)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume	Final Conc.	Foot Notes (if applicable)	MFG. Exp Date	Ampoule			
								pg/ml	ul	Date Opened	Date Expired
								ml	pg/ml		
Full List 100X PDS	SVLC-1217	20,000	125	5	500	1,2	-	11/20/2020	3/9/2021		
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	5/6/1903		
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021		
96% Methanol	20-298	pure	4,375		#VALUE!	1	-	11/13/2020	11/13/2021		

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water  
 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1223</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>1000 ppt PFAS FL ICAL (L5)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
Full List 100X PDS	SVLC-1217	20,000	750	15	1000	1,2	-	11/20/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	750		1000	1	-	11/16/2020	8/27/2021	
ID IS 20ppb	SVLC-1208	20,000.0	750		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	12,750		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1224</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>2000 ppt PFAS FL ICAL (L6)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/ml	ul					Date Opened	Date Expired
Full List 100X PDS	SVLC-1217	20,000	500	5	2000	1,2	-	11/20/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	4,000		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1225</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>5000 ppt PFAS FL ICAL (L7)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
Full List 10X PDS	SVLC-1215	200,000	125	5	5000	1,2	-	11/19/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	4,375		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1226</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>10000 ppt PFAS FL ICAL (L8)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
Full List 10X PDS	SVLC-1215	200,000	500	10	10000	1,2	-	11/19/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	500		1000	1	-	11/16/2020	5/10/1903
ID IS 20ppb	SVLC-1208	20,000.0	500		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	8,500		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1227</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>15000 ppt PFAS FL ICAL (L9)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
								Full List 10X PDS	SVLC-1215	200,000
ID SUR 20ppb	SVLC-1209	20,000.0	500	1000	1	-	11/16/2020	5/11/1903		
ID IS 20ppb	SVLC-1208	20,000.0	500	1000	1	-	11/16/2020	7/8/2021		
96% Methanol	20-298	pure	8,250	#VALUE!	1	-	11/13/2020	11/13/2021		

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed



## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1228</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>20000 ppt PFAS FL ICAL (L10)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume	Final Conc.	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/ml	ul	ml	pg/ml			Date Opened	Date Expired
Full List 10X PDS	SVLC-1215	200,000	1,500	15	20000	1,2	-	11/19/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	750		1000	1	-	11/16/2020	5/12/1903
ID IS 20ppb	SVLC-1208	20,000.0	750		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	12,000		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1247</u>	Level 2 Reviewed by: <u>ARC2</u>
Prep. Date: <u>12/16/2020</u>	Mix Name: <u>PFAS Full List 100X PDS</u>	Date: <u>12/28/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>Methanol/Water</u>	
Pipet ID: <u>374,20-2533</u>	Solvent Name: <u>20-2645/20-2564</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. ng/mL	Aliquoted Volume uL	Dilution Volume mL	Final Conc. ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
Full List Stock PDS (10X)	SVLC-1215	200.0	1,500	15	20	1,2	-	11/29/2020	3/9/2021	
96% Methanol	20-329	pure	13,500		#VALUE!	1	-	12/8/2020	12/8/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water. 2. GenX is present at twice (2x) the concentration listed - 40ng/mL

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u> Prep. Date: <u>12/16/2020</u> Exp. Date: <u>3/9/2021</u> Pipet ID: <u>374, 20-2533</u>	Mix ID #: <u>SVLC- 1248</u> Mix Name: <u>1000 ppt PFAS FL ICAL (L5)</u> Solvent ID #: <u>20-2645/20-2564</u> Solvent Name: <u>Methanol/Water</u>	Level 2 Reviewed by: <u>ARC2</u> Date: <u>12/28/2020</u>
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Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
Full List 100X PDS	SVLC-1247	20,000	750	15	1000	1,2	-	12/16/2020	3/9/2021
ID SUR 20ppb	SVLC-1239	20,000.0	750		1000	1	-	12/6/2020	10/7/2021
ID IS 20ppb	SVLC-1240	20,000.0	750		1000	1	-	12/6/2020	7/8/2021
96% Methanol	20-329	pure	12,750		#VALUE!	1	-	12/8/2020	12/8/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: ARC2  
 Prep. Date: 12/18/2020  
 Exp. Date: 11/23/2021  
 Pipet ID: 20-2534,374

Mix ID #: SVLC- 1249  
 Mix Name: PFAS ID 100ppb SUR  
 Solvent ID #: 20-2645/20-2564  
 Solvent Name: Methanol/Water

Level 2 Reviewed by: MBR  
 Date: 12/28/2020

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. ng/mL	Aliquoted Volume uL	Dilution Volume mL	Final Conc. ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
MPFAC-C-ES	20-2667	2,000.0	1,100	22	100	1	8/19/2025	12/18/2020	12/18/2021	
ID 50X SUR Mix	SVLC-1245A	1,000.0	2,200		100	1,2	-	12/10/2020	11/23/2021	
Methanol	20-2645	pure	17,908		#VALUE!	1	5/31/2025	12/18/2020	5/31/2025	
Water	20-2564	pure	792		#VALUE!	1	9/30/2025	12/18/2020	9/30/2025	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. 13C3-GenX, 13C2-4:2FTS, 13C2-6:2FTS, 13C2-8:2FTS, d5-EtFOSAA, and d3-MeFOSAA are present at 500ppb = 500ng/mL (5x normal concentration)

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: MBR  
 Prep. Date: 12/21/2020  
 Exp. Date: 11/23/2021  
 Pipet ID: 383,20-2535

Mix ID #: SVLC- 1252  
 Mix Name: PFAS ID 100ppb SUR  
 Solvent ID #: 20-2645/20-2564  
 Solvent Name: Methanol/Water

Level 2 Reviewed by: ARC2  
 Date: 12/30/2020

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume mL	Final Conc. ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
		ng/mL	uL					Date Opened	Date Expired	
MPFAC-C-ES	20-2667	2,000.0	1,100	22	100	1	8/19/2025	12/21/2020	12/21/2021	
ID 50X SUR Mix	SVLC-1245A	1,000.0	2,200		100	1,2	-	12/10/2020	11/23/2021	
Methanol	20-2645	pure	17,908		#VALUE!	1	5/31/2025	12/21/2020	12/21/2021	
Water	20-2564	pure	792		#VALUE!	1	9/30/2025	12/21/2020	12/21/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. 13C3-GenX, 13C2-4:2FTS, 13C2-6:2FTS, 13C2-8:2FTS, d5-EtFOSAA, and d3-MeFOSAA are present at 500ppb = 500ng/mL (5x normal concentration)



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## Report of Analysis

**CH2M - Jacobs**  
59 Lilac Ct.  
Pagosa Springs, CO 81147  
Attention: Doug Scott

Project Name: IAAAP PFAS  
Project Number: 679172CH.01.11.FW  
Lot Number: **VL11043**  
Date Completed: 01/05/2021

01/07/2021 12:15 AM  
Approved and released by:  
Project Manager II: **Cathy S. Dover**



The electronic signature above is the equivalent of a handwritten signature.  
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# PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

## Case Narrative CH2M - Jacobs Lot Number: VL11043

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP. DoD reporting conventions and qualifiers are not utilized in this data package.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. The extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

$$CF = DF * FV / V_0$$

FV is volume of extract (mL)

V<sub>0</sub> is initial sample volume (mL)

DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:

Concentration (ng/L) = C<sub>s</sub>\*CF,

$$C_s = \left( \frac{A_s}{A_{is}} - b \right) * \left( \frac{C_{is}}{a} \right)$$

Where:

A<sub>s</sub> is peak response of target analyte in the sample

A<sub>is</sub> is peak response of internal standard in the sample

C<sub>s</sub> is concentration of target analyte in the sample

C<sub>is</sub> is concentration of internal standard in the sample (1ng/mL)

a is the slope from the ICAL linear regression

b is the y-intercept from the ICAL linear regression. If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Sample VL11043-005 (FTA-TT-MW-03-1220), required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

Surrogate recovery for sample VL11043-001 (FFS-MW05-1220) was outside control limits. Re-extraction and re-analysis was performed with concurring results. The original analysis has been reported.

The MS/MSD for batch 77741 and parent sample VL11043-001 (FFS-MW05-1220), recovered outside control limits for PFHxS and PFBA. The associated LCS passed all acceptance criteria.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

# PACE ANALYTICAL SERVICES, LLC

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## Sample Summary

CH2M - Jacobs

Lot Number: VL11043

Project Name: IAAAP PFAS

Project Number: 679172CH.01.11.FW

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Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	FFS-MW05-1220	Aqueous	12/09/2020 1055	12/11/2020
002	FFS-MW04-1220	Aqueous	12/09/2020 0820	12/11/2020
003	JAW-63-1220	Aqueous	12/09/2020 0850	12/11/2020
004	C-00-1-1220	Aqueous	12/09/2020 1115	12/11/2020
005	FTA-TT-MW-03-1220	Aqueous	12/09/2020 0905	12/11/2020
006	FTP-MW5-1220	Aqueous	12/09/2020 1035	12/11/2020
007	FTA-99-1-1220	Aqueous	12/09/2020 1040	12/11/2020
008	TB01-121020	Aqueous	12/09/2020	12/11/2020

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(8 samples)



# PACE ANALYTICAL SERVICES, LLC

## Detection Summary

CH2M - Jacobs

Lot Number: VL11043

Project Name: IAAAP PFAS

Project Number: 679172CH.01.11.FW

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	FFS-MW05-1220	Aqueous	6:2 FTS	PFAS by ID	8.1	Q	ng/L	6
001	FFS-MW05-1220	Aqueous	PFBS	PFAS by ID	4.6		ng/L	6
001	FFS-MW05-1220	Aqueous	PFHxS	PFAS by ID	17	S	ng/L	6
001	FFS-MW05-1220	Aqueous	PFBA	PFAS by ID	110	S	ng/L	6
001	FFS-MW05-1220	Aqueous	PFHpA	PFAS by ID	2.2	J	ng/L	6
001	FFS-MW05-1220	Aqueous	PFHxA	PFAS by ID	4.6		ng/L	6
001	FFS-MW05-1220	Aqueous	PFOA	PFAS by ID	9.1		ng/L	6
001	FFS-MW05-1220	Aqueous	PFPeA	PFAS by ID	11		ng/L	6
001	FFS-MW05-1220	Aqueous	PFOS	PFAS by ID	8.5		ng/L	6
002	FFS-MW04-1220	Aqueous	6:2 FTS	PFAS by ID	63		ng/L	7
002	FFS-MW04-1220	Aqueous	PFBS	PFAS by ID	47		ng/L	7
002	FFS-MW04-1220	Aqueous	PFHxS	PFAS by ID	630		ng/L	7
002	FFS-MW04-1220	Aqueous	PFBA	PFAS by ID	130		ng/L	7
002	FFS-MW04-1220	Aqueous	PFHpA	PFAS by ID	42		ng/L	7
002	FFS-MW04-1220	Aqueous	PFHxA	PFAS by ID	150		ng/L	7
002	FFS-MW04-1220	Aqueous	PFOA	PFAS by ID	27		ng/L	7
002	FFS-MW04-1220	Aqueous	PFPeA	PFAS by ID	200		ng/L	7
002	FFS-MW04-1220	Aqueous	PFOS	PFAS by ID	94		ng/L	7
003	JAW-63-1220	Aqueous	6:2 FTS	PFAS by ID	2.7	J	ng/L	8
003	JAW-63-1220	Aqueous	PFBS	PFAS by ID	5.7		ng/L	8
003	JAW-63-1220	Aqueous	PFHxS	PFAS by ID	110		ng/L	8
003	JAW-63-1220	Aqueous	PFBA	PFAS by ID	2.0	J	ng/L	8
003	JAW-63-1220	Aqueous	PFHxA	PFAS by ID	4.3		ng/L	8
003	JAW-63-1220	Aqueous	PFOA	PFAS by ID	1.5	J	ng/L	8
003	JAW-63-1220	Aqueous	PFPeA	PFAS by ID	1.0	J	ng/L	8
003	JAW-63-1220	Aqueous	PFOS	PFAS by ID	17		ng/L	8
004	C-00-1-1220	Aqueous	6:2 FTS	PFAS by ID	9.3		ng/L	9
004	C-00-1-1220	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	9
004	C-00-1-1220	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	9
004	C-00-1-1220	Aqueous	PFBA	PFAS by ID	6.3		ng/L	9
004	C-00-1-1220	Aqueous	PFHxA	PFAS by ID	1.4	J	ng/L	9
004	C-00-1-1220	Aqueous	PFOA	PFAS by ID	2.9	J	ng/L	9
004	C-00-1-1220	Aqueous	PFPeA	PFAS by ID	1.6	J	ng/L	9
004	C-00-1-1220	Aqueous	PFOS	PFAS by ID	2.0	J	ng/L	9
005	FTA-TT-MW-03-1220	Aqueous	6:2 FTS	PFAS by ID	62		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFBS	PFAS by ID	210		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFHxS	PFAS by ID	1400		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFBA	PFAS by ID	21		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFHpA	PFAS by ID	15		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFHxA	PFAS by ID	160		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFOA	PFAS by ID	31		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFPeA	PFAS by ID	25		ng/L	10
005	FTA-TT-MW-03-1220	Aqueous	PFOS	PFAS by ID	620		ng/L	10

## Detection Summary (Continued)

Lot Number: VL11043

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	FTP-MW5-1220	Aqueous	PFBS	PFAS by ID	5.2		ng/L	11
006	FTP-MW5-1220	Aqueous	PFHxS	PFAS by ID	91		ng/L	11
006	FTP-MW5-1220	Aqueous	PFBA	PFAS by ID	16		ng/L	11
006	FTP-MW5-1220	Aqueous	PFHxA	PFAS by ID	2.5	J	ng/L	11
006	FTP-MW5-1220	Aqueous	PFOA	PFAS by ID	3.9		ng/L	11
006	FTP-MW5-1220	Aqueous	PFPeA	PFAS by ID	4.2		ng/L	11
006	FTP-MW5-1220	Aqueous	PFOS	PFAS by ID	37		ng/L	11
007	FTA-99-1-1220	Aqueous	6:2 FTS	PFAS by ID	12		ng/L	12
007	FTA-99-1-1220	Aqueous	PFBS	PFAS by ID	24		ng/L	12
007	FTA-99-1-1220	Aqueous	PFHxS	PFAS by ID	360		ng/L	12
007	FTA-99-1-1220	Aqueous	PFBA	PFAS by ID	8.7		ng/L	12
007	FTA-99-1-1220	Aqueous	PFHpA	PFAS by ID	2.4	J	ng/L	12
007	FTA-99-1-1220	Aqueous	PFHxA	PFAS by ID	19		ng/L	12
007	FTA-99-1-1220	Aqueous	PFOA	PFAS by ID	5.6		ng/L	12
007	FTA-99-1-1220	Aqueous	PFPeA	PFAS by ID	4.0		ng/L	12
007	FTA-99-1-1220	Aqueous	PFOS	PFAS by ID	80		ng/L	12

(59 detections)

# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-001
Description: FFS-MW05-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 1055	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1224	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	8.1	Q	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	4.6		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	17	S	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	110	S	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.2	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.6		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	9.1		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	11		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.5		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		105	50-150
13C2_PFDaA		96	50-150
13C2_PFTeDA		88	50-150
13C3_PFBs		98	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBa		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		106	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		113	50-150
13C8_PFOs		96	50-150
13C9_PFNa		98	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-002
Description: FFS-MW04-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 0820	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1256	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	63		6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	47		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	630		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	130		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	42		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	150		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	200		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	94		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		124	50-150
13C2_8:2FTS		91	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBa		99	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		93	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		94	50-150
13C8_PFOs		89	50-150
13C9_PFNa		91	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-003
Description: JAW-63-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 0850	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1317	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.7	J	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	110		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanefluoronic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.3		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.5	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	17		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		86	50-150
13C8_PFOS		88	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-004
Description: C-00-1-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 1115	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1327	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.3		7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	1.3	J	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	6.3		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.4	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.6	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	J	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		91	50-150
13C8_PFOS		92	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-005
Description: FTA-TT-MW-03-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 0905	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1338	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1138	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	62		6.7	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	210		3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1400		17	8.5	4.2	ng/L	2
Perfluoro-n-butanefluoronic acid (PFBA)	375-22-4	PFAS by ID SOP	21		3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	15		3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	160		3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	31		3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	25		3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	620		3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150		102	50-150
13C2_8:2FTS		113	50-150		90	50-150
13C2_PFDaA		81	50-150		91	50-150
13C2_PFTeDA		61	50-150		88	50-150
13C3_PFBS		80	50-150		95	50-150
13C3_PFHxS		81	50-150		98	50-150
13C3-HFPO-DA		75	50-150		95	50-150
13C4_PFBA		73	50-150		101	50-150
13C4_PFHpA		86	50-150		97	50-150
13C5_PFHxA		88	50-150		96	50-150
13C5_PFPeA		82	50-150		96	50-150
13C6_PFDA		92	50-150		93	50-150
13C7_PFUdA		85	50-150		95	50-150
13C8_PFOA		85	50-150		94	50-150
13C8_PFOS		73	50-150		92	50-150
13C9_PFNA		77	50-150		90	50-150
d5-EtFOSAA		84	50-150		90	50-150
d3-MeFOSAA		90	50-150		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-006
Description: FTP-MW5-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 1035	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1149	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	5.2		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	91		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanefluoronic acid (PFBA)	375-22-4	PFAS by ID SOP	16		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.5	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.9		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.2		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	37		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		81	50-150
13C2_PFDaA		88	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBa		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		93	50-150
13C8_PFOs		93	50-150
13C9_PFNa		86	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-007
Description: FTA-99-1-1220	Matrix: Aqueous
Date Sampled: 12/09/2020 1040	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1359	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	24		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	360		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.7		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.4	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	19		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.6		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.0		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	80		3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		95	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		89	50-150
13C2_PFTeDA		81	50-150
13C3_PFBs		94	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBa		98	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		102	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		92	50-150
13C8_PFOs		91	50-150
13C9_PFNa		92	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: CH2M - Jacobs	Laboratory ID: VL11043-008
Description: TB01-121020	Matrix: Aqueous
Date Sampled: 12/09/2020	Project Name: IAAAP PFAS
Date Received: 12/11/2020	Project Number: 679172CH.01.11.FW

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1410	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanefluoronic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		99	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		87	50-150
13C2_PFTeDA		83	50-150
13C3_PFBs		94	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBa		95	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDa		90	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		91	50-150
13C8_PFOs		93	50-150
13C9_PFNa		89	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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## QC Summary

PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDaA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBa		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

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Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

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LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDaA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048
Surrogate	Q	% Rec	Acceptance Limit				
13C2_6:2FTS		87	50-150				
13C2_8:2FTS		85	50-150				
13C2_PFDaA		90	50-150				
13C2_PFTeDA		87	50-150				
13C3_PFBs		86	50-150				
13C3_PFHxS		90	50-150				
13C3-HFPO-DA		90	50-150				
13C4_PFBa		90	50-150				
13C4_PFHpA		89	50-150				
13C5_PFHxA		90	50-150				
13C5_PFPeA		90	50-150				
13C6_PFDa		92	50-150				
13C7_PFUdA		85	50-150				
13C8_PFOA		86	50-150				
13C8_PFOS		82	50-150				
13C9_PFNA		88	50-150				
d5-EtFOSAA		83	50-150				

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

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Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

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LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	14	13		1	93	70-150	12/28/2020 1235
11CI-PF3OUdS	ND	14	12		1	90	70-150	12/28/2020 1235
8:2 FTS	ND	14	12		1	87	67-138	12/28/2020 1235
6:2 FTS	8.1	14	19		1	78	64-140	12/28/2020 1235
GenX	ND	29	27		1	93	70-150	12/28/2020 1235
ADONA	ND	14	14		1	100	70-150	12/28/2020 1235
EtFOSAA	ND	15	14		1	98	61-135	12/28/2020 1235
MeFOSAA	ND	15	16		1	112	65-136	12/28/2020 1235
PFBS	4.6	13	16		1	88	72-130	12/28/2020 1235
PFHxS	17	13	19	N	1	14	68-131	12/28/2020 1235
PFBA	110	15	97	N	1	-57	73-129	12/28/2020 1235
PFDA	ND	15	13		1	90	71-129	12/28/2020 1235
PFDaA	ND	15	15		1	100	72-134	12/28/2020 1235
PFHpA	2.2	15	17		1	100	72-130	12/28/2020 1235
PFHxA	4.6	15	17		1	87	72-129	12/28/2020 1235
PFNA	ND	15	14		1	98	69-130	12/28/2020 1235
PFOA	9.1	15	21		1	80	71-133	12/28/2020 1235
PFPeA	11	15	23		1	82	72-129	12/28/2020 1235
PFTeDA	ND	15	14		1	98	71-132	12/28/2020 1235
PFTTrDA	ND	15	14		1	97	65-144	12/28/2020 1235
PFUdA	ND	15	15		1	101	69-133	12/28/2020 1235
PFOS	8.5	14	17		1	66	65-140	12/28/2020 1235
Surrogate	Q	% Rec	Acceptance Limit					
13C2_6:2FTS		125	50-150					
13C2_8:2FTS		99	50-150					
13C2_PFDaA		94	50-150					
13C2_PFTeDA		86	50-150					
13C3_PFBs		91	50-150					
13C3_PFHxS		96	50-150					
13C3-HFPO-DA		95	50-150					
13C4_PFBa		103	50-150					
13C4_PFHpA		89	50-150					
13C5_PFHxA		97	50-150					
13C5_PFPeA		101	50-150					
13C6_PFDa		97	50-150					
13C7_PFUdA		92	50-150					
13C8_PFOA		102	50-150					
13C8_PFOS		89	50-150					
13C9_PFNA		96	50-150					
d5-EtFOSAA		92	50-150					

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results



# PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	13	13		1	100	2.7	70-150	30	12/28/2020 1245
11CI-PF3OUdS	ND	13	12		1	93	0.47	70-150	30	12/28/2020 1245
8:2 FTS	ND	13	15		1	111	19	67-138	30	12/28/2020 1245
6:2 FTS	8.1	13	18		1	76	4.5	64-140	30	12/28/2020 1245
GenX	ND	28	25		1	90	8.6	70-150	30	12/28/2020 1245
ADONA	ND	13	13		1	101	3.2	70-150	30	12/28/2020 1245
EtFOSAA	ND	14	13		1	90	14	61-135	30	12/28/2020 1245
MeFOSAA	ND	14	13		1	91	25	65-136	30	12/28/2020 1245
PFBS	4.6	12	15		1	82	7.9	72-130	30	12/28/2020 1245
PFHxS	17	13	20	N	1	20	3.8	68-131	30	12/28/2020 1245
PFBA	110	14	100	N	1	-22	5.2	73-129	30	12/28/2020 1245
PFDA	ND	14	14		1	103	8.1	71-129	30	12/28/2020 1245
PFDaA	ND	14	15		1	104	0.63	72-134	30	12/28/2020 1245
PFHpA	2.2	14	16		1	98	5.8	72-130	30	12/28/2020 1245
PFHxA	4.6	14	17		1	90	0.88	72-129	30	12/28/2020 1245
PFNA	ND	14	14		1	102	0.11	69-130	30	12/28/2020 1245
PFOA	9.1	14	21		1	85	0.69	71-133	30	12/28/2020 1245
PFPeA	11	14	23		1	83	2.0	72-129	30	12/28/2020 1245
PFTeDA	ND	14	14		1	100	3.1	71-132	30	12/28/2020 1245
PFTrDA	ND	14	13		1	96	5.1	65-144	30	12/28/2020 1245
PFUdA	ND	14	15		1	108	1.4	69-133	30	12/28/2020 1245
PFOS	8.5	13	19		1	80	8.0	65-140	30	12/28/2020 1245
Surrogate	Q	% Rec	Acceptance Limit							
13C2_6:2FTS		140	50-150							
13C2_8:2FTS		96	50-150							
13C2_PFDaA		94	50-150							
13C2_PFTeDA		86	50-150							
13C3_PFBs		97	50-150							
13C3_PFHxS		97	50-150							
13C3-HFPO-DA		97	50-150							
13C4_PFBa		107	50-150							
13C4_PFHpA		96	50-150							
13C5_PFHxA		99	50-150							
13C5_PFPeA		105	50-150							
13C6_PFDa		96	50-150							
13C7_PFUdA		91	50-150							
13C8_PFOA		105	50-150							
13C8_PFOS		87	50-150							
13C9_PFNA		96	50-150							
d5-EtFOSAA		95	50-150							

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

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Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		96	50-150

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LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody  
and  
Miscellaneous Documents



**PACE ANALYTICAL SERVICES, LLC**  
 106 Vantage Point Drive • West Columbia, SC 29172  
 Telephone No. 803-791-9700 Fax No. 803-791-9111  
 www.pacelabs.com

**Number 114707**

Client: CH2M/Jacobs  
 Address: 59 Lilac Ct.  
 City: Pagosa Springs CO 81147  
 Project Name: INAAP PFAS

Report to Contact: David Scott  
 Sampler's Signature: *David Scott*  
 Printed Name: David Kortjohn / Joe Spies

Telephone No./E-mail: Doug Scott @ pacelabs.com  
 Quote No.: 1720-445-2278  
 Analysts (Attach list if more space is needed): [blank]

Page 1 of 1  
 Lot # Bar Code: VL11043  
 CSO: MS/MSD

Sample ID / Description (Continues for each sample may be combined on one line)	Collection Date/Time	Concentration (activity)	No. of Containers by Preservative Type					Matrix	Sample Disposal Return to Client <input checked="" type="checkbox"/> Disposal by Lab	Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Irritant <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison <input checked="" type="checkbox"/> Unknown	OC Requirements (Specify)
			Acid	Alkaline	None	Other	Other				
FFS-MW05-1220	12/19/20	1055	6					X			
FFS-MW04-1220	12/19/20	820	2					X			
JAW-63-1220	12/19/20	850	2					X			
C-00-1-1220	12/19/20	1115	2					X			
FTA-TT-MW-03-1220	12/10/20	905	2					X			
FTP-MW5-1220	12/10/20	1035	2					X			
FTA-99-1-1220	12/10/20	1040	2					X			
TB01-121020	12/03/20	-	2					X			

Turn Around Time Required (Prior full approval required for expedited TAT):  
 Standard  Rush (Specify):  
 1. Refiniquished by: *David Scott* Date: 12/10/20 Time: 1600  
 2. Refiniquished by: Date: Time:  
 3. Refiniquished by: Date: Time:  
 4. Refiniquished by: **FED EX** Date: 12/10/20 Time: 1600  
 Note: All samples are retained for four weeks from receipt unless other arrangements are made.

1. Received by: *David Scott* Date: 12/11/20 Time: 1010  
 2. Received by: Date: Time:  
 3. Received by: Date: Time:  
 4. Laboratory received by: *David Scott* Date: 12/11/20 Time: 1010  
 LAB USE ONLY: Recaptured on ice (Circle) Yes No Ice Pack Resistor Temp. 4.2 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-FinAmClient Copy  
 Document Number: MED03N2-01

# PACE ANALYTICAL SERVICES, LLC

Shealy Environmental Services, Inc.  
Document Number: MBI018C-14

## Sample Receipt Checklist (SRC)

Client: CH2M

Cooler Inspected by/date: BMG / 12/11/2020 Lot #: VL11043

Means of receipt: <input type="checkbox"/> SESI <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: NA Chlorine Strip ID: NA	Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA	
4.2 / 4.2 °C NA / NA °C NA / NA °C NA / NA °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	14. Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (1/4" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH <sub>3</sub> /TKN/cyanide/phenol/625 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # NA
<b>Sample Preservation</b> (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA	
Time of preservation NA. If more than one preservative is needed, please note in the comments below.	
Sample(s) NA were received with bubbles >6 mm in diameter.	
Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy ID: NA	
SR barcode labels applied by: KPB Date: 12/10/2020	

Comments:

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# PFAS

# QC SUMMARY



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-001</b>
Description: <b>FFS-MW05-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1055</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1224	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>8.1</b>	<b>Q</b>	<b>7.2</b>	<b>3.6</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>4.6</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>17</b>	<b>S</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>	<b>S</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>2.2</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>4.6</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>11</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>8.5</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		105	50-150
13C2_PFDaA		96	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		113	50-150
13C8_PFOS		96	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-002</b>
Description: <b>FFS-MW04-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0820</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1256	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>63</b>		<b>6.9</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>47</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>630</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>130</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>42</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>150</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>27</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>200</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		124	50-150
13C2_8:2FTS		91	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBa		99	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		93	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		94	50-150
13C8_PFOs		89	50-150
13C9_PFNa		91	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-003</b>
Description: <b>JAW-63-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0850</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1317	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>2.7</b>	<b>J</b>	<b>7.0</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>5.7</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>4.3</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>1.5</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>17</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		86	50-150
13C8_PFOs		88	50-150
13C9_PFNa		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-004</b>
Description: <b>C-00-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1115</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1327	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>9.3</b>		<b>7.0</b>	<b>3.5</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>1.3</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1.1</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>6.3</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>2.9</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>2.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		92	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDa		96	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		91	50-150
13C8_PFOs		92	50-150
13C9_PFNa		92	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-005</b>
Description: <b>FTA-TT-MW-03-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0905</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1338	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1138	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>62</b>		<b>6.7</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>210</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1400</b>		<b>17</b>	<b>8.5</b>	<b>4.2</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>21</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>160</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>31</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>25</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>620</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150		102	50-150
13C2_8:2FTS		113	50-150		90	50-150
13C2_PFDaA		81	50-150		91	50-150
13C2_PFTeDA		61	50-150		88	50-150
13C3_PFBS		80	50-150		95	50-150
13C3_PFHxS		81	50-150		98	50-150
13C3-HFPO-DA		75	50-150		95	50-150
13C4_PFBA		73	50-150		101	50-150
13C4_PFHpA		86	50-150		97	50-150
13C5_PFHxA		88	50-150		96	50-150
13C5_PFPeA		82	50-150		96	50-150
13C6_PFDA		92	50-150		93	50-150
13C7_PFUdA		85	50-150		95	50-150
13C8_PFOA		85	50-150		94	50-150
13C8_PFOS		73	50-150		92	50-150
13C9_PFNA		77	50-150		90	50-150
d5-EtFOSAA		84	50-150		90	50-150
d3-MeFOSAA		90	50-150		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-006</b>
Description: <b>FTP-MW5-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1035</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1149	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>5.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>91</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>16</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>2.5</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>3.9</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>4.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>37</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		81	50-150
13C2_PFDaA		88	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBa		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		93	50-150
13C8_PFOs		93	50-150
13C9_PFNa		86	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-007</b>
Description: <b>FTA-99-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1040</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1359	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>12</b>		<b>7.0</b>	<b>3.5</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>24</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>360</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>8.7</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>5.6</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>4.0</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>80</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		95	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		89	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		92	50-150
13C8_PFOS		91	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-008</b>
Description: <b>TB01-121020</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1410	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanefluoro acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanefluoro acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		99	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		87	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		91	50-150
13C8_PFOS		93	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDaA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		85	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		86	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBa		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		90	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		86	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		83	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	14	13		1	93	70-150	12/28/2020 1235
11CI-PF3OUdS	ND	14	12		1	90	70-150	12/28/2020 1235
8:2 FTS	ND	14	12		1	87	67-138	12/28/2020 1235
6:2 FTS	8.1	14	19		1	78	64-140	12/28/2020 1235
GenX	ND	29	27		1	93	70-150	12/28/2020 1235
ADONA	ND	14	14		1	100	70-150	12/28/2020 1235
EtFOSAA	ND	15	14		1	98	61-135	12/28/2020 1235
MeFOSAA	ND	15	16		1	112	65-136	12/28/2020 1235
PFBS	4.6	13	16		1	88	72-130	12/28/2020 1235
PFHxS	17	13	19	N	1	14	68-131	12/28/2020 1235
PFBA	110	15	97	N	1	-57	73-129	12/28/2020 1235
PFDA	ND	15	13		1	90	71-129	12/28/2020 1235
PFDoA	ND	15	15		1	100	72-134	12/28/2020 1235
PFHpA	2.2	15	17		1	100	72-130	12/28/2020 1235
PFHxA	4.6	15	17		1	87	72-129	12/28/2020 1235
PFNA	ND	15	14		1	98	69-130	12/28/2020 1235
PFOA	9.1	15	21		1	80	71-133	12/28/2020 1235
PFPeA	11	15	23		1	82	72-129	12/28/2020 1235
PFTeDA	ND	15	14		1	98	71-132	12/28/2020 1235
PFTrDA	ND	15	14		1	97	65-144	12/28/2020 1235
PFUdA	ND	15	15		1	101	69-133	12/28/2020 1235
PFOS	8.5	14	17		1	66	65-140	12/28/2020 1235

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		125	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBa		103	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		101	50-150
13C6_PFDa		97	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		102	50-150
13C8_PFOS		89	50-150
13C9_PFNAA		96	50-150
d5-EtFOSAA		92	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	13	13		1	100	2.7	70-150	30	12/28/2020 1245
11CI-PF3OUdS	ND	13	12		1	93	0.47	70-150	30	12/28/2020 1245
8:2 FTS	ND	13	15		1	111	19	67-138	30	12/28/2020 1245
6:2 FTS	8.1	13	18		1	76	4.5	64-140	30	12/28/2020 1245
GenX	ND	28	25		1	90	8.6	70-150	30	12/28/2020 1245
ADONA	ND	13	13		1	101	3.2	70-150	30	12/28/2020 1245
EtFOSAA	ND	14	13		1	90	14	61-135	30	12/28/2020 1245
MeFOSAA	ND	14	13		1	91	25	65-136	30	12/28/2020 1245
PFBS	4.6	12	15		1	82	7.9	72-130	30	12/28/2020 1245
PFHxS	17	13	20	N	1	20	3.8	68-131	30	12/28/2020 1245
PFBA	110	14	100	N	1	-22	5.2	73-129	30	12/28/2020 1245
PFDA	ND	14	14		1	103	8.1	71-129	30	12/28/2020 1245
PFDoA	ND	14	15		1	104	0.63	72-134	30	12/28/2020 1245
PFHpA	2.2	14	16		1	98	5.8	72-130	30	12/28/2020 1245
PFHxA	4.6	14	17		1	90	0.88	72-129	30	12/28/2020 1245
PFNA	ND	14	14		1	102	0.11	69-130	30	12/28/2020 1245
PFOA	9.1	14	21		1	85	0.69	71-133	30	12/28/2020 1245
PFPeA	11	14	23		1	83	2.0	72-129	30	12/28/2020 1245
PFTeDA	ND	14	14		1	100	3.1	71-132	30	12/28/2020 1245
PFTrDA	ND	14	13		1	96	5.1	65-144	30	12/28/2020 1245
PFUdA	ND	14	15		1	108	1.4	69-133	30	12/28/2020 1245
PFOS	8.5	13	19		1	80	8.0	65-140	30	12/28/2020 1245
Surrogate	Q	% Rec	Acceptance Limit							
13C2_6:2FTS		140	50-150							
13C2_8:2FTS		96	50-150							
13C2_PFDoA		94	50-150							
13C2_PFTeDA		86	50-150							
13C3_PFBs		97	50-150							
13C3_PFHxS		97	50-150							
13C3-HFPO-DA		97	50-150							
13C4_PFBa		107	50-150							
13C4_PFHpA		96	50-150							
13C5_PFHxA		99	50-150							
13C5_PFPeA		105	50-150							
13C6_PFDa		96	50-150							
13C7_PFUdA		91	50-150							
13C8_PFOA		105	50-150							
13C8_PFOS		87	50-150							
13C9_PFNA		96	50-150							
d5-EtFOSAA		95	50-150							

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11043

Project No.: 679172CH.01.

AnalyticalMethod: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
FFS-MW05-1220	157 *	105	96	88	98	99	96	105	96
FFS-MW04-1220	124	91	86	78	91	88	89	99	90
JAW-63-1220	92	80	84	85	90	96	91	102	87
C-00-1-1220	100	93	86	87	92	97	96	102	98
FTA-TT-MW-03-12	D45	113	81	61	80	81	75	73	86
FTA-TT-MW-03-12	D02	90	91	88	95	98	95	101	97
FTP-MW5-1220	92	81	88	85	91	84	95	97	95
FTA-99-1-1220	95	92	89	81	94	87	94	98	88
TB01-121020	99	92	87	83	94	91	93	95	92
VQ77741-001	99	87	94	92	90	88	102	96	94
VQ77741-002	87	85	90	87	86	90	90	90	89
FFS-MW05-1220MS	125	99	94	86	91	96	95	103	89
FFS-MW05-1220MS	D140	96	94	86	97	97	97	107	96

QC LIMITS

- IDS1 = 13C2\_6:2FTS 50-150
- IDS2 = 13C2\_8:2FTS 50-150
- IDS3 = 13C2\_PFD<sub>o</sub>A 50-150
- IDS4 = 13C2\_PFTeDA 50-150
- IDS5 = 13C3\_PFBs 50-150
- IDS6 = 13C3\_PFHxS 50-150
- IDS7 = 13C3-HFPO-DA 50-150
- IDS8 = 13C4\_PFBA 50-150
- IDS9 = 13C4\_PFH<sub>p</sub>A 50-150

\* Recoveries outside QC limits  
D IDS Diluted Out

FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11043

Project No.: 679172CH.01.

Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
FFS-MW05-1220	102	106	100	95	113	96	98	96	
FFS-MW04-1220	95	93	93	88	94	89	91	89	
JAW-63-1220	88	93	91	87	86	88	88	87	
C-00-1-1220	96	96	96	91	91	92	92	91	
FTA-TT-MW-03-1220	88	82	92	85	85	73	77	84	
FTA-TT-MW-03-1220	96	96	93	95	94	92	90	90	
FTP-MW5-1220	92	93	91	86	93	93	86	86	
FTA-99-1-1220	95	102	92	89	92	91	92	88	
TB01-121020	96	96	90	89	91	93	89	92	
VQ77741-001	95	99	100	92	93	85	97	91	
VQ77741-002	90	90	92	85	86	82	88	83	
FFS-MW05-1220MS	97	101	97	92	102	89	96	92	
FFS-MW05-1220MSD	99	105	96	91	105	87	96	95	

QC LIMITS

- IDS10 = 13C5\_PFHxA
- IDS11 = 13C5\_PFPeA
- IDS12 = 13C6\_PFDA
- IDS13 = 13C7\_PFUdA
- IDS14 = 13C8\_PFOA
- IDS15 = 13C8\_PFOS
- IDS16 = 13C9\_PFNA
- IDS17 = d5-EtFOSAA

- 50-150
- 50-150
- 50-150
- 50-150
- 50-150
- 50-150
- 50-150
- 50-150

\* Recoveries outside QC limits  
D IDS Diluted Out

FORM 2  
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc.

Lot No.: VL11043

Project No.: 679172CH.01.

AnalyticalMethod: PFAS by ID SOP QSM B-15

Matrix: Water

CLIENT SAMPLE ID	IDS18								TOT OUT
FFS-MW05-1220	97								1
FFS-MW04-1220	91								0
JAW-63-1220	90								0
C-00-1-1220	95								0
FTA-TT-MW-03-1220	90								0
FTA-TT-MW-03-1220	98								0
FTP-MW5-1220	96								0
FTA-99-1-1220	92								0
TB01-121020	94								0
VQ77741-001	97								0
VQ77741-002	86								0
FFS-MW05-1220MS	94								0
FFS-MW05-1220MSD	96								0

IDS18 = d3-MeFOSAA QC LIMITS  
50-150

\* Recoveries outside QC limits  
D IDS Diluted Out

FORM 3  
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11043

Project No.: 679172CH.01.

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): FFS-MW05-1220

Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2 Lab Sample ID: VL11043-001MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC	#	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	14		13	93		70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	14		12	90		70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	14		12	87		67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	14	8.1	19	78		64-140
Hexafluoropropylene oxide dimer acid (GenX)	29		27	93		70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	14		14	100		70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	15		14	98		61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	15		16	112		65-136
Perfluoro-1-butanesulfonic acid (PFBS)	13	4.6	16	88		72-130
Perfluorohexanesulfonic acid (PFHxS)	13	17	19	14	*	68-131
Perfluoro-n-butanoic acid (PFBA)	15	110	97	-57	*	73-129
Perfluoro-n-decanoic acid (PFDA)	15		13	90		71-129
Perfluoro-n-dodecanoic acid (PFDoA)	15		15	100		72-134
Perfluoro-n-heptanoic acid (PFHpA)	15	2.2	17	100		72-130
Perfluoro-n-hexanoic acid (PFHxA)	15	4.6	17	87		72-129
Perfluoro-n-nonanoic acid (PFNA)	15		14	98		69-130
Perfluoro-n-octanoic acid (PFOA)	15	9.1	21	80		71-133
Perfluoro-n-pentanoic acid (PFPeA)	15	11	23	82		72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	15		14	98		71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	15		14	97		65-144
Perfluoro-n-undecanoic acid (PFUdA)	15		15	101		69-133
Perfluorooctanesulfonic acid (PFOS)	14	8.5	17	66		65-140

\* Values outside of QC Limits

FORM 3  
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11043

Project No.: 679172CH.01.

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): FFS-MW05-1220

Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2 Lab Sample ID: VL11043-001MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	MSD CONCENTRATION	MSD %R	#	RPD	#	QC LIMITS	
							RPD	%R
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	13	13	100		2.7		0-30	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF30HdS)	13	12	93		0.47		0-30	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 ETS)	13	15	111		19		0-30	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 ETS)	13	18	76		4.5		0-30	64-140
Hexafluoropropylene oxide dimer acid (GenX)	28	25	90		8.6		0-30	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	13	13	101		3.2		0-30	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	14	13	90		14		0-30	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	14	13	91		25		0-30	65-136
Perfluoro-1-butanefluoronic acid (PFBS)	12	15	82		7.9		0-30	72-130
Perfluorohexanesulfonic acid (PFHxS)	13	20	20	*	3.8		0-30	68-131
Perfluoro-n-butanoic acid (PFBA)	14	100	-22	*	5.2		0-30	73-129
Perfluoro-n-decanoic acid (PFDA)	14	14	103		8.1		0-30	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	14	15	104		0.63		0-30	72-134
Perfluoro-n-heptanoic acid (PFHpA)	14	16	98		5.8		0-30	72-130
Perfluoro-n-hexanoic acid (PFHxA)	14	17	90		0.88		0-30	72-129
Perfluoro-n-nonanoic acid (PFNA)	14	14	102		0.11		0-30	69-130
Perfluoro-n-octanoic acid (PFOA)	14	21	85		0.69		0-30	71-133
Perfluoro-n-pentanoic acid (PFPeA)	14	23	83		2.0		0-30	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	14	14	100		3.1		0-30	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	14	13	96		5.1		0-30	65-144
Perfluoro-n-undecanoic acid (PFUDA)	14	15	108		1.4		0-30	69-133
Perfluorooctanesulfonic acid (PFOS)	13	19	80		8.0		0-30	65-140

\* Values outside of QC Limits

FORM 3  
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11043  
 Project No.: 679172CH.01.  
 Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water  
 Client Sample ID: VQ77741-002 Lab Sample ID: VQ77741-002  
 Instrument ID: Sciex\_5060884 (QTRAP 4500)\_LCMSMS2  
 Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PE30MS)	15	16	106	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	15	100	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	16	109	64-140
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	15	101	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PE30NS)	15	16	106	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	31	96	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	16	98	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	16	99	65-136
Perfluoro-1-butanefluoric acid (PFBS)	14	13	94	72-130
Perfluoro-n-butanoic acid (PFBA)	16	16	99	73-129
Perfluoro-n-decanoic acid (PFDA)	16	16	100	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	15	94	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	15	93	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	15	95	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	16	99	69-130
Perfluoro-n-octanoic acid (PFOA)	16	16	99	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	15	95	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	102	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	15	95	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	16	97	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	14	95	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	103	65-140

\* Values outside of QC Limits

FORM 4  
METHOD BLANK SUMMARY

CLIENT SAMPLE ID

VQ77741-001

Lab Name: Shealy Environmental Services, Inc. Lot No.: VL11043  
 Project No.: 679172CH.01. Lab Sample ID: VQ77741-001  
 Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water  
 Instrument ID: Sciex\_5060884 (QTRAP 4500) LCMSMS2 Lab File ID: \_\_\_\_\_  
 Extraction Type: SOP SPE Date Extracted: 12/27/2020  
 LC Column: Gemini C18 ID: 2.00 (mm) Date Analyzed: 12/28/2020  
 Time Analyzed: 10:38

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
FFS-MW05-1220	VL11043-001		12:24
FFS-MW04-1220	VL11043-002		12:56
JAW-63-1220	VL11043-003		13:17
C-00-1-1220	VL11043-004		13:27
FTA-TT-MW-03-1220	VL11043-005		13:38
FTA-TT-MW-03-1220	VL11043-005		11:38
FTP-MW5-1220	VL11043-006		11:49
FTA-99-1-1220	VL11043-007		13:59
TB01-121020	VL11043-008		14:10
VQ77741-002	VQ77741-002		10:48
FFS-MW05-1220MS	VL11043-001MS		12:35
FFS-MW05-1220MSD	VL11043-001MD		12:45

# RAW SAMPLE DATA



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-001</b>
Description: <b>FFS-MW05-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1055</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1224	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>8.1</b>	<b>Q</b>	<b>7.2</b>	<b>3.6</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>4.6</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>17</b>	<b>S</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>	<b>S</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>2.2</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>4.6</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>9.1</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>11</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>8.5</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		105	50-150
13C2_PFDaA		96	50-150
13C2_PFTeDA		88	50-150
13C3_PFBs		98	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBa		105	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		106	50-150
13C6_PFDa		100	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		113	50-150
13C8_PFOs		96	50-150
13C9_PFNa		98	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820019.d  
 Injection Date: 28-Dec-2020 12:24:27 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 11  
 Lab Sample ID: VL11043-001 Lab Prep. Batch: 77741  
 Client ID: FFS-MW05-1220 Sample Group: VL11043  
 Sample Info: VL11043-001 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0395288$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	278	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 679210 22 >100:1 1001.00 979.32 105

**8 Perfluoro-n-butanoic acid (PFBFA) CAS: 375-22-4**

212.9 > 168.9 46 1.718 1.696 2/1 1798470 35 74:1 2661.19 105.19

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 706702 17 >100:1 1001.00 1027.35 106

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.067 2.072 0/0 206435 13 31:1 290.83 11.496 M

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 234145 18 >100:1 1001.00 1017.00 98.3

**7 Perfluoro-1-butanesulfonic acid (PFBFS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 32389 16 15:1 Target = 3.34  
 298.9 > 99 44 2.120 2.125 9524 24 21:1 3.40 (1.67-5.02) 117.44 4.6423

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 755535 19 >100:1 1001.00 1025.05 102

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.423 0/0 87394 20 34:1 Target = 17.01  
 313 > 119 49 2.425 2.423 5255 18 28:1 16.63 (8.50-25.52) 117.28 4.6359

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1349171 18 >100:1 5005.00 5065.33 96.3

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND 860 18 >100:1 5005.00 5065.33 96.3 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 610145 18 >100:1 1001.00 1005.77 96.3

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.782 2.772 1/0 34657 15 9.0:1 Target = 3.79  
 363 > 169 47 2.773 2.772 7466 14 20:1 4.64 (1.89-5.69) 54.816 2.1668 J

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 172104 17 >100:1 1001.00 1005.11 98.8

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.791 2.790 1/0 79074 27 >100:1 Target = 3.80 0.15 433.76 17.146  
 399 > 99 45 2.791 2.790 25373 26 >100:1 3.11 (1.90-5.71) 0.13

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	163662	20	>100:1			5005.00	8498.21	157*	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.129	3.128	1/0	15312	21	>100:1	Target = 1.77		203.80	8.0560		
427 > 81	64	3.122	3.128		7432	21	39:1	2.06 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	712635	22	>100:1			1001.00	1204.05	113	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	167957	38	47:1	Target = 2.85	0.52	231.42	9.1477		
413 > 169	53	3.142	3.148		60243	36	85:1	2.78 (1.42-4.28)	0.62				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	146236	22	>100:1			1001.00	975.37	95.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.520	0/0	37082	51	75:1	Target = 6.80	3.85	214.21	8.4673		
499 > 99	54	3.529	3.520		7901	42	44:1	4.69 (3.40-10.20)	1.48				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.514	3.520	0	753481	21	>100:1			1001.00	1003.35	98.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	105723	19	>100:1			5005.00	5699.31	105	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	671690	21	>100:1			1001.00	1012.60	99.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	767237	18	>100:1			5005.00	5345.13	96.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	700529	18	>100:1			5005.00	5274.48	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	612174	18	>100:1			1001.00	968.52	95.1	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	586622	19	>100:1			1001.00	969.12	96	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	712877	18	>100:1			1001.00	846.20	87.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	752004	21	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	822262	18	>100:1					112	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	741424	23	>100:1					124	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	705062	22	>100:1					116	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	172468	21	>100:1					106	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820019.d

Injection Date: 28-Dec-2020 12:24:27

Inst. ID: LCMSMS02

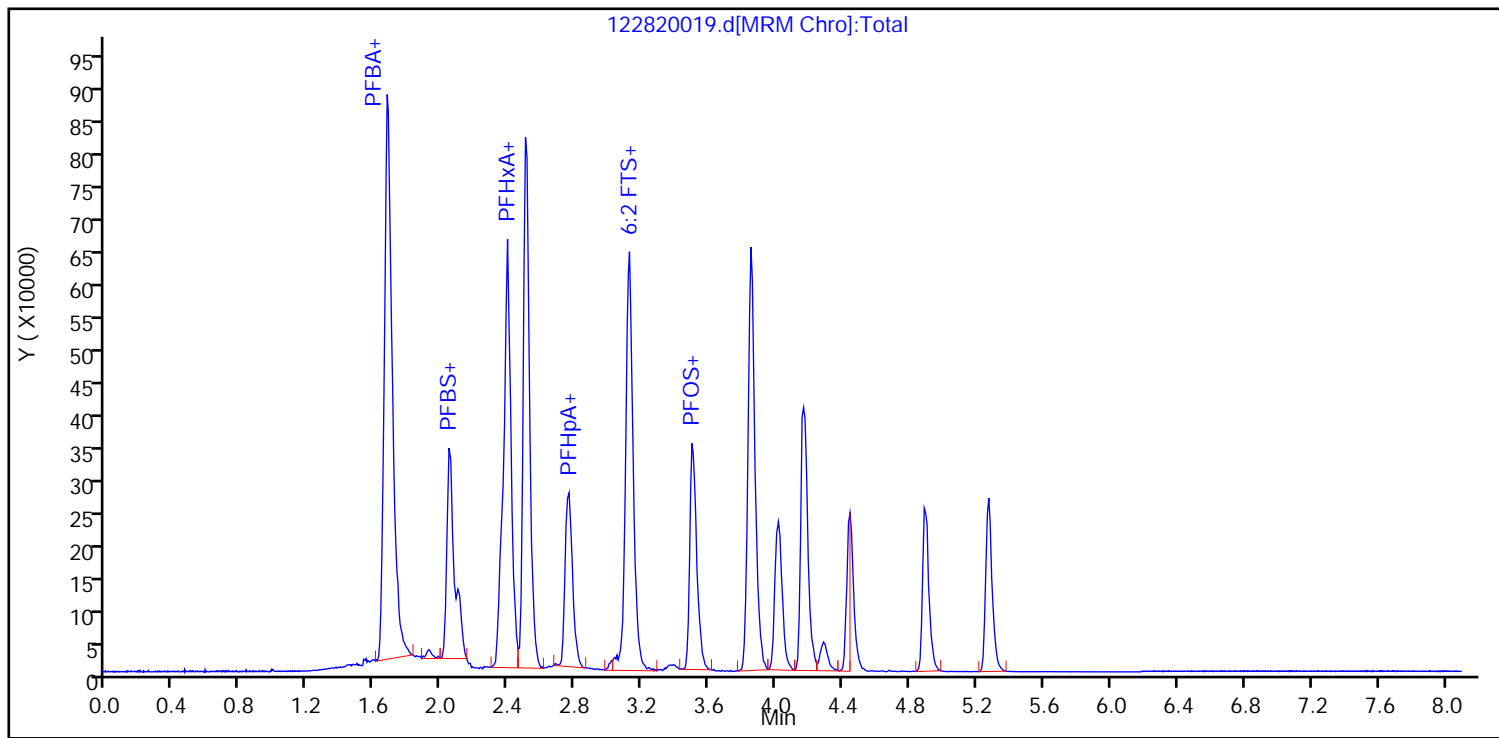
Client ID: FFS-MW05-1220

Lab ID: VL11043-001

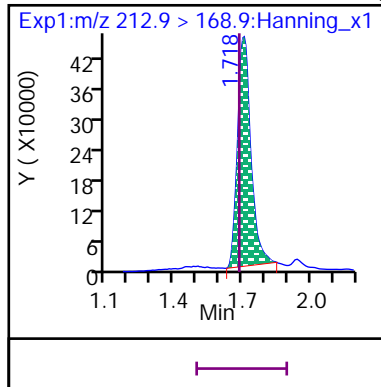
Sample Info: VL11043-001

Dil. Factor: 1

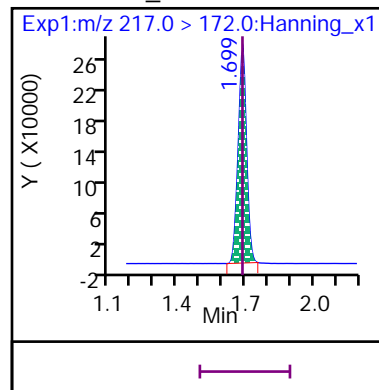
Operator: Matthew M. Miller



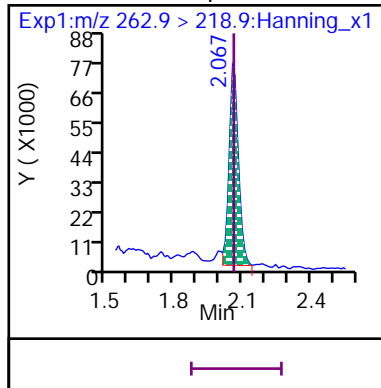
8 Perfluoro-n-butanoic acid (PFBA)



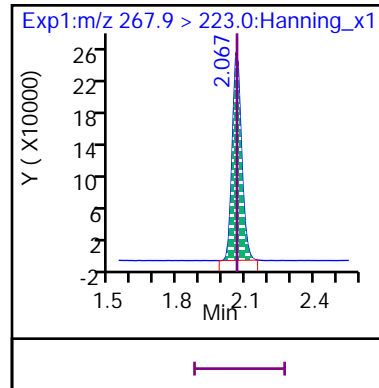
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

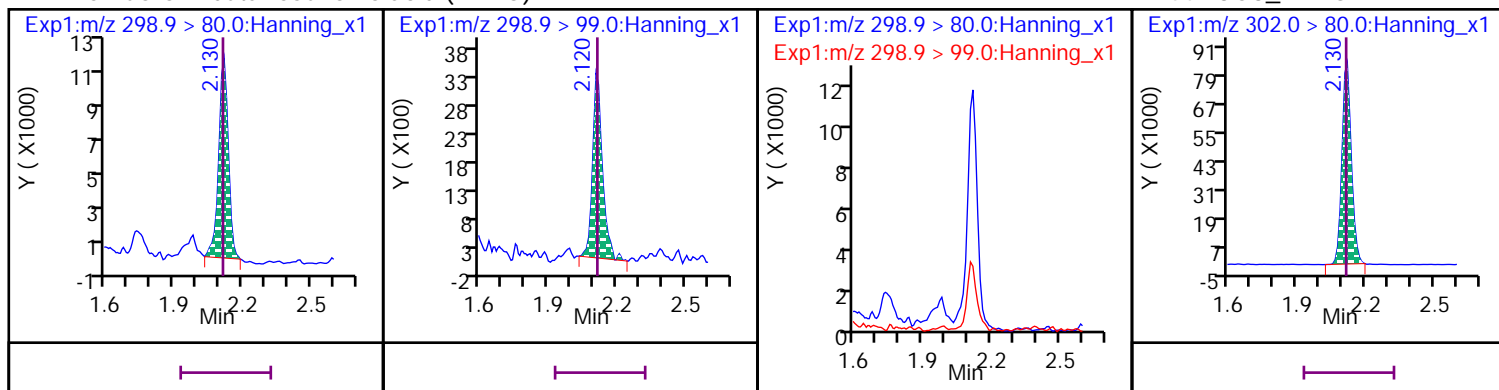


D 50 13C5\_PFPeA



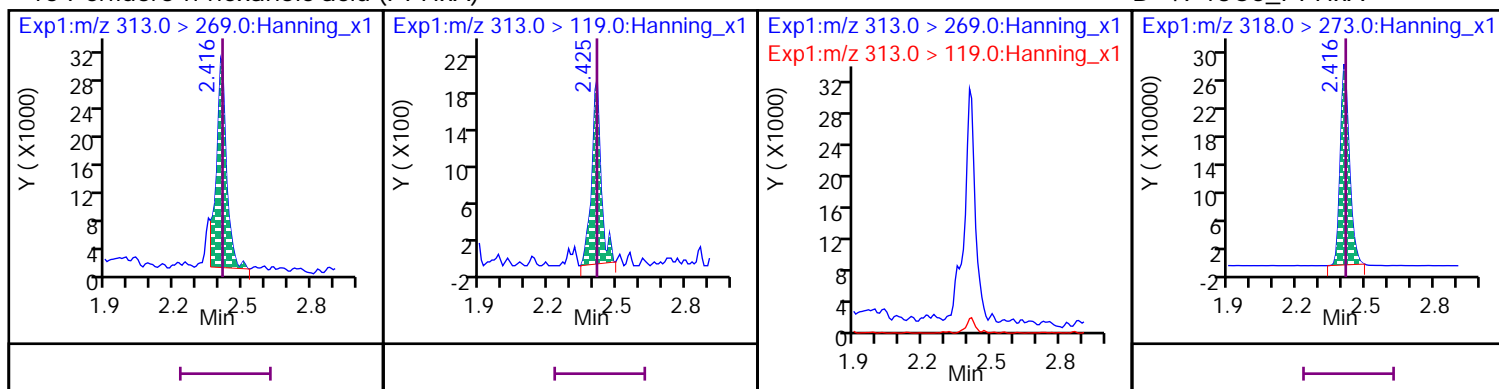
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



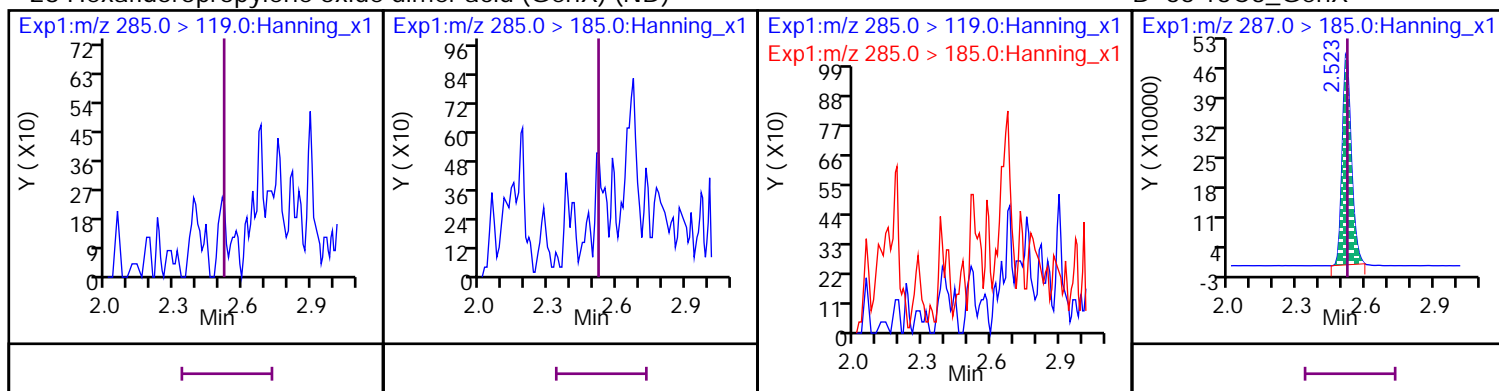
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



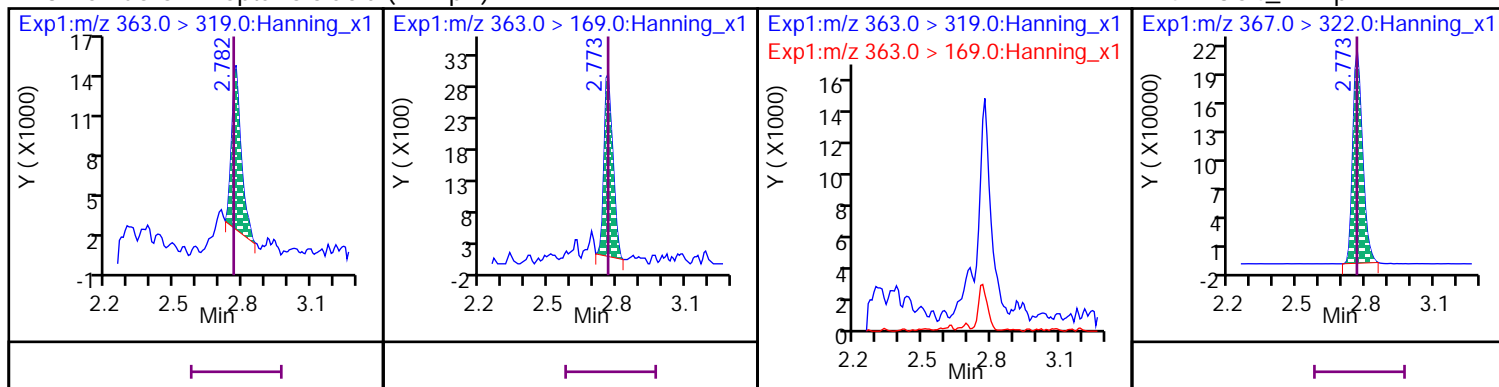
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



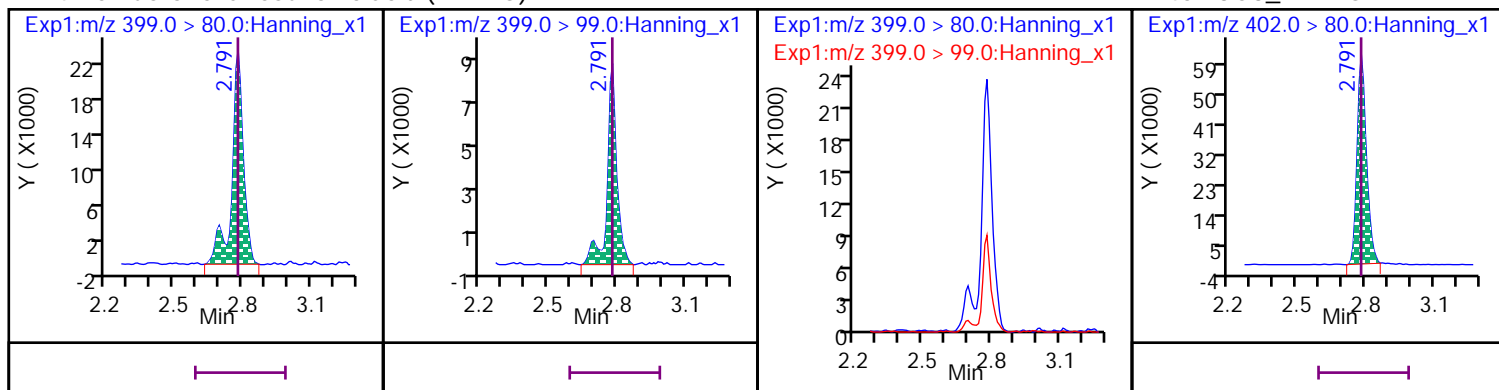
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



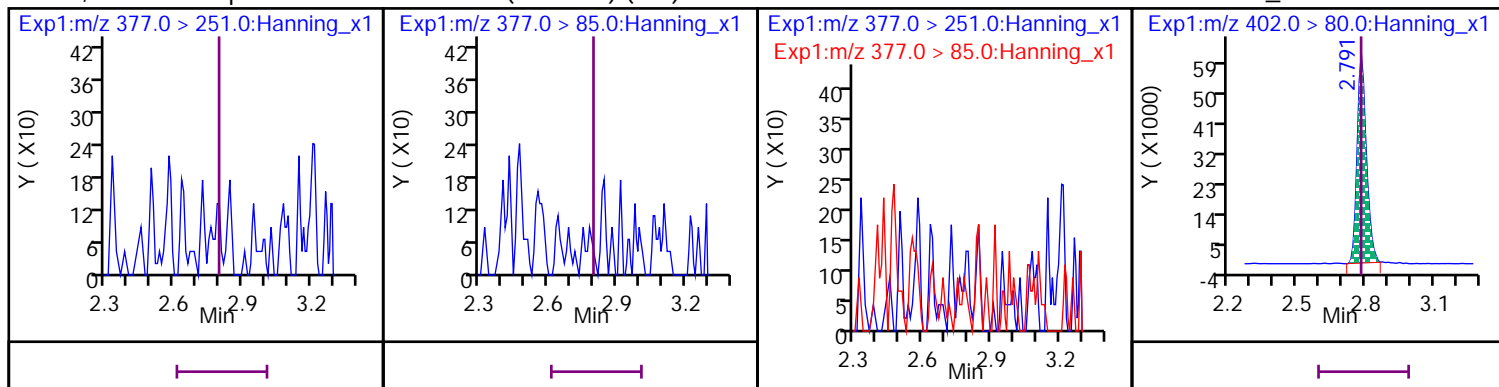
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



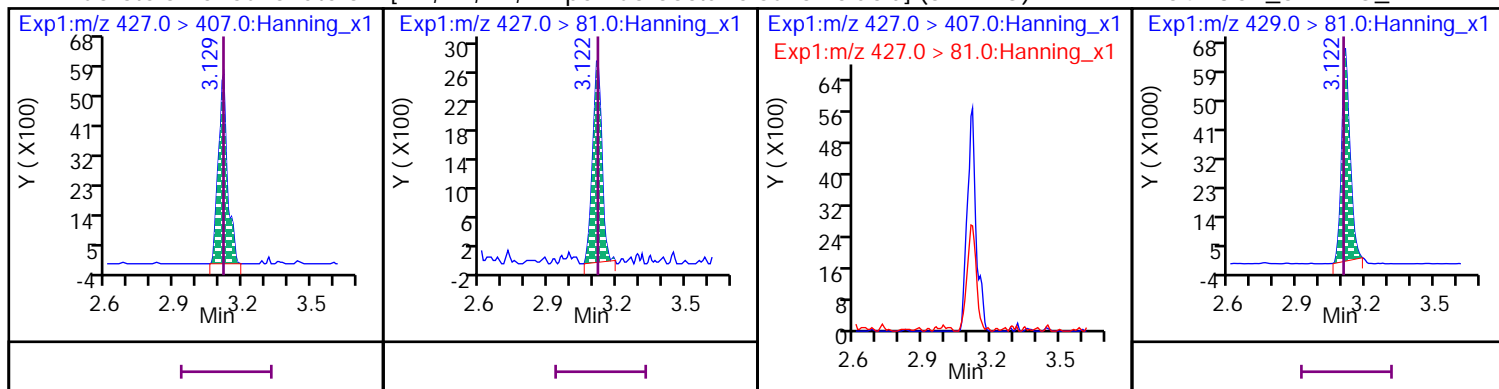
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



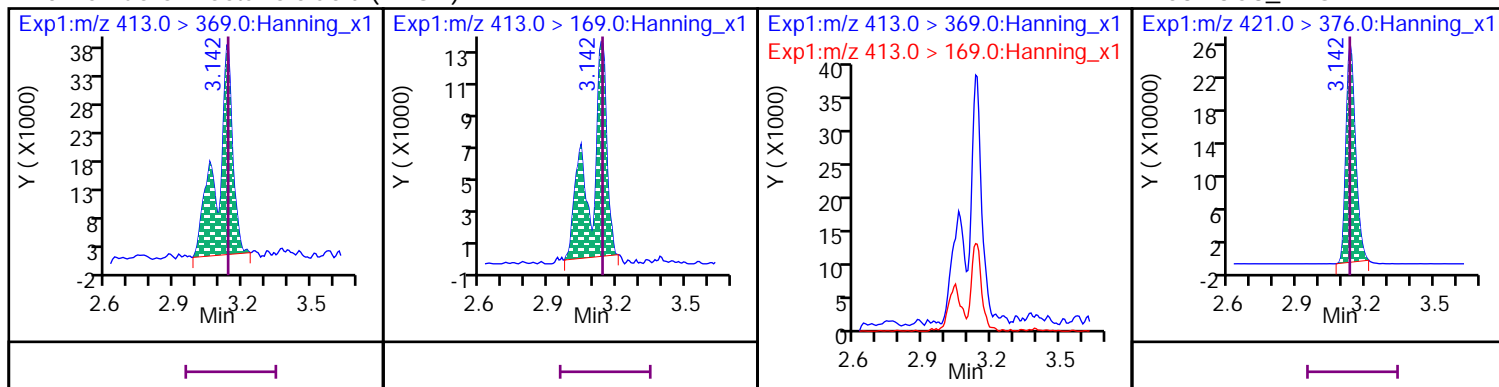
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



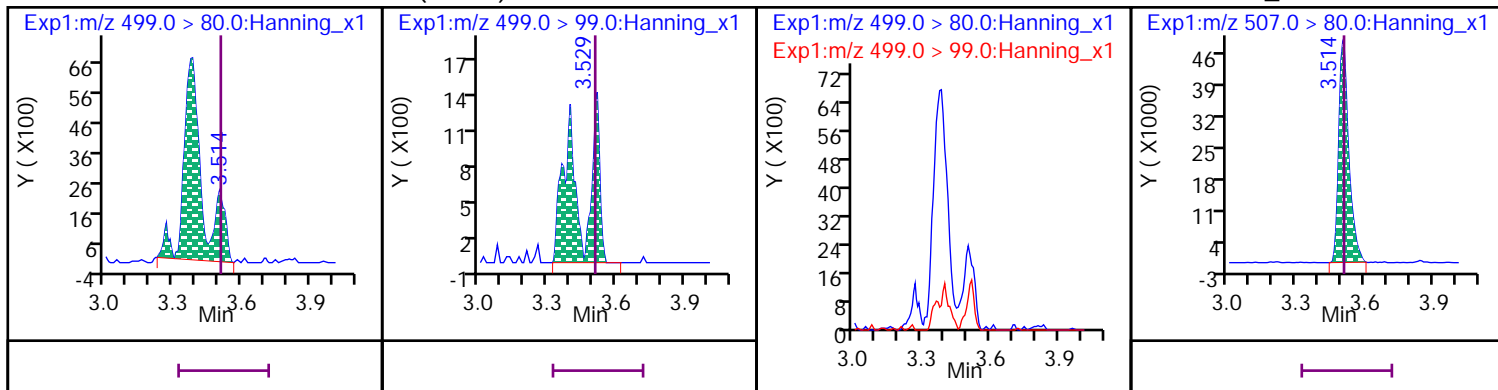
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



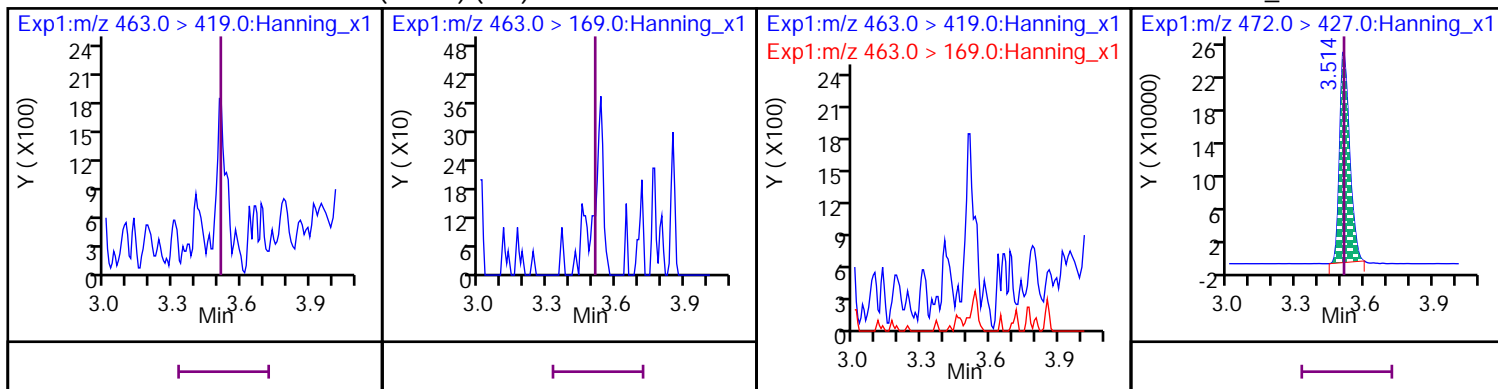
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



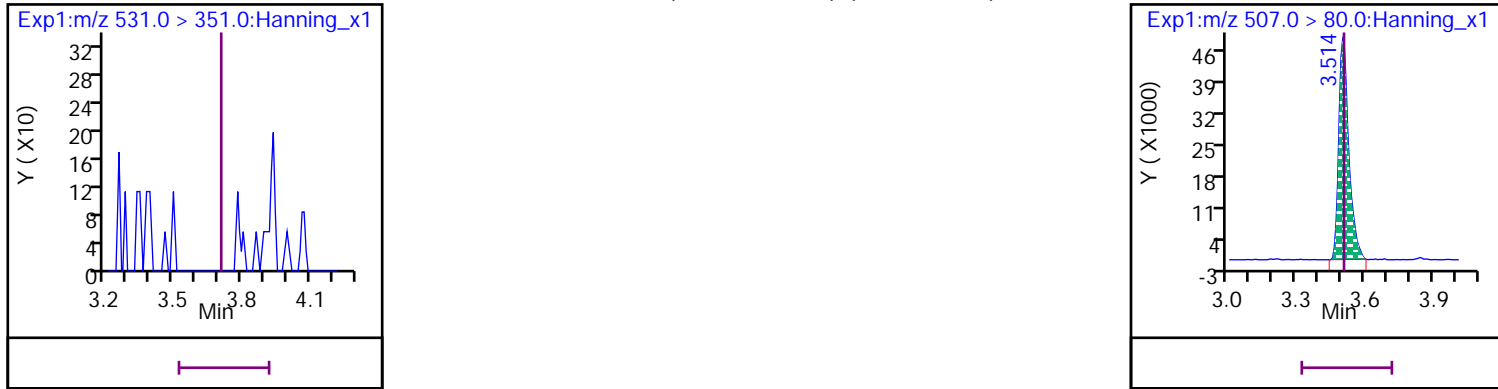
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



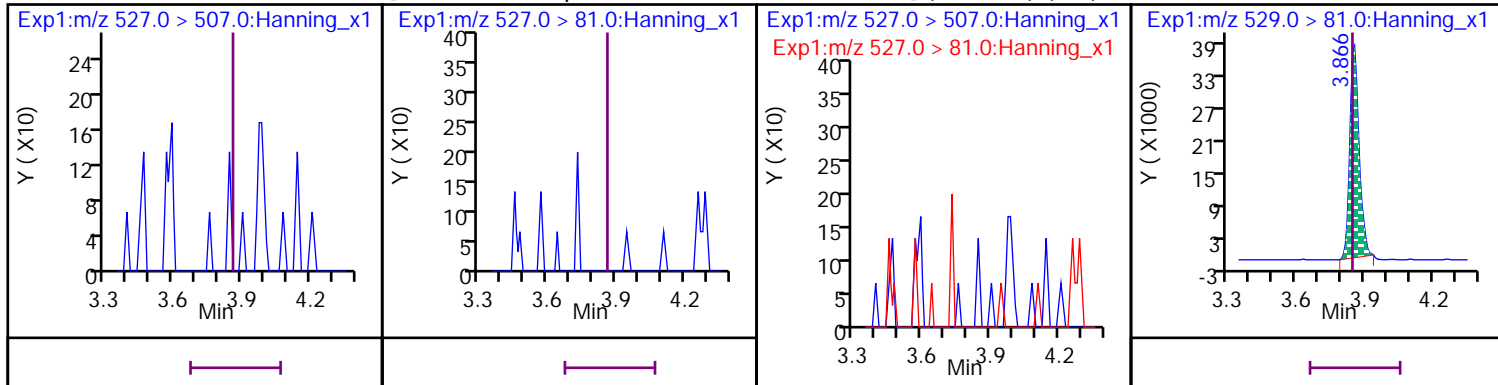
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

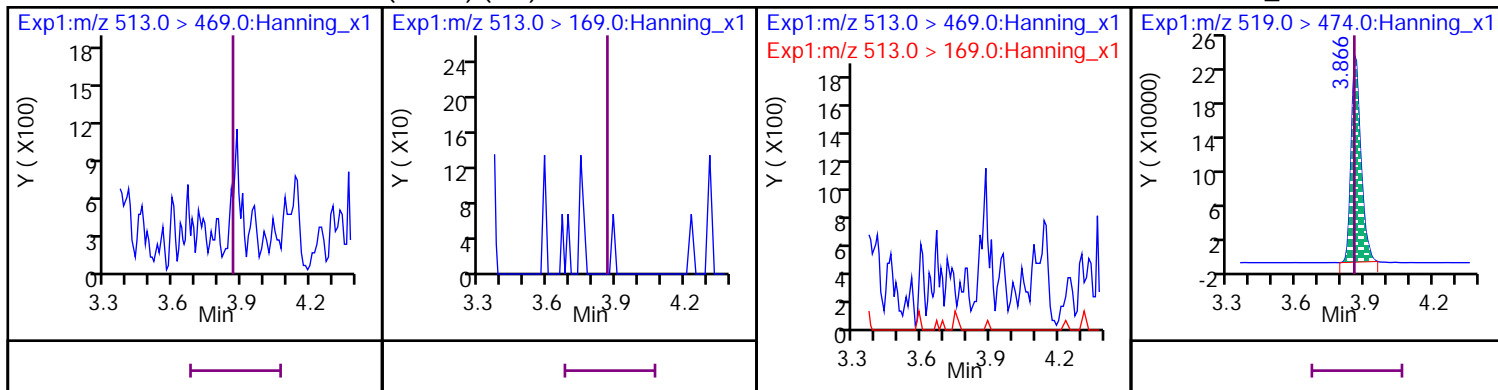
D 65 13C2\_8:2 FTS\_2





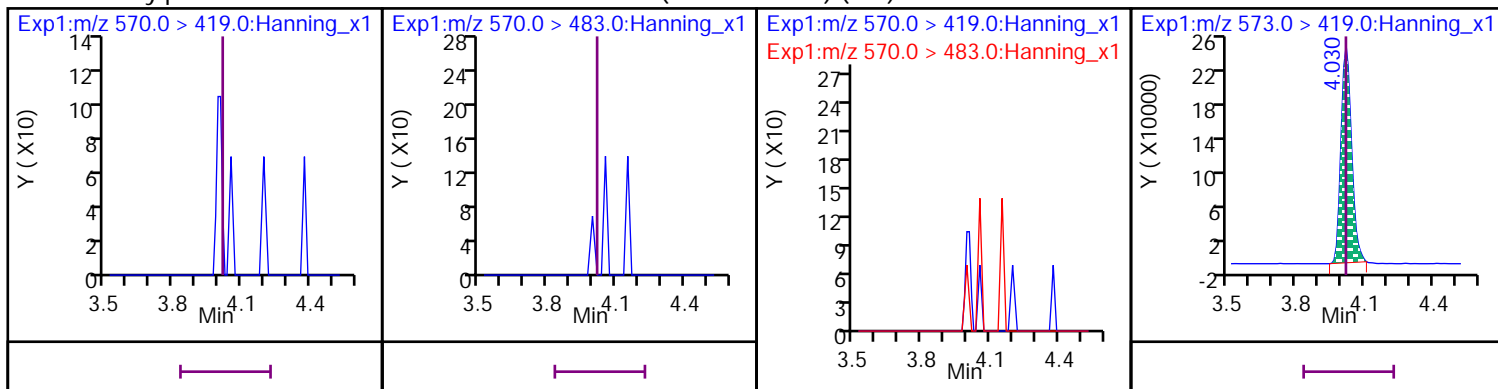
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



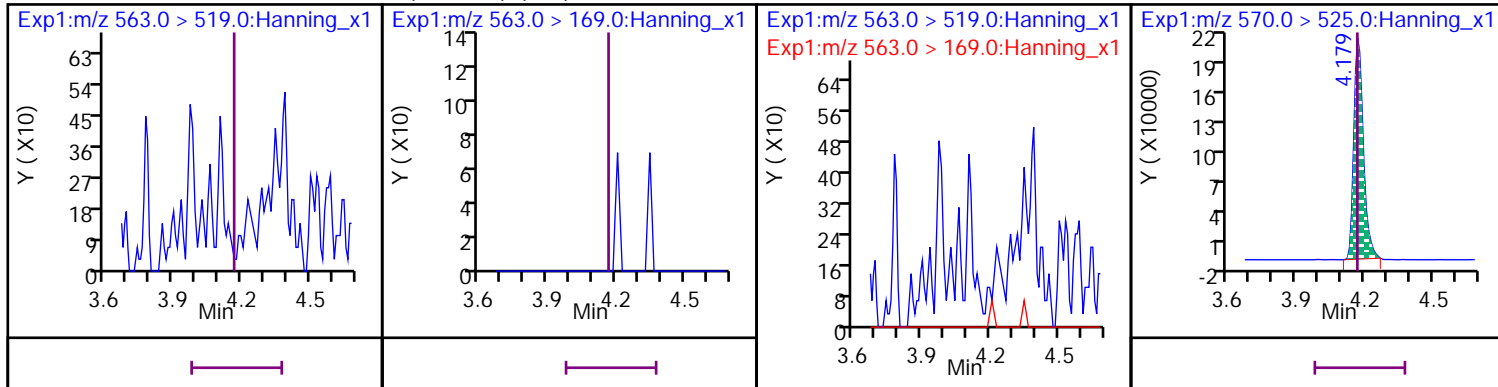
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



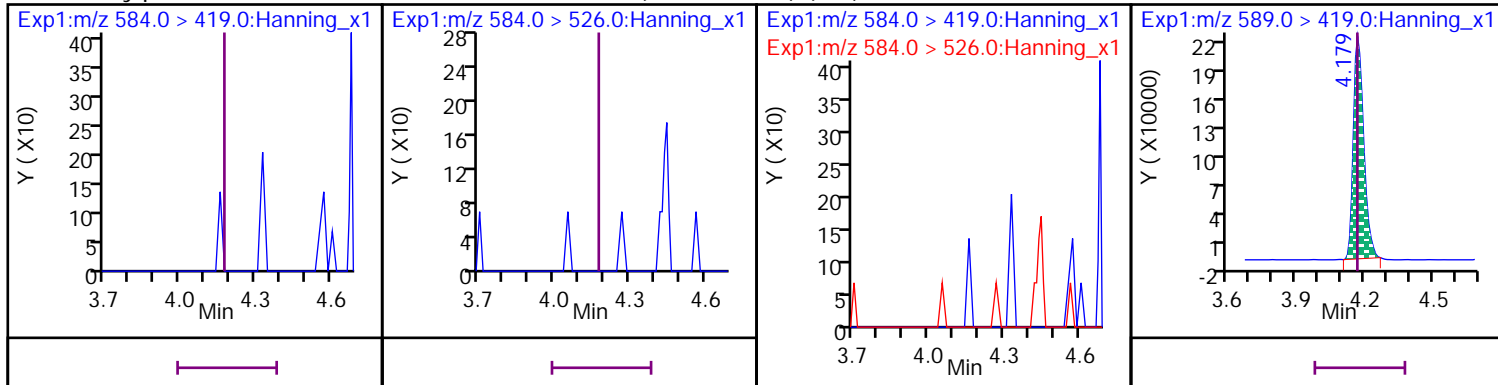
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

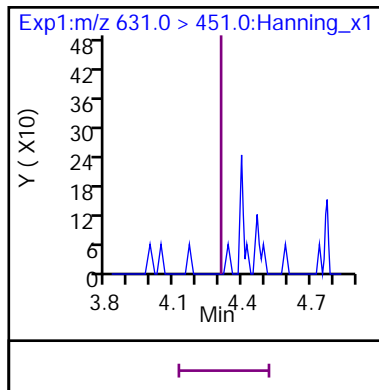


5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

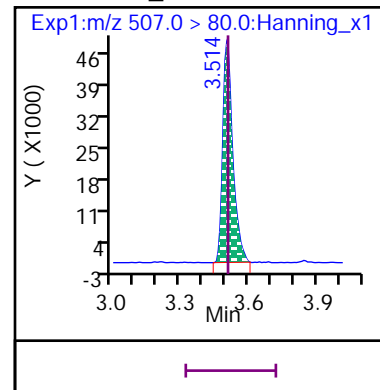
D 60 d5-EtFOSAA



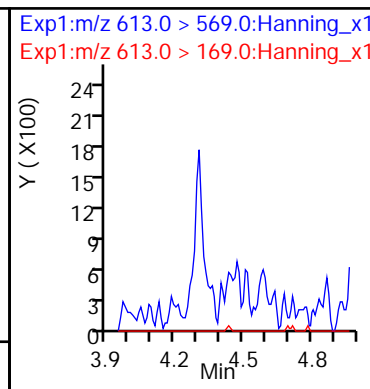
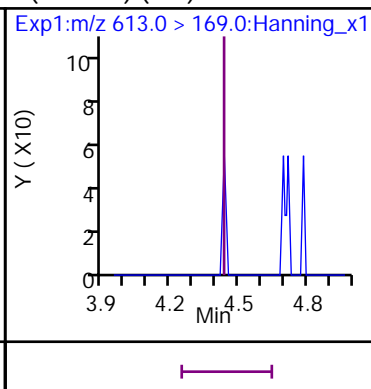
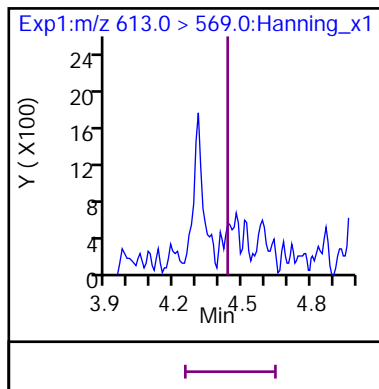
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



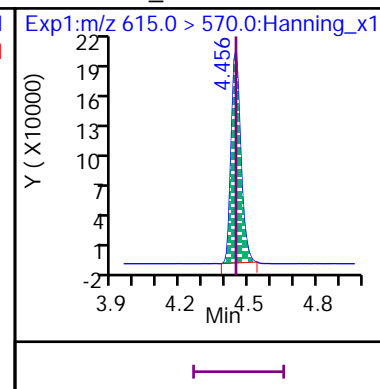
## D 54 13C8\_PFOS



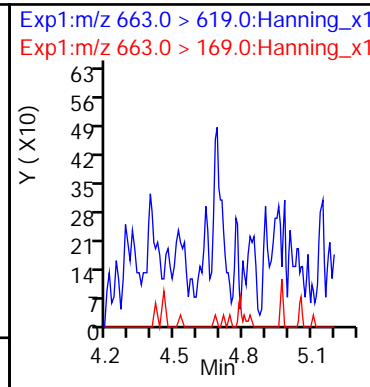
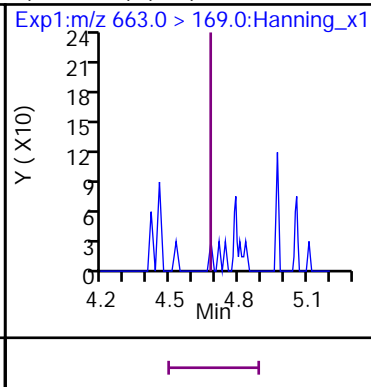
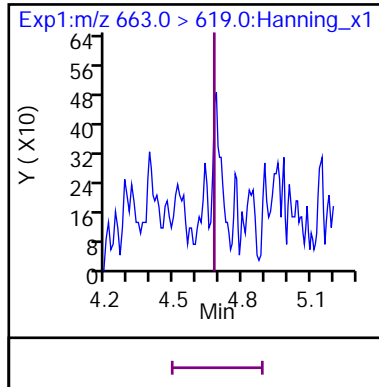
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



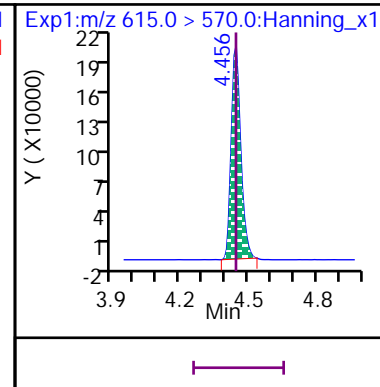
## D 38 13C2\_PFDoA



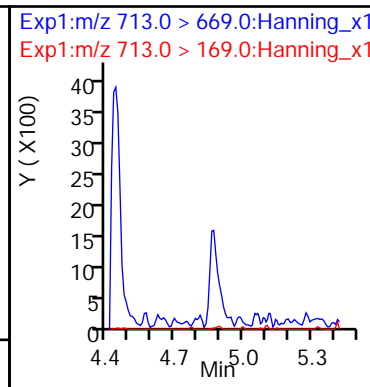
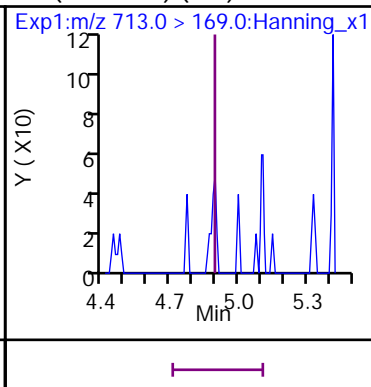
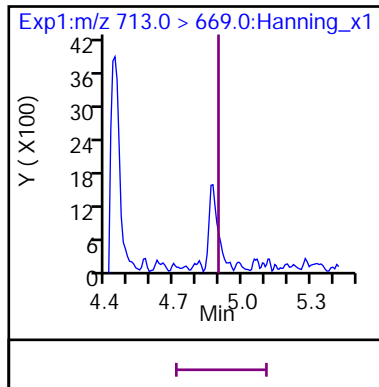
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



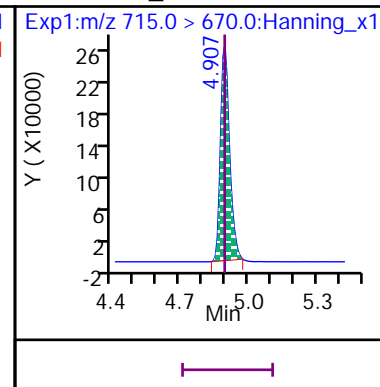
## D 38 13C2\_PFDoA



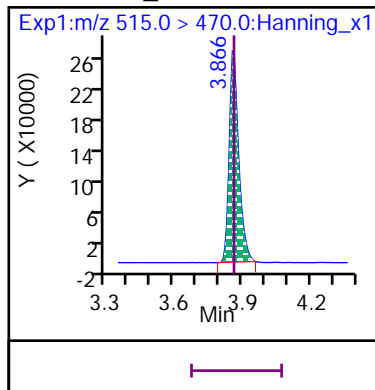
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



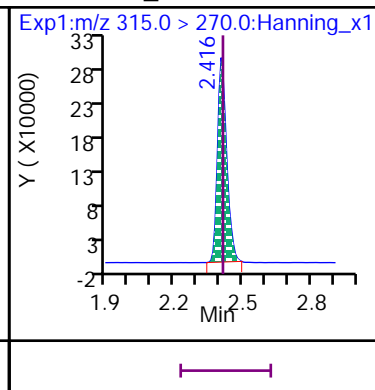
## D 42 13C2\_PFTeDA



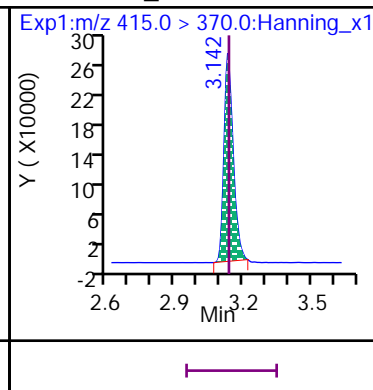
\* 37 13C2\_PFDA



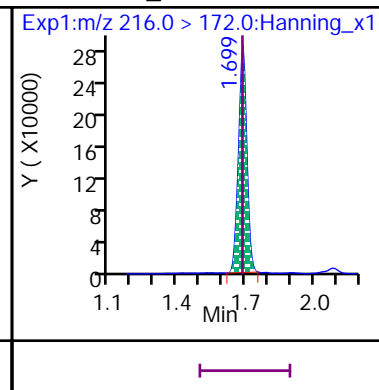
\* 39 13C2\_PFHxA



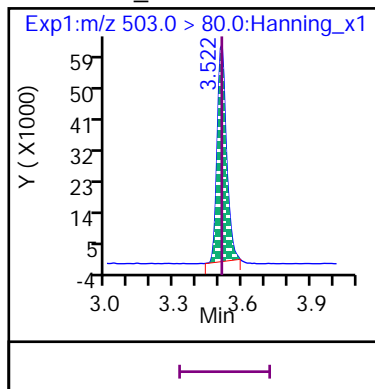
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820019.d

Injection Date: 28-Dec-2020 12:24:27

Inst. ID: LCMSMS02

Client ID: FFS-MW05-1220

Lab ID: VL11043-001

Sample Info: VL11043-001

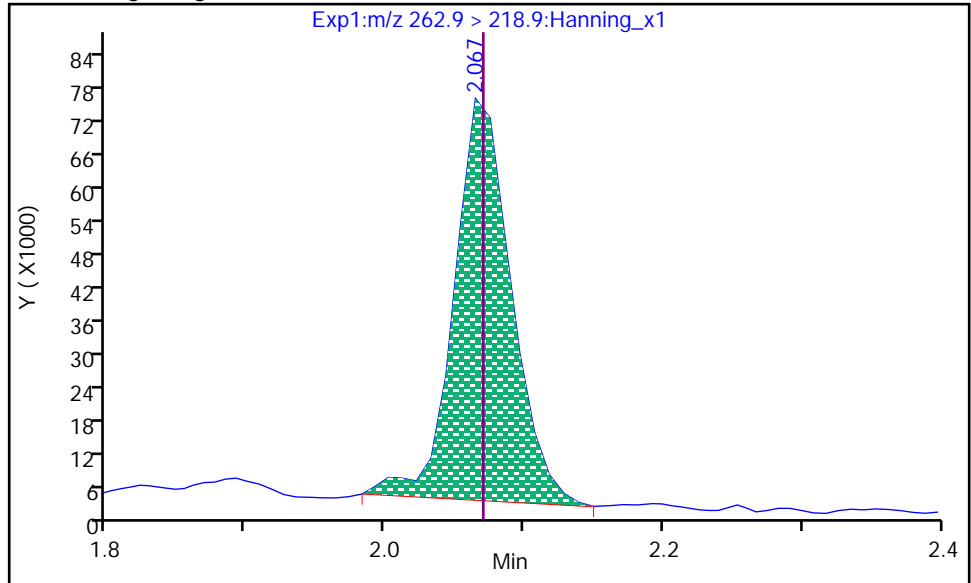
Dil. Factor: 1

Operator: Matthew M. Miller

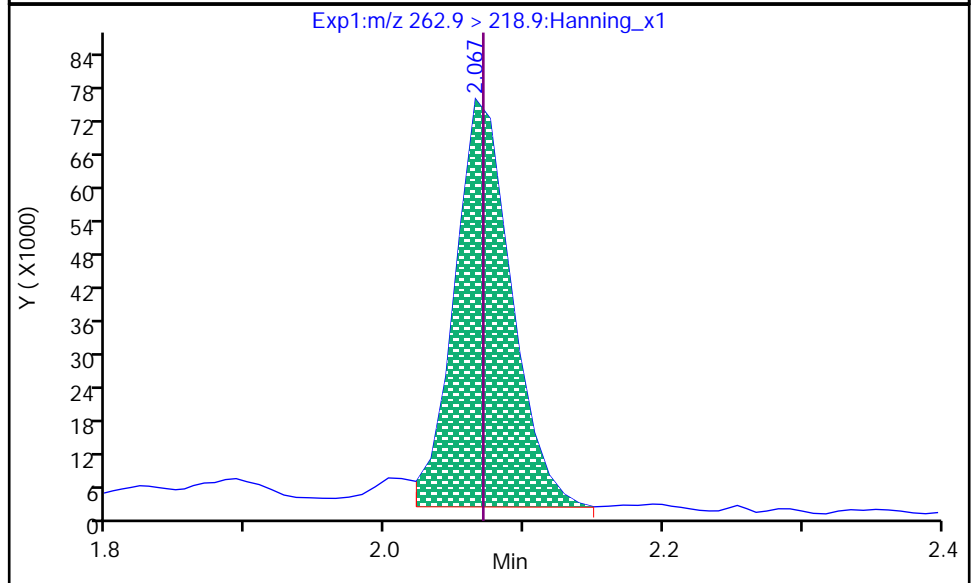
21 PFPeA, CAS: 2706-90-3

Processing Integration Results

RT: 2.067  
Area: 205682  
Conc: 11.454  
Conc Units: ng/L



RT: 2.067  
Area: 206435  
Conc: 11.496  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:33:25

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-002</b>
Description: <b>FFS-MW04-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0820</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1256	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>63</b>		<b>6.9</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>47</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>630</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>130</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>42</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>150</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>27</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>200</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>94</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		124	50-150
13C2_8:2FTS		91	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		78	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBa		99	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		93	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		94	50-150
13C8_PFOs		89	50-150
13C9_PFNa		91	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d  
Injection Date: 28-Dec-2020 12:56:08 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 14  
Lab Sample ID: VL11043-002 Lab Prep. Batch: 77741  
Client ID: FFS-MW04-1220 Sample Group: VL11043  
Sample Info: VL11043-002 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0380243$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	289	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	640854	22	>100:1			1001.00	924.02	98.6	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.696	1/0	2183014	33	>100:1			3423.53	130.18		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	615913	16	>100:1			1001.00	895.37	92.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	3323203	18	>100:1			5371.87	204.26		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	217396	16	>100:1			1001.00	944.25	91.3	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/1	317027	17	>100:1	Target = 3.34		1238.08	47.077		
298.9 > 99	44	2.130	2.125		89165	17	>100:1	3.55 (1.67-5.02)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.423	0	703695	19	>100:1			1001.00	954.72	94.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.416	2.423	0/0	2707214	16	>100:1	Target = 17.01		3900.61	148.32		M
313 > 119	49	2.416	2.423		136209	19	>100:1	19.87 (8.50-25.52)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.523	2.530	0	1243071	18	>100:1			5005.00	4666.99	88.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.530	ND									U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	570014	18	>100:1			1001.00	939.61	90	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	653584	18	>100:1	Target = 3.79		1106.53	42.075		M
363 > 169	47	2.773	2.772		162290	17	>100:1	4.02 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	153111	17	>100:1			1001.00	894.19	87.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	2667466	27	>100:1	Target = 3.80	0.15	16448	625.41		
399 > 99	45	2.791	2.790		792921	25	>100:1	3.36 (1.90-5.71)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.116	3.114	1	129468	23	>100:1			5005.00	6722.68	124	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	87343	22	>100:1	Target = 1.77		1649.95	62.738		
427 > 81	64	3.122	3.128		46367	19	>100:1	1.88 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	587509	22	>100:1			1001.00	992.64	93.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	428259	34	>100:1	Target = 2.85	0.22	715.75	27.216		
413 > 169	53	3.142	3.148		160733	37	>100:1	2.66 (1.42-4.28)	0.28				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.515	3.520	0	135198	22	>100:1			1001.00	901.75	88.7	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.398	3.520	-7/-7	393859	58		Target = 6.80	0.23	2460.89	93.573		M
499 > 99	54	3.405	3.520		80801	58	>100:1	4.87 (3.40-10.20)	0.02				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	699327	20	>100:1			1001.00	931.24	91.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.859	3.857	1	91076	19	>100:1			5005.00	4909.72	90.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.867	3.865	1	623677	20	>100:1			1001.00	940.22	92.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	716638	18	>100:1			5005.00	4992.62	90.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	651513	18	>100:1			5005.00	4905.43	89	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	563738	18	>100:1			1001.00	891.89	87.6	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.458	4.455	1	527676	20	>100:1			1001.00	871.73	86.3	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.908	4.906	1	633292	19	>100:1			1001.00	751.73	77.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.867	3.873	0	755625	20	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	807205	18	>100:1					110	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	712286	23	>100:1					119	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	700758	23	>100:1					115	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	179775	21	>100:1					110	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d

Injection Date: 28-Dec-2020 12:56:08

Inst. ID: LCMSMS02

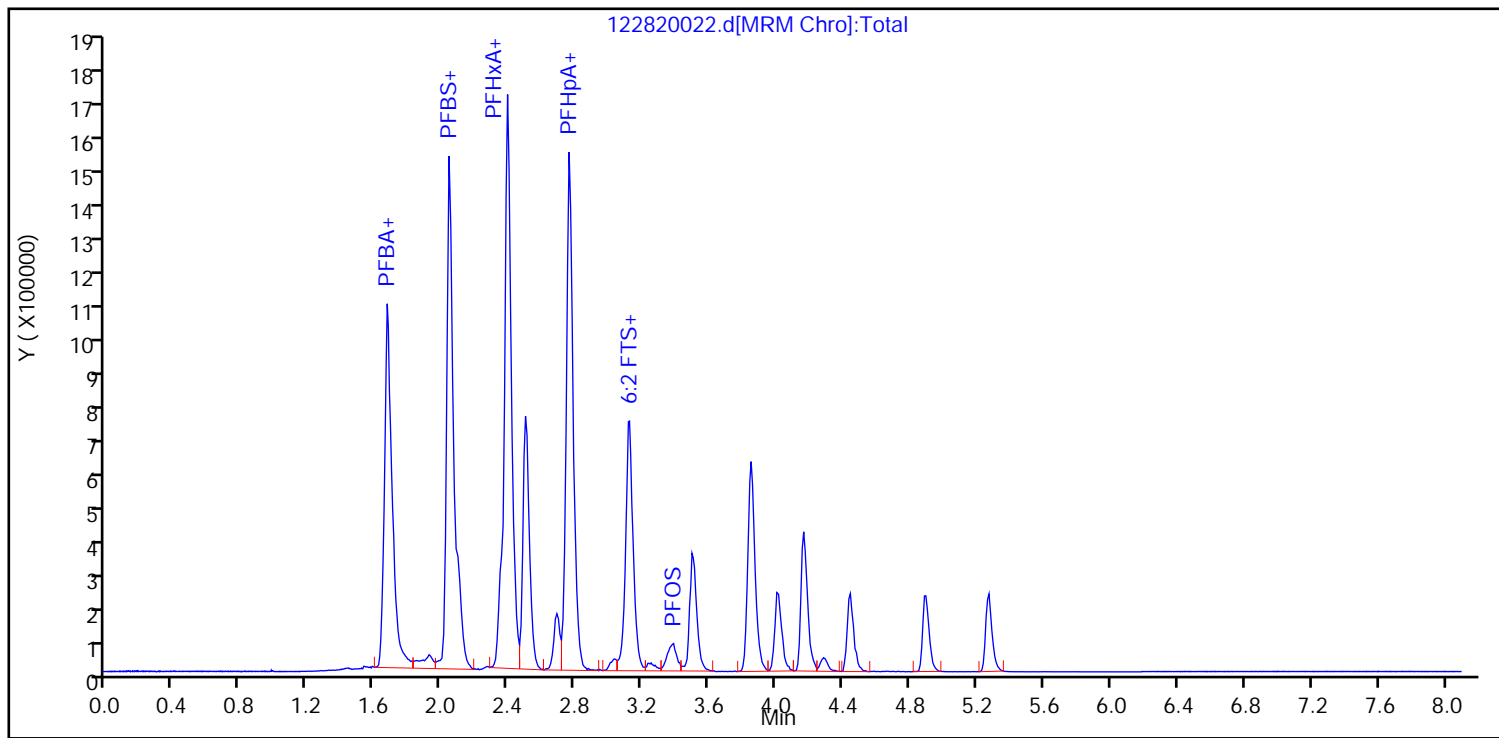
Client ID: FFS-MW04-1220

Lab ID: VL11043-002

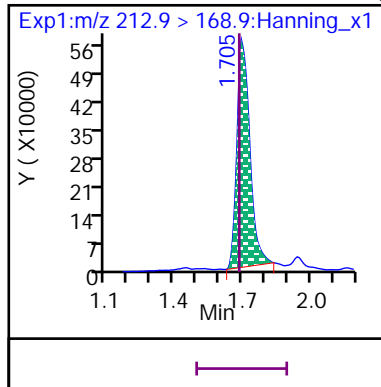
Sample Info: VL11043-002

Dil. Factor: 1

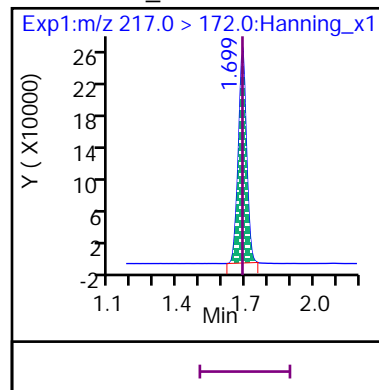
Operator: Matthew M. Miller



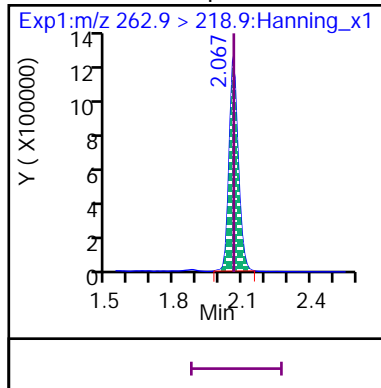
8 Perfluoro-n-butanoic acid (PFBA)



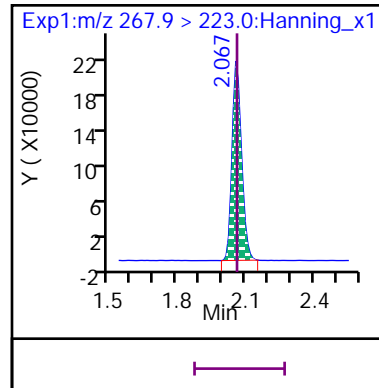
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

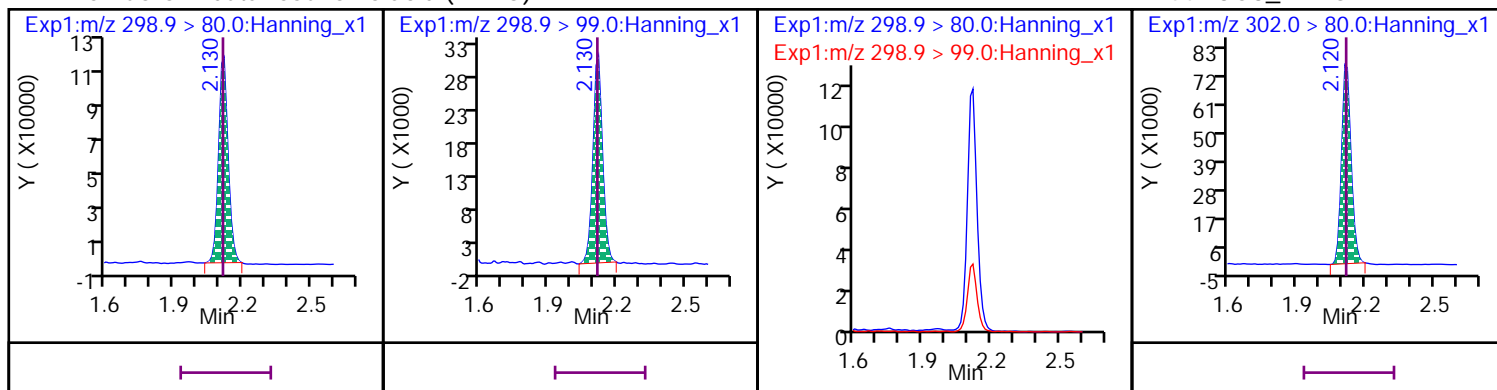


D 50 13C5\_PFPeA



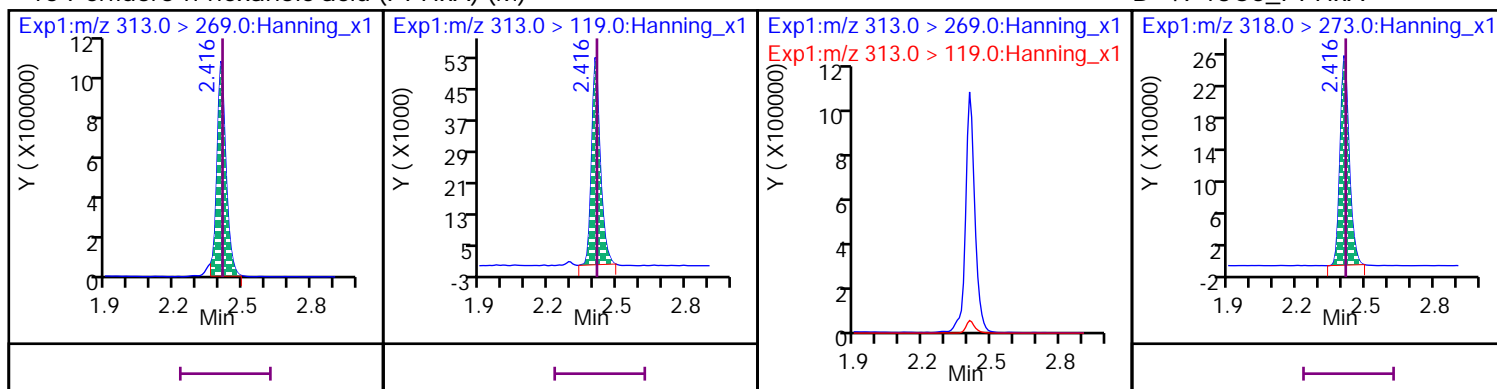
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



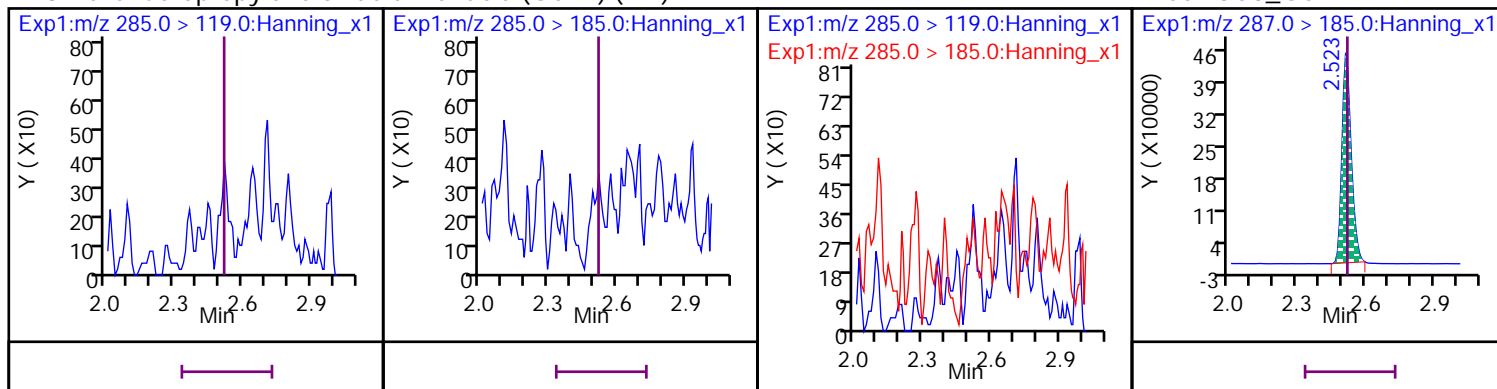
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



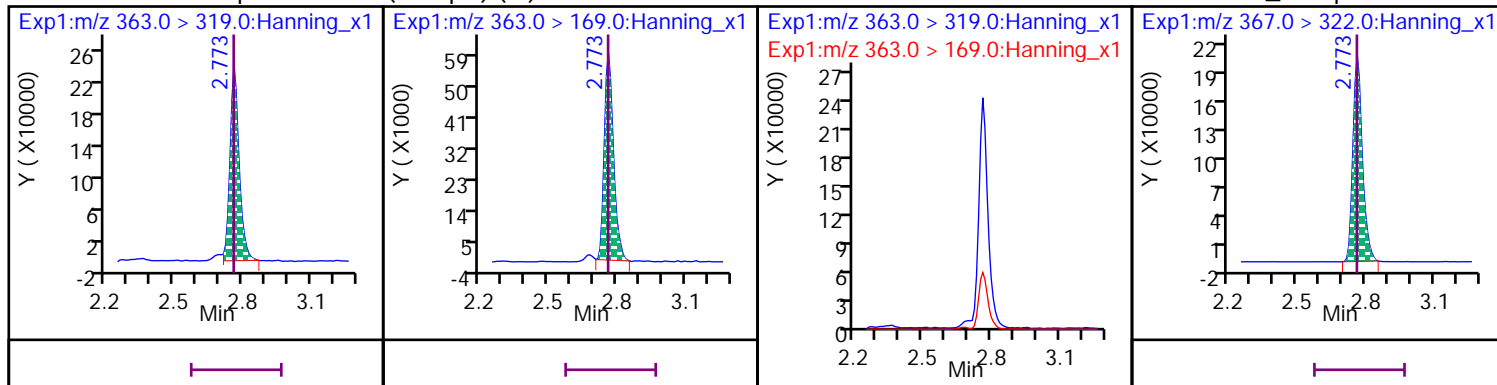
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



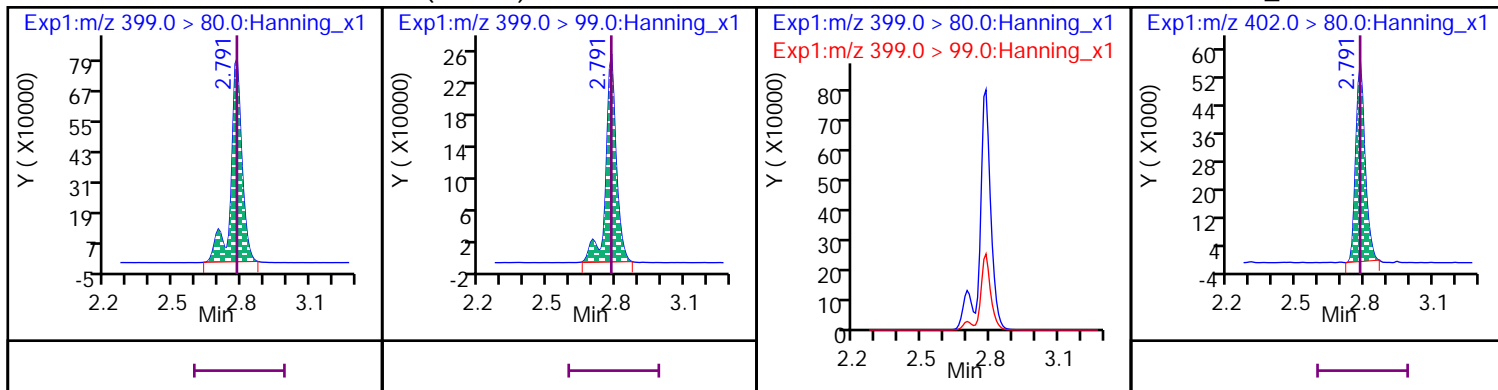
## 13 Perfluoro-n-heptanoic acid (PFHpA) (M)

D 47 13C4\_PFHpA



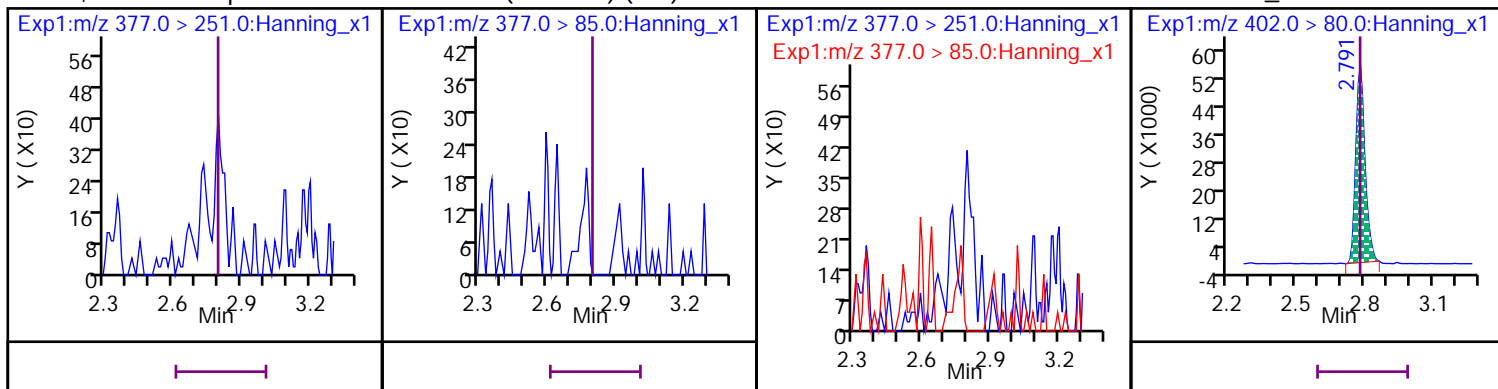
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



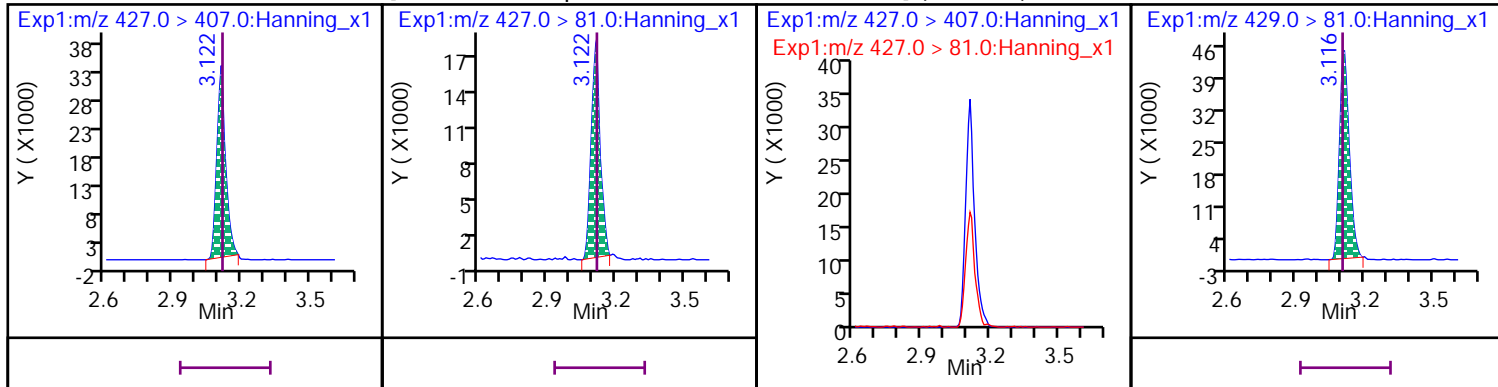
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



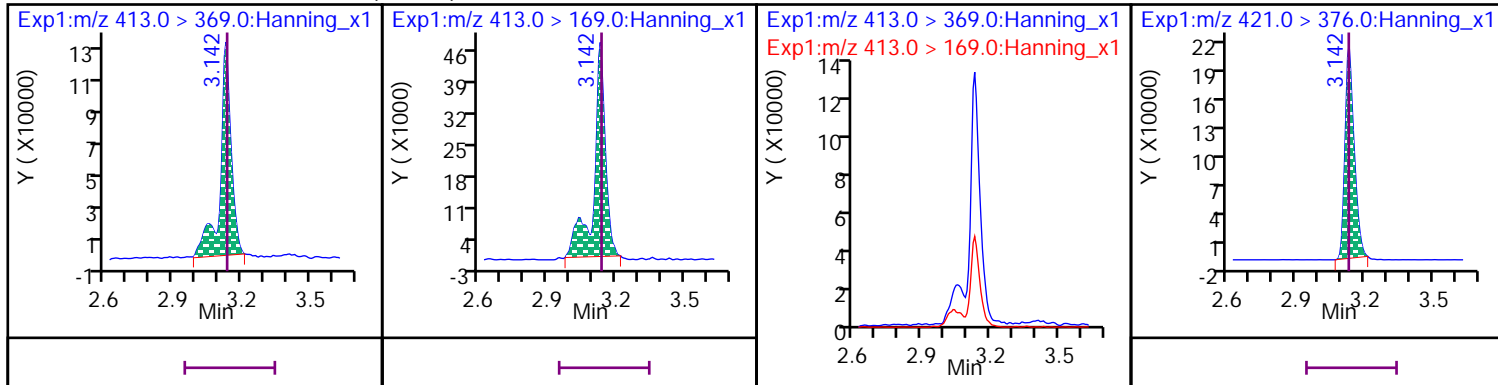
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



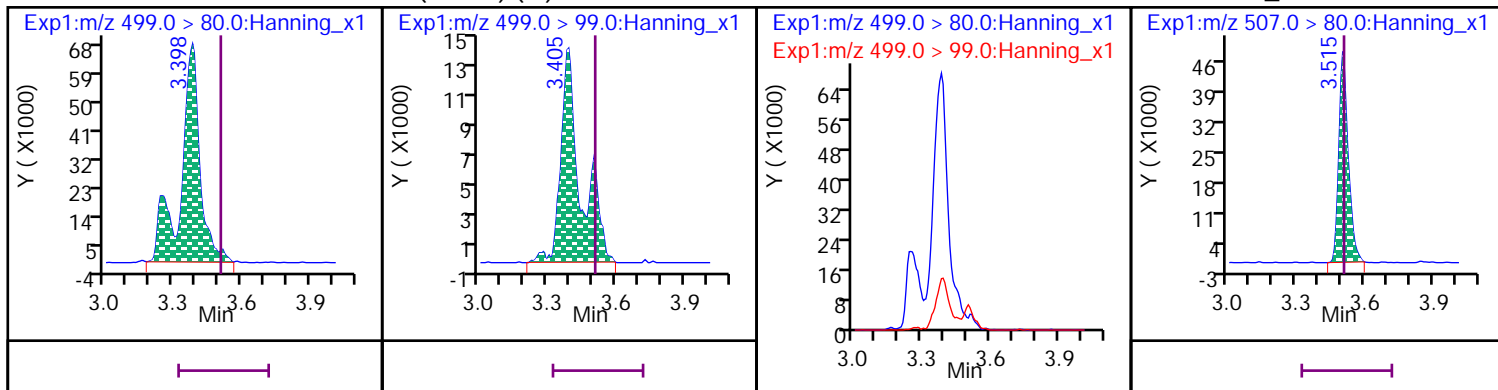
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



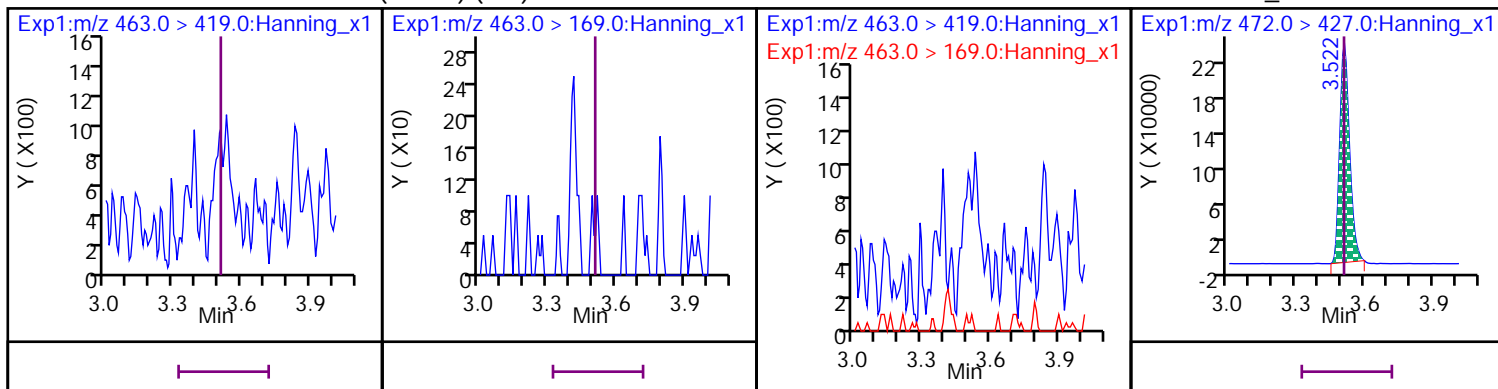
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



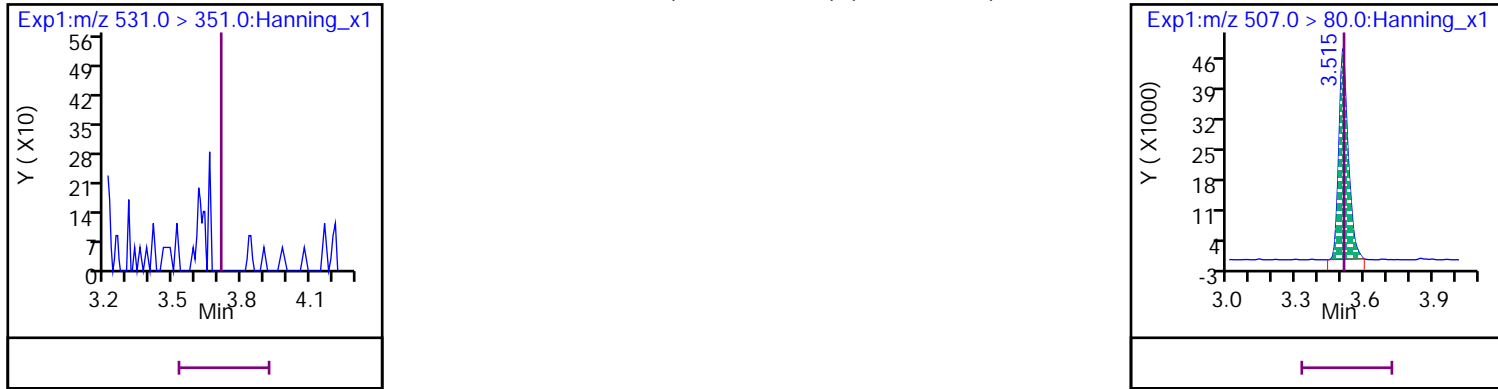
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



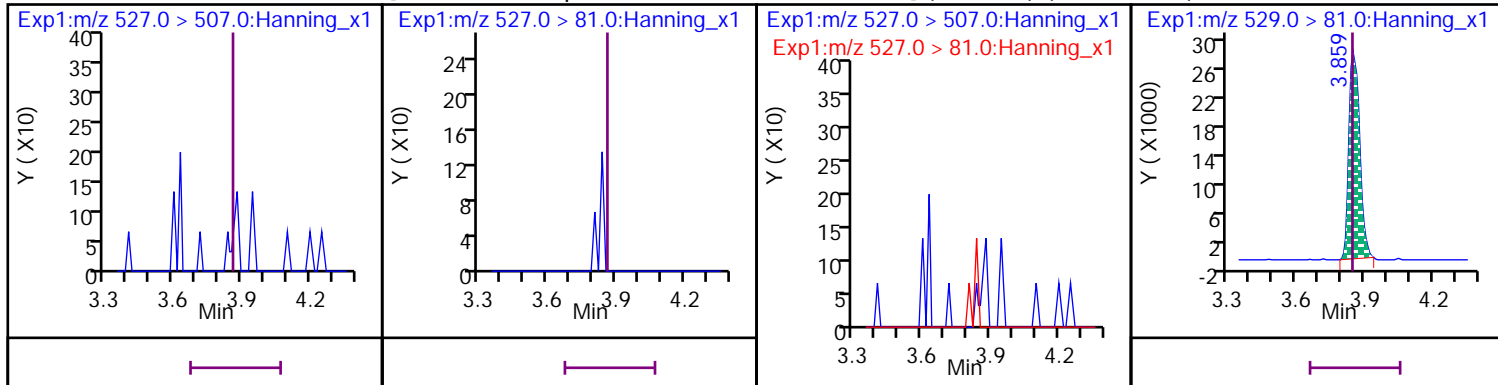
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



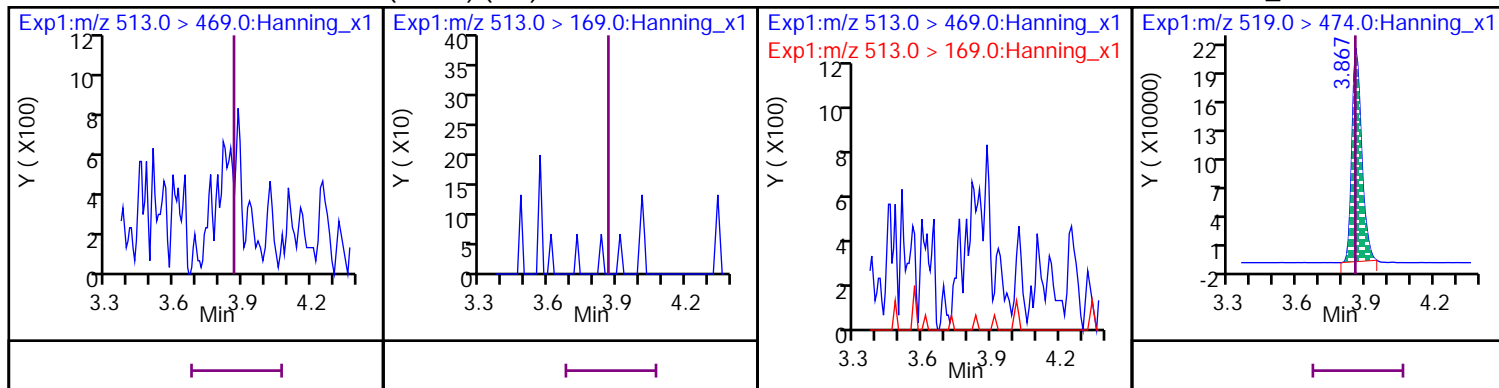
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ND)

D 54 13C2\_8:2 FTS\_2



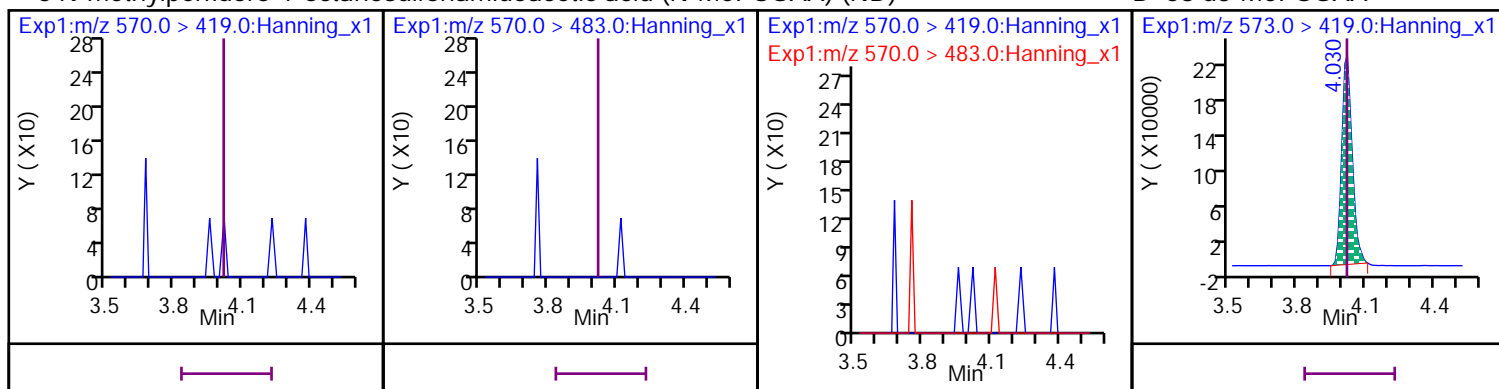
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



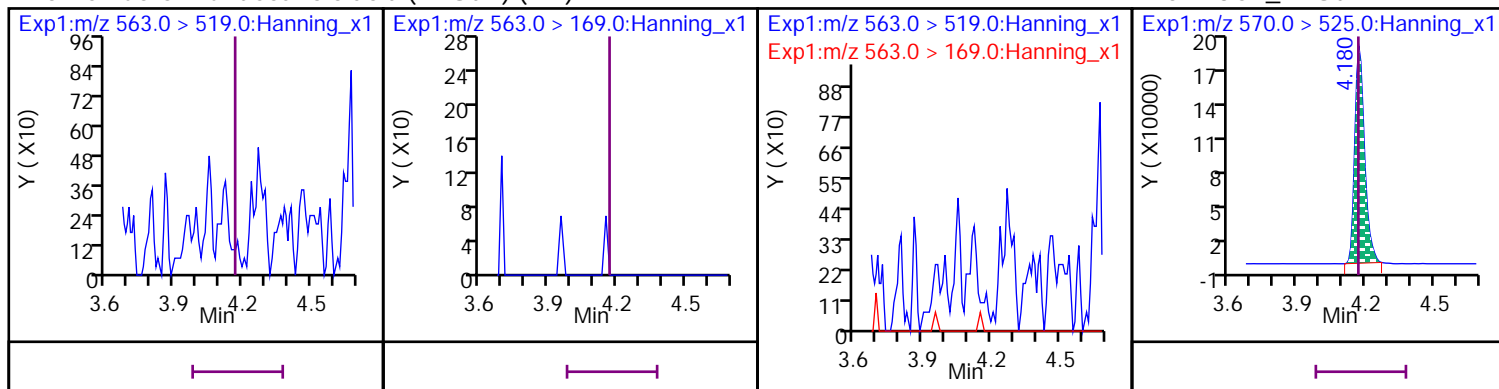
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



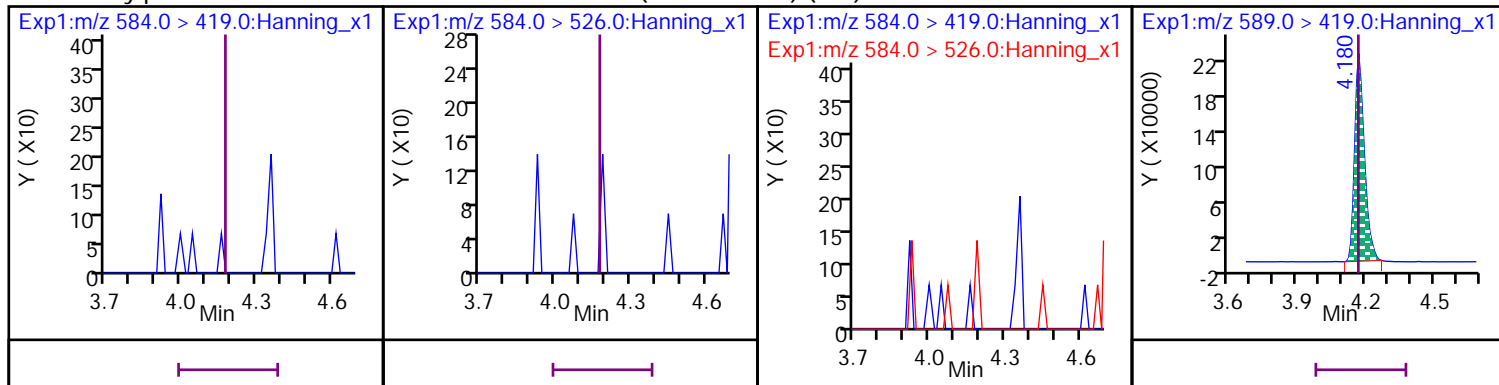
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

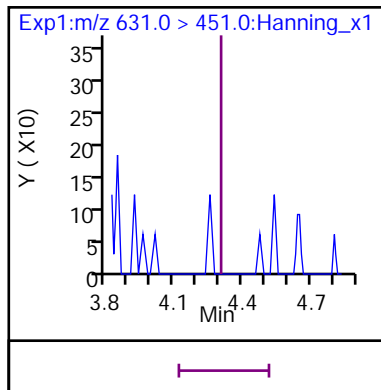


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

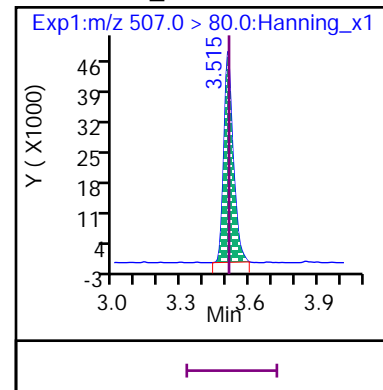
D 60 d5-EtFOSAA



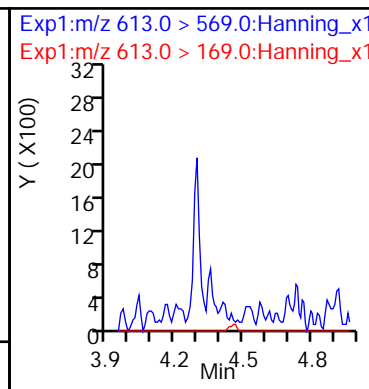
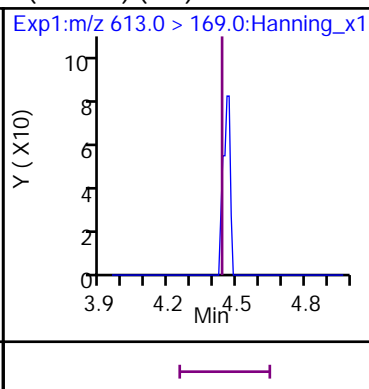
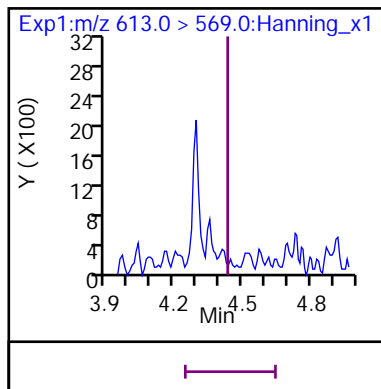
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



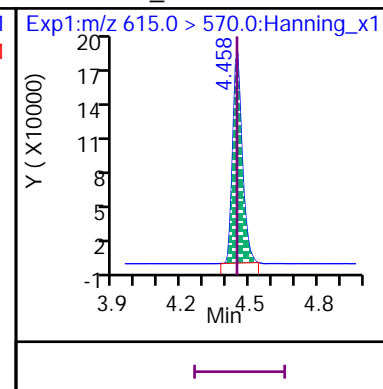
D 54 13C8\_PFOS



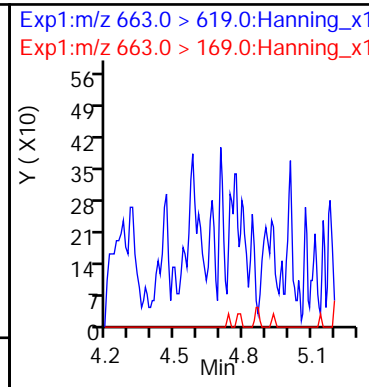
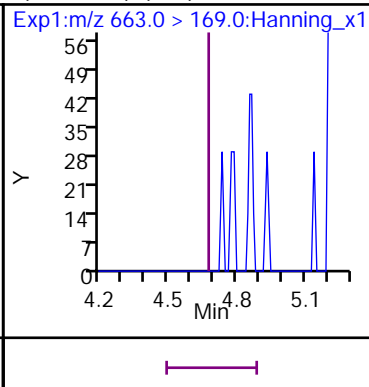
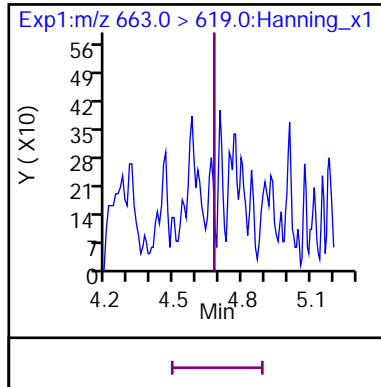
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



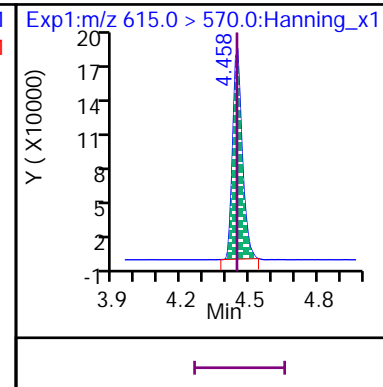
D 38 13C2\_PFDoA



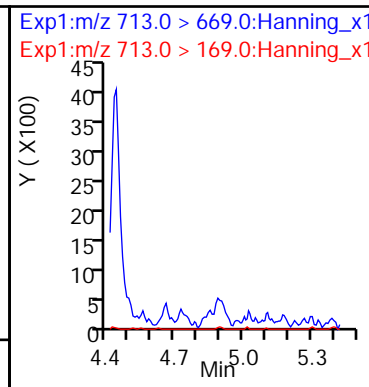
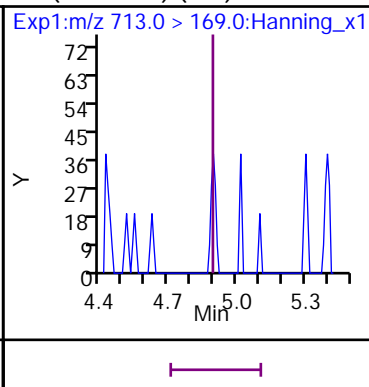
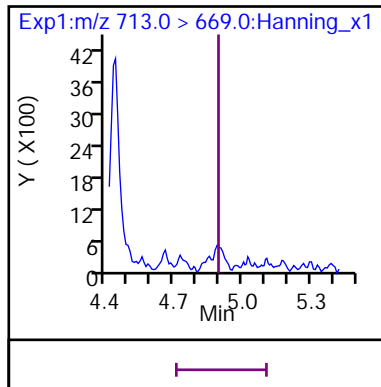
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



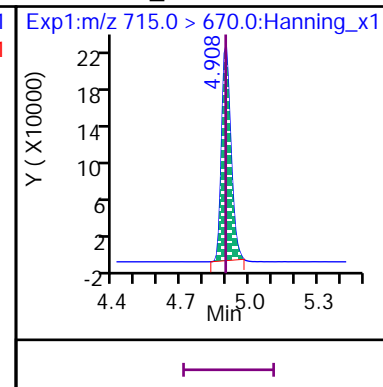
D 38 13C2\_PFDoA



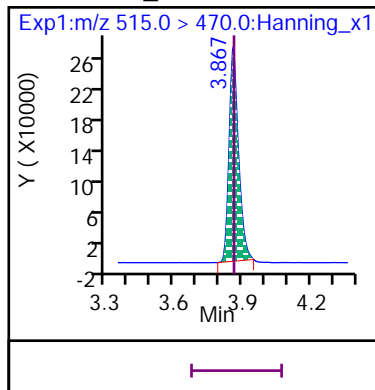
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



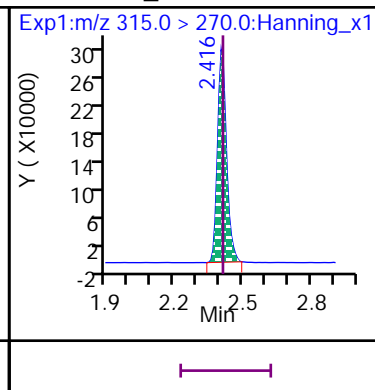
D 42 13C2\_PFTeDA



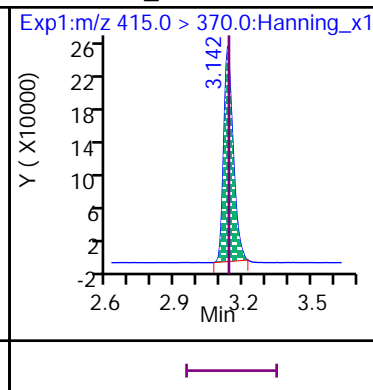
\* 37 13C2\_PFDA



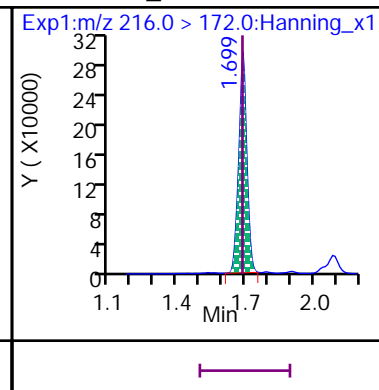
\* 39 13C2\_PFHxA



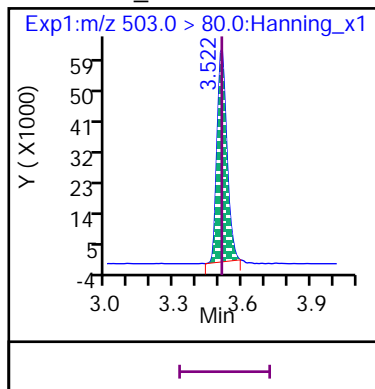
\* 41 13C2\_PFOA



\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d

Injection Date: 28-Dec-2020 12:56:08

Inst. ID: LCMSMS02

Client ID: FFS-MW04-1220

Lab ID: VL11043-002

Sample Info: VL11043-002

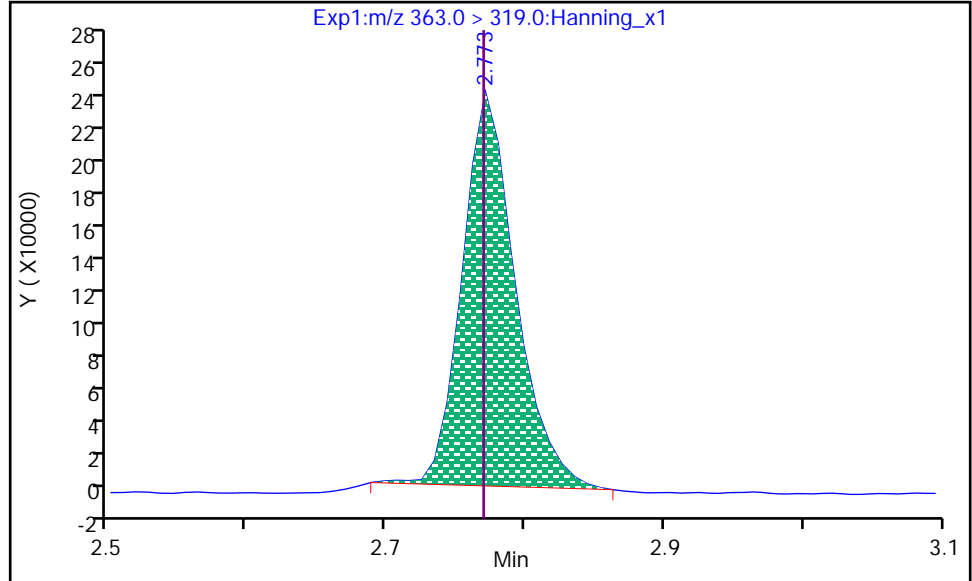
Dil. Factor: 1

Operator: Matthew M. Miller

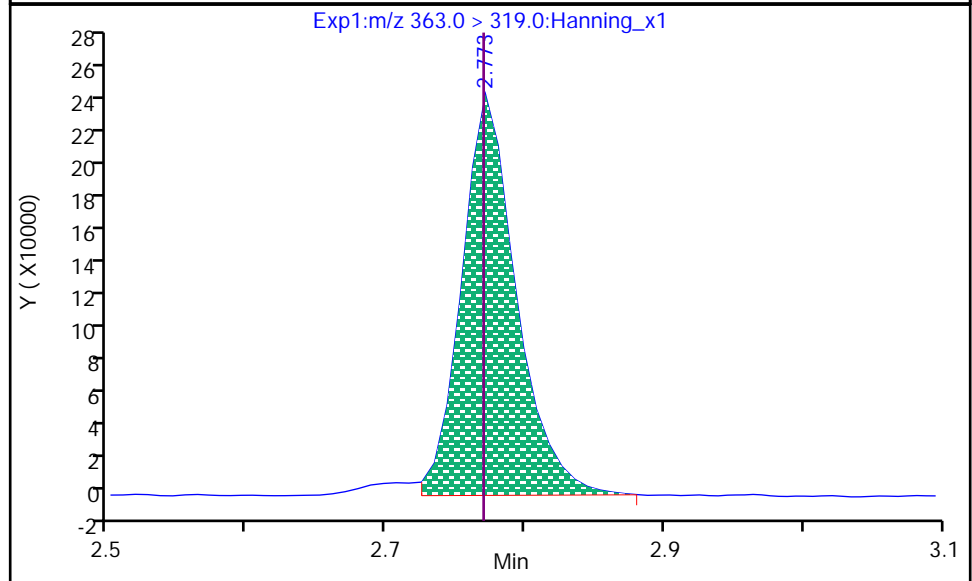
13 PFHpA, CAS: 375-85-9

RT: 2.773  
Area: 626854  
Conc: 40.354  
Conc Units: ng/L

Processing Integration Results



RT: 2.773  
Area: 653584  
Conc: 42.075  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:35:04

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d

Injection Date: 28-Dec-2020 12:56:08

Inst. ID: LCMSMS02

Client ID: FFS-MW04-1220

Lab ID: VL11043-002

Sample Info: VL11043-002

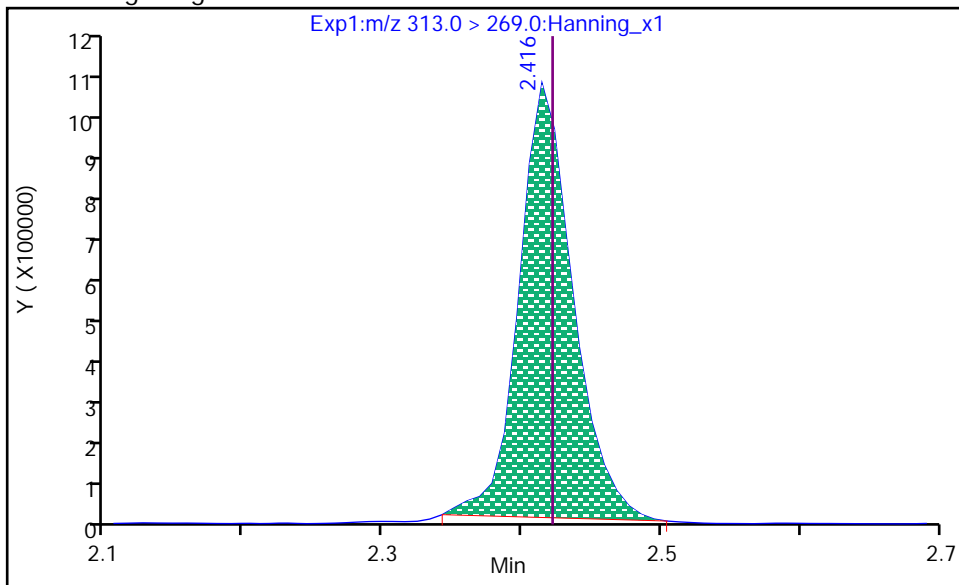
Dil. Factor: 1

Operator: Matthew M. Miller

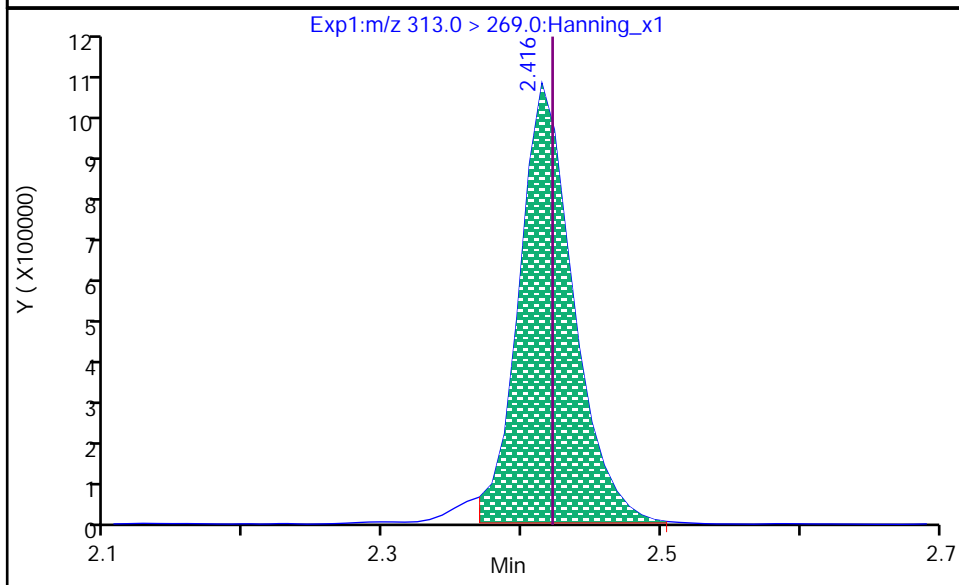
15 PFHxA, CAS: 307-24-4

Processing Integration Results

RT: 2.416  
Area: 2671399  
Conc: 146.36  
Conc Units: ng/L



RT: 2.416  
Area: 2707214  
Conc: 148.32  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:34:57

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d

Injection Date: 28-Dec-2020 12:56:08

Inst. ID: LCMSMS02

Client ID: FFS-MW04-1220

Lab ID: VL11043-002

Sample Info: VL11043-002

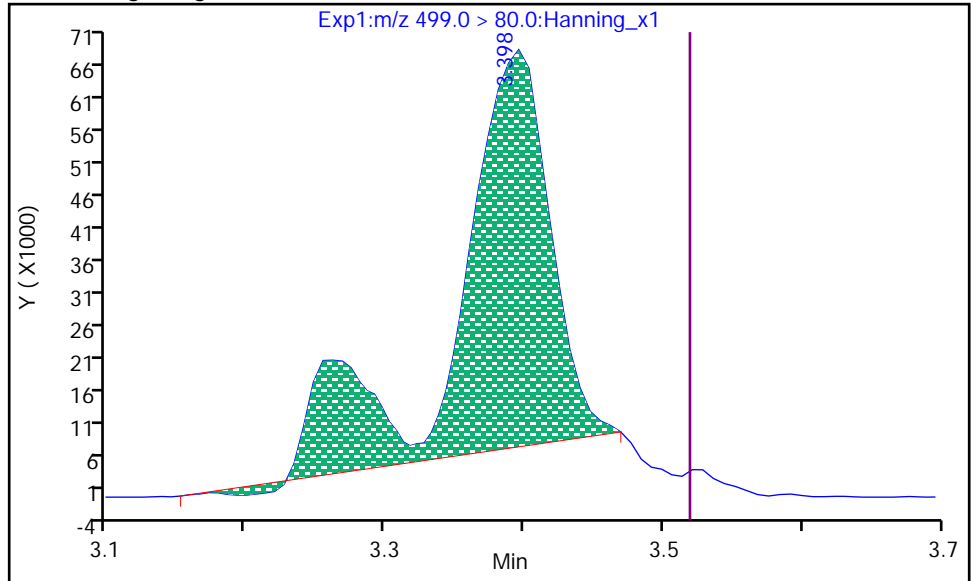
Dil. Factor: 1

Operator: Matthew M. Miller

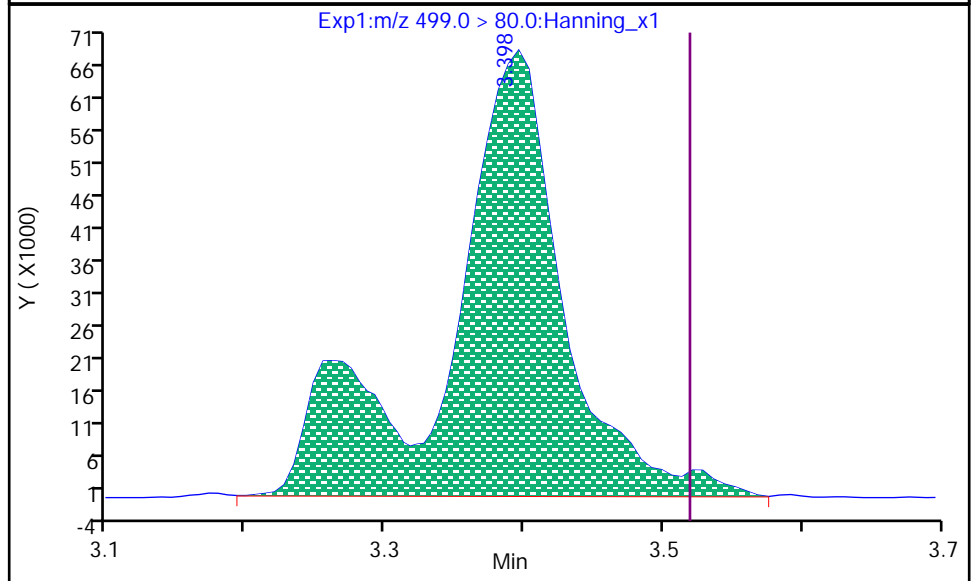
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.398  
Area: 281466  
Conc: 66.871  
Conc Units: ng/L



RT: 3.398  
Area: 393859  
Conc: 93.573  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:35:12

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820022.d

Injection Date: 28-Dec-2020 12:56:08

Inst. ID: LCMSMS02

Client ID: FFS-MW04-1220

Lab ID: VL11043-002

Sample Info: VL11043-002

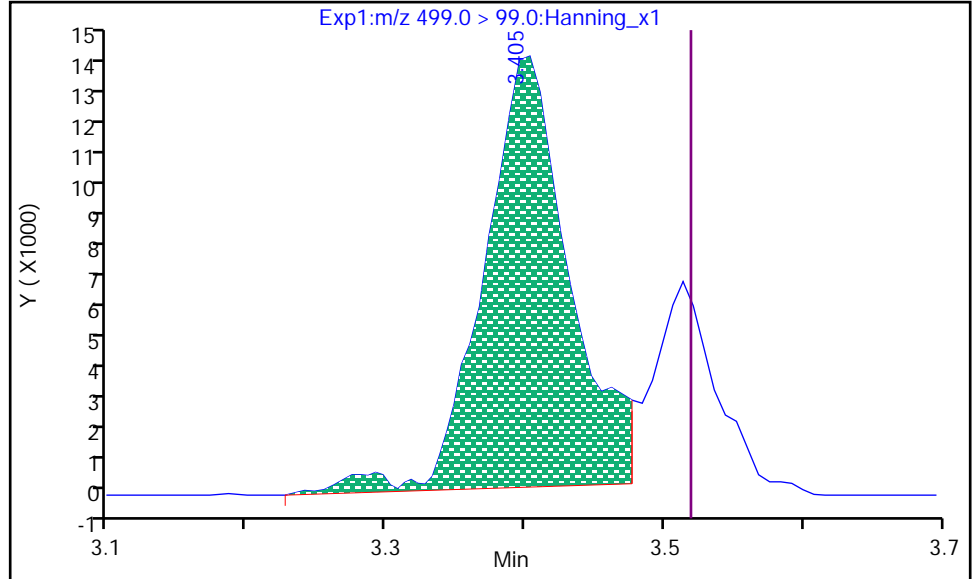
Dil. Factor: 1

Operator: Matthew M. Miller

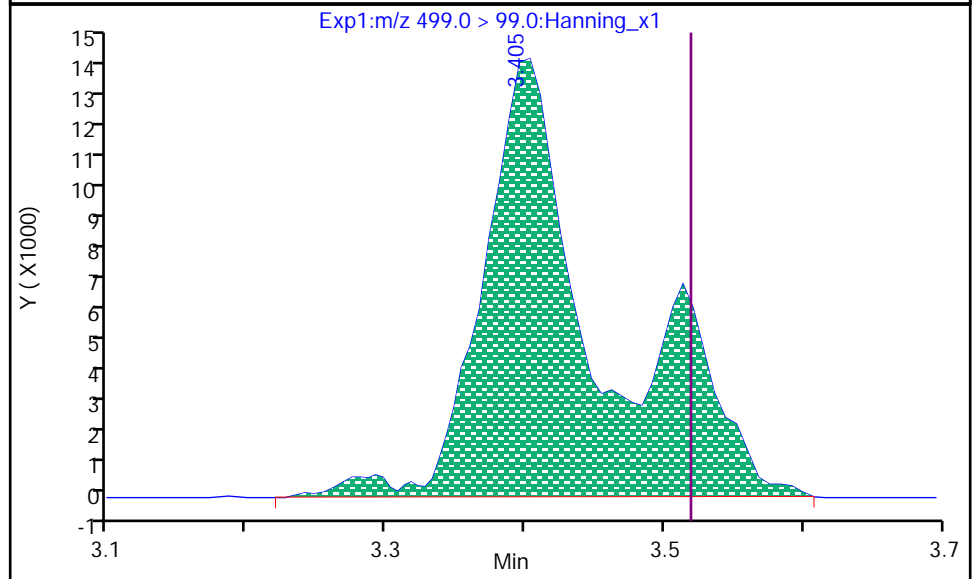
18 PFOS, CAS: 1763-23-1

RT: 3.405  
Area: 57501  
Conc: 93.573  
Conc Units: ng/L

Processing Integration Results



RT: 3.405  
Area: 80801  
Conc: 93.573  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:35:16

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-003</b>
Description: <b>JAW-63-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0850</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1317	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>2.7</b>	<b>J</b>	<b>7.0</b>	<b>3.5</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>5.7</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>110</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>4.3</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>1.5</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>17</b>		<b>3.5</b>	<b>1.8</b>	<b>0.87</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		80	50-150
13C2_PFDaA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		90	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		86	50-150
13C8_PFOs		88	50-150
13C9_PFNa		88	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820024.d  
 Injection Date: 28-Dec-2020 13:17:18 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 16  
 Lab Sample ID: VL11043-003 Lab Prep. Batch: 77741  
 Client ID: JAW-63-1220 Sample Group: VL11043  
 Sample Info: VL11043-003 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0384231$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	286	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	-----------------	-----------------	------	-------

**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 663543 22 >100:1 1001.00 956.73 102

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/0 33709 19 11:1 51.057 1.9618 J

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 617864 18 >100:1 1001.00 898.21 92.8

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/1 16940 15 20:1 27.297 1.0488 J

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 214948 17 >100:1 1001.00 933.62 90.2

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 37412 18 36:1 Target = 3.34  
 298.9 > 99 44 2.130 2.125 12099 16 67:1 3.09 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 655760 19 >100:1 1001.00 889.68 88.2

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.423 0/0 71599 16 82:1 Target = 17.01  
 313 > 119 49 2.416 2.423 4079 22 31:1 17.55 (8.50-25.52) M

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1280055 18 >100:1 5005.00 4805.84 91.4

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 548412 19 >100:1 1001.00 904.00 86.5

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 ND U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 167186 17 >100:1 1001.00 976.39 96

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.791 2.790 1/0 513622 27 >100:1 Target = 3.80 0.16 2900.38 111.44  
 399 > 99 45 2.791 2.790 150053 27 >100:1 3.42 (1.90-5.71) 0.11

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	96399	24	>100:1			5005.00	5005.56	92.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													J
427 > 407	64	3.115	3.128	0/-1	3818	20	14:1	Target = 1.77		69.527	2.6714		
427 > 81	64	3.115	3.128		1731	17	14:1	2.20 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	538953	22	>100:1			1001.00	910.60	85.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													J
413 > 369	53	3.142	3.148	0/-1	21759	51		Target = 2.85	0.16	39.642	1.5232		
413 > 169	53	3.155	3.148		6070	31	16:1	3.58 (1.42-4.28)	0.28				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	134542	22	>100:1			1001.00	897.37	88.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	72108	55	>100:1	Target = 6.80	9.21	452.74	17.396		
499 > 99	54	3.507	3.520		14287	33		5.04 (3.40-10.20)	1.56				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroicosadecafluoro-3-oxadecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	672578	22	>100:1			1001.00	895.62	87.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	80565	21				5005.00	4343.09	80.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	610130	21	>100:1			1001.00	919.80	90.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	713472	17				5005.00	4970.57	90.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	636409	18	>100:1			5005.00	4791.71	87	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	557988	19	>100:1			1001.00	882.79	86.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDdA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	512452	19	>100:1			1001.00	846.58	83.8	
<b>11 Perfluoro-n-dodecanoic acid (PFDdA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	693723	18	>100:1			1001.00	823.47	85.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	680531	21	>100:1					92.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	744604	18	>100:1					102	

Data File: \\ORGANICS\ILL\LCMSMS02.1\122820-DOD.b\122820024.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	628687	24	>100:1					105	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	682916	22	>100:1					112	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	158439	20	>100:1					97.2	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

J - Compound Concentration Below Quantitation Limit

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820024.d

Injection Date: 28-Dec-2020 13:17:18

Inst. ID: LCMSMS02

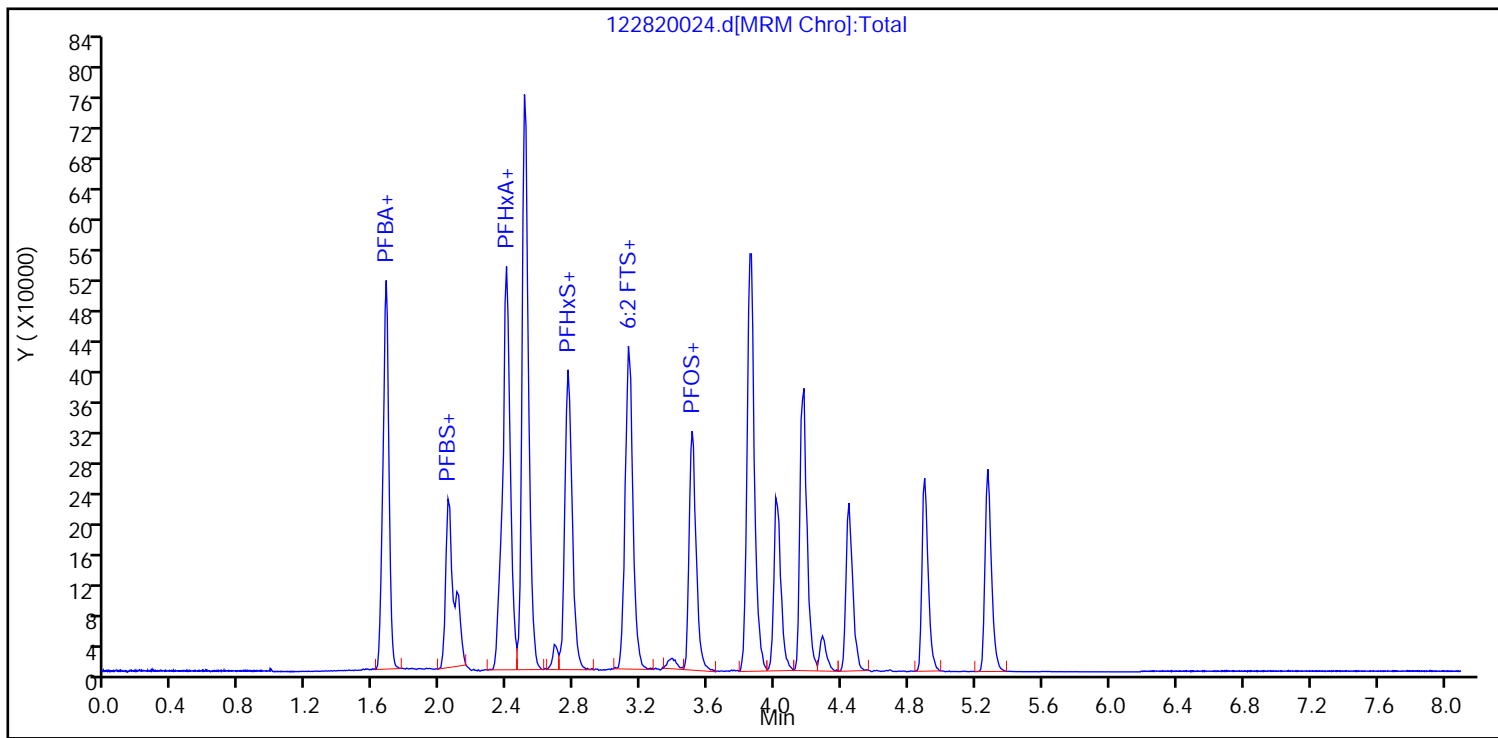
Client ID: JAW-63-1220

Lab ID: VL11043-003

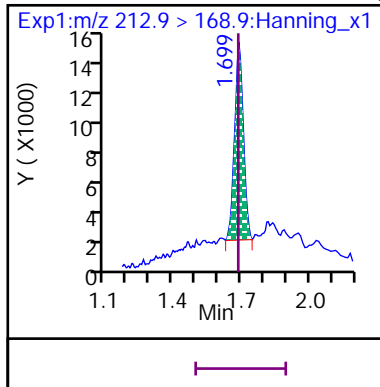
Sample Info: VL11043-003

Dil. Factor: 1

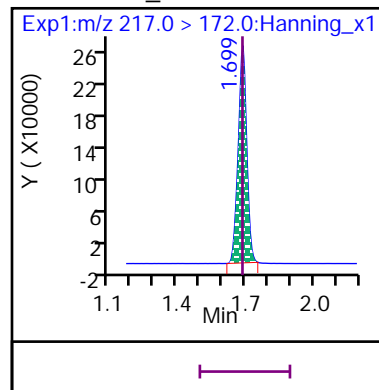
Operator: Matthew M. Miller



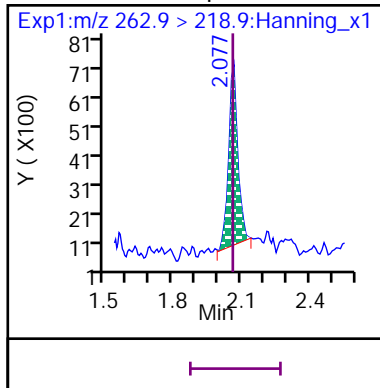
8 Perfluoro-n-butanoic acid (PFBA)



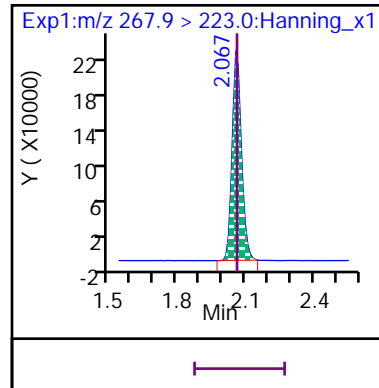
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



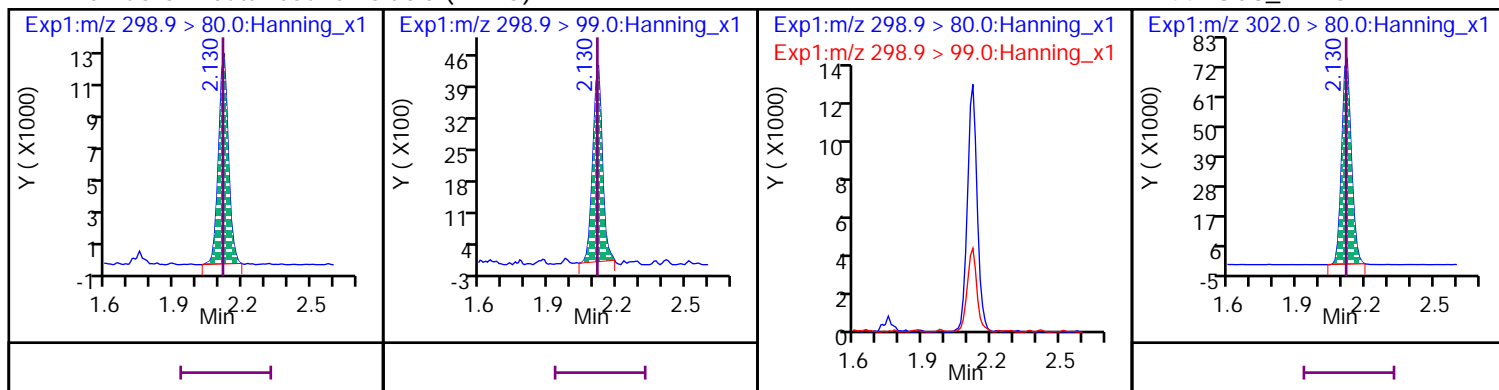
D 50 13C5\_PFPeA





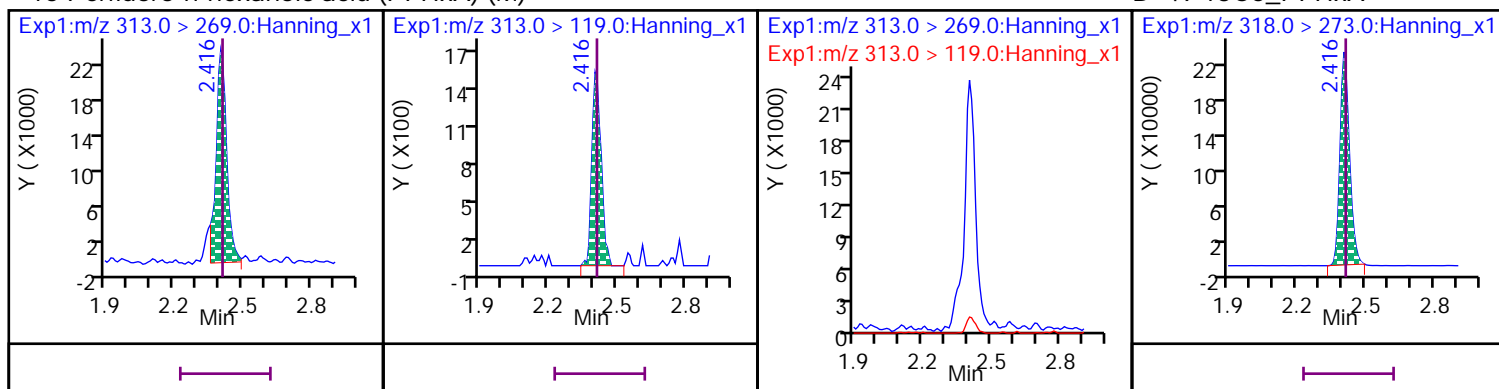
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



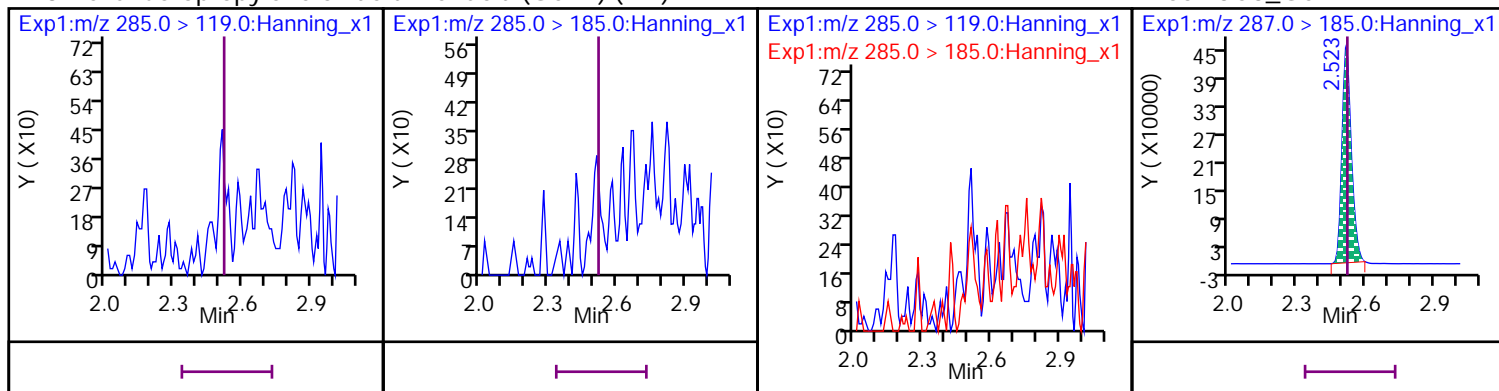
## 15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



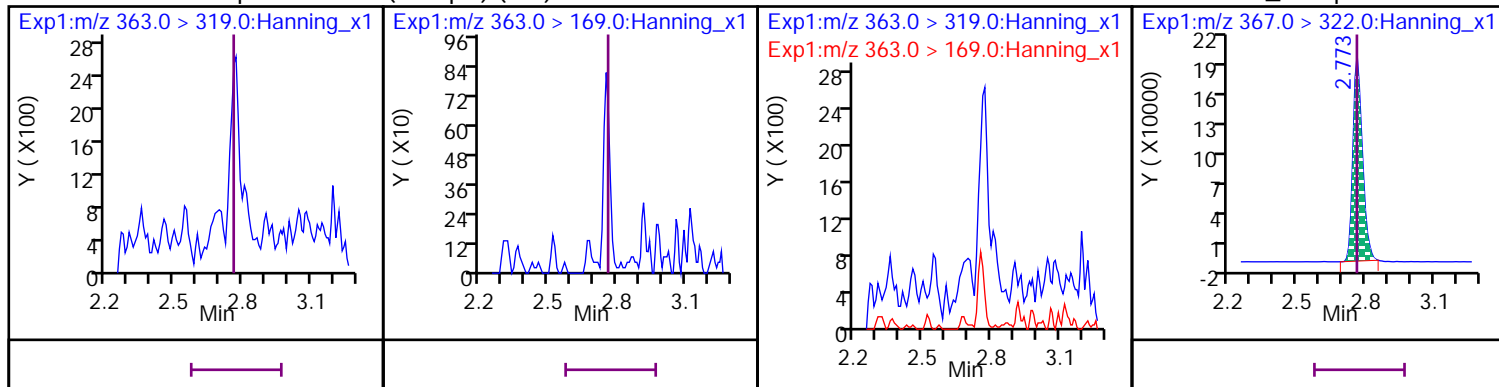
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



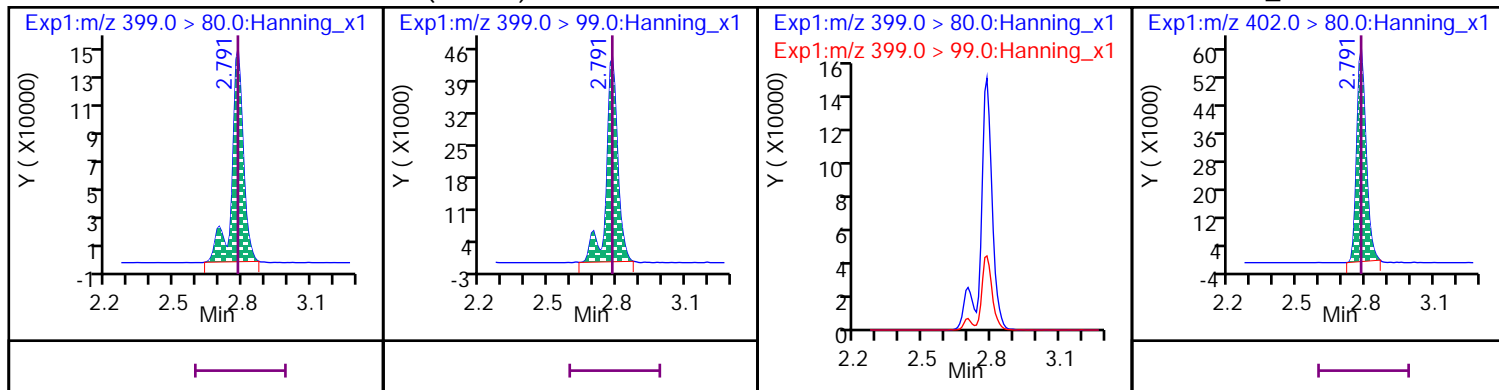
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



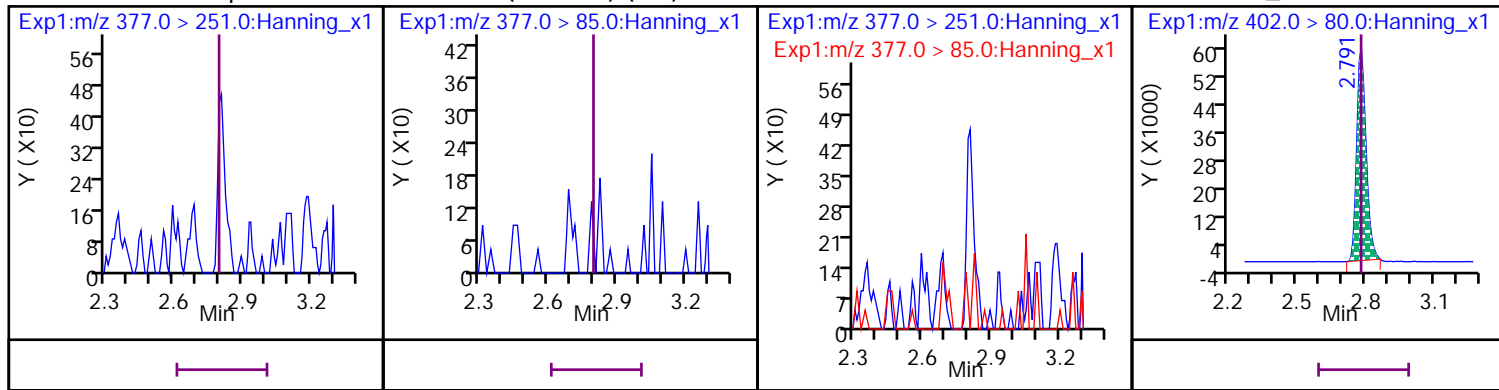
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



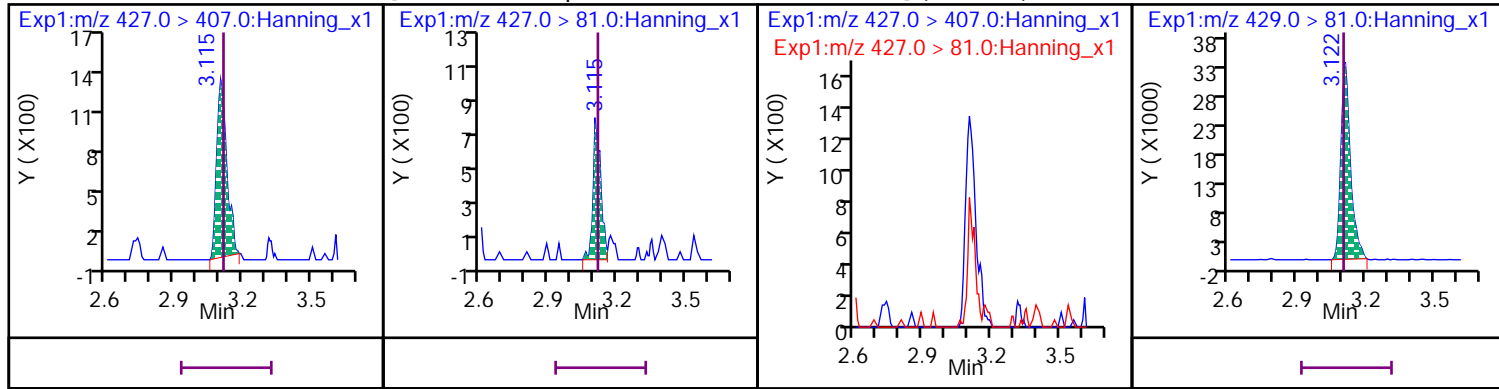
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



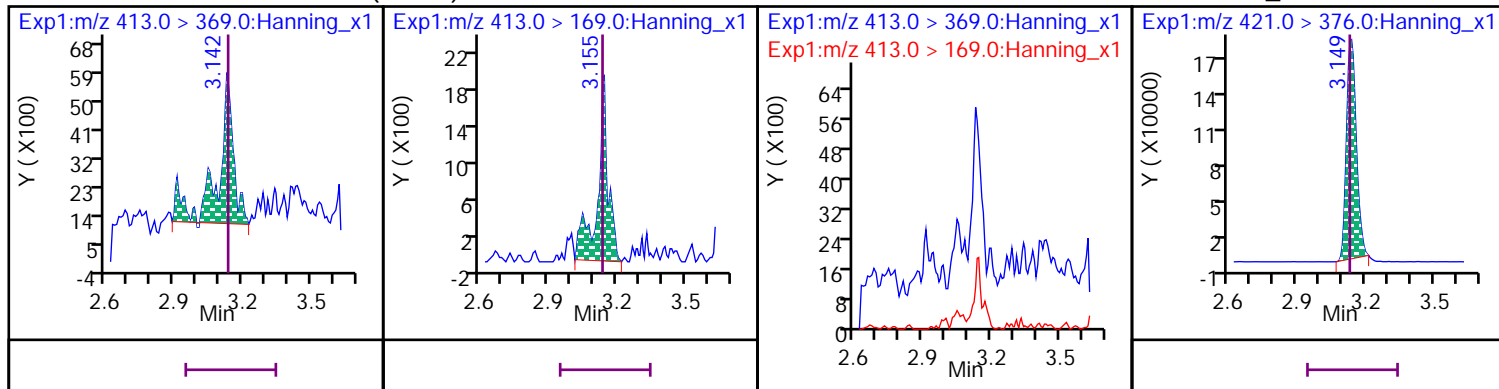
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



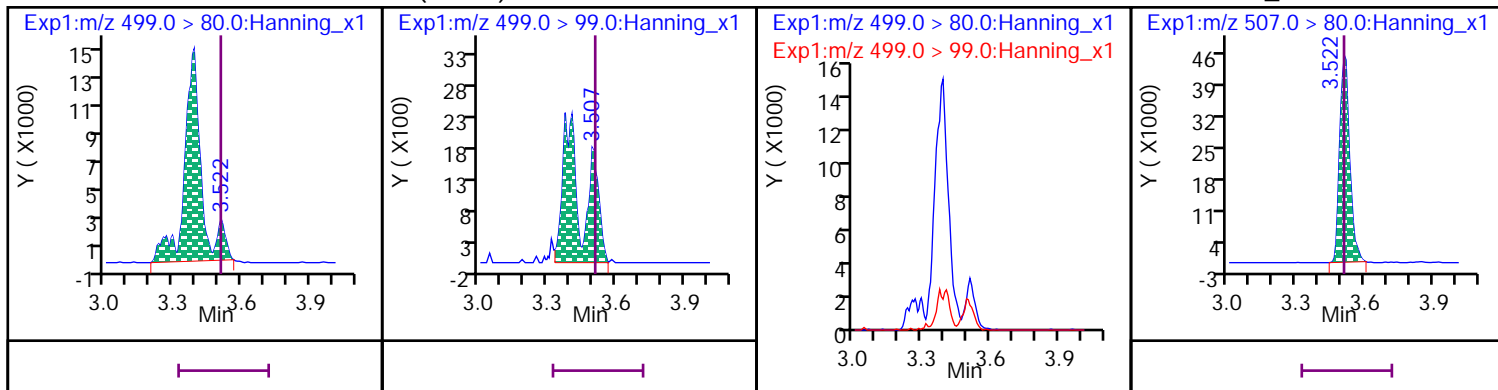
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



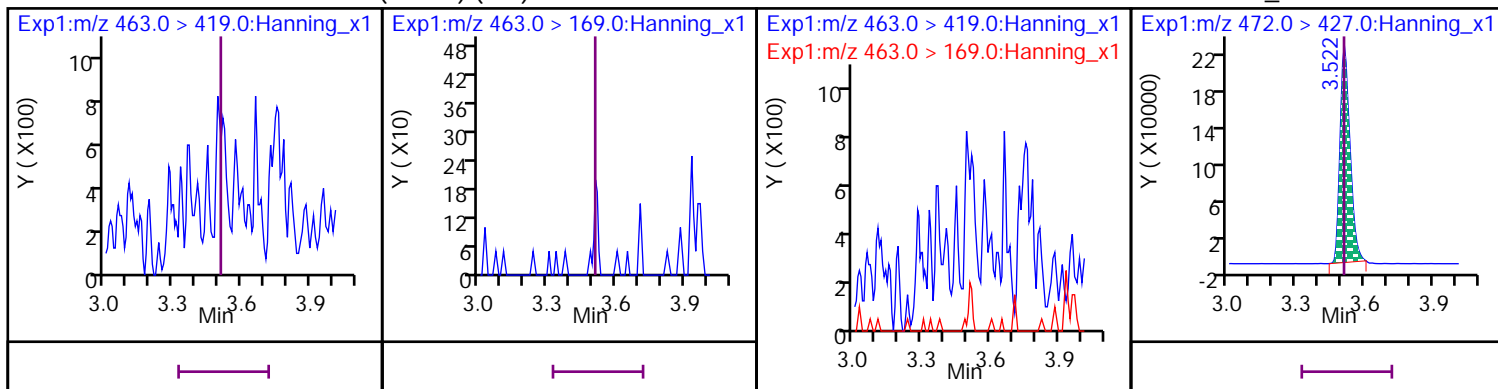
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



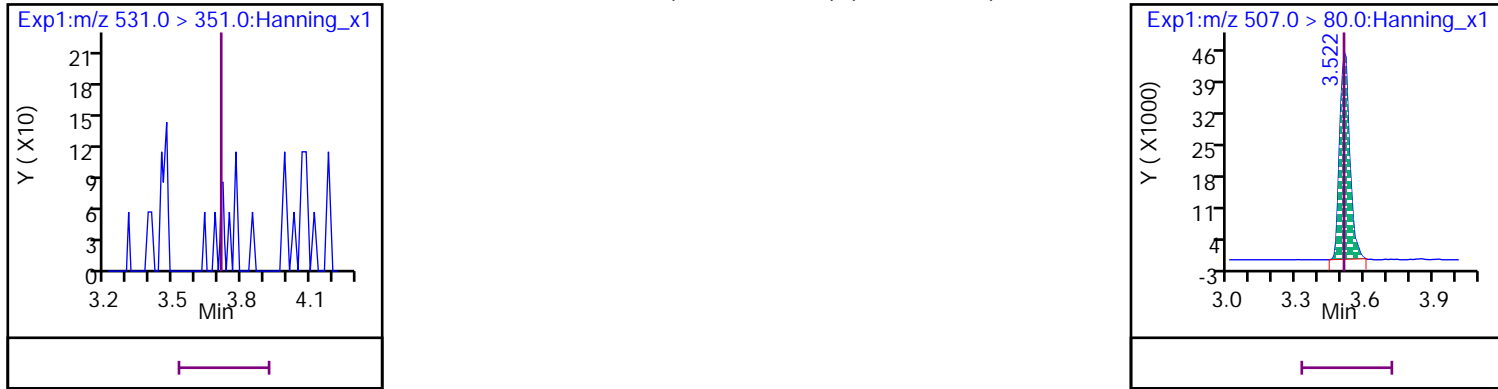
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



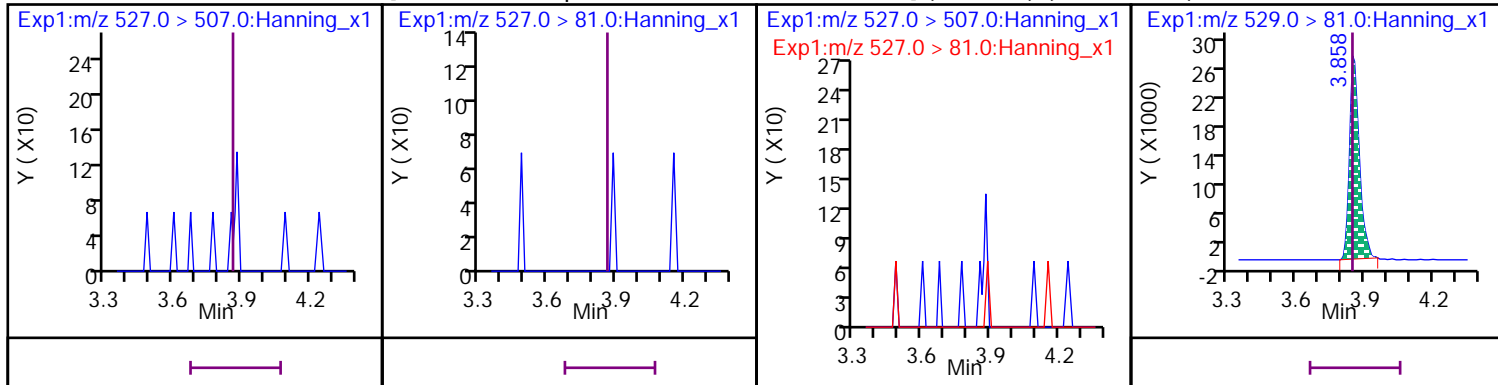
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



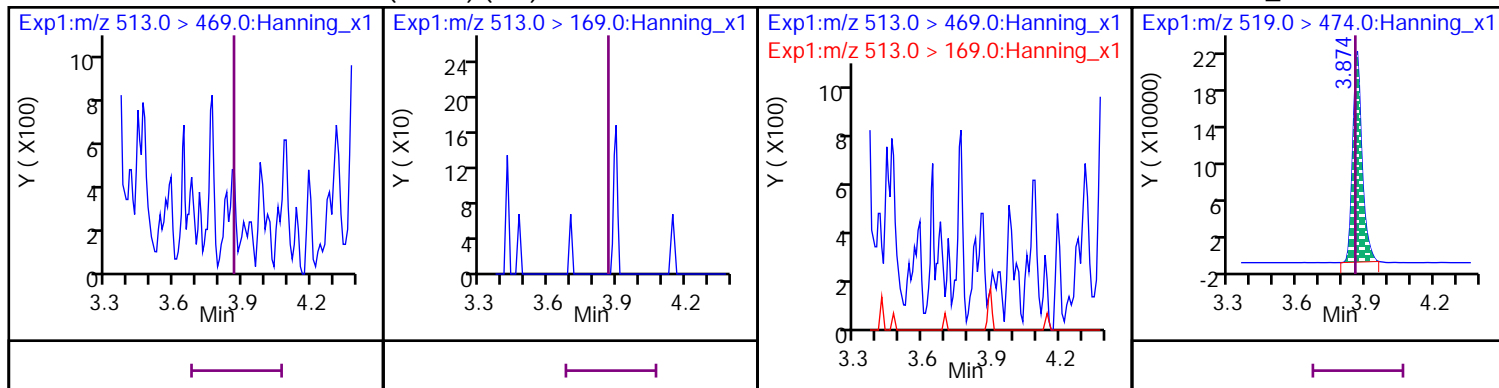
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ND)

D 55 13C2\_8:2 FTS\_2



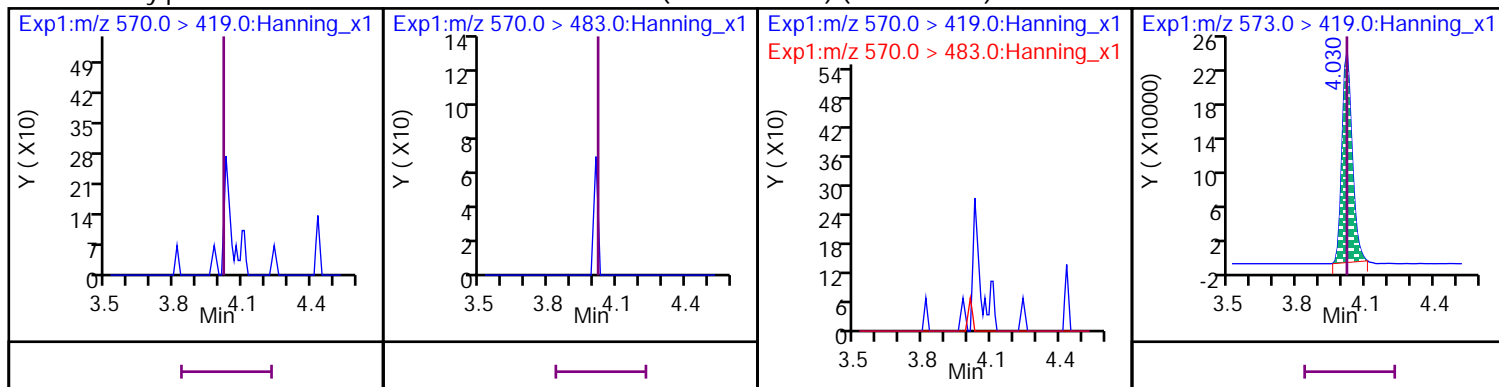
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



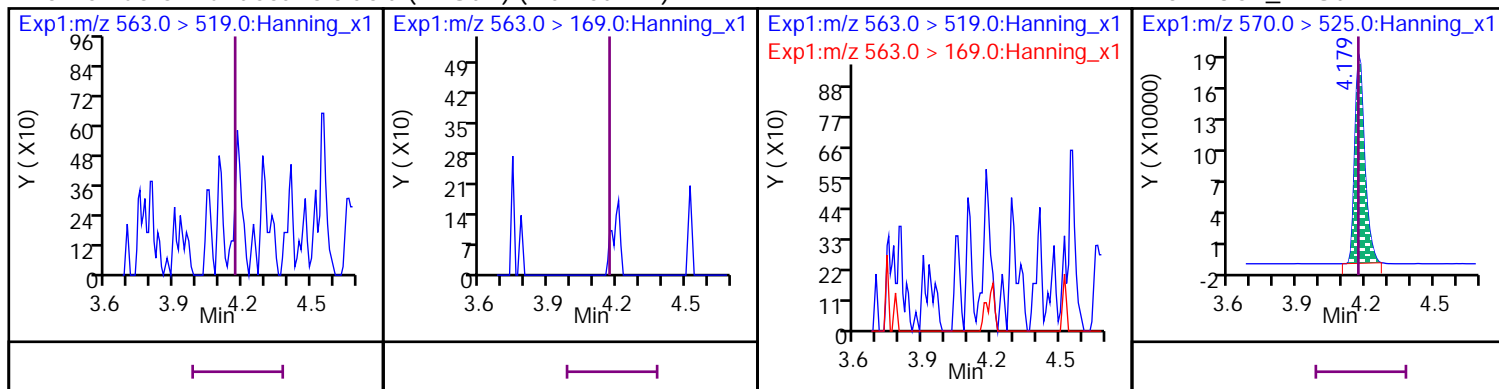
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



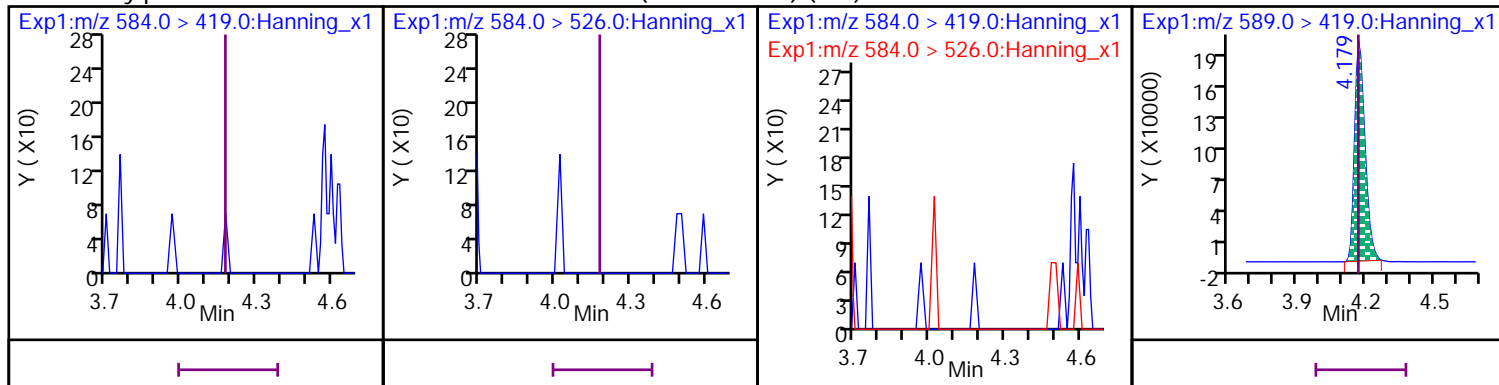
## 25 Perfluoro-n-undecanoic acid (PFUdA) (Marked ND)

D 52 13C7\_PFUdA

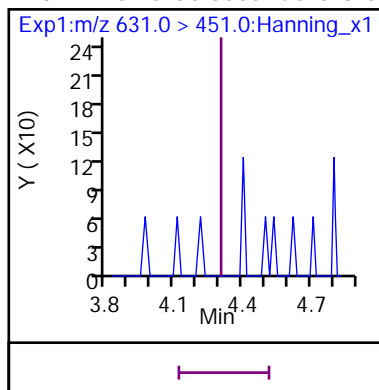


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

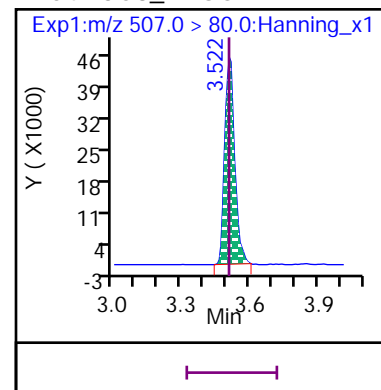
D 60 d5-EtFOSAA



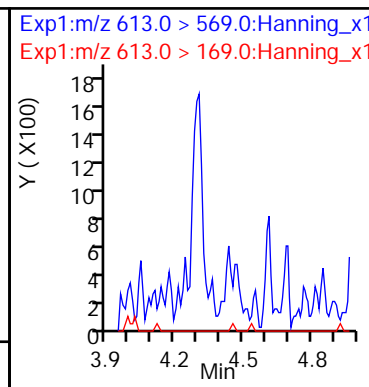
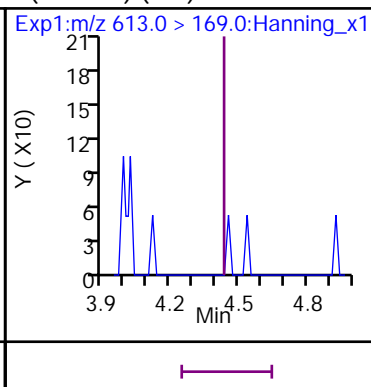
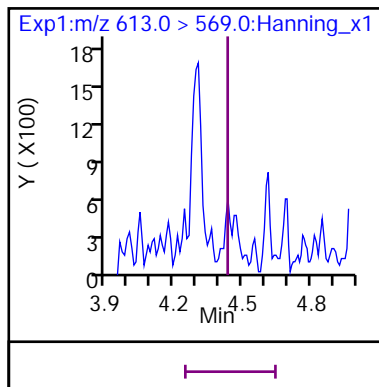
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



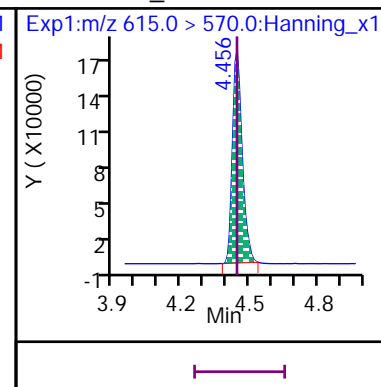
## D 54 13C8\_PFOS



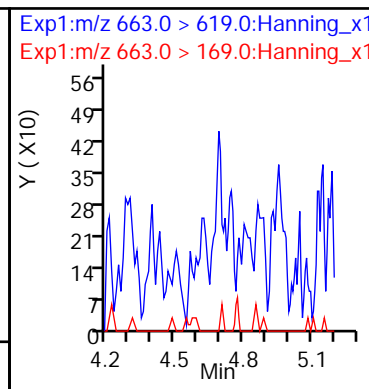
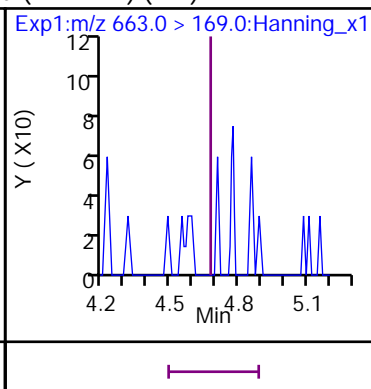
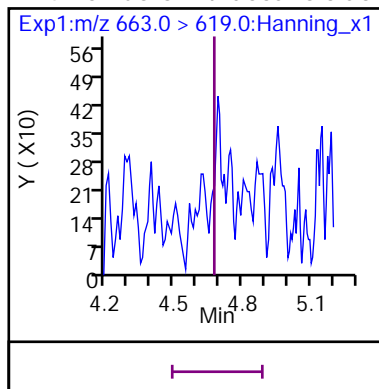
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



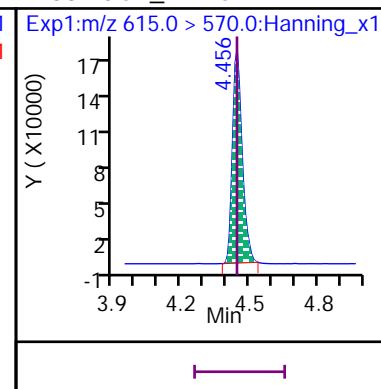
## D 38 13C2\_PFDoA



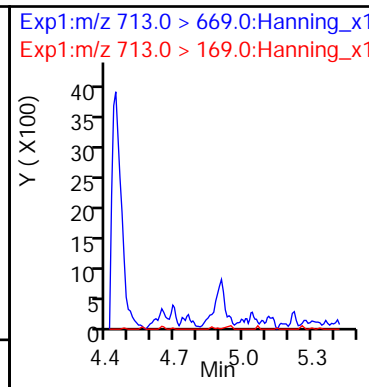
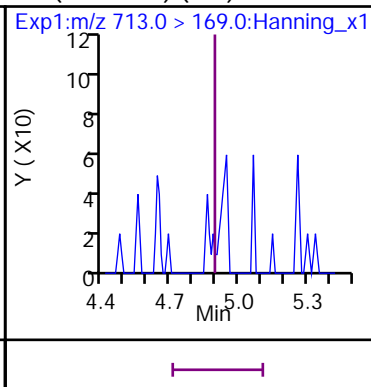
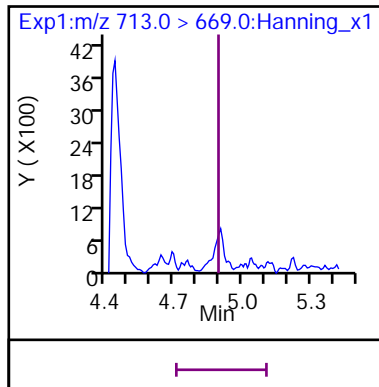
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



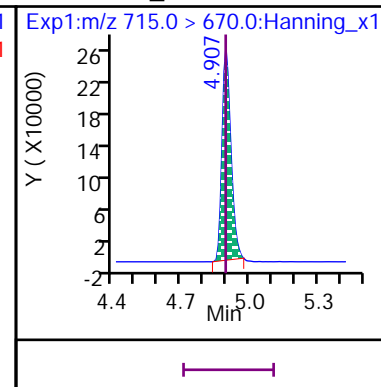
## D 38 13C2\_PFDoA



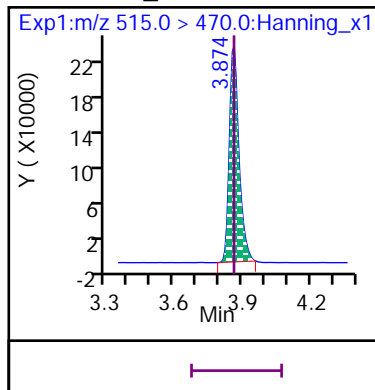
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



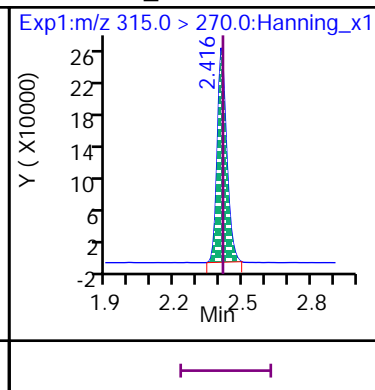
## D 42 13C2\_PFTeDA



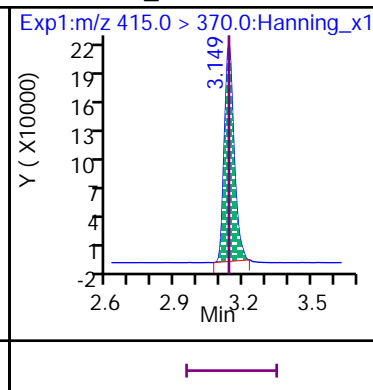
\* 37 13C2\_PFDA



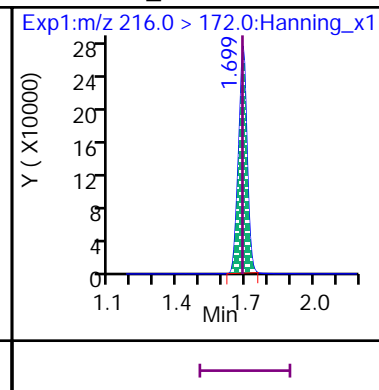
\* 39 13C2\_PFHxA



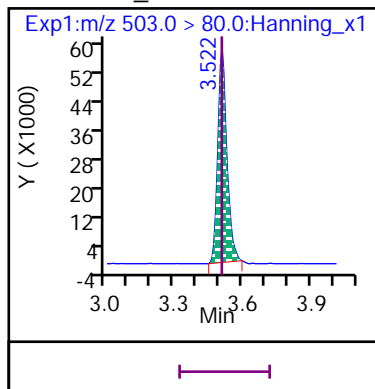
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820024.d

Injection Date: 28-Dec-2020 13:17:18

Inst. ID: LCMSMS02

Client ID: JAW-63-1220

Lab ID: VL11043-003

Sample Info: VL11043-003

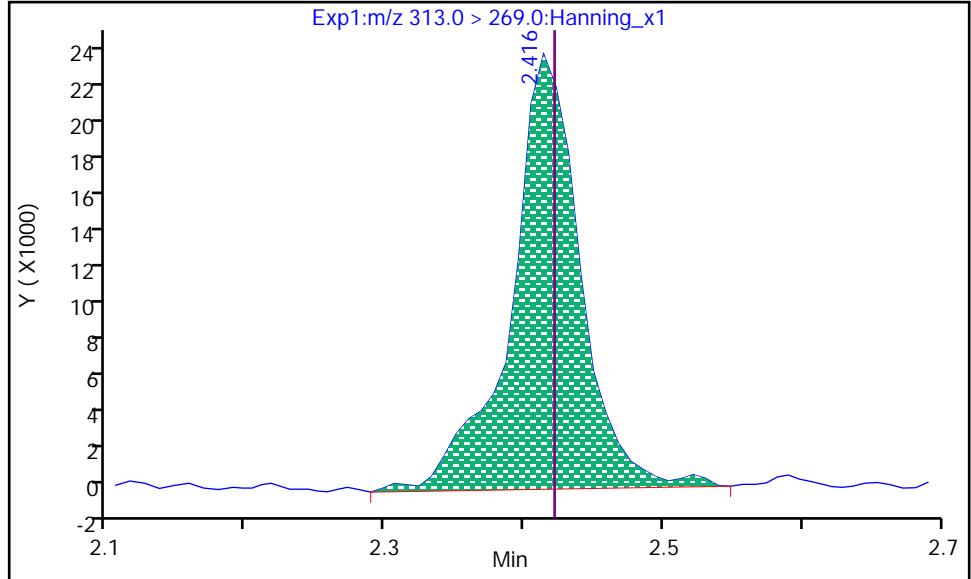
Dil. Factor: 1

Operator: Matthew M. Miller

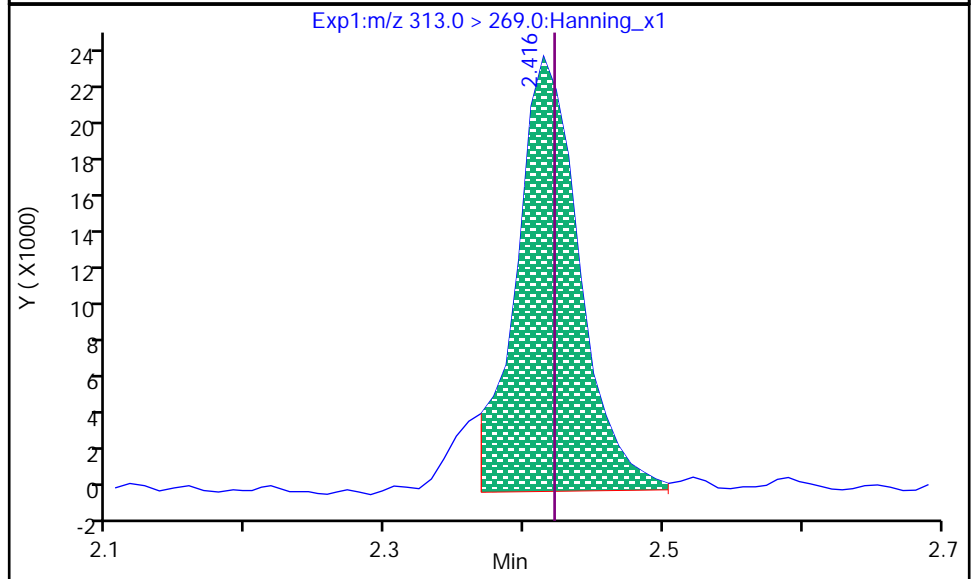
15 PFHxA, CAS: 307-24-4

Processing Integration Results

RT: 2.416  
Area: 79330  
Conc: 4.7128  
Conc Units: ng/L



RT: 2.416  
Area: 71599  
Conc: 4.2535  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:36:03

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-004</b>
Description: <b>C-00-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1115</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1327	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>9.3</b>		<b>7.0</b>	<b>3.5</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>1.3</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1.1</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>6.3</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>2.9</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>2.0</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDaA		86	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		92	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBa		102	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDa		96	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		91	50-150
13C8_PFOs		92	50-150
13C9_PFNa		92	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820025.d  
 Injection Date: 28-Dec-2020 13:27:56 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 17  
 Lab Sample ID: VL11043-004 Lab Prep. Batch: 77741  
 Client ID: C-00-1-1220 Sample Group: VL11043  
 Sample Info: VL11043-004 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0385579$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	285	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 665795 22 >100:1 1001.00 959.98 102

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/0 108328 22 26:1 163.52 6.3051

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 641252 17 >100:1 1001.00 932.21 96.3

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.067 2.072 0/0 27217 14 0.283:1 42.257 1.6293 J

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 219926 18 >100:1 1001.00 955.24 92.3

**7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 8755 17 15:1 Target = 3.34 33.798 1.3032 J  
 298.9 > 99 44 2.120 2.125 3168 14 1.6:1 2.76 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 713771 19 >100:1 1001.00 968.39 96

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.425 2.423 1/1 26115 22 3.0:1 Target = 17.01 37.096 1.4303 J  
 313 > 119 49 2.407 2.423 1515 15 10:1 17.23 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1342705 19 >100:1 5005.00 5041.05 95.8

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 620933 19 >100:1 1001.00 1023.55 98

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 ND ND U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.782 2.790 0 169623 17 >100:1 1001.00 990.62 97.4

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.782 2.790 0/0 5026 25 23:1 Target = 3.80 0.50 27.974 1.0786 J  
 399 > 99 45 2.782 2.790 1891 32 8.7:1 2.65 (1.90-5.71) 0.06

**29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4**

377 > 251 45 2.808 ND ND U

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.115	3.114	1	103779	22	>100:1			5005.00	5388.77	99.5	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.128	0/-1	11299	21	95:1	Target = 1.77		241.92	9.3280		
427 > 81	64	3.115	3.128		4923	15	25:1	2.29 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	570579	24	>100:1			1001.00	964.04	90.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	43015	36	11:1	Target = 2.85	1.18	74.024	2.8542		J
413 > 169	53	3.142	3.148		14903	38	17:1	2.88 (1.42-4.28)	0.65				
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	139579	22	>100:1			1001.00	930.97	91.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.520	1/1	8524	54	26:1	Target = 6.80	2.56	51.587	1.9891		J
499 > 99	54	3.529	3.520		1640	45	12:1	5.19 (3.40-10.20)	2.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.722		ND								U
<b>31 11-chloroicoicfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUs) CAS: 763051-92-9</b>													
631 > 451	54		4.317		ND								U
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	709490	22	>100:1			1001.00	944.77	92.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.520		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	93311	21	>100:1			5005.00	5030.20	92.9	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.873		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	642443	20	>100:1			1001.00	968.51	95.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.873		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	751191	18	>100:1			5005.00	5233.35	94.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.029		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	663119	20	>100:1			5005.00	4992.81	90.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.187		ND								U
<b>D 52 13C7_PFOA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	585546	18	>100:1			1001.00	926.39	91	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.178		ND								U
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	525495	18	>100:1			1001.00	868.13	86	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38		4.446		ND								U
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38		4.688		ND								U
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	708227	19	>100:1			1001.00	840.68	87.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42		4.906		ND								U
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	729797	19	>100:1					99.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	771295	19	>100:1					106	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	617858	23	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	679304	23	>100:1					111	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	166138	20	>100:1					102	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820025.d

Injection Date: 28-Dec-2020 13:27:56

Inst. ID: LCMSMS02

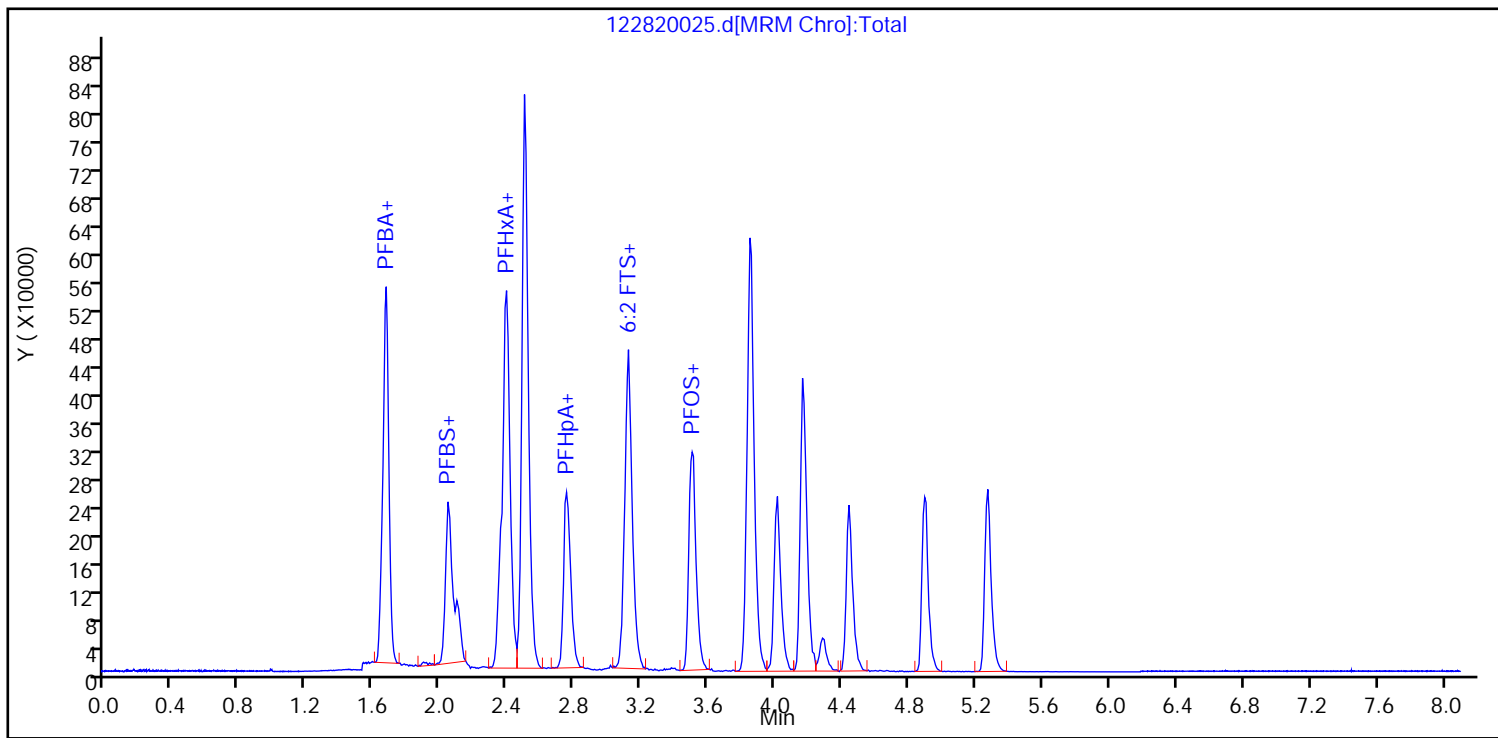
Client ID: C-00-1-1220

Lab ID: VL11043-004

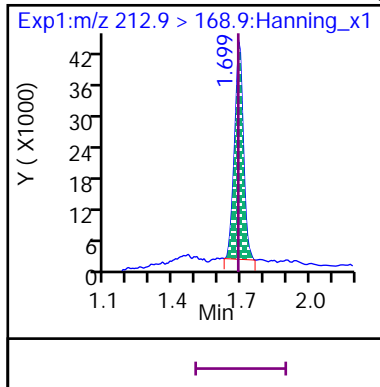
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Dil. Factor: 1

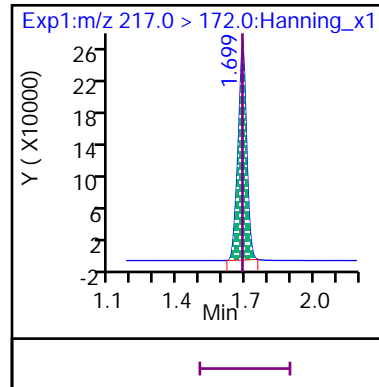
Operator: Matthew M. Miller



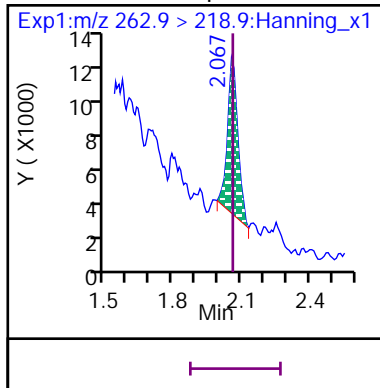
8 Perfluoro-n-butanoic acid (PFBA)



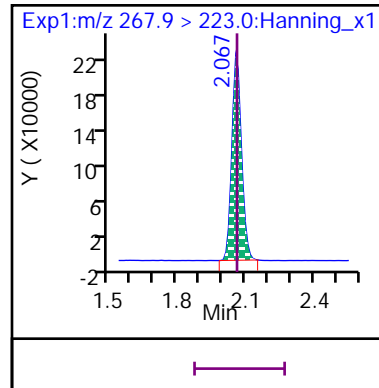
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

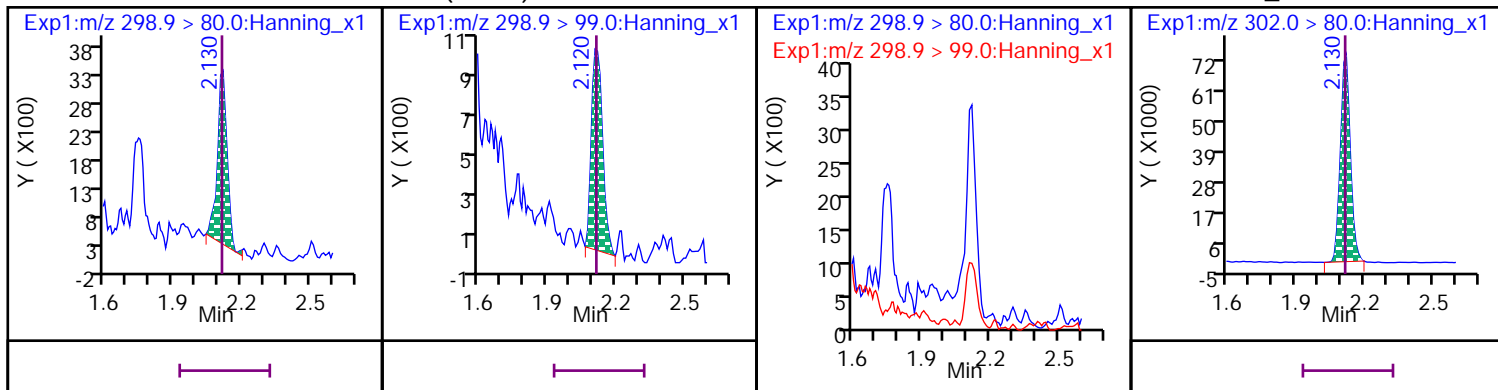


D 50 13C5\_PFPeA



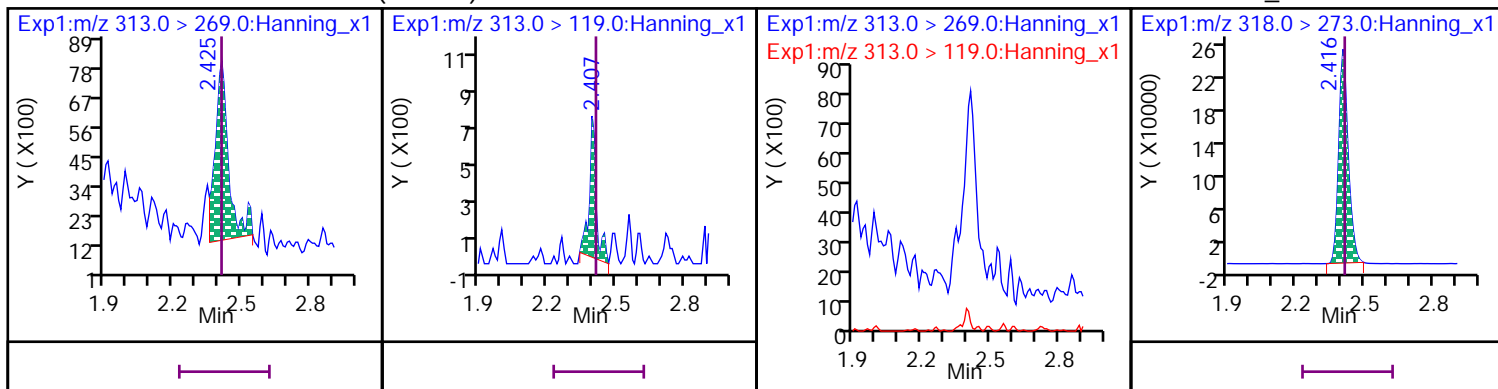
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



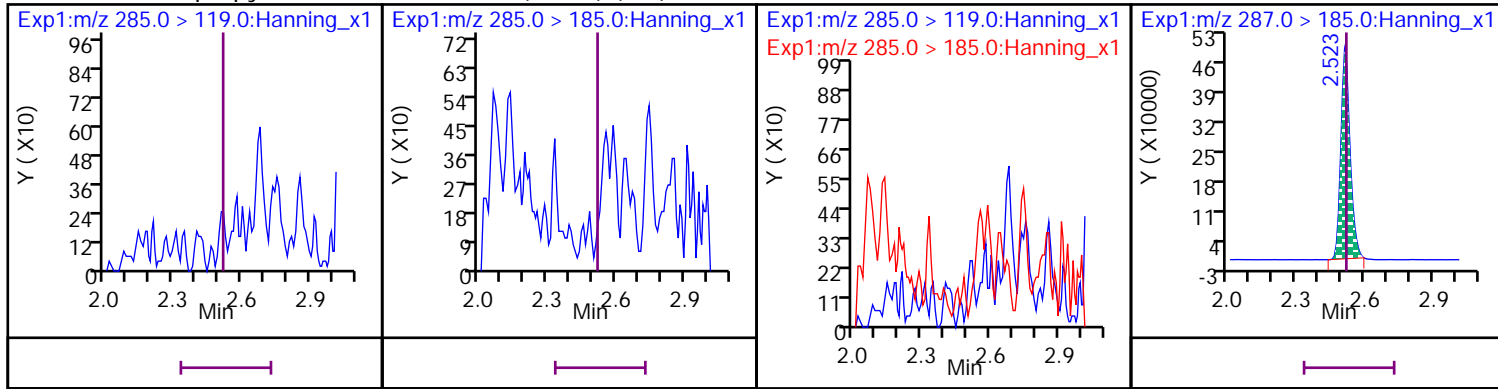
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



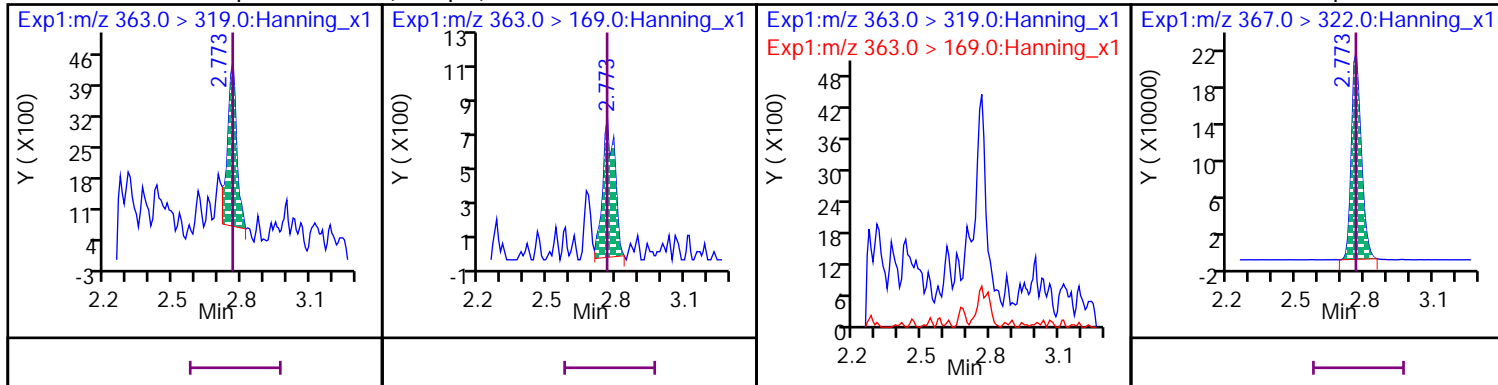
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



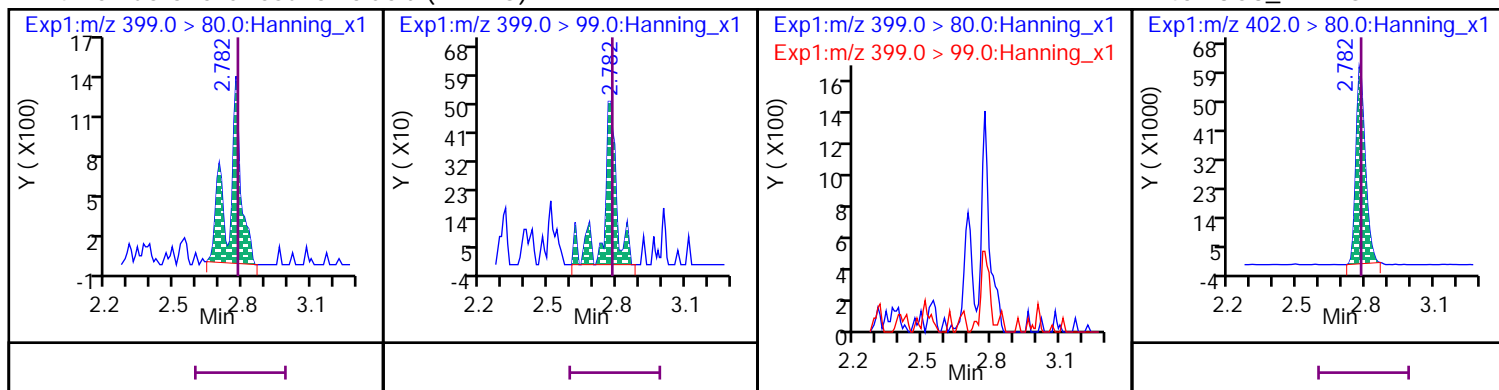
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



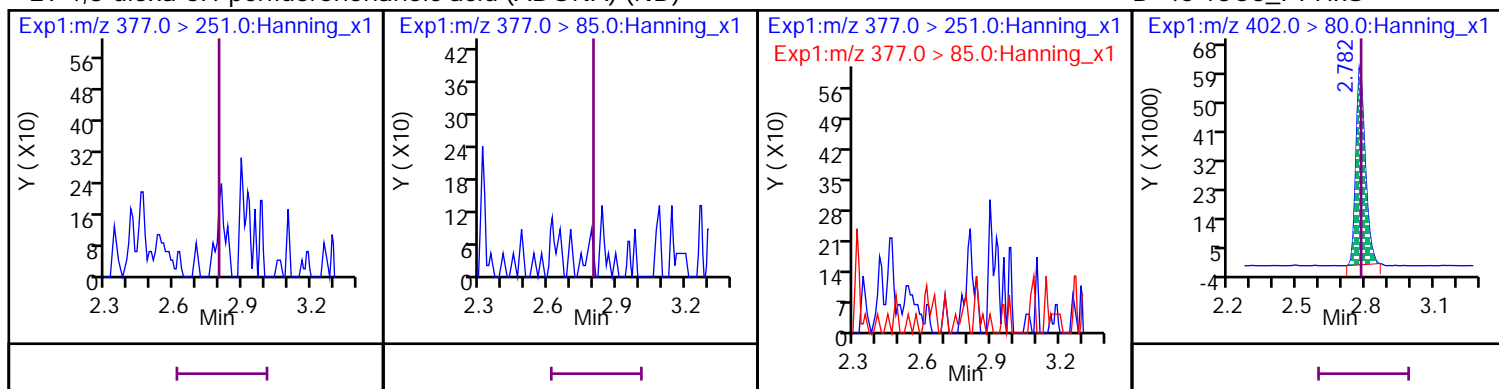
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



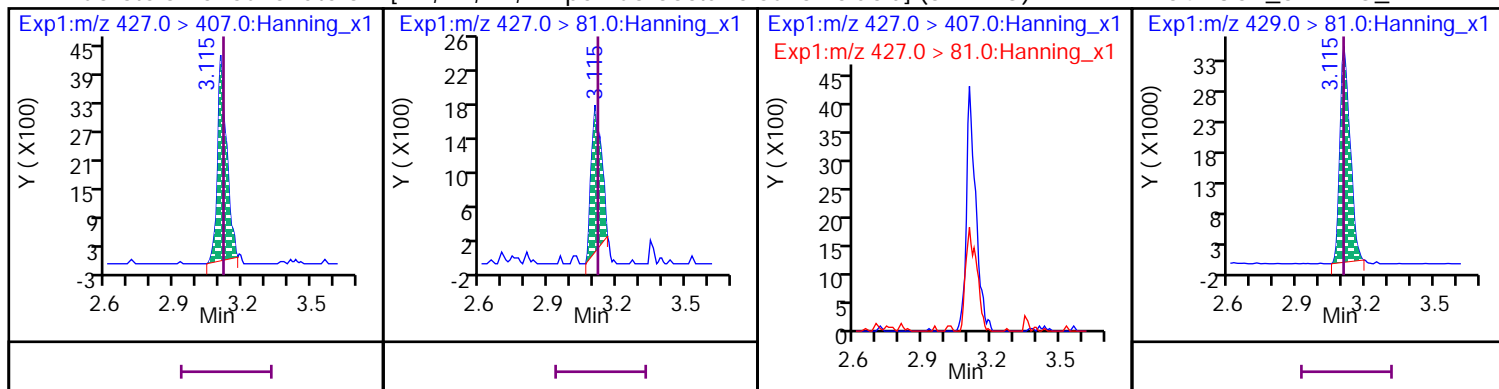
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



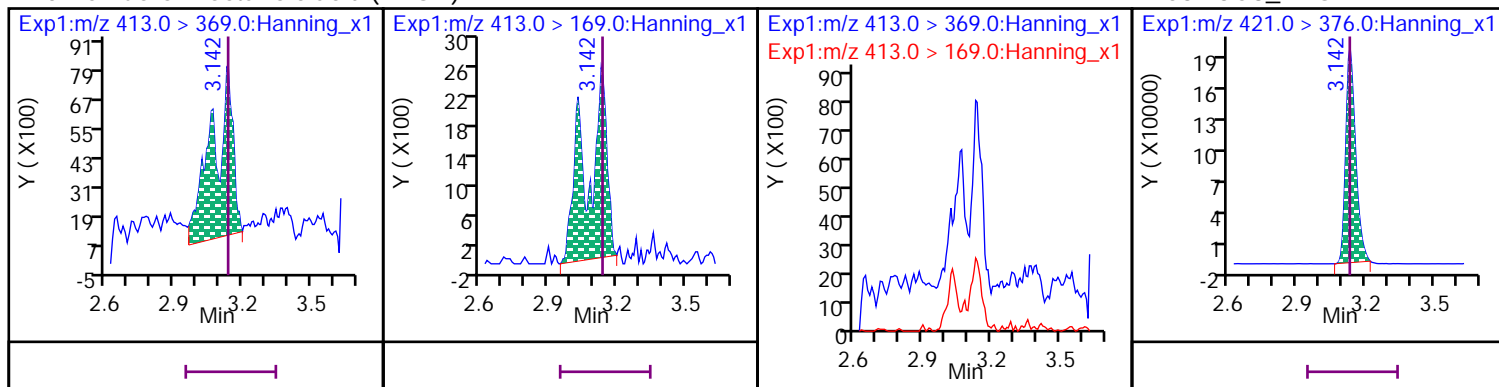
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



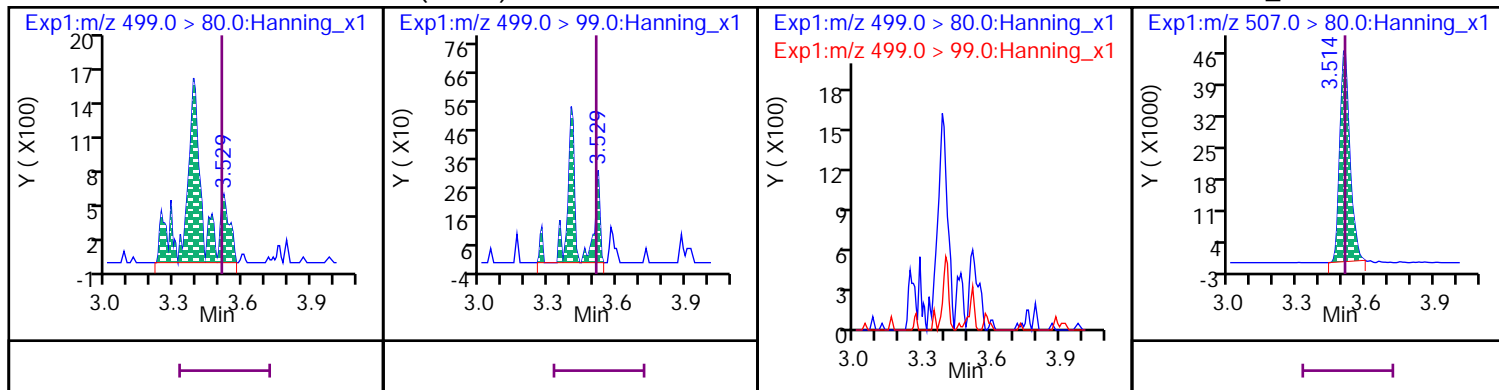
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



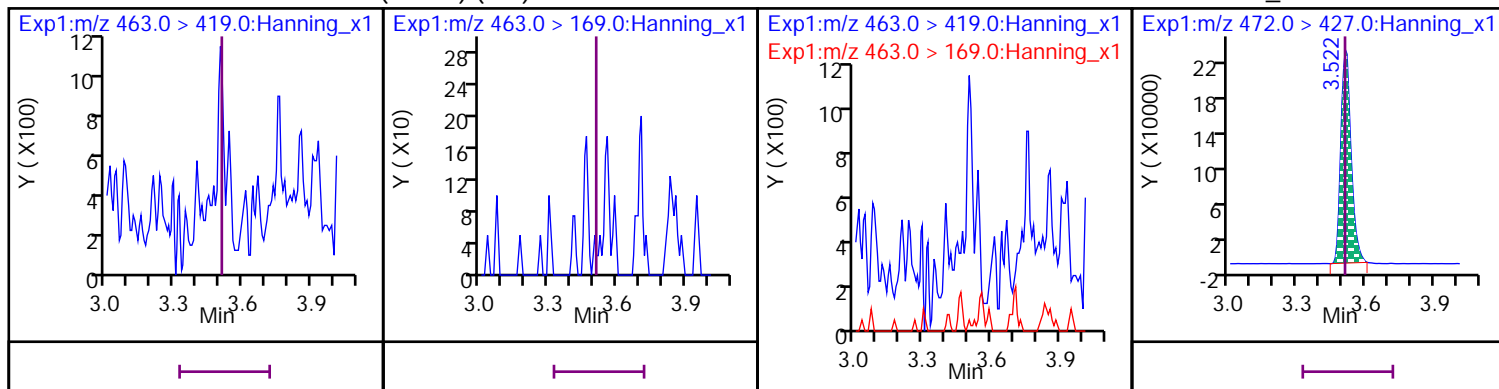
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



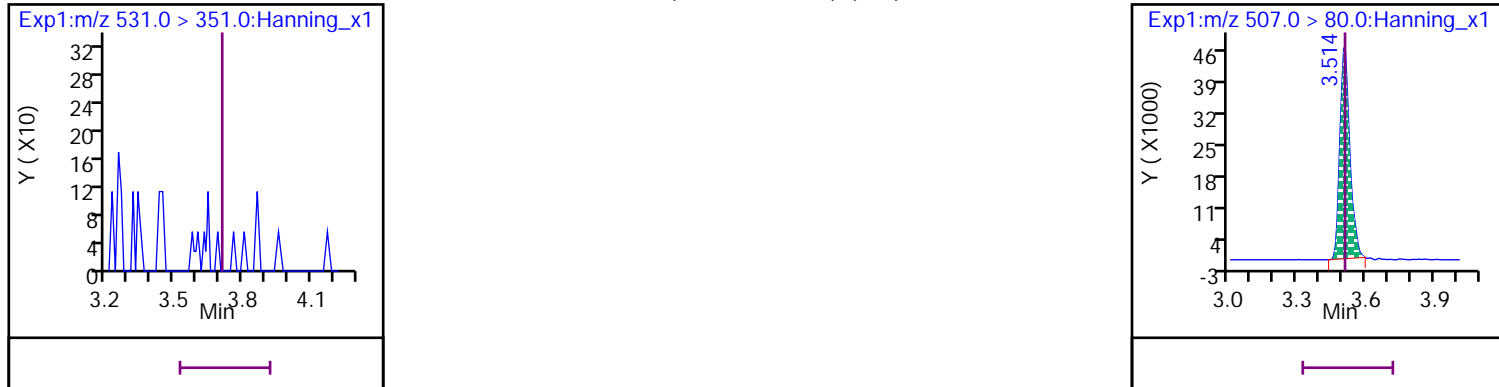
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



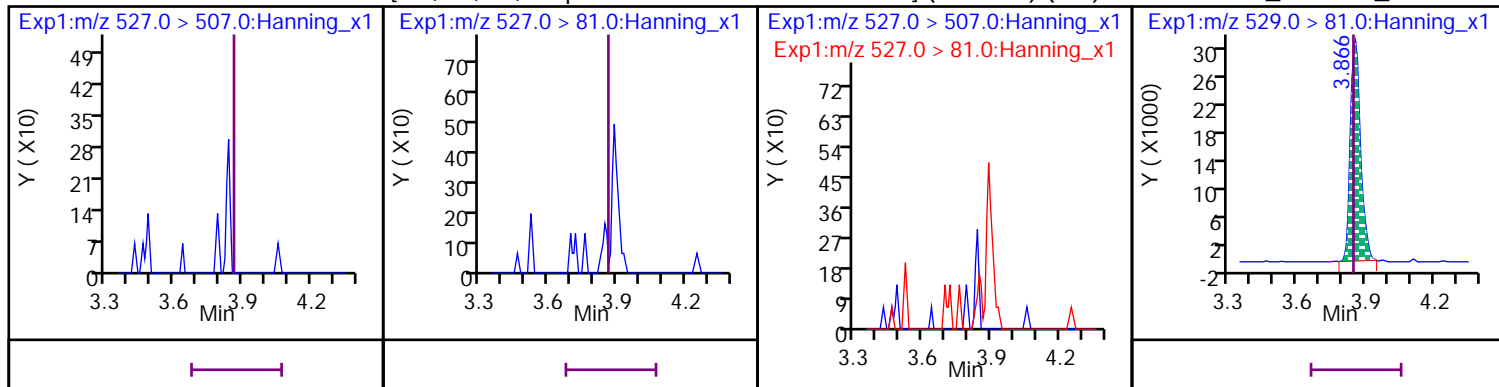
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



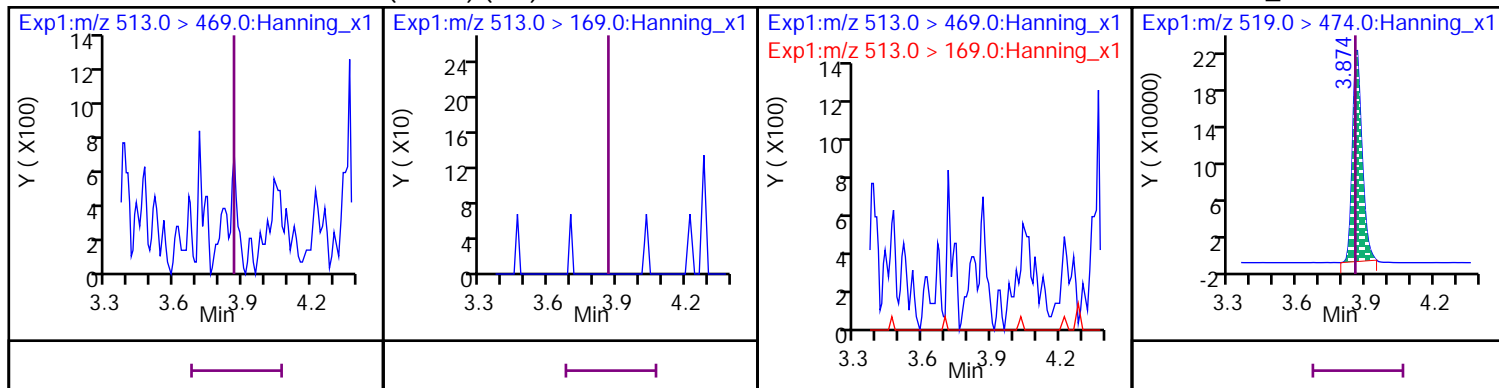
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



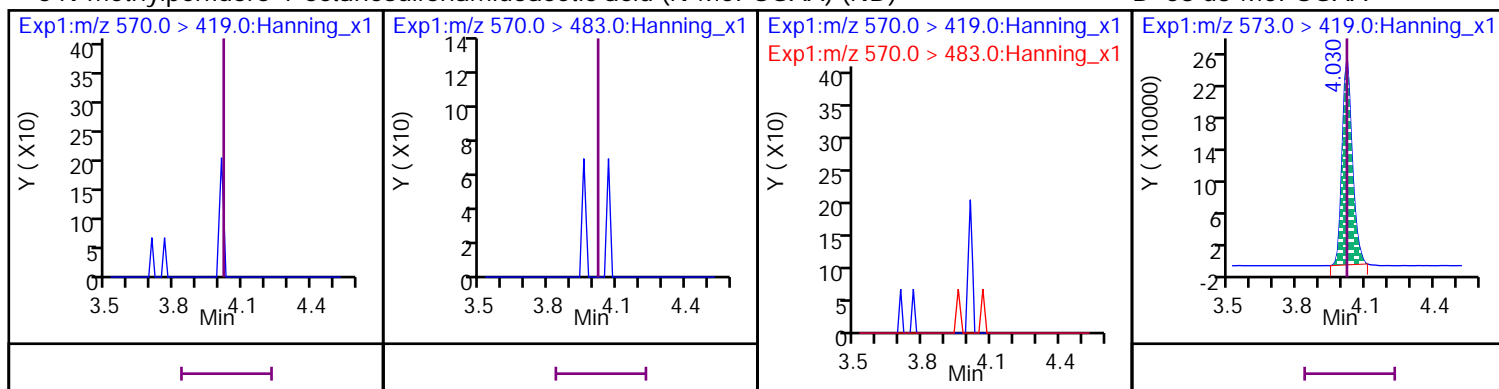
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



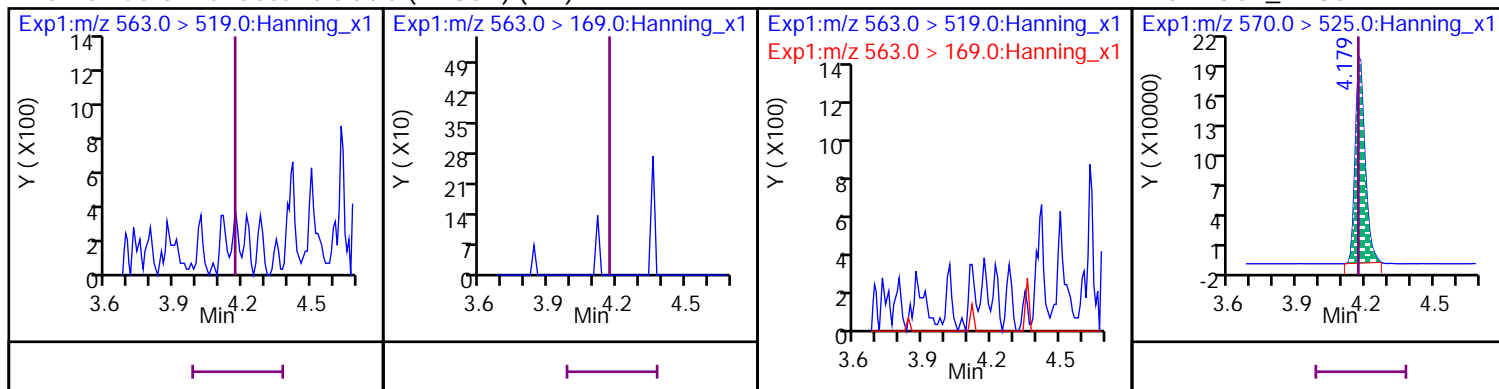
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



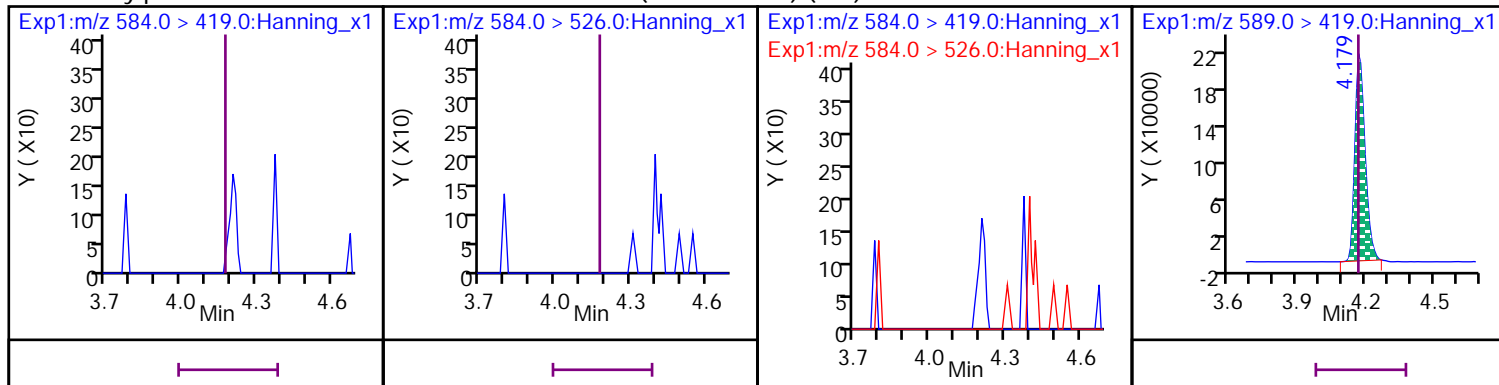
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



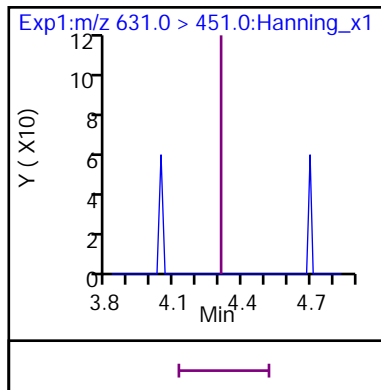
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA

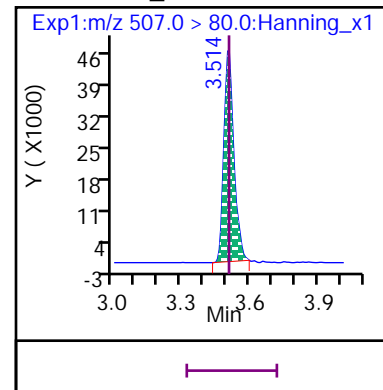




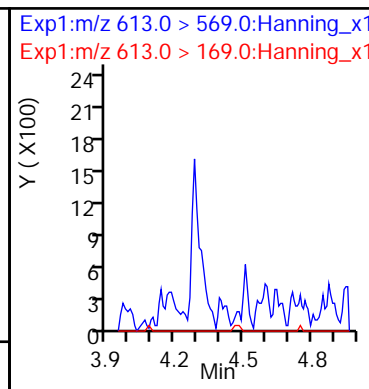
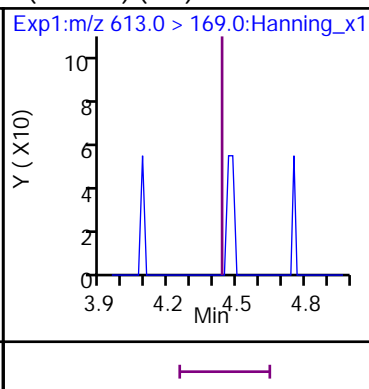
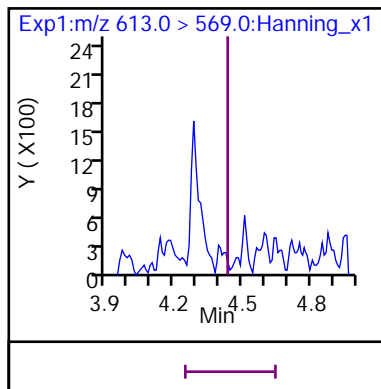
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



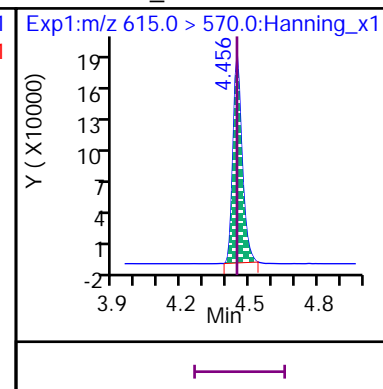
D 54 13C8\_PFOS



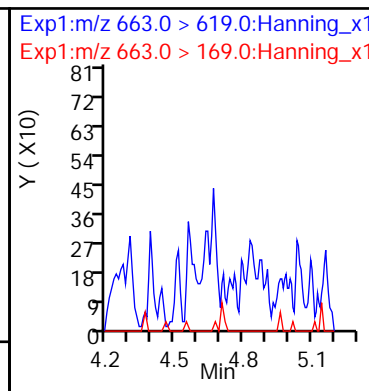
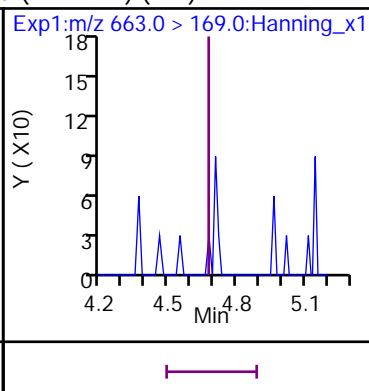
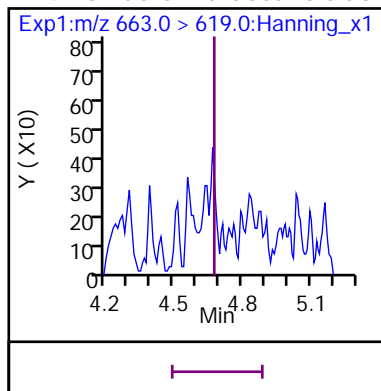
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



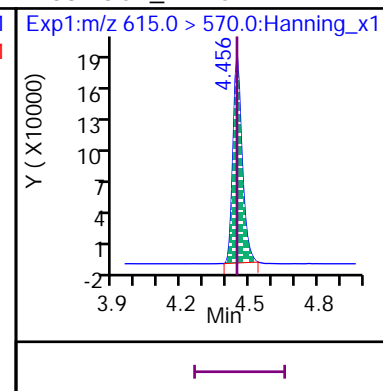
D 38 13C2\_PFDoA



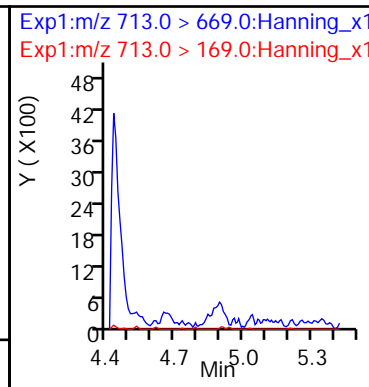
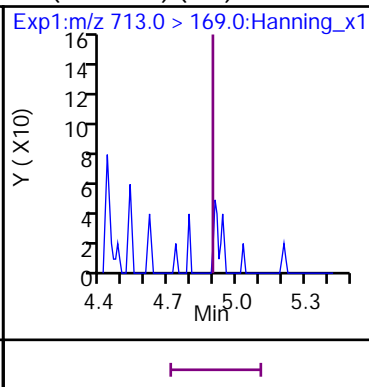
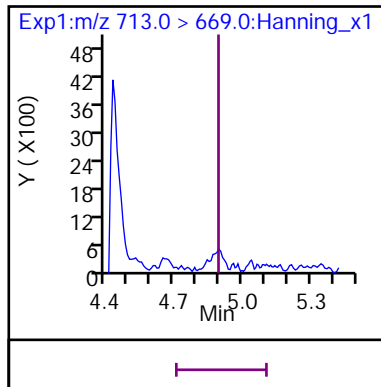
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



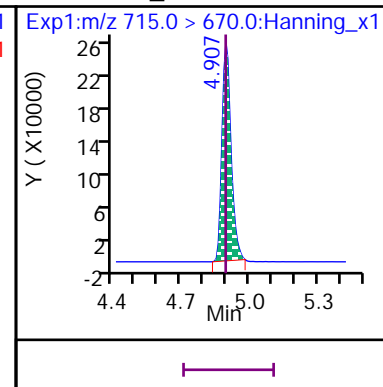
D 38 13C2\_PFDoA



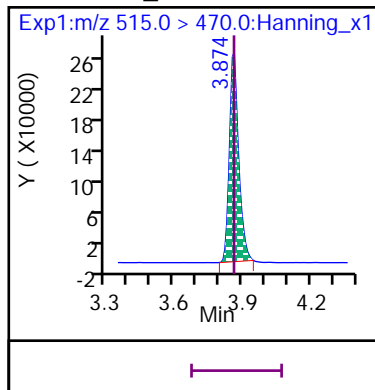
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



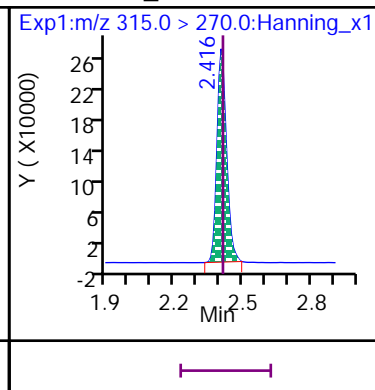
D 42 13C2\_PFTeDA



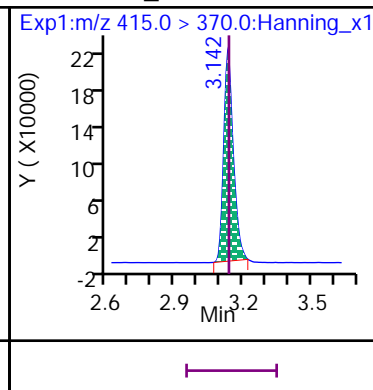
\* 37 13C2\_PFDA



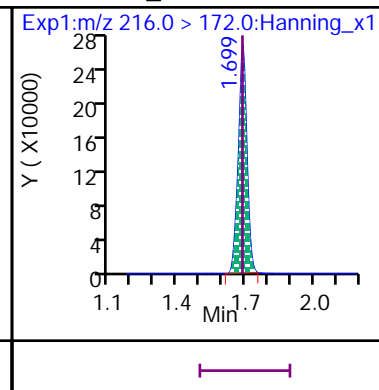
\* 39 13C2\_PFHxA



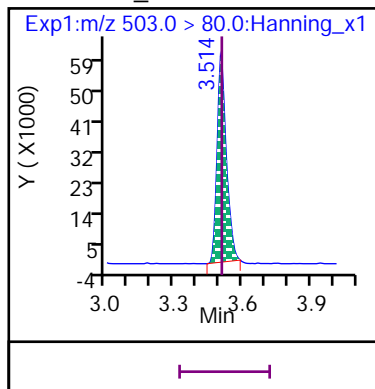
\* 41 13C2\_PFOA



\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-005</b>
Description: <b>FTA-TT-MW-03-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 0905</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1338	MMM	12/27/2020 1725	77741
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/29/2020 1138	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>62</b>		<b>6.7</b>	<b>3.4</b>	<b>1.7</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>210</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>1400</b>		<b>17</b>	<b>8.5</b>	<b>4.2</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-butanefluoronic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>21</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>15</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>160</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>31</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>25</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>620</b>		<b>3.4</b>	<b>1.7</b>	<b>0.84</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150		102	50-150
13C2_8:2FTS		113	50-150		90	50-150
13C2_PFDaA		81	50-150		91	50-150
13C2_PFTeDA		61	50-150		88	50-150
13C3_PFBS		80	50-150		95	50-150
13C3_PFHxS		81	50-150		98	50-150
13C3-HFPO-DA		75	50-150		95	50-150
13C4_PFBA		73	50-150		101	50-150
13C4_PFHpA		86	50-150		97	50-150
13C5_PFHxA		88	50-150		96	50-150
13C5_PFPeA		82	50-150		96	50-150
13C6_PFDA		92	50-150		93	50-150
13C7_PFUdA		85	50-150		95	50-150
13C8_PFOA		85	50-150		94	50-150
13C8_PFOS		73	50-150		92	50-150
13C9_PFNA		77	50-150		90	50-150
d5-EtFOSAA		84	50-150		90	50-150
d3-MeFOSAA		90	50-150		98	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820026.d  
 Injection Date: 28-Dec-2020 13:38:33 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 18  
 Lab Sample ID: VL11043-005 Lab Prep. Batch: 77741  
 Client ID: FTA-TT-MW-03-1220 Sample Group: VL11043  
 Sample Info: VL11043-005 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0370000$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	297	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 472934 21 >100:1 1001.00 681.90 72.8

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/0 261073 18 7.5:1 554.80 20.528

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 543181 17 >100:1 1001.00 789.64 81.6

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/1 372881 12 22:1 683.46 25.288

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 190043 15 25:1 1001.00 825.45 79.8

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 1261404 17 >100:1 Target = 3.34 5635.18 208.50  
 298.9 > 99 44 2.130 2.125 389294 17 >100:1 3.24 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 652679 18 >100:1 1001.00 885.50 87.8

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.423 0/0 2850779 15 >100:1 Target = 17.01 4428.52 163.86  
 313 > 119 49 2.416 2.423 143992 18 >100:1 19.79 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1053003 17 >100:1 5005.00 3953.40 75.2

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 545387 17 >100:1 1001.00 899.02 86.1

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.773 2.772 1/0 225205 15 2.1:1 Target = 3.79 398.49 14.744  
 363 > 169 47 2.773 2.772 57645 15 >100:1 3.90 (1.89-5.69)

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 141468 16 >100:1 1001.00 826.19 81.2

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.791 2.790 1/0 6819717 28 >100:1 Target = 3.80 0.20 45511 1683.92 E  
 399 > 99 45 2.791 2.790 1928849 27 >100:1 3.53 (1.90-5.71) 0.14

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	151817	22	>100:1			5005.00	7883.16	145	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	103675	23	>100:1	Target = 1.77		1670.52	61.809		
427 > 81	64	3.129	3.128		62793	25	>100:1	1.65 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	532288	24	>100:1			1001.00	899.34	84.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	457426	36	>100:1	Target = 2.85	0.36	843.80	31.221		
413 > 169	53	3.149	3.148		148688	33	57:1	3.07 (1.42-4.28)	0.43				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	111381	23	>100:1			1001.00	742.89	73.1	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	2220896	57	>100:1	Target = 6.80	1.39	16844	623.22		
499 > 99	54	3.522	3.520		527621	41	>100:1	4.20 (3.40-10.20)	0.49				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	593176	23	>100:1			1001.00	789.89	77.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.857	1	113284	26	>100:1			5005.00	6106.91	113	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	618426	19	>100:1			1001.00	932.30	91.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	715715	16	>100:1			5005.00	4986.19	90.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	612311	20	>100:1			5005.00	4610.27	83.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	545666	18				1001.00	863.29	84.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	492163	18	>100:1			1001.00	813.07	80.5	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	494987	18	>100:1			1001.00	587.56	60.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	766048	21	>100:1					105	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	736918	18	>100:1					101	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	628669	22	>100:1					105	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	562583	22	>100:1					92.3	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	153699	22	>100:1					94.3	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 E - Compound Concentration Exceeds Max. Calibration Range

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820026.d

Injection Date: 28-Dec-2020 13:38:33

Inst. ID: LCMSMS02

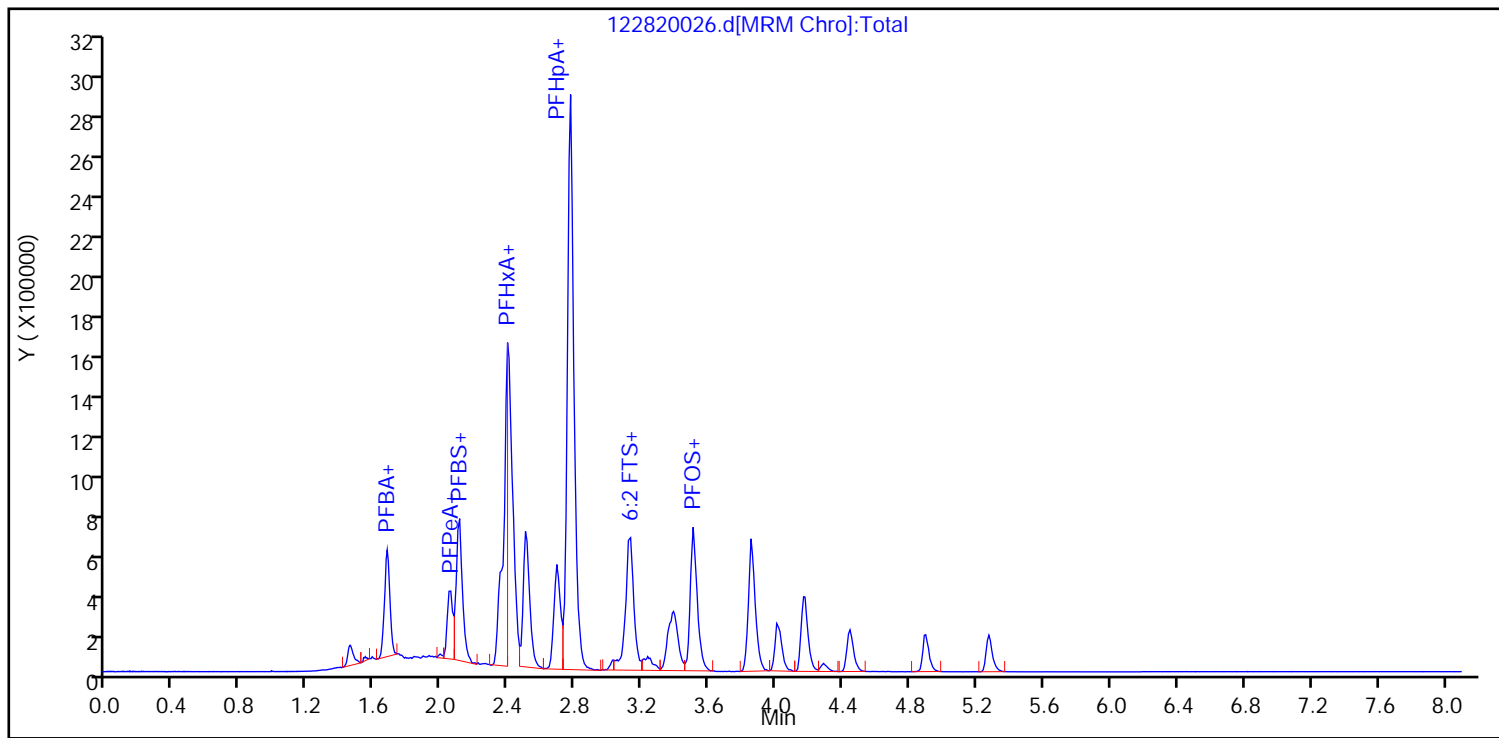
Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

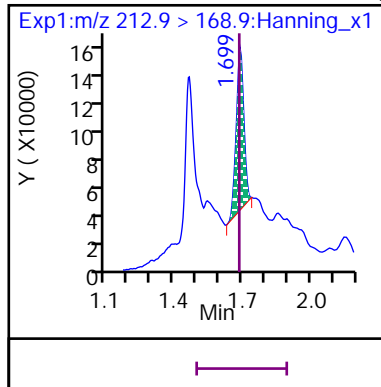
Sample Info: VL11043-005

Dil. Factor: 1

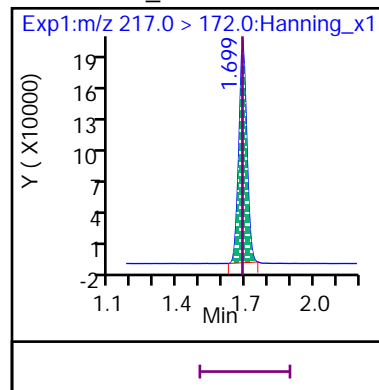
Operator: Matthew M. Miller



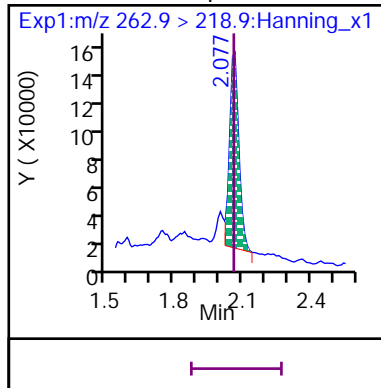
8 Perfluoro-n-butanoic acid (PFBA)



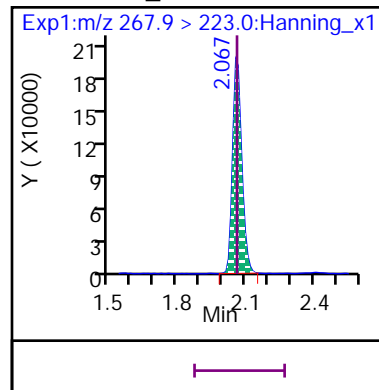
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

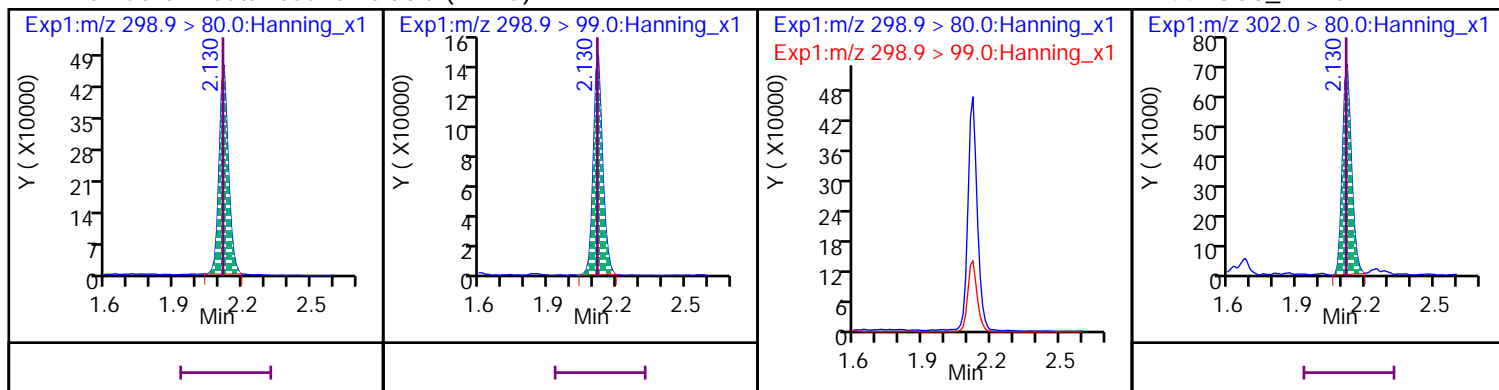


D 50 13C5\_PFPeA



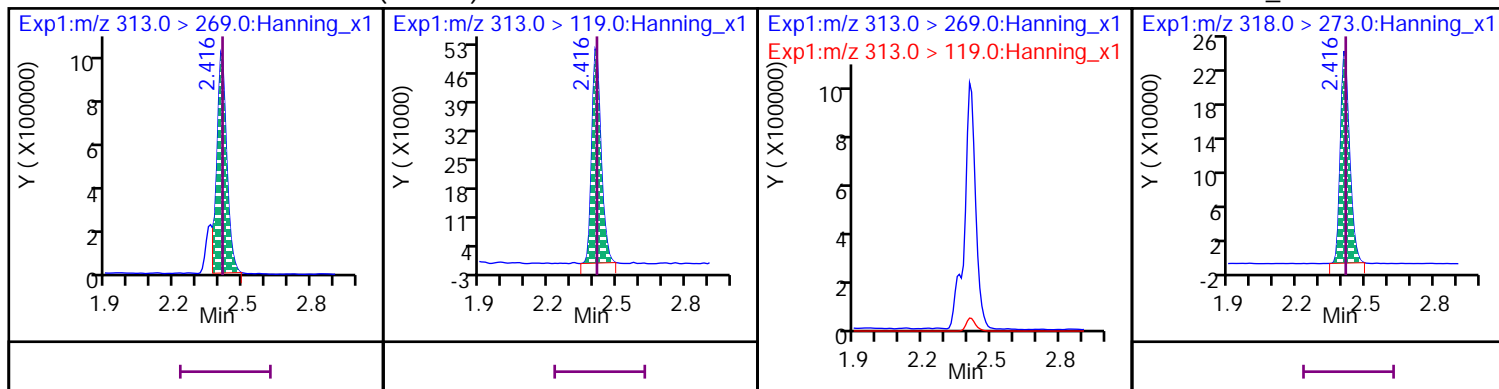
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



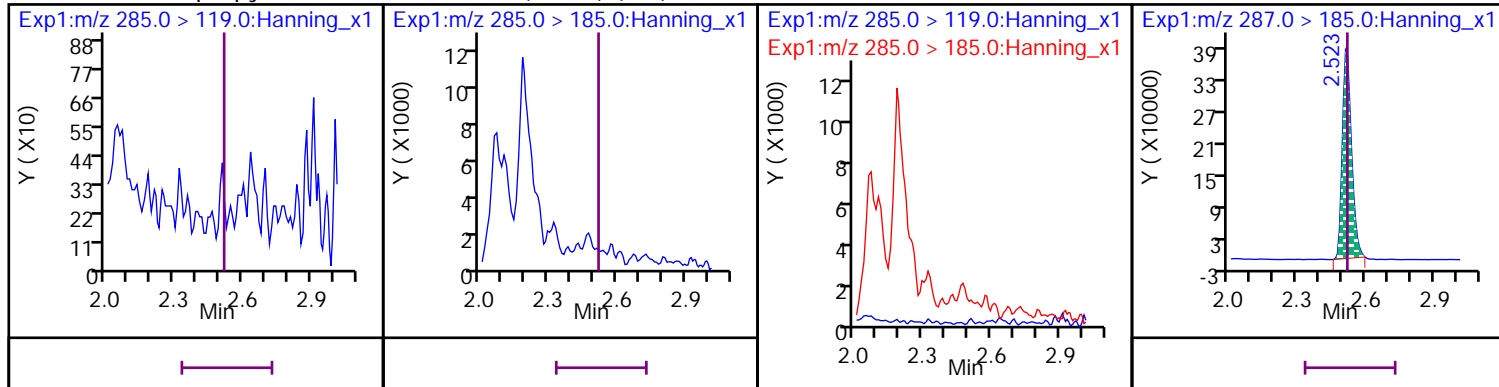
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



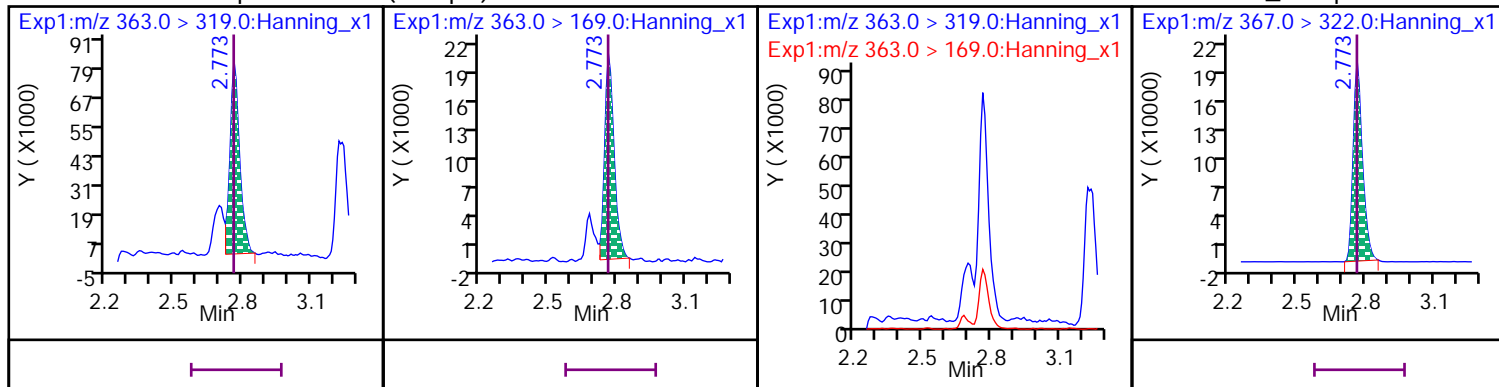
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



13 Perfluoro-n-heptanoic acid (PFHpA)

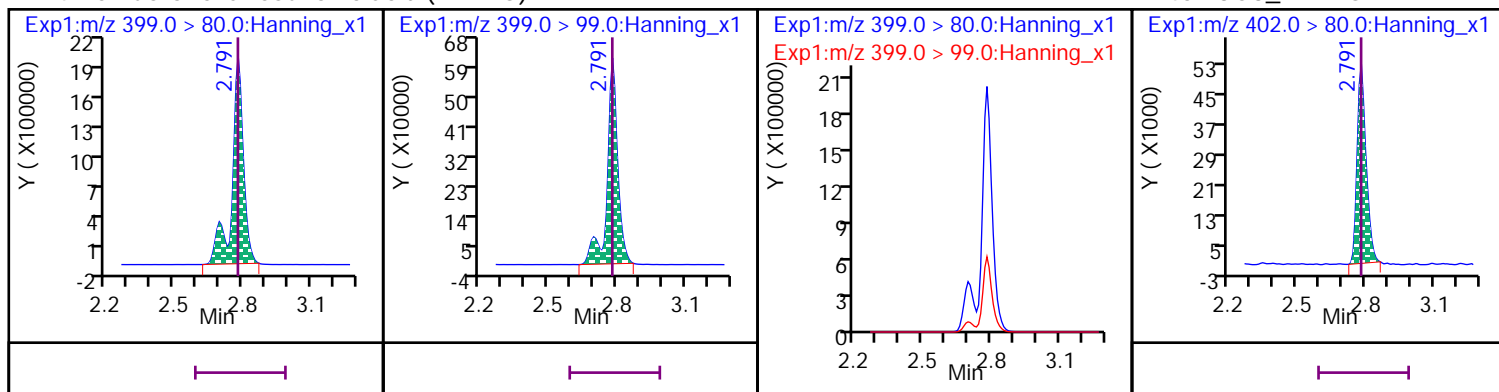
D 47 13C4\_PFHpA





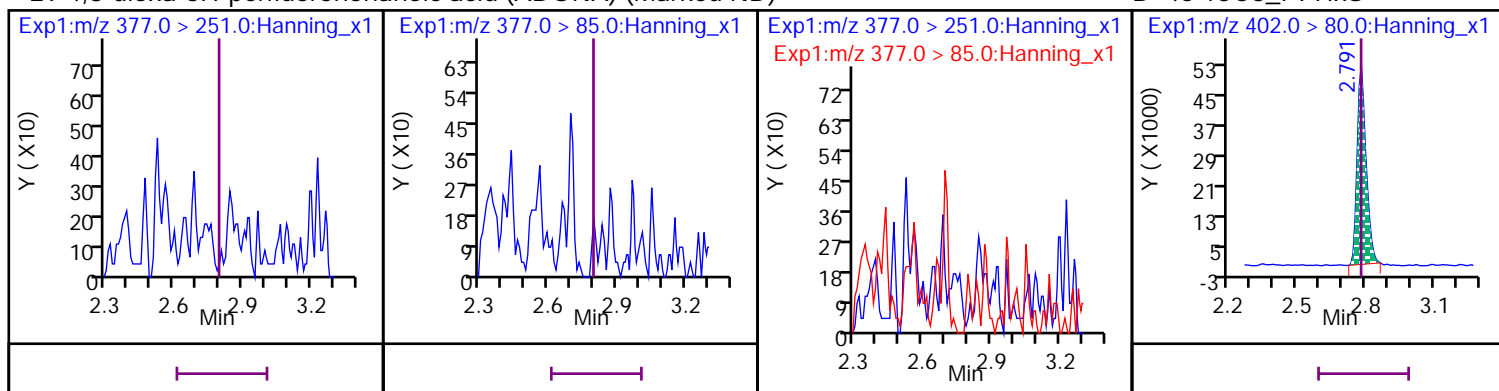
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



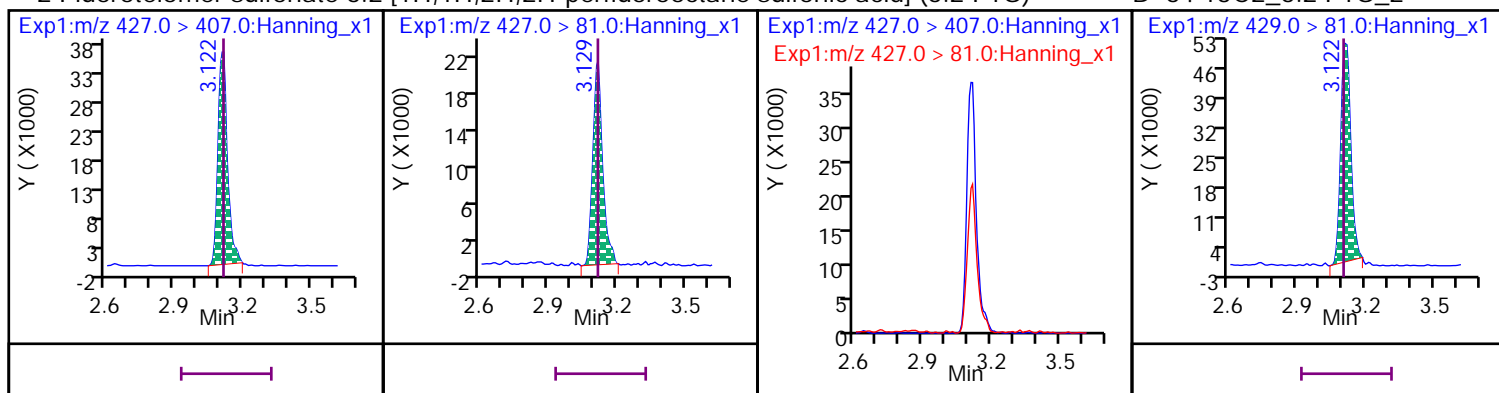
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (Marked ND)

D 45 13C3\_PFHxS



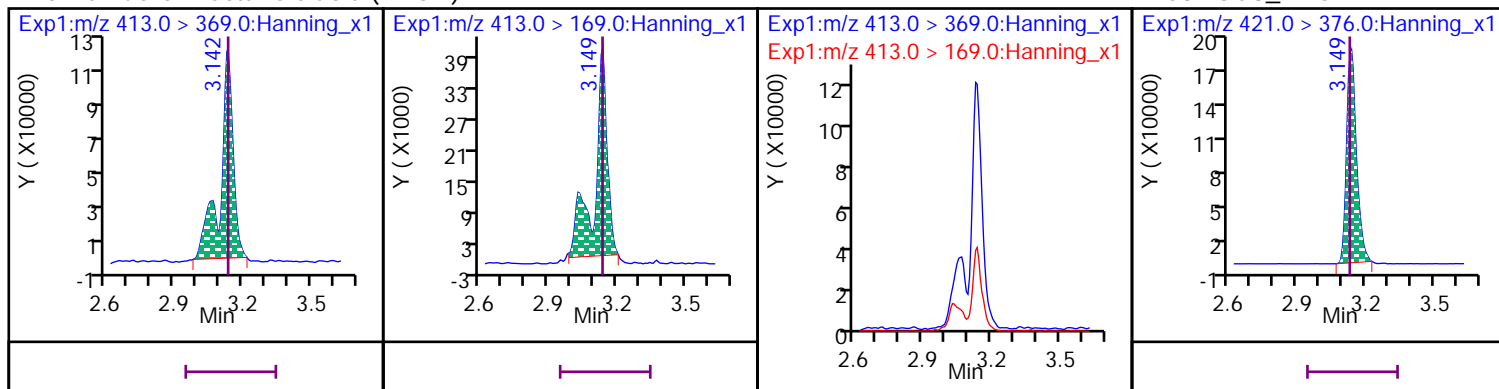
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



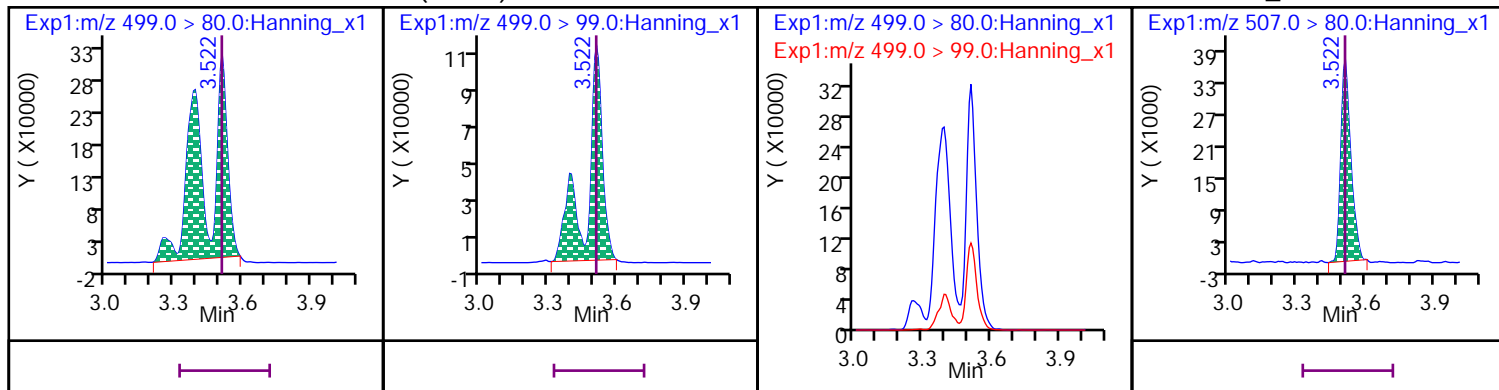
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



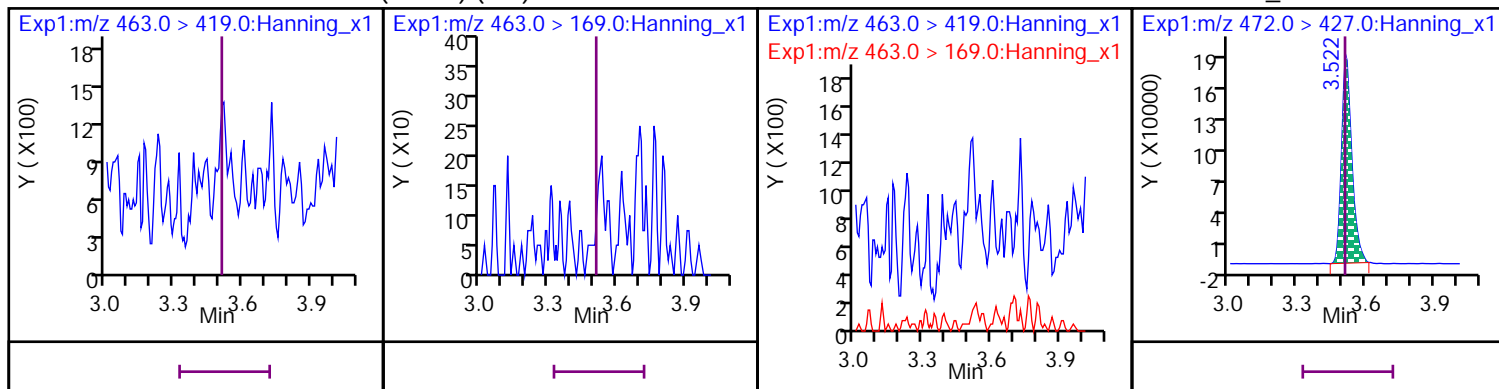
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



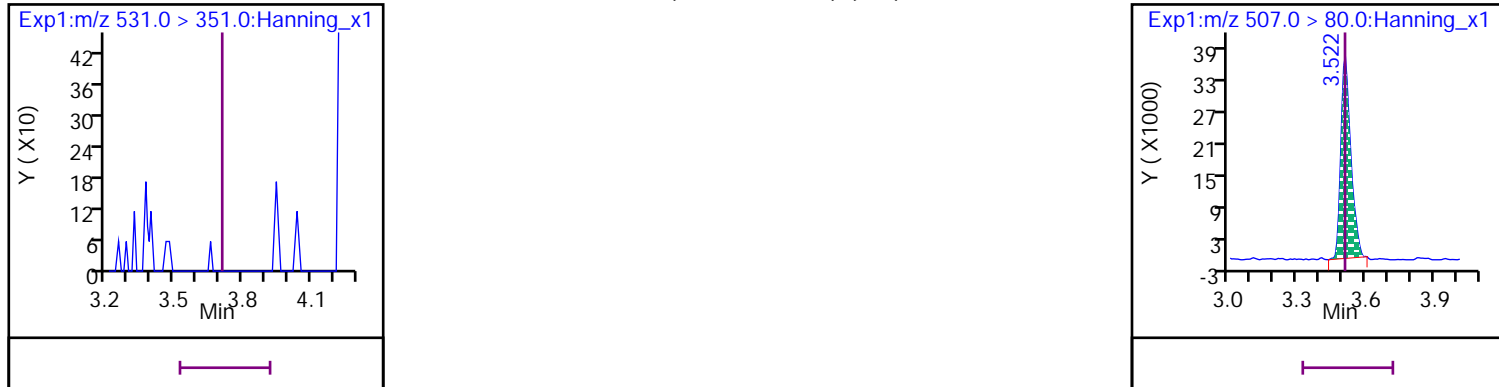
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



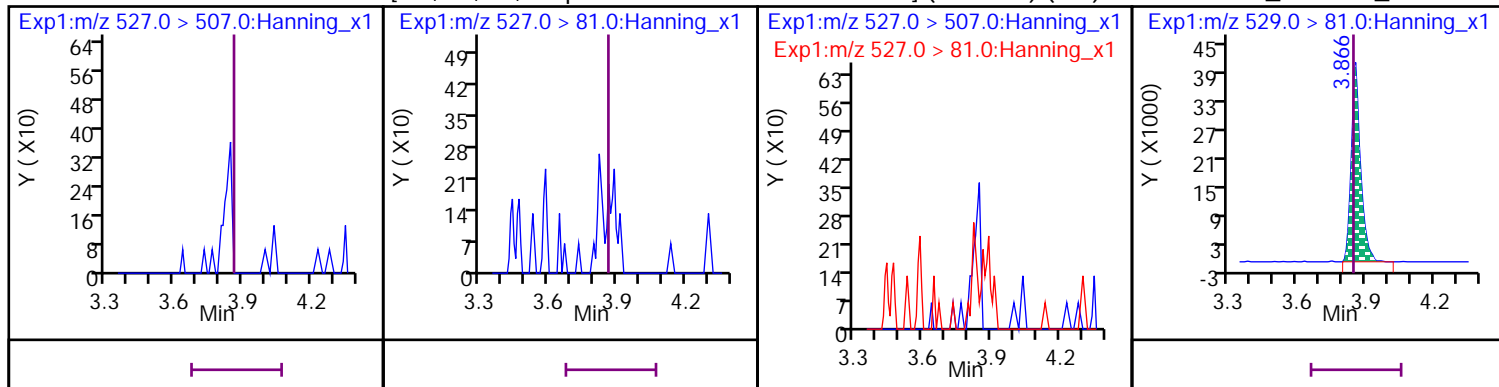
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



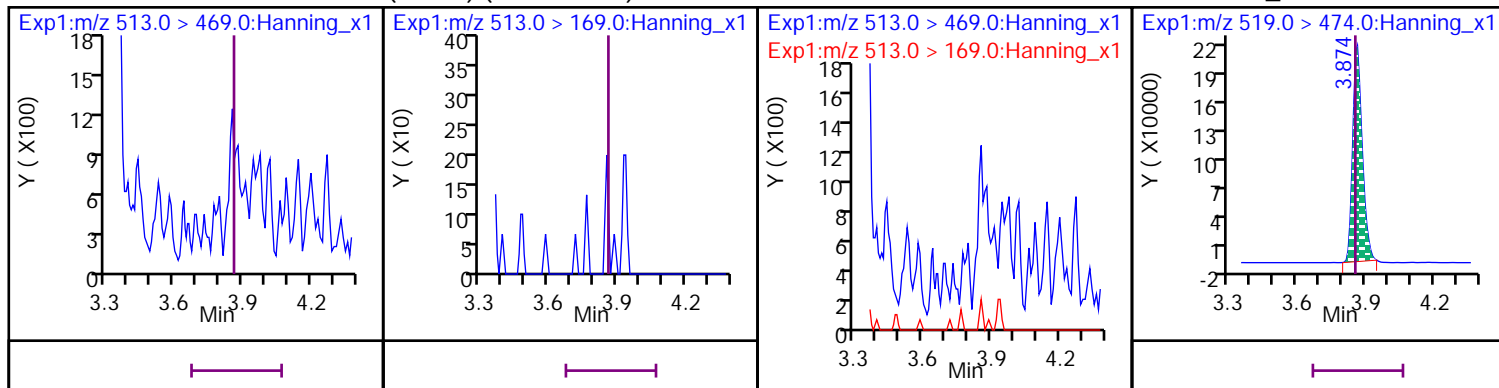
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



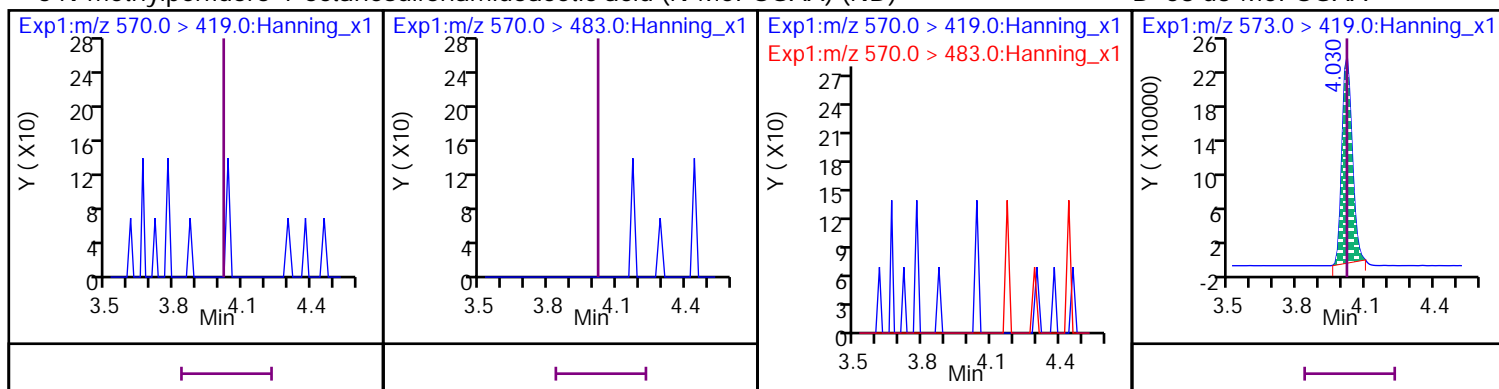
## 10 Perfluoro-n-decanoic acid (PFDA) (Marked ND)

D 51 13C6\_PFDA



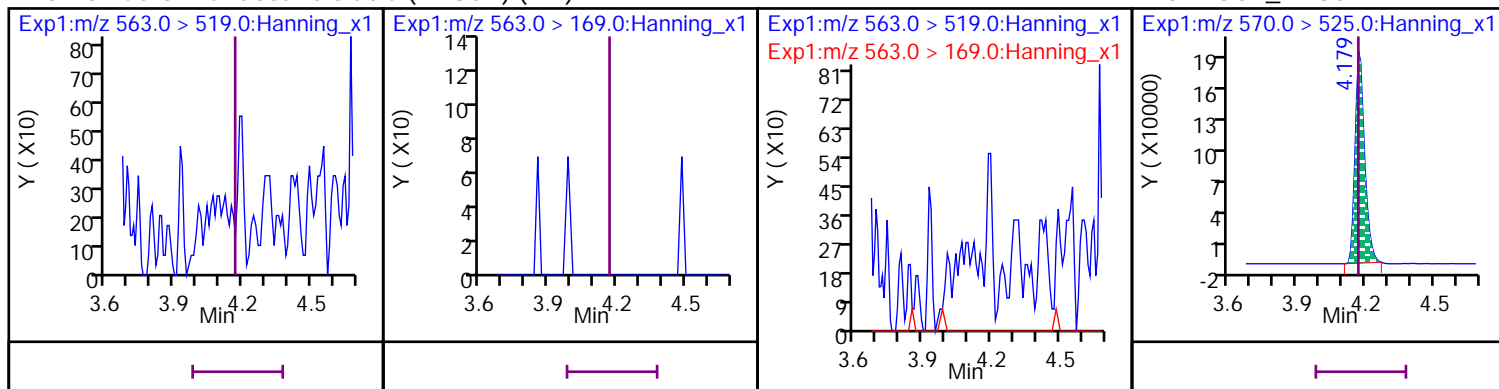
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



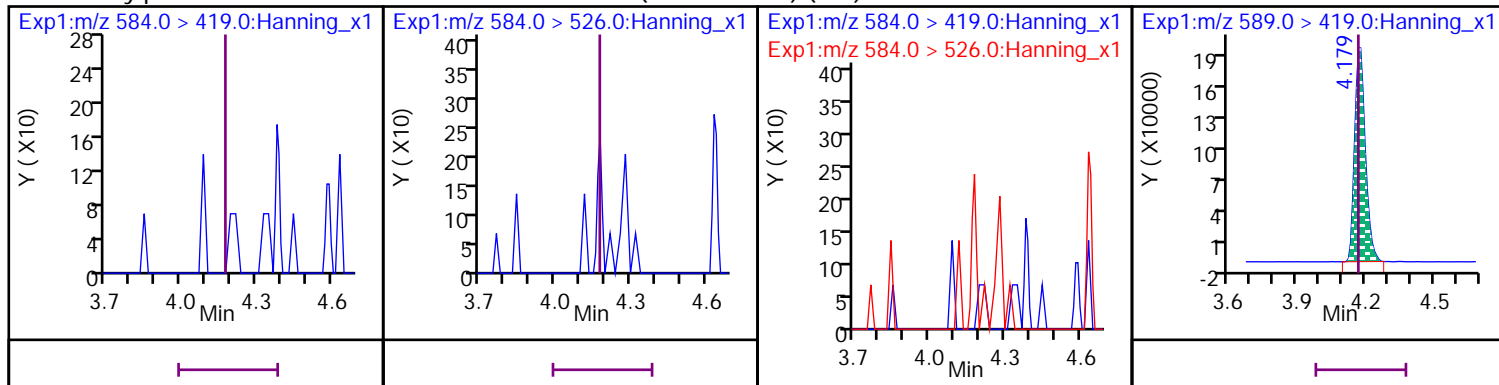
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

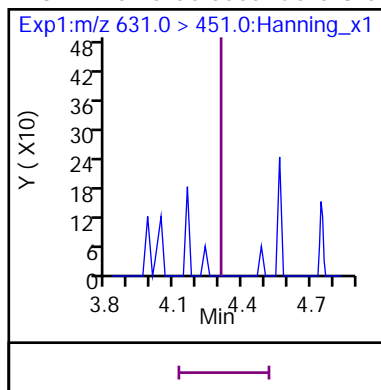


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

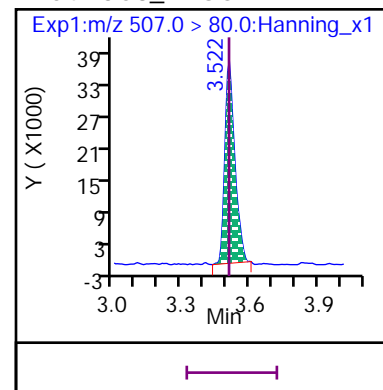
D 60 d5-EtFOSAA



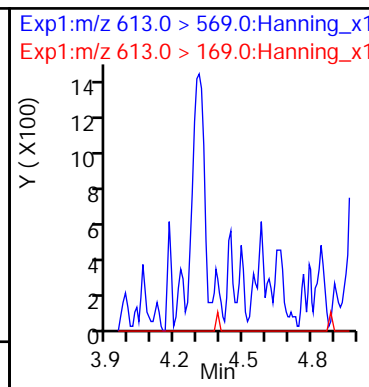
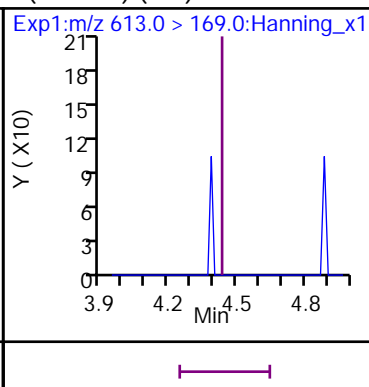
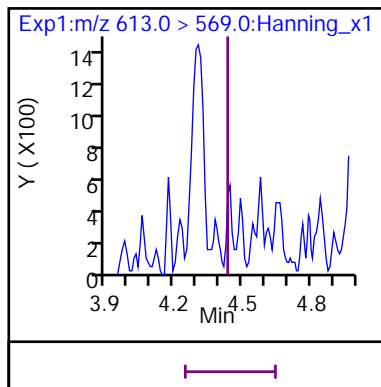
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



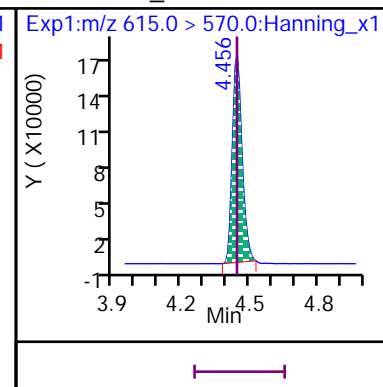
D 54 13C8\_PFOS



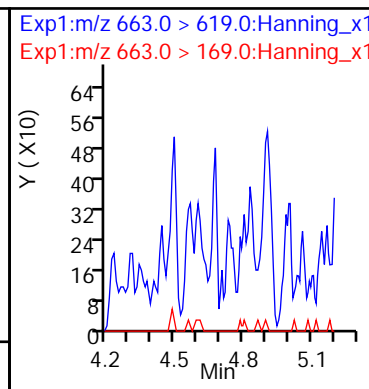
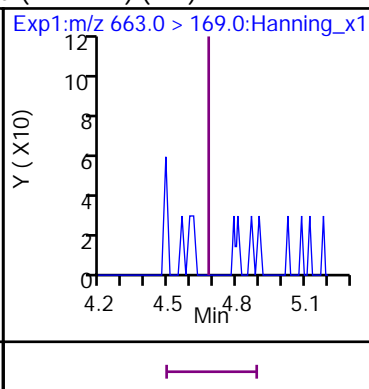
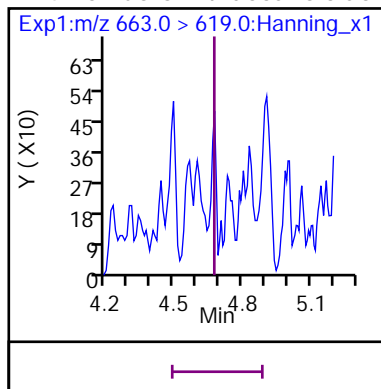
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



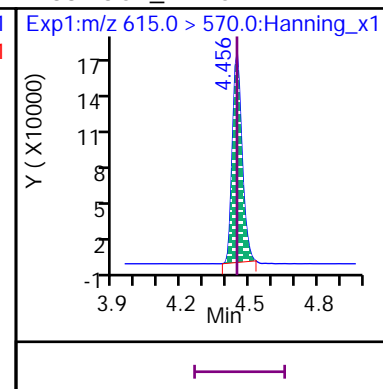
D 38 13C2\_PFDoA



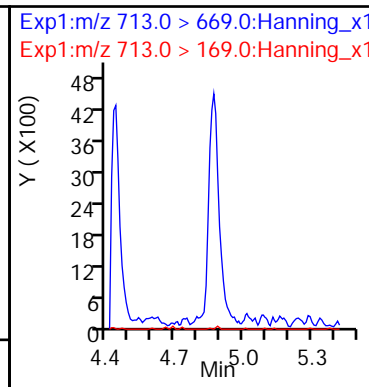
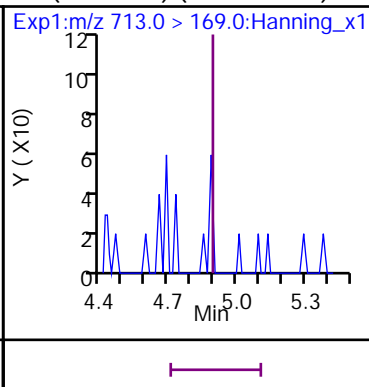
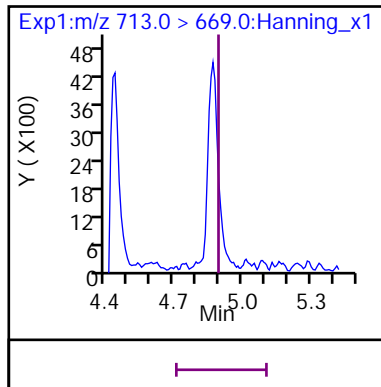
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



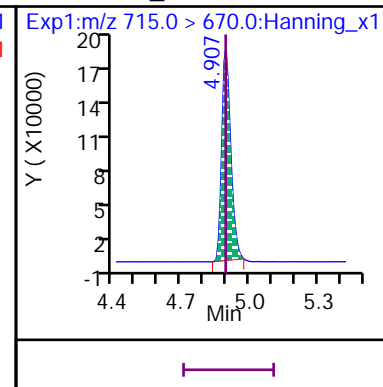
D 38 13C2\_PFTeDA



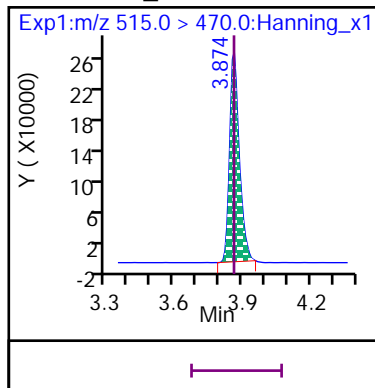
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



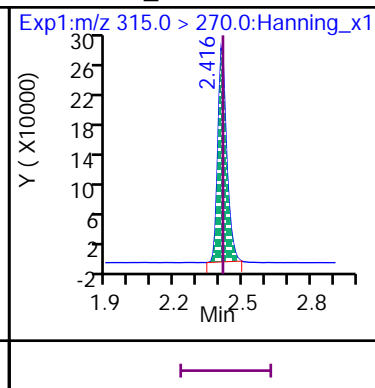
D 42 13C2\_PFTeDA



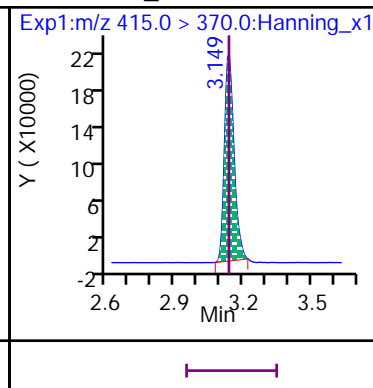
\* 37 13C2\_PFDA



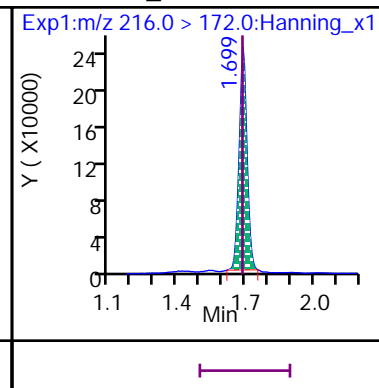
\* 39 13C2\_PFHxA



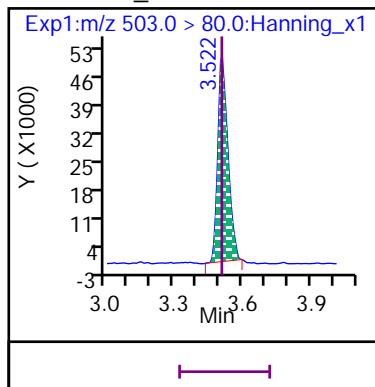
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d  
 Injection Date: 29-Dec-2020 11:38:23 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 6  
 Lab Sample ID: VL11043-005 Lab Prep. Batch: 77741  
 Client ID: FTA-TT-MW-03-1220 Sample Group: VL11043  
 Sample Info: VL11043-005,5 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0336700$

Name	Value	Units	Description
DF	5		Dilution Factor
VF	10000	ul	Final Volume
VI	297	ml	Initial Sample Volume
AlsDf	1		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.702 1.702 0 677603 23 >100:1 1100.00 977.00 101

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.702 1.709 0/0 75837 19 2.8:1 123.61 20.809 M

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.072 2.080 0 661922 19 >100:1 1100.00 962.26 96.2

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.072 2.080 0/0 94970 13 16:1 156.97 26.426 M

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.125 2.133 0 229358 17 >100:1 1100.00 996.21 95.1

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.125 2.133 0/0 286641 19 >100:1 Target = 3.34 1165.97 196.29  
 298.9 > 99 44 2.125 2.133 78356 18 81:1 3.65 (1.67-5.02)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.414 2.429 0 728308 20 >100:1 1100.00 988.11 96.4

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.414 2.420 0/0 650836 17 >100:1 Target = 17.01 995.66 167.62 M  
 313 > 119 49 2.423 2.420 28142 19 92:1 23.12 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.521 2.536 0 1344818 20 >100:1 5500.00 5048.99 95

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.536 ND ND U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.772 2.777 0 597362 20 >100:1 1100.00 984.69 97.4

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.772 2.786 0/0 47514 15 18:1 Target = 3.79 84.351 14.200 M  
 363 > 169 47 2.772 2.786 14201 13 27:1 3.34 (1.89-5.69) M

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.790 2.795 0 181203 21 >100:1 1100.00 1058.25 97.5

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.790 2.795 0/0 1442662 28 >100:1 Target = 3.80 0.20 8259.78 1390.54  
 399 > 99 45 2.790 2.795 422363 28 >100:1 3.41 (1.90-5.71) M

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.823		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.132	0	107958	23	>100:1			5500.00	5605.76	102	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.121	3.139	-1/-1	14119	20	86:1	Target = 1.77		328.63	55.325		
427 > 81	64	3.114	3.139		7638	23	24:1	1.84 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.159	0	569847	25	>100:1			1100.00	962.80	93.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.159	0/0	81325	35	41:1	Target = 2.85	0.24	153.99	25.924		
413 > 169	53	3.148	3.159		30601	32	36:1	2.65 (1.42-4.28)	0.41				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.520	3.533	0	141629	22	>100:1			1100.00	944.64	92.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.533	0/0	488508	60	>100:1	Target = 6.80	1.27	3201.84	539.03		
499 > 99	54	3.520	3.533		116595	42	>100:1	4.18 (3.40-10.20)	0.44				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.740		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.334		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.527	3.533	0	708112	22	>100:1			1100.00	942.94	89.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.533		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.873	3.879	0	94271	20				5500.00	5081.96	90.1	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.911		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.873	3.887	0	649477	21	>100:1			1100.00	979.11	92.6	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.887		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.037	4.034	1	714047	19	>100:1			5500.00	4974.57	98.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.043		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.193	0	639577	19	>100:1			5500.00	4815.56	90	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.203		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.193	0	610498	19	>100:1			1100.00	965.86	95.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.193		ND								
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.455	4.461	0	551922	17	>100:1			1100.00	911.79	90.5	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.918	0	689441	19	>100:1			1100.00	818.38	87.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.887	0	711938	21	>100:1					103	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.429	0	756607	20	>100:1					103	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.152	0	624687	25	>100:1					101	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.702	1.702	0	684063	24	>100:1					107	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.520	3.533	0	160579	22	>100:1					93.3	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated



Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

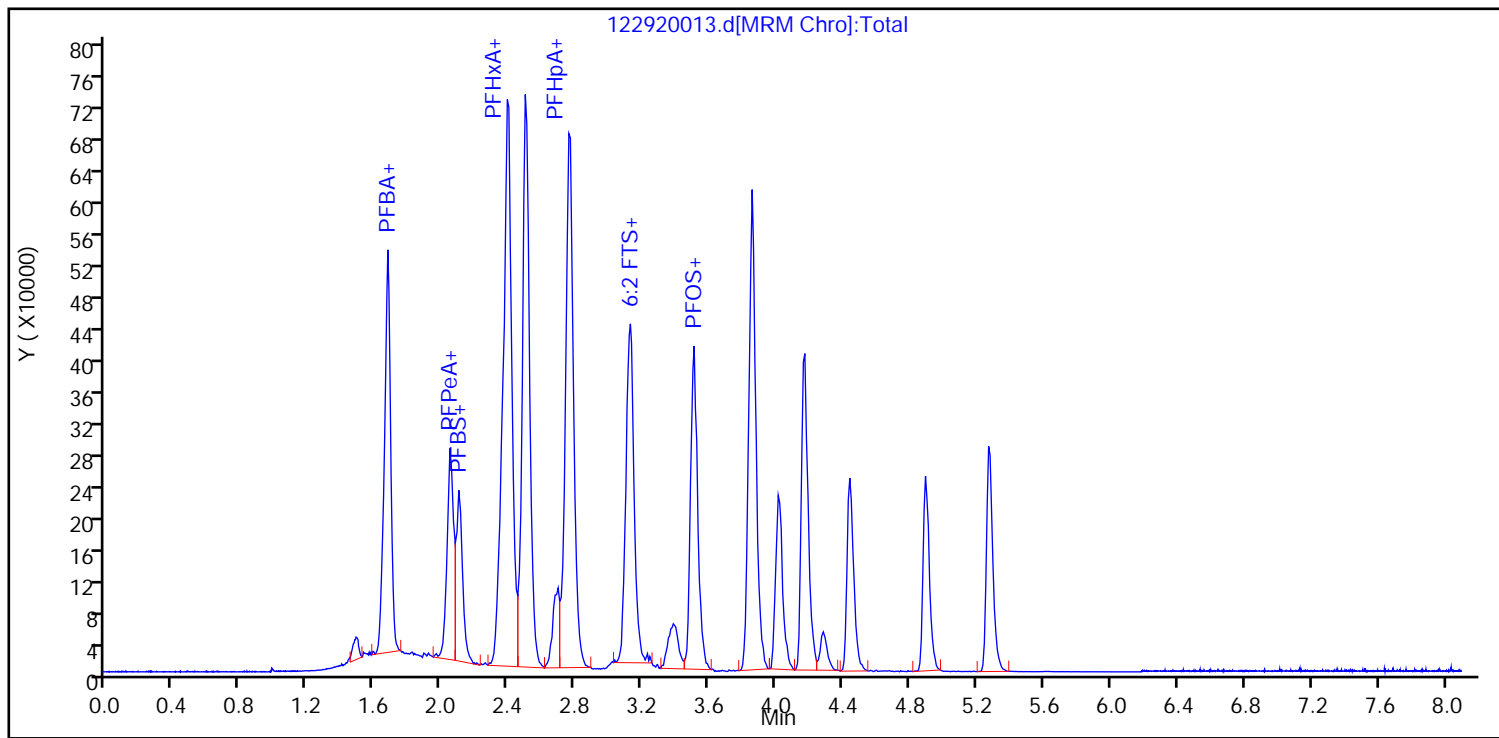
Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

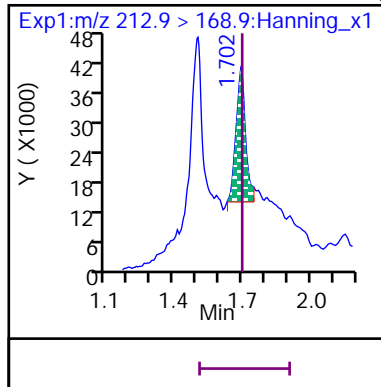
Sample Info: VL11043-005,5

Dil. Factor: 5

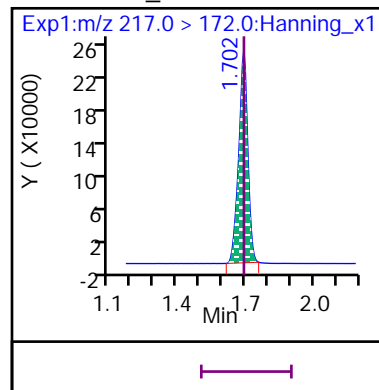
Operator: Matthew M. Miller



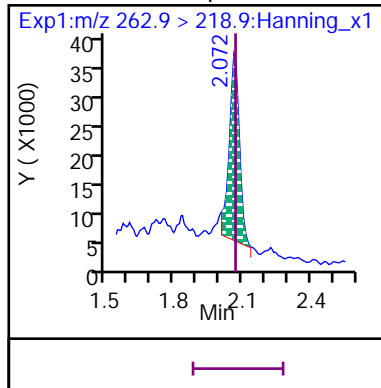
8 Perfluoro-n-butanoic acid (PFBA) (M)



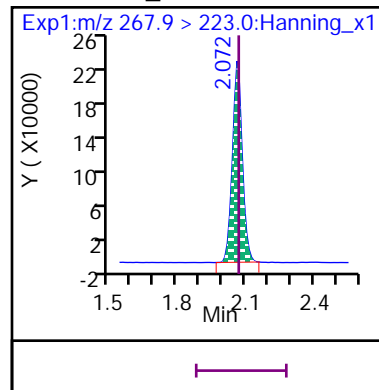
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)

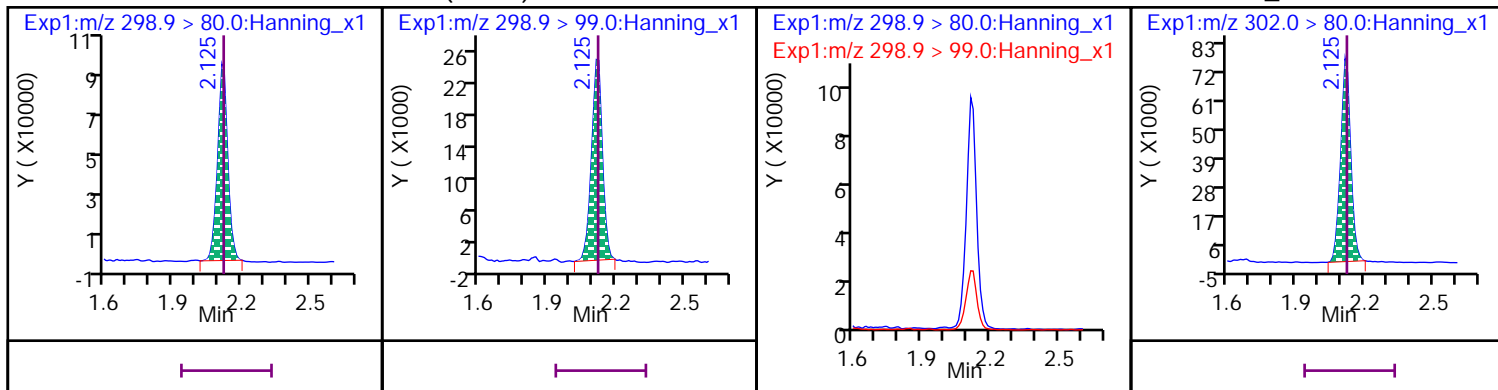


D 50 13C5\_PFPeA



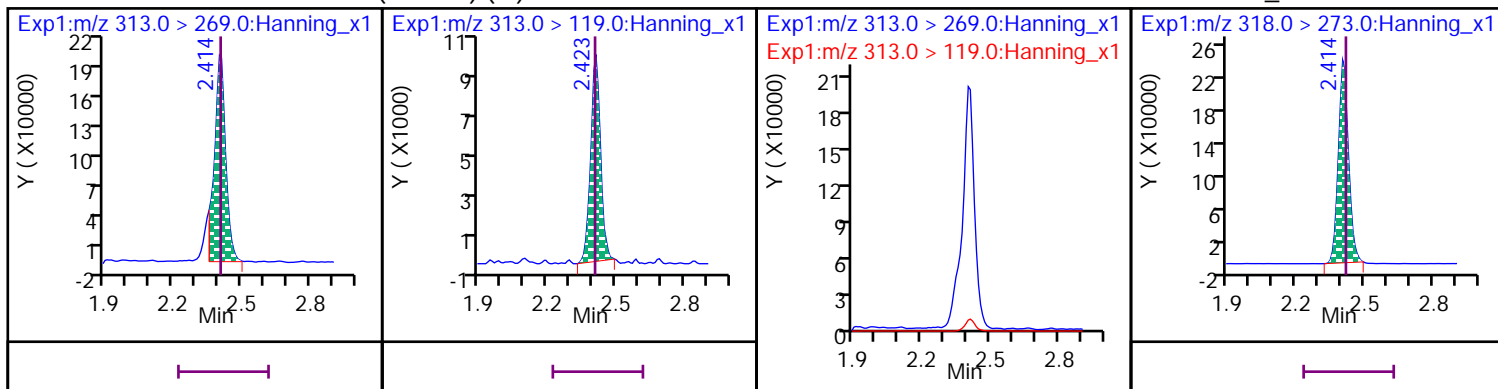
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



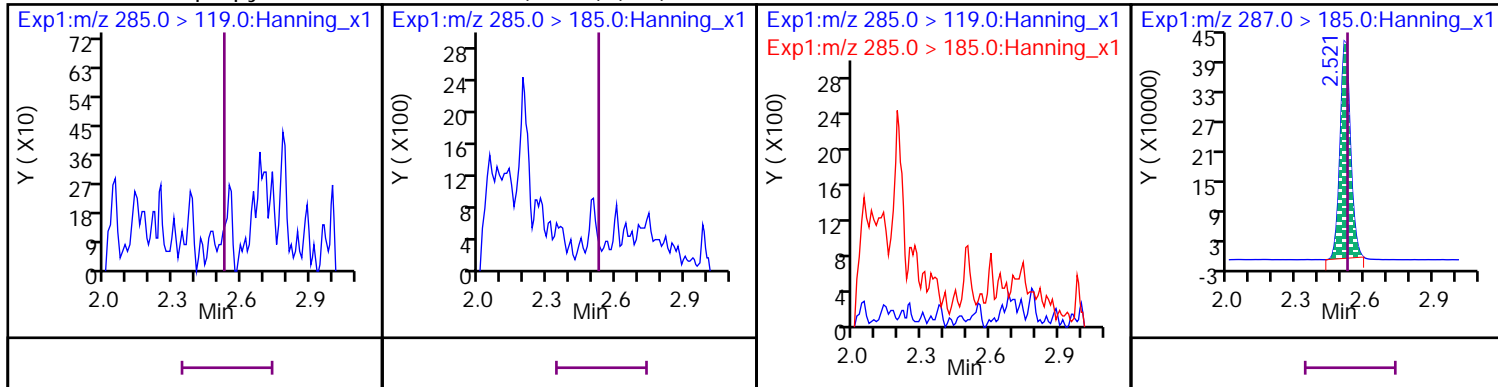
15 Perfluoro-n-hexanoic acid (PFHxA) (M)

D 49 13C5\_PFHxA



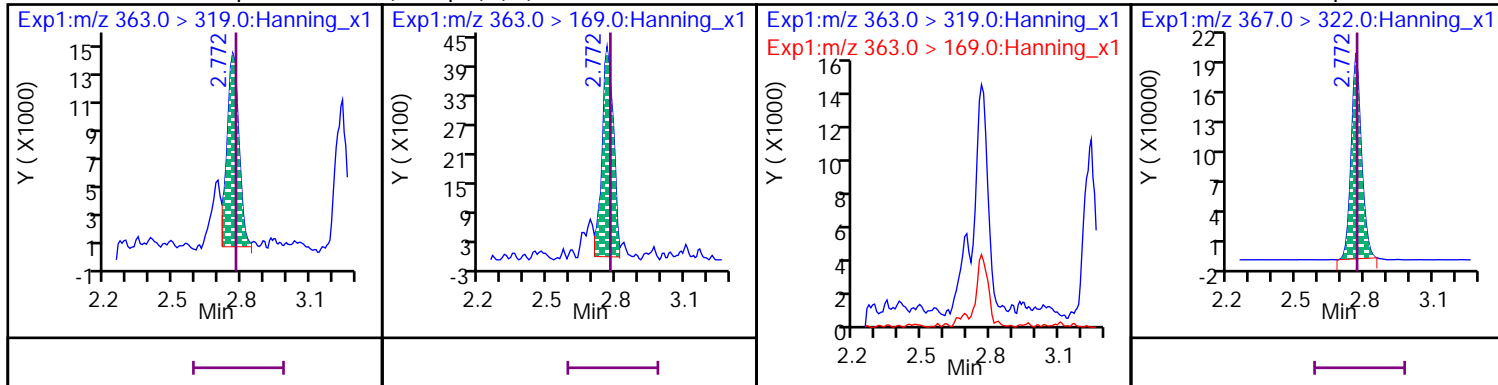
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



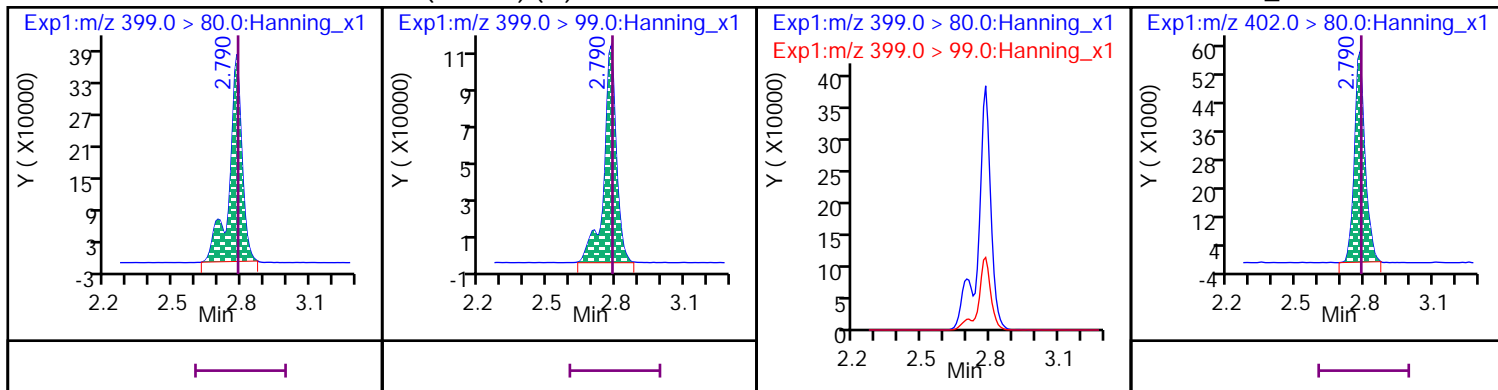
13 Perfluoro-n-heptanoic acid (PFHpA) (M)

D 47 13C4\_PFHpA



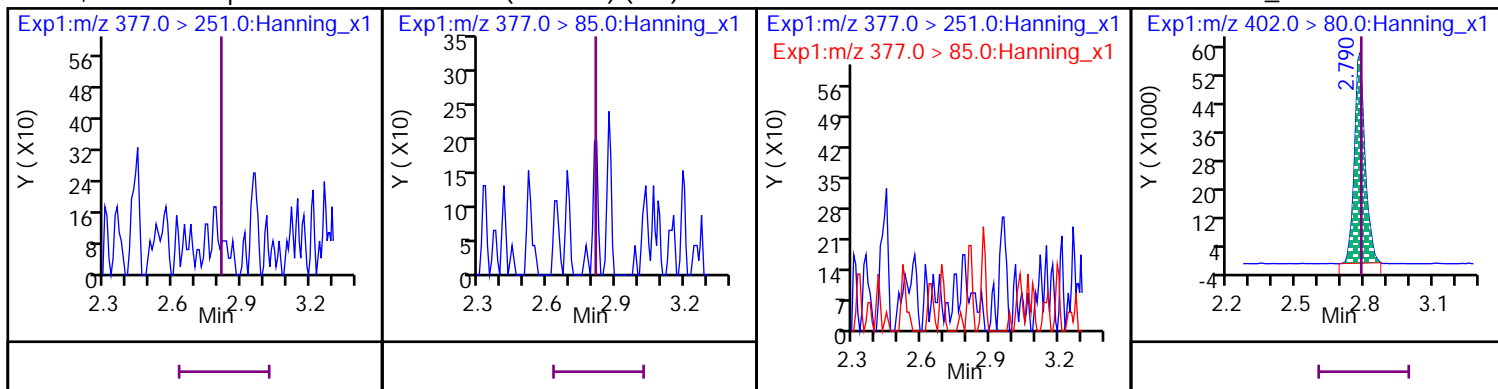
14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



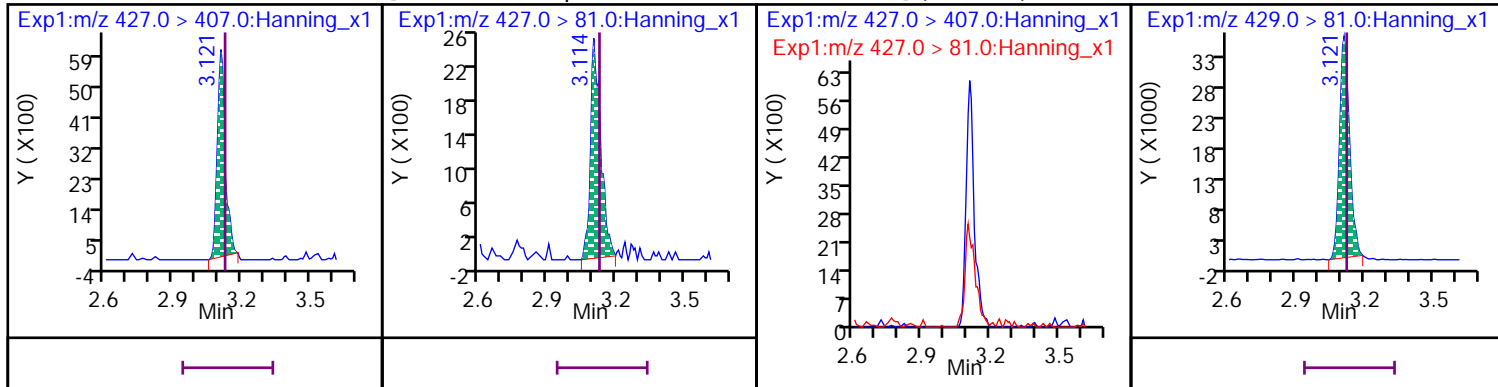
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



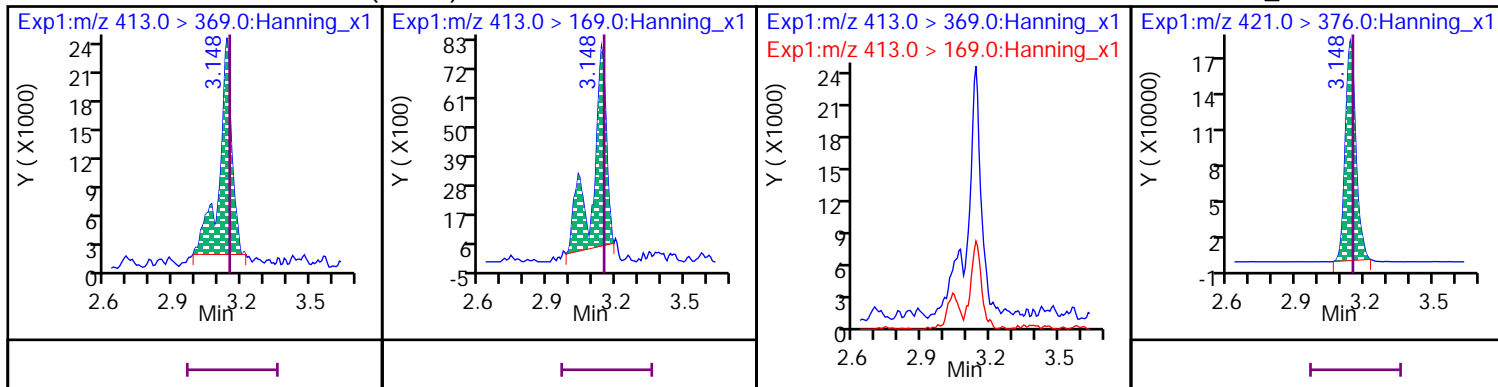
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



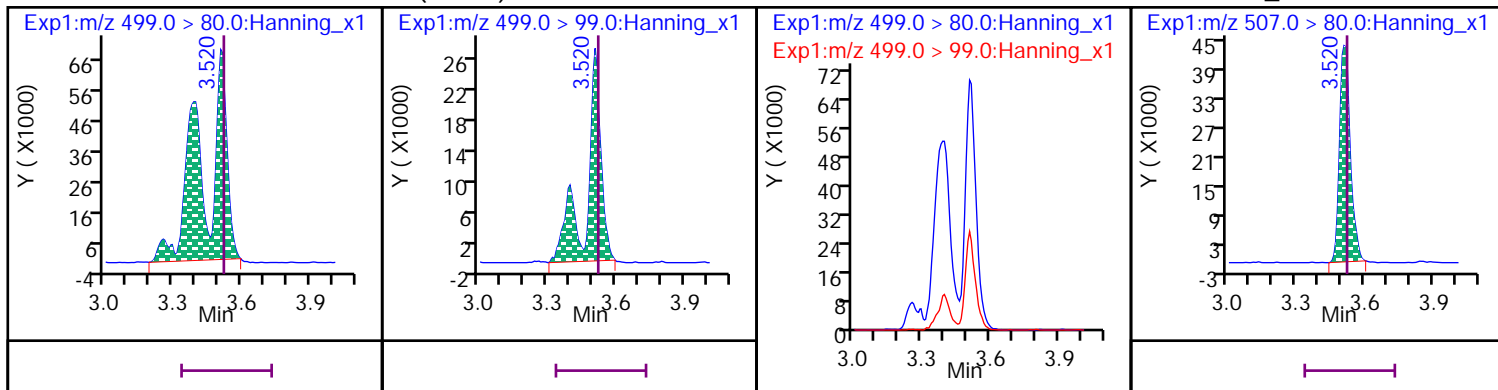
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



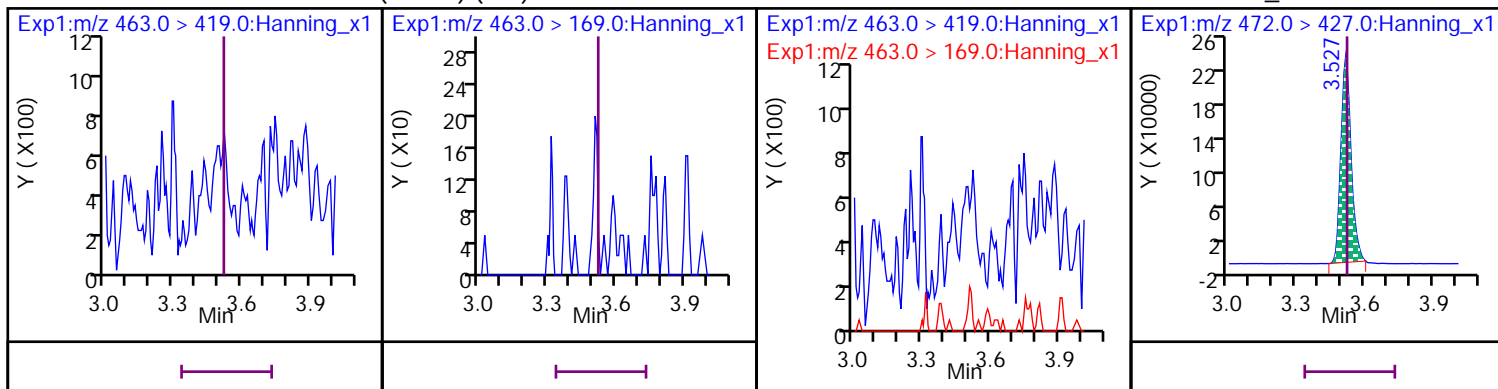
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



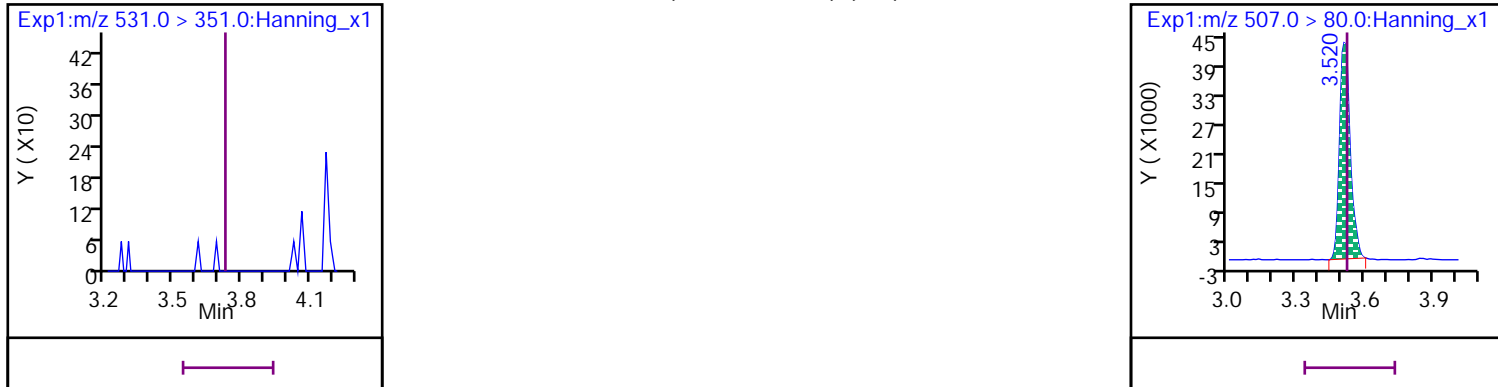
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



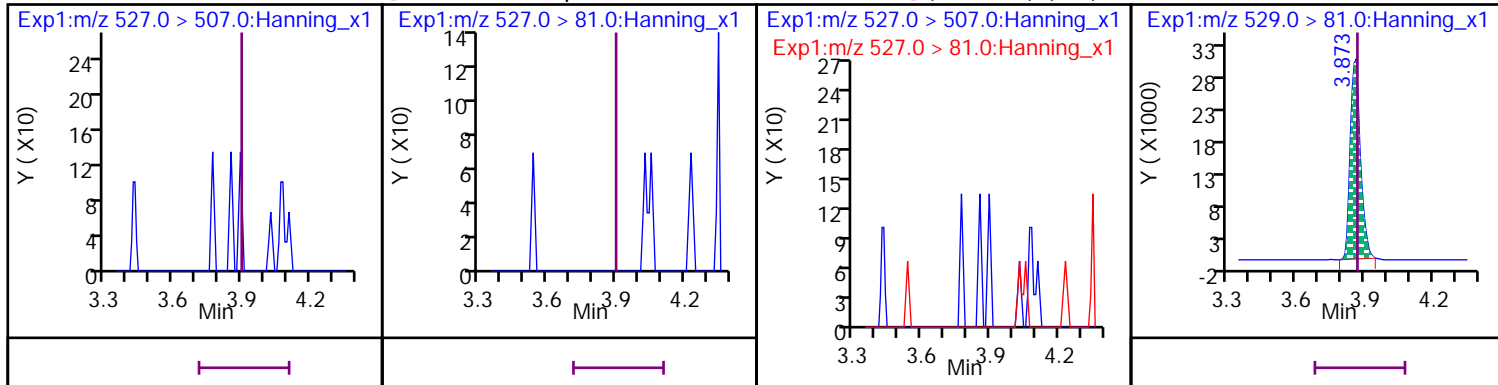
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



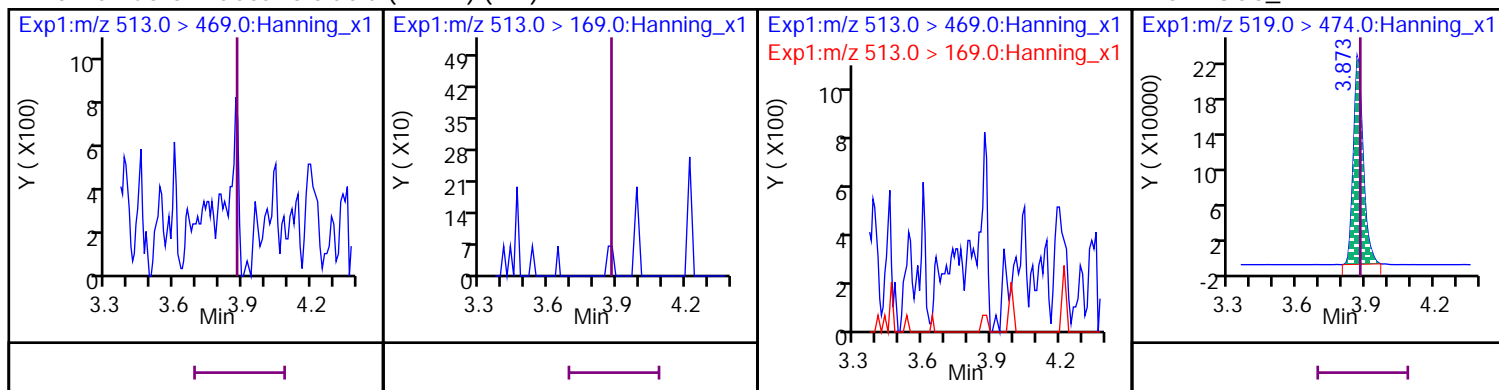
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



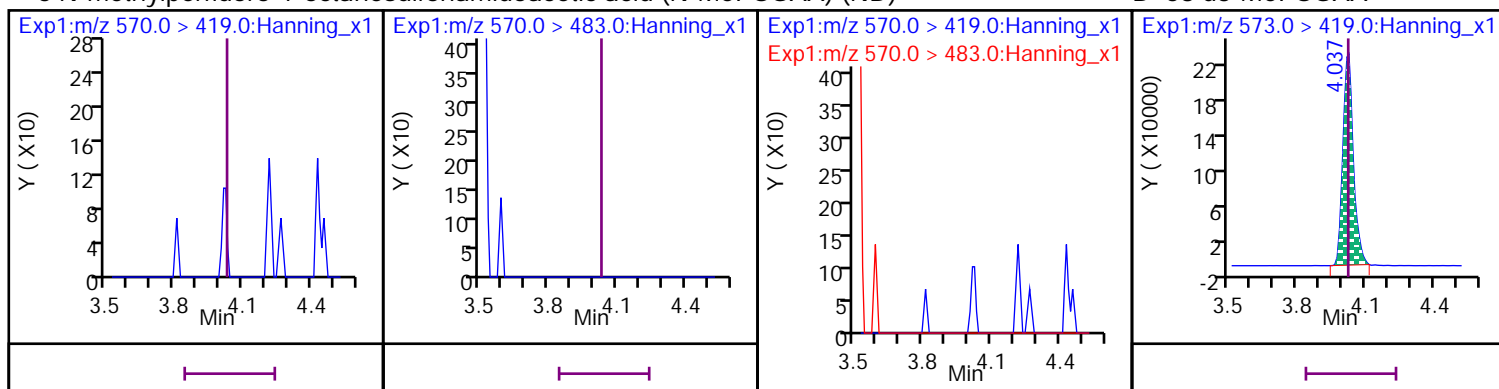
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



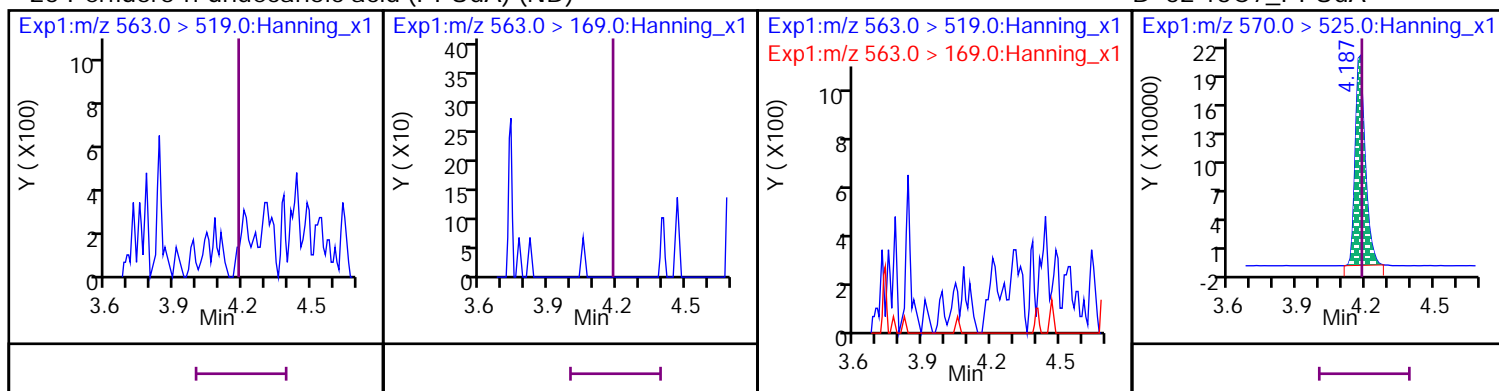
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



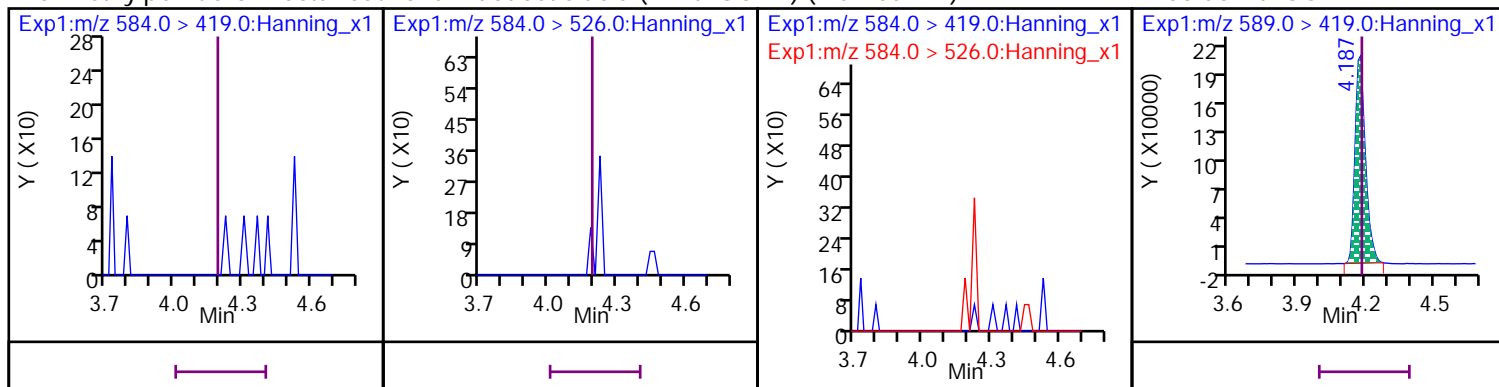
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

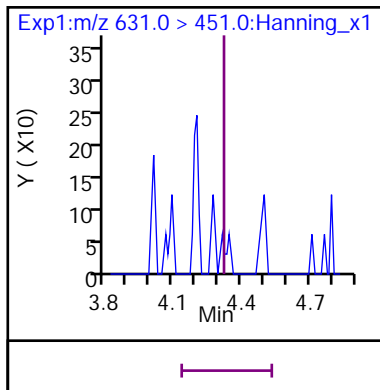


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

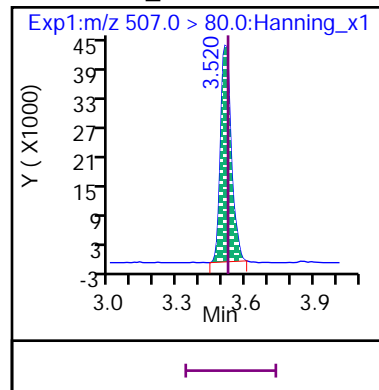
D 60 d5-EtFOSAA



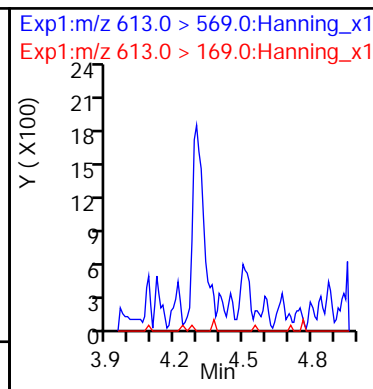
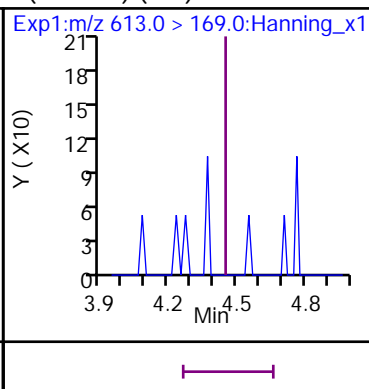
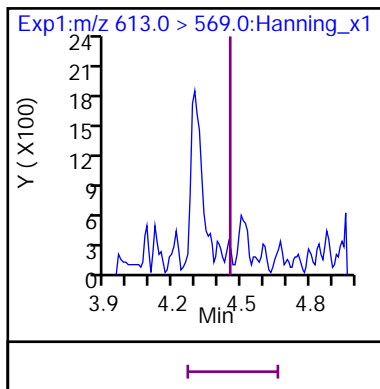
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



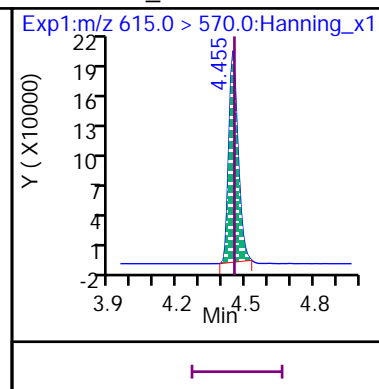
D 54 13C8\_PFOS



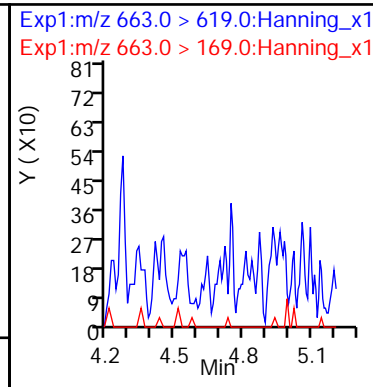
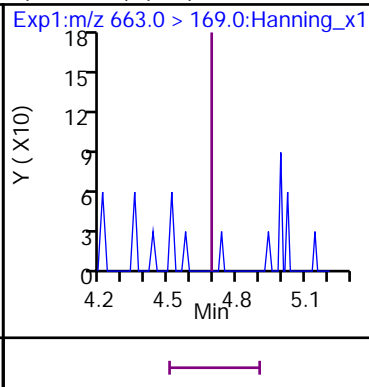
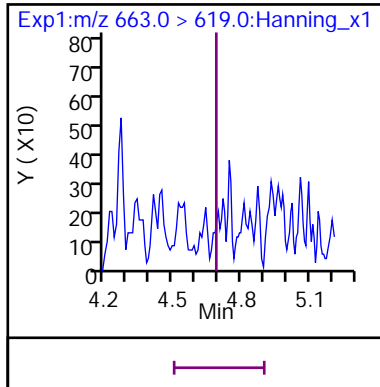
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



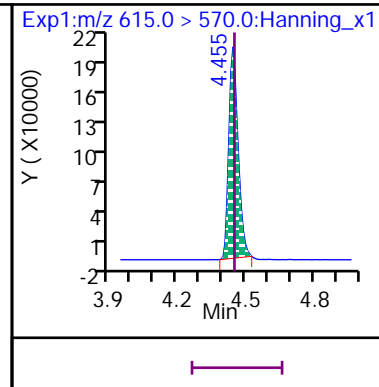
D 38 13C2\_PFDoA



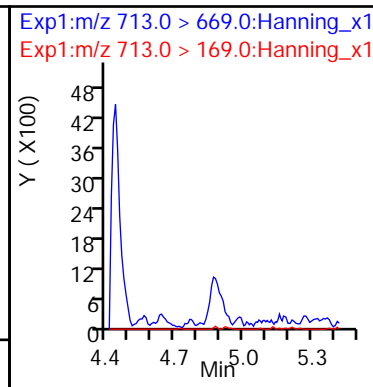
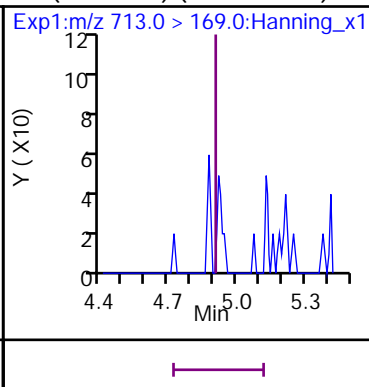
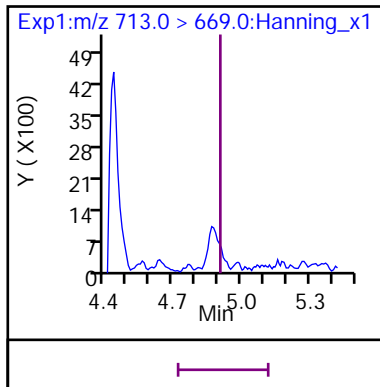
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



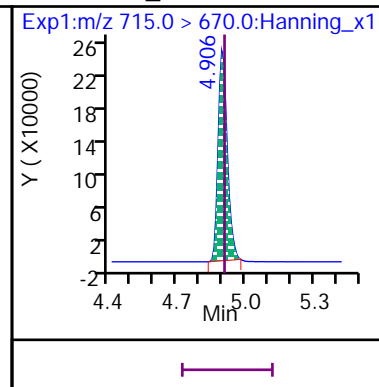
D 38 13C2\_PFTeDA



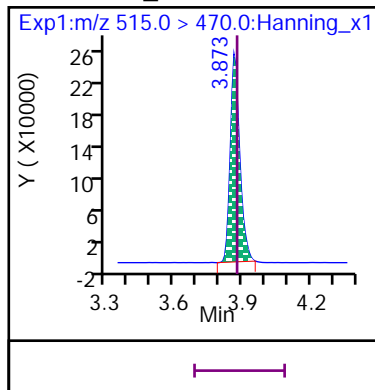
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)



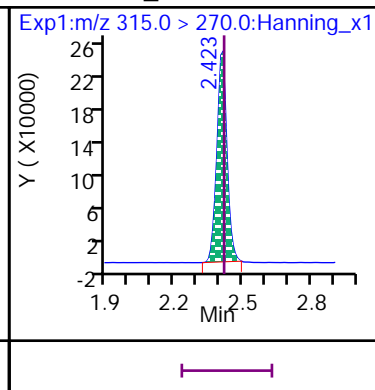
D 42 13C2\_PFTeDA



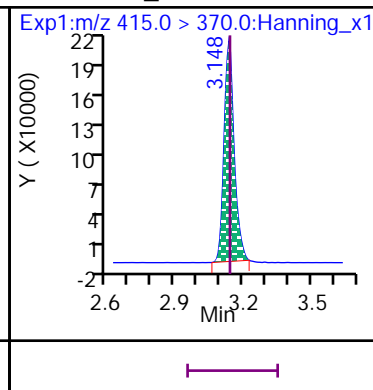
\* 37 13C2\_PFDA



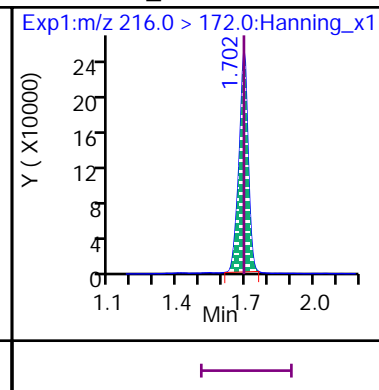
\* 39 13C2\_PFHxA



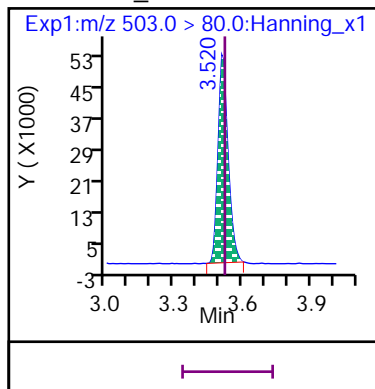
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

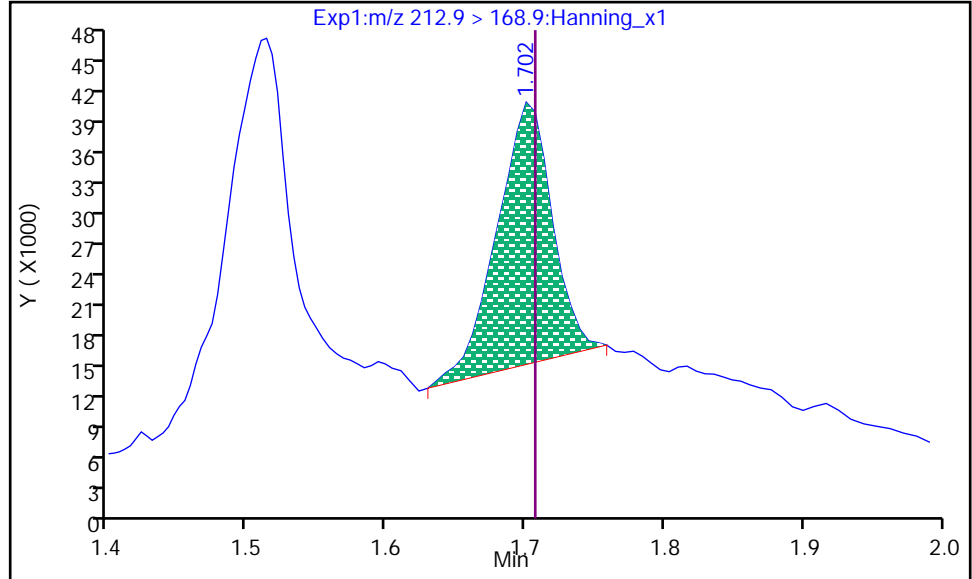
Dil. Factor: 5

Operator: Matthew M. Miller

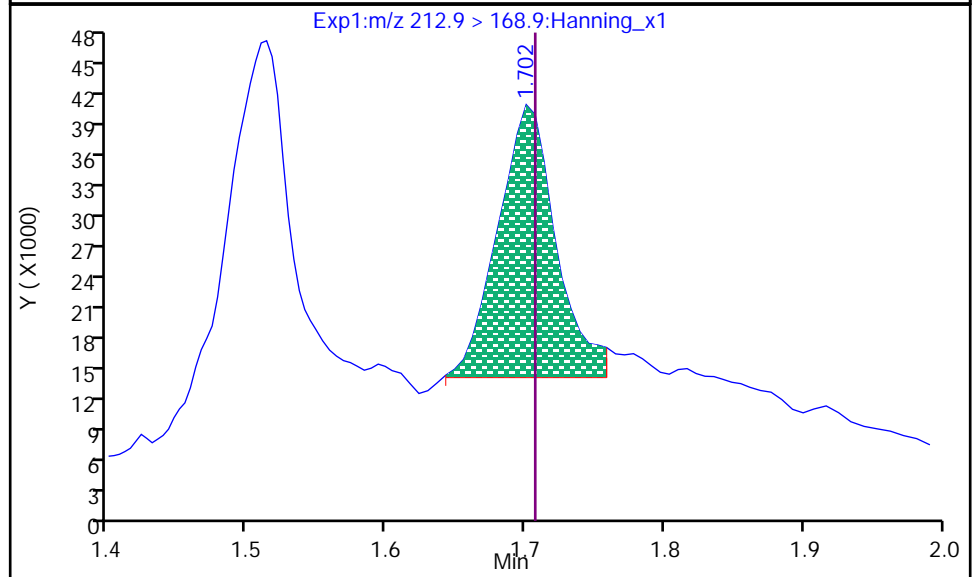
8 PFBA, CAS: 375-22-4

RT: 1.702  
Area: 69141  
Conc: 18.972  
Conc Units: ng/L

Processing Integration Results



RT: 1.702  
Area: 75837  
Conc: 20.809  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:45:11

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

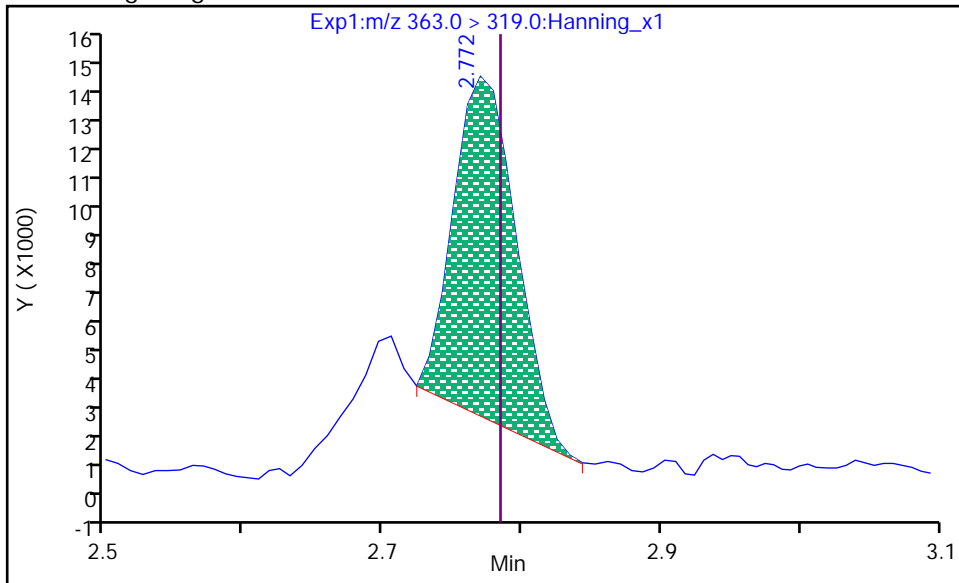
Dil. Factor: 5

Operator: Matthew M. Miller

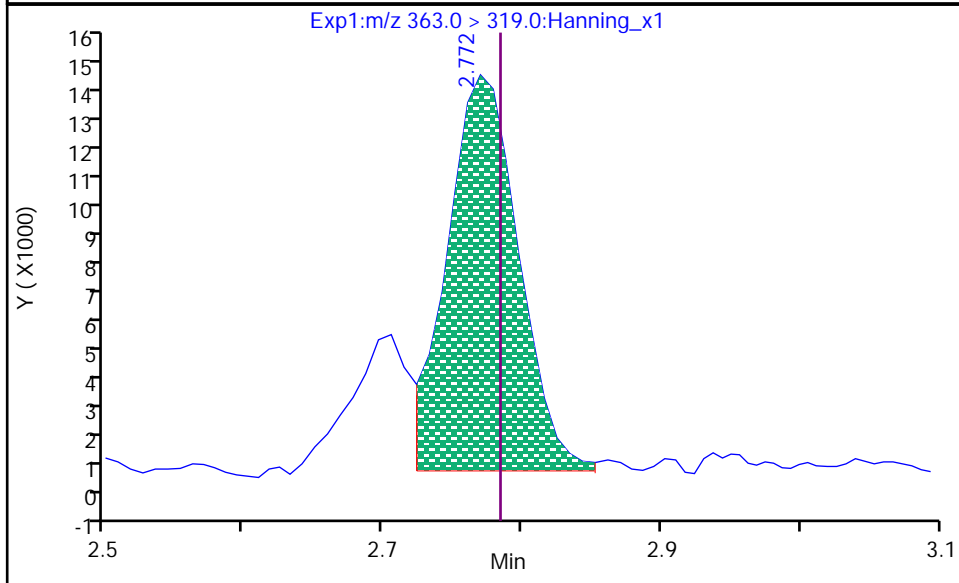
13 PFHpA, CAS: 375-85-9

RT: 2.772  
Area: 35971  
Conc: 10.751  
Conc Units: ng/L

Processing Integration Results



RT: 2.772  
Area: 47514  
Conc: 14.200  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:45:55

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

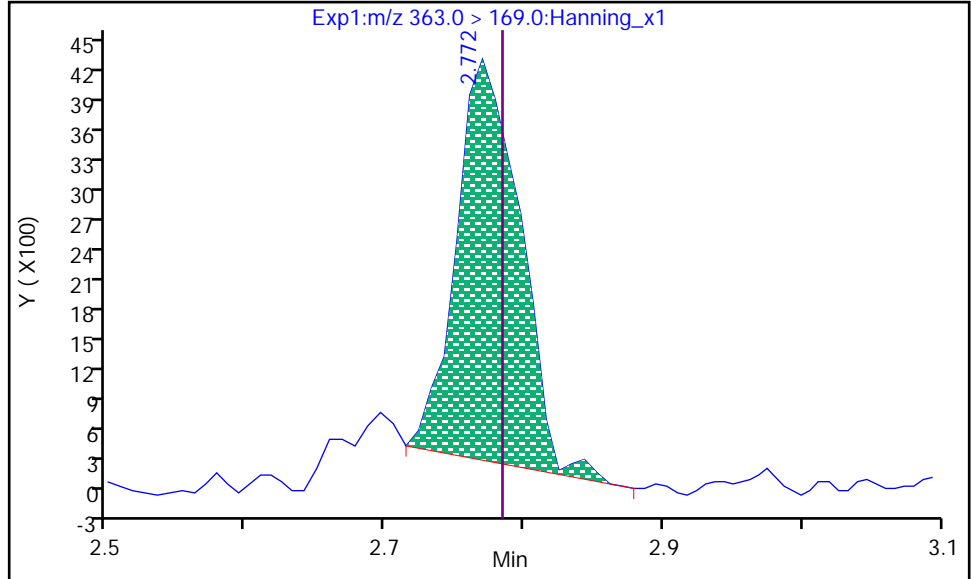
Dil. Factor: 5

Operator: Matthew M. Miller

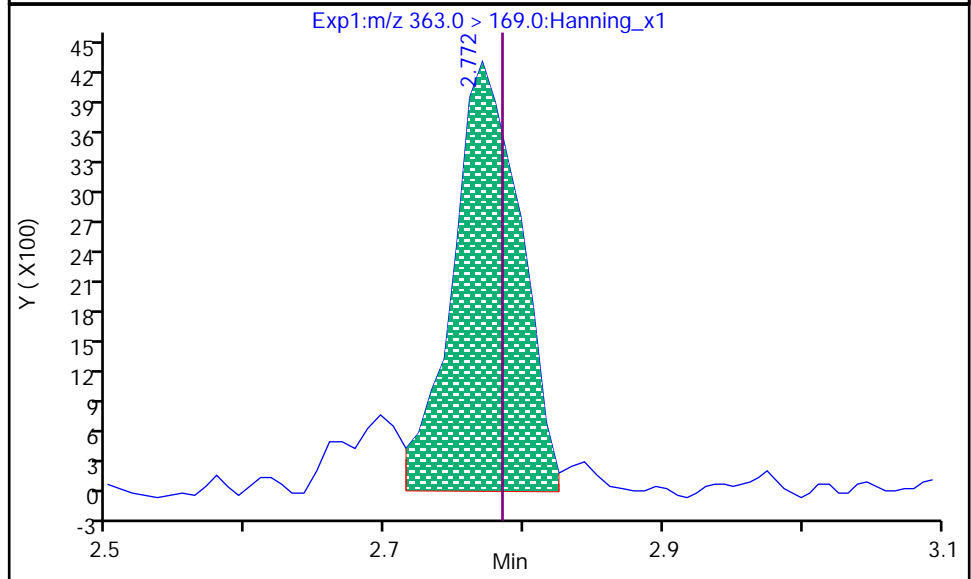
13 PFHpA, CAS: 375-85-9

RT: 2.772  
Area: 12588  
Conc: 14.200  
Conc Units: ng/L

Processing Integration Results



RT: 2.772  
Area: 14201  
Conc: 14.200  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:47:12

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

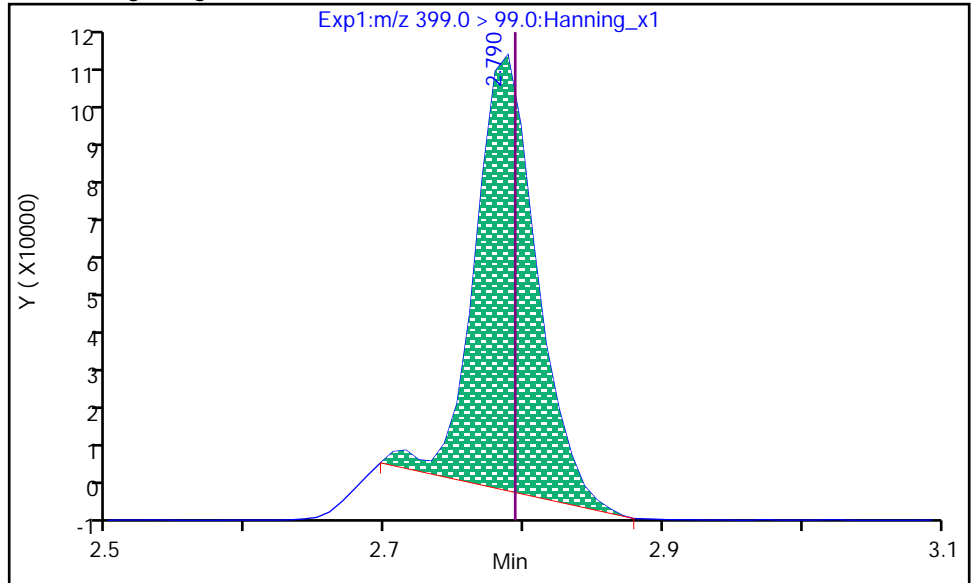
Dil. Factor: 5

Operator: Matthew M. Miller

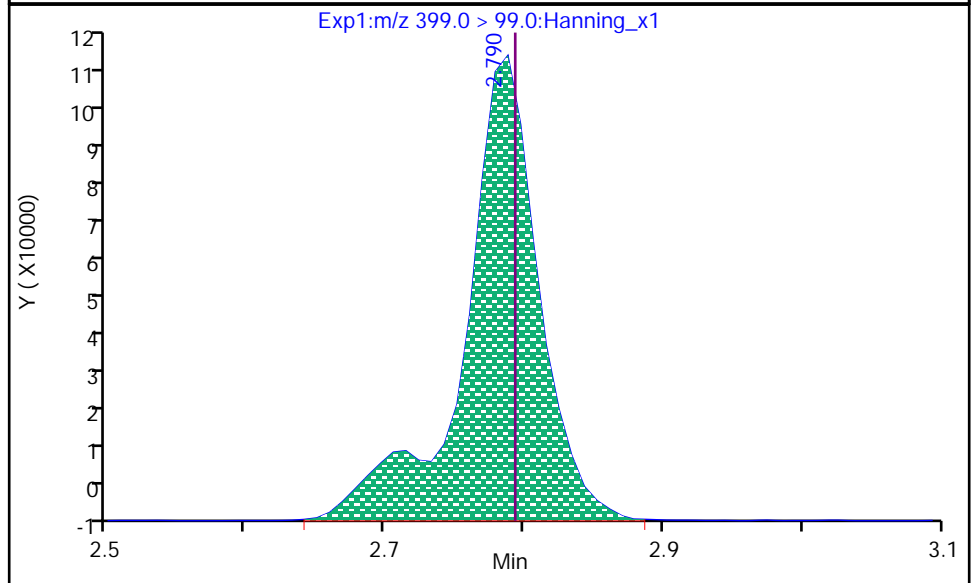
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.790  
Area: 325754  
Conc: 1390.54  
Conc Units: ng/L



RT: 2.790  
Area: 422363  
Conc: 1390.54  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:47:21

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

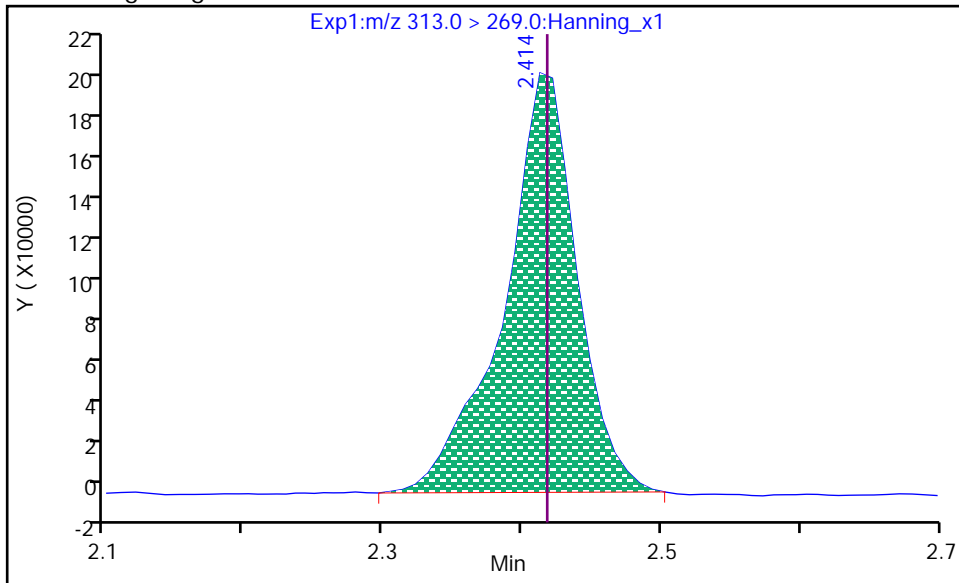
Dil. Factor: 5

Operator: Matthew M. Miller

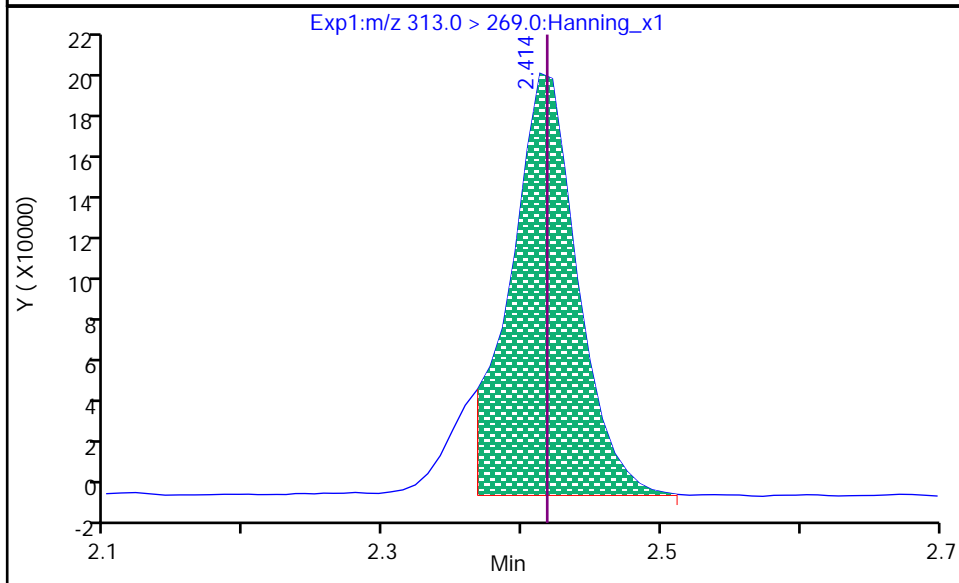
15 PFHxA, CAS: 307-24-4

RT: 2.414  
Area: 708220  
Conc: 182.40  
Conc Units: ng/L

Processing Integration Results



RT: 2.414  
Area: 650836  
Conc: 167.62  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:45:46

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920013.d

Injection Date: 29-Dec-2020 11:38:23

Inst. ID: LCMSMS02

Client ID: FTA-TT-MW-03-1220

Lab ID: VL11043-005

Sample Info: VL11043-005,5

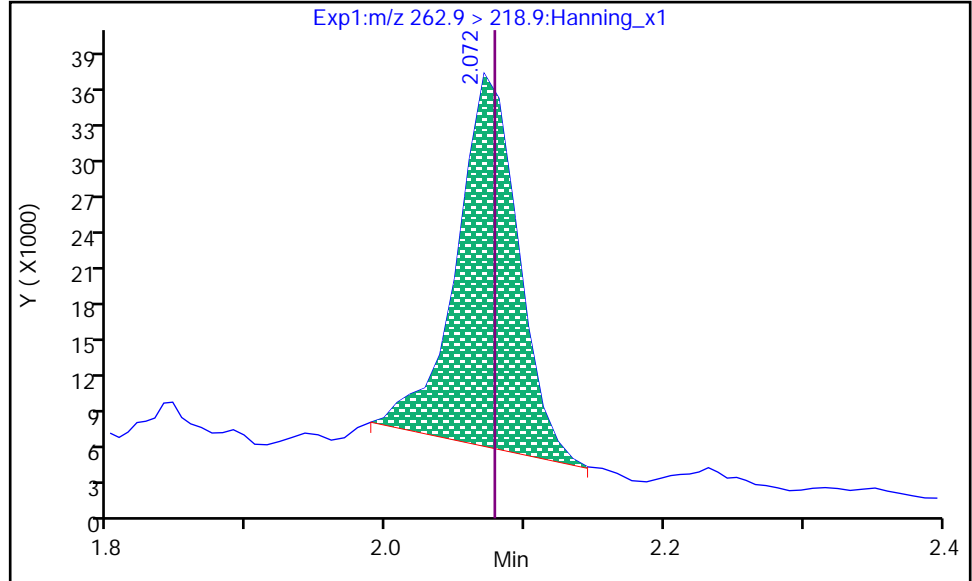
Dil. Factor: 5

Operator: Matthew M. Miller

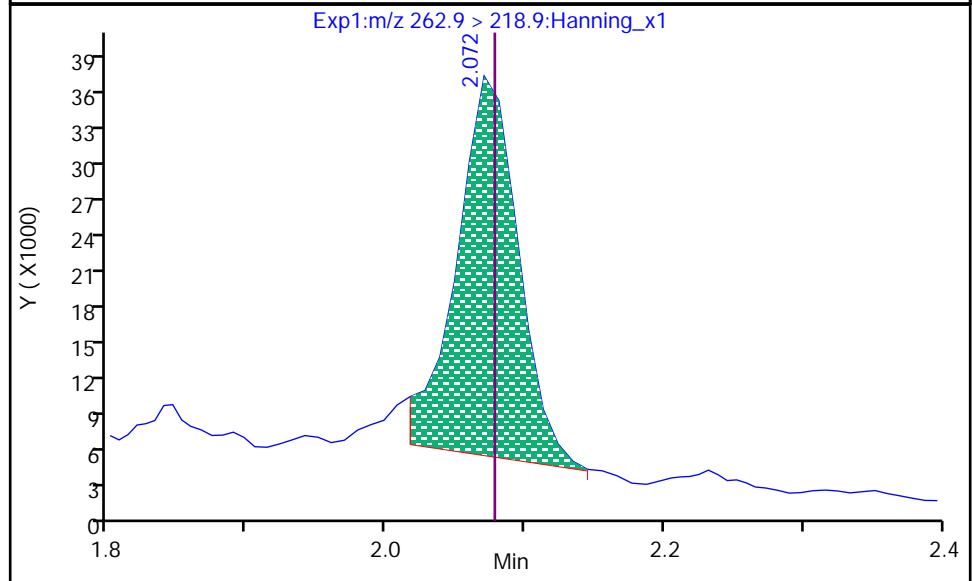
21 PFPeA, CAS: 2706-90-3

RT: 2.072  
Area: 93752  
Conc: 26.088  
Conc Units: ng/L

Processing Integration Results



RT: 2.072  
Area: 94970  
Conc: 26.426  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:45:24

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-006</b>
Description: <b>FTP-MW5-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1035</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2020 1149	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>5.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>91</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>16</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>2.5</b>	<b>J</b>	<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>3.9</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>4.2</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>37</b>		<b>3.6</b>	<b>1.8</b>	<b>0.90</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		81	50-150
13C2_PFDaA		88	50-150
13C2_PFTeDA		85	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBa		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		93	50-150
13C6_PFDa		91	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		93	50-150
13C8_PFOs		93	50-150
13C9_PFNa		86	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920014.d  
 Injection Date: 29-Dec-2020 11:49:02 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 7  
 Lab Sample ID: VL11043-006 Lab Prep. Batch: 77741  
 Client ID: FTP-MW5-1220 Sample Group: VL11043  
 Sample Info: VL11043-006 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0393871$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	279	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.702 1.702 0 646553 22 >100:1 1001.00 932.23 96.5

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.702 1.709 0/0 254143 23 >100:1 395.05 15.560

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.072 2.080 0 639272 17 >100:1 1001.00 929.33 92.9

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.072 2.080 0/0 67838 17 26:1 105.65 4.1613

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.125 2.133 0 219020 17 >100:1 1001.00 951.31 90.8

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.136 2.133 1/1 34161 16 87:1 Target = 3.34  
 298.9 > 99 44 2.125 2.133 10758 21 32:1 3.17 (1.67-5.02) 132.42 5.2156

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.414 2.429 0 698627 19 >100:1 1001.00 947.84 92.4

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.414 2.420 0/0 43853 14 48:1 Target = 17.01  
 313 > 119 49 2.423 2.420 2848 13 22:1 15.39 (8.50-25.52) 63.643 2.5067 J

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.530 2.536 0 1338754 19 >100:1 5005.00 5026.22 94.6

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.536 ND 850 13 22:1 15.39 (8.50-25.52) 63.643 2.5067 U

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.772 2.777 0 583389 19 >100:1 1001.00 961.66 95.1

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.786 ND 850 13 22:1 15.39 (8.50-25.52) 63.643 2.5067 U

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.790 2.795 0 155591 18 >100:1 1001.00 908.67 83.8

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.790 2.795 0/0 380603 27 >100:1 Target = 3.80 0.19 2309.40 90.960  
 399 > 99 45 2.790 2.795 106968 27 >100:1 3.55 (1.90-5.71) 0.12

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.823		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.128	3.132	0	96843	28	>100:1			5005.00	5028.61	91.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.139		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.159	0	564793	24	>100:1			1001.00	954.26	93	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.154	3.159	0/0	57293	35	19:1	Target = 2.85	0.25	99.605	3.9231		M
413 > 169	53	3.161	3.159		20159	33	41:1	2.84 (1.42-4.28)	0.40				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.528	3.533	0	142727	21	>100:1			1001.00	951.97	93	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.411	3.533	-7/-7	158083	61	>100:1	Target = 6.80	7.04	935.62	36.851		M
499 > 99	54	3.418	3.533		29052	47		5.44 (3.40-10.20)	2.03				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.740		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													U
631 > 451	54		4.334		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.528	3.533	0	676974	22	>100:1			1001.00	901.47	85.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.533		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.873	3.879	0	84902	19				5005.00	4576.89	81.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.911		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.881	3.887	0	638220	22	>100:1			1001.00	962.14	91	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.887		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.028	4.034	0	697023	17	>100:1			5005.00	4855.97	95.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.043		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.193	0	607610	19	>100:1			5005.00	4574.87	85.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.203		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.193	0	549331	18	>100:1			1001.00	869.09	85.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.193		ND								
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.461	0	536869	20	>100:1			1001.00	886.92	88	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.918	0	668653	19	>100:1			1001.00	793.71	85	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.887	0	638525	20	>100:1					92.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.414	2.429	0	679515	19	>100:1					92.9	



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.152	0	564526	22	>100:1					91.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.702	1.702	0	608008	22	>100:1					95	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.528	3.533	0	157303	22	>100:1					91.4	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920014.d

Injection Date: 29-Dec-2020 11:49:02

Inst. ID: LCMSMS02

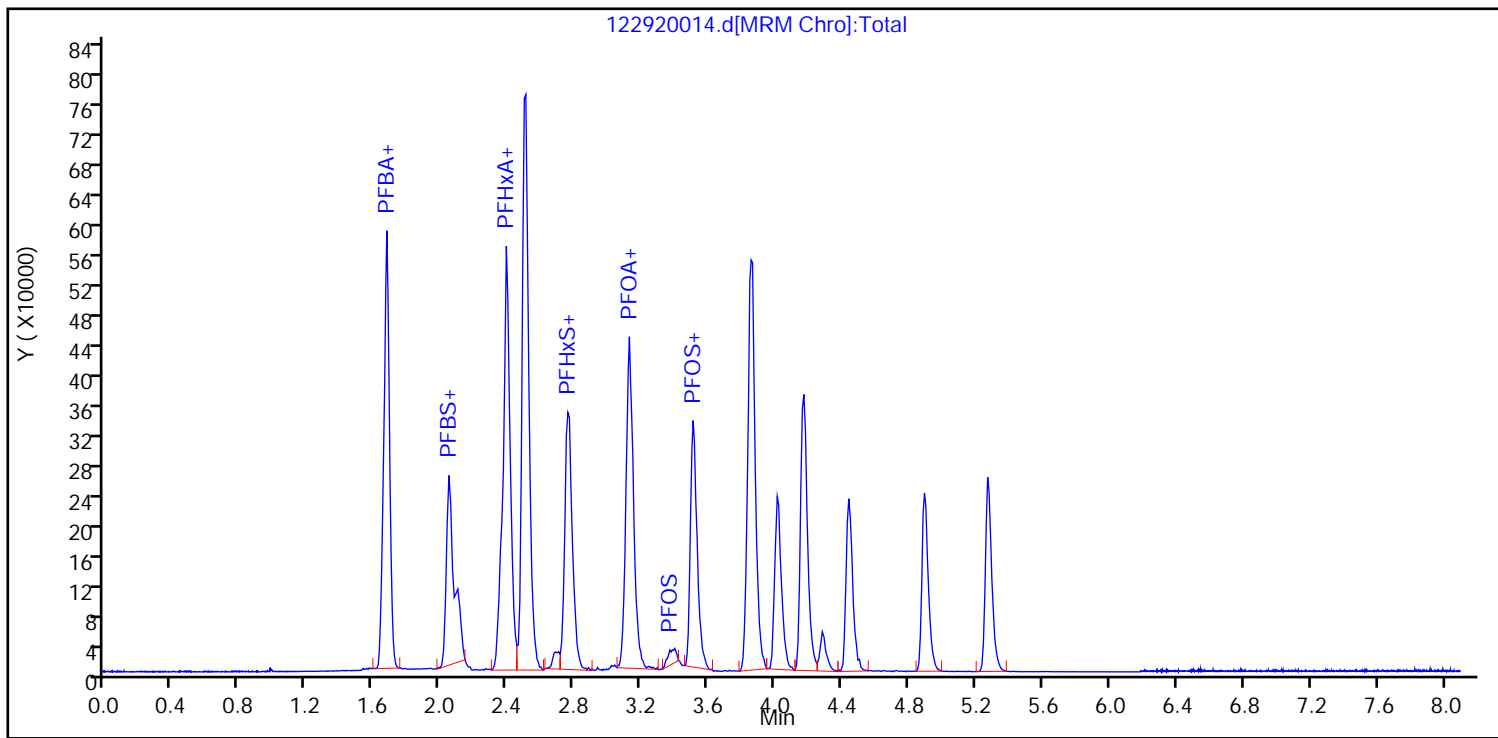
Client ID: FTP-MW5-1220

Lab ID: VL11043-006

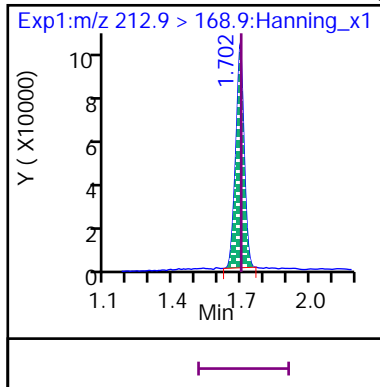
Sample Info: VL11043-006

Dil. Factor: 1

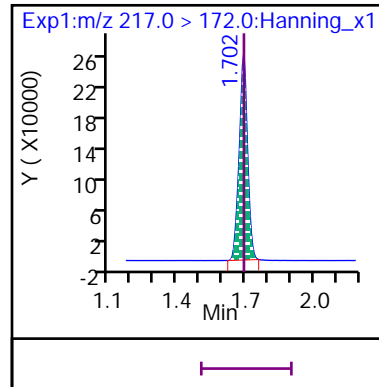
Operator: Matthew M. Miller



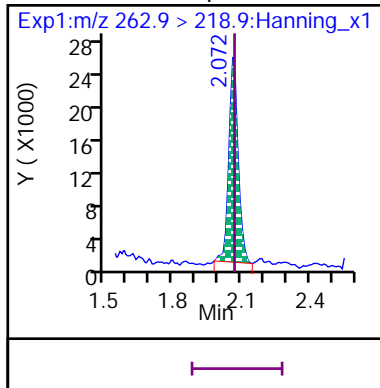
8 Perfluoro-n-butanoic acid (PFBA)



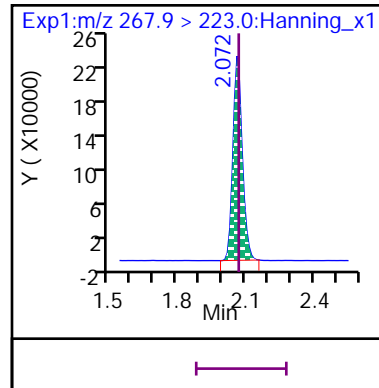
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

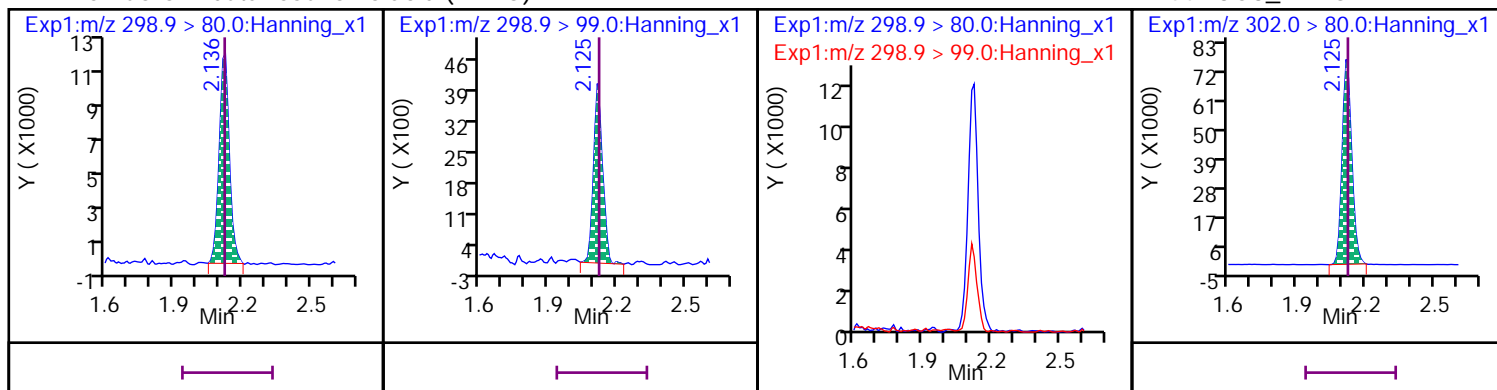


D 50 13C5\_PFPeA



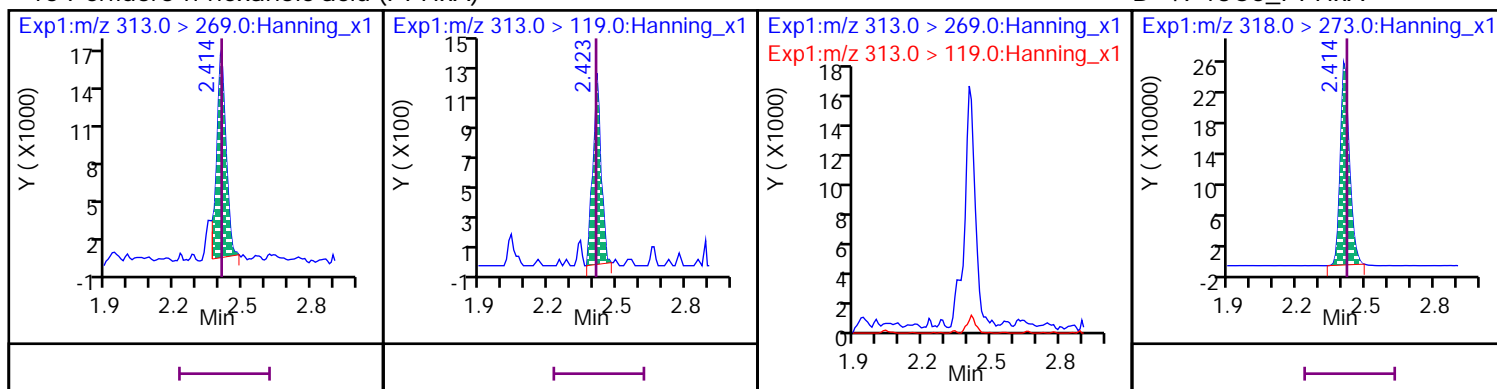
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



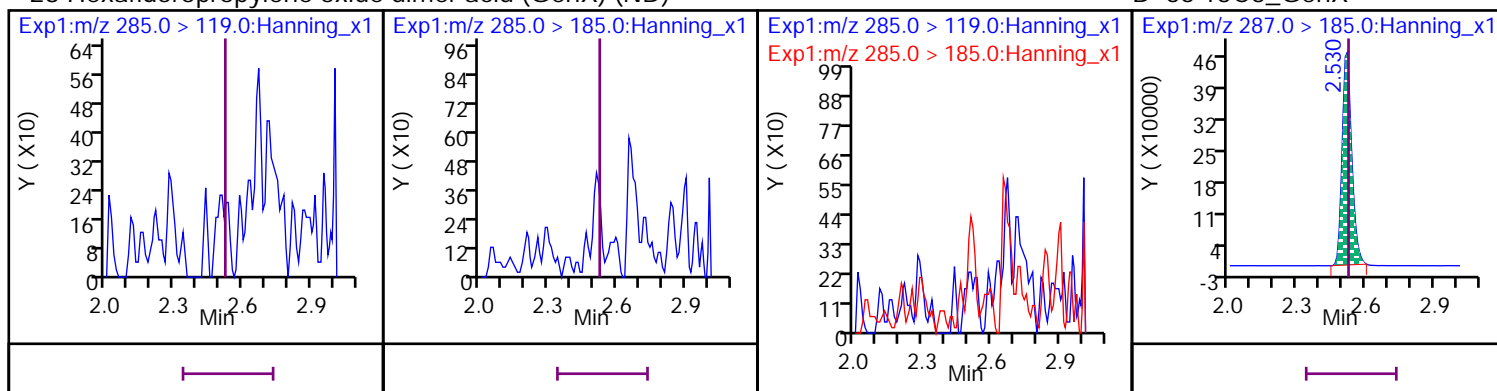
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



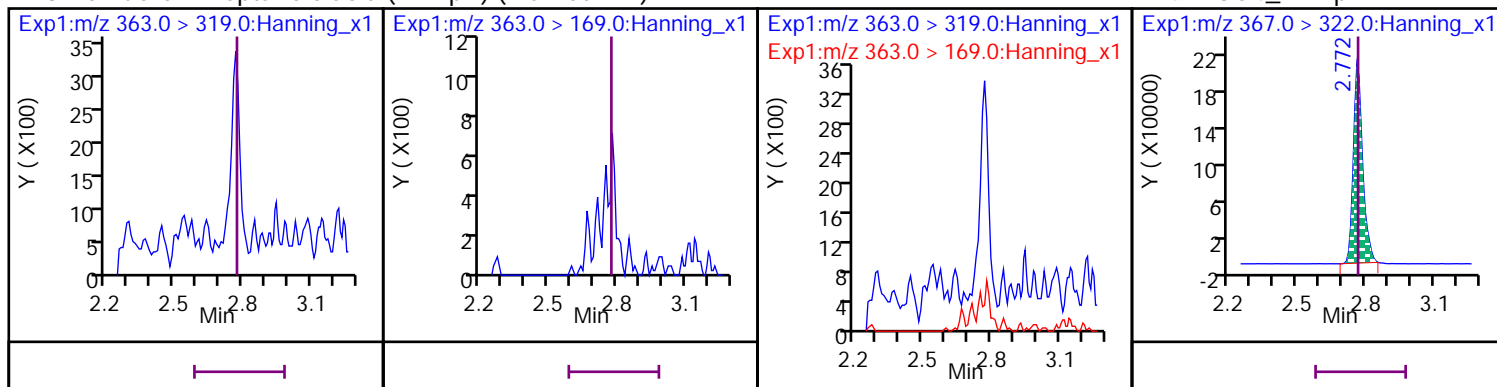
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



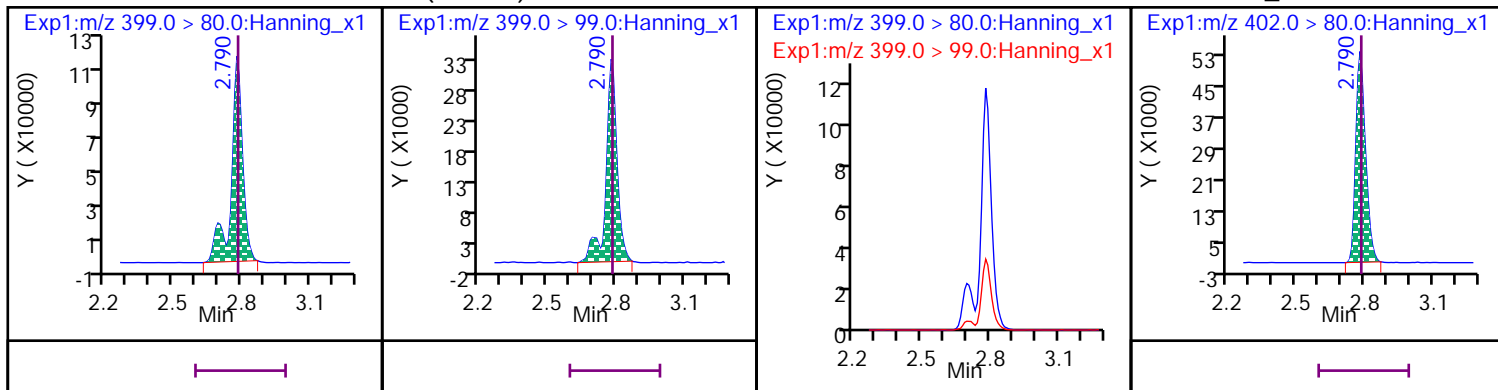
## 13 Perfluoro-n-heptanoic acid (PFHpA) (Marked ND)

D 47 13C4\_PFHpA



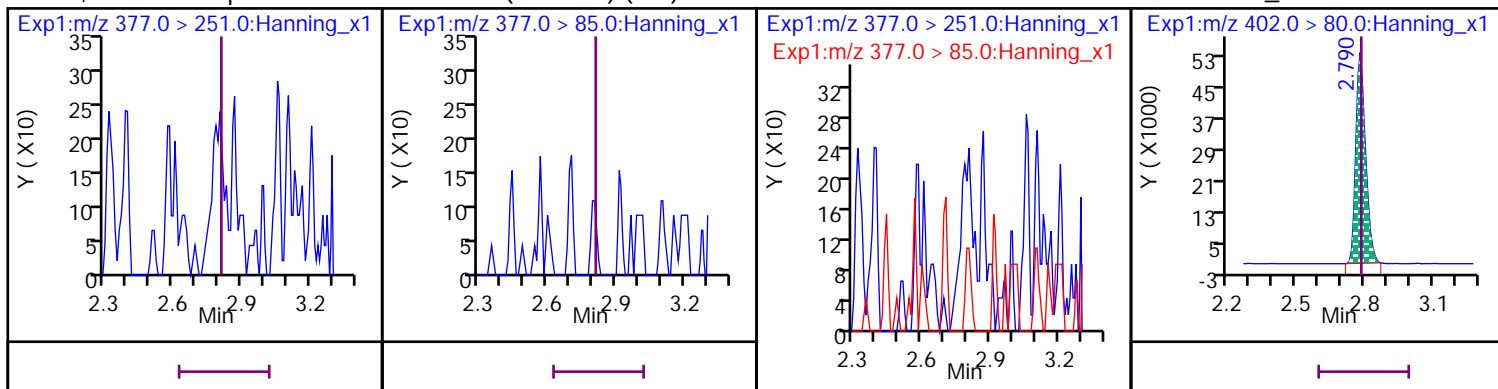
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



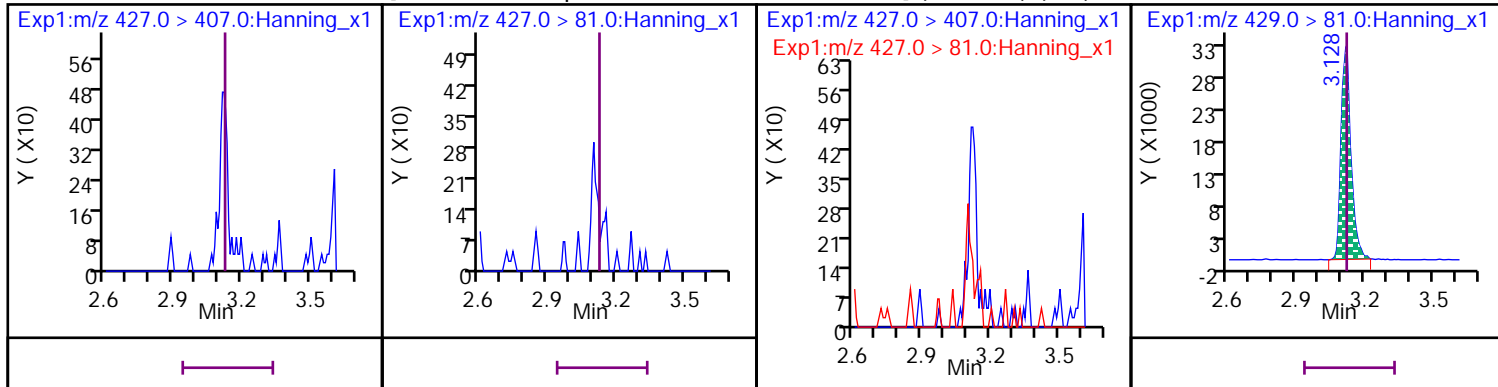
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



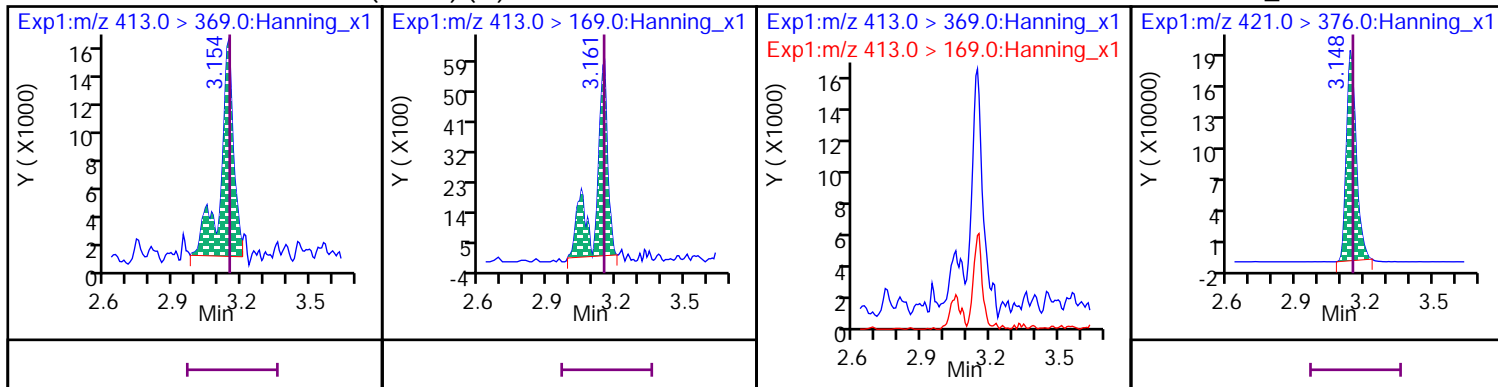
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



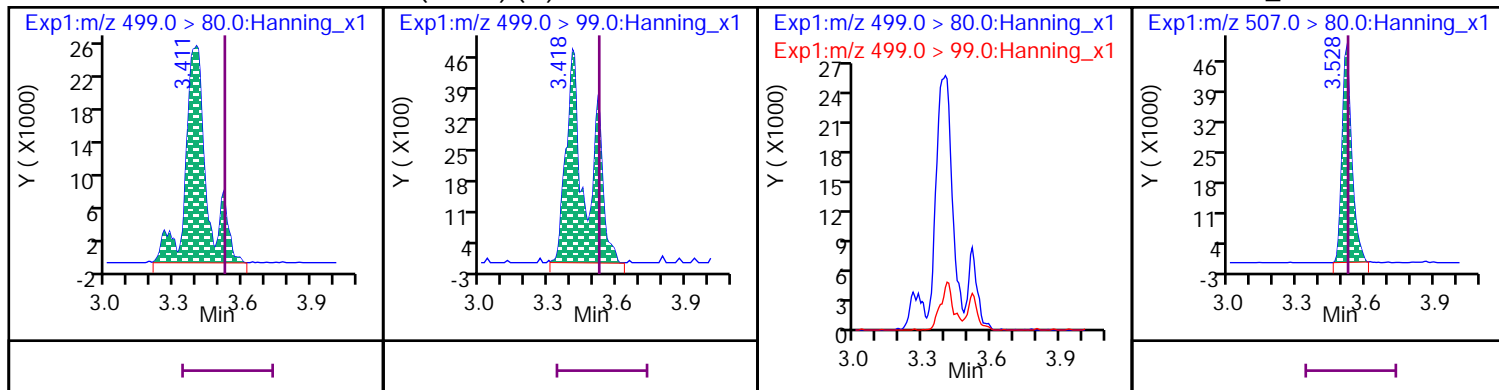
20 Perfluoro-n-octanoic acid (PFOA) (M)

D 53 13C8\_PFOA



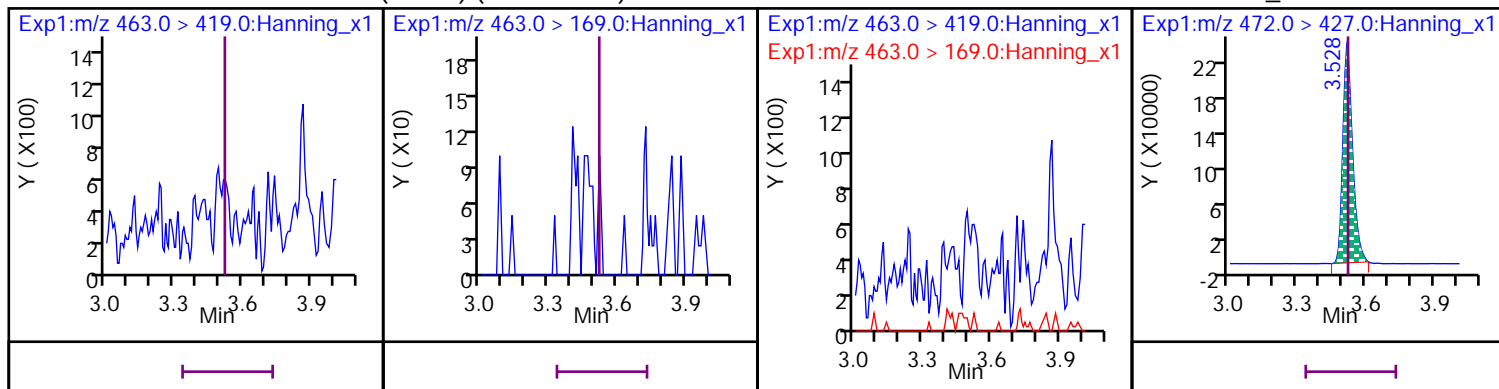
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



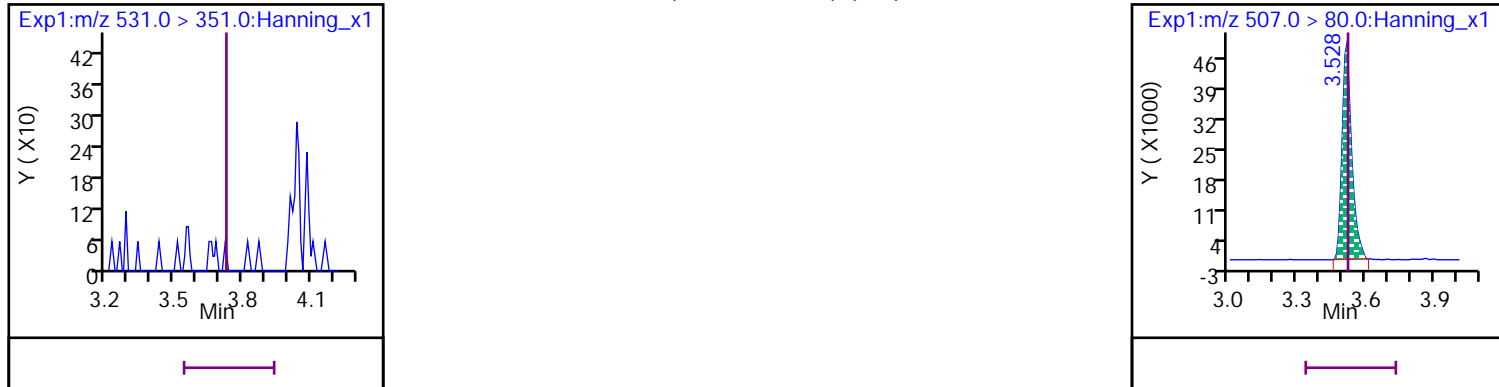
17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



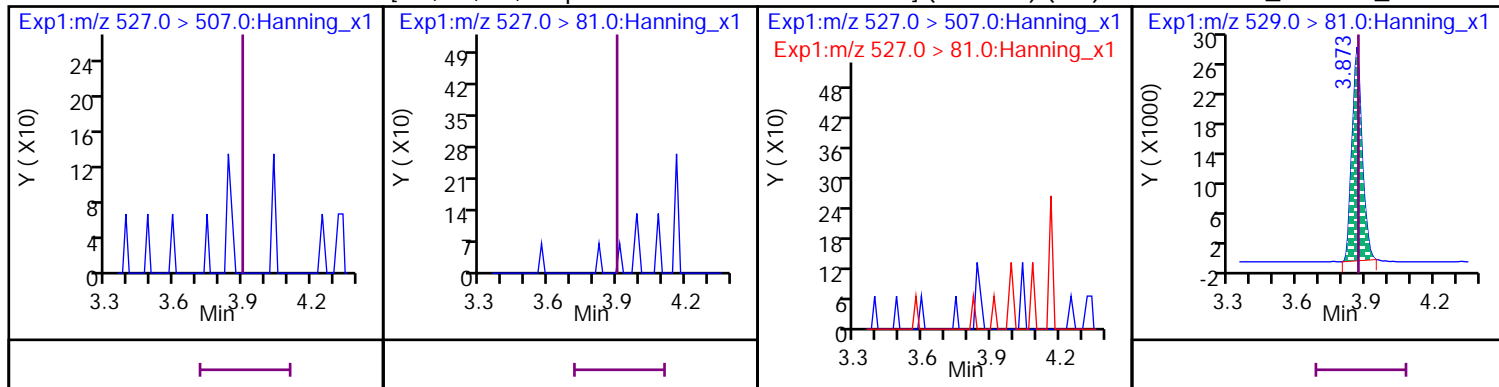
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



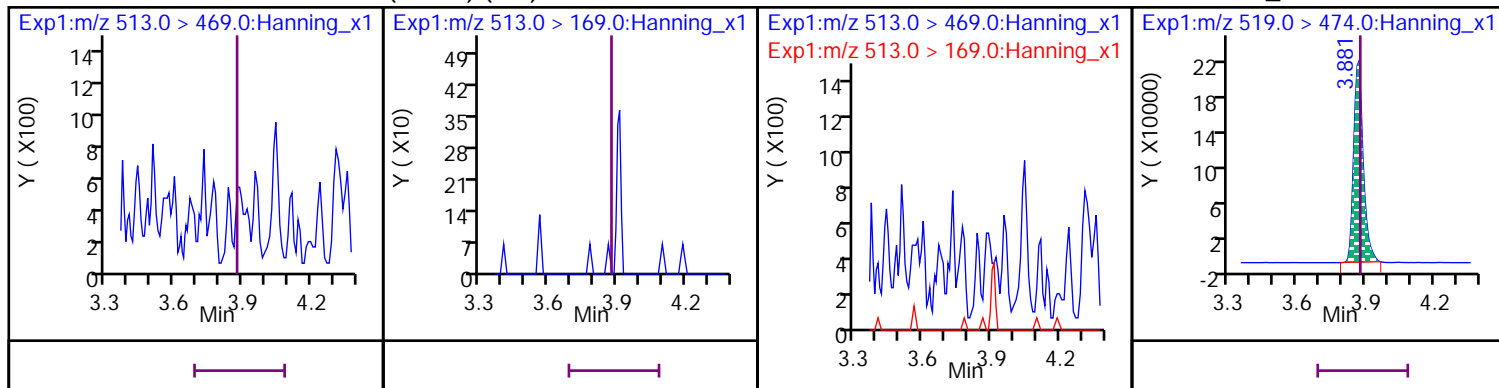
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



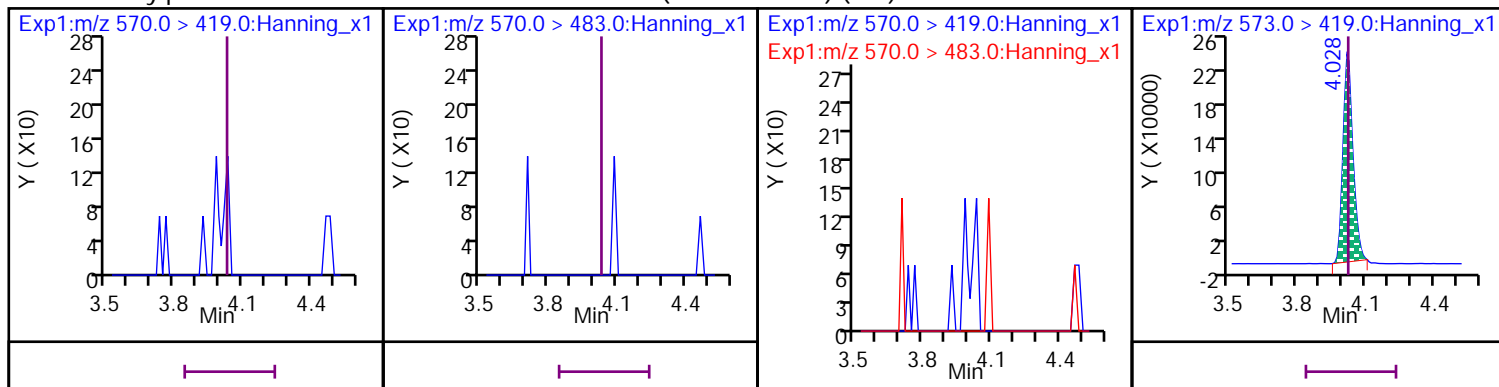
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

## D 51 13C6\_PFDA



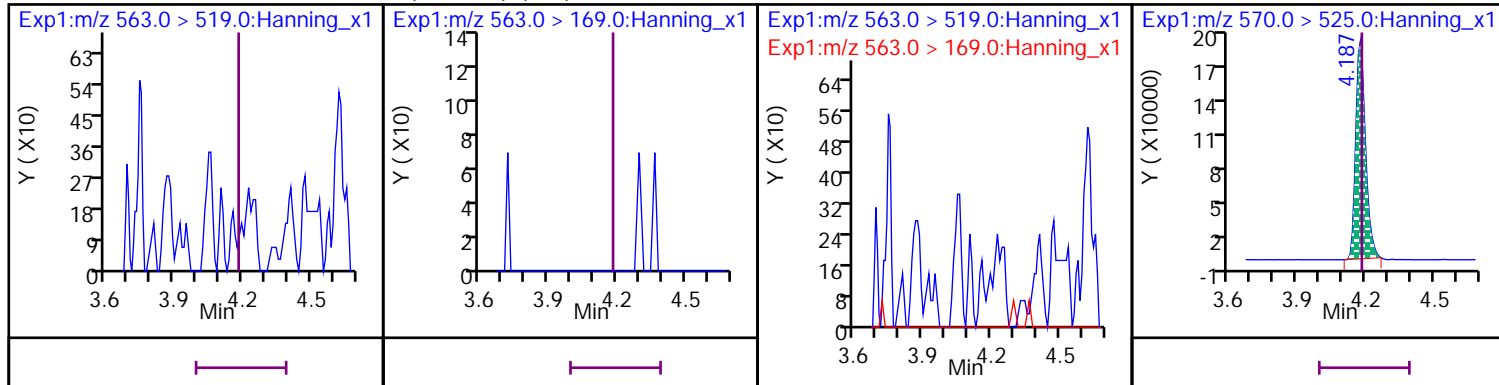
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

## D 58 d3-MeFOSAA



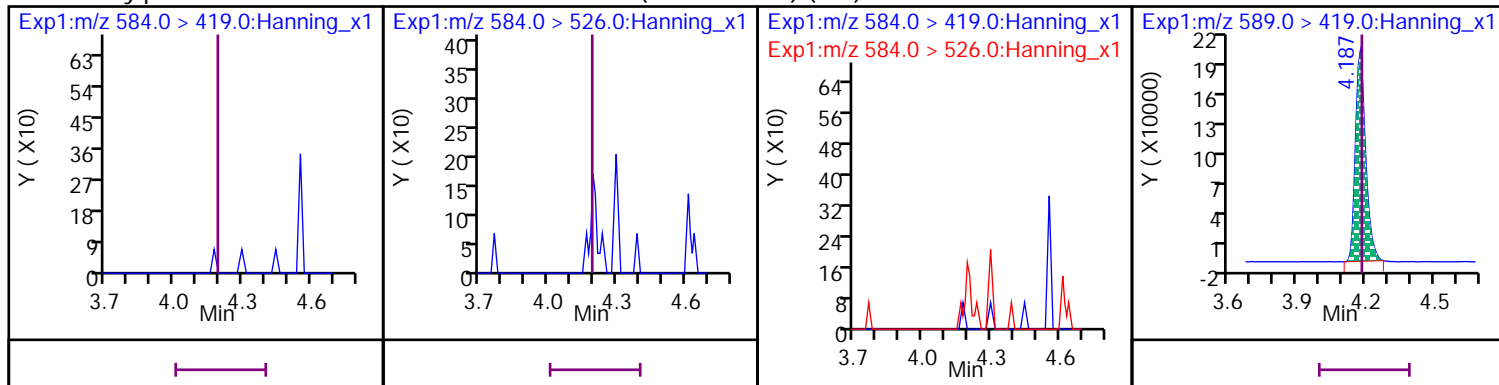
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

## D 52 13C7\_PFUdA

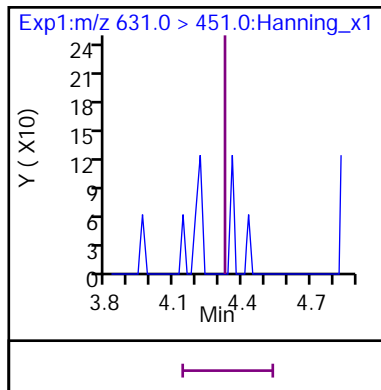


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

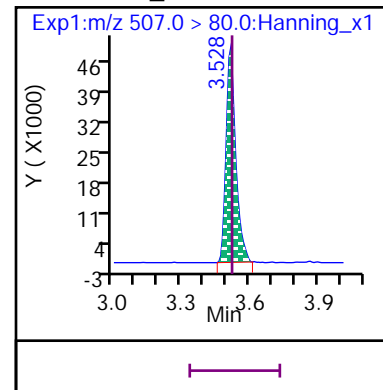
## D 60 d5-EtFOSAA



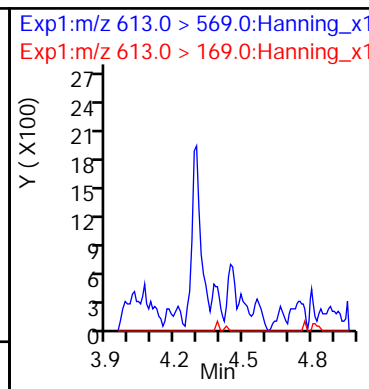
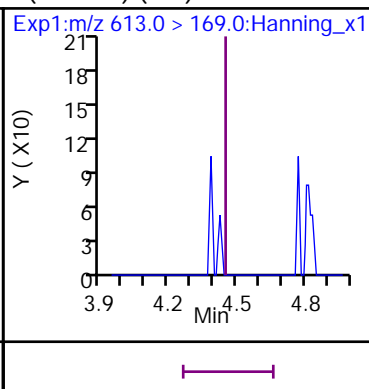
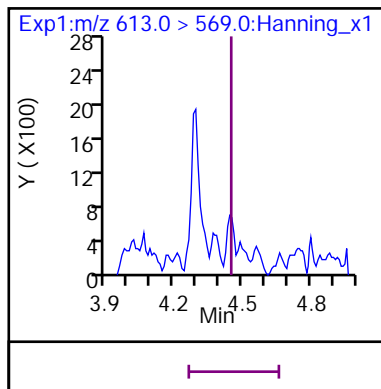
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



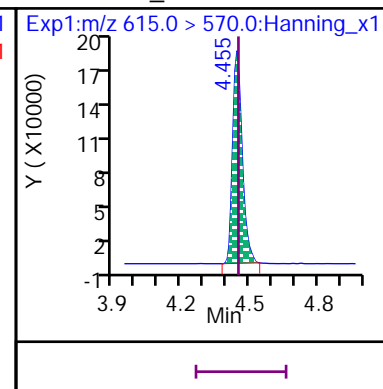
D 54 13C8\_PFOS



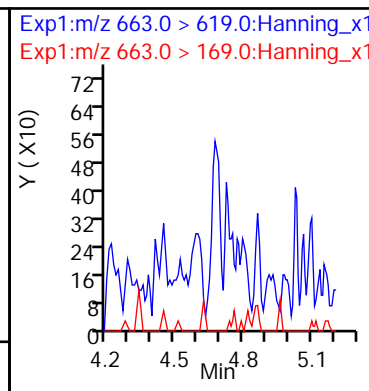
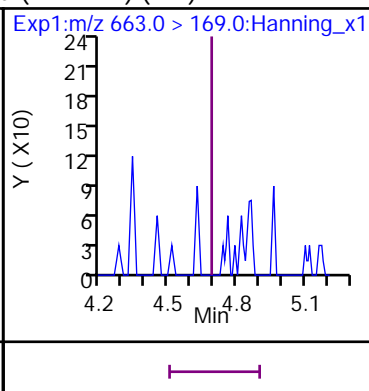
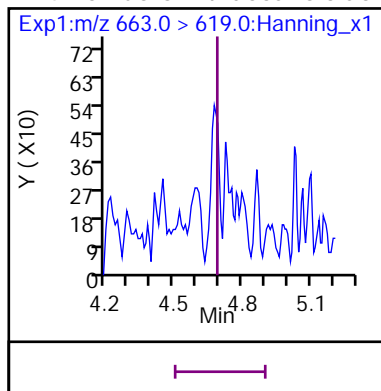
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



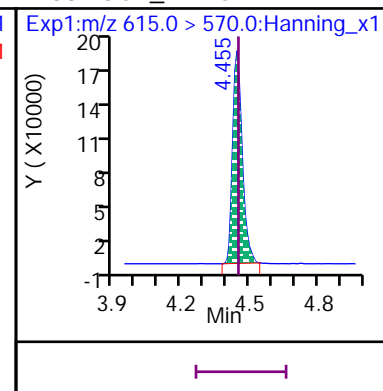
D 38 13C2\_PFDoA



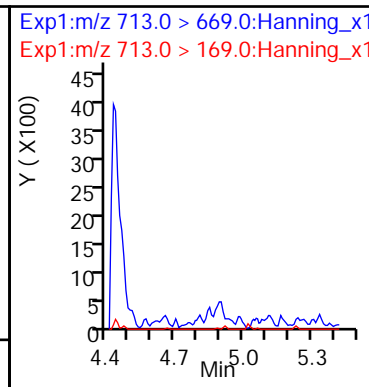
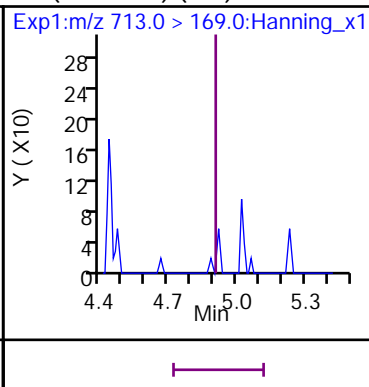
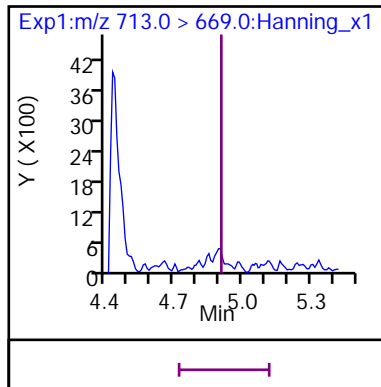
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



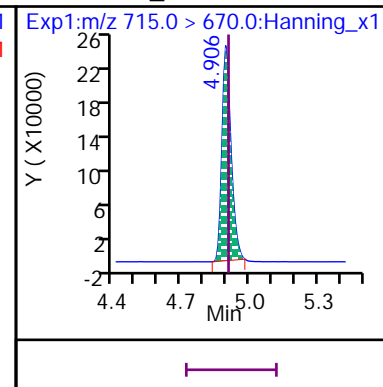
D 38 13C2\_PFDoA



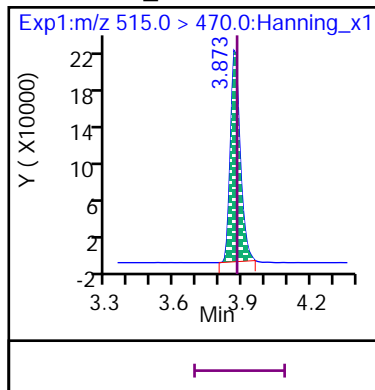
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



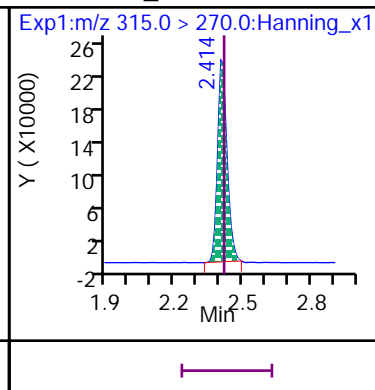
D 42 13C2\_PFTeDA



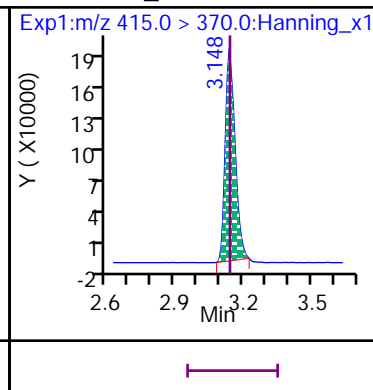
\* 37 13C2\_PFDA



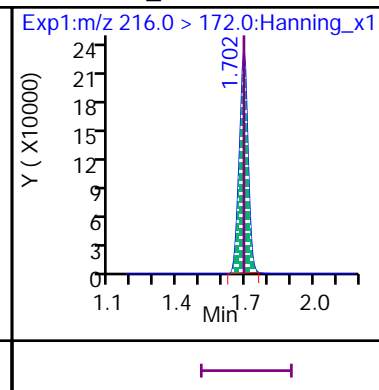
\* 39 13C2\_PFHxA



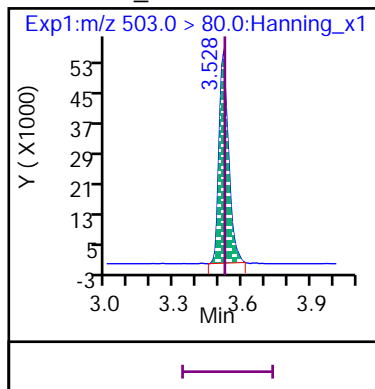
\* 41 13C2\_PFOA



\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920014.d

Injection Date: 29-Dec-2020 11:49:02

Inst. ID: LCMSMS02

Client ID: FTP-MW5-1220

Lab ID: VL11043-006

Sample Info: VL11043-006

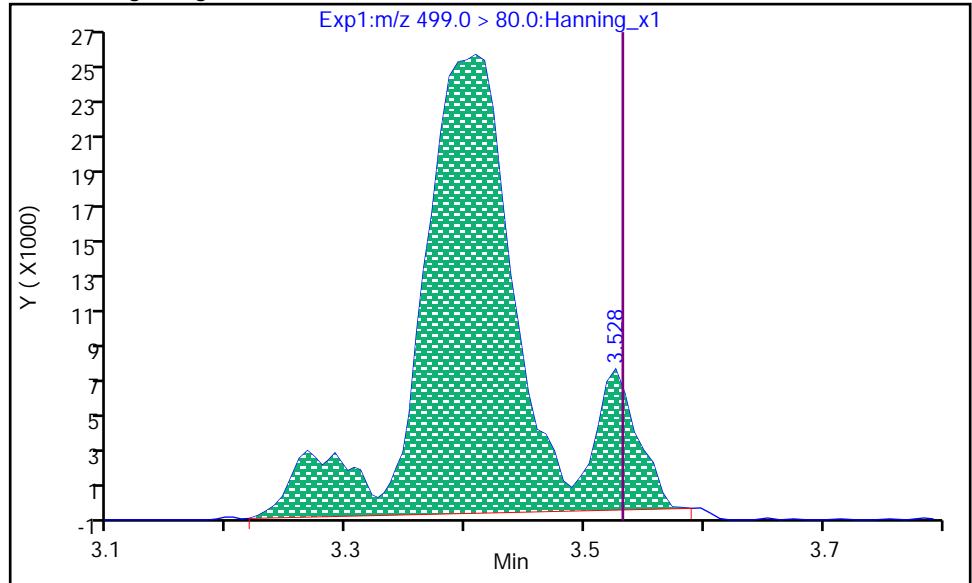
Dil. Factor: 1

Operator: Matthew M. Miller

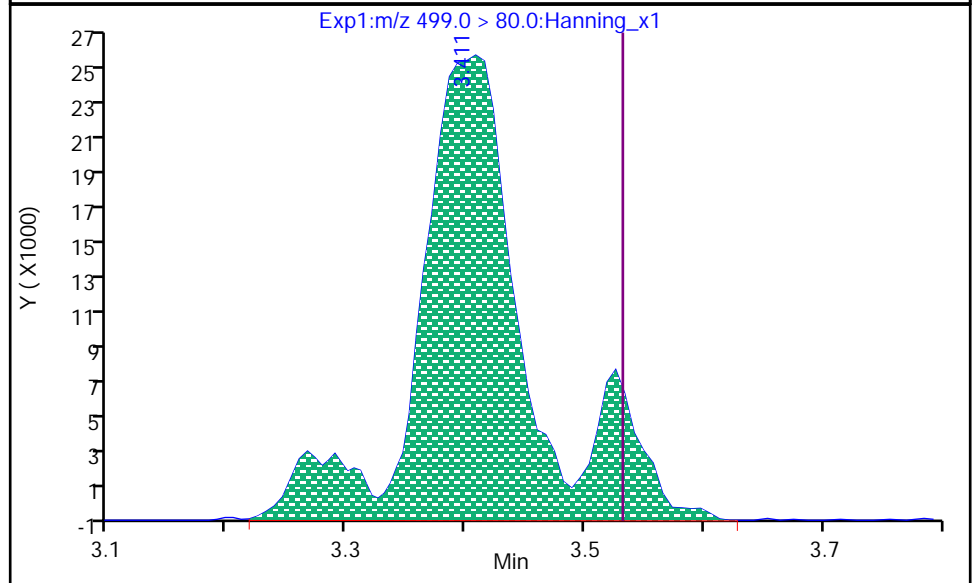
18 PFOS, CAS: 1763-23-1

RT: 3.528  
Area: 149284  
Conc: 34.800  
Conc Units: ng/L

Processing Integration Results



RT: 3.411  
Area: 158083  
Conc: 36.851  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:48:21

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920014.d

Injection Date: 29-Dec-2020 11:49:02

Inst. ID: LCMSMS02

Client ID: FTP-MW5-1220

Lab ID: VL11043-006

Sample Info: VL11043-006

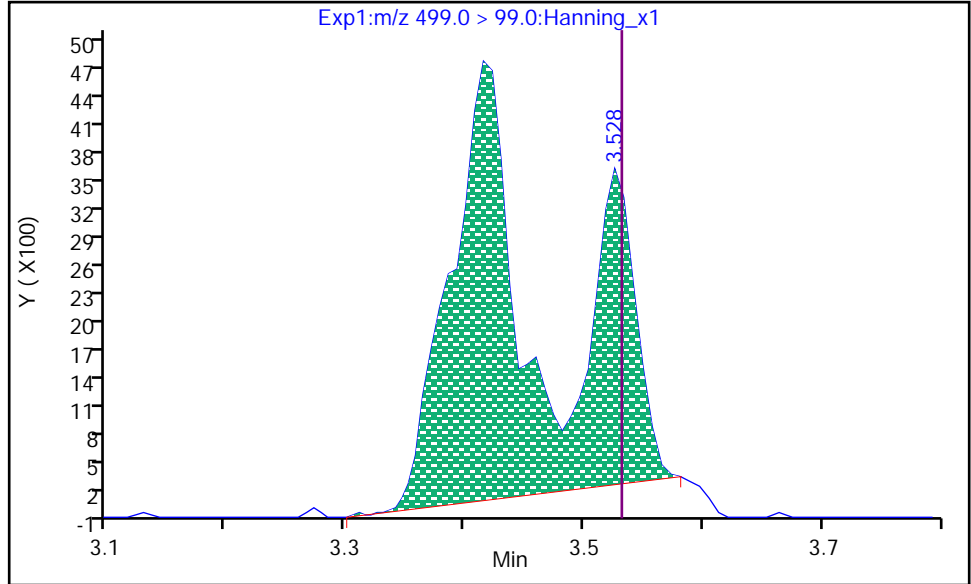
Dil. Factor: 1

Operator: Matthew M. Miller

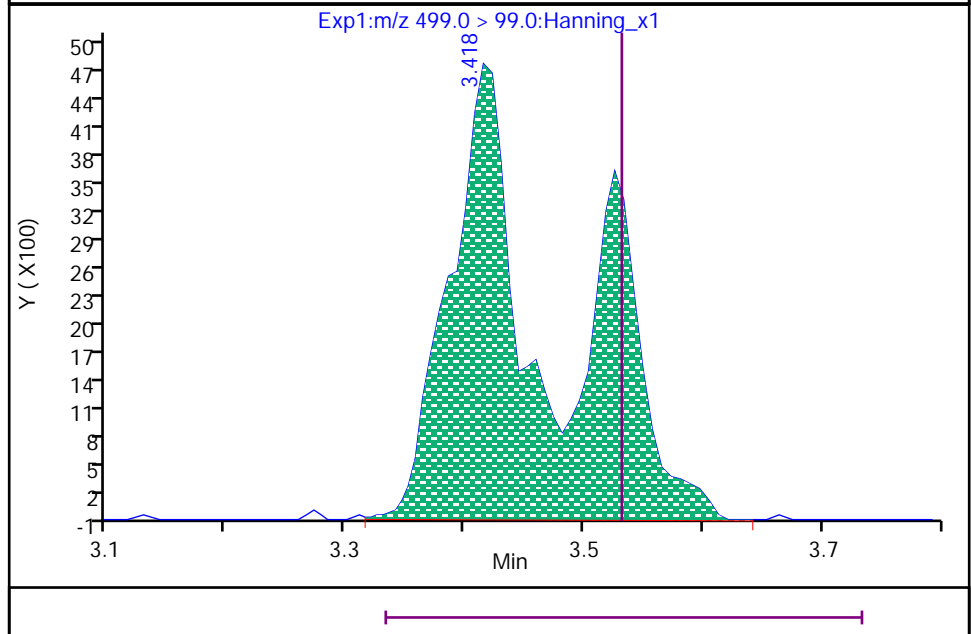
18 PFOS, CAS: 1763-23-1

RT: 3.528  
Area: 24943  
Conc: 36.851  
Conc Units: ng/L

Processing Integration Results



RT: 3.418  
Area: 29052  
Conc: 36.851  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:48:28

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

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Injection Date: 29-Dec-2020 11:49:02

Inst. ID: LCMSMS02

Client ID: FTP-MW5-1220

Lab ID: VL11043-006

Sample Info: VL11043-006

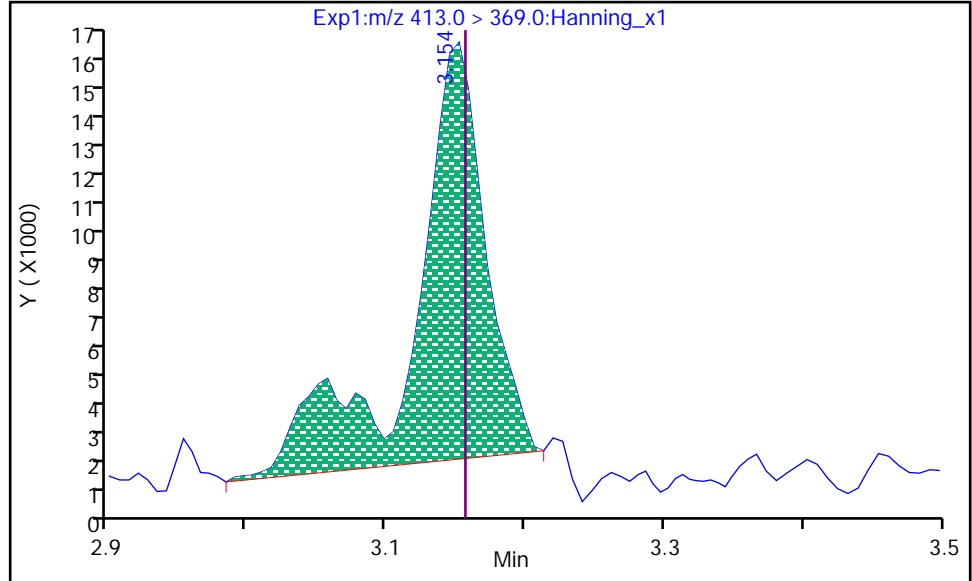
Dil. Factor: 1

Operator: Matthew M. Miller

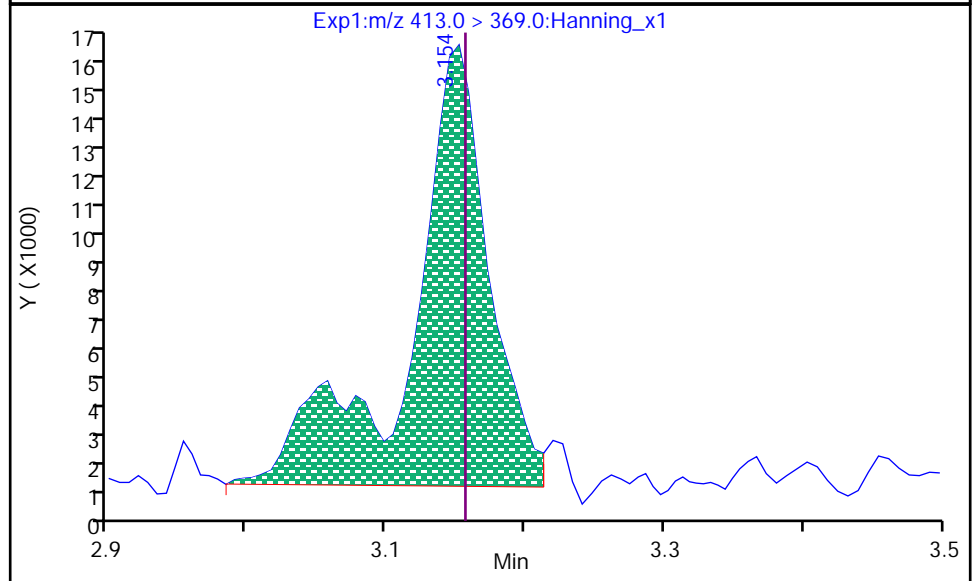
20 PFOA, CAS: 335-67-1

RT: 3.154  
Area: 49782  
Conc: 3.4088  
Conc Units: ng/L

Processing Integration Results



RT: 3.154  
Area: 57293  
Conc: 3.9231  
Conc Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:48:13

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-007</b>
Description: <b>FTA-99-1-1220</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020 1040</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1359	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)</b>	<b>27619-97-2</b>	<b>PFAS by ID SOP</b>	<b>12</b>		<b>7.0</b>	<b>3.5</b>	<b>1.8</b>	<b>ng/L</b>	<b>1</b>
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>24</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>PFAS by ID SOP</b>	<b>360</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>8.7</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>J</b>	<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>19</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluoro-n-octanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>PFAS by ID SOP</b>	<b>5.6</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>4.0</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>PFAS by ID SOP</b>	<b>80</b>		<b>3.5</b>	<b>1.8</b>	<b>0.88</b>	<b>ng/L</b>	<b>1</b>

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		95	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		89	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		92	50-150
13C8_PFOS		91	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820028.d  
Injection Date: 28-Dec-2020 13:59:47 Injection Vol: 10.0 uL  
Sample Type: Client Auto Sampler: 20  
Lab Sample ID: VL11043-007 Lab Prep. Batch: 77741  
Client ID: FTA-99-1-1220 Sample Group: VL11043  
Sample Info: VL11043-007 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0386937$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	284	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 635087 21 >100:1 1001.00 915.70 97.7

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.705 1.696 1/0 142839 21 36:1 226.04 8.7464

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.077 2.072 1 677940 18 >100:1 1001.00 985.54 102

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/0 70101 13 6.7:1 102.95 3.9835 M

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 223902 16 >100:1 1001.00 972.51 94

**7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 161636 18 >100:1 Target = 3.34  
298.9 > 99 44 2.130 2.125 49752 24 69:1 3.24 (1.67-5.02) 612.89 23.715

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 702505 18 >100:1 1001.00 953.10 94.5

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.425 2.423 1/1 342758 15 >100:1 Target = 17.01  
313 > 119 49 2.425 2.423 16595 17 59:1 20.65 (8.50-25.52) 494.69 19.141

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.532 2.530 1 1315622 18 >100:1 5005.00 4939.37 93.9

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.530 ND ND

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 558136 19 >100:1 1001.00 920.03 88.1

**13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9**

363 > 319 47 2.773 2.772 1/0 36423 12 20:1 Target = 3.79  
363 > 169 47 2.782 2.772 9355 13 29:1 3.89 (1.89-5.69) 62.977 2.4368 J M M

**D 45 13C3\_PFHxS CAS: SESI-0096**

402 > 80 2.791 2.790 1 151719 17 >100:1 1001.00 886.06 87.1

**14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4**

399 > 80 45 2.791 2.790 1/0 1501577 26 >100:1 Target = 3.80  
399 > 99 45 2.791 2.790 436546 26 >100:1 3.43 (1.90-5.71) 0.19 9343.69 361.54 0.14

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													U
377 > 251	45		2.808		ND								
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	98809	24	>100:1			5005.00	5130.70	94.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.116	3.128	0/-1	13946	20	>100:1	Target = 1.77		322.22	12.468		
427 > 81	64	3.116	3.128		8013	22	61:1	1.74 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	580066	21	>100:1			1001.00	980.07	92.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	85099	33	34:1	Target = 2.85	0.33	144.05	5.5738		
413 > 169	53	3.149	3.148		33272	38	50:1	2.55 (1.42-4.28)	0.53				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	138077	22	>100:1			1001.00	920.95	90.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	338204	56	>100:1	Target = 6.80	3.62	2069.09	80.061		
499 > 99	54	3.515	3.520		68167	40	>100:1	4.96 (3.40-10.20)	0.96				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	707000	22	>100:1			1001.00	941.46	92.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.867	3.857	1	92481	20				5005.00	4985.46	92.1	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.875	3.865	1	619752	21	>100:1			1001.00	934.30	92.1	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	726836	18	>100:1			5005.00	5063.67	91.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	645570	19	>100:1			5005.00	4860.68	88.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	574227	18	>100:1			1001.00	908.48	89.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.458	4.455	1	545693	18	>100:1			1001.00	901.50	89.3	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.908	4.906	1	660924	18	>100:1			1001.00	784.53	81.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.875	3.873	1	618050	20	>100:1					84.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	675520	18	>100:1					92.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	557197	23	>100:1					93	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	583207	21	>100:1					95.7	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	142797	20	>100:1					87.6	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit  
 J - Compound Concentration Below Quantitation Limit  
 M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820028.d

Injection Date: 28-Dec-2020 13:59:47

Inst. ID: LCMSMS02

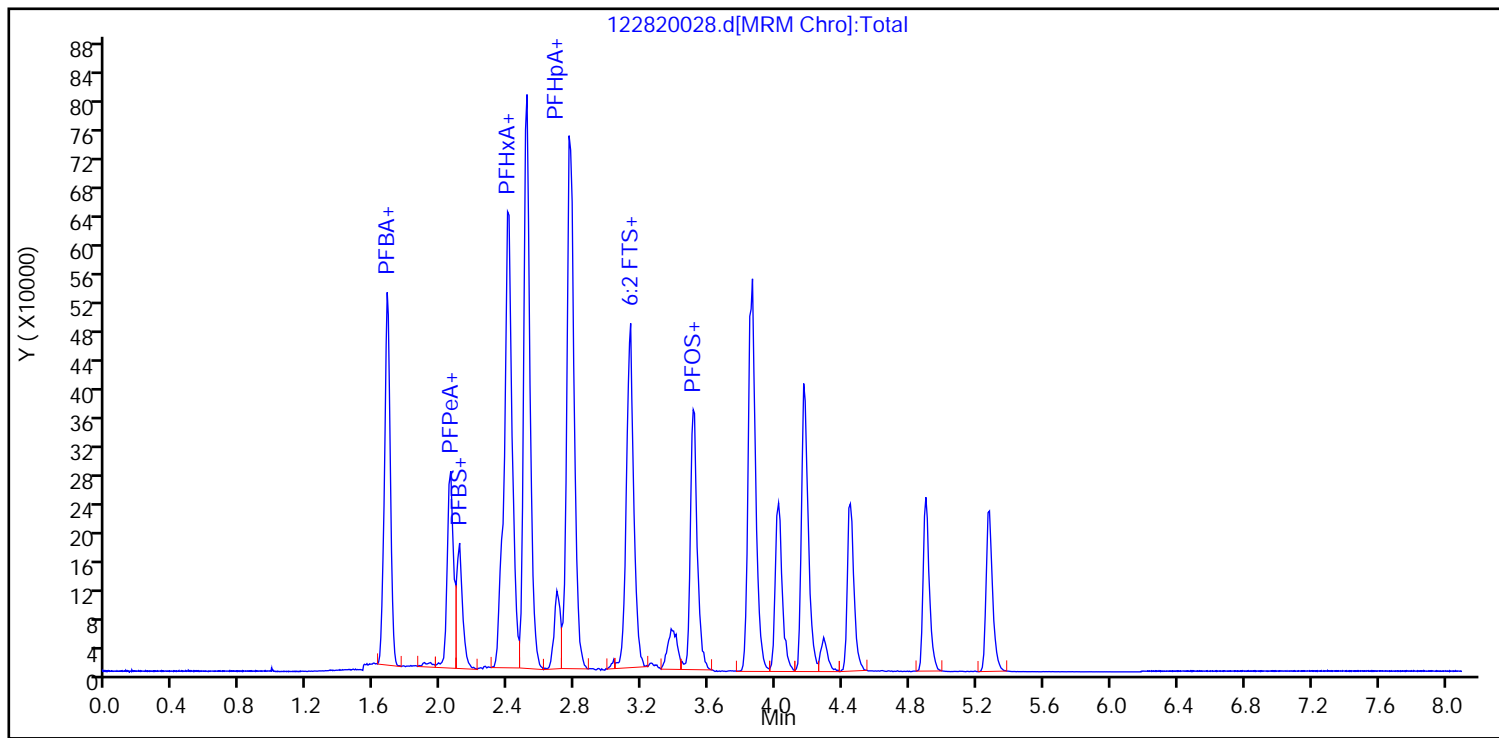
Client ID: FTA-99-1-1220

Lab ID: VL11043-007

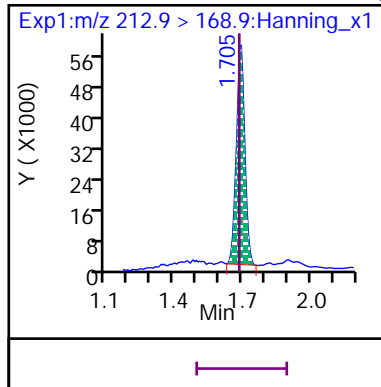
Sample Info: VL11043-007

Dil. Factor: 1

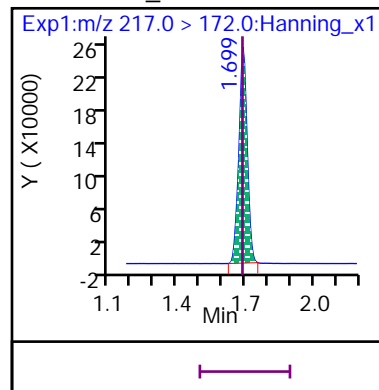
Operator: Matthew M. Miller



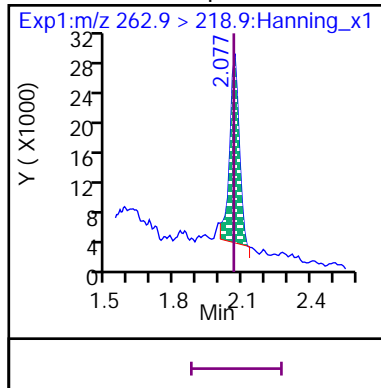
8 Perfluoro-n-butanoic acid (PFBA)



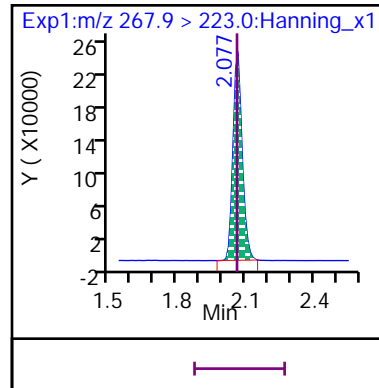
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (M)



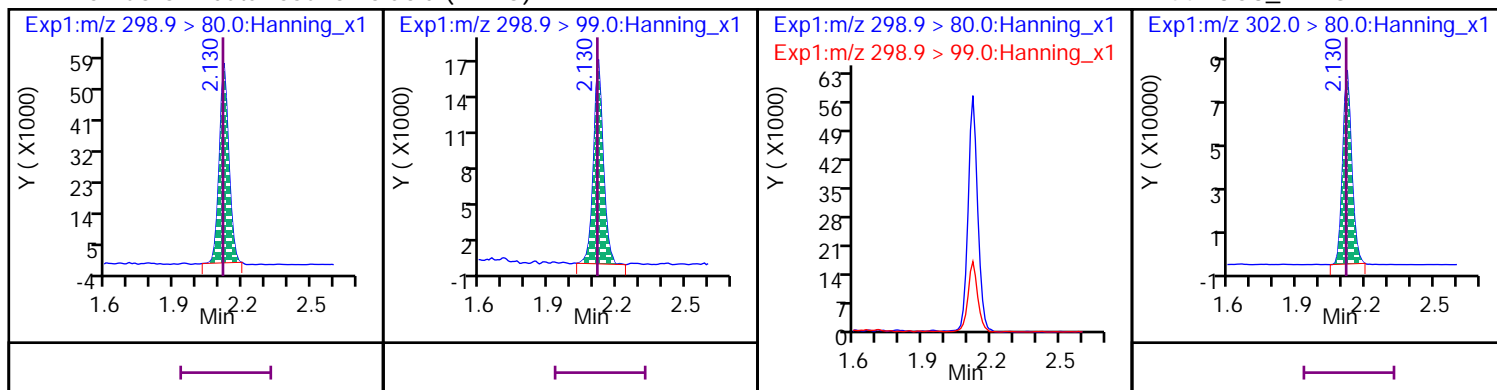
D 50 13C5\_PFPeA





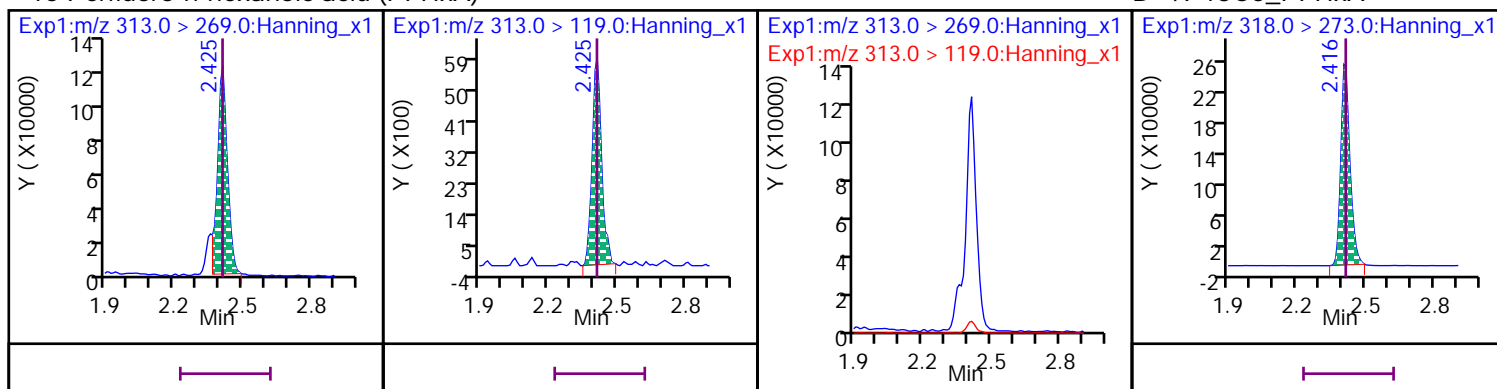
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



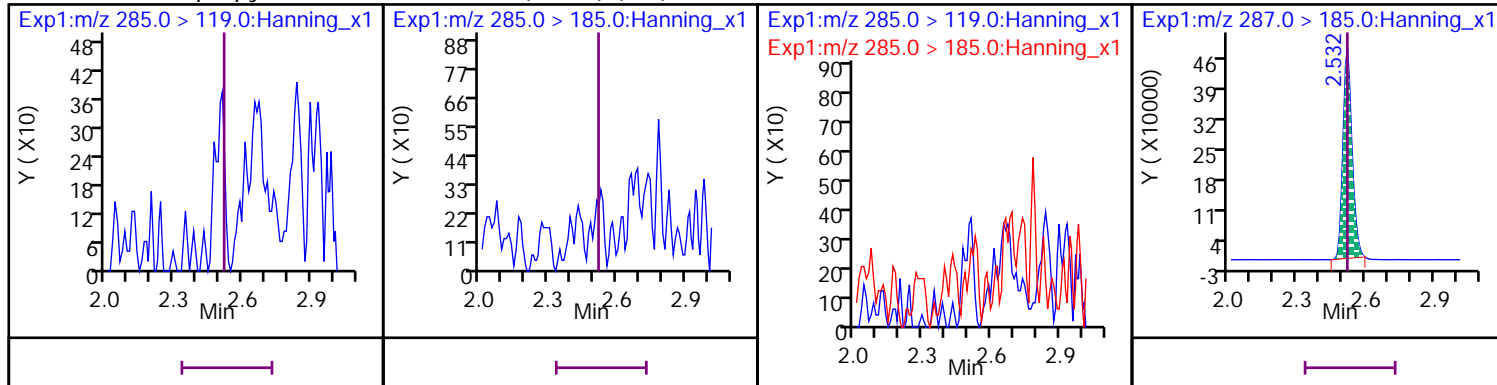
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



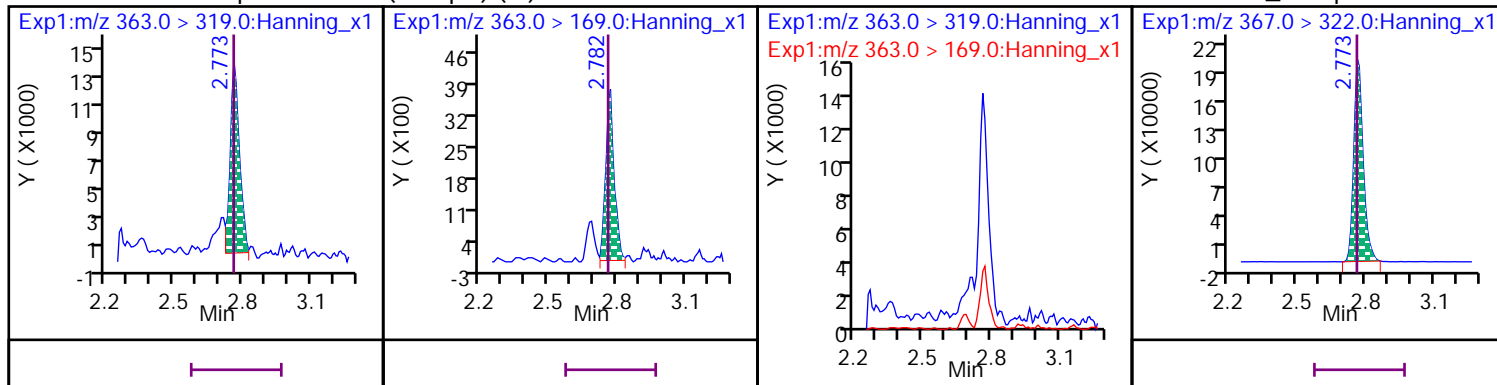
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



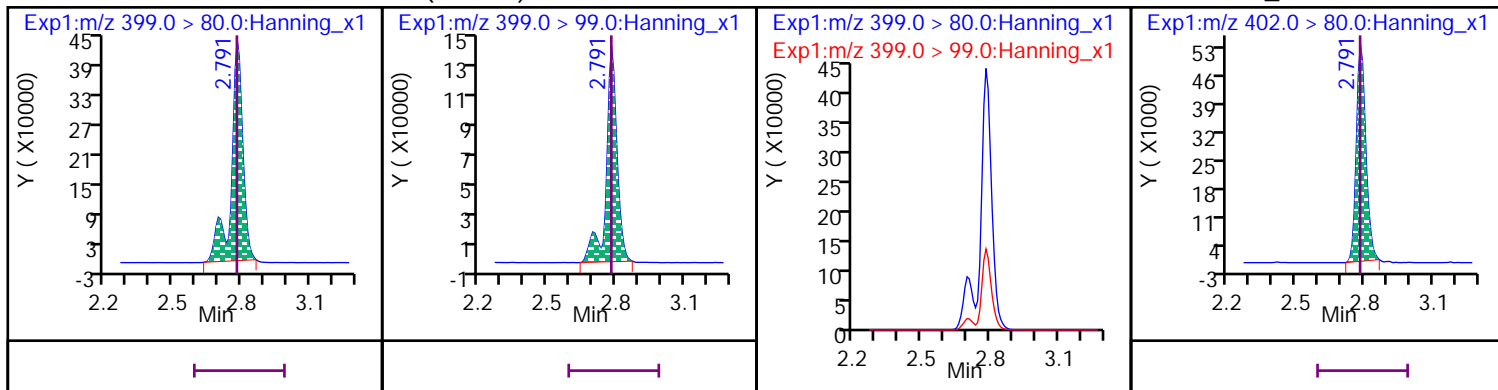
## 13 Perfluoro-n-heptanoic acid (PFHpA) (M)

D 47 13C4\_PFHpA



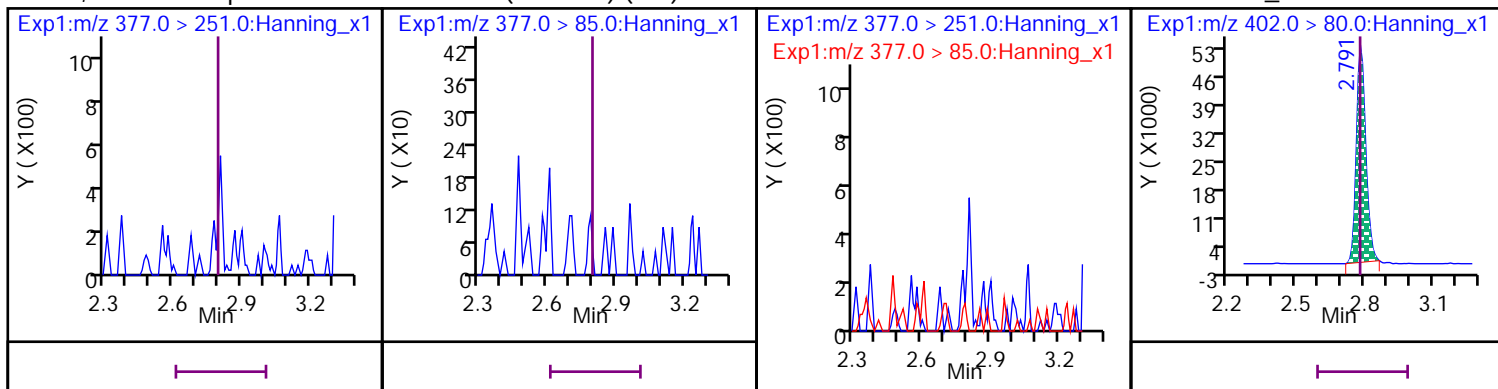
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



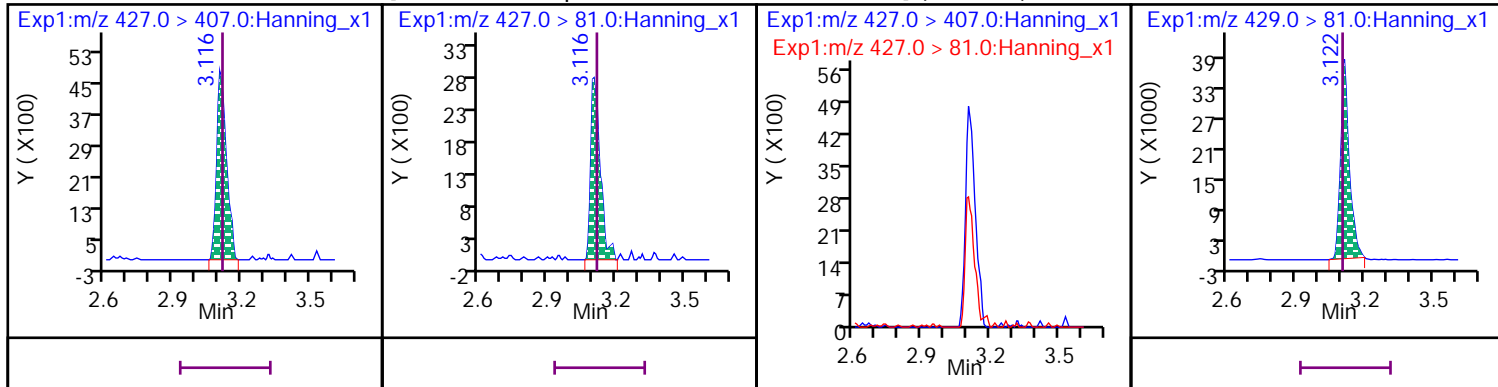
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



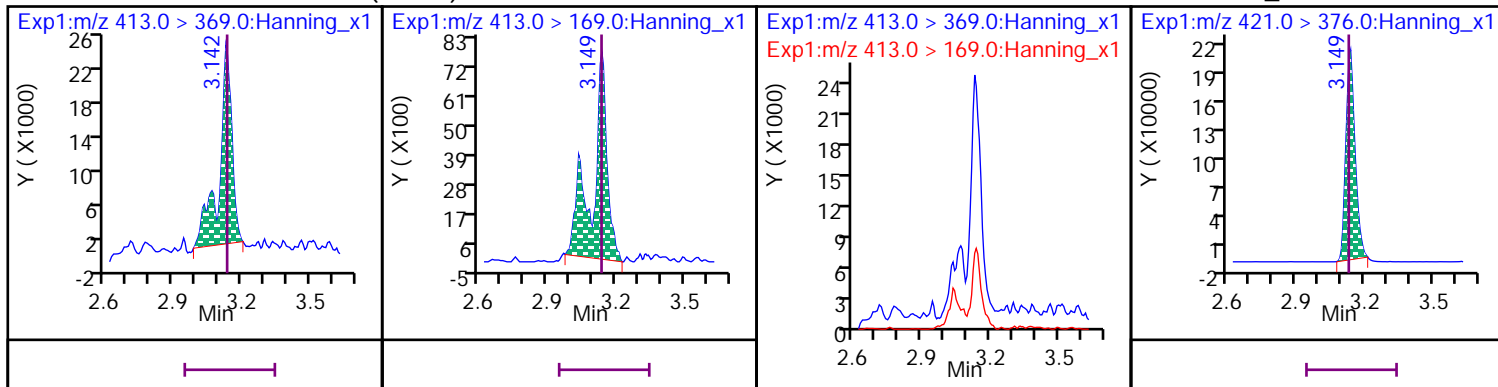
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



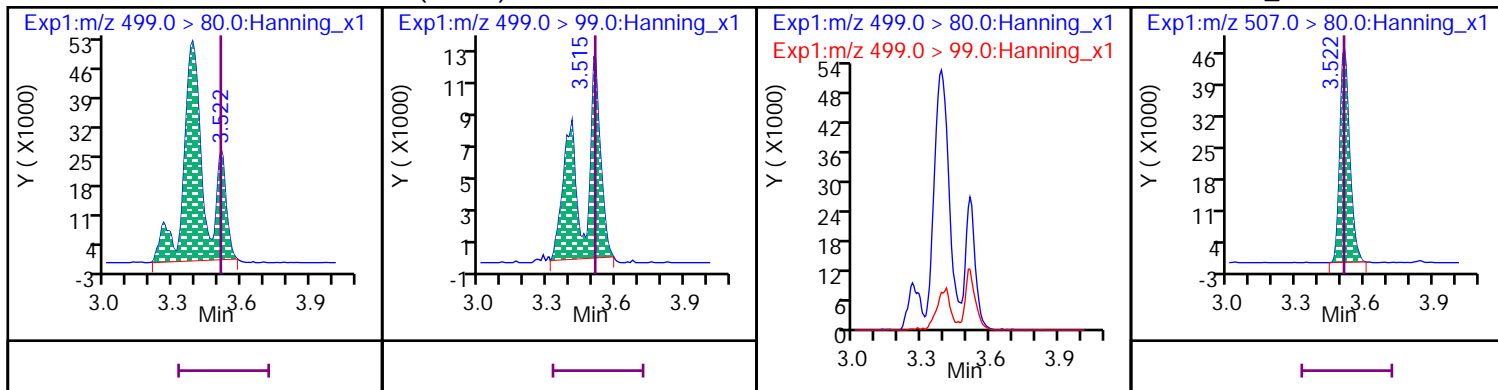
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



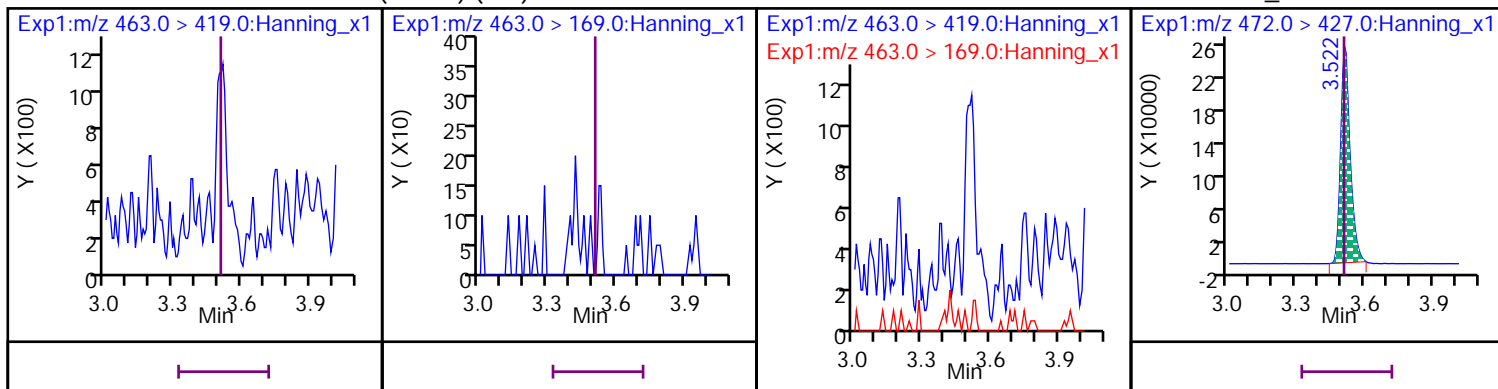
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



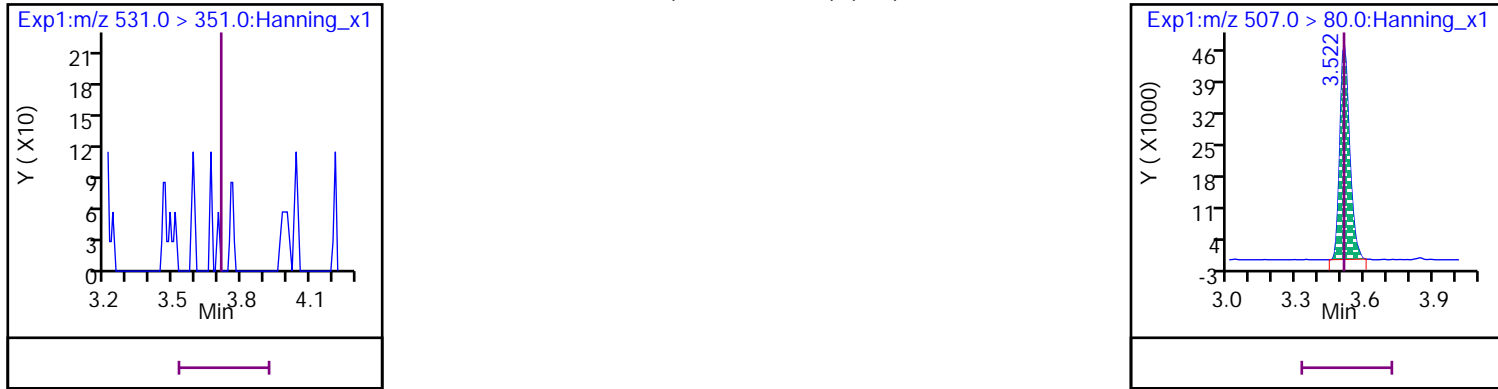
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA

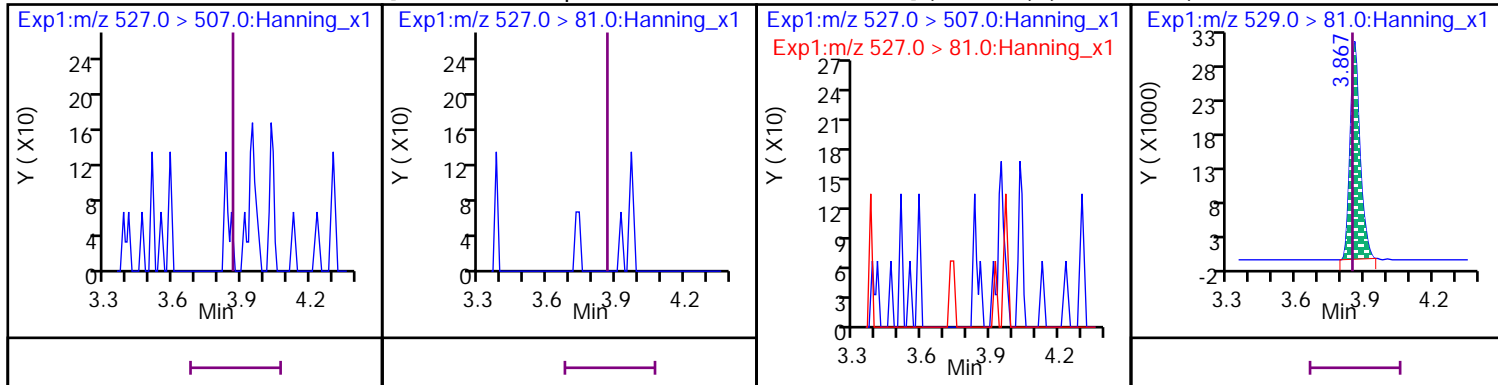


30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS

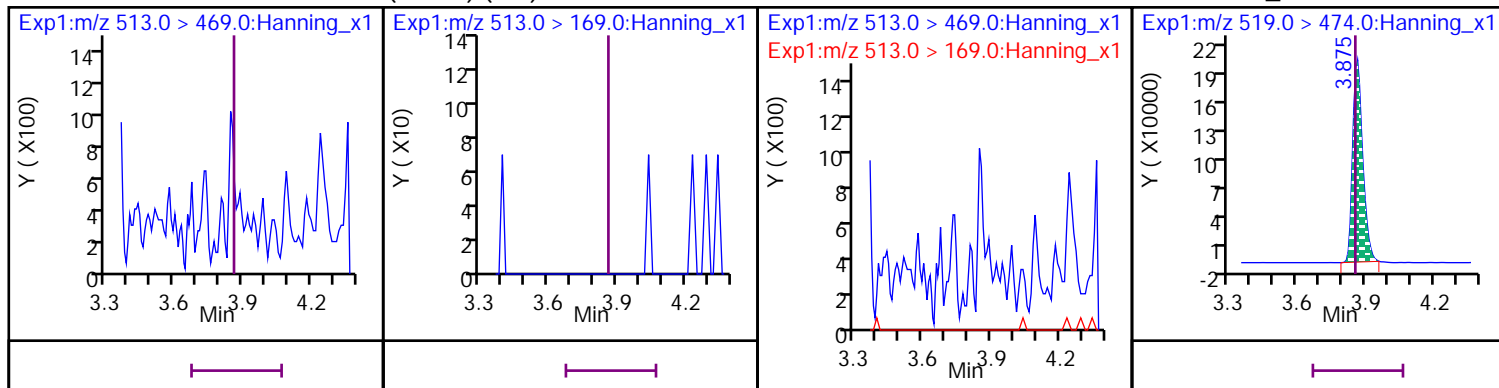


3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked DND) D 54 13C2\_8:2 FTS\_2



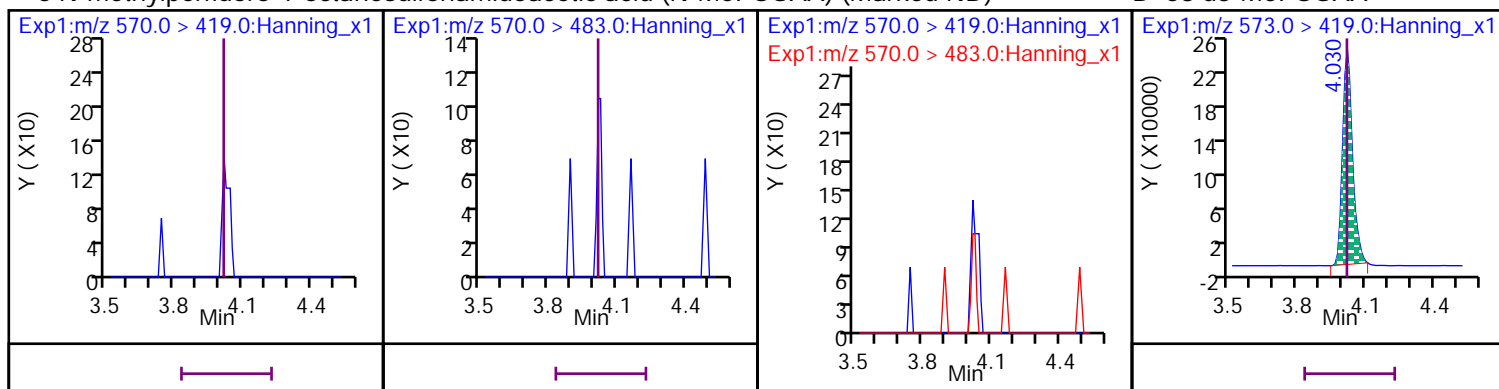
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



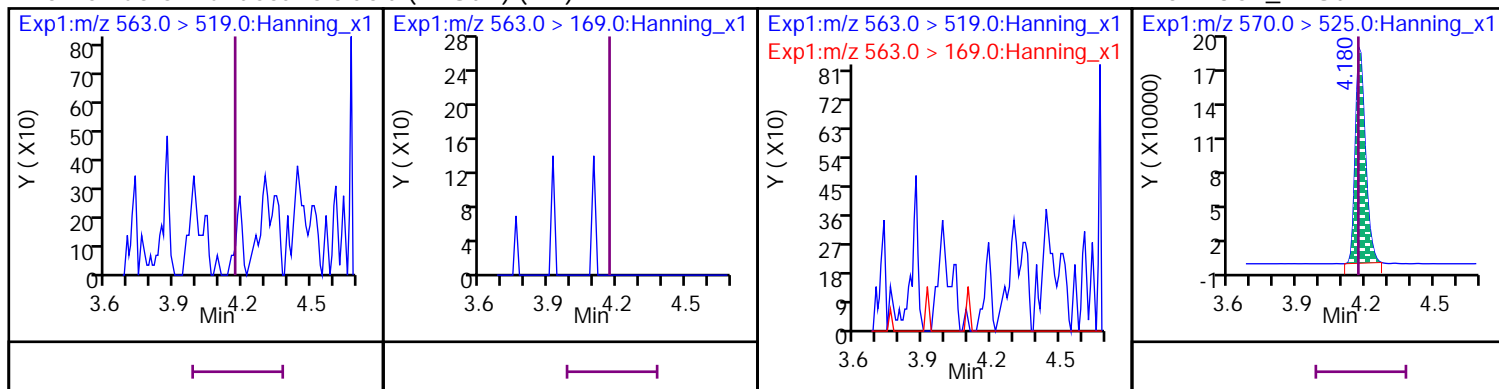
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



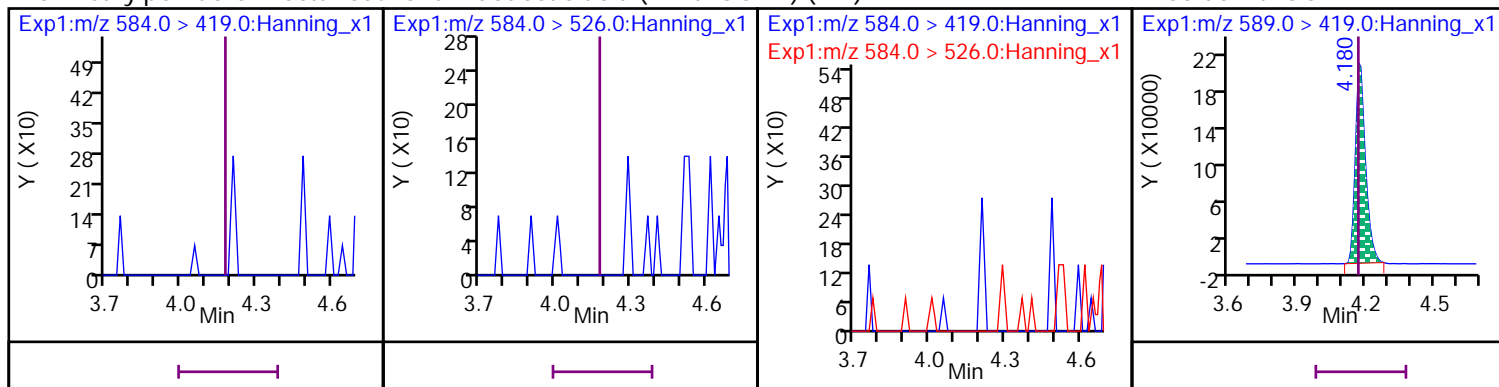
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

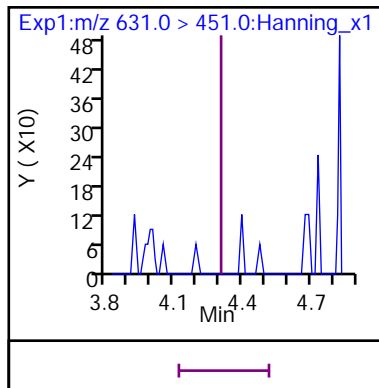


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

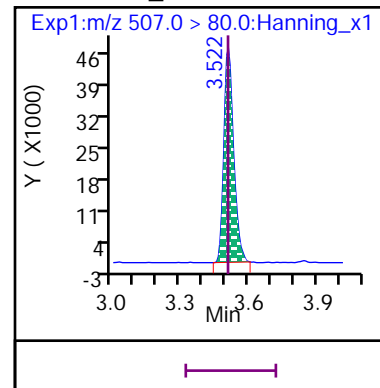
D 60 d5-EtFOSAA



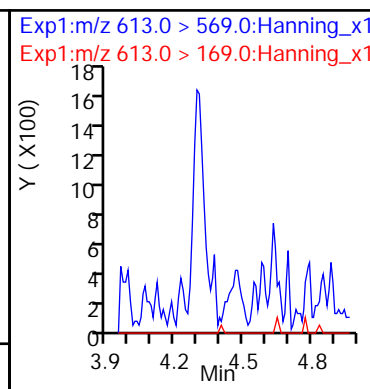
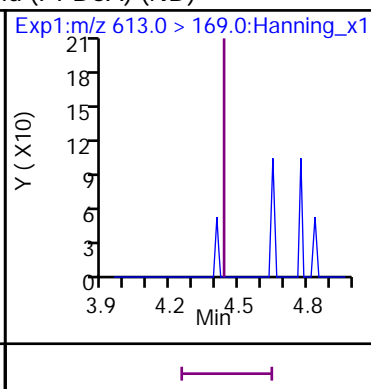
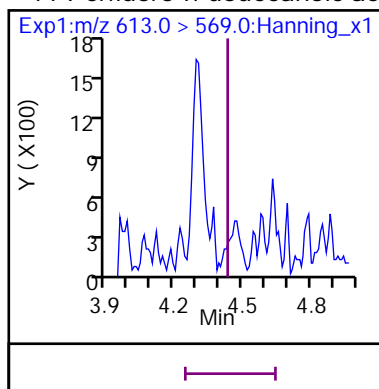
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (ND)



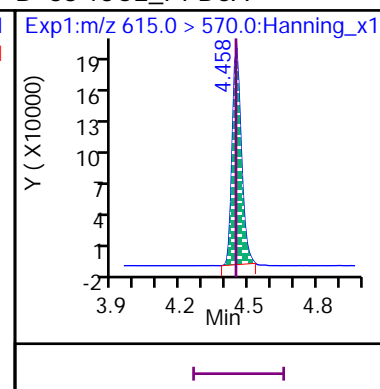
## D 54 13C8\_PFOS



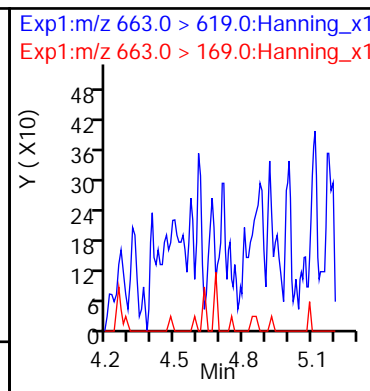
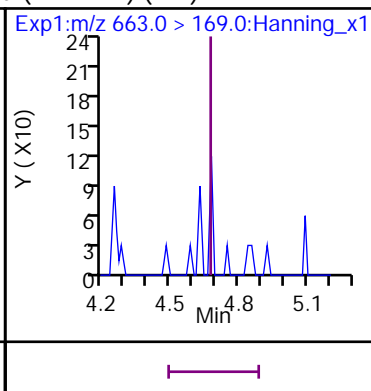
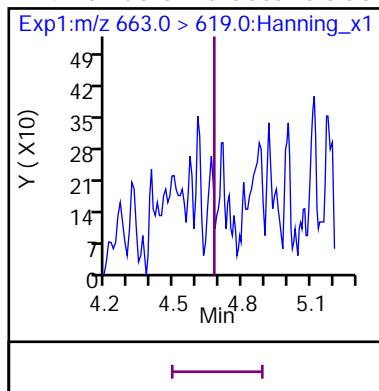
## 11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



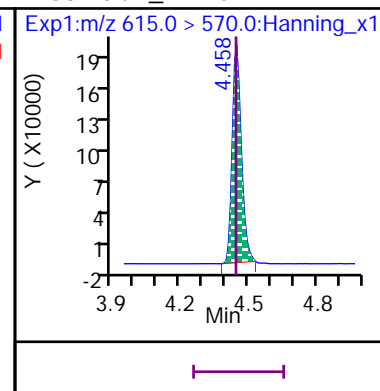
## D 38 13C2\_PFDoA



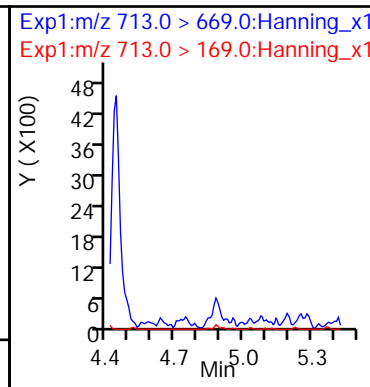
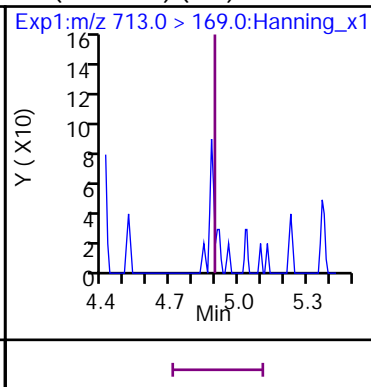
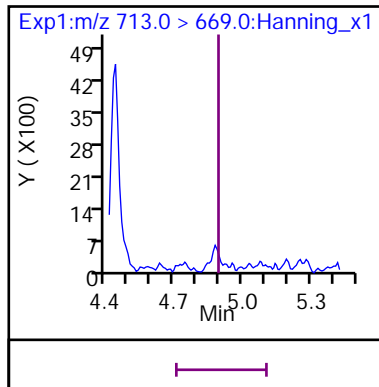
## 24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



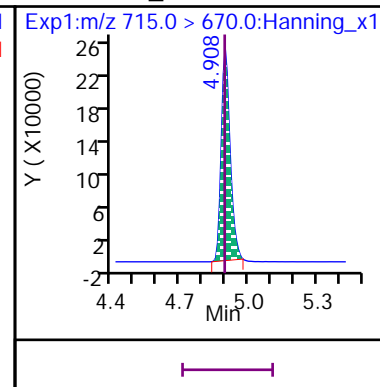
## D 38 13C2\_PFTeDA



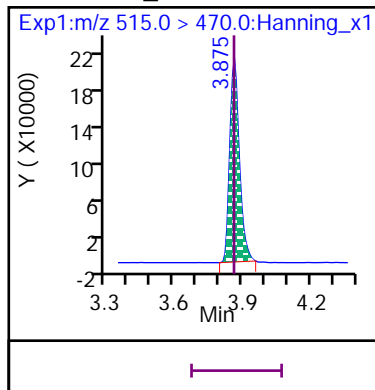
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



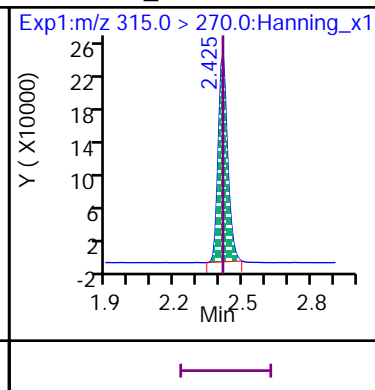
## D 42 13C2\_PFTeDA



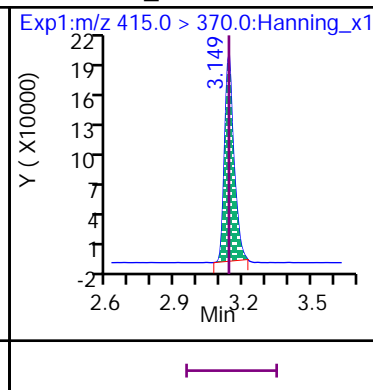
\* 37 13C2\_PFDA



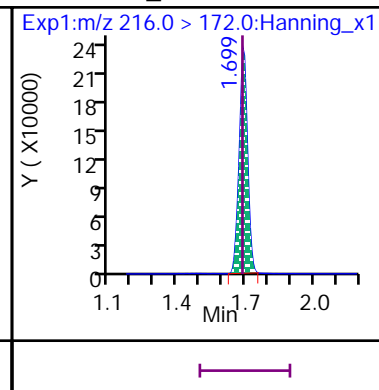
\* 39 13C2\_PFHxA



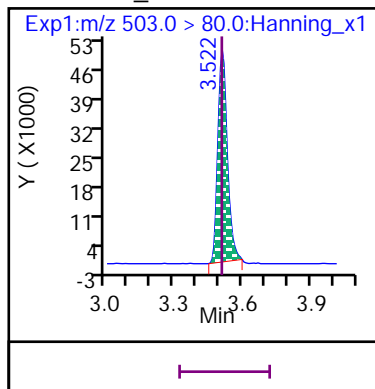
\* 41 13C2\_PFOA



\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820028.d

Injection Date: 28-Dec-2020 13:59:47

Inst. ID: LCMSMS02

Client ID: FTA-99-1-1220

Lab ID: VL11043-007

Sample Info: VL11043-007

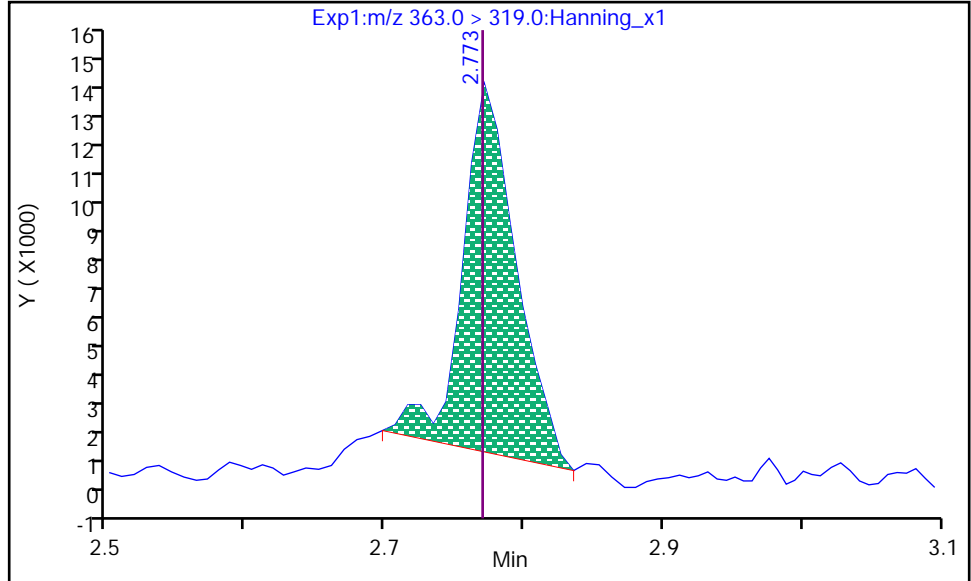
Dil. Factor: 1

Operator: Matthew M. Miller

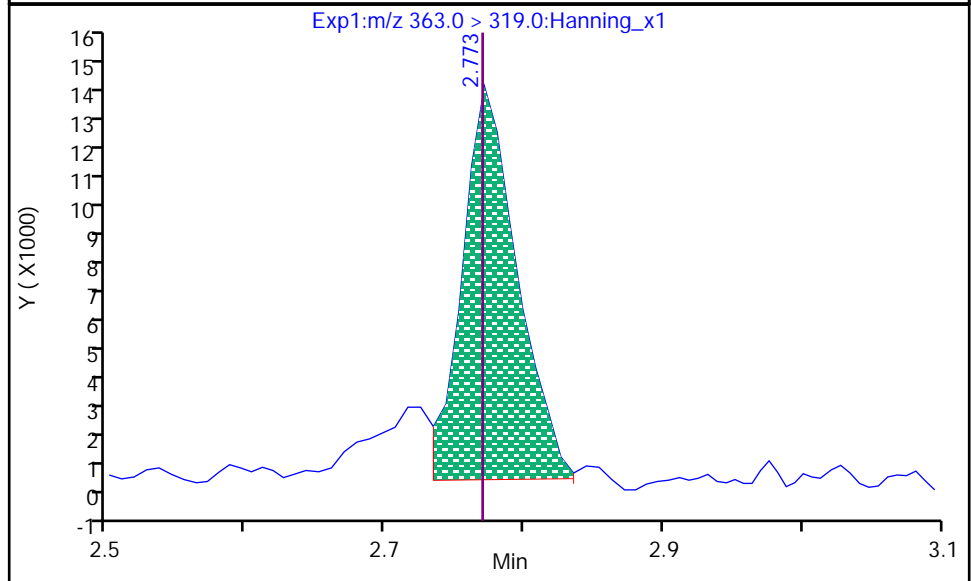
13 PFHpA, CAS: 375-85-9

RT: 2.773  
Area: 33630  
Conc: 2.2499  
Conc Units: ng/L

Processing Integration Results



RT: 2.773  
Area: 36423  
Conc: 2.4368  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:38:25

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820028.d

Injection Date: 28-Dec-2020 13:59:47

Inst. ID: LCMSMS02

Client ID: FTA-99-1-1220

Lab ID: VL11043-007

Sample Info: VL11043-007

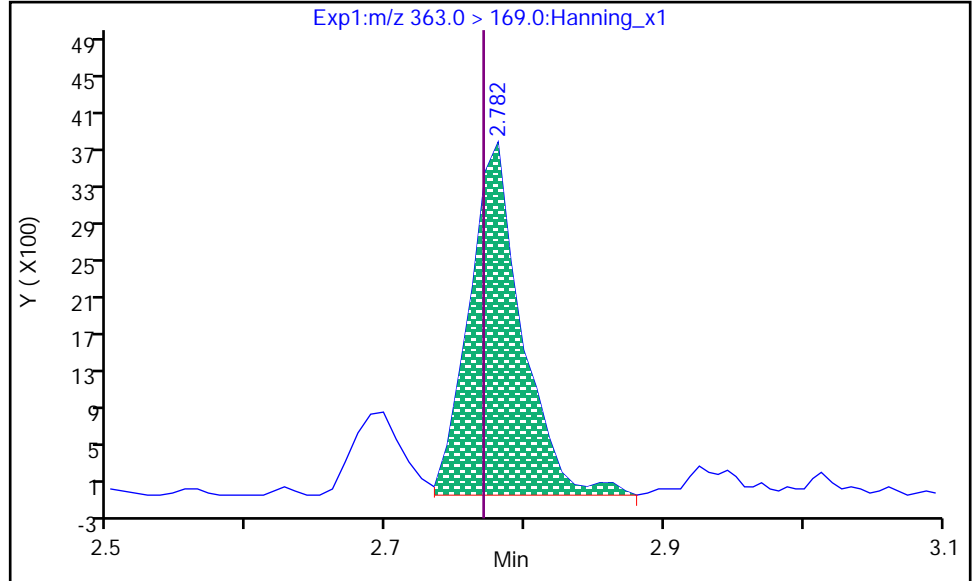
Dil. Factor: 1

Operator: Matthew M. Miller

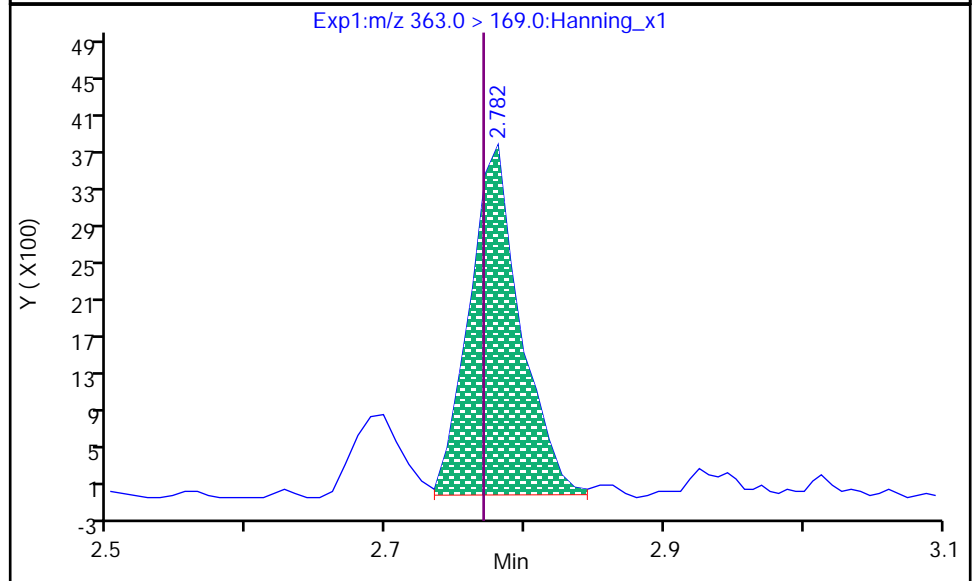
13 PFHpA, CAS: 375-85-9

RT: 2.782  
Area: 9733  
Conc: 2.4368  
Conc Units: ng/L

Processing Integration Results



RT: 2.782  
Area: 9355  
Conc: 2.4368  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:38:30

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820028.d

Injection Date: 28-Dec-2020 13:59:47

Inst. ID: LCMSMS02

Client ID: FTA-99-1-1220

Lab ID: VL11043-007

Sample Info: VL11043-007

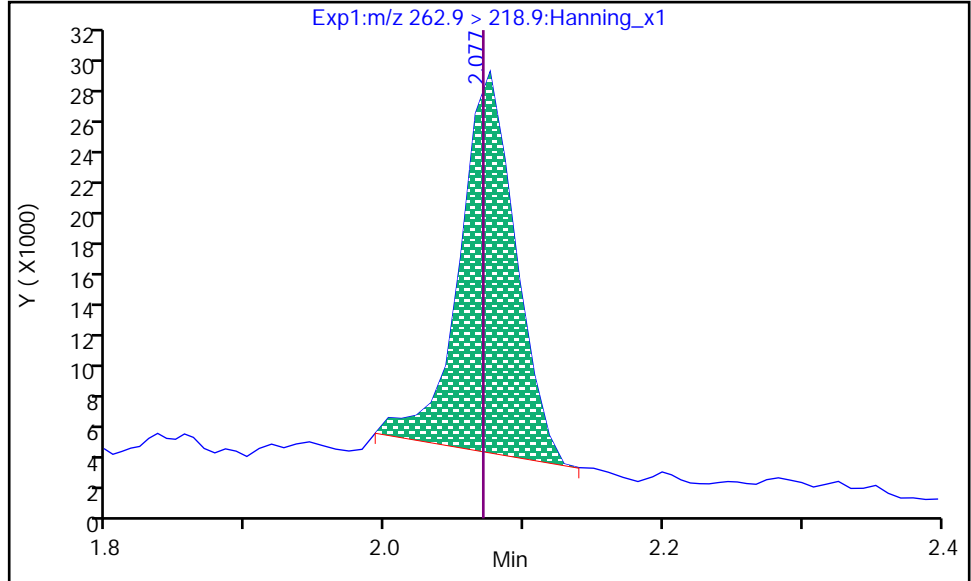
Dil. Factor: 1

Operator: Matthew M. Miller

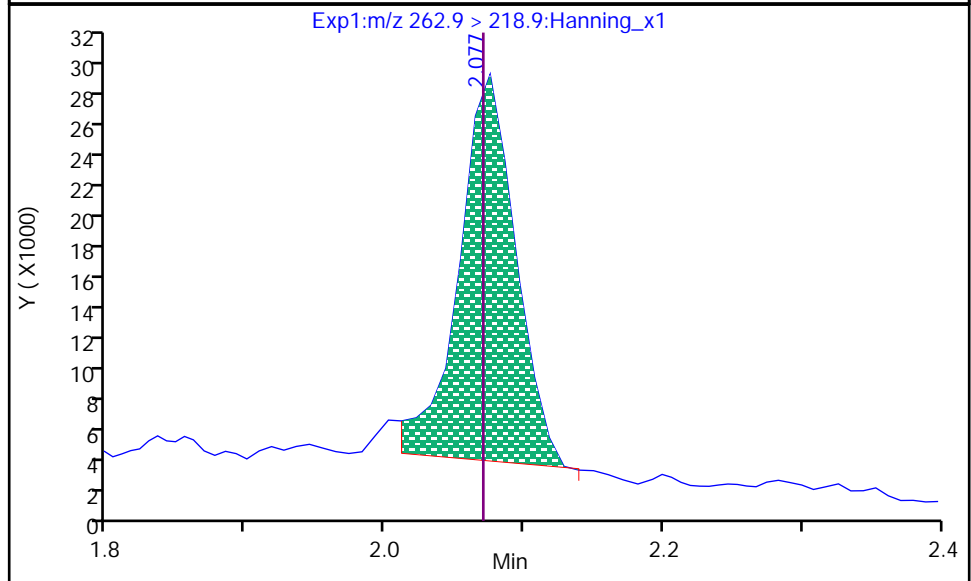
21 PFPeA, CAS: 2706-90-3

RT: 2.077  
Area: 68424  
Conc: 3.8882  
Conc Units: ng/L

Processing Integration Results



RT: 2.077  
Area: 70101  
Conc: 3.9835  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:38:13

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS

Client: <b>CH2M - Jacobs</b>	Laboratory ID: <b>VL11043-008</b>
Description: <b>TB01-121020</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/09/2020</b>	Project Name: <b>IAAAP PFAS</b>
Date Received: <b>12/11/2020</b>	Project Number: <b>679172CH.01.11.FW</b>

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/28/2020 1410	MMM	12/27/2020 1725	77741

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanefluoro acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanefluoro acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		99	50-150
13C2_8:2FTS		92	50-150
13C2_PFDaA		87	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		91	50-150
13C8_PFOS		93	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 U = Not detected at or above the LOQ      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      LOD = Limit of Detection      S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820029.d  
 Injection Date: 28-Dec-2020 14:10:27 Injection Vol: 10.0 uL  
 Sample Type: Client Auto Sampler: 21  
 Lab Sample ID: VL11043-008 Lab Prep. Batch: 77741  
 Client ID: TB01-121020 Sample Group: VL11043  
 Sample Info: VL11043-008 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous  
 Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0405499$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	271	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	619738	24	>100:1			1001.00	893.57	95.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46		1.696		ND								U
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	637606	17	>100:1			1001.00	926.91	95.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.072		ND								U
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	224111	17	>100:1			1001.00	973.42	94.1	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.125		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	715201	19	>100:1			1001.00	970.33	96.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.423		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.530	1	1306336	20	>100:1			5005.00	4904.51	93.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.530		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	580615	20	>100:1			1001.00	957.09	91.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.772		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	157774	21	>100:1			1001.00	921.42	90.6	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.790		ND								U
<b>29 4,8-dioxo-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.808		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.114	1	103257	23	>100:1			5005.00	5361.66	99	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.128		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	573830	24	>100:1			1001.00	969.53	91.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													U
413 > 369	53		3.148		ND								
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.529	3.520	1	141913	20	>100:1			1001.00	946.54	93.1	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													U
499 > 80	54		3.520		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUDS) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.529	3.520	1	686267	21	>100:1			1001.00	913.85	89.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.857	2	92312	20				5005.00	4976.35	91.9	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.874	3.865	1	608497	20	>100:1			1001.00	917.33	90.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.029	1	744214	19	>100:1			5005.00	5184.74	94	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.178	1	674573	19	>100:1			5005.00	5079.05	92.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.178	1	570904	18				1001.00	903.22	88.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	530244	17				1001.00	875.98	86.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.906	1	677594	19	>100:1			1001.00	804.32	83.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	635971	20	>100:1					86.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	657110	19	>100:1					89.9	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	590026	24	>100:1					98.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	583720	23	>100:1					95.8	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.529	3.520	1	150328	24	>100:1					92.2	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820029.d

Injection Date: 28-Dec-2020 14:10:27

Inst. ID: LCMSMS02

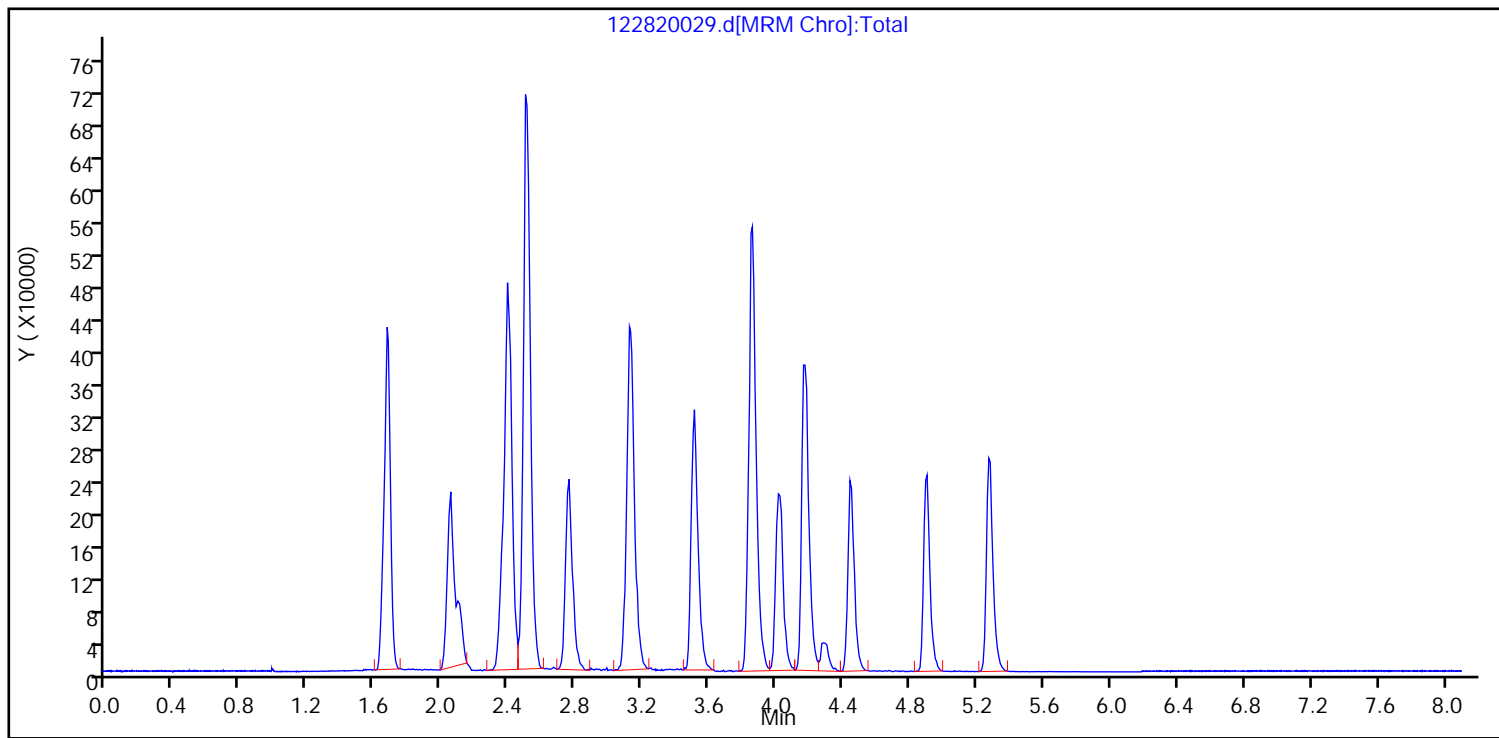
Client ID: TB01-121020

Lab ID: VL11043-008

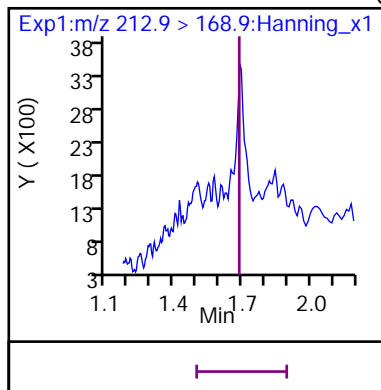
Sample Info: VL11043-008

Dil. Factor: 1

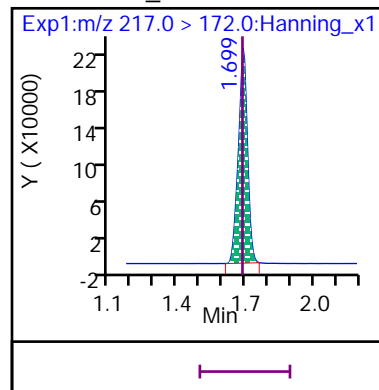
Operator: Matthew M. Miller



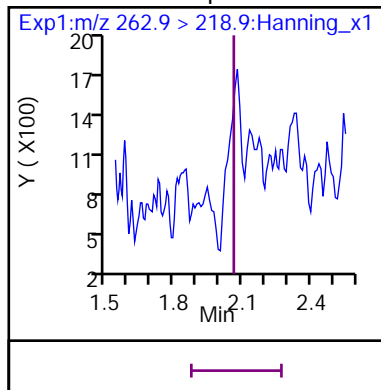
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



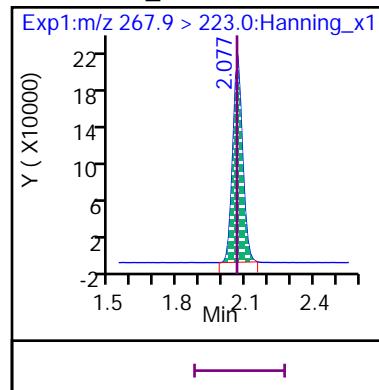
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

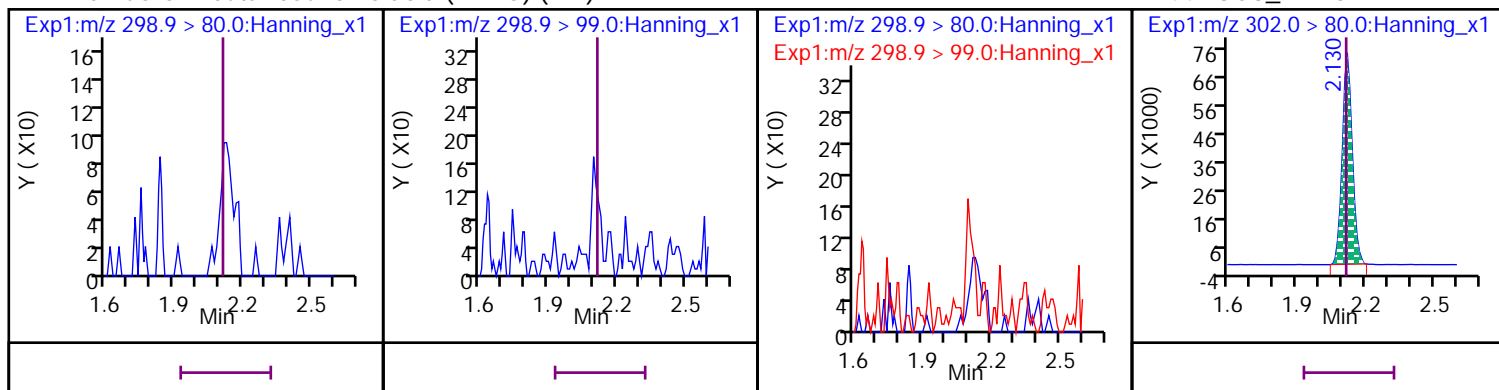


D 50 13C5\_PFPeA



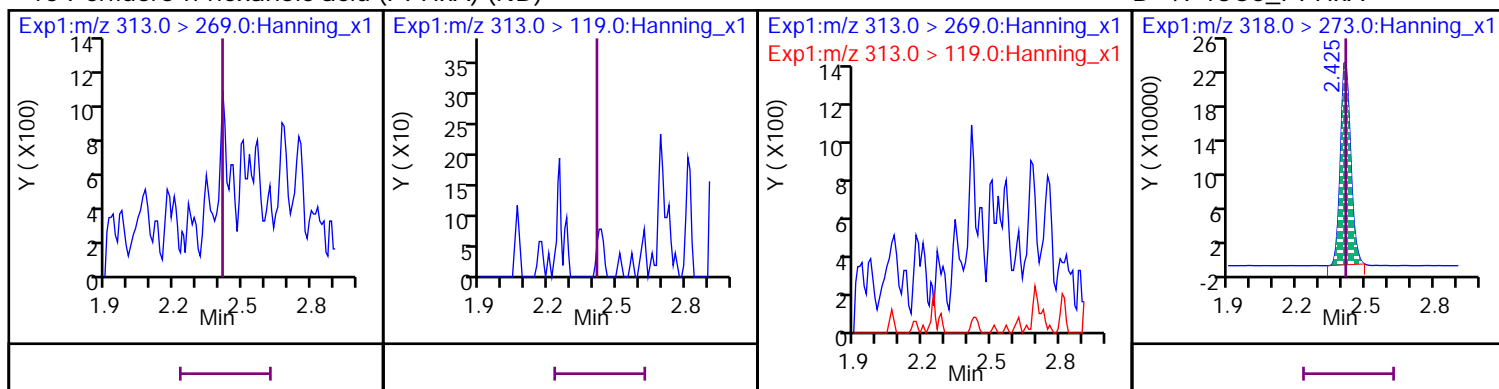
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



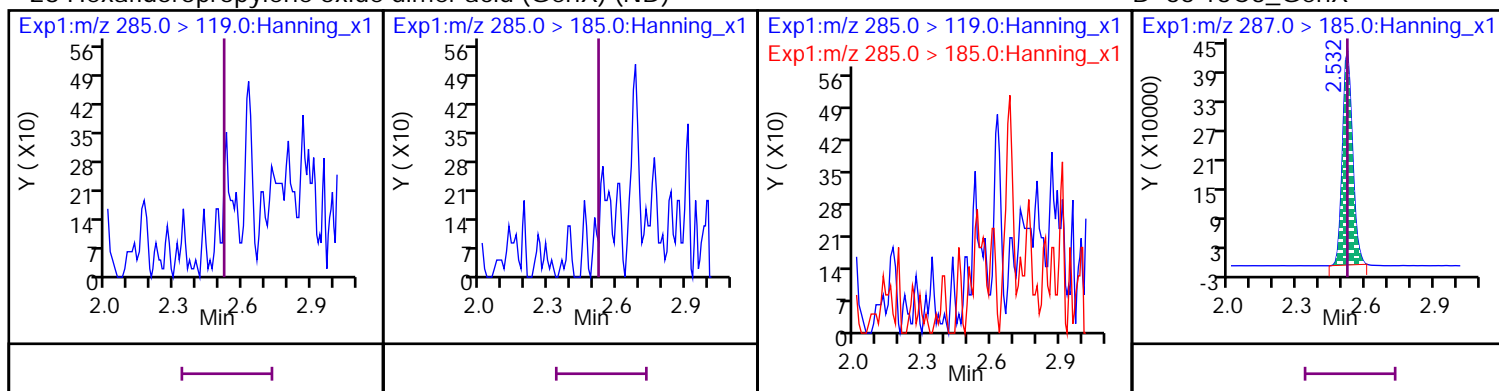
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



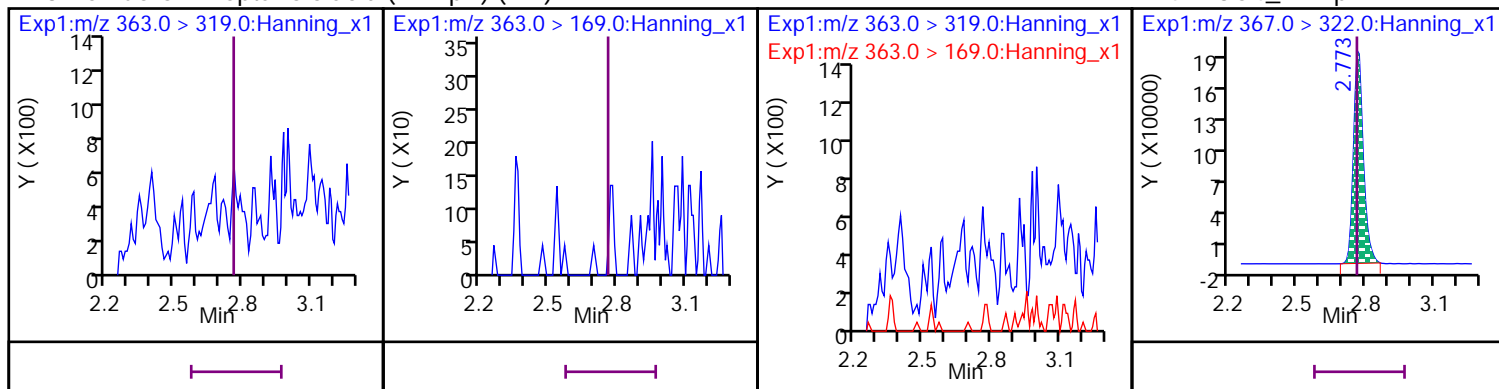
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



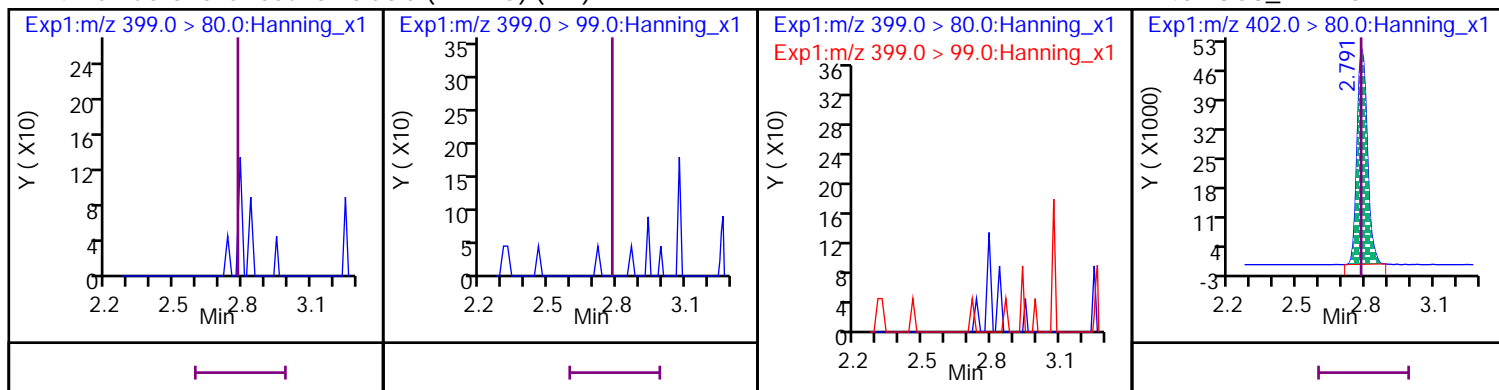
13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



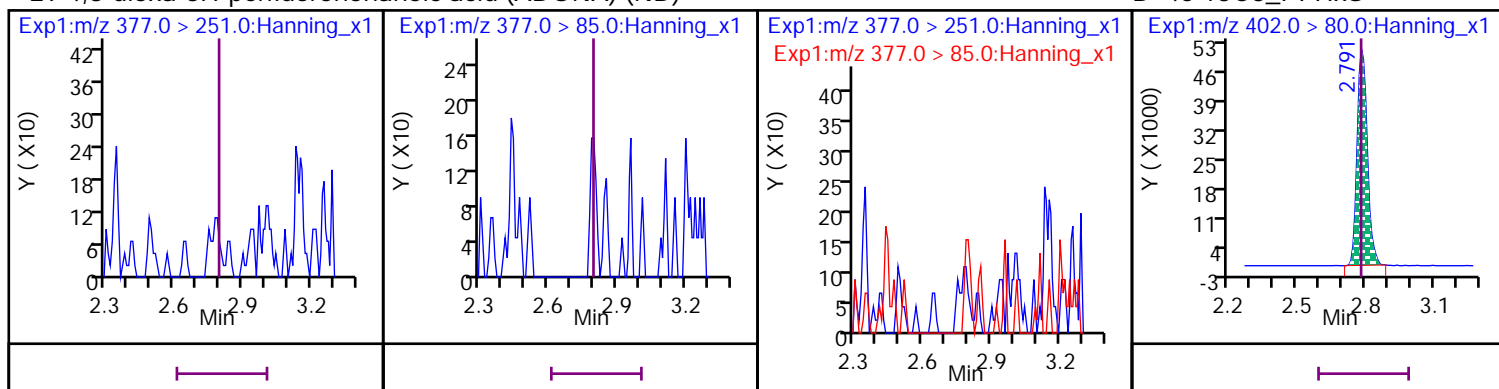
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS



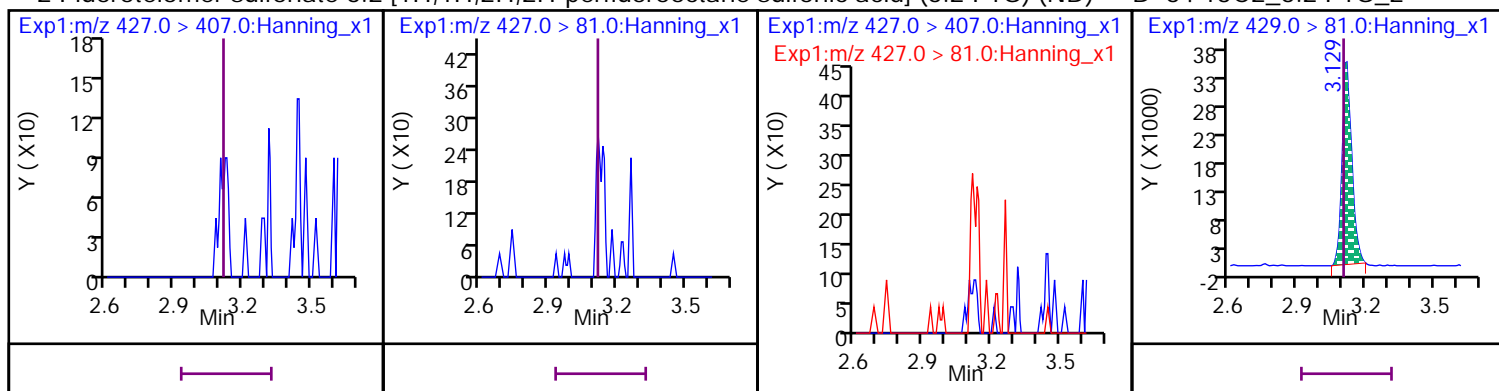
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



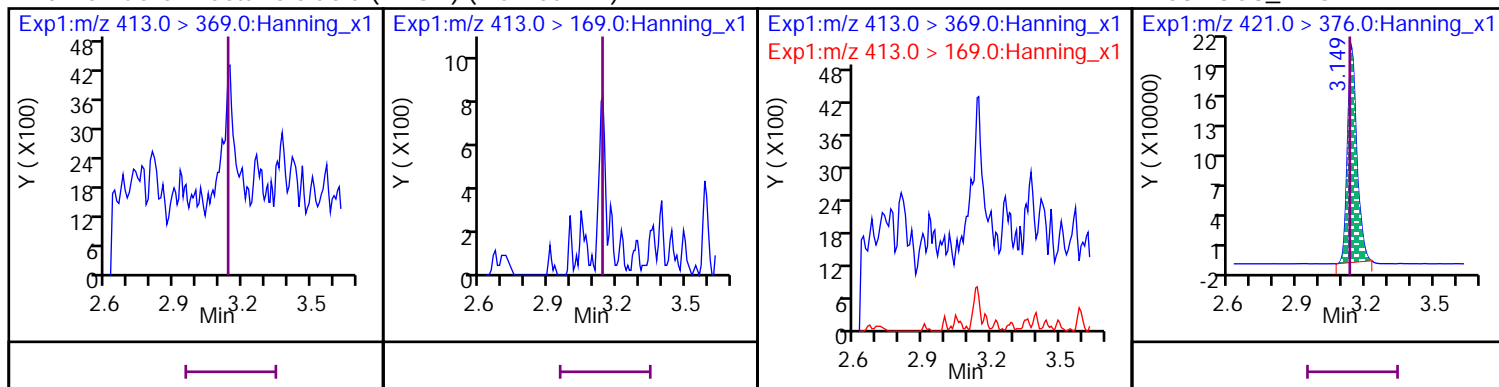
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

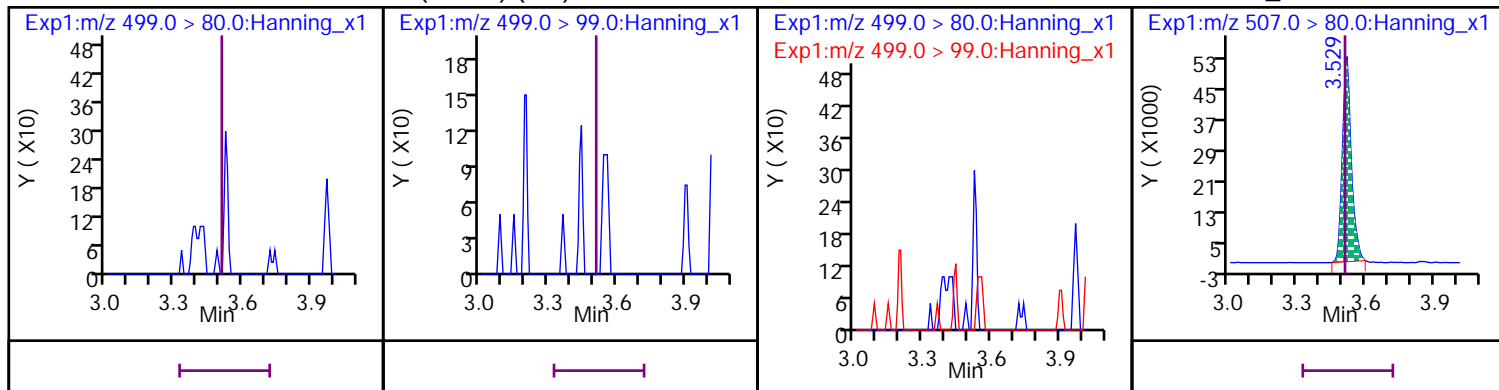
D 53 13C8\_PFOA





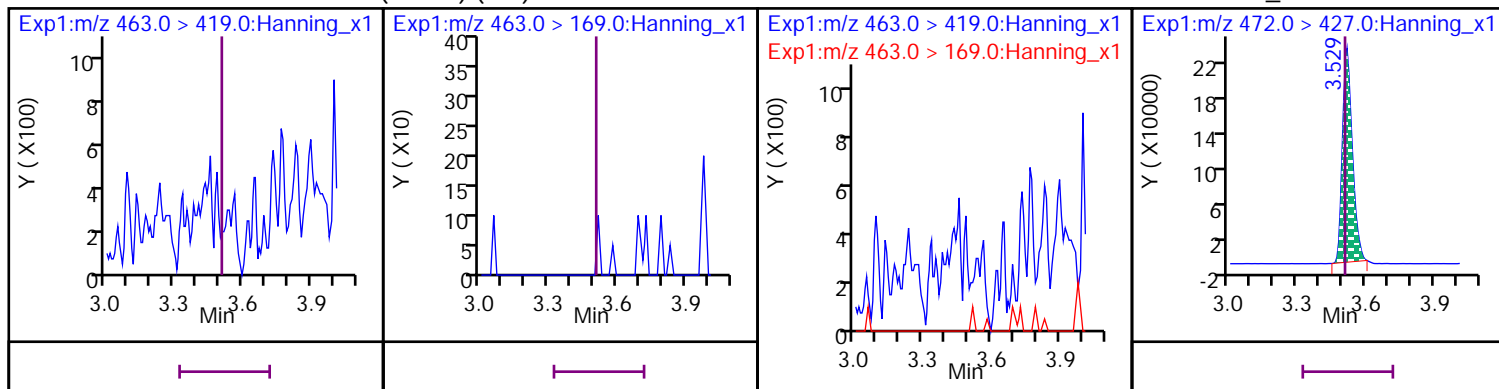
18 Perfluorooctanesulfonic acid (PFOS) (ND)

D 54 13C8\_PFOS



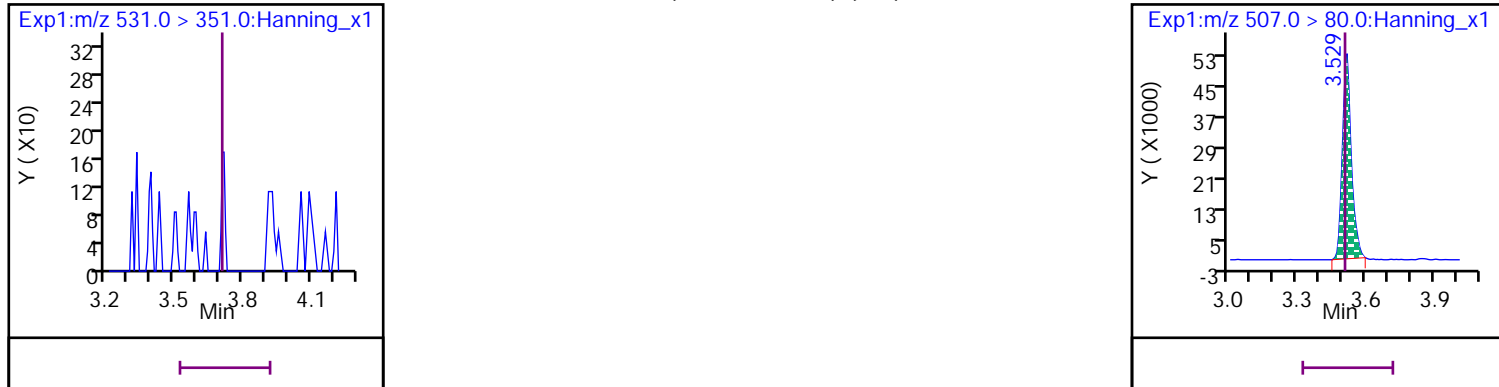
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



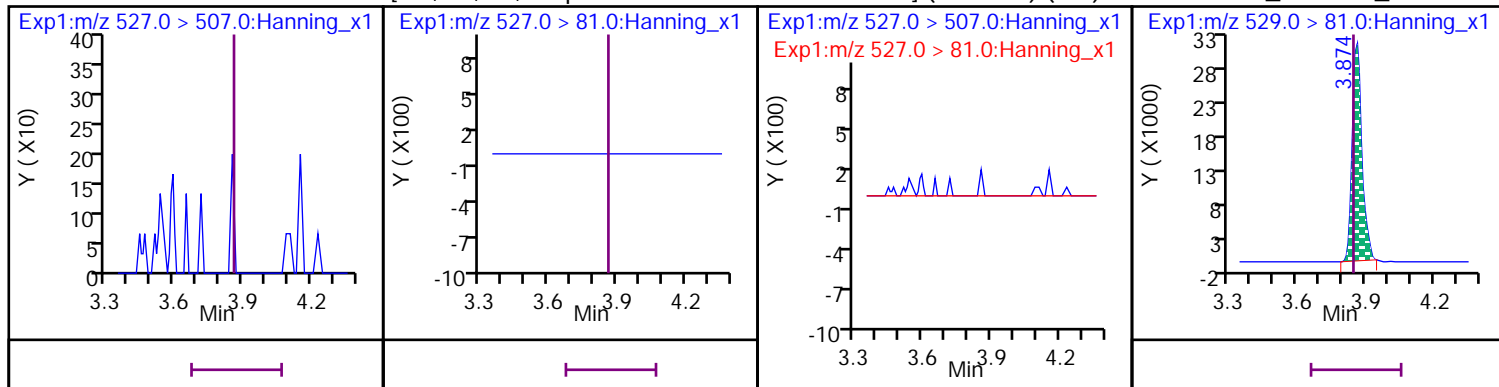
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



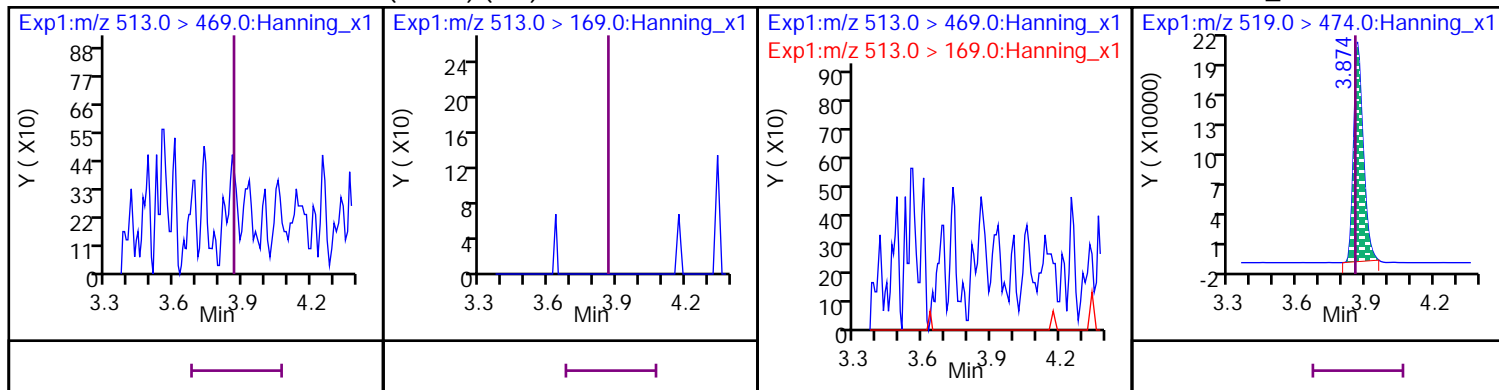
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



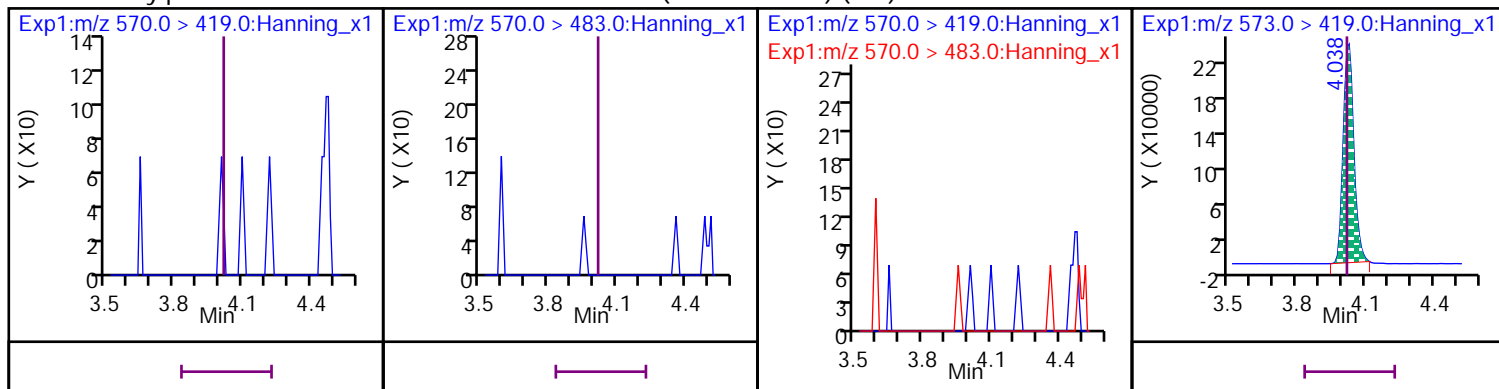
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



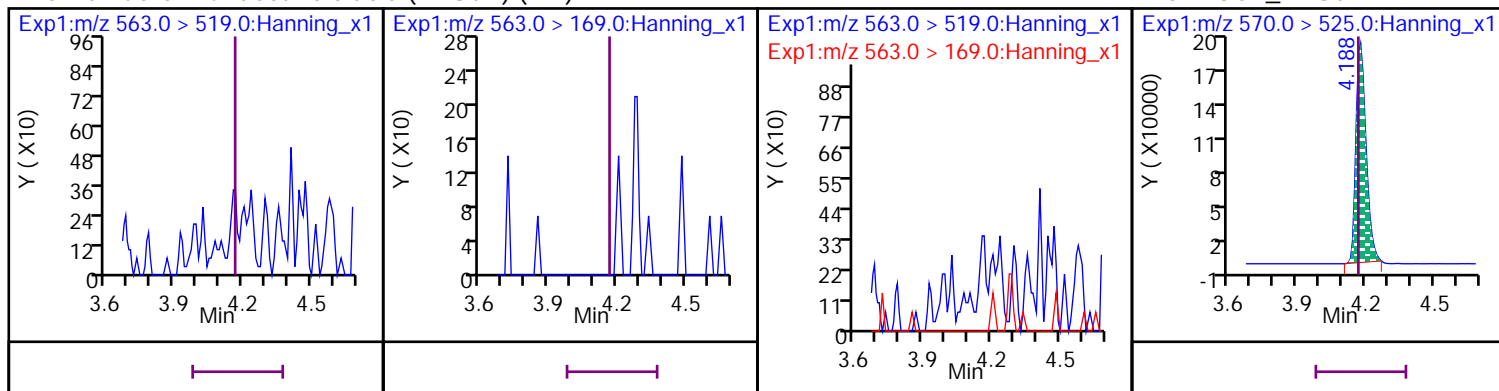
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



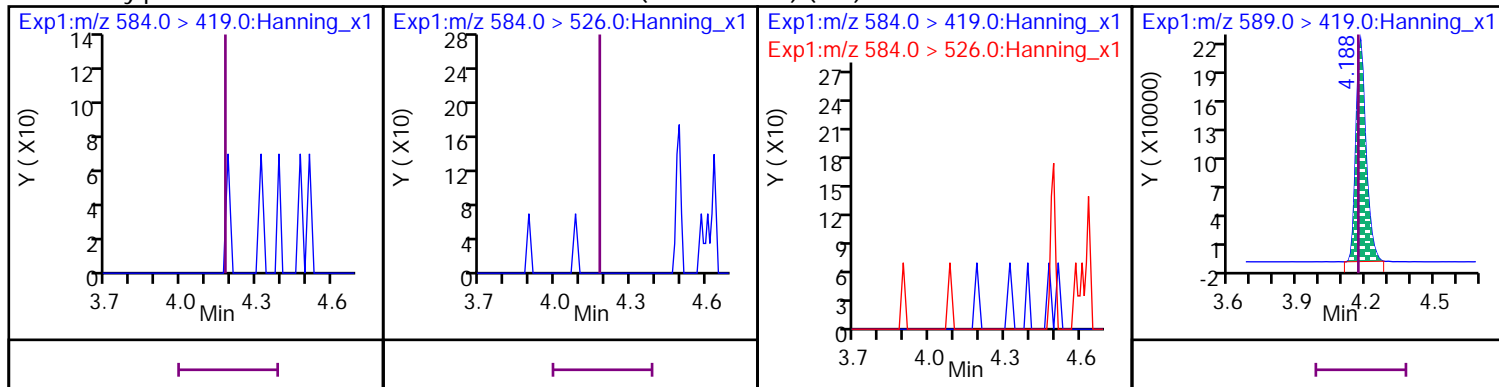
25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

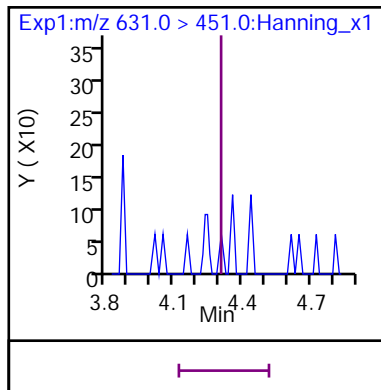


5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

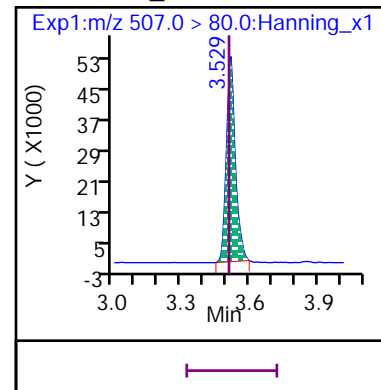
D 60 d5-EtFOSAA



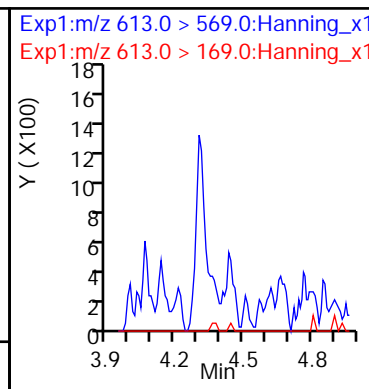
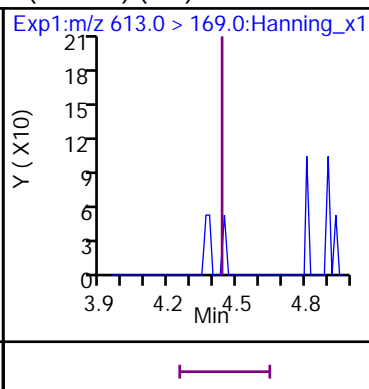
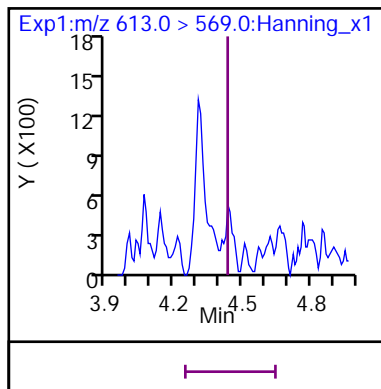
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



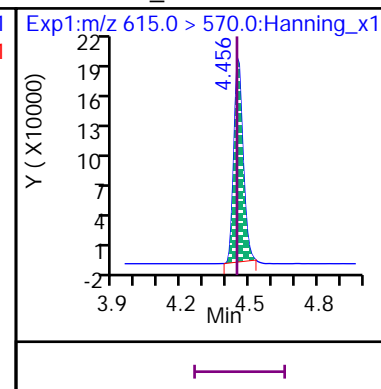
D 54 13C8\_PFOS



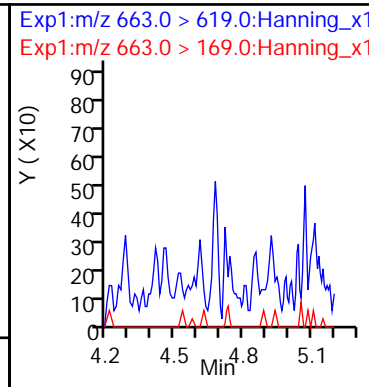
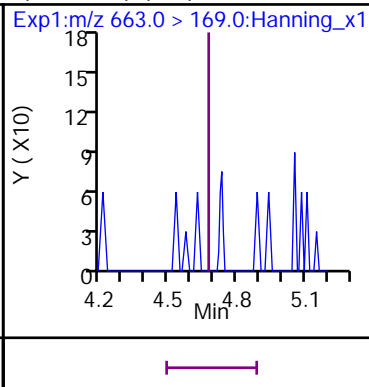
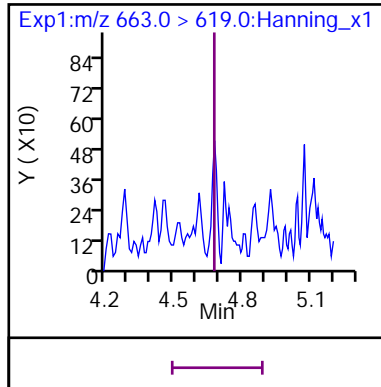
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



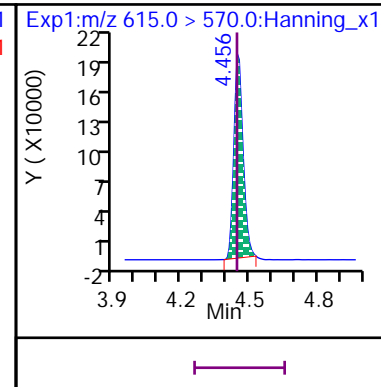
D 38 13C2\_PFDoA



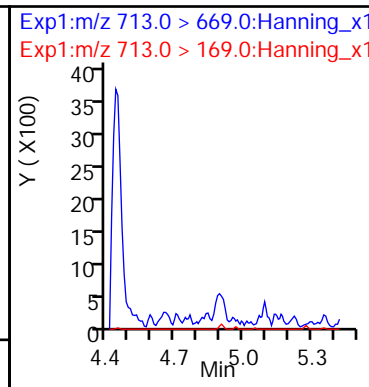
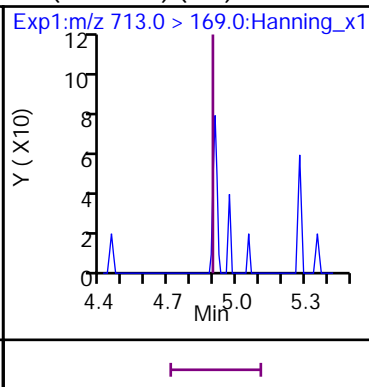
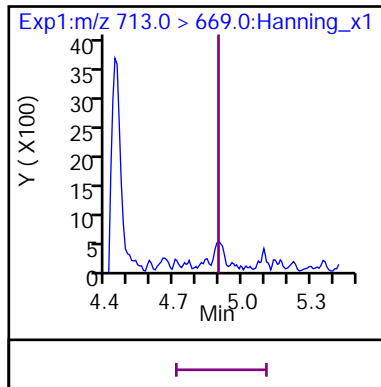
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



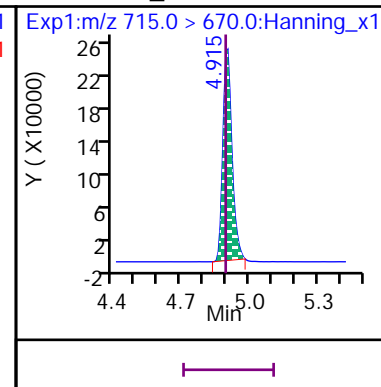
D 38 13C2\_PFTeDA



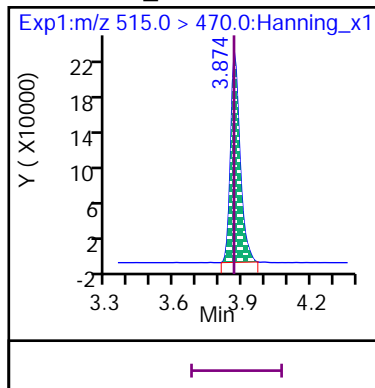
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



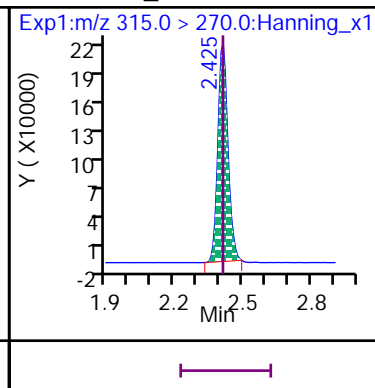
D 42 13C2\_PFTeDA



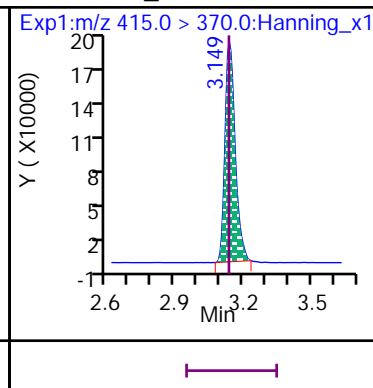
\* 37 13C2\_PFDA



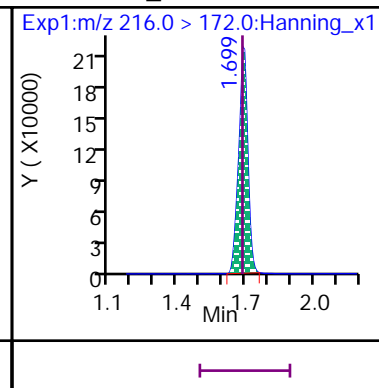
\* 39 13C2\_PFHxA



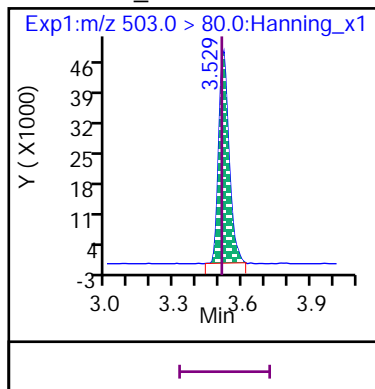
\* 41 13C2\_PFOA



\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



# CALIBRATION DATA

Pace Environmental Services, LLC  
Initial Calibration Signal Ratios Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.375	3.365	3.417	3.583	3.350	3.422	3.669	3.539	3.651	3.689	3.506	2.888-3.811	0.15375	1.675
1 4:2 FTS	1.740	1.271	2.227	1.747	1.641	1.778	1.917	1.832	1.949	1.952	1.805	0.915-2.366	0.24199	0.820
15 PFHxA	18.442	20.030	15.499	18.416	17.013	17.619	19.976	18.600	19.133	18.707	18.343	12.643-21.382	1.45644	8.506
22 PFPeS	3.429	2.825	3.387	2.905	3.095	3.026	3.153	3.038	3.064	3.127	3.104	2.544-3.645	0.18357	1.547
28 GenX	0.802	0.874	0.881	0.845	0.791	0.810	0.794	0.784	0.799	0.800	0.818	0.679-0.902	0.03719	0.395
13 PFHpA	3.160	3.841	3.704	4.011	3.797	3.680	3.758	3.723	3.730	3.674	3.707	3.176-4.417	0.20677	1.898
14 PFHxS	2.856	3.471	2.752	3.296	3.809	3.210	3.239	3.197	3.210	3.083	3.212	2.972-4.645	0.27880	1.904
29 ADONA	2.792	3.100	2.997	3.093	2.977	2.950	3.069	2.986	2.933	2.883	2.978	2.711-3.242	0.08838	1.488
2 6:2 FTS	1.990	1.694	1.765	1.765	1.774	1.860	1.730	1.843	1.762	1.897	1.808	1.358-2.189	0.13840	0.887
20 PFOA	2.767	3.072	2.862	2.931	2.854	2.911	2.831	2.839	2.943	2.747	2.875	2.569-3.138	0.09491	1.427
12 PFHpS	2.779	3.432	2.972	2.960	3.099	3.098	3.291	3.060	3.192	3.018	3.090	2.532-3.665	0.18868	1.549
18 PFOS	2.665	2.939	4.256	4.054	6.805	3.293	3.509	3.623	3.647	3.636	3.842	3.623-9.986	1.06054	3.402
17 PFNA	6.042	6.114	6.308	5.979	6.190	6.089	6.324	6.330	6.001	6.242	6.161	5.774-6.605	0.13861	3.095
3 8:2 FTS	1.969	2.043	2.152	1.669	2.111	1.940	2.024	1.839	1.917	1.873	1.953	1.717-2.504	0.13117	1.055
16 PFNS	6.029	2.522	3.073	2.421	3.036	2.621	2.732	2.668	2.858	2.813	3.077	0.046-6.025	0.99644	1.518
10 PFDA	24.185	15.981	15.642	21.616	13.225	13.928	14.668	13.457	13.525	13.228	15.945	1.743-24.706	3.82708	6.612
6 N-MeFOSAA	1.071	1.340	1.449	1.414	1.348	1.284	1.404	1.361	1.295	1.345	1.331	0.871-1.824	0.15871	0.674
9 PFDS	4.189	3.172	3.768	2.572	2.741	2.987	2.736	2.778	2.827	2.617	3.038	1.210-4.271	0.51006	1.370
25 PFUdA	22.113	12.610	15.515	16.875	16.054	13.756	14.349	15.840	14.439	13.537	15.508	8.383-23.724	2.55696	8.027
5 N-EtFOSAA	1.454	1.506	1.535	1.583	1.715	1.712	1.572	1.582	1.584	1.584	1.582	1.488-1.941	0.07543	0.857
26 MeFOSA	1.144	1.399	1.179	1.011	1.183	1.031	1.104	1.058	1.076	1.044	1.122	0.824-1.541	0.11940	0.591
11 PFDaA	13.126	9.490	12.137	10.877	10.358	10.825	10.909	10.101	10.483	10.296	10.860	7.324-13.391	1.01122	5.179
4 10:2 FTS	2.424	3.224	3.510	3.104	3.053	3.054	3.423	3.130	3.276	3.276	3.147	2.247-3.858	0.26845	1.526
27 EtFOSA	1.213	0.968	1.149	1.090	1.080	1.003	0.916	0.993	0.975	1.004	1.039	0.782-1.377	0.09912	0.540
34 PFDOS	4.707	3.977	2.930	2.897	3.168	3.112	3.157	3.063	3.273	3.106	3.339	1.349-4.986	0.60609	1.584
24 PFTTrDA	8.783	8.481	8.000	8.710	8.564	8.109	8.466	8.154	8.257	8.250	8.377	7.797-9.330	0.25559	4.282
23 PFTeDA	14.094	12.348	12.933	12.364	11.293	11.231	12.205	11.590	11.672	11.431	12.116	8.819-13.766	0.82455	5.646
35 PFHxDA	12.861	12.762	11.367	10.860	11.440	11.225	11.378	11.252	11.036	10.721	11.490	9.164-13.715	0.75841	5.720
36 PFODA	13.320	14.856	14.467	13.704	13.845	13.962	14.032	13.700	13.500	13.437	13.882	12.374-15.315	0.49033	6.922

Pace Environmental Services, LLC  
Initial Calibration RF Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No.Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Curve Legend: Ex. Avg;H Wt:C2 Org:F Dep:A

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area  
 Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None  
 Org: Origin, F-Force, I-Include, N-Neither  
 Dep: Dependent Variable, A-Amount, R-Response

$\%Rec = (\text{Measured Amount} / \text{True Amount}) * 100$

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBFA	706	694	712	706	735	691	690	665	667	670	Avg:A Wt:C2	694		RSD=3.2	
	102	100	103	102	106	99.6	99.5	95.9	96.1	96.6	Org:N Dep:A				
8 PFBA	1.091139	1.054497	1.012192	0.941608	0.918189	0.991494	0.991606	1.004334	0.982925	0.971965	Avg:A Wt:C2	0.995995		RSD=5.0	
	110	106	102	94.5	92.2	99.5	99.6	101	98.7	97.6	Org:N Dep:A				
D 50 13C5_PFPeA	707	694	717	687	728	708	674	652	663	650	Avg:A Wt:C2	688		RSD=4.0	
	103	101	104	99.8	106	103	97.9	94.8	96.4	94.5	Org:N Dep:A				
21 PFPeA	1.086981	1.044304	1.010325	0.982642	0.942195	0.958032	1.014471	1.041862	0.989098	0.984260	Avg:A Wt:C2	1.005417		RSD=4.3	
	108	104	100	97.7	93.7	95.3	101	104	98.4	97.9	Org:N Dep:A				
D 44 13C3_PFBS	235	232	231	238	248	234	228	218	218	220	Avg:A Wt:C2	230		RSD=4.1	
	102	101	100	103	108	102	99.1	94.7	94.8	95.6	Org:N Dep:A				
7 PFBS	1.319500	1.193640	1.210181	1.070606	1.063597	1.144377	1.182630	1.201174	1.199969	1.204724	Avg:A Wt:C2	1.179040		RSD=6.2	
	112	101	103	90.8	90.2	97.1	100	102	102	102	Org:N Dep:A				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
1 4:2 FTS	2.185420	1.863370	1.975258	2.030625	1.773490	2.052481	1.998581	2.012288	2.129223	1.936507	Avg:A Wt:C2	1.995724		RSD=6.0	
	110	93.4	99	102	88.9	103	100	101	107	97	Org:N Dep:A				
D 63 13C2_4:2 FTS_2	24.5250	24.2762	24.8226	23.3586	25.2928	23.5290	23.8080	23.8800	23.4802	25.1108	Avg:A Wt:C2	24.2083		RSD=2.9	
	101	100	103	96.5	104	97.2	98.3	98.6	97	104	Org:N Dep:A				
D 49 13C5_PFHxA	762	745	793	747	774	731	728	706	680	704	Avg:A Wt:C2	737		RSD=4.7	
	103	101	108	101	105	99.2	98.8	95.8	92.3	95.5	Org:N Dep:A				
15 PFHxA	1.067720	1.082954	0.932674	0.955775	0.927055	0.976939	0.988566	0.959037	1.010955	0.971111	Avg:A Wt:C2	0.987279		RSD=5.3	
	108	110	94.5	96.8	93.9	99	100	97.1	102	98.4	Org:N Dep:A				
22 PFPeS	0.923263	0.862346	0.897577	0.795888	0.788463	0.823648	0.863930	0.911847	0.890047	0.917479	Avg:A Wt:C2	0.867449		RSD=5.7	
	106	99.4	103	91.8	90.9	95	99.6	105	103	106	Org:N Dep:A				
28 GenX	0.697112	0.796040	0.772472	0.704563	0.655423	0.697711	0.696856	0.712622	0.740380	0.711419	Avg:A Wt:C2	0.718460		RSD=5.7	
	97	111	108	98.1	91.2	97.1	97	99.2	103	99	Org:N Dep:A				
D 66 13C3_GenX	276	271	270	272	282	267	264	257	246	257	Avg:A Wt:C2	266		RSD=4.0	
	104	102	101	102	106	100	99.3	96.5	92.5	96.4	Org:N Dep:A				
D 47 13C4_PFHpA	639	593	601	616	616	620	623	580	569	609	Avg:A Wt:C2	607		RSD=3.5	
	105	97.7	99.1	102	102	102	103	95.6	93.8	100	Org:N Dep:A				
13 PFHpA	1.011664	1.101543	1.118109	1.061199	1.020700	0.993781	0.982342	1.057344	1.042522	0.983416	Avg:A Wt:C2	1.037262		RSD=4.6	
	97.5	106	108	102	98.4	95.8	94.7	102	101	94.8	Org:N Dep:A				
14 PFHxS	1.039563	1.166554	1.088356	0.915465	1.045658	1.077000	1.045534	1.021450	1.095271	1.108019	Avg:A Wt:C2	1.060287		RSD=6.2	
	98	110	103	86.3	98.6	102	98.6	96.3	103	105	Org:N Dep:A				
D 45 13C3_PFHxS	177	180	174	177	179	169	169	174	158	153	Avg:A Wt:C2	171		RSD=5.3	
	104	105	102	104	105	98.8	99	102	92.1	89.5	Org:N Dep:A				
29 ADONA	5.782667	6.559767	6.584441	6.142465	6.039204	6.398585	6.374612	6.196943	6.568953	6.840559	Avg:A Wt:C2	6.348820		RSD=4.9	
	91.1	103	104	96.7	95.1	101	100	97.6	103	108	Org:N Dep:A				
2 6:2 FTS	3.313509	2.552165	2.298217	1.826136	2.092252	2.089672	2.021017	2.212993	1.983334	2.118831	Ln:A Wt:C2	2.011042	58.4075	R <sup>2</sup> =0.994	
	103	96.3	99	84.7	101	102	99.9	110	98.4	105	Org:N Dep:A			RSE=7	
D 64 13C2_6:2 FTS_2	19.6676	18.2686	19.2178	21.0354	20.9246	19.9252	19.0898	17.7098	18.7552	17.9900	Avg:A Wt:C2	19.2584		RSD=5.9	
	102	94.9	99.8	109	109	103	99.1	92	97.4	93.4	Org:N Dep:A				
D 53 13C8_PFOA	601	628	615	613	655	600	596	535	540	536	Avg:A Wt:C2	592		RSD=7.0	
	102	106	104	104	111	101	101	90.3	91.3	90.5	Org:N Dep:A				
20 PFOA	1.067889	1.119744	1.057825	0.985823	0.935567	1.015830	0.970504	1.039156	1.023232	0.978943	Avg:A Wt:C2	1.019451		RSD=5.3	
	105	110	104	96.7	91.8	99.6	95.2	102	100	96	Org:N Dep:A				
12 PFHpS	0.821583	1.000625	1.032417	0.876048	0.891586	0.891871	0.929346	0.847056	0.906036	0.887734	Avg:A Wt:C2	0.908430		RSD=7.1	
	90.4	110	114	96.4	98.1	98.2	102	93.2	99.7	97.7	Org:N Dep:A				
D 54 13C8_PFOS	155	151	157	149	154	150	155	141	140	146	Avg:A Wt:C2	150		RSD=4.0	
	104	101	105	99.4	103	100	104	94.3	93.5	97.1	Org:N Dep:A				
18 PFOS	1.288019	1.106634	1.264640	1.185556	1.105127	1.096804	1.124743	1.211778	1.230661	1.235891	Avg:A Wt:C2	1.184985		RSD=6.1	
	109	93.4	107	100	93.3	92.6	94.9	102	104	104	Org:N Dep:A				
17 PFNA	1.073000	1.114280	1.028578	0.954886	0.923649	0.987359	0.993144	0.996369	0.955990	0.973031	Avg:A Wt:C2	1.000029		RSD=5.8	
	107	111	103	95.5	92.4	98.7	99.3	99.6	95.6	97.3	Org:N Dep:A				
D 56 13C9_PFNA	801	741	765	769	792	747	735	719	713	727	Avg:A Wt:C2	751		RSD=4.0	
	107	98.7	102	102	106	99.5	97.8	95.7	94.9	96.8	Org:N Dep:A				



Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
30 9CI-PF3ONS	3.203947	3.357981	3.519008	3.335492	3.147725	3.318553	3.239700	3.499262	3.639860	3.403234	Avg:A Wt:C2	3.366476		RSD=4.5	
	95.2	99.7	105	99.1	93.5	98.6	96.2	104	108	101	Org:N Dep:A				
D 55 13C8_PFOA	303	313	315	328	331	312	302	304	302	286	Avg:A Wt:C2	310		RSD=4.3	
	97.9	101	102	106	107	101	97.5	98.1	97.6	92.5	Org:N Dep:A				
19 PFOSA	0.951815	1.021259	1.014955	0.977637	0.970307	0.984338	0.975203	0.974789	0.959640	1.024556	Avg:A Wt:C2	0.985450		RSD=2.6	
	96.6	104	103	99.2	98.5	99.9	99	98.9	97.4	104	Org:N Dep:A				
3 8:2 FTS	3.137111	2.022161	2.059449	1.823517	2.040387	2.064826	2.030473	1.976196	2.049735	1.913367	Ln:A Wt:C	1.976470	33.2946	R <sup>2</sup> =0.998	
	124	84.7	95.4	88.7	101	104	102	99.8	104	96.7	Org:N Dep:A			RSE=11.1	
16 PFNS	0.825404	0.780532	0.854565	0.704842	0.762032	0.759628	0.693956	0.784910	0.756785	0.730025	Avg:A Wt:C2	0.765268		RSD=6.5	
	108	102	112	92.1	99.6	99.3	90.7	103	98.9	95.4	Org:N Dep:A				
D 65 13C2_8:2 FTS_2	18.5336	19.6208	19.5874	19.3574	18.6628	17.4824	18.3224	17.9880	17.4196	18.5270	Avg:A Wt:C2	18.5501		RSD=4.3	
	99.9	106	106	104	101	94.2	98.8	97	93.9	99.9	Org:N Dep:A				
D 51 13C6_PFDA	666	671	672	686	698	682	667	634	618	639	Avg:A Wt:C2	663		RSD=3.8	
	100	101	101	103	105	103	100	95.6	93.2	96.3	Org:N Dep:A				
10 PFDA	1.082776	0.954504	1.050577	0.979894	0.905707	0.961047	0.950554	1.000079	1.010610	0.930209	Avg:A Wt:C2	0.982595		RSD=5.5	
	110	97.1	107	99.7	92.2	97.8	96.7	102	103	94.7	Org:N Dep:A				
D 58 d3-MeFOSAA	145	136	143	143	152	147	146	137	139	147	Avg:A Wt:C2	144		RSD=3.4	
	101	94.8	99.8	99.4	106	102	101	95.8	97	102	Org:N Dep:A				
6 N-MeFOSAA	0.635947	0.855857	0.854728	0.788585	0.717535	0.737984	0.756366	0.808021	0.765873	0.760614	Avg:A Wt:C2	0.768151		RSD=8.5	
	82.8	111	111	103	93.4	96.1	98.5	105	99.7	99	Org:N Dep:A				
9 PFDS	0.695408	0.731307	0.789111	0.698172	0.686800	0.739729	0.687780	0.763202	0.770649	0.695154	Avg:A Wt:C2	0.725731		RSD=5.3	
	95.8	101	109	96.2	94.6	102	94.8	105	106	95.8	Org:N Dep:A				
25 PFUdA	1.115782	0.933393	0.965682	0.875313	0.897037	0.906414	0.909248	0.985626	0.926951	0.883298	Avg:A Wt:C2	0.939874		RSD=7.5	
	119	99.3	103	93.1	95.4	96.4	96.7	105	98.6	94	Org:N Dep:A				
D 60 d5-EtFOSAA	144	136	141	142	148	132	131	124	120	111	Avg:A Wt:C2	133		RSD=8.8	
	108	102	106	107	111	99.3	98.4	93.2	90.5	83.7	Org:N Dep:A				
5 N-EtFOSAA	1.044603	1.126368	1.002271	0.932952	0.927289	1.003713	0.986979	0.952588	0.965127	1.013948	Avg:A Wt:C2	0.995584		RSD=5.9	
	105	113	101	93.7	93.1	101	99.1	95.7	96.9	102	Org:N Dep:A				
D 52 13C7_PFUdA	651	670	639	625	679	644	627	593	601	592	Avg:A Wt:C2	632		RSD=4.8	
	103	106	101	98.9	107	102	99.2	93.8	95	93.6	Org:N Dep:A				
D 61 d7-MeFOSE	104	100	113	111	117	107	113	98.7630	107	110	Avg:A Wt:C2	108		RSD=5.4	
	96.3	92.7	104	103	108	99.1	105	91.3	98.8	102	Org:N Dep:A				
32 MeFOSE	0.997727	1.192239	0.949548	0.895760	0.834200	0.901858	0.861530	0.972567	0.895099	0.895480	Avg:A Wt:C2	0.939601		RSD=10.8	
	106	127	101	95.3	88.8	96	91.7	104	95.3	95.3	Org:N Dep:A				
26 MeFOA	1.020662	1.423995	1.218730	1.188712	1.125489	1.042353	1.087780	1.086879	0.991204	1.096250	Avg:A Wt:C2	1.128205		RSD=11.1	
	90.5	126	108	105	99.8	92.4	96.4	96.3	87.9	97.2	Org:N Dep:A				
D 57 d3-MeFOA	50.6730	50.8850	52.4070	46.1020	54.9690	56.5600	54.5890	52.2610	58.1020	52.6210	Avg:A Wt:C2	52.9169		RSD=6.4	
	95.8	96.2	99	87.1	104	107	103	98.8	110	99.4	Org:N Dep:A				
31 11Cl-PF3OUDS	2.931943	3.091536	2.822319	2.750533	2.704033	2.749012	2.667085	3.027545	2.805208	2.850209	Avg:A Wt:C2	2.839942		RSD=4.9	
	103	109	99.4	96.9	95.2	96.8	93.9	107	98.8	100	Org:N Dep:A				
D 62 d9-EtFOSE	125	124	132	131	122	122	130	118	120	130	Avg:A Wt:C2	125		RSD=4.0	
	99.8	98.8	105	105	97.2	97	104	94.3	95.8	104	Org:N Dep:A				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	MI	B	Curve Errors	Flags
33 EtFOSE	1.019154	0.880146	0.947863	0.797594	0.885335	0.885237	0.830966	0.912332	0.915327	0.822825	Avg:A Wt:C2	0.889678		RSD=7.3	
	115	98.9	107	89.6	99.5	99.5	93.4	103	103	92.5	Org:N Dep:A				
D 38 13C2_PFDoA	642	608	629	618	649	611	615	581	527	574	Avg:A Wt:C2	605		RSD=6.0	
	106	100	104	102	107	101	102	96	87	94.8	Org:N Dep:A				
D 59 d5-EtFOSA	56.9440	45.8870	49.7250	45.9440	51.5170	49.5820	48.3220	45.1220	48.6870	49.2150	Avg:A Wt:C2	49.0945		RSD=7.0	
	116	93.5	101	93.6	105	101	98.4	91.9	99.2	100	Org:N Dep:A				
11 PFDoA	1.122255	1.090672	1.055226	1.013845	0.920179	1.006988	0.970170	0.971516	1.049850	0.925985	Avg:A Wt:C2	1.012668		RSD=6.7	
	111	108	104	100	90.9	99.4	95.8	95.9	104	91.4	Org:N Dep:A				
4 10:2 FTS	2.657504	2.129589	2.424499	2.133487	2.295656	2.563159	2.273434	2.262591	2.254972	2.114073	Avg:A Wt:C2	2.310896		RSD=8.0	
	115	92.2	105	92.3	99.3	111	98.4	97.9	97.6	91.5	Org:N Dep:A				
27 EtFOSA	0.978856	1.295574	1.193062	1.167421	1.061009	1.057450	1.013774	1.110846	0.989496	1.057651	Avg:A Wt:C2	1.092514		RSD=9.2	
	89.6	119	109	107	97.1	96.8	92.8	102	90.6	96.8	Org:N Dep:A				
34 PFDOS	0.882871	0.792564	0.811512	0.741446	0.799524	0.771282	0.750037	0.832942	0.840539	0.805590	Avg:A Wt:C2	0.802831		RSD=5.3	
	110	98.7	101	92.4	99.6	96.1	93.4	104	105	100	Org:N Dep:A				
24 PFTrDA	1.006007	1.028828	1.025216	0.969996	0.922421	0.959307	0.948191	0.981902	1.057372	0.950146	Avg:A Wt:C2	0.984939		RSD=4.4	
	102	104	104	98.5	93.7	97.4	96.3	99.7	107	96.5	Org:N Dep:A				
D 42 13C2_PFTeDA	846	851	838	857	887	833	829	824	823	837	Avg:A Wt:C2	842		RSD=2.3	
	100	101	99.4	102	105	98.9	98.5	97.8	97.7	99.4	Org:N Dep:A				
23 PFTeDA	0.948194	0.918834	0.915903	0.848893	0.816283	0.837434	0.877354	0.845799	0.845161	0.810642	Avg:A Wt:C2	0.866450		RSD=5.4	
	109	106	106	98	94.2	96.7	101	97.6	97.5	93.6	Org:N Dep:A				
35 PFHxDA	0.804237	0.723303	0.688060	0.633582	0.618643	0.620417	0.626323	0.627488	0.601309	0.590532	Avg:A Wt:C2	0.653389		RSD=10.2	
	123	111	105	97	94.7	95	95.9	96	92	90.4	Org:N Dep:A				
D 40 13C2_PFHxDA	925	909	917	911	914	939	907	870	884	887	Avg:A Wt:C2	906		RSD=2.3	
	102	100	101	101	101	104	100	96.1	97.6	97.9	Org:N Dep:A				
36 PFODA	0.919372	0.930591	0.921761	0.856482	0.857857	0.845176	0.878381	0.894528	0.869450	0.878589	Avg:A Wt:C2	0.885219		RSD=3.4	
	104	105	104	96.8	96.9	95.5	99.2	101	98.2	99.3	Org:N Dep:A				

Pace Environmental Services, LLC  
Initial Calibration Ion Suppression Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No.Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector:

LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	663024	682347	669430	674242	726117	687130	648368	678382	640826	655979	0.26
* 39 13C2_PFHxA	695280	736017	745707	712364	752645	712399	707776	719360	727334	724179	1.01
* 41 13C2_PFOA	576963	627818	627559	603232	644116	588156	567038	571070	533004	567967	0.39
* 43 13C3_PFBA	610167	654143	654457	635147	665854	635025	621648	642378	606649	622072	0.48
* 48 13C4_PFOS	146687	165000	163672	161217	162438	153888	143306	163967	156417	162431	2.54

13C2\_PFDA ( (|655979 - 663024| / (655979 + 663024)) / 2) \* 100 = 0.27  
 13C2\_PFHxA ( (|724179 - 695280| / (724179 + 695280)) / 2) \* 100 = 1.02  
 13C2\_PFOA ( (|567967 - 576963| / (567967 + 576963)) / 2) \* 100 = 0.39  
 13C3\_PFBA ( (|622072 - 610167| / (622072 + 610167)) / 2) \* 100 = 0.48  
 13C4\_PFOS ( (|162431 - 146687| / (162431 + 146687)) / 2) \* 100 = 2.55

Pace Environmental Services, LLC  
Initial Calibration Response Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Quantitation Standards (\* - Istd) (D - Iso Dil Std)

- \* 37 13C2\_PFDA
- \* 39 13C2\_PFHxA
- \* 41 13C2\_PFOA
- \* 43 13C3\_PFBA
- \* 48 13C4\_PFOS
- D 38 13C2\_PFDoA
- D 40 13C2\_PFHxDA
- D 42 13C2\_PFTeDA
- D 44 13C3\_PFBS
- D 45 13C3\_PFHxS
- D 46 13C4\_PFBA
- D 47 13C4\_PFHpA
- D 49 13C5\_PFHxA
- D 50 13C5\_PFPeA
- D 51 13C6\_PFDA
- D 52 13C7\_PFUdA
- D 53 13C8\_PFOA
- D 54 13C8\_PFOS
- D 55 13C8\_PFOA
- D 56 13C9\_PFNA
- D 57 d3-MeFOSA
- D 58 d3-MeFOSAA
- D 59 d5-EtFOSA
- D 60 d5-EtFOSAA
- D 61 d7-MeFOSE
- D 62 d9-EtFOSE
- D 63 13C2\_4:2 FTS\_2
- D 64 13C2\_6:2 FTS\_2
- D 65 13C2\_8:2 FTS\_2
- D 66 13C3\_GenX

Column: 1

Detector:

LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	705996	694056	711668	706020	735341	690771	689746	665321	666524	670075	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	38517	73188	144069	332397	675182	1369790	3419782	6682046	9827144	13025794	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	706599	693821	717259	686828	728206	707649	673601	651811	663206	649876	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	38403	72456	144933	337453	686112	1355901	3416745	6790971	9839633	12792943	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	235006	232321	231160	237792	247575	234029	228127	218052	218164	220082	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	13706	24514	49459	112525	232775	473501	1192471	2315358	3471337	4687642	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	2503	4225	9159	22151	41896	90211	222209	448819	700424	908357	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	122625	121381	124113	116793	126464	117645	119040	119400	117401	125554	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	761735	745193	793257	746858	774364	730846	727937	706446	680161	703908	
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	40666	80701	147970	356914	717878	1427984	3598068	6775081	10314185	13671450	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	10176	18792	38924	88761	183101	361613	924332	1865025	2732060	3788032	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	19247	43113	83476	191755	370236	745633	1842769	3663382	5473439	7308102	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1380482	1353983	1350793	1360808	1412202	1335856	1322202	1285178	1232123	1284072	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	639145	592578	601216	615843	616003	620403	623058	580132	569084	609009	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	32330	65275	134445	326766	628754	1233089	3060279	6133989	8899240	11978188	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	8383	19133	34534	73859	170607	331697	806242	1618935	2357954	3091076	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	177230	180234	174343	177317	179294	169221	169479	174169	157718	153282	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	48271	111372	216274	512996	1019991	2039948	5088509	10167151	14639276	19754392	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	3089	4420	8374	18208	41503	78944	182873	371537	528953	722713	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	98338	91343	96089	105177	104623	99626	95449	88549	93776	89950	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	601280	628251	615324	612816	654941	599661	595770	534634	540395	535572	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	32105	70348	130181	302064	612741	1218307	2890986	5555679	8294244	10485888	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	6931	17169	34271	73941	152183	287358	749722	1404494	2040587	2590841	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155227	150912	157006	149008	154357	150186	155392	141411	140164	145625	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	9277	15498	36852	81969	158302	305729	810961	1590209	2401122	3340366	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42994	82559	157415	367390	731878	1474929	3648336	7162720	10223367	14144518	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	801379	740918	765207	769495	792377	746906	734704	718882	712934	726828	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23176	47230	102987	231609	452834	929018	2345953	4611854	7132279	9237909	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	303168	312712	315019	328216	330552	312166	301964	303539	302106	286198	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	14428	31936	63946	160438	320737	614554	1472381	2958864	4348697	5864519	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	2785	3801	7729	16908	36480	69164	178203	340548	513089	679202	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	6150	11308	25761	50413	112920	219044	517609	1065551	1527466	2041151	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	92668	98104	97937	96787	93314	87412	91612	89940	87098	92635	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	666066	671396	672326	685807	698114	682060	666513	634238	618084	638714	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	36060	64085	141266	336009	632287	1310983	3167782	6342880	9369624	11882751	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	723802	680663	716544	713379	762102	735121	728018	687461	696167	733711	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	4603	11651	24498	56256	109367	217003	550648	1110966	1599526	2232283	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	5203	10639	23887	50144	102196	214195	515140	1040398	1561930	1951749	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	36310	62546	123504	273549	608820	1167255	2851720	5844692	8350413	10456451	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	717593	678730	706396	710894	738335	659409	653728	618761	600812	556076	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7496	15290	28320	66323	136930	264743	645216	1178848	1739580	2255329	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	650844	670093	639465	625031	678701	643886	627270	592993	600565	591898	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	104257	100349	112543	110965	117292	107248	113389	98763	106887	110386	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5201	11964	21373	49699	97845	193445	488440	960536	1435117	1976969	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2586	7246	12774	27401	61867	117911	296904	568014	863864	1153715	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	50673	50885	52407	46102	54969	56560	54589	52261	58102	52621	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21436	43949	83484	193040	393178	777834	1952030	4032967	5555764	7819762	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	125143	123934	131865	131192	121851	121638	130009	118273	120117	129932	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6377	10908	24998	52319	107879	215357	540165	1079042	1649195	2138227	
D 38 13C2_PFD0A	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	641904	608304	628619	617850	649290	610527	614915	581218	526602	573941	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	56944	45887	49725	45944	51517	49582	48322	45122	48687	49215	
11 PFD0A	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	36019	66346	132667	313202	597463	1229587	2982859	5646628	8292794	10629213	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2374	4028	9156	19906	41301	86394	200776	392343	567999	755148	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2787	5945	11865	26818	54660	104861	244938	501236	722634	1041046	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6633	11578	24667	53473	119463	224258	564101	1140180	1710650	2271201	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32288	62584	128894	299656	598919	1171366	2915284	5706994	8352213	10906551	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	845523	850556	837660	856925	887372	833060	829396	823800	822708	837427	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	40086	78152	153443	363719	724347	1395266	3638371	6967694	10429810	13577068	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37182	65729	126217	288509	565232	1164830	2839296	5461937	7973247	10474146	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	924653	908734	917195	910723	913664	938748	906655	870445	883988	886840	
36 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	42505	84566	169087	390009	783793	1586814	3981944	7786374	11528747	15583360	

## Pace Environmental Services, LLC

## Initial Calibration RT Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID  
 Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	121720006.d	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20
2	121720007.d	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59
3	121720008.d	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32
4	121720009.d	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06
5	121720010.d	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45
6	121720011.d	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20
7	121720012.d	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55
8	121720013.d	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34
9	121720014.d	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15
10	121720015.d	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55

Column: 1

Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg-RT	%Rsd RT
D 46 13C4_PFBFA	1.691	1.692	1.692	1.690	1.696	1.696	1.692	1.696	1.692	1.693	1.693	0.141
8 PFBA	1.698	1.699	1.699	1.696	1.696	1.696	1.692	1.696	1.699	1.699	1.697	0.109
D 50 13C5_PFPeA	2.066	2.067	2.067	2.062	2.072	2.072	2.067	2.062	2.067	2.067	2.066	0.179
21 PFPeA	2.066	2.067	2.067	2.072	2.072	2.072	2.067	2.072	2.067	2.067	2.068	0.152
D 44 13C3_PFBFS	2.119	2.120	2.120	2.125	2.125	2.125	2.120	2.125	2.120	2.120	2.121	0.151
7 PFBFS	2.119	2.120	2.120	2.125	2.125	2.125	2.120	2.125	2.120	2.120	2.121	0.151
1 4:2 FTS	2.370	2.398	2.389	2.388	2.388	2.388	2.389	2.388	2.380	2.389	2.386	0.295
D 63 13C2_4:2 FTS_2	2.388	2.389	2.389	2.379	2.388	2.388	2.380	2.379	2.389	2.380	2.384	0.187
D 49 13C5_PFHxA	2.424	2.425	2.425	2.423	2.423	2.423	2.425	2.423	2.424	2.425	2.424	0.022
15 PFHxA	2.424	2.425	2.425	2.423	2.423	2.423	2.425	2.423	2.424	2.425	2.424	0.022
22 PFPeS	2.450	2.451	2.451	2.459	2.459	2.459	2.451	2.450	2.451	2.451	2.453	0.158
28 GenX	2.539	2.532	2.532	2.530	2.539	2.539	2.532	2.530	2.531	2.532	2.533	0.159
D 66 13C3_GenX	2.531	2.532	2.532	2.530	2.539	2.530	2.532	2.530	2.531	2.532	2.531	0.107
D 47 13C4_PFHpA	2.790	2.791	2.782	2.790	2.790	2.781	2.782	2.781	2.791	2.782	2.786	0.168
13 PFHpA	2.790	2.782	2.782	2.790	2.790	2.790	2.782	2.781	2.782	2.782	2.785	0.152
14 PFHxS	2.809	2.800	2.800	2.799	2.799	2.799	2.800	2.799	2.800	2.801	2.800	0.097
D 45 13C3_PFHxS	2.799	2.800	2.800	2.799	2.799	2.799	2.800	2.799	2.800	2.801	2.800	0.019
29 ADONA	2.827	2.828	2.828	2.827	2.827	2.827	2.828	2.827	2.828	2.828	2.827	0.019
2 6:2 FTS	3.141	3.135	3.142	3.142	3.135	3.142	3.142	3.134	3.142	3.136	3.139	0.115
D 64 13C2_6:2 FTS_2	3.141	3.142	3.142	3.135	3.135	3.135	3.135	3.141	3.142	3.136	3.138	0.108
D 53 13C8_PFOA	3.168	3.169	3.162	3.162	3.169	3.162	3.162	3.161	3.169	3.162	3.164	0.102
20 PFOA	3.175	3.169	3.169	3.169	3.169	3.162	3.162	3.161	3.169	3.162	3.166	0.137
12 PFHpS	3.161	3.183	3.169	3.176	3.169	3.169	3.169	3.168	3.176	3.169	3.170	0.179
D 54 13C8_PFOS	3.551	3.545	3.545	3.545	3.545	3.537	3.545	3.543	3.545	3.537	3.543	0.122
18 PFOS	3.551	3.553	3.545	3.545	3.545	3.545	3.545	3.543	3.545	3.545	3.545	0.091
17 PFNA	3.559	3.553	3.553	3.553	3.545	3.545	3.545	3.551	3.553	3.545	3.549	0.139
D 56 13C9_PFNA	3.551	3.553	3.553	3.553	3.545	3.545	3.545	3.551	3.553	3.545	3.549	0.111
30 9Cl-PF3ONS	3.756	3.758	3.751	3.757	3.750	3.751	3.751	3.756	3.757	3.751	3.753	0.093
D 55 13C8_PFOSA	3.873	3.874	3.866	3.866	3.866	3.866	3.866	3.865	3.874	3.866	3.868	0.098
19 PFOSA	3.873	3.866	3.866	3.866	3.866	3.866	3.866	3.865	3.874	3.866	3.867	0.084
3 8:2 FTS	3.898	3.891	3.899	3.899	3.891	3.891	3.891	3.890	3.899	3.891	3.893	0.106
16 PFNS	3.898	3.899	3.899	3.891	3.891	3.891	3.891	3.890	3.891	3.883	3.891	0.128
D 65 13C2_8:2 FTS_2	3.898	3.899	3.891	3.891	3.891	3.891	3.891	3.890	3.899	3.891	3.892	0.097



Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 51 13C6_PFDA	3.906	3.907	3.899	3.899	3.899	3.899	3.899	3.898	3.907	3.899	3.900	0.106
10 PFDA	3.914	3.899	3.899	3.899	3.899	3.899	3.899	3.898	3.907	3.899	3.900	0.140
D 58 d3-MeFOSAA	4.064	4.056	4.056	4.056	4.056	4.056	4.056	4.055	4.056	4.056	4.056	0.059
6 N-MeFOSAA	4.073	4.074	4.065	4.065	4.065	4.056	4.065	4.064	4.065	4.056	4.064	0.136
9 PFDS	4.206	4.198	4.198	4.207	4.198	4.198	4.198	4.197	4.198	4.188	4.198	0.127
25 PFUdA	4.227	4.218	4.218	4.218	4.217	4.217	4.218	4.216	4.217	4.207	4.217	0.107
D 60 d5-EtFOSAA	4.217	4.218	4.218	4.218	4.217	4.207	4.218	4.216	4.217	4.207	4.215	0.098
5 N-EtFOSAA	4.227	4.228	4.228	4.218	4.217	4.217	4.218	4.227	4.228	4.218	4.222	0.120
D 52 13C7_PFUdA	4.217	4.218	4.218	4.218	4.217	4.207	4.218	4.216	4.217	4.207	4.215	0.098
D 61 d7-MeFOSE	4.307	4.308	4.298	4.298	4.298	4.298	4.298	4.297	4.298	4.298	4.300	0.095
32 MeFOSE	4.317	4.308	4.308	4.308	4.308	4.308	4.308	4.307	4.308	4.308	4.309	0.067
26 MeFOSA	4.327	4.328	4.328	4.318	4.318	4.318	4.318	4.327	4.328	4.319	4.323	0.117
D 57 d3-MeFOSA	4.327	4.318	4.318	4.318	4.318	4.318	4.318	4.317	4.318	4.319	4.319	0.067
31 11Cl-PF3OUDS	4.366	4.358	4.358	4.358	4.357	4.358	4.358	4.356	4.358	4.358	4.358	0.067
D 62 d9-EtFOSE	4.473	4.465	4.465	4.465	4.465	4.465	4.465	4.464	4.465	4.456	4.464	0.091
33 EtFOSE	4.482	4.483	4.474	4.474	4.474	4.474	4.474	4.482	4.474	4.474	4.476	0.092
D 38 13C2_PFDoA	4.500	4.492	4.492	4.492	4.483	4.492	4.492	4.491	4.492	4.483	4.491	0.109
D 59 d5-EtFOSA	4.491	4.492	4.483	4.483	4.483	4.483	4.483	4.482	4.492	4.483	4.486	0.095
11 PFDoA	4.491	4.492	4.492	4.492	4.492	4.492	4.492	4.491	4.492	4.483	4.491	0.062
4 10:2 FTS	4.500	4.492	4.492	4.492	4.492	4.492	4.492	4.500	4.501	4.492	4.495	0.090
27 EtFOSA	4.491	4.492	4.492	4.492	4.492	4.492	4.492	4.491	4.492	4.492	4.492	0.009
34 PFDOS	4.710	4.711	4.704	4.704	4.704	4.704	4.704	4.703	4.704	4.697	4.704	0.082
24 PFTrDA	4.737	4.731	4.731	4.724	4.731	4.731	4.724	4.730	4.731	4.725	4.729	0.085
D 42 13C2_PFTeDA	4.956	4.948	4.948	4.948	4.948	4.948	4.948	4.947	4.948	4.940	4.948	0.072
23 PFTeDA	4.956	4.948	4.948	4.948	4.948	4.948	4.948	4.947	4.948	4.948	4.949	0.046
35 PFHxDA	5.342	5.335	5.334	5.334	5.334	5.334	5.334	5.333	5.334	5.334	5.335	0.048
D 40 13C2_PFHxDA	5.342	5.335	5.334	5.334	5.334	5.334	5.334	5.333	5.334	5.334	5.335	0.048
36 PFODA	5.702	5.696	5.696	5.696	5.689	5.689	5.689	5.694	5.689	5.688	5.692	0.081



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d  
Injection Date: 17-Dec-2020 12:22:20 Injection Vol: 10.0 uL  
Sample Type: lcal, Level: 1 Auto Sampler: 1  
Sample Info: ICAL 50\_SVLC-1219 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.691	1.696	0	705996	22	>100:1			1000.00	1017.94	96	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.696	1/1	38517	21	20:1			50.000	54.776		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.066	2.072	0	706599	17	>100:1			1000.00	1027.20	97	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.066	2.072	0/0	38403	16	59:1			50.000	54.056		
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.119	2.125	0	235006	16	>100:1			1000.00	1020.74	94.9	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.119	2.125	0/0	13706	17	>100:1	Target = 3.50		44.200	49.466		
298.9 > 99	44	2.119	2.125		4060	14	48:1	3.37 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.459	0/0	10176	19	>100:1	Target = 3.10		46.900	49.918		
349 > 99	44	2.450	2.459		2967	19	24:1	3.42 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	1	122625	19	>100:1			5000.00	5065.41	97	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.370	2.388	-1/-2	2503	22	27:1	Target = 1.80		46.700	51.139		
327 > 81	63	2.370	2.388		1438	10	12:1	1.74 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	761735	19	>100:1			1000.00	1033.46	98.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	40666	24	62:1	Target = 18.34		50.000	54.074		
313 > 119	49	2.415	2.423		2205	22	16:1	18.44 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1380482	20	>100:1			5000.00	5182.88	97.8	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	1/1	19247	19	52:1	Target = 0.81		100.00	97.029		
285 > 185	66	2.539	2.539		23991	19	94:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	639145	20	>100:1			1000.00	1053.57	104	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	32330	17	49:1	Target = 3.70		50.000	48.766		
363 > 169	47	2.781	2.790		10229	15	75:1	3.16 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	177230	20	>100:1			1000.00	1035.05	98.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.809	2.799	1/0	8383	33	79:1	Target = 3.21	0.13	45.500	44.611		
399 > 99	45	2.790	2.799		2935	16	19:1	2.85 (1.60-4.81)	0.15				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	48271	18	>100:1	Target = 2.97		47.100	42.900		
377 > 85	45	2.827	2.827		17289	24	100:1	2.79 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.161	3.169	0/-1	6931	16	26:1	Target = 3.08		47.600	43.049		
449 > 99	45	3.175	3.169		2494	21	21:1	2.77 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	98338	23	>100:1			5000.00	5106.24	94	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.135	1/0	3089	28	44:1	Target = 1.80		47.400	49.056		
427 > 81	64	3.134	3.135		1552	17	31:1	1.99 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.168	3.169	0	601280	24	>100:1			1000.00	1015.91	91.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.175	3.169	1/1	32105	20	20:1	Target = 2.87		50.000	52.376		
413 > 169	53	3.175	3.169		11599	22	58:1	2.76 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.551	3.545	1	155227	21	>100:1			1000.00	1035.34	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.551	3.545	1/0	9277	48	30:1	Target = 3.84	0.23	46.400	50.434		
499 > 99	54	3.559	3.545		3481	27	28:1	2.66 (1.92-5.76)	0.07				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.756	3.750	1/0	23176	25	70:1			46.600	44.350		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.898	3.891	1/0	6150	24	52:1	Target = 3.07		48.000	51.772		
549 > 99	54	3.898	3.891		1020	15	3.3:1	6.02 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.206	4.198	1/0	5203	19		Target = 3.03		48.200	46.186		
599 > 99	54	4.187	4.198		1242	18	8.2:1	4.18 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.366	4.357	1/0	21436	22	>100:1			47.100	48.626		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.710	4.704	1/0	6633	16	98:1	Target = 3.33		48.400	53.225		
699 > 99	54	4.710	4.704		1409	22	15:1	4.70 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	801379	21	>100:1			1000.00	1067.14	101	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.559	3.545	1/0	42994	24	75:1	Target = 6.16		50.000	53.648		
463 > 169	56	3.551	3.545		7115	26	33:1	6.04 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.873	3.866	1	303168	20	>100:1			1000.00	979.34	91.7	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.873	3.866	1/0	14428	19	58:1			50.000	48.293		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.898	3.891	1	92668	18	>100:1			5000.00	4995.54	99.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.898	3.891	1/0	2785	29	16:1	Target = 1.95		47.900	59.183		
527 > 81	65	3.898	3.891		1414	20	11:1	1.96 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.500	4.492	1/0	2374	16	16:1	Target = 3.14		48.200	55.429		
627 > 80	65	4.500	4.492		979	16	16:1	2.42 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.906	3.899	1	666066	19	>100:1			1000.00	1004.12	95.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.914	3.899	1/0	36060	18	72:1	Target = 15.94		50.000	55.098		
513 > 169	51	3.922	3.899		1491	18	8.0:1	24.18 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.064	4.056	1	723802	17	>100:1			5000.00	5042.53	95	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.073	4.065	1/0	4603	27		Target = 1.33		50.000	41.395		M
570 > 483	58	4.073	4.065		4295	29	14:1	1.07 (0.66-1.99)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	0	717593	17	>100:1			5000.00	5402.96	97.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.227	4.217	1/1	7496	33		Target = 1.58	0.14	50.000	52.462		M
584 > 526	60	4.227	4.217		5152	35	13:1	1.45 (0.79-2.37)	0.38				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	0	650844	18	>100:1			1000.00	1029.69	95.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.227	4.217	1/1	36310	19	72:1	Target = 15.50		50.000	59.358		
563 > 169	52	4.227	4.217		1642	20	13:1	22.11 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.307	4.298	1	104257	15	>100:1			1000.00	963.49	88.9	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.317	4.308	1/0	5201	10	25:1			50.000	53.093		M
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.327	4.318	1	50673	15	>100:1			1000.00	957.60	92.2	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.318	1/0	2586	20	7.0:1	Target = 1.12		50.000	45.234		
512 > 219	57	4.317	4.318		2260	18	21:1	1.14 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.473	4.465	1	125143	16	>100:1			1000.00	997.99	103	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.474	1/0	6377	19	26:1			50.000	57.277		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.500	4.483	2	641904	18	>100:1			1000.00	1060.44	98.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.491	4.492	0/-2	36019	16	9.9:1	Target = 10.85		50.000	55.411		
613 > 169	38	4.491	4.492		2744	24		13.12 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.737	4.731	1/-1	32288	20	>100:1	Target = 8.37		50.000	51.070		
663 > 169	38	4.730	4.731		3676	19	66:1	8.78 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.491	4.483	1	56944	16	>100:1			1000.00	1159.89	111	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.492	0/-1	2787	21	18:1	Target = 1.03		50.000	44.798		
526 > 219	59	4.491	4.492		2297	18	28:1	1.21 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.956	4.948	1	845523	19	>100:1			1000.00	1003.66	95.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.956	4.948	1/0	40086	19	>100:1	Target = 12.11		50.000	54.717		
713 > 169	42	4.956	4.948		2844	15	47:1	14.09 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.342	5.334	1	924653	18	>100:1			1000.00	1020.40	101	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.342	5.334	1/0	37182	17	12:1	Target = 11.48		50.000	61.543		
813 > 269	40	5.334	5.334		2891	14	>100:1	12.86 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.702	5.689	1/0	42505	24	>100:1	Target = 13.88		50.000	51.929		
913 > 319	40	5.702	5.689		3191	25	85:1	13.32 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.906	3.899	1	663024	19	>100:1					91.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	695280	19	>100:1					92.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.168	3.169	0	576963	25	>100:1					89.6	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.691	1.696	0	610167	22	>100:1					91.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.551	3.545	1	146687	21						90.3	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

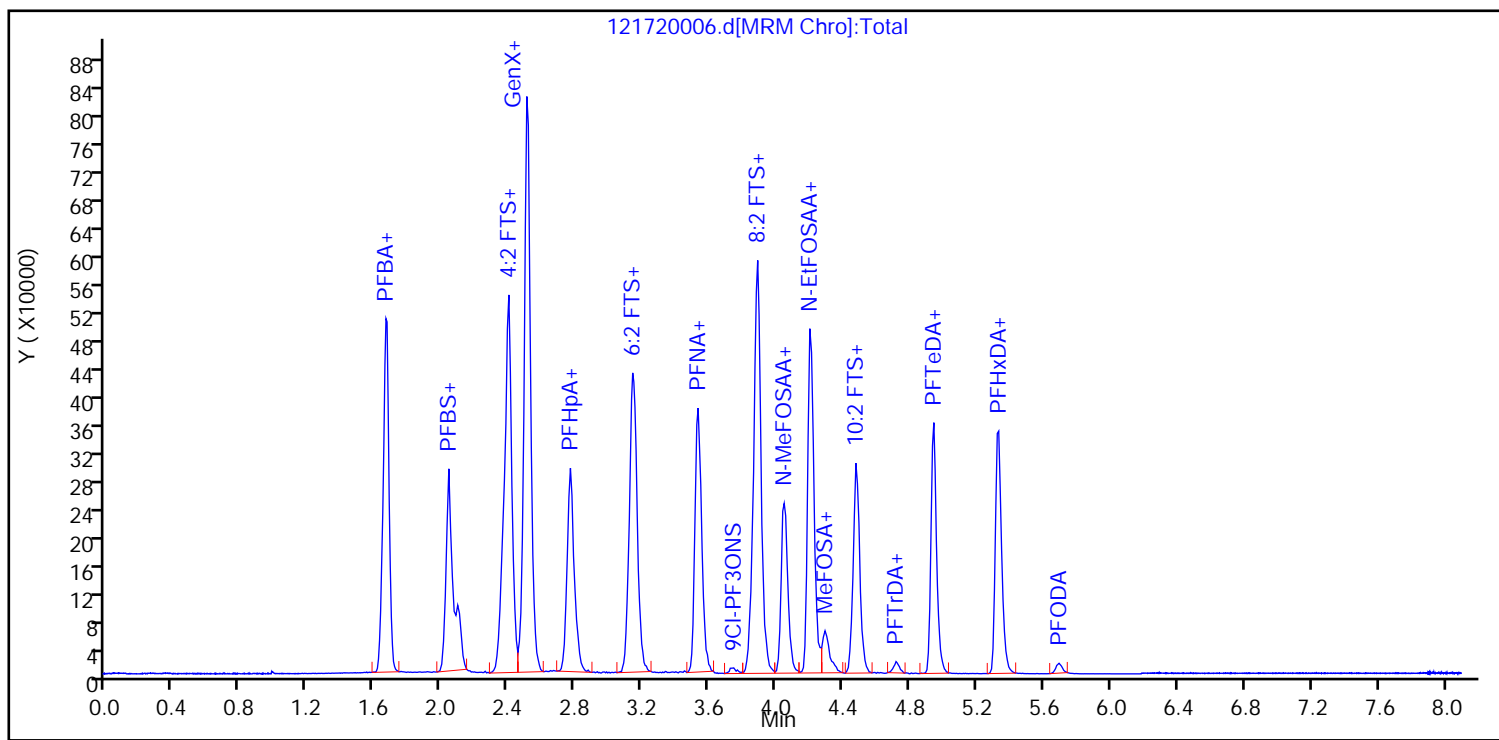
Client ID:

Lab ID: ICAL 50\_SVLC-1219

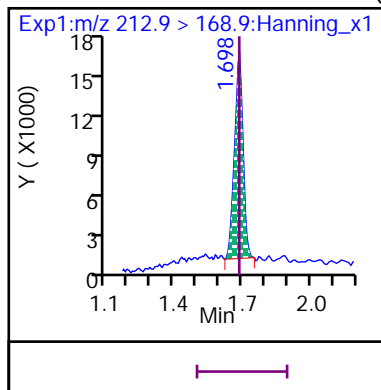
Sample Info: ICAL 50\_SVLC-1219

Dil. Factor: 1

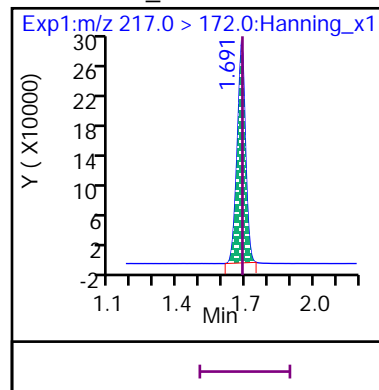
Operator: Stephen E. Somerville



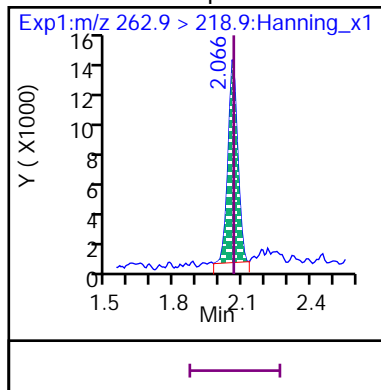
8 Perfluoro-n-butanoic acid (PFBA)



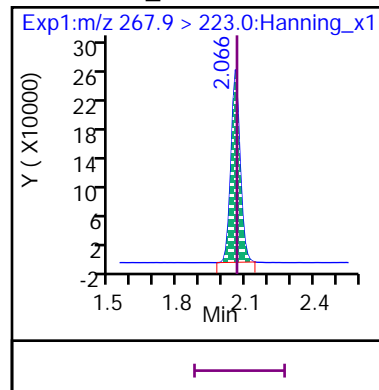
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

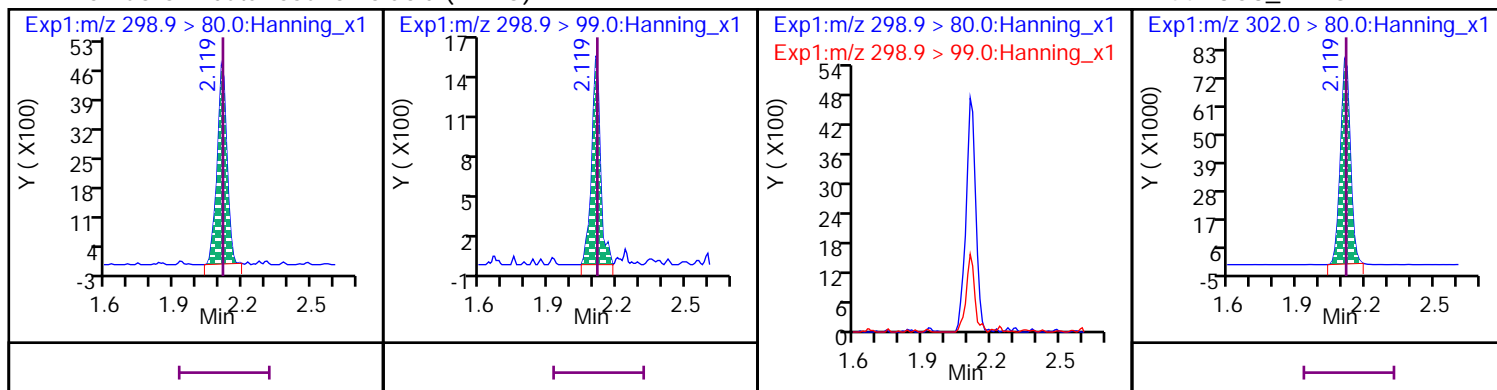


D 50 13C5\_PFPeA



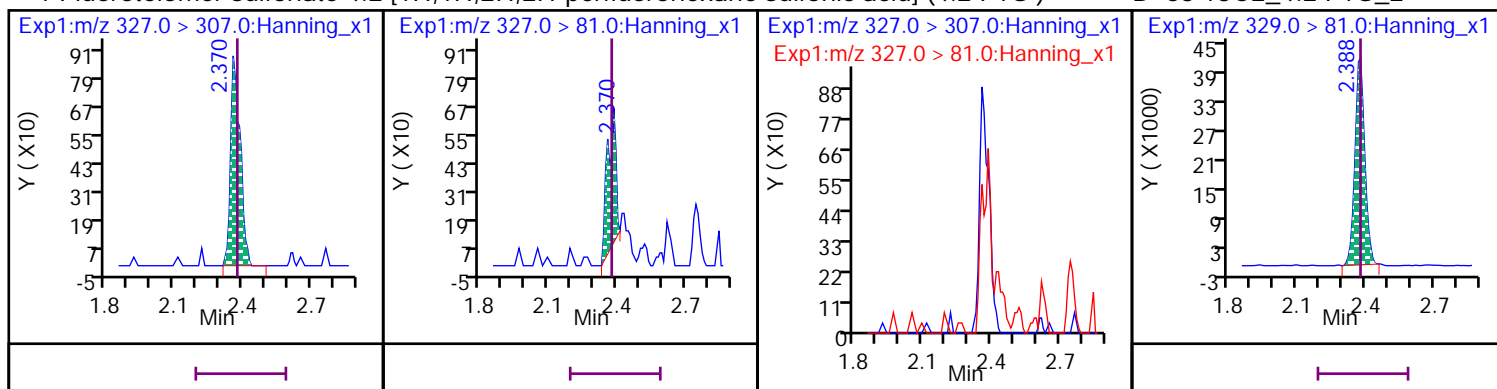
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



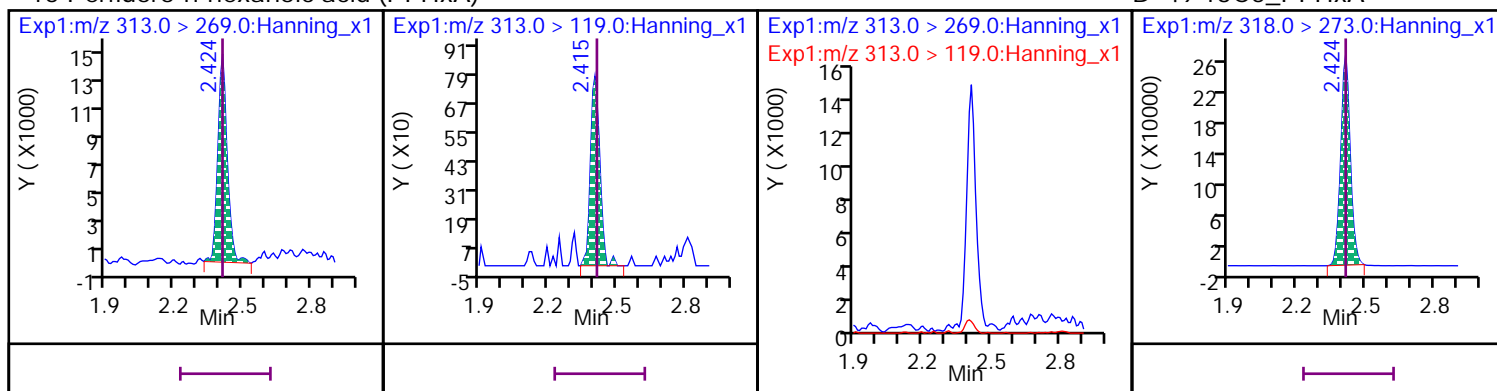
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



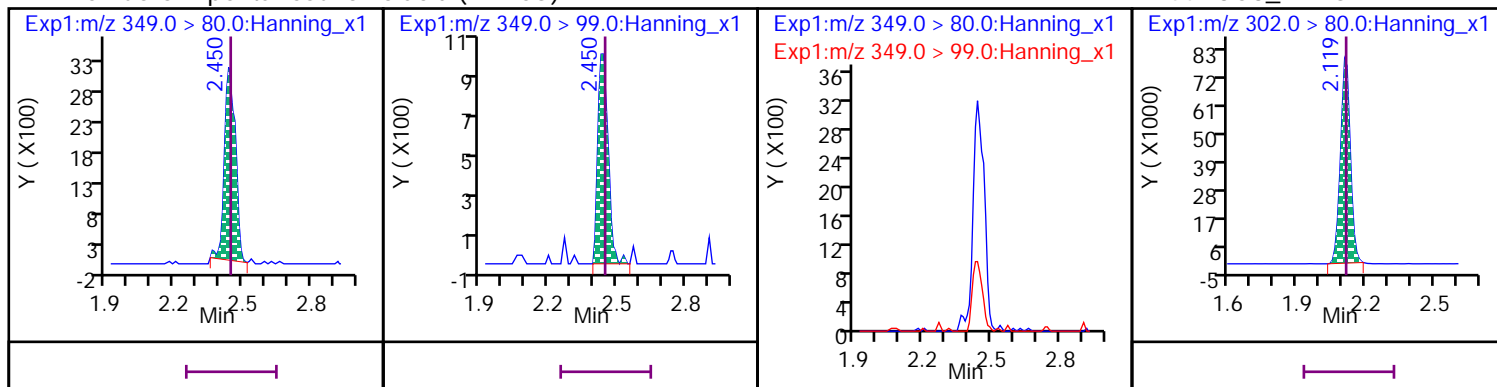
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



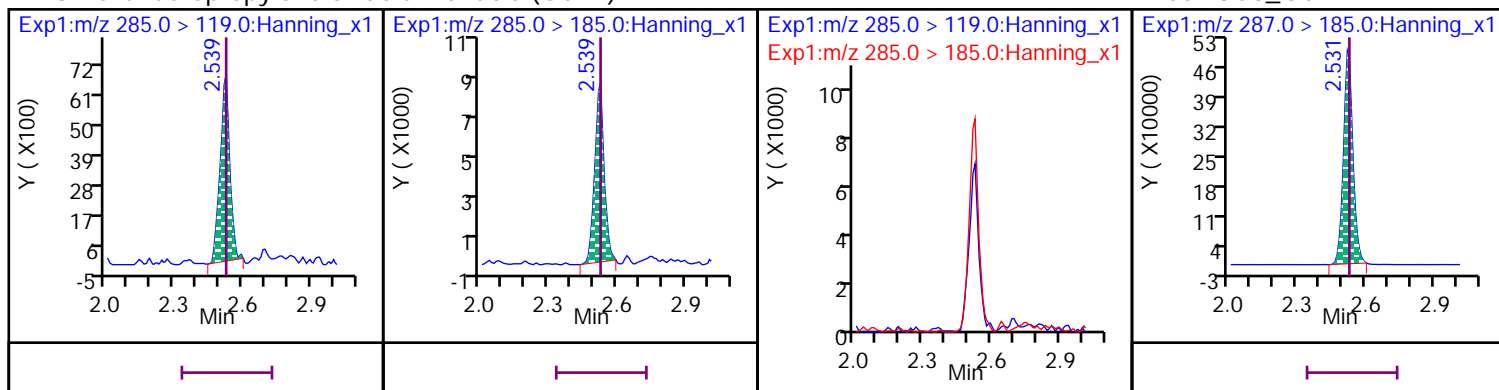
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



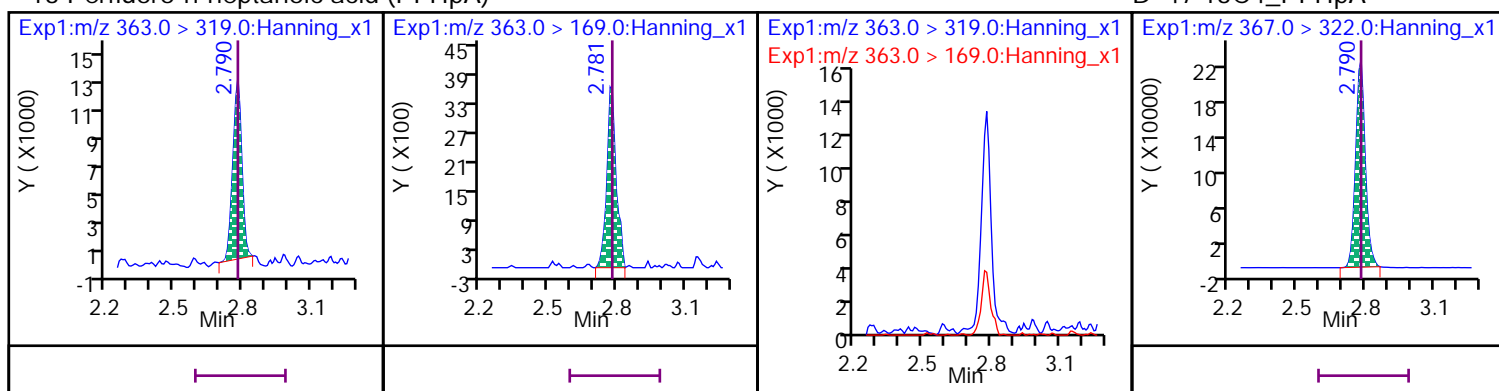
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



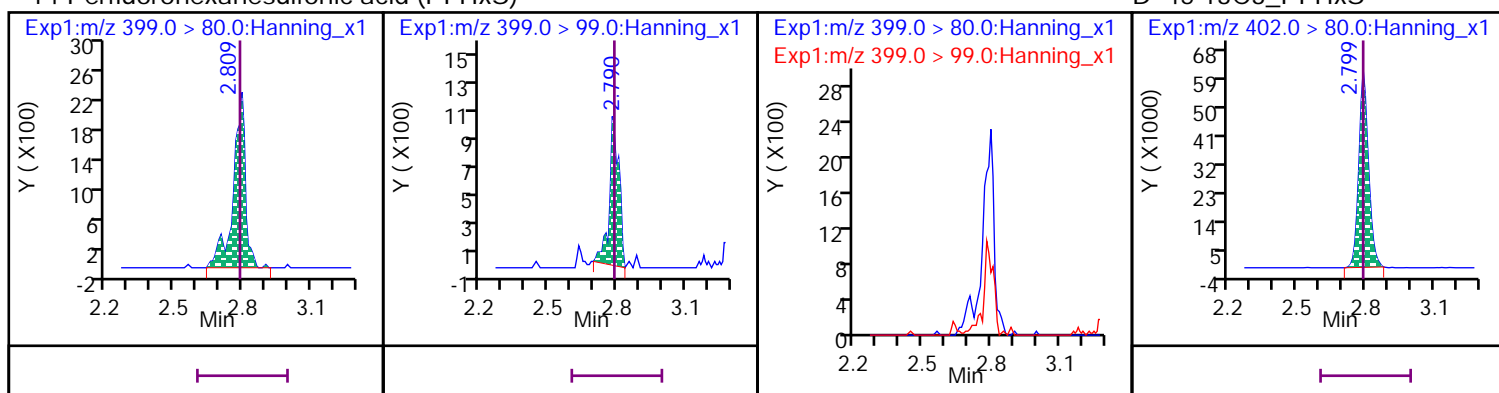
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



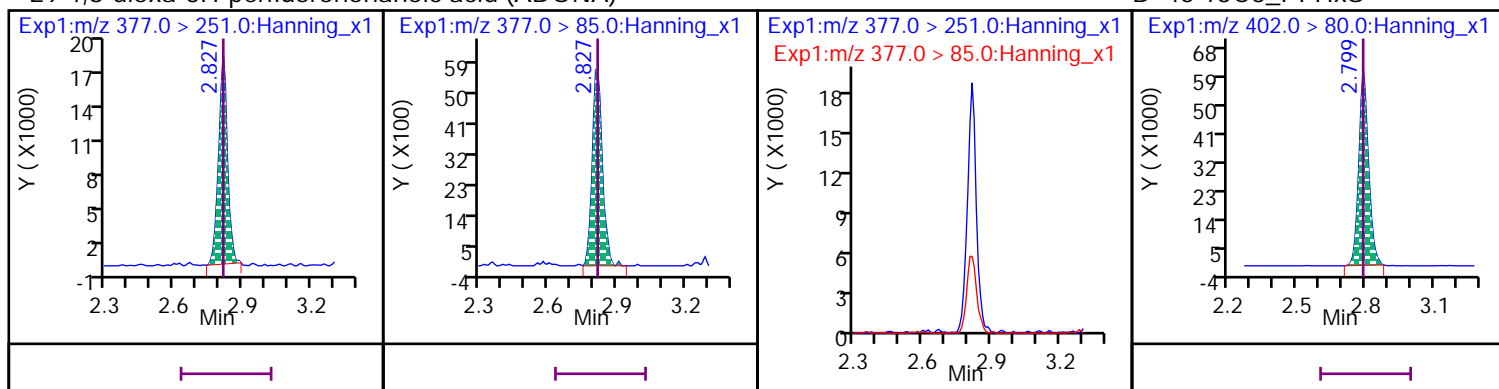
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



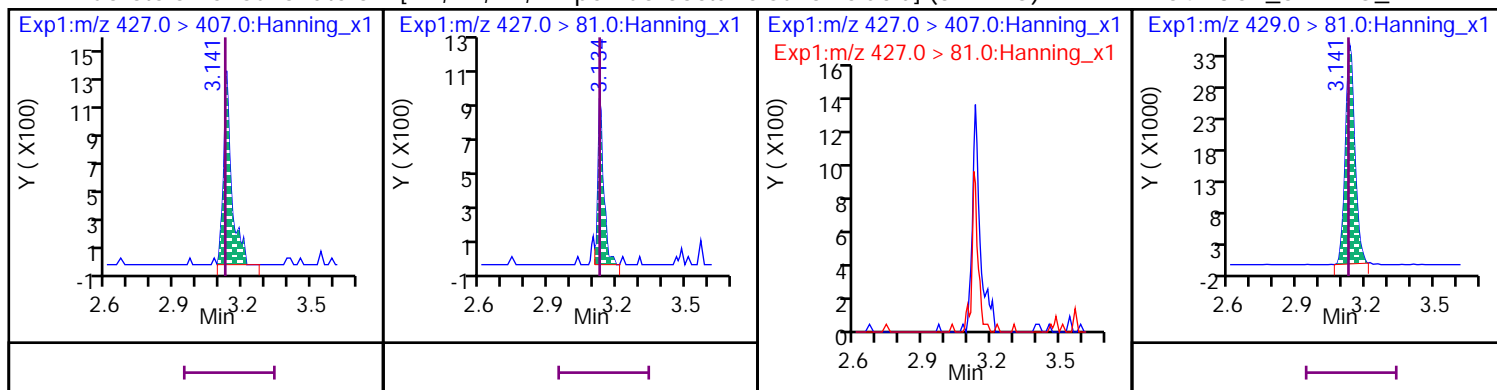
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



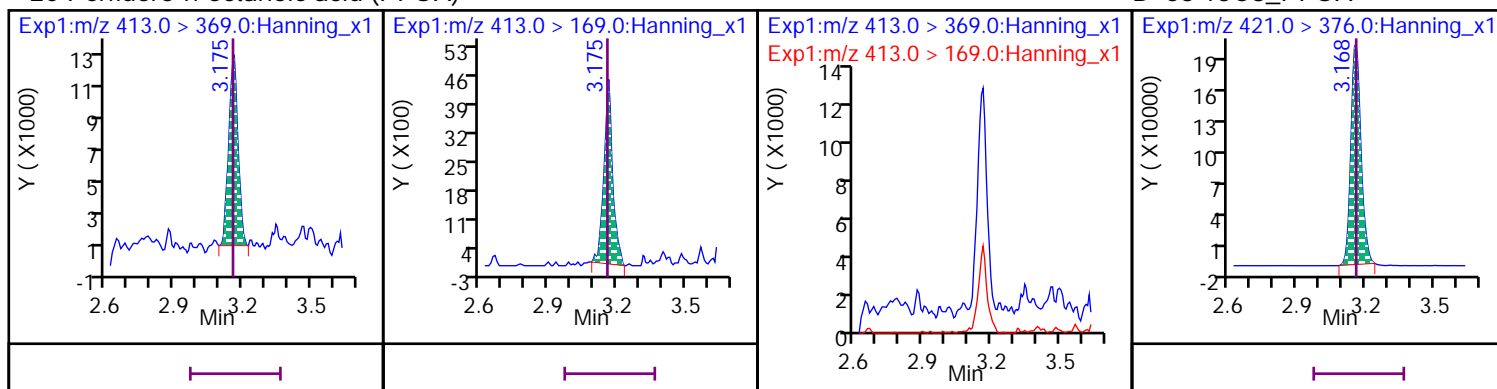
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



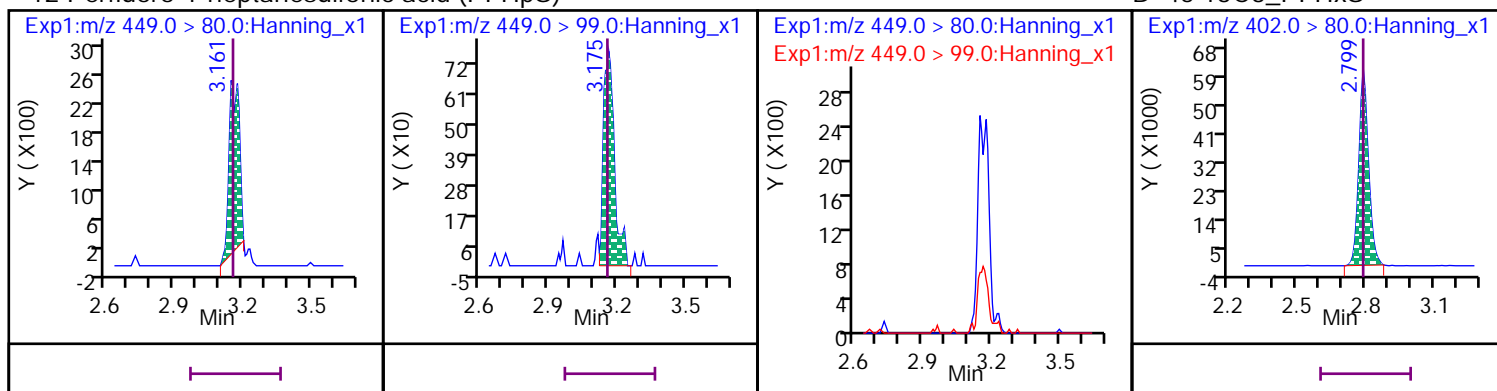
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



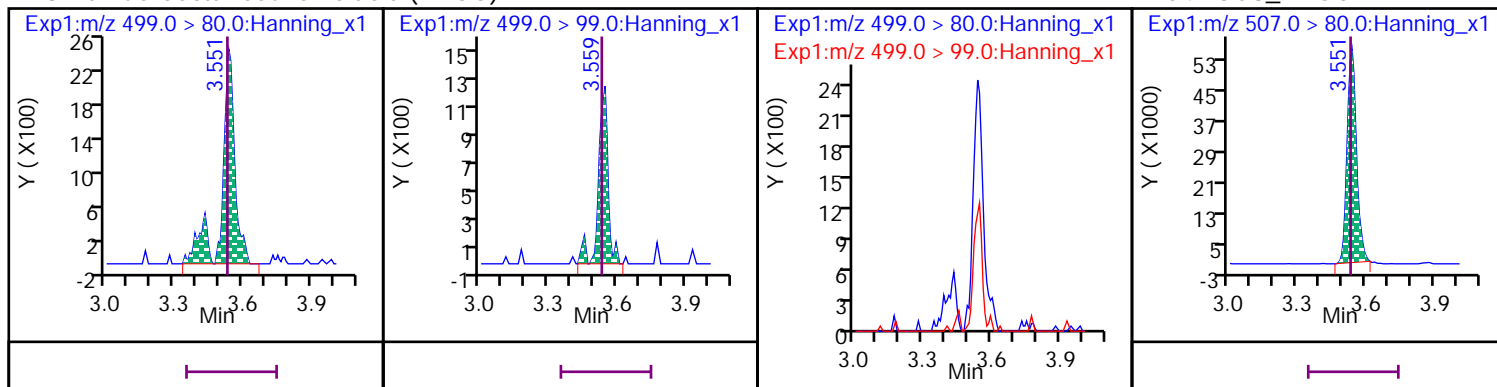
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



## 18 Perfluorooctanesulfonic acid (PFOS)

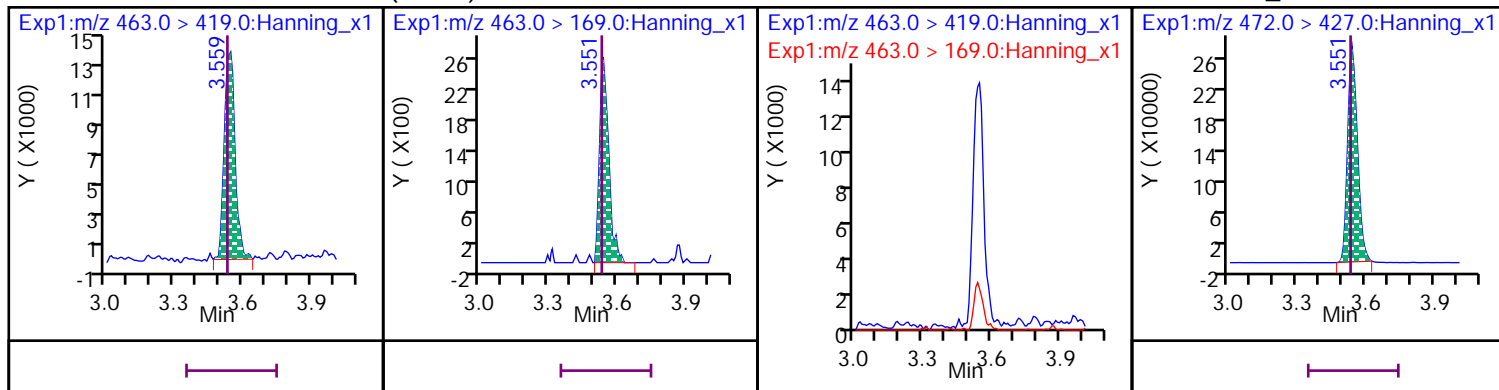
D 54 13C8\_PFOS





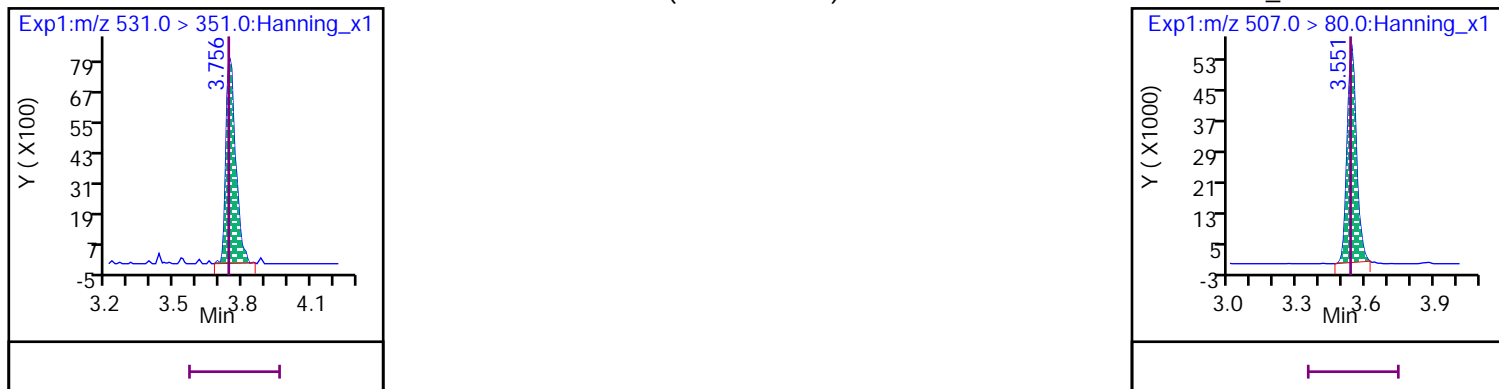
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



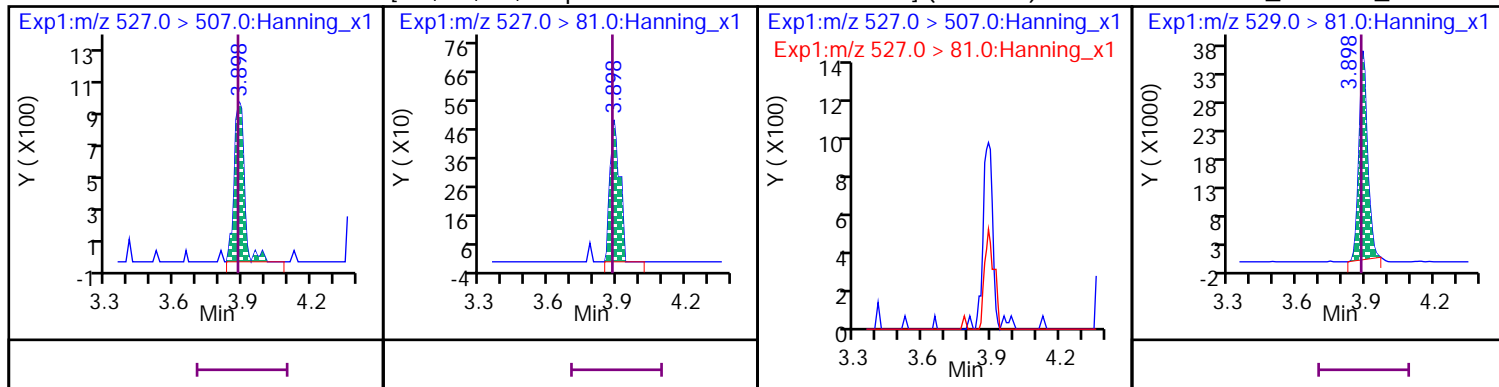
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



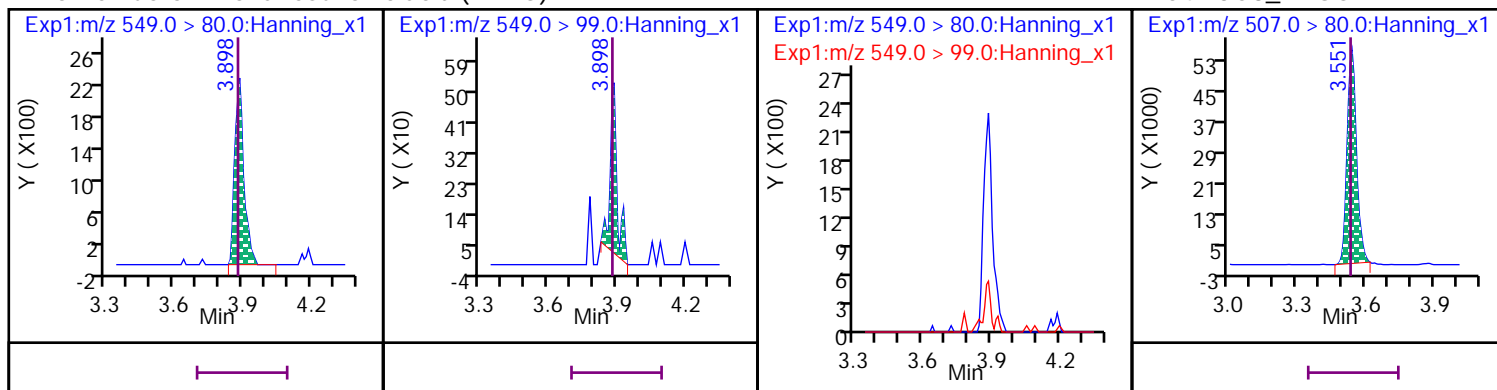
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



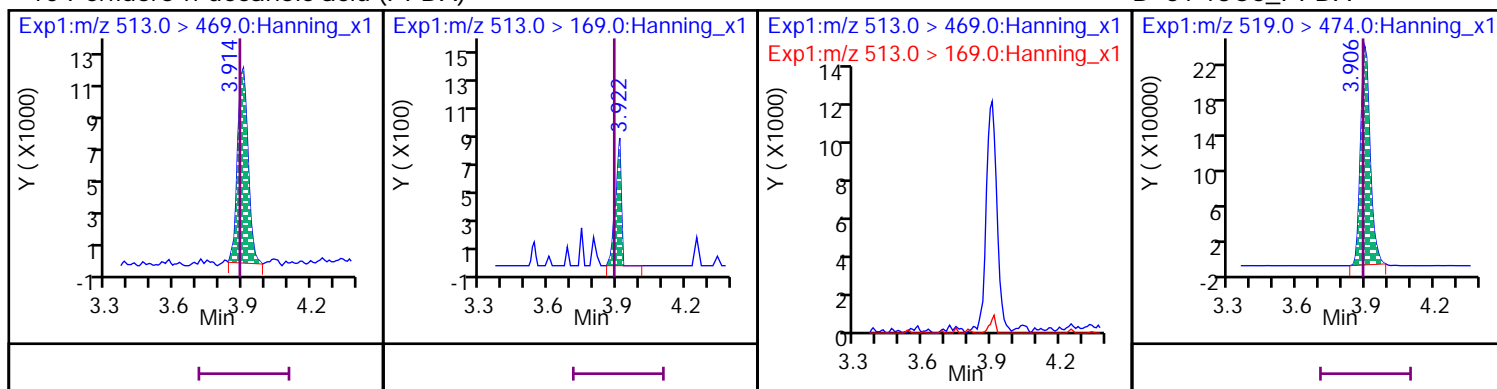
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



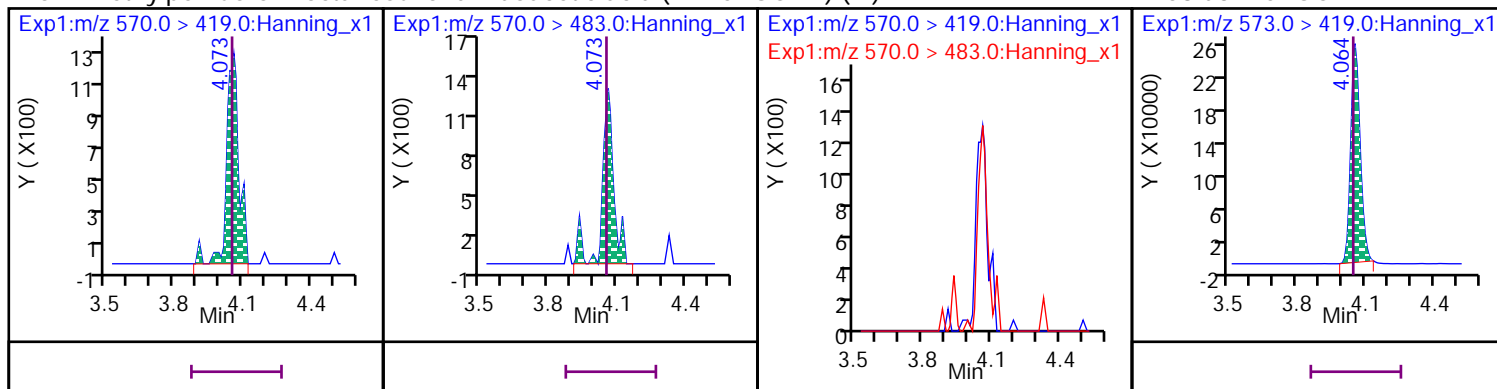
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



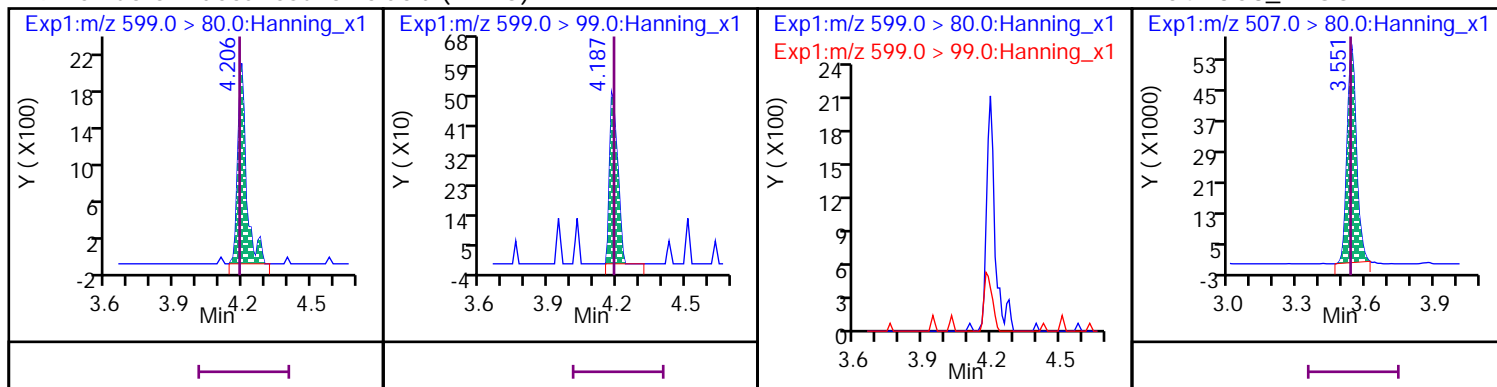
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



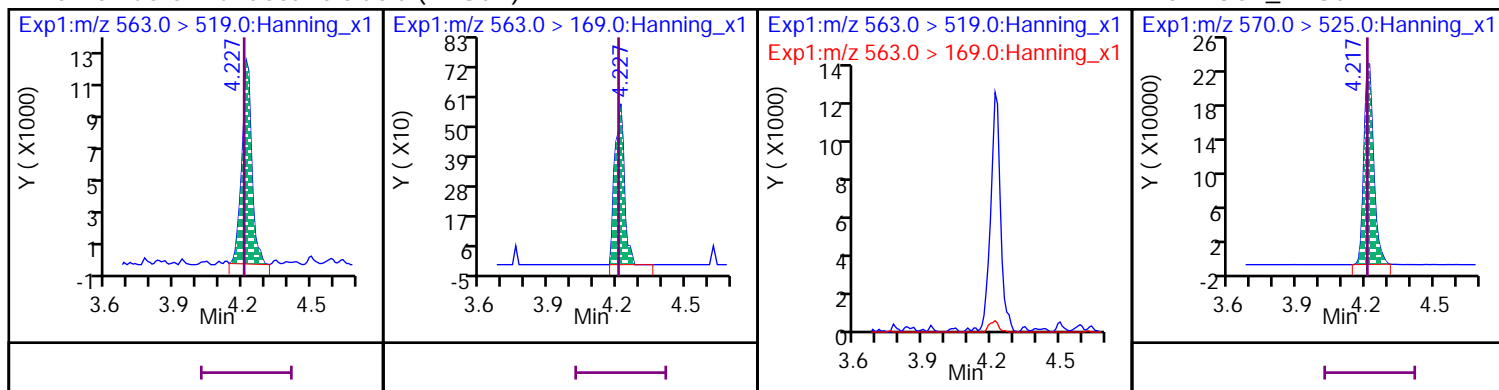
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



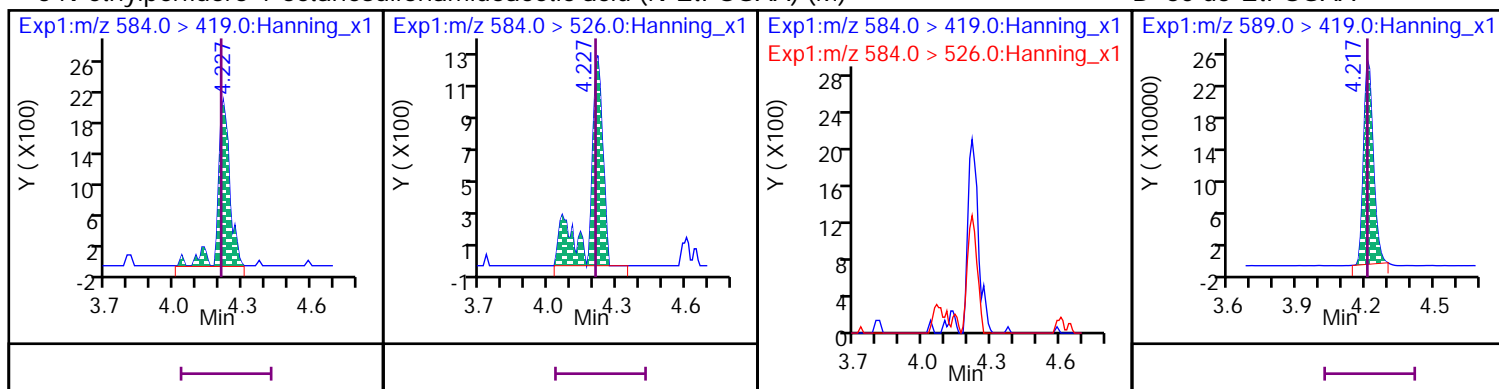
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



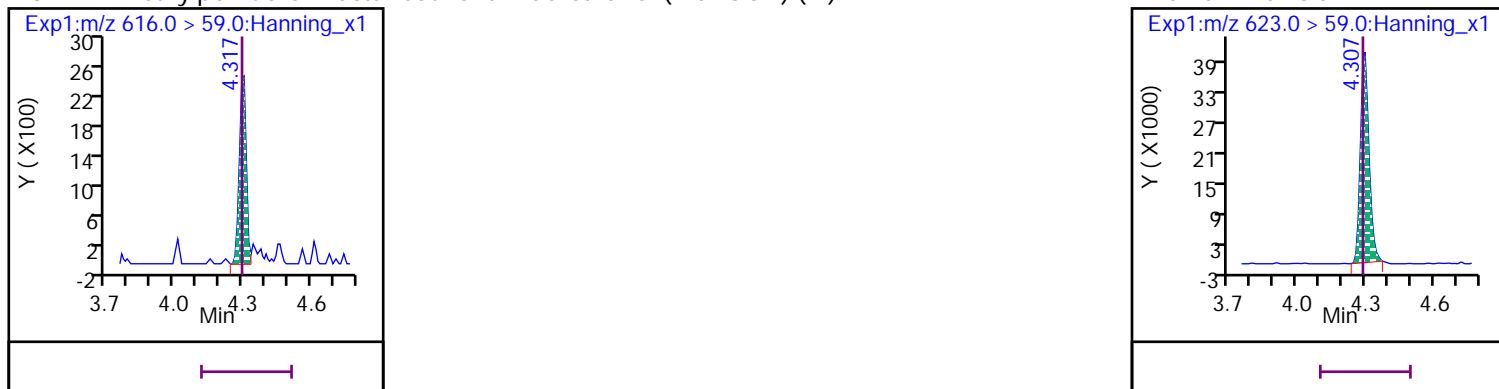
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



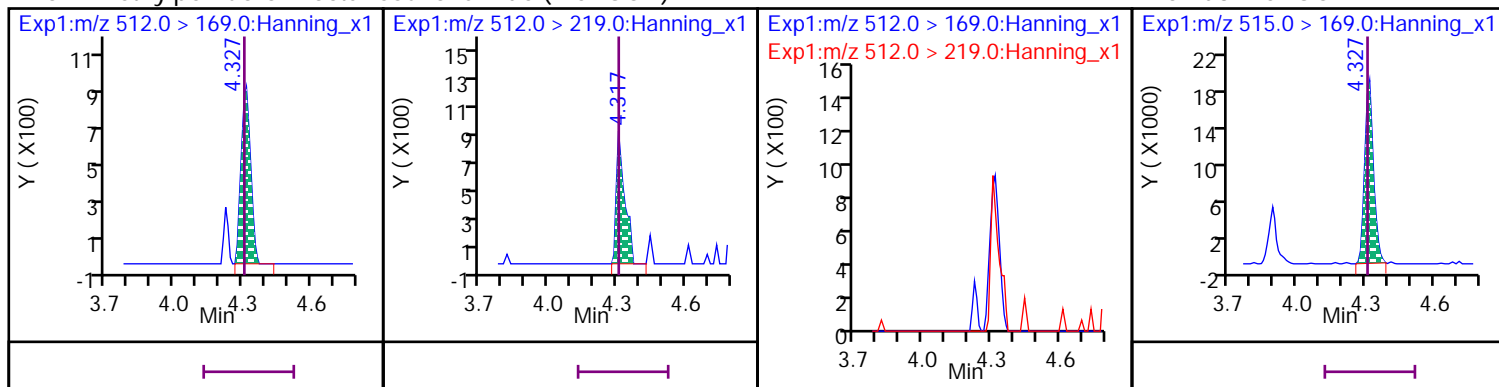
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (M)

D 61 d7-MeFOSE

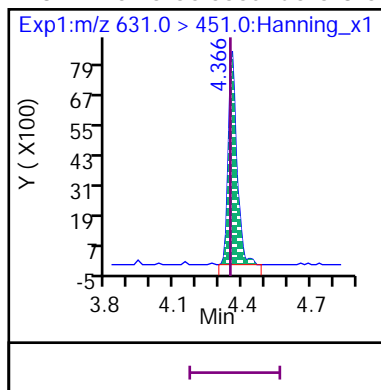


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

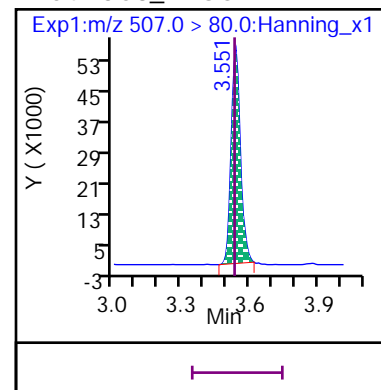
D 57 d3-MeFOSA



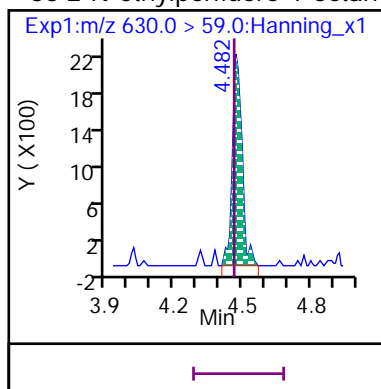
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



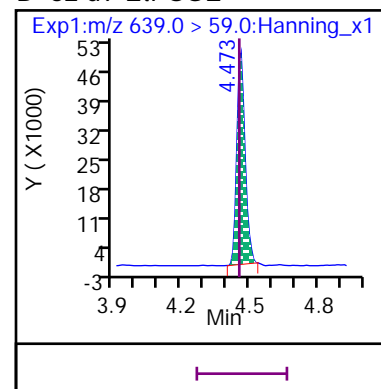
D 54 13C8\_PFOS



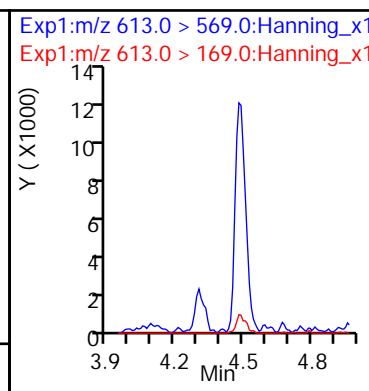
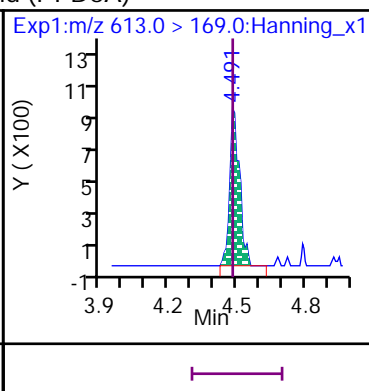
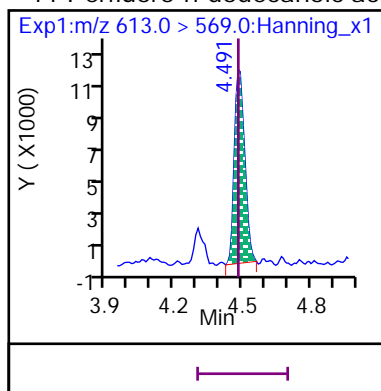
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



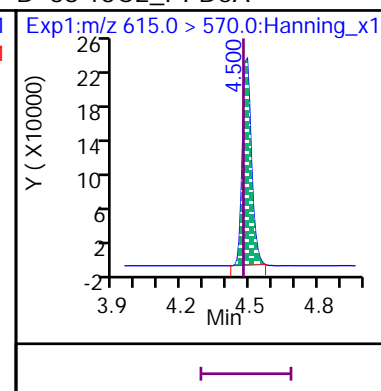
D 62 d9-EtFOSE



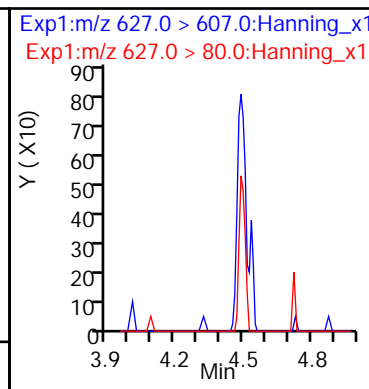
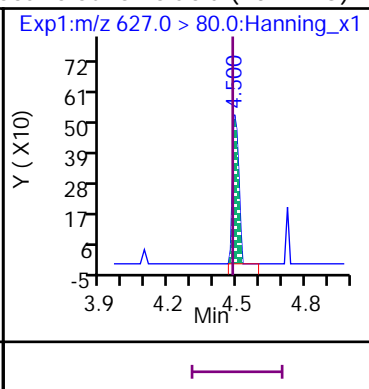
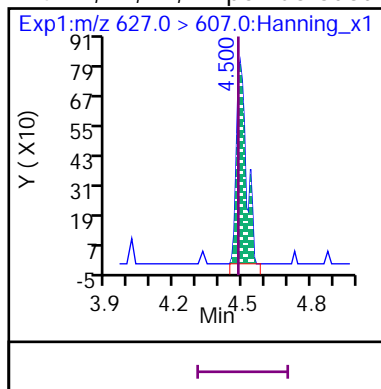
11 Perfluoro-n-dodecanoic acid (PFDoA)



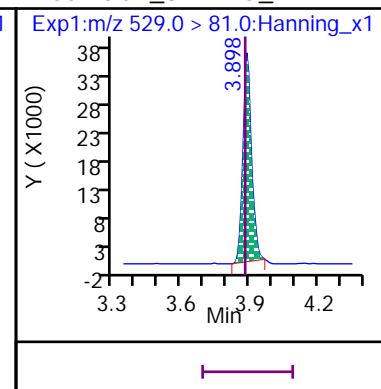
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

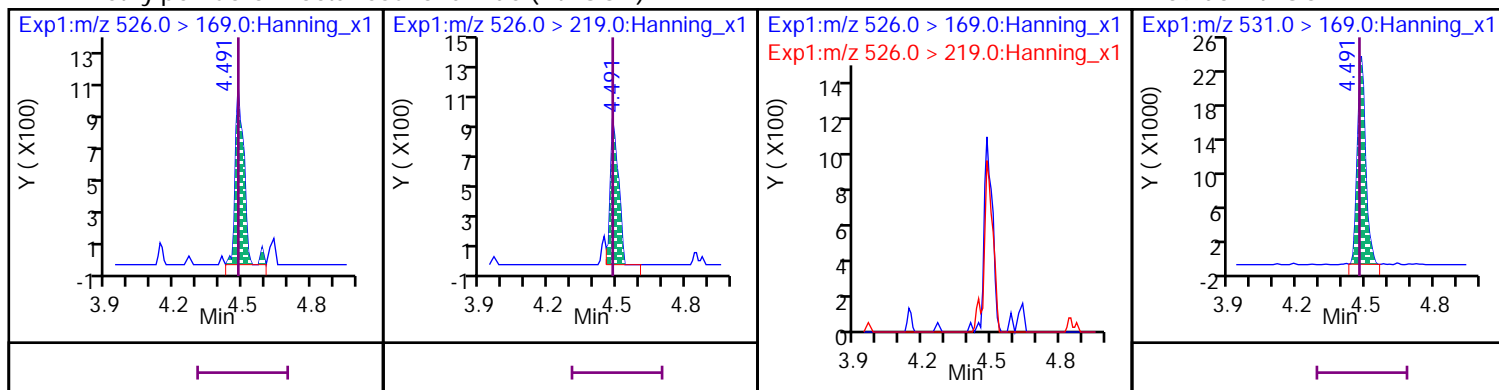


D 65 13C2\_8:2 FTS\_2



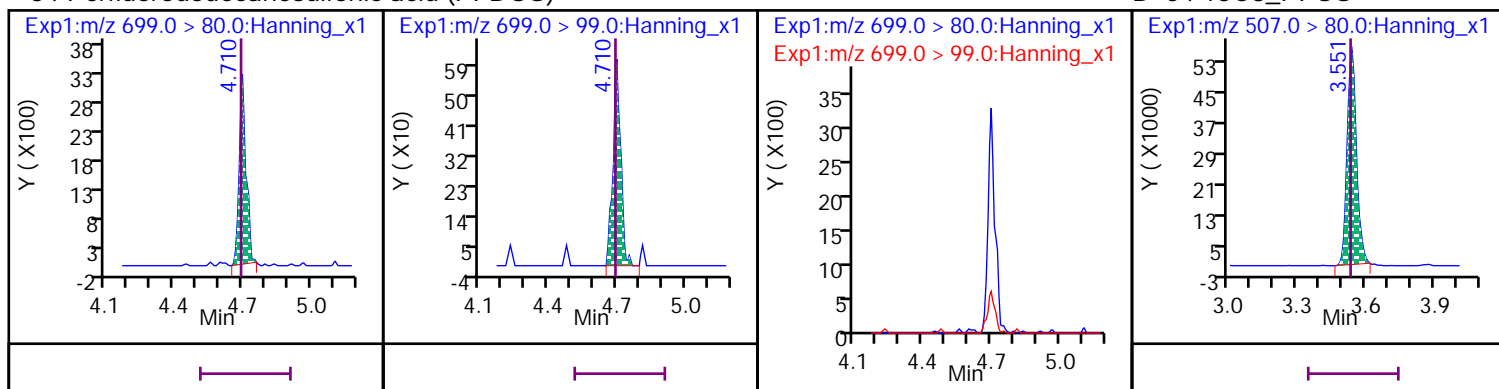
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



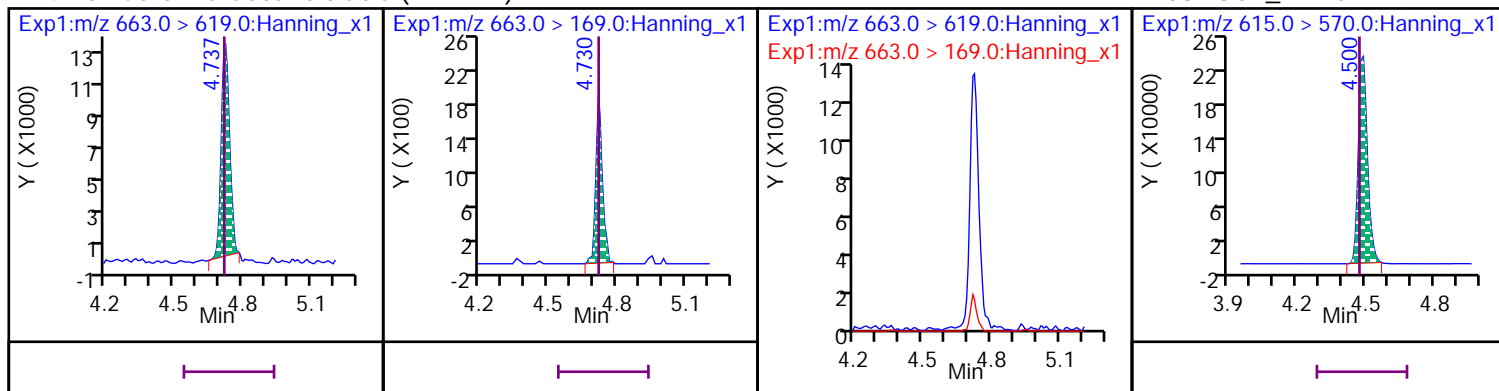
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



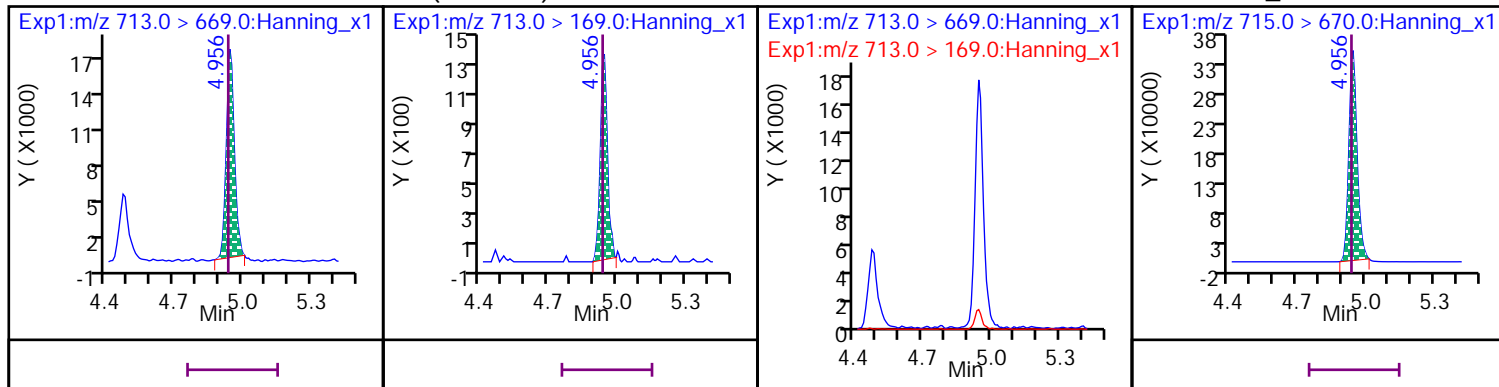
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



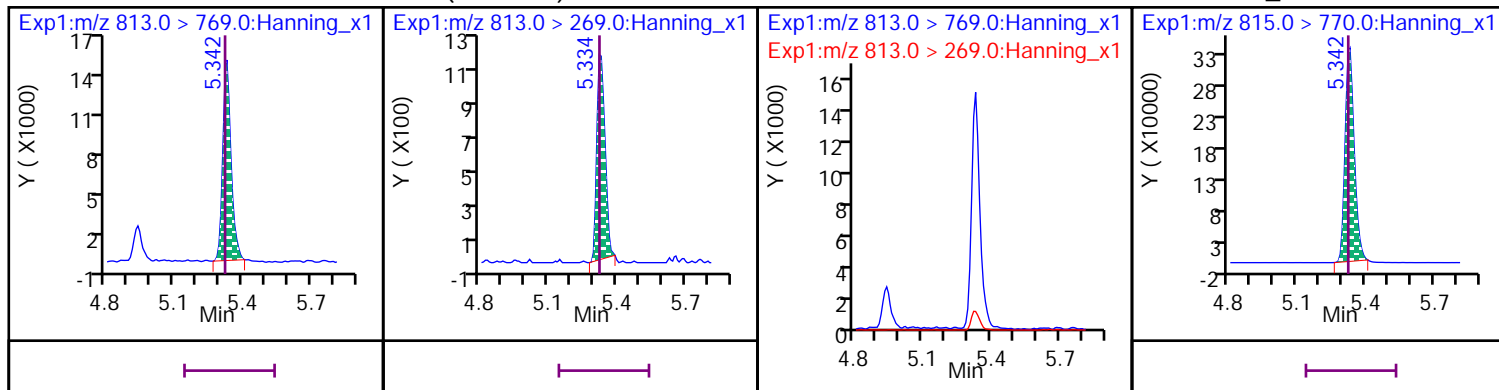
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



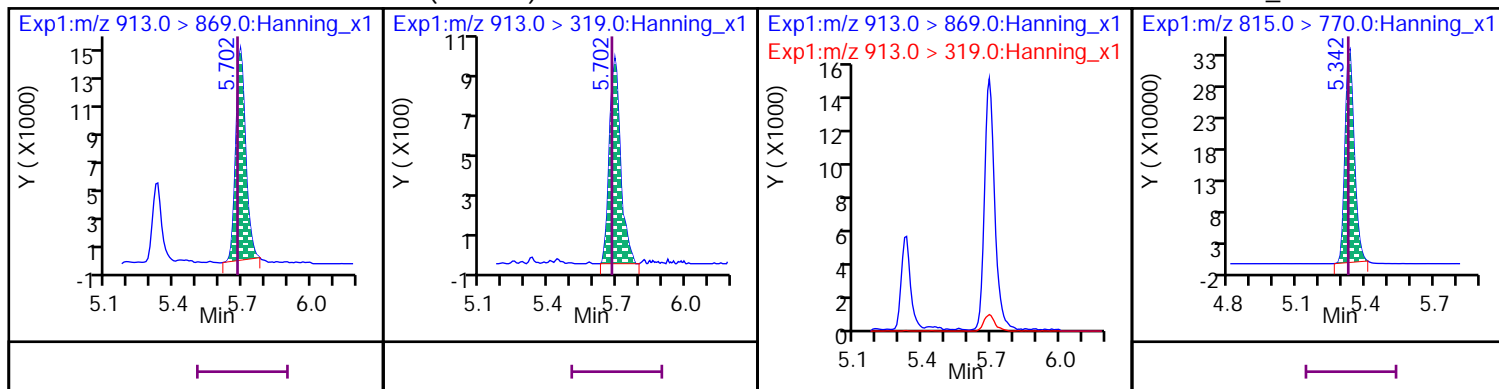
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

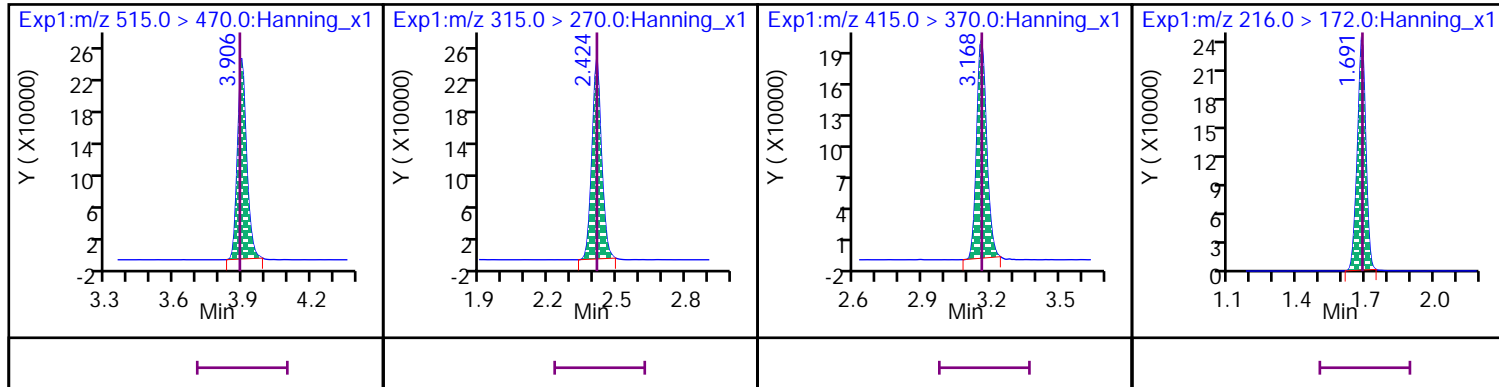


\* 37 13C2\_PFDA

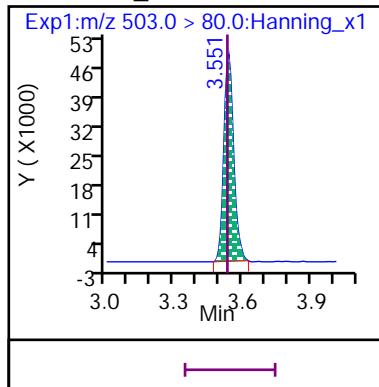
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

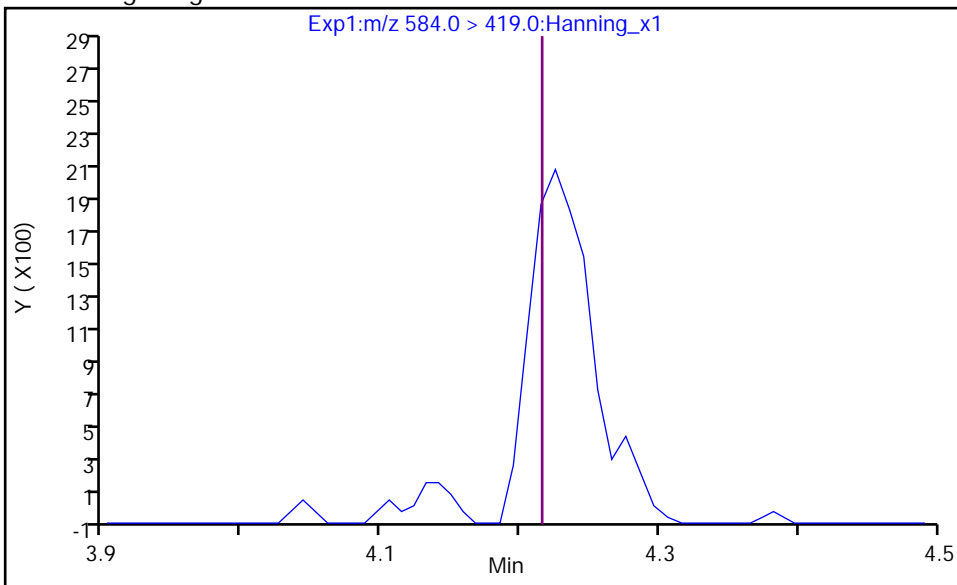
Dil. Factor: 1

Operator: Stephen E. Somerville

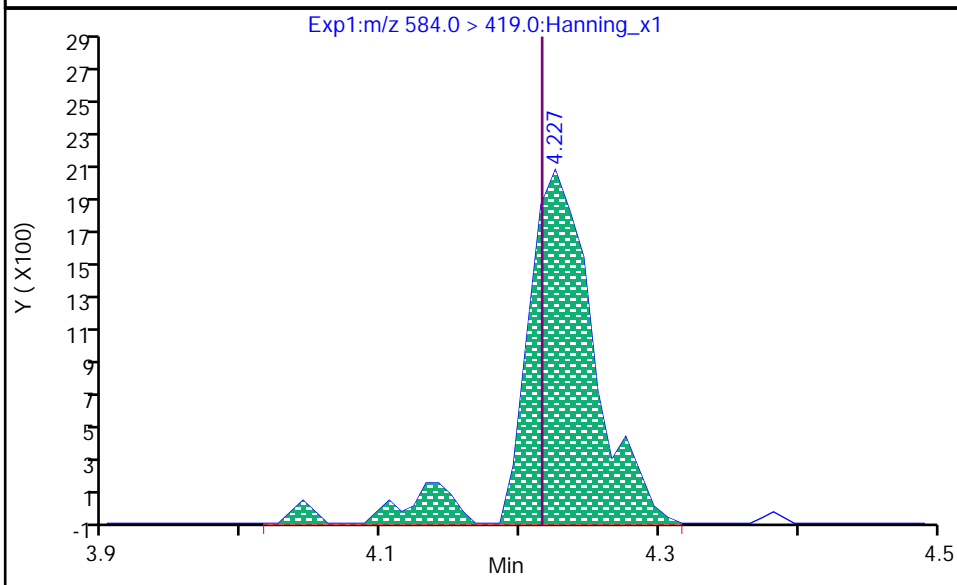
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.227  
Area: 7594  
Amount: 54.109  
Amount Units: ng/L



RT: 4.227  
Area: 7496  
Amount: 52.462  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:33

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

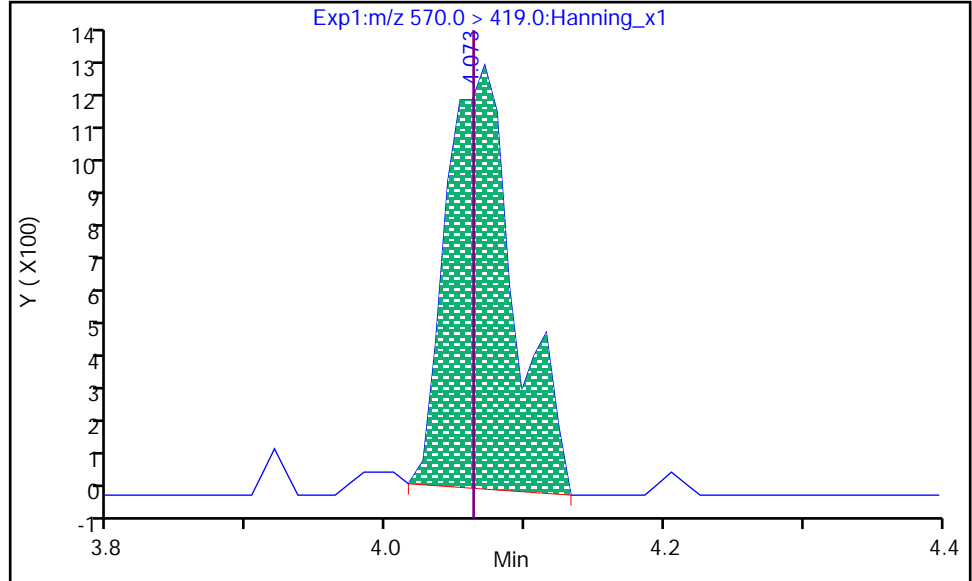
Dil. Factor: 1

Operator: Stephen E. Somerville

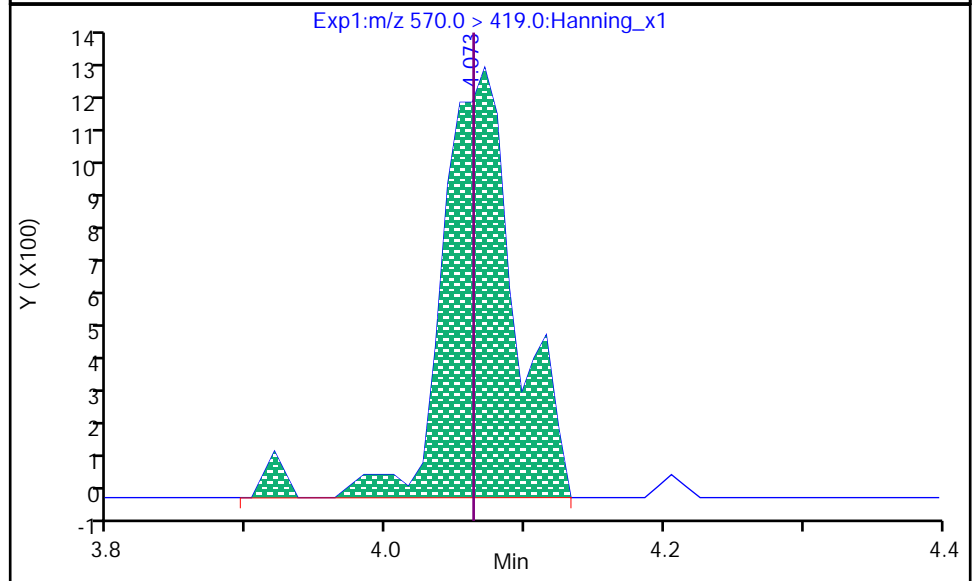
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.073  
Area: 4189  
Amount: 38.580  
Amount Units: ng/L

Processing Integration Results



RT: 4.073  
Area: 4603  
Amount: 41.395  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:01

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720006.d

Injection Date: 17-Dec-2020 12:22:20

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 50\_SVLC-1219

Sample Info: ICAL 50\_SVLC-1219

Dil. Factor: 1

Operator: Stephen E. Somerville

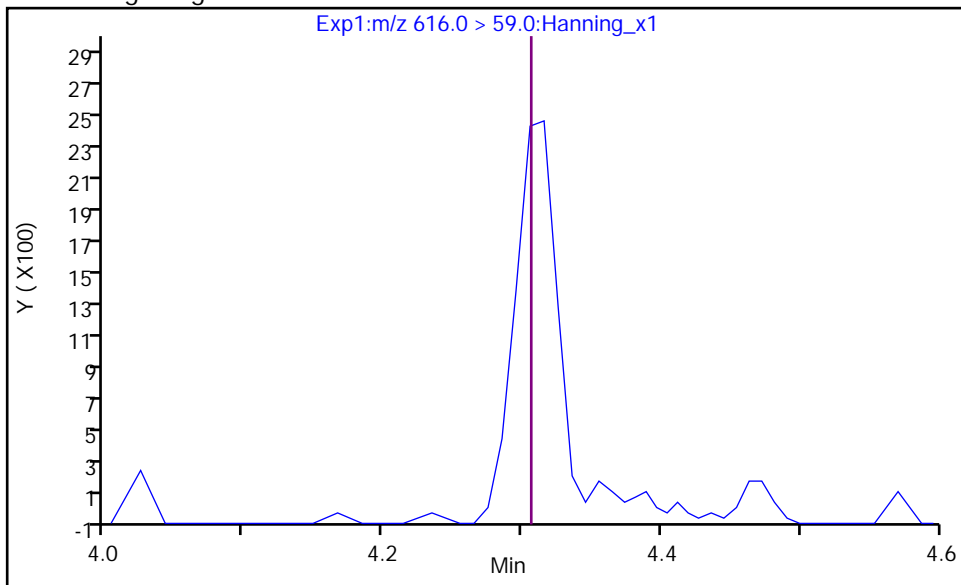
32 MeFOSE, CAS: 24448-09-7

Processing Integration Results

Not Detected

Expected RT: 4.308

RT Window: 4.117-4.517

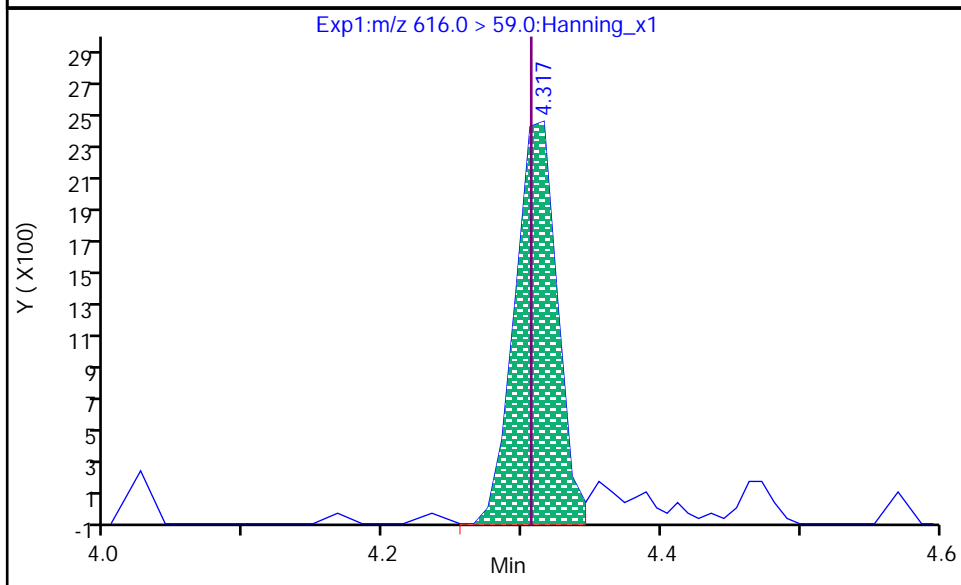


RT: 4.317

Area: 5201

Amount: 53.093

Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:15:27

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d  
 Injection Date: 17-Dec-2020 12:32:59 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 2 Auto Sampler: 2  
 Sample Info: ICAL 100\_SVLC-1220 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	694056	22	>100:1			1000.00	1000.73	94.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	73188	20	42:1			100.00	105.87		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	693821	17	>100:1			1000.00	1008.63	95.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	72456	15	>100:1			100.00	103.87		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	232321	16	>100:1			1000.00	1009.08	93.8	
<b>7 Perfluoro-1-butanefluorobutanoic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	24514	14	>100:1	Target = 3.50		88.400	89.495		
298.9 > 99	44	2.130	2.125		7283	15	47:1	3.36 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	18792	25	>100:1	Target = 3.10		93.800	93.248		
349 > 99	44	2.451	2.459		6650	26	30:1	2.82 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	121381	19	>100:1			5000.00	5014.02	96	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.398	2.388	1/0	4225	28	29:1	Target = 1.80		93.400	87.206		
327 > 81	63	2.380	2.388		3324	26	20:1	1.27 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	745193	19	>100:1			1000.00	1011.02	96.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	80701	20	>100:1	Target = 18.34		100.00	109.69		
313 > 119	49	2.425	2.423		4029	13	28:1	20.03 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1353983	20	>100:1			5000.00	5083.40	95.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	43113	25	>100:1	Target = 0.81		200.00	221.60		
285 > 185	66	2.532	2.539		49305	18	>100:1	0.87 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.791	2.790	1	592578	20	>100:1			1000.00	976.81	96.2	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/-1	65275	19	98:1	Target = 3.70		100.00	106.20		
363 > 169	47	2.791	2.790		16992	19	>100:1	3.84 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	180234	20				1000.00	1052.59	101	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	19133	25	89:1	Target = 3.21	0.07	91.000	100.12		
399 > 99	45	2.800	2.799		5512	22	55:1	3.47 (1.60-4.81)	0.07				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	111372	21	>100:1	Target = 2.97		94.200	97.330		
377 > 85	45	2.828	2.827		35923	20	>100:1	3.10 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.183	3.169	1/0	17169	24		Target = 3.08		95.200	104.86		
449 > 99	45	3.169	3.169		5002	42	25:1	3.43 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	91343	20	>100:1			5000.00	4743.02	87.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.135	1/0	4420	19	58:1	Target = 1.80		94.800	91.265		
427 > 81	64	3.142	3.135		2609	24	16:1	1.69 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	1	628251	23	>100:1			1000.00	1061.48	95.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/0	70348	23	39:1	Target = 2.87		100.00	109.84		
413 > 169	53	3.169	3.169		22895	23	>100:1	3.07 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	150912	20	>100:1			1000.00	1006.56	97.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.553	3.545	1/0	15498	36	42:1	Target = 3.84	0.27	92.800	86.664		
499 > 99	54	3.553	3.545		5273	42	69:1	2.93 (1.92-5.76)	0.09				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.758	3.750	1/0	47230	22	>100:1			93.200	92.965		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.899	3.891	1/0	11308	23		Target = 3.07		96.000	97.915		
549 > 99	54	3.891	3.891		4483	13	28:1	2.52 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	10639	14		Target = 3.03		96.400	97.141		
599 > 99	54	4.207	4.198		3353	17	19:1	3.17 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	43949	18	>100:1			94.200	102.55		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.711	4.704	1/0	11578	14	>100:1	Target = 3.33		96.800	95.562		
699 > 99	54	4.704	4.704		2911	26	59:1	3.97 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	740918	20	>100:1			1000.00	986.62	93.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	82559	26	>100:1	Target = 6.16		100.00	111.42		
463 > 169	56	3.545	3.545		13502	25	63:1	6.11 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.874	3.866	1	312712	19	>100:1			1000.00	1010.17	94.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	31936	22	>100:1			100.00	103.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.899	3.891	1	98104	20				5000.00	5288.59	105	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	3801	12	24:1	Target = 1.95		95.800	81.169		
527 > 81	65	3.883	3.891		1860	12	7.5:1	2.04 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	4028	14		Target = 3.14		96.400	88.837		
627 > 80	65	4.492	4.492		1249	15		3.22 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.907	3.899	1	671396	18	>100:1			1000.00	1012.16	96.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	64085	20	60:1	Target = 15.94		100.00	97.141		
513 > 169	51	3.899	3.899		4010	18	25:1	15.98 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	680663	18	>100:1			5000.00	4742.00	89.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.074	4.065	1/0	11651	30	73:1	Target = 1.33	0.17	100.00	111.42		M
570 > 483	58	4.065	4.065		8693	35		1.34 (0.66-1.99)	0.34				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	678730	18	>100:1			5000.00	5110.35	91.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	15290	30	96:1	Target = 1.58	0.08	100.00	113.14		M
584 > 526	60	4.238	4.217		10149	39		1.50 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	670093	17	>100:1			1000.00	1060.15	98.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	62546	18	>100:1	Target = 15.50		100.00	99.310		
563 > 169	52	4.218	4.217		4960	19	26:1	12.61 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.308	4.298	1	100349	15	>100:1			1000.00	927.37	85.6	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	11964	22	70:1			100.00	126.89		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	50885	15	>100:1			1000.00	961.60	92.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	7246	19		Target = 1.12		100.00	126.22		
512 > 219	57	4.338	4.318		5178	13	19:1	1.39 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	123934	22	>100:1			1000.00	988.35	102	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.483	4.474	1/0	10908	21	88:1			100.00	98.929		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	608304	18	>100:1			1000.00	1004.93	93.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	66346	19	38:1	Target = 10.85		100.00	107.70		
613 > 169	38	4.492	4.492		6991	27	43:1	9.49 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	62584	20	>100:1	Target = 8.37		100.00	104.46		
663 > 169	38	4.731	4.731		7379	18	97:1	8.48 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.492	4.483	1	45887	16	>100:1			1000.00	934.67	89.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	5945	17	59:1	Target = 1.03		100.00	118.59		
526 > 219	59	4.483	4.492		6140	19	42:1	0.96 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	850556	19	>100:1			1000.00	1009.63	95.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	78152	21	12:1	Target = 12.11		100.00	106.05		
713 > 169	42	4.948	4.948		6329	19	49:1	12.34 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.335	5.334	1	908734	19	>100:1			1000.00	1002.84	99.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.335	5.334	1/0	65729	20	17:1	Target = 11.48		100.00	110.70		
813 > 269	40	5.335	5.334		5150	13	>100:1	12.76 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	84566	24	9.1:1	Target = 13.88		100.00	105.13		
913 > 319	40	5.696	5.689		5692	22	>100:1	14.85 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.907	3.899	1	682347	19	>100:1					94	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	736017	19	>100:1					97.8	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	1	627818	23	>100:1					97.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	654143	22	>100:1					98.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.553	3.545	1	165000	20	>100:1					102	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

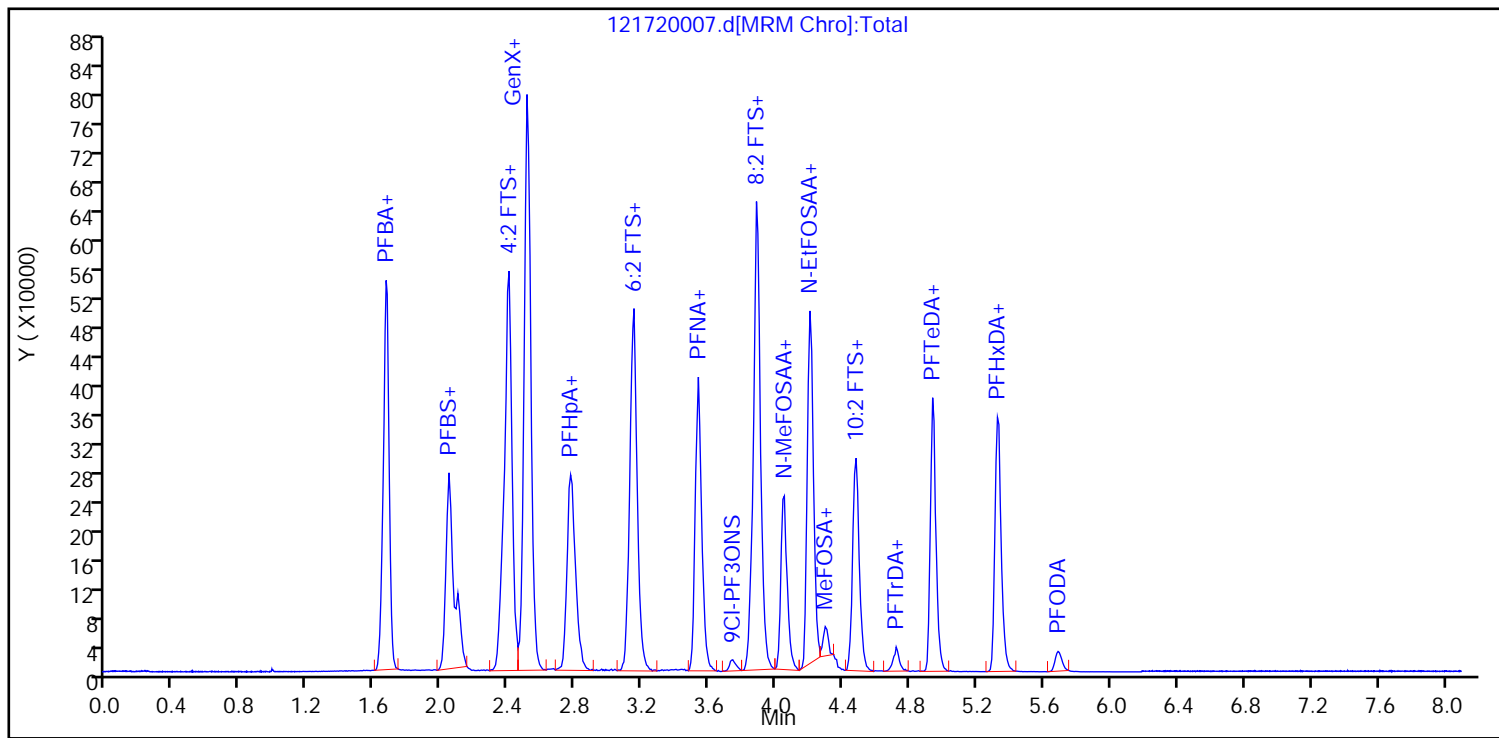
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Lab ID: ICAL 100\_SVLC-1220

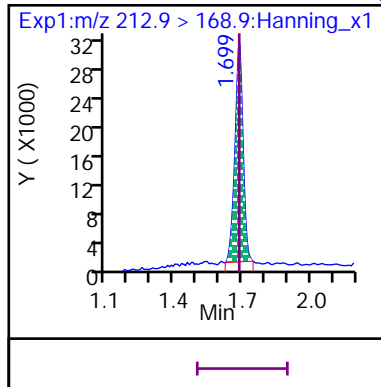
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Dil. Factor: 1

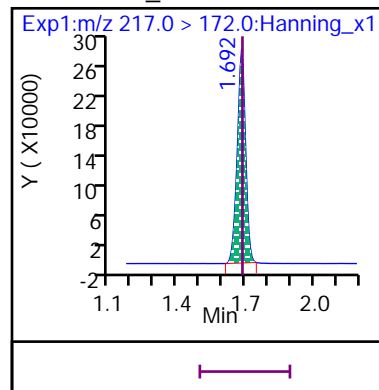
Operator: Stephen E. Somerville



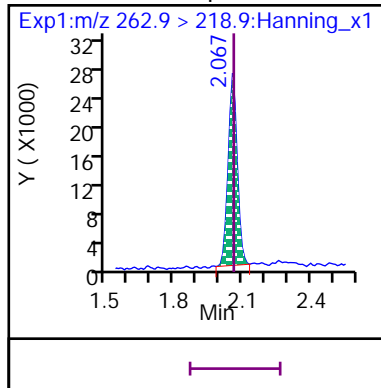
8 Perfluoro-n-butanoic acid (PFBA)



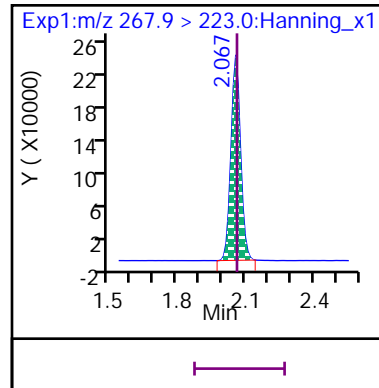
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

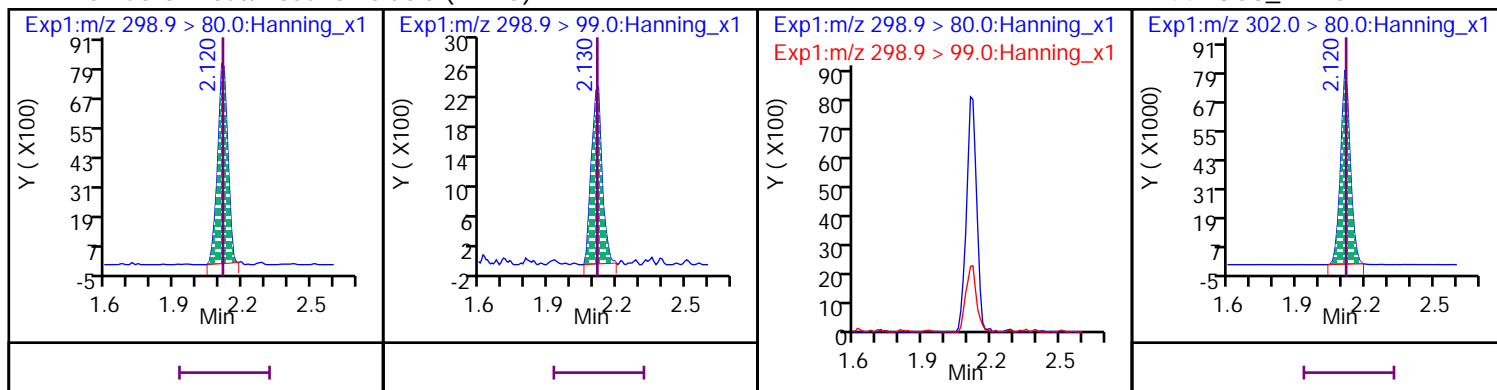


D 50 13C5\_PFPeA



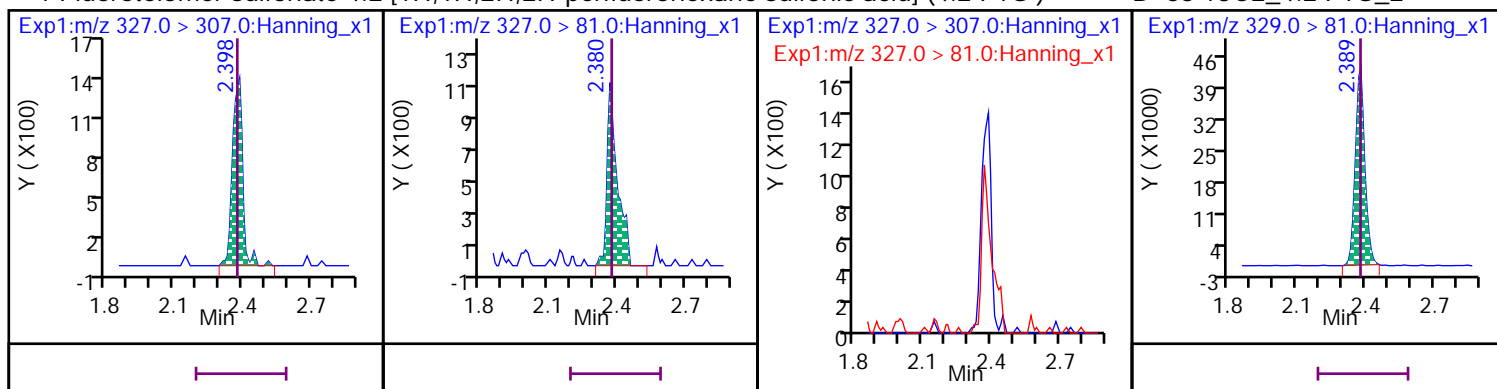
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



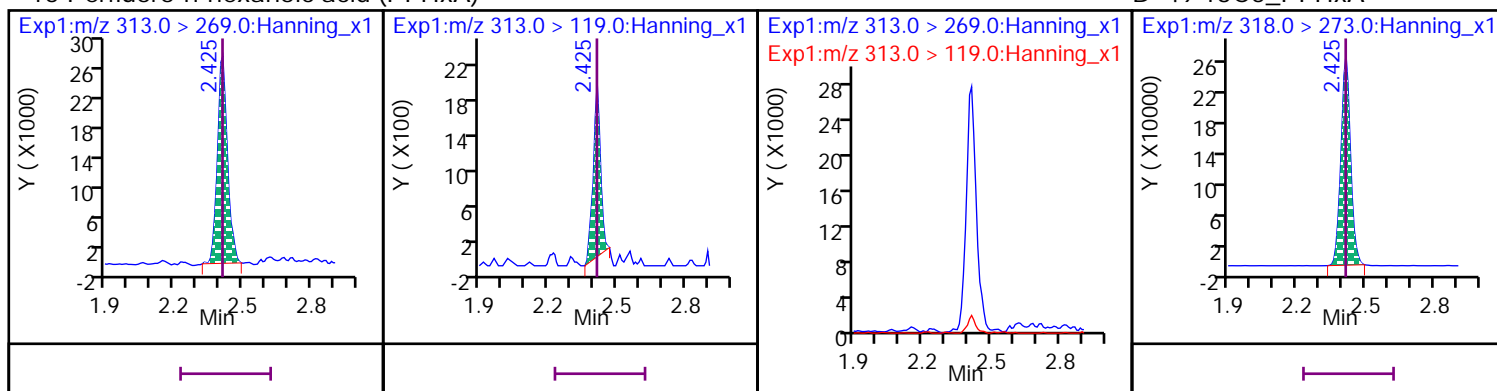
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



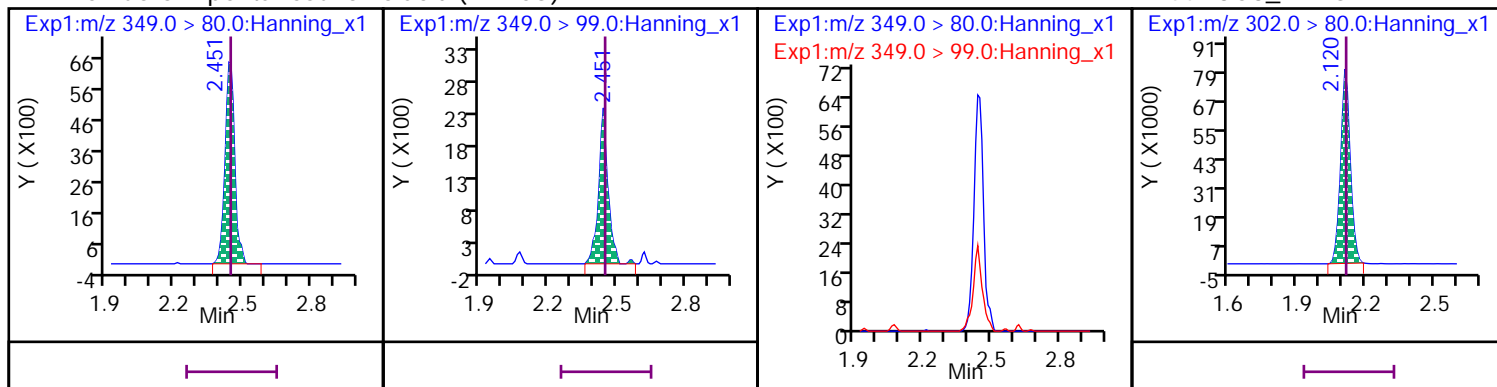
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



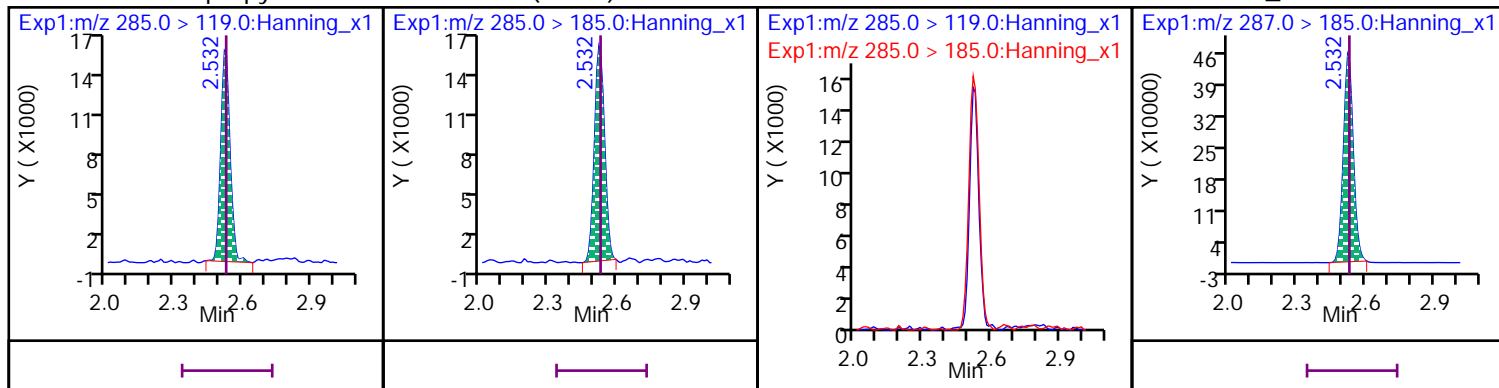
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



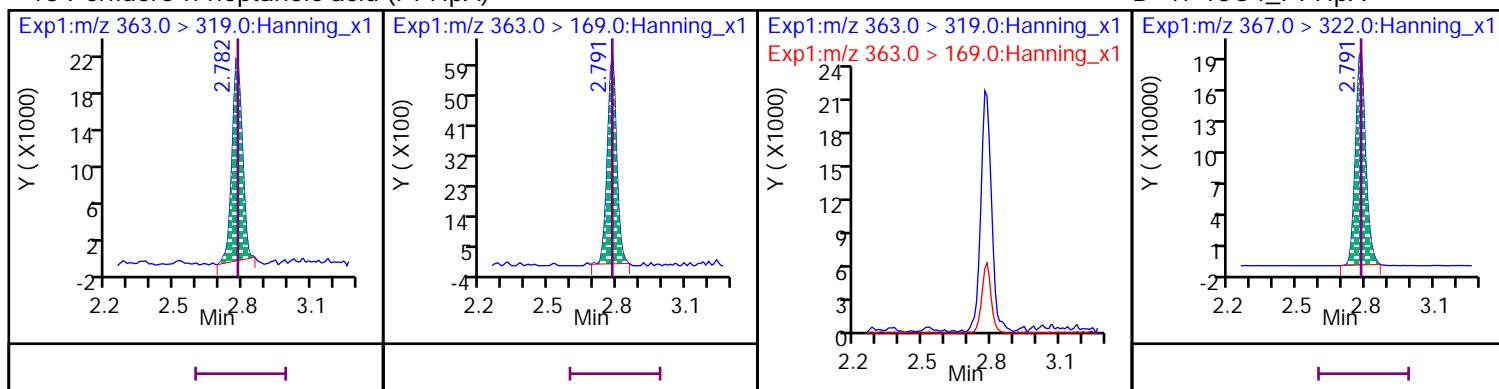
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



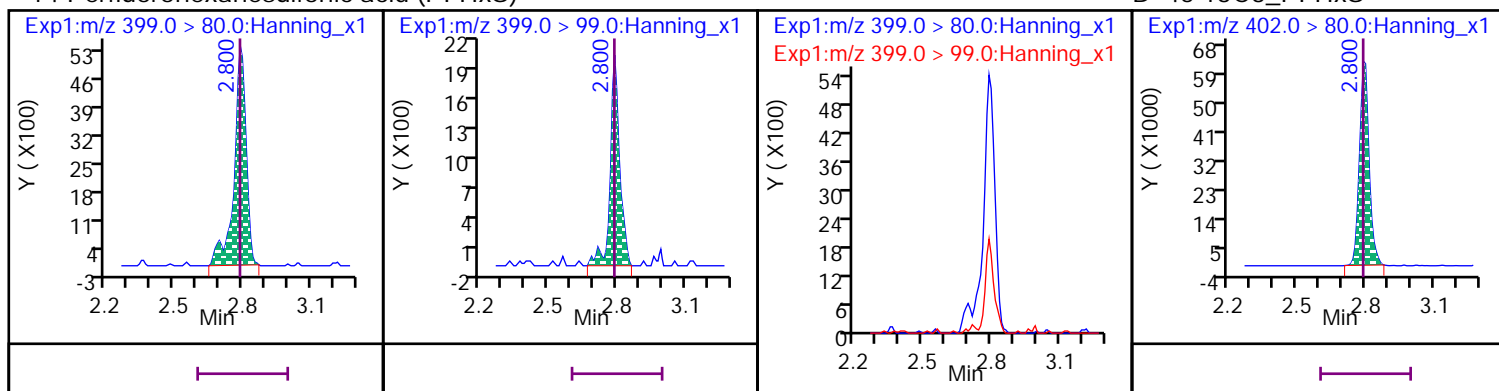
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



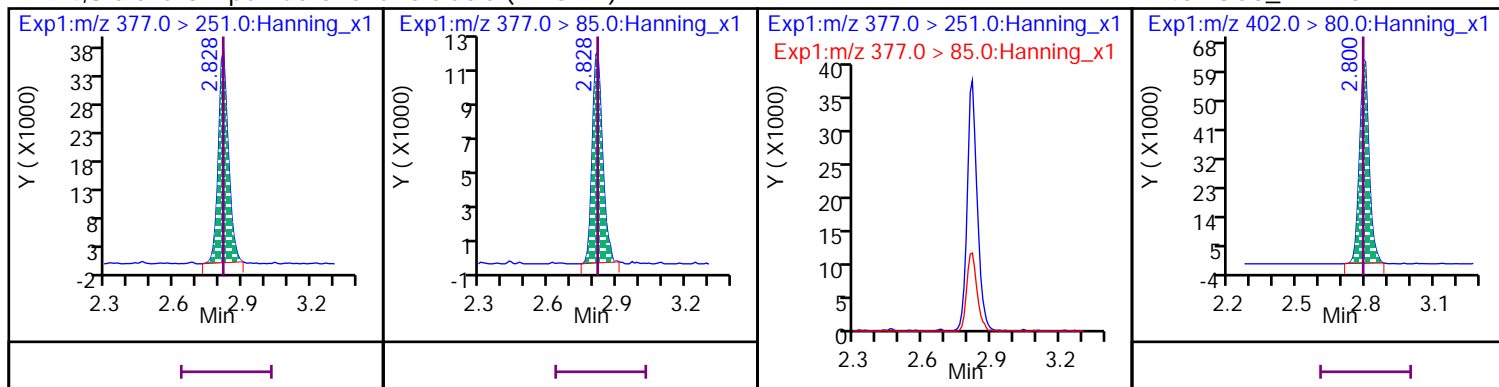
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

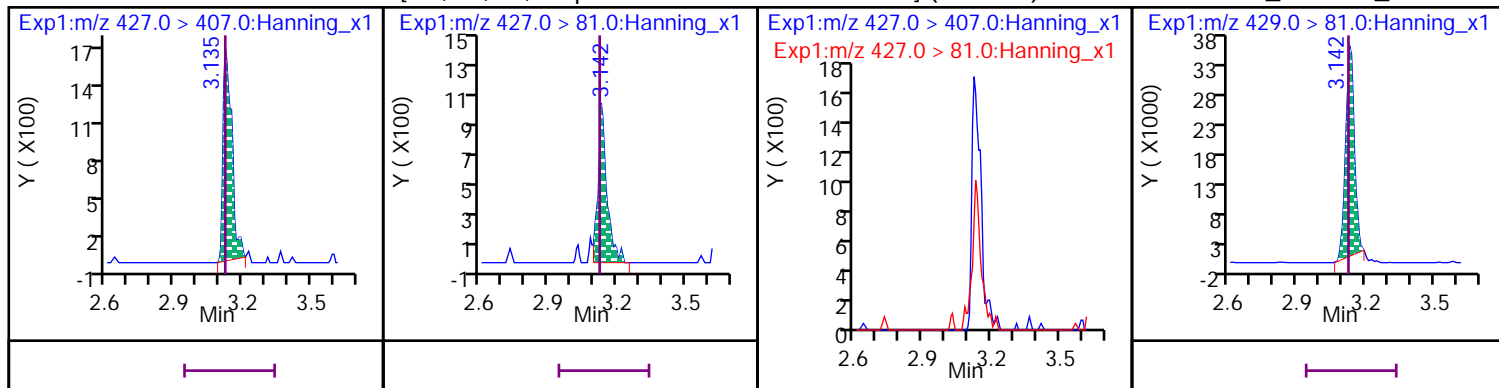
D 45 13C3\_PFHxS





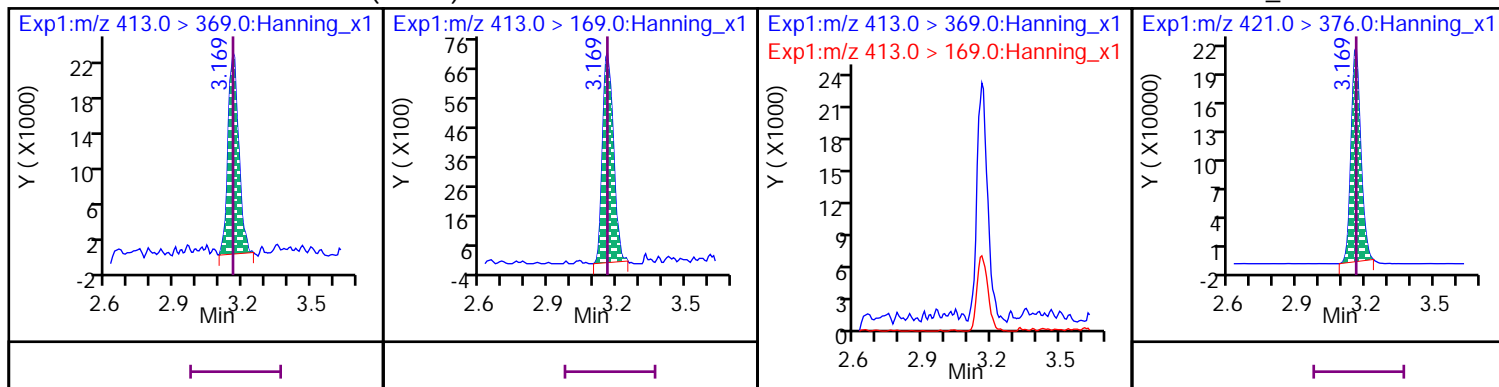
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



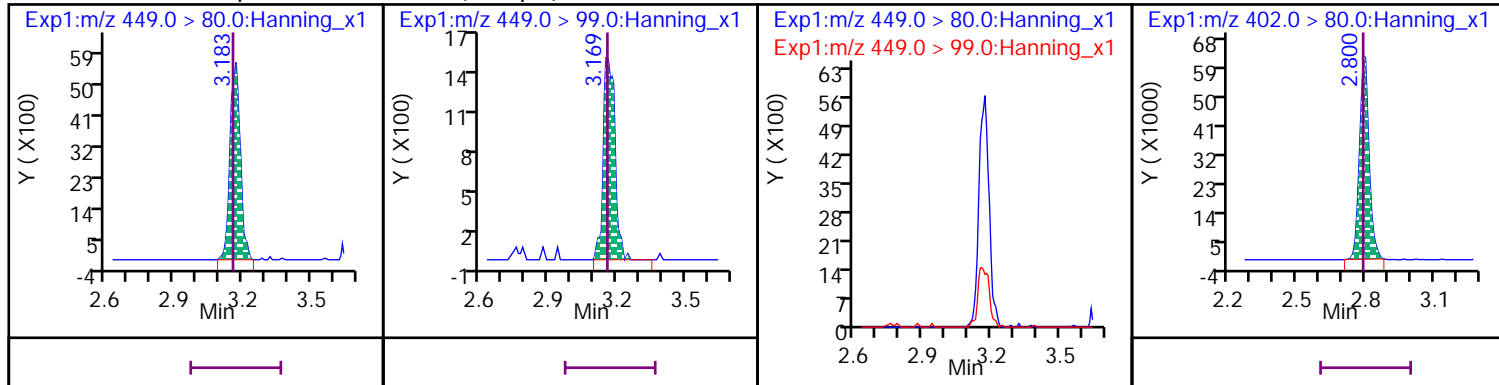
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



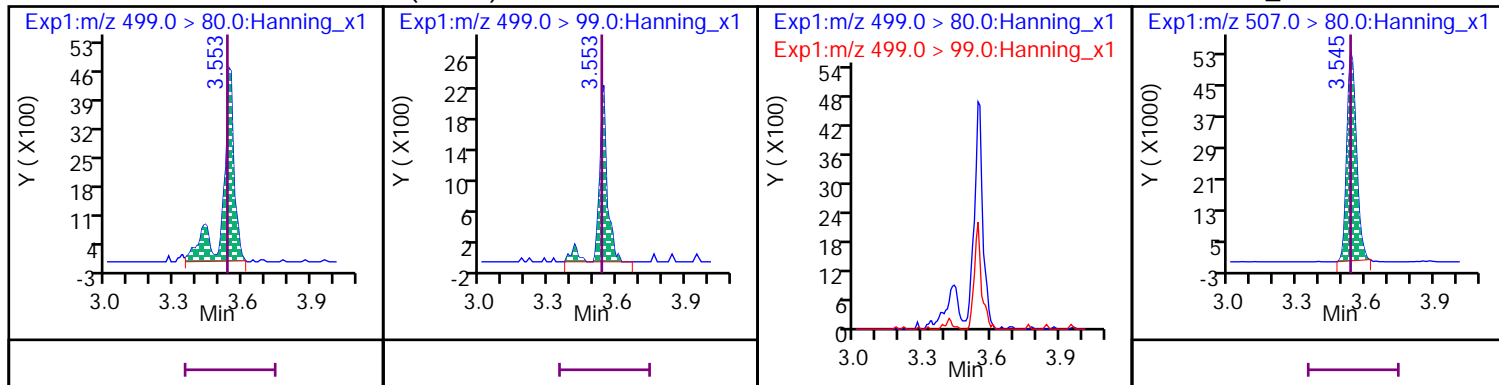
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



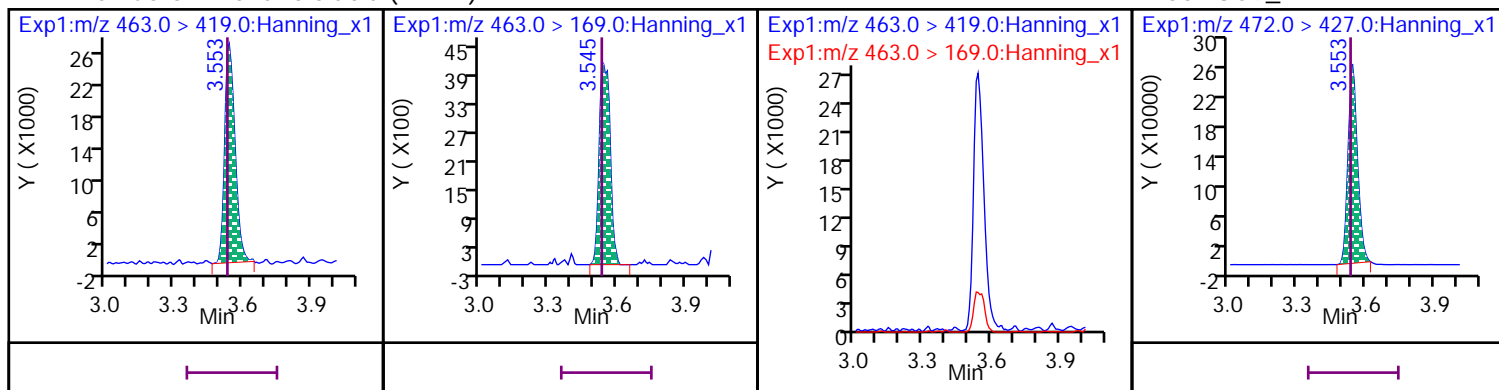
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



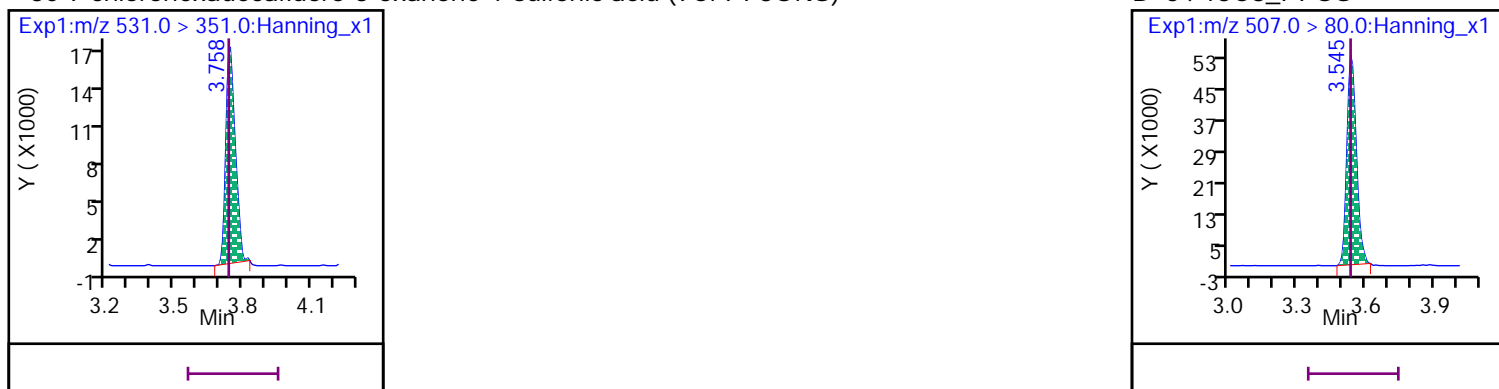
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



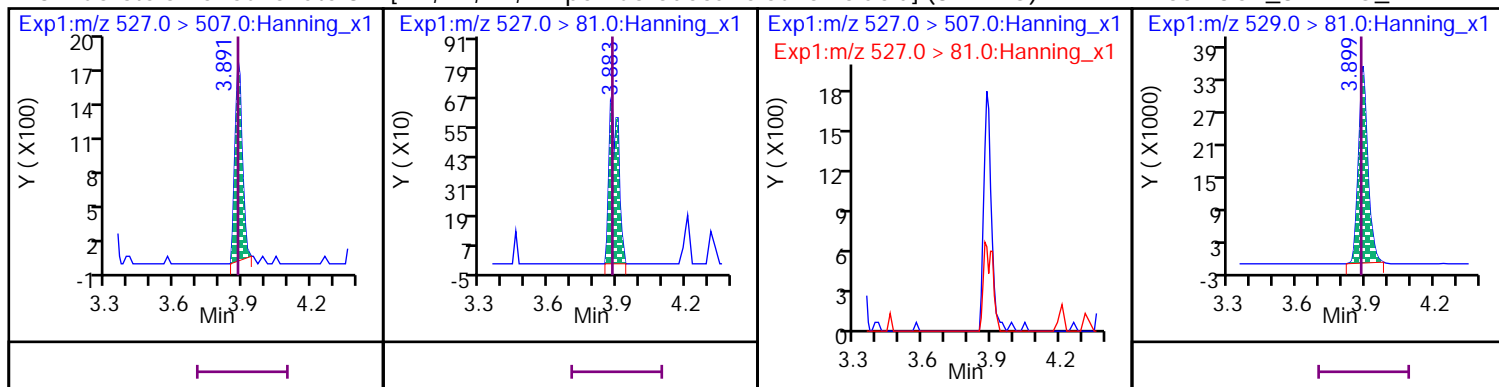
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



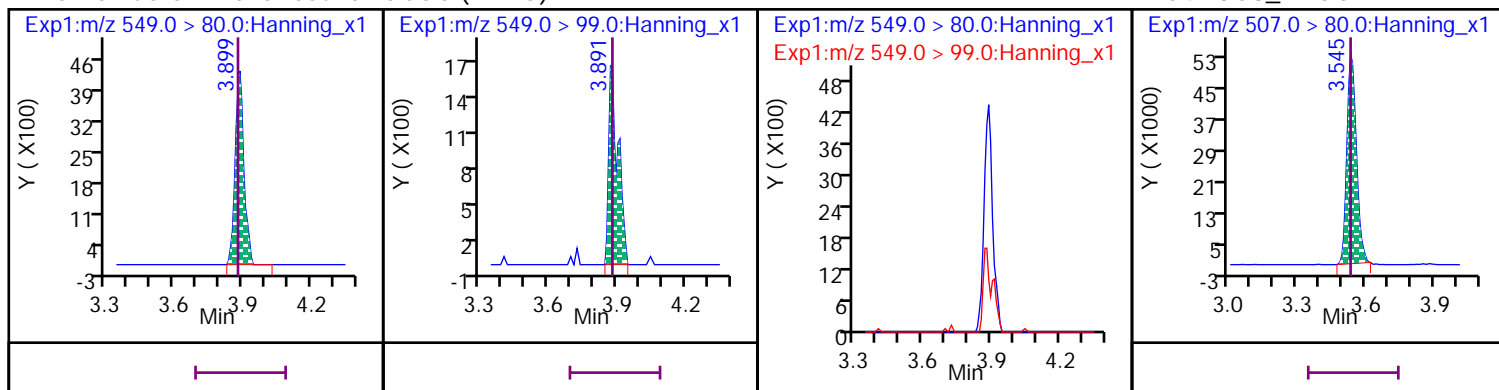
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



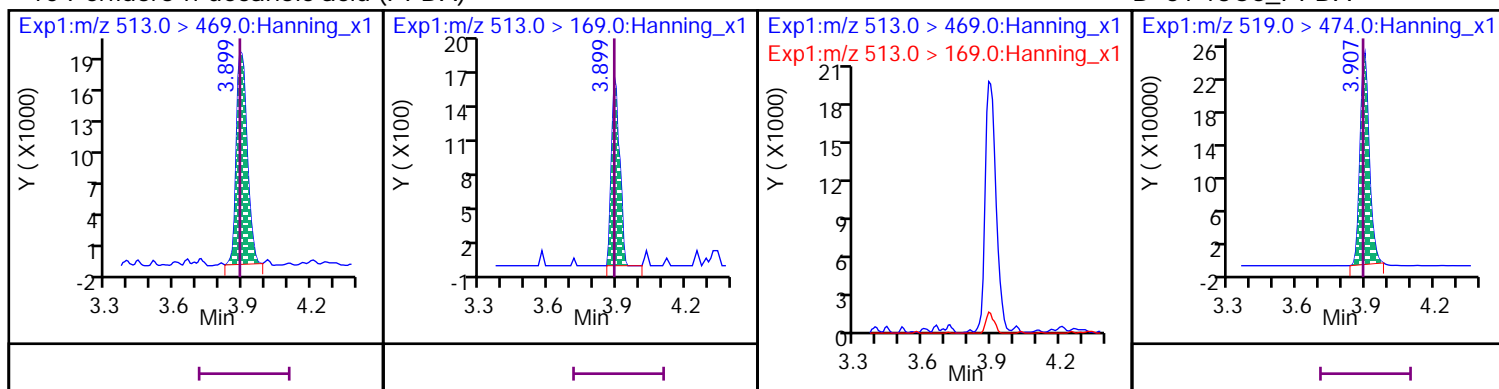
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



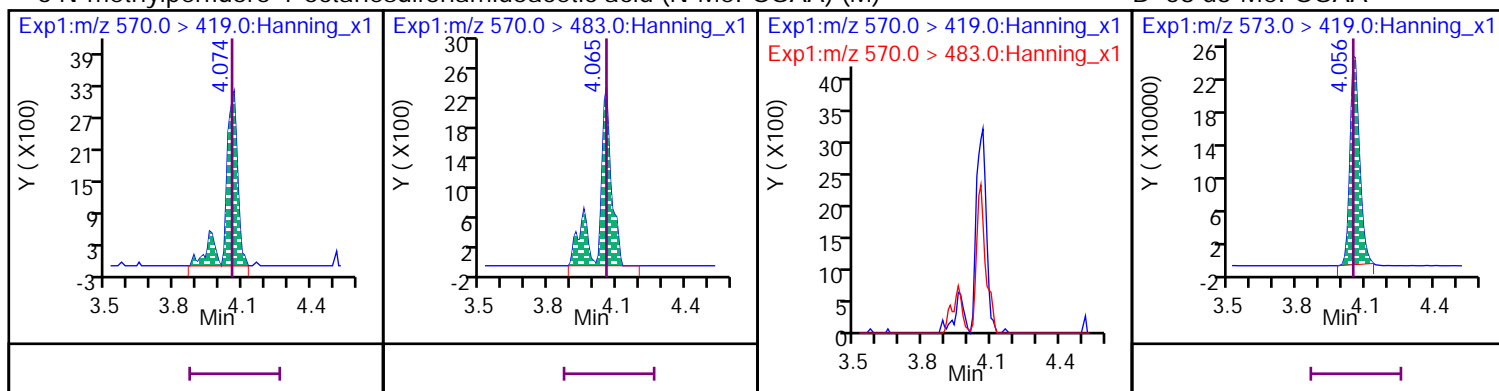
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



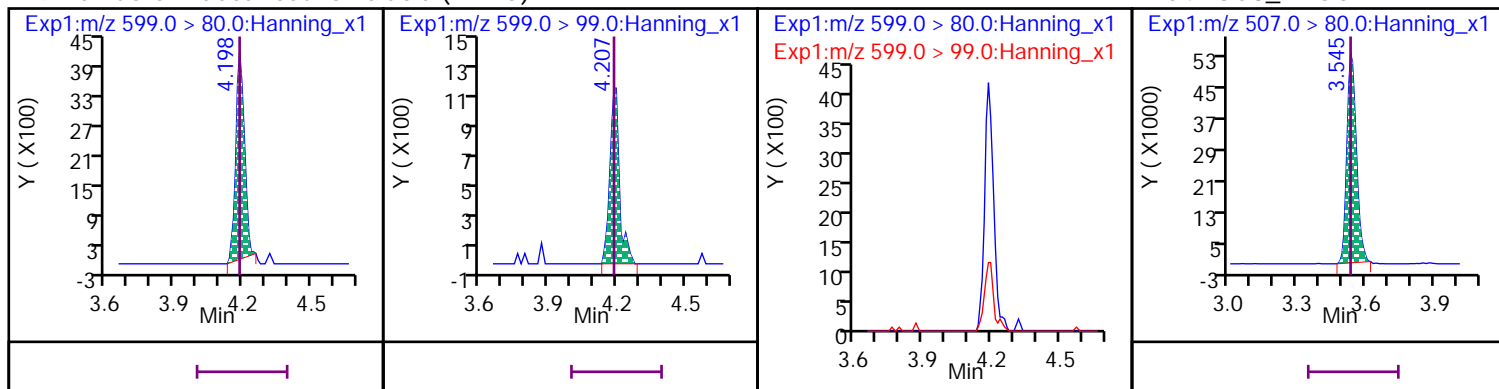
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



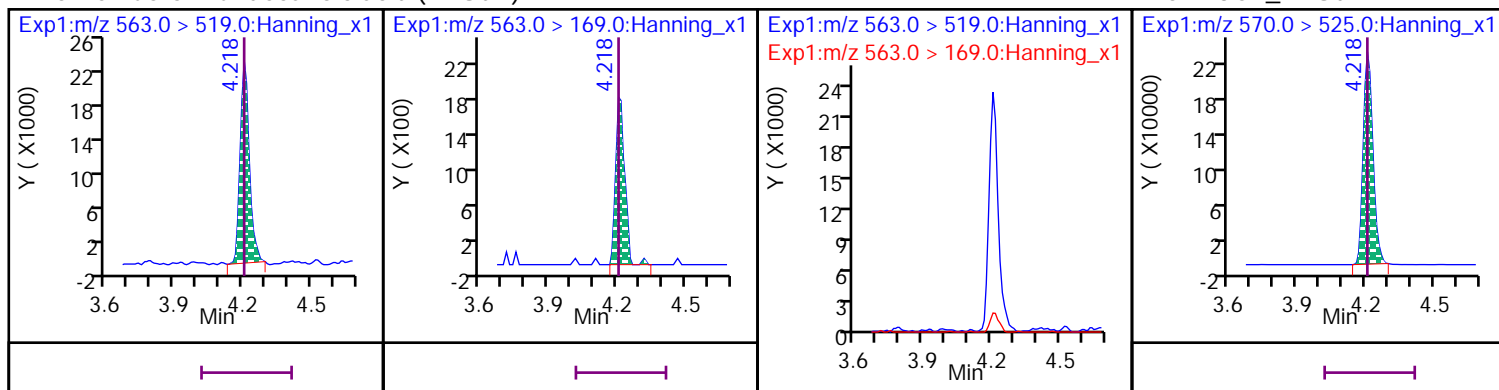
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



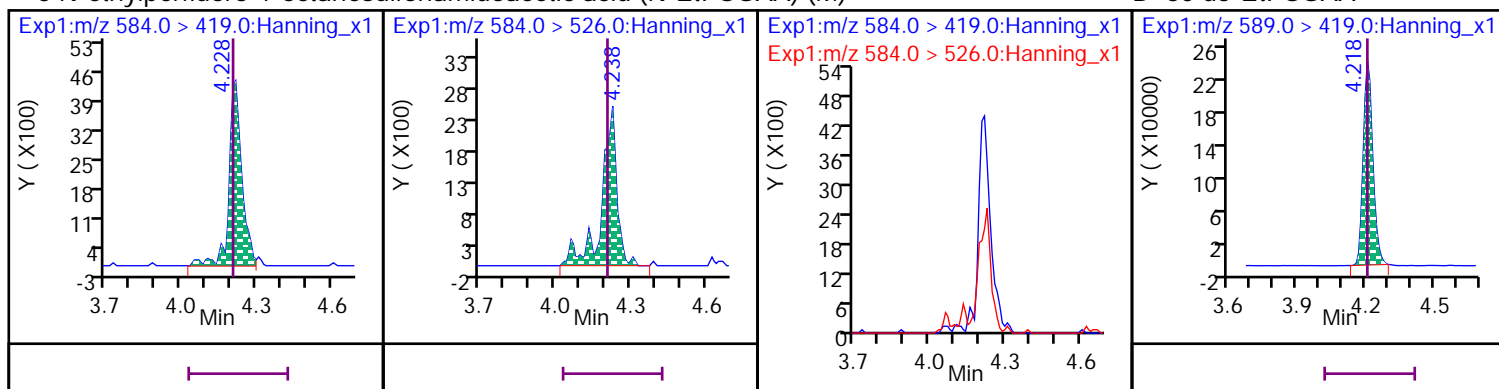
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



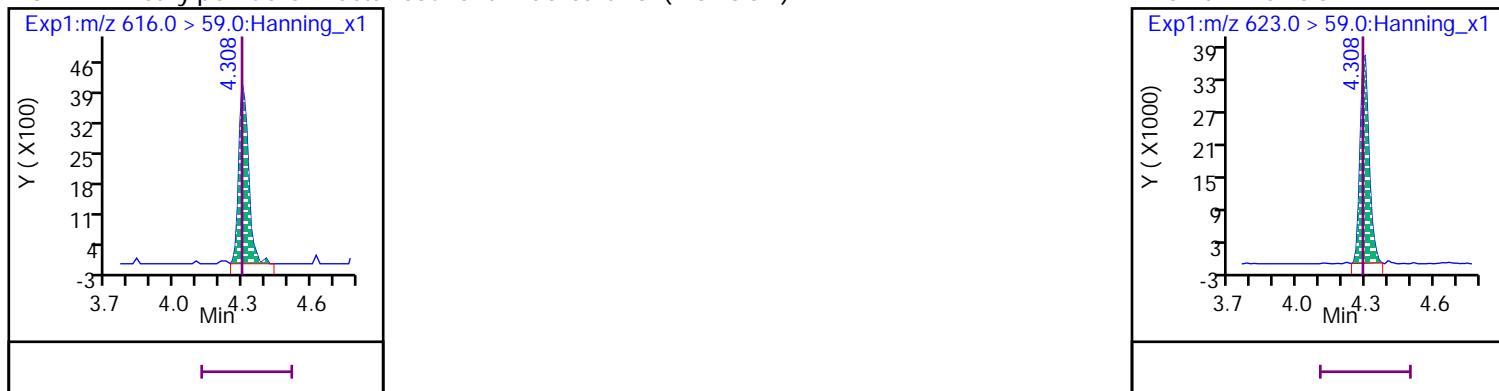
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



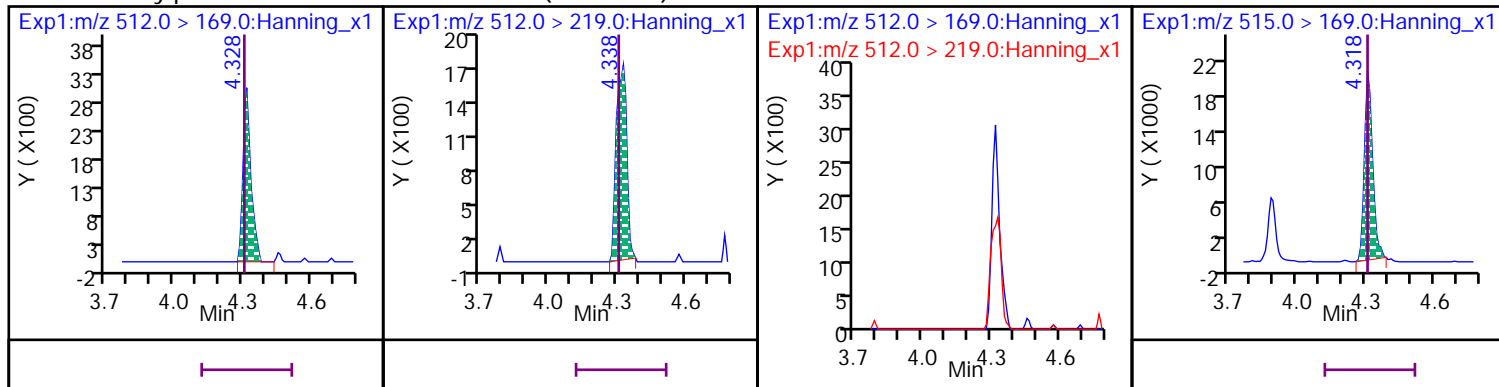
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

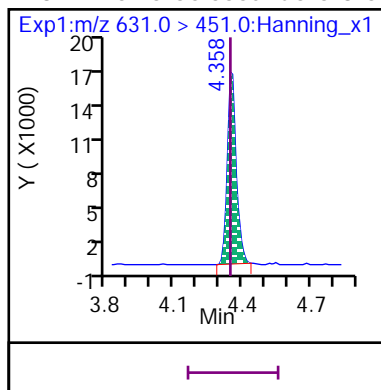


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

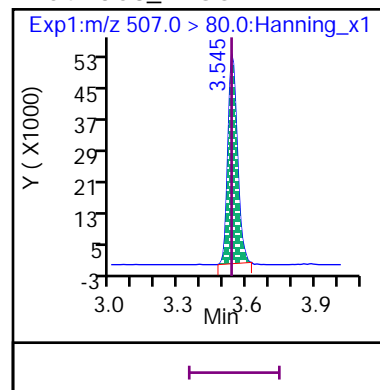
D 57 d3-MeFOSA



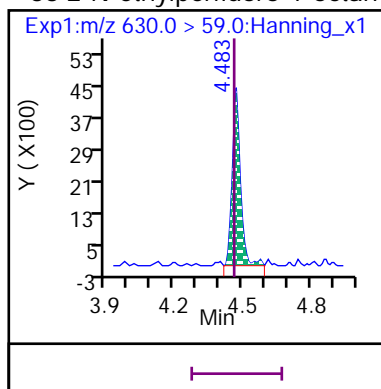
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



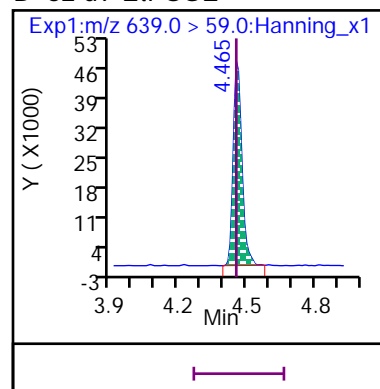
D 54 13C8\_PFOS



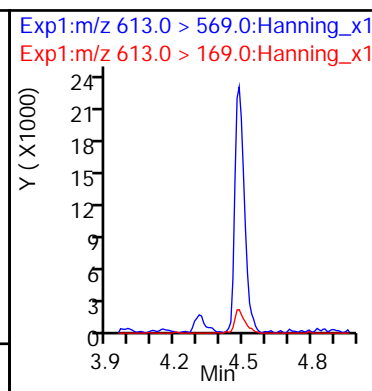
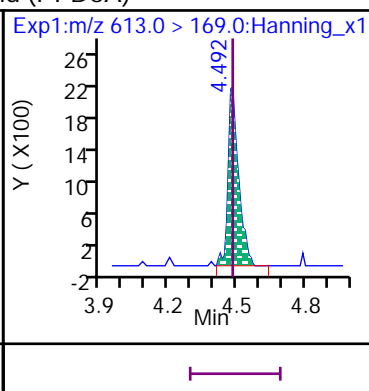
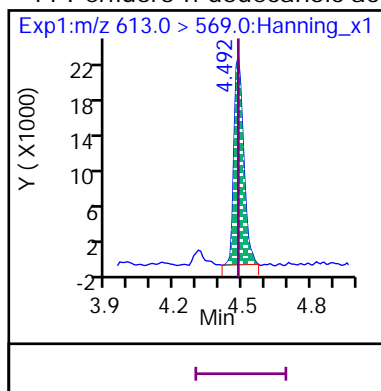
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



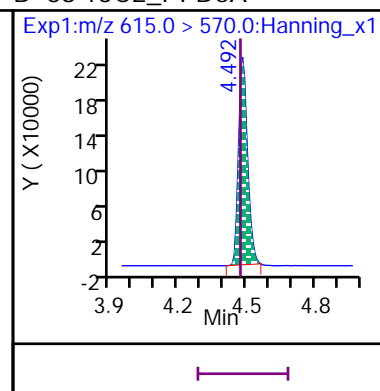
D 62 d9-EtFOSE



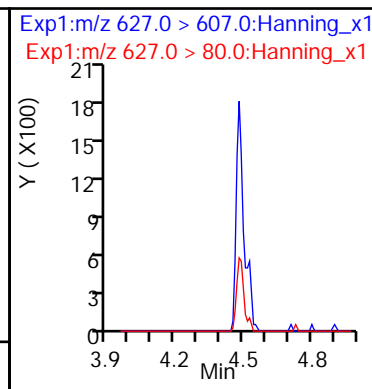
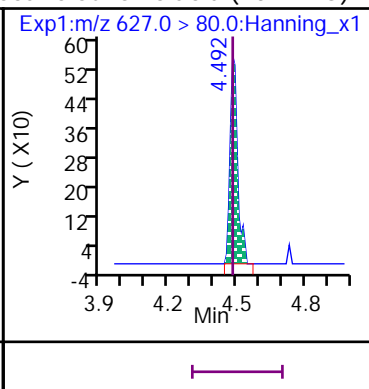
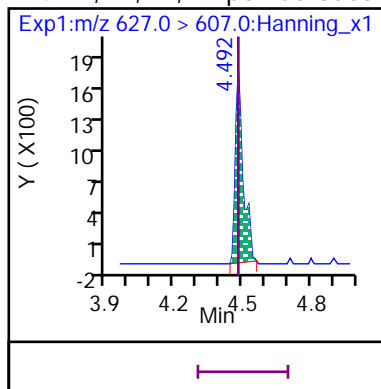
11 Perfluoro-n-dodecanoic acid (PFDoA)



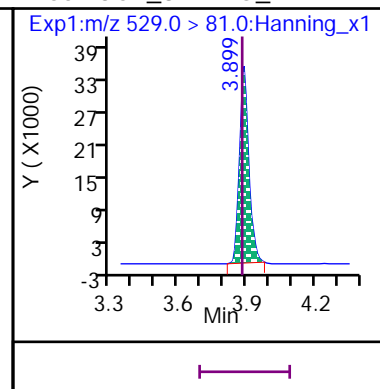
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

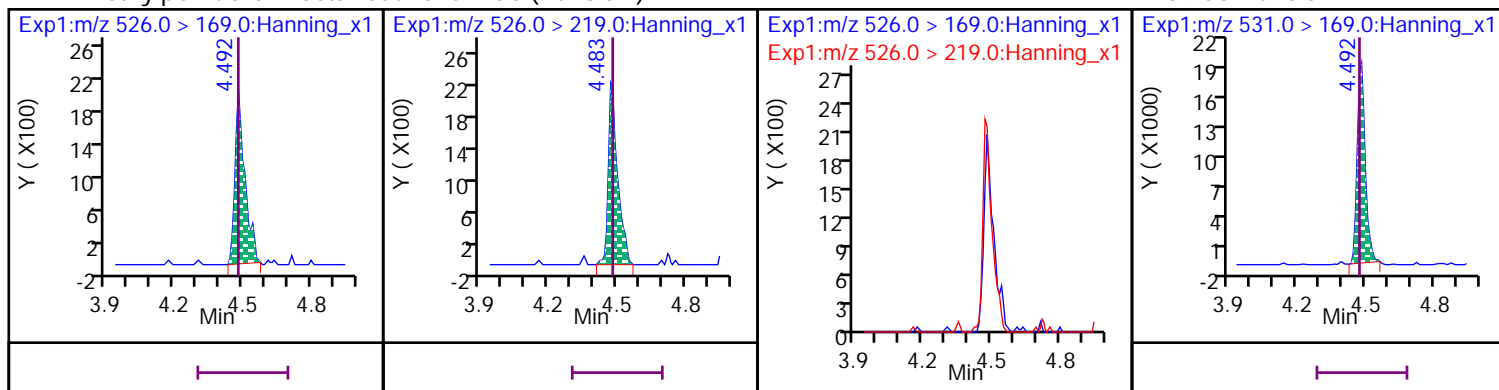


D 65 13C2\_8:2 FTS\_2



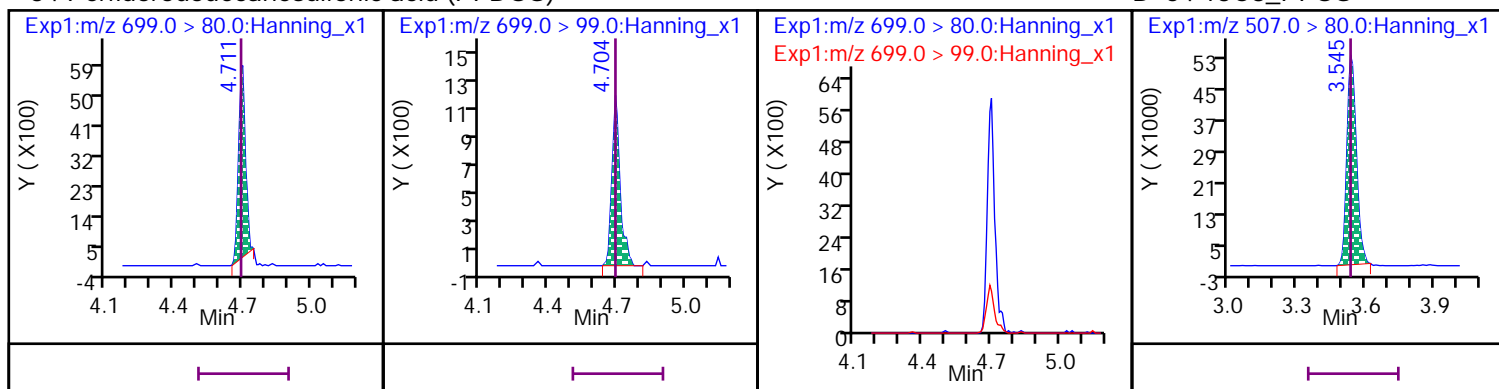
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



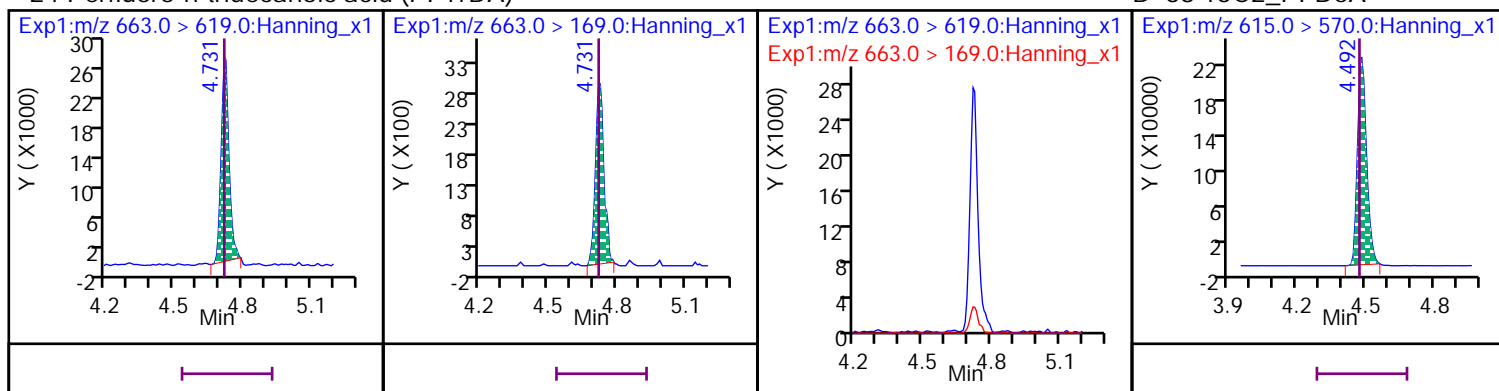
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



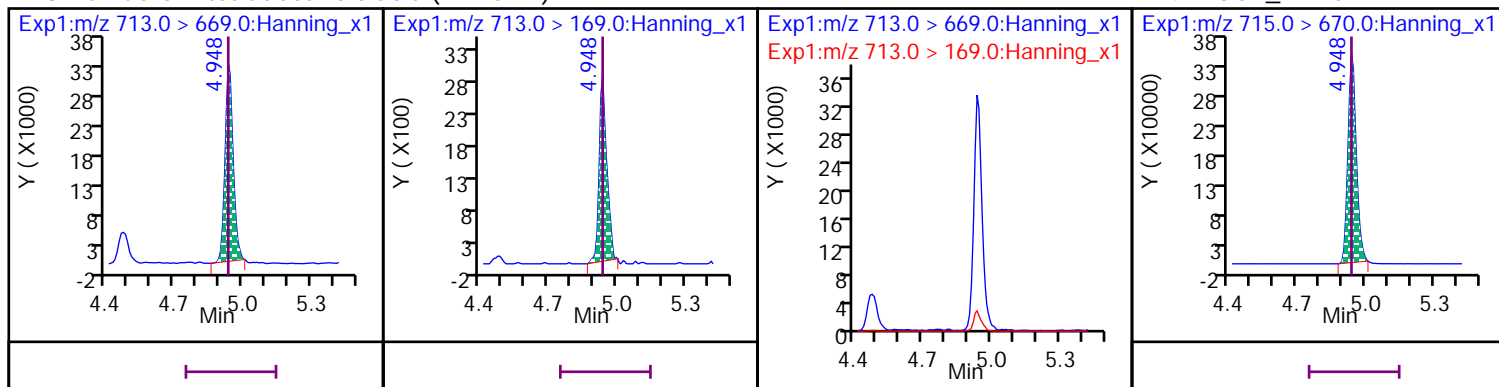
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



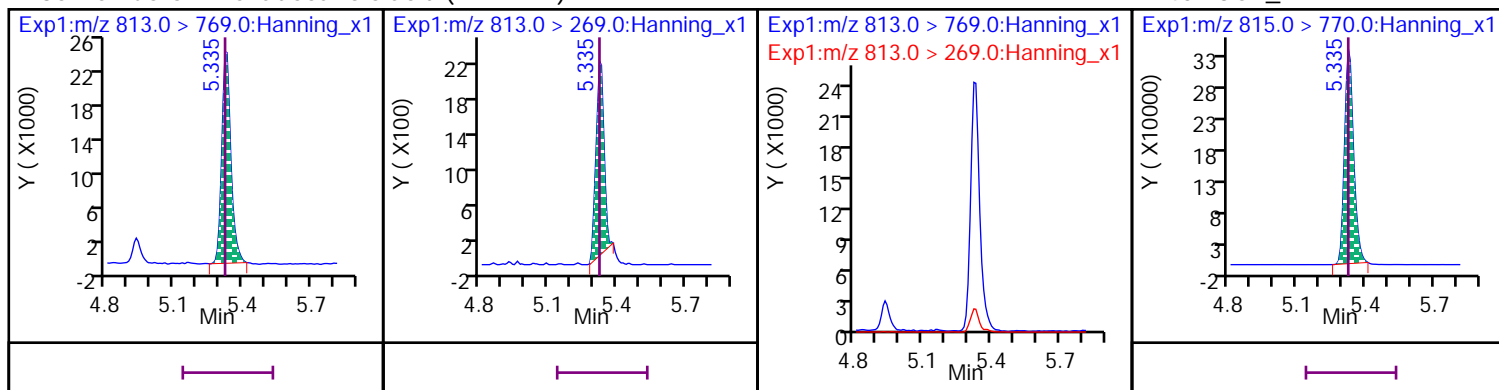
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



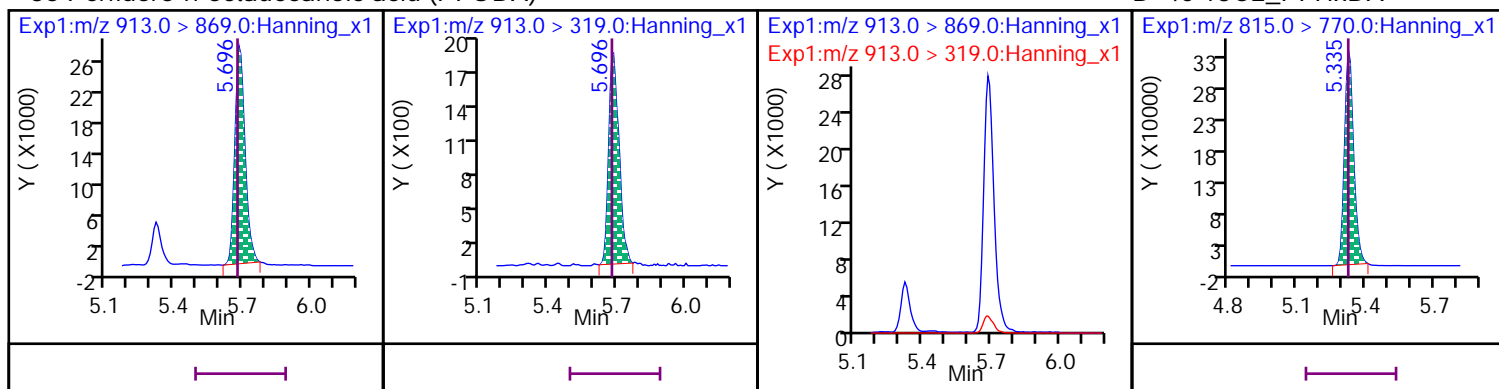
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

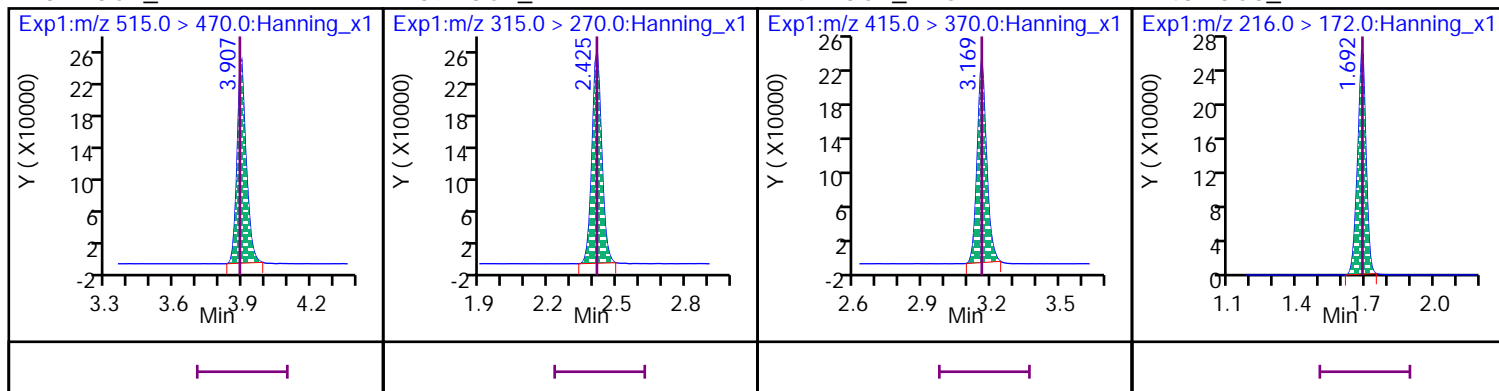


\* 37 13C2\_PFDA

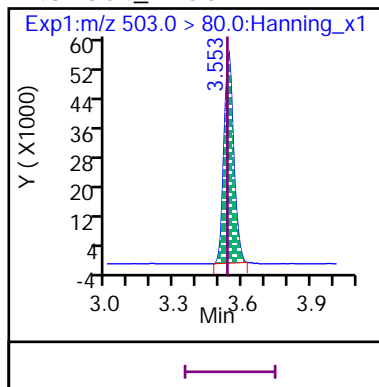
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 100\_SVLC-1220

Sample Info: ICAL 100\_SVLC-1220

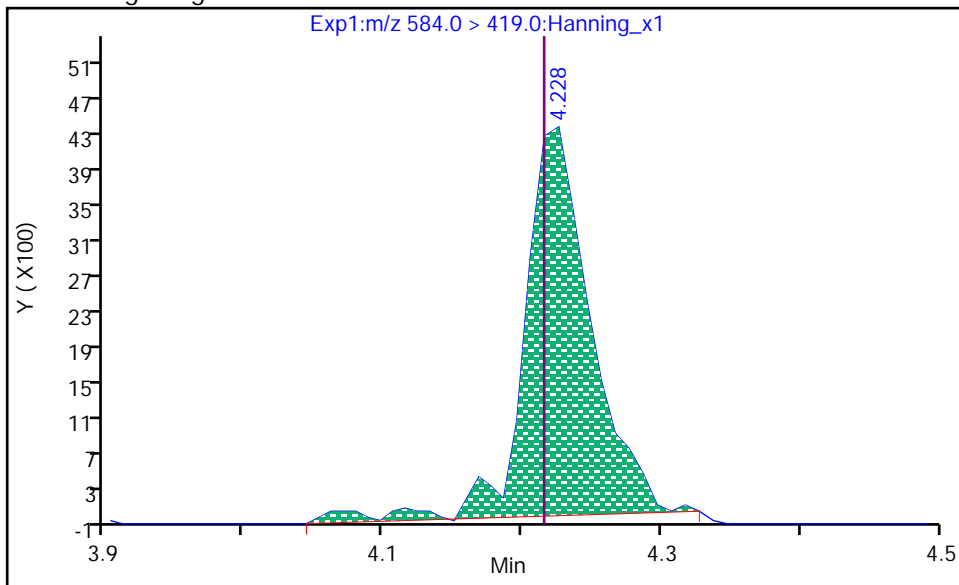
Dil. Factor: 1

Operator: Stephen E. Somerville

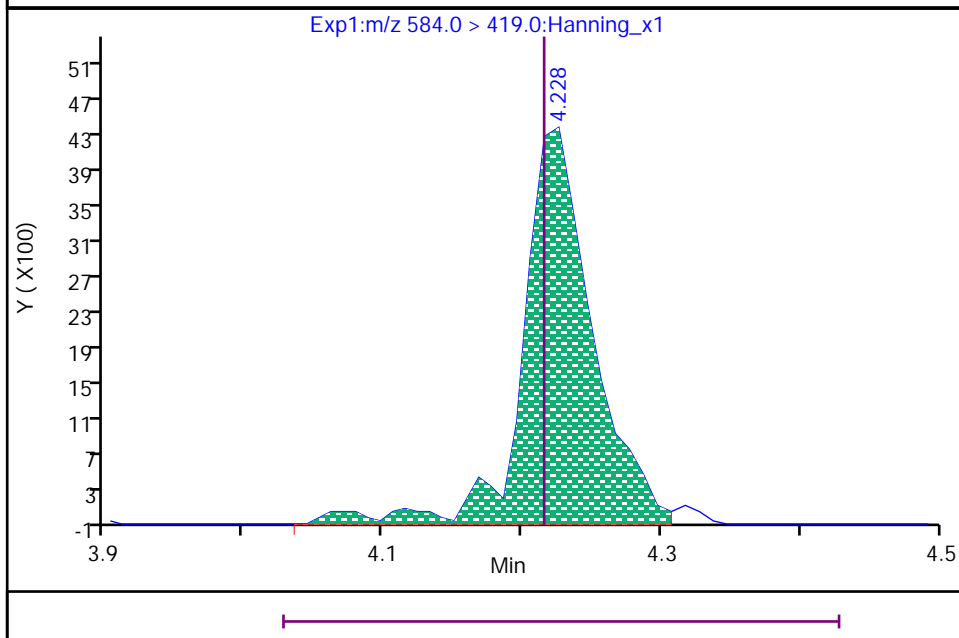
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.228  
Area: 14202  
Amount: 107.14  
Amount Units: ng/L



RT: 4.228  
Area: 15290  
Amount: 113.14  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:39

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720007.d

Injection Date: 17-Dec-2020 12:32:59

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 100\_SVLC-1220

Sample Info: ICAL 100\_SVLC-1220

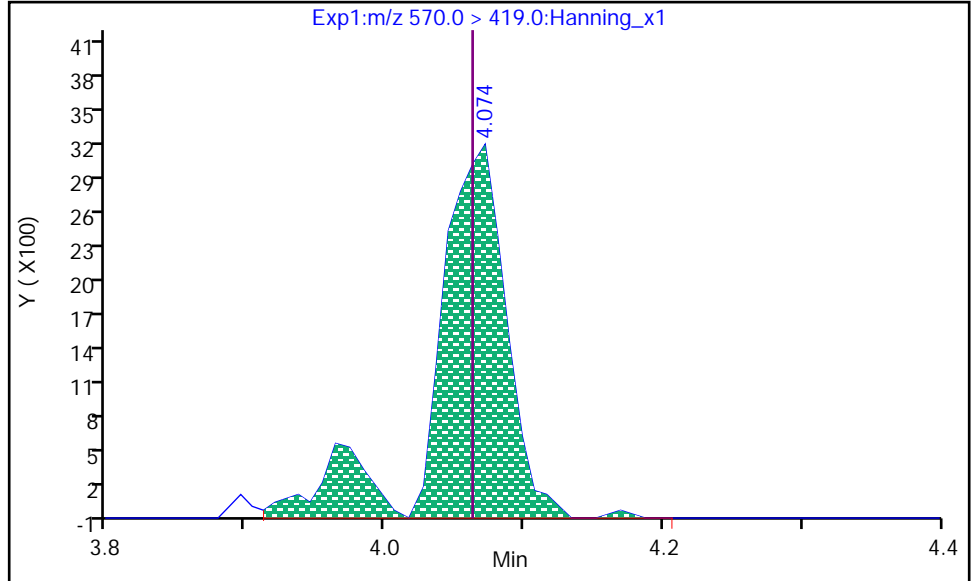
Dil. Factor: 1

Operator: Stephen E. Somerville

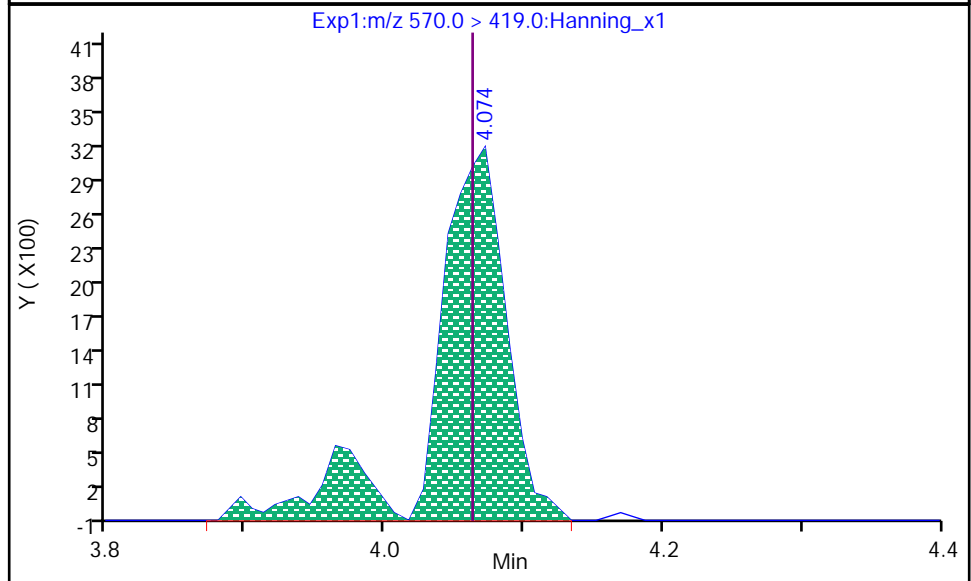
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.074  
Area: 11444  
Amount: 111.23  
Amount Units: ng/L

Processing Integration Results



RT: 4.074  
Area: 11651  
Amount: 111.42  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:06

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d  
 Injection Date: 17-Dec-2020 12:43:32 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 3 Auto Sampler: 3  
 Sample Info: ICAL 200\_SVLC-1221 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	711668	23	>100:1			1000.00	1026.12	96.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	144069	23	86:1			200.00	203.25		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	717259	17	>100:1			1000.00	1042.70	98.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	144933	16	>100:1			200.00	200.98		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	231160	16	>100:1			1000.00	1004.04	93.4	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	49459	18	>100:1	Target = 3.50		176.80	181.47		
298.9 > 99	44	2.120	2.125		14474	18	>100:1	3.41 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	38924	16	>100:1	Target = 3.10		187.60	194.12		
349 > 99	44	2.451	2.459		11492	24	78:1	3.38 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	124113	20	>100:1			5000.00	5126.87	98.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/0	9159	22	74:1	Target = 1.80		186.80	184.88		
327 > 81	63	2.389	2.388		4111	18	46:1	2.22 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	793257	19	>100:1			1000.00	1076.23	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	147970	19	>100:1	Target = 18.34		200.00	188.94		
313 > 119	49	2.416	2.423		9547	17	94:1	15.49 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1350793	20	>100:1			5000.00	5071.42	95.7	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	83476	20	>100:1	Target = 0.81		400.00	430.07		
285 > 185	66	2.532	2.539		94732	19	>100:1	0.88 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	601216	19	>100:1			1000.00	991.05	97.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	134445	19	>100:1	Target = 3.70		200.00	215.59		
363 > 169	47	2.782	2.790		36289	21	>100:1	3.70 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	174343	19	>100:1			1000.00	1018.19	97.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	34534	26		Target = 3.21	0.15	182.00	186.82		
399 > 99	45	2.800	2.799		12548	25	99:1	2.75 (1.60-4.81)	0.06				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	216274	19	>100:1	Target = 2.97		188.40	195.39		
377 > 85	45	2.828	2.827		72152	22	>100:1	2.99 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	34271	22		Target = 3.08		190.40	216.39		
449 > 99	45	3.169	3.169		11529	21	69:1	2.97 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	96089	24	>100:1			5000.00	4989.46	91.8	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	8374	28	46:1	Target = 1.80		189.60	187.63		
427 > 81	64	3.135	3.135		4744	25	54:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	615324	24	>100:1			1000.00	1039.64	94	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/1	130181	24	78:1	Target = 2.87		200.00	207.53		
413 > 169	53	3.162	3.169		45478	32	>100:1	2.86 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	157006	21	>100:1			1000.00	1047.20	102	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	36852	38	>100:1	Target = 3.84	0.28	185.60	198.08		
499 > 99	54	3.545	3.545		8658	39	25:1	4.25 (1.92-5.76)	0.27				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/0	102987	21	>100:1			186.40	194.85		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.899	3.891	1/0	25761	23		Target = 3.07		192.00	214.40		
549 > 99	54	3.899	3.891		8382	24	25:1	3.07 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	23887	15		Target = 3.03		192.80	209.64		
599 > 99	54	4.198	4.198		6339	22		3.76 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	83484	19	>100:1			188.40	187.23		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	24667	21		Target = 3.33		193.60	195.69		
699 > 99	54	4.704	4.704		8416	20	>100:1	2.93 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	765207	21	>100:1			1000.00	1018.97	96.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	157415	21	>100:1	Target = 6.16		200.00	205.71		
463 > 169	56	3.553	3.545		24954	27	>100:1	6.30 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	315019	20	>100:1			1000.00	1017.62	95.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	63946	25	>100:1			200.00	205.99		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	97937	20				5000.00	5279.58	105	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	7729	23	45:1	Target = 1.95		191.60	182.80		
527 > 81	65	3.899	3.891		3591	20	16:1	2.15 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	9156	13		Target = 3.14		192.80	202.28		
627 > 80	65	4.492	4.492		2608	23		3.51 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	672326	21	>100:1			1000.00	1013.56	96.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	141266	21	>100:1	Target = 15.94		200.00	213.84		
513 > 169	51	3.891	3.899		9031	24	75:1	15.64 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	716544	18	>100:1			5000.00	4991.97	94	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	24498	36	>100:1	Target = 1.33	0.11	200.00	222.54		M
570 > 483	58	4.065	4.065		16896	38		1.44 (0.66-1.99)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	706396	18	>100:1			5000.00	5318.66	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	28320	29	>100:1	Target = 1.58	0.14	200.00	201.34		
584 > 526	60	4.218	4.217		18444	31	59:1	1.53 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	639465	18	>100:1			1000.00	1011.69	94.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	123504	16	>100:1	Target = 15.50		200.00	205.49		
563 > 169	52	4.207	4.217		7960	23	49:1	15.51 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	112543	17	>100:1			1000.00	1040.06	96	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	21373	21	>100:1			200.00	202.12		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	52407	16	>100:1			1000.00	990.36	95.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	12774	14		Target = 1.12		200.00	216.05		
512 > 219	57	4.318	4.318		10827	20	>100:1	1.17 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	131865	18	>100:1			1000.00	1051.59	108	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	24998	17	>100:1			200.00	213.08		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	628619	17	>100:1			1000.00	1038.50	96.8	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	132667	21	55:1	Target = 10.85		200.00	208.40		
613 > 169	38	4.492	4.492		10930	18	74:1	12.13 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	128894	20	>100:1	Target = 8.37		200.00	208.18		
663 > 169	38	4.731	4.731		16111	20	>100:1	8.00 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49725	15	>100:1			1000.00	1012.84	96.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	11865	21	>100:1	Target = 1.03		200.00	218.41		
526 > 219	59	4.492	4.492		10318	17	65:1	1.14 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	837660	19	>100:1			1000.00	994.32	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	153443	17	20:1	Target = 12.11		200.00	211.42		
713 > 169	42	4.948	4.948		11864	18	>100:1	12.93 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	917195	18	>100:1			1000.00	1012.17	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	126217	20	33:1	Target = 11.48		200.00	210.61		
813 > 269	40	5.334	5.334		11103	18	>100:1	11.36 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	169087	24	18:1	Target = 13.88		200.00	208.26		
913 > 319	40	5.696	5.689		11687	21	>100:1	14.46 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	669430	18	>100:1					92.2	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	745707	19	>100:1					99.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	627559	23	>100:1					97.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	654457	22	>100:1					98.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	163672	20	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d

Injection Date: 17-Dec-2020 12:43:32

Inst. ID: LCMSMS02

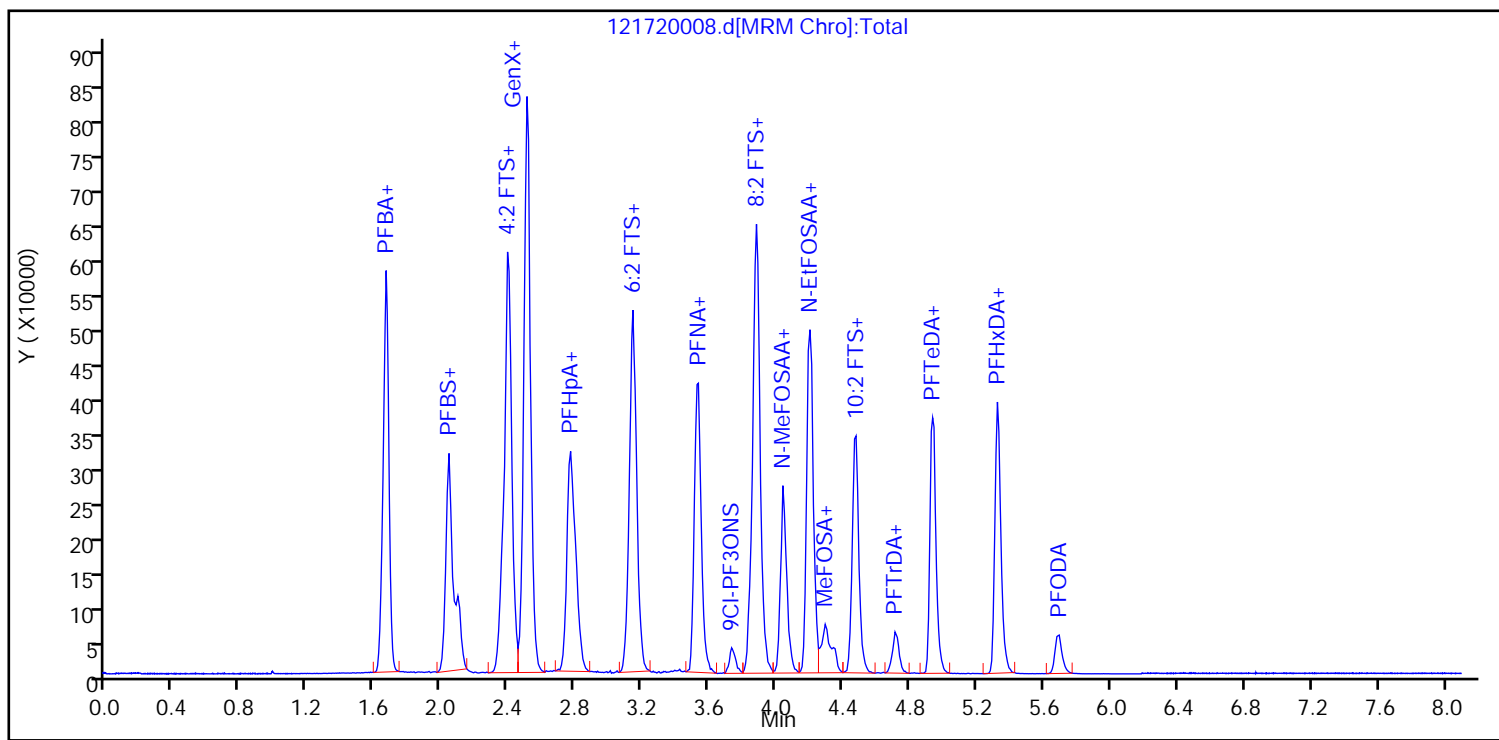
Client ID:

Lab ID: ICAL 200\_SVLC-1221

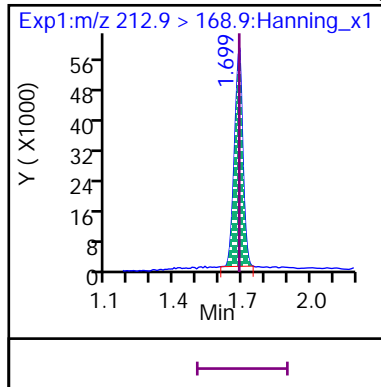
Sample Info: ICAL 200\_SVLC-1221

Dil. Factor: 1

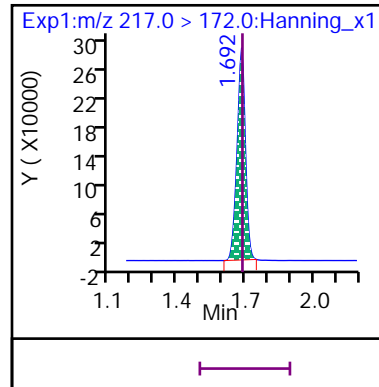
Operator: Stephen E. Somerville



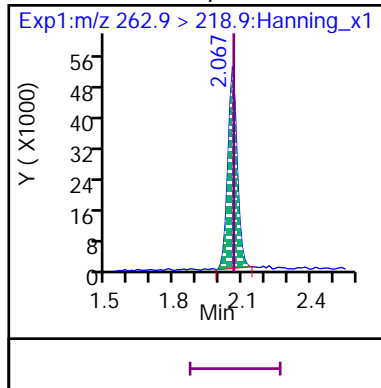
8 Perfluoro-n-butanoic acid (PFBA)



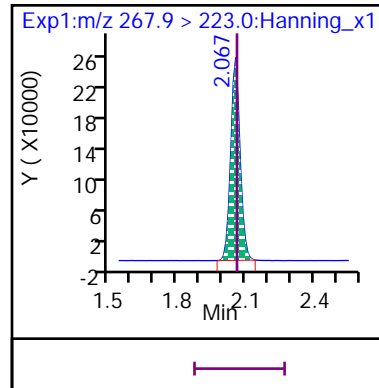
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

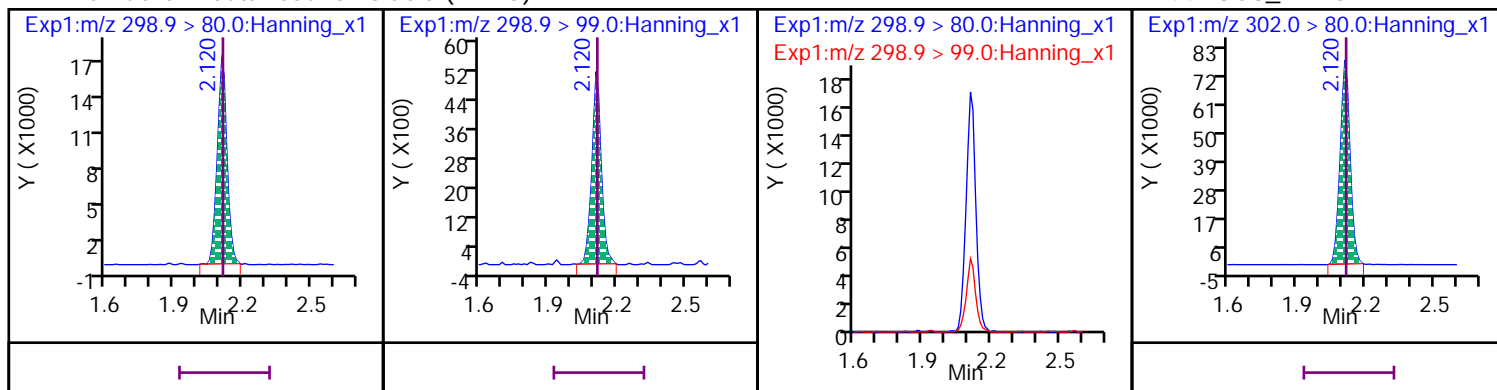


D 50 13C5\_PFPeA



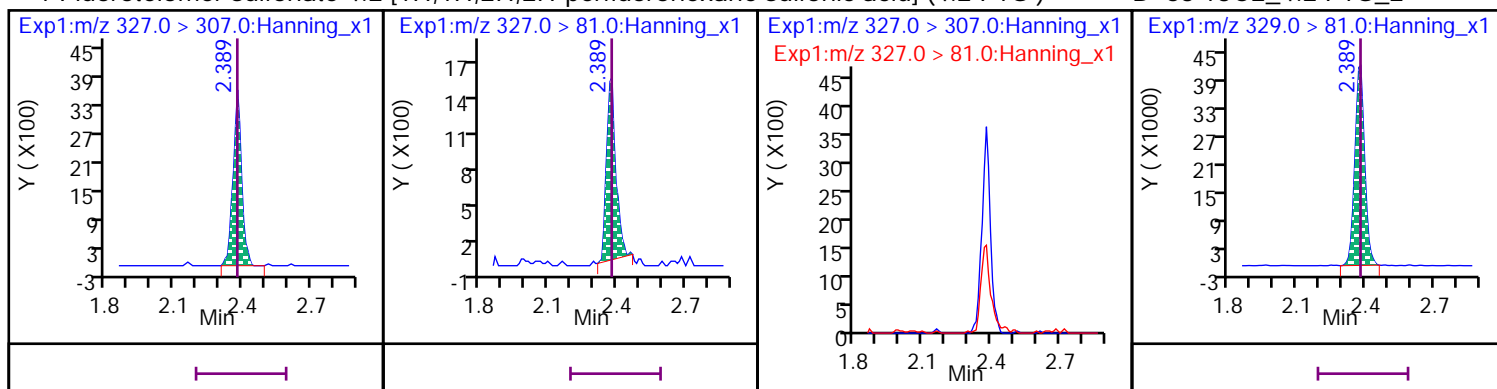
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



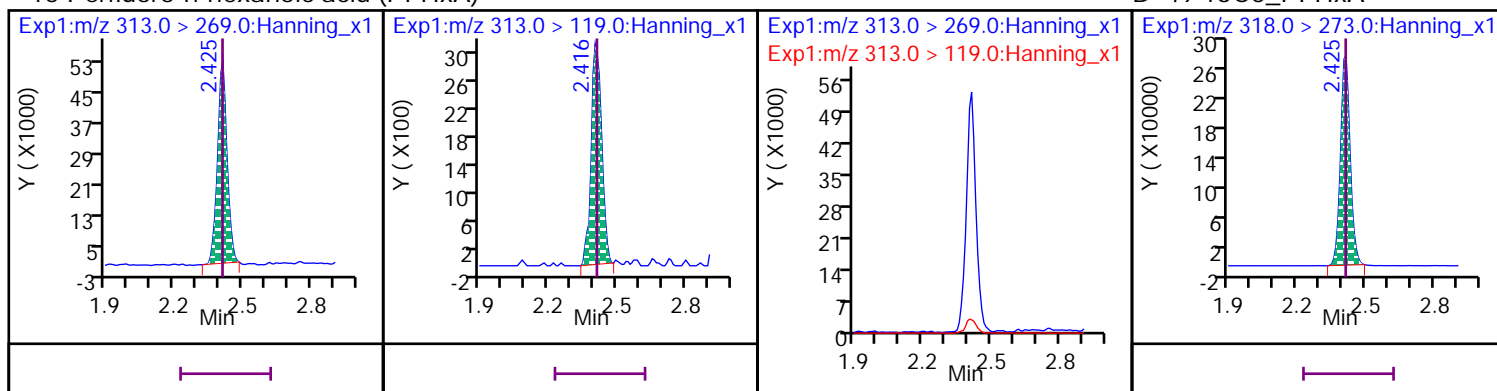
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



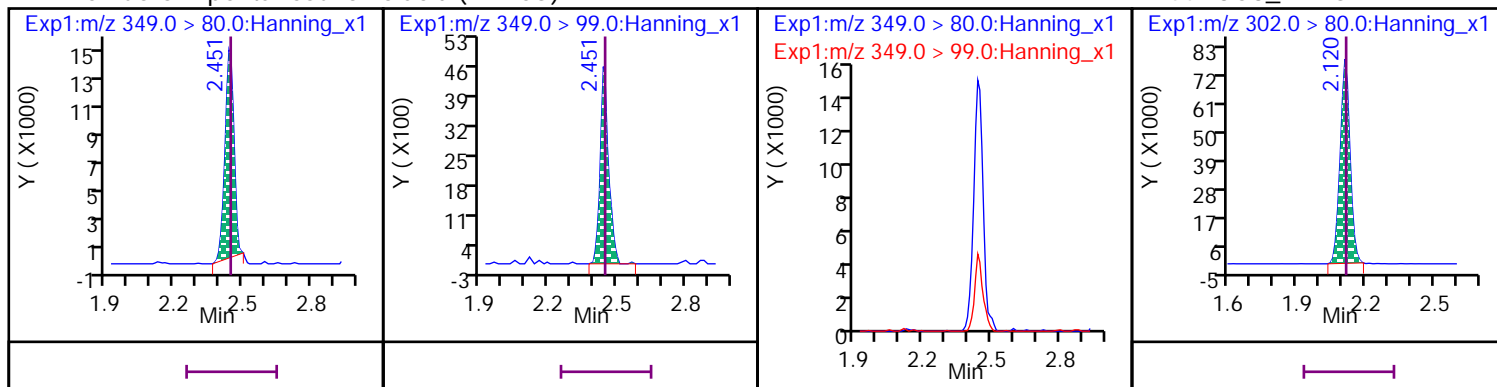
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



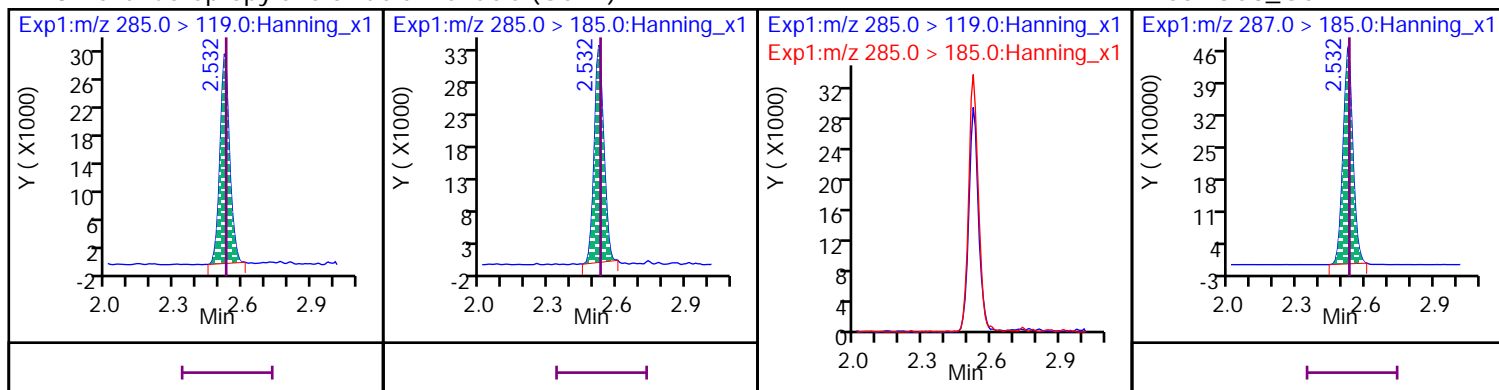
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



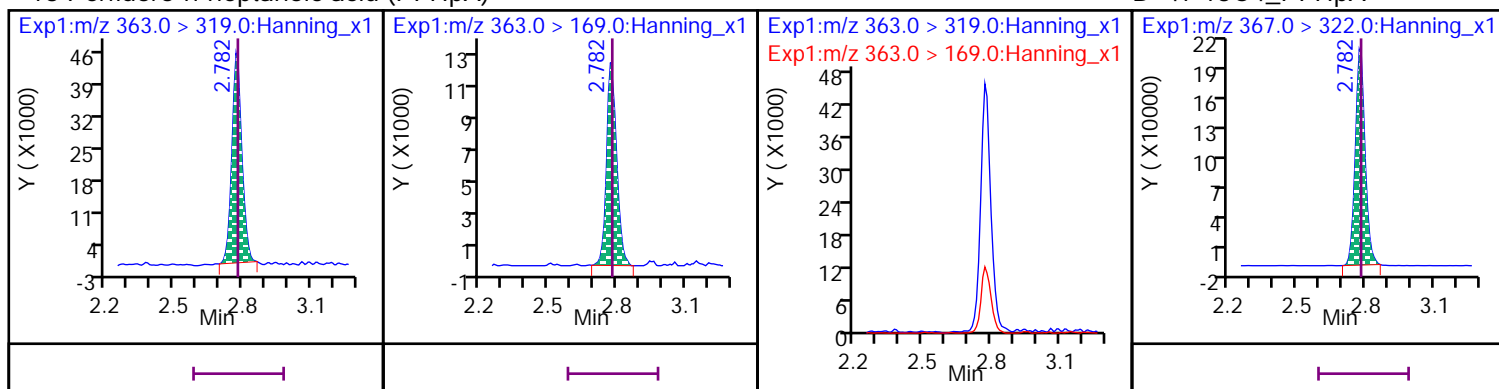
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



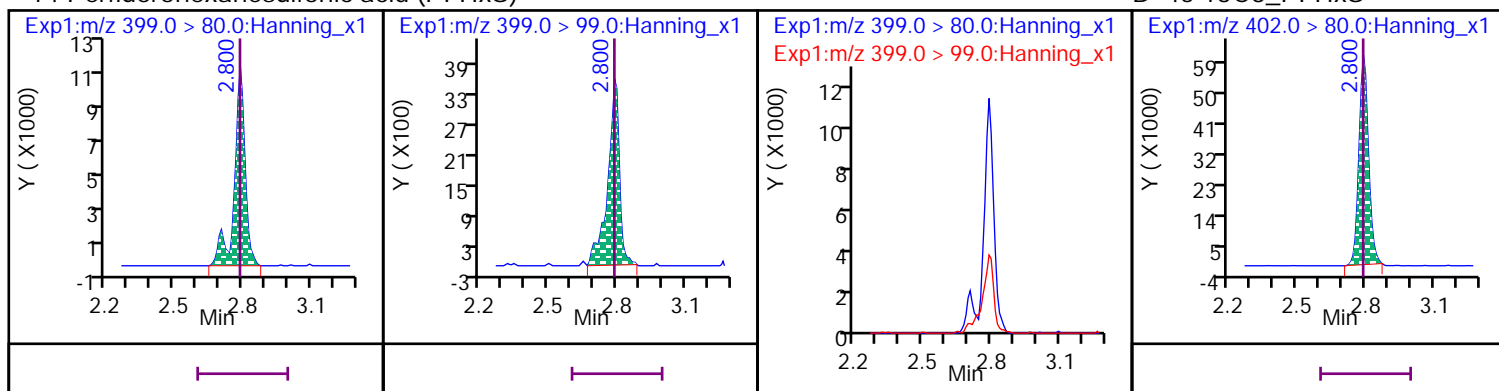
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



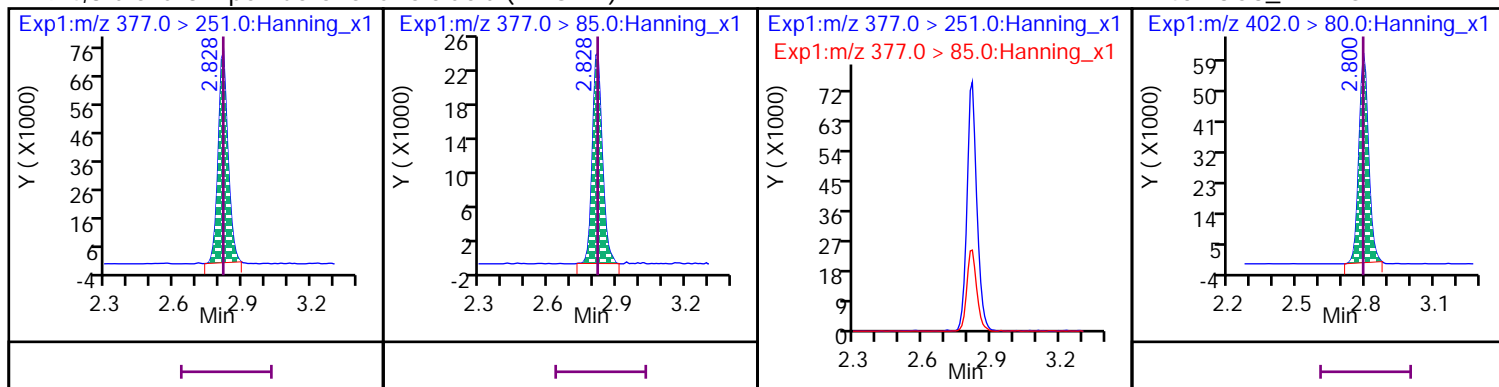
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

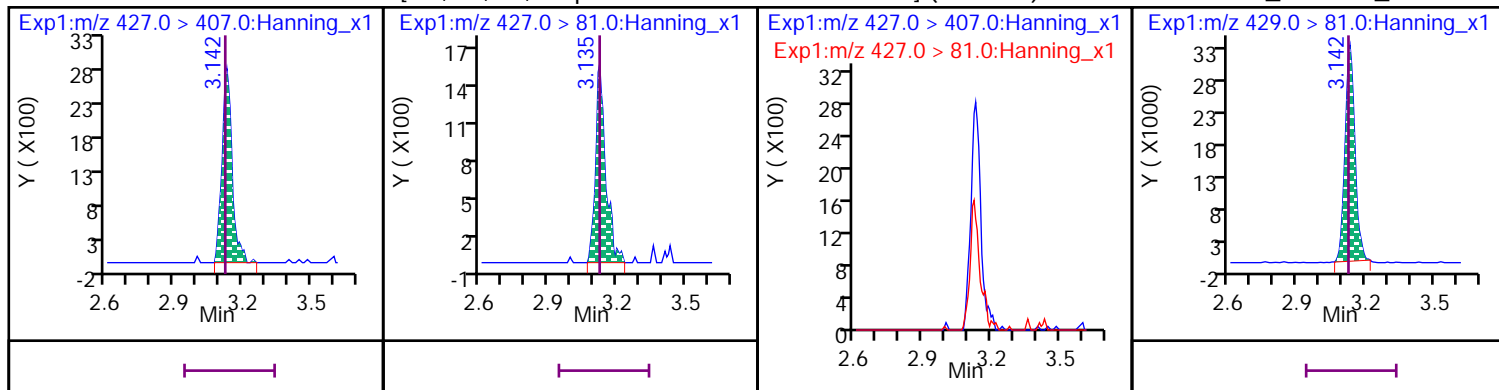
D 45 13C3\_PFHxS





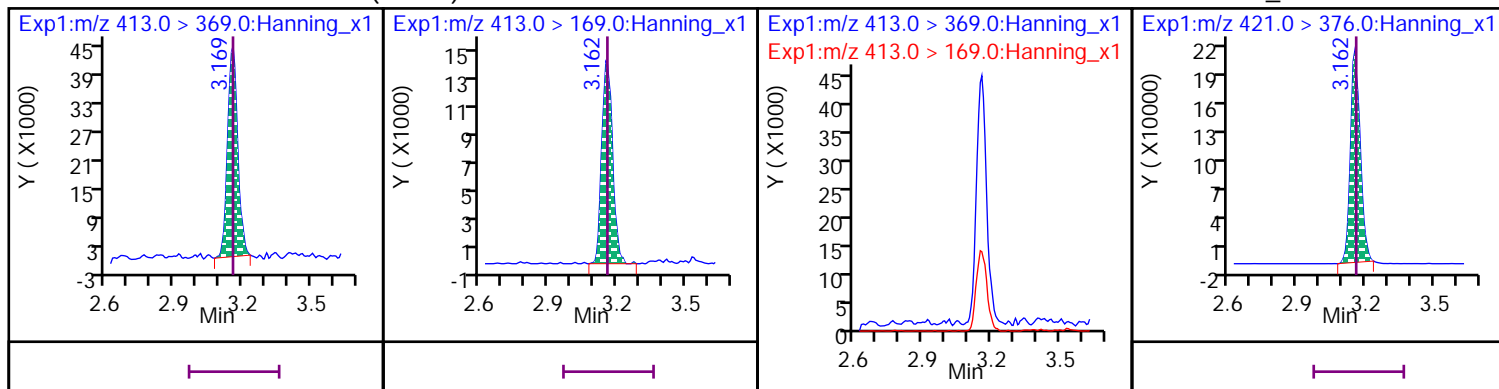
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



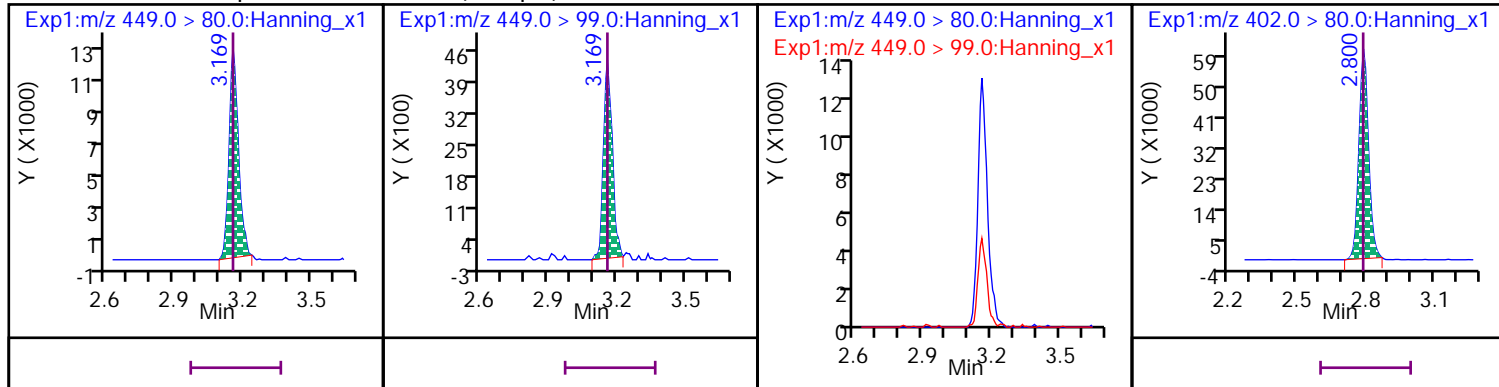
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



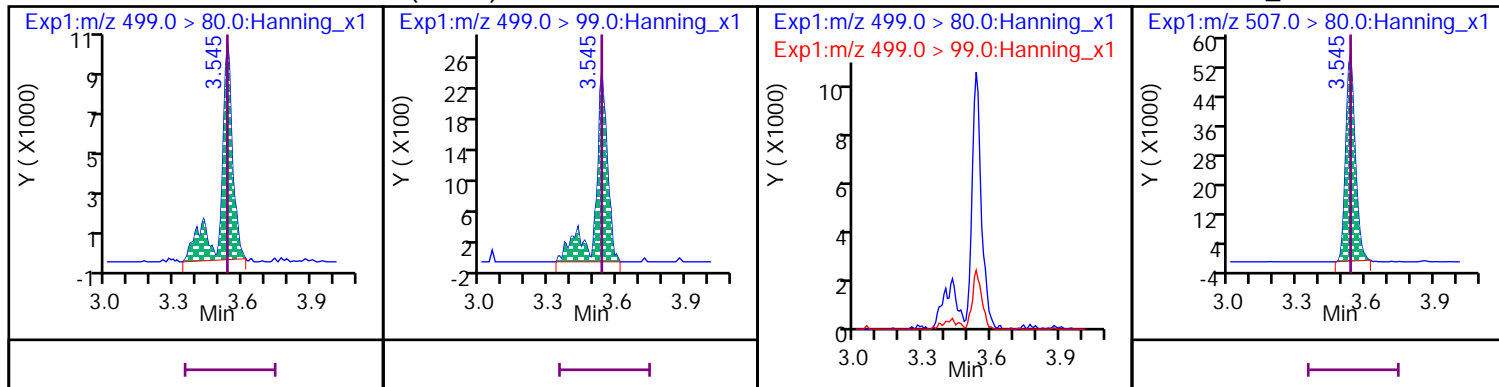
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



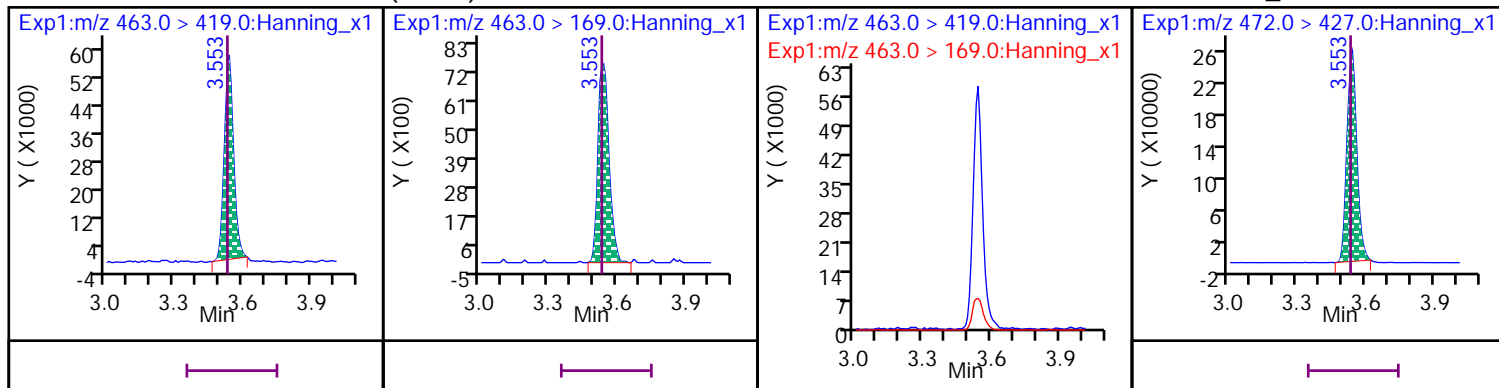
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



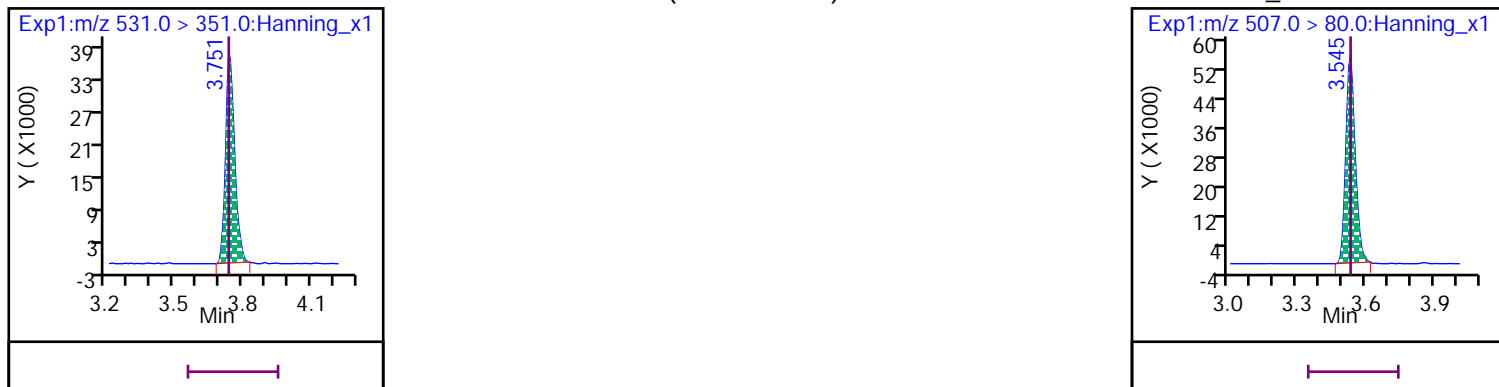
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



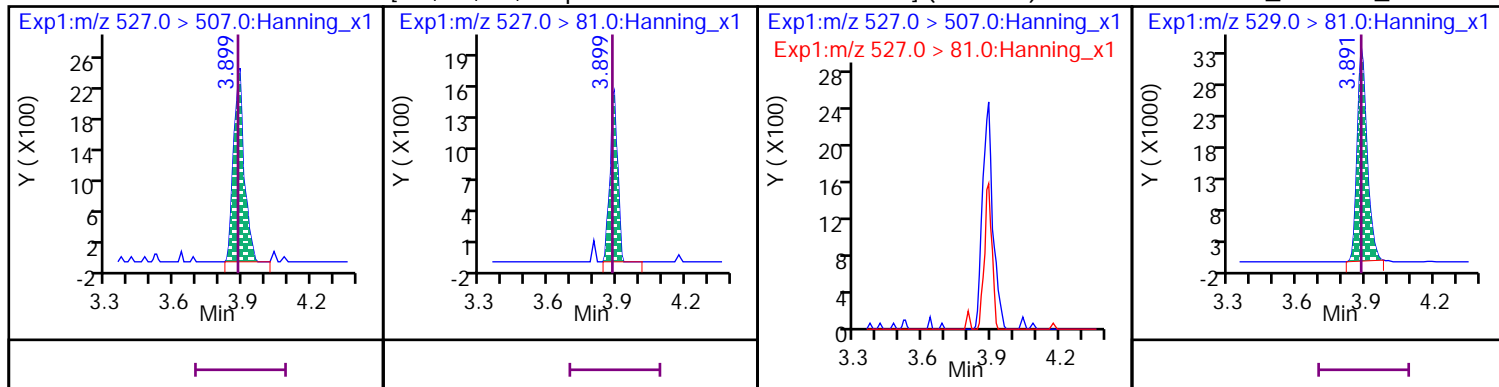
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



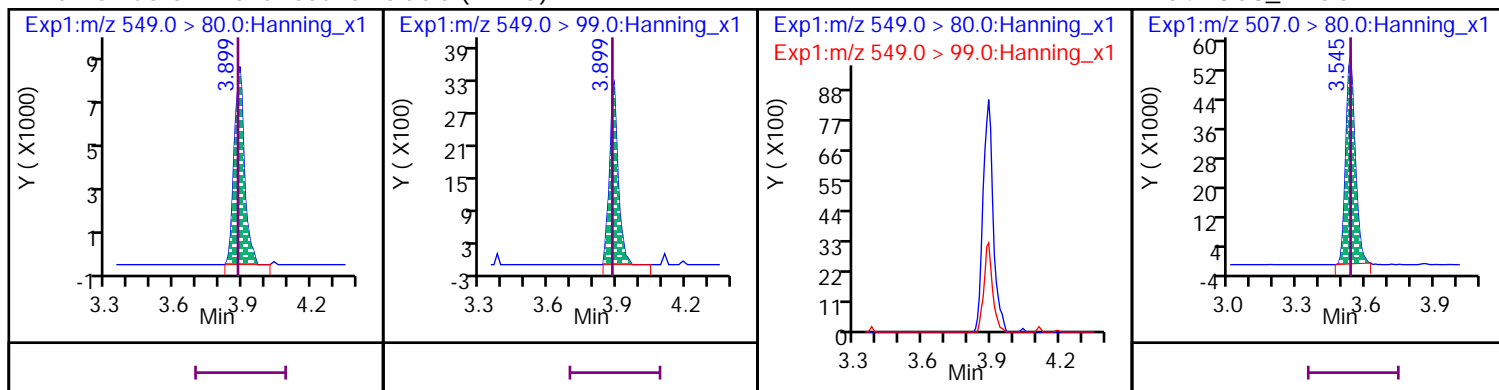
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



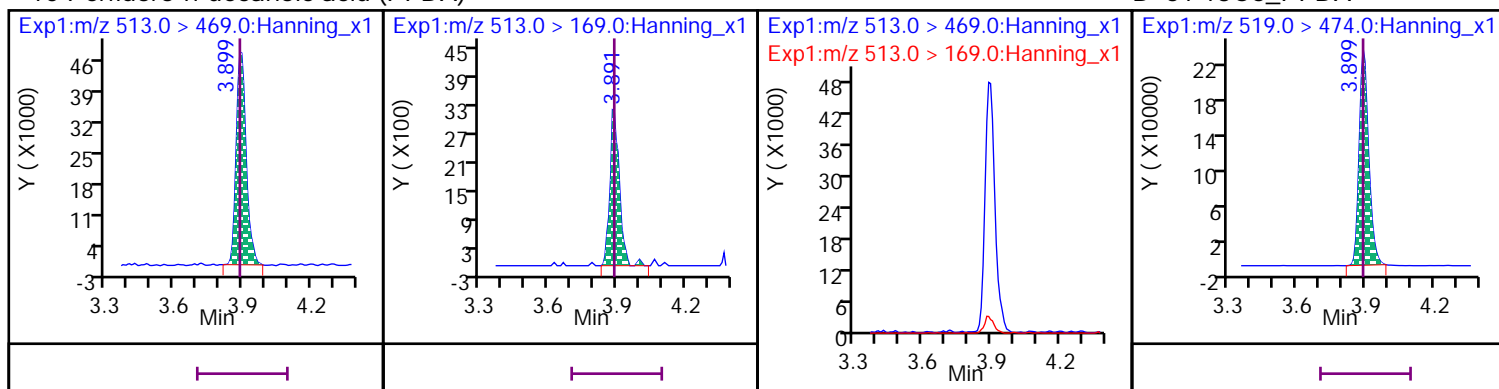
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



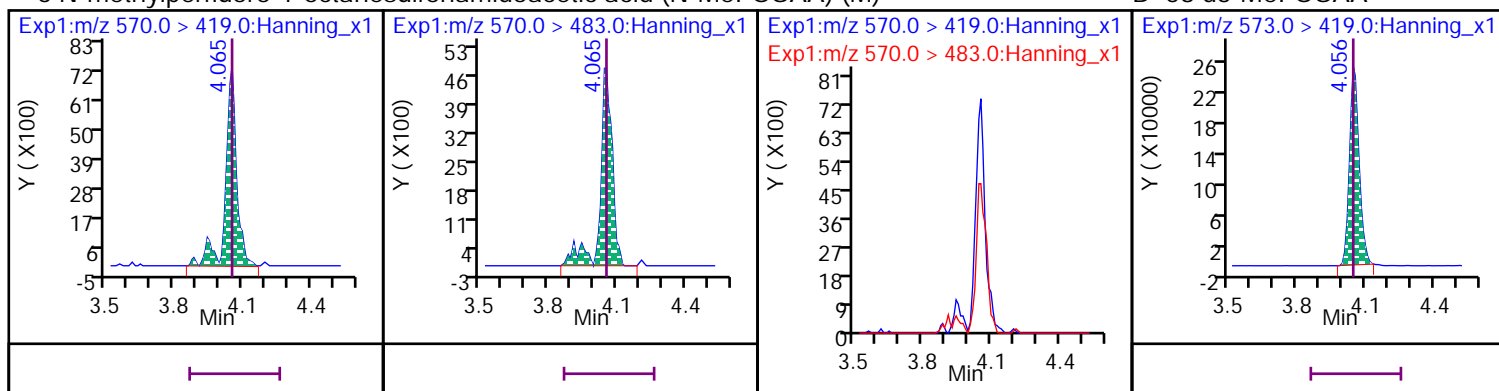
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



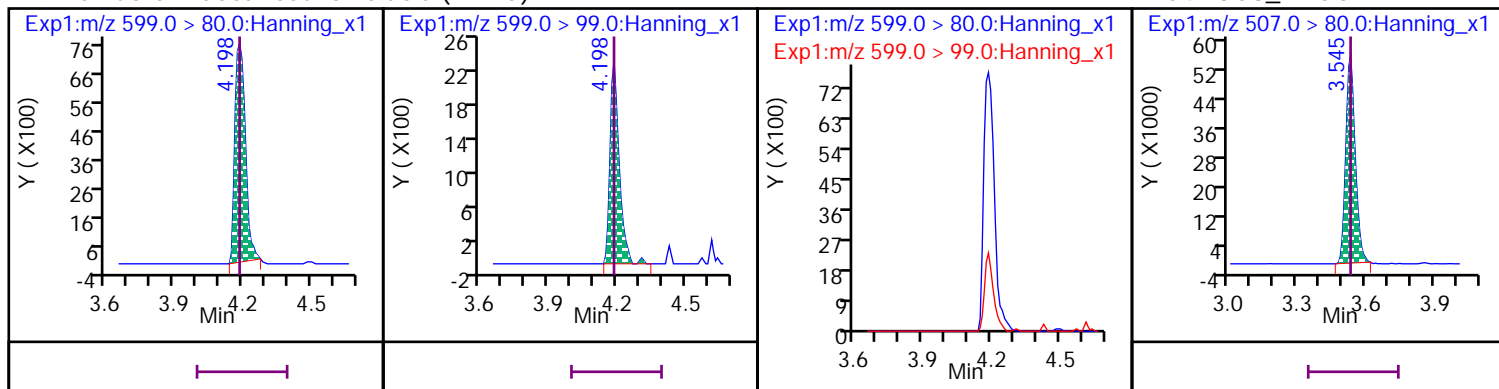
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



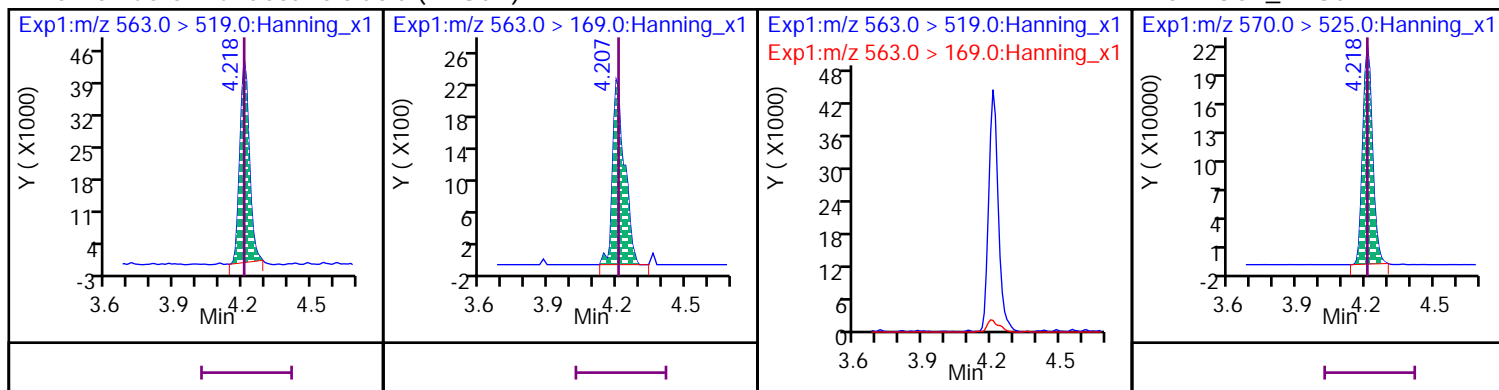
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



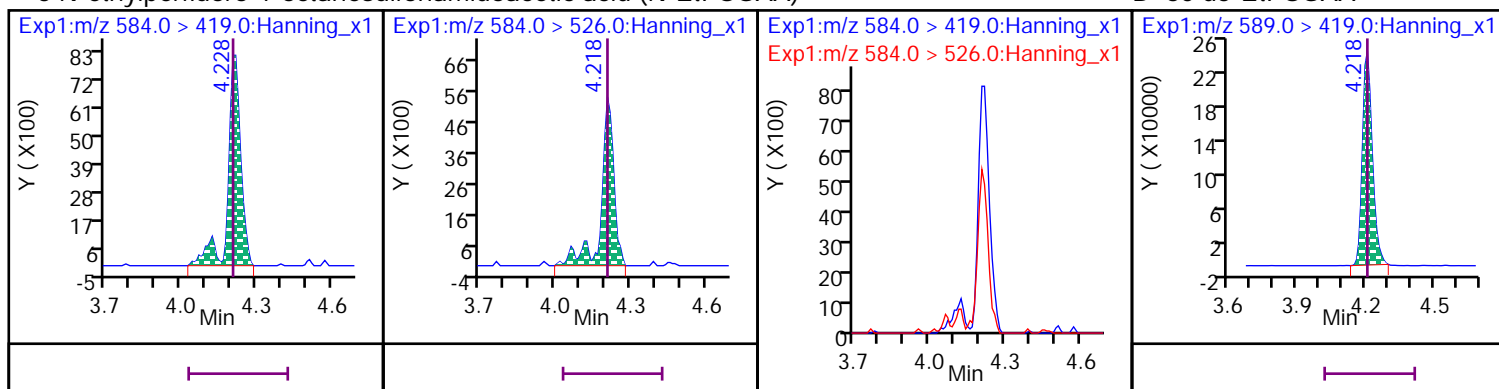
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



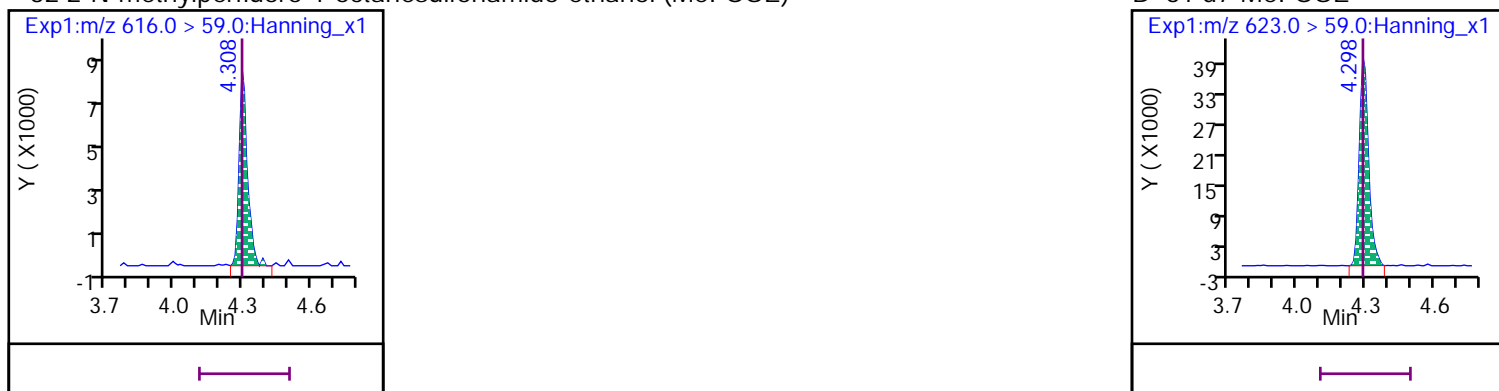
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



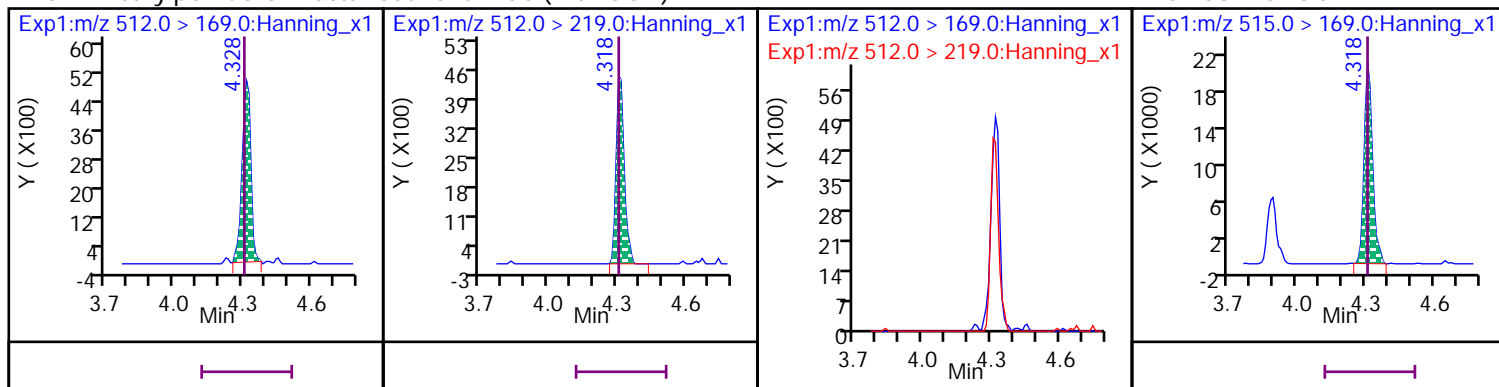
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

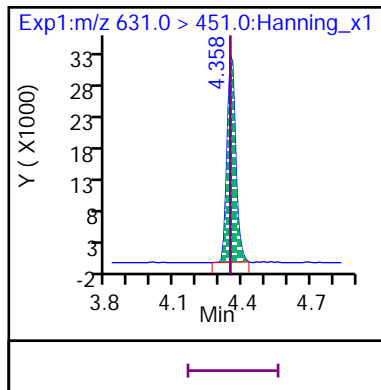


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

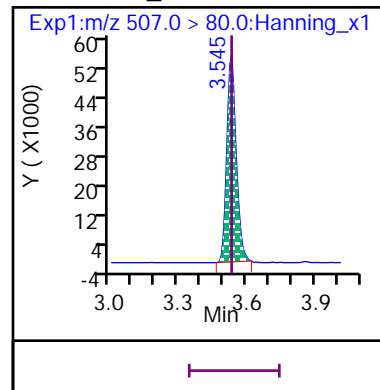
D 57 d3-MeFOSA



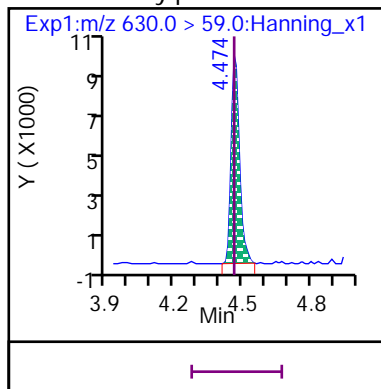
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



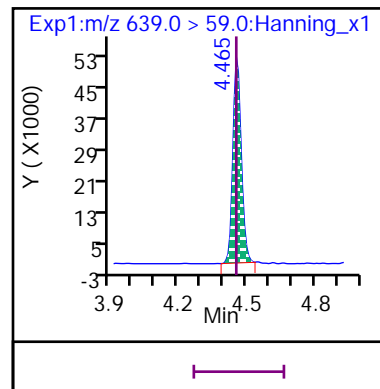
D 54 13C8\_PFOS



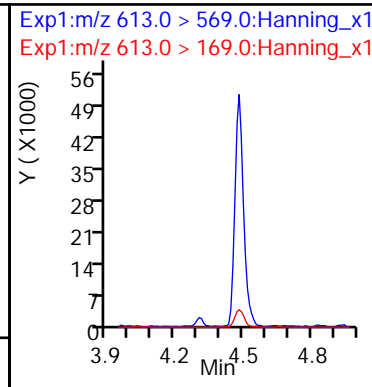
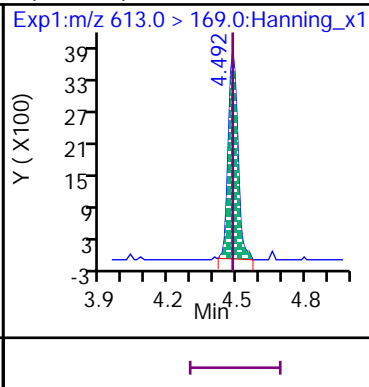
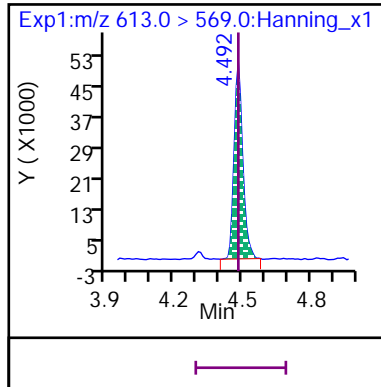
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



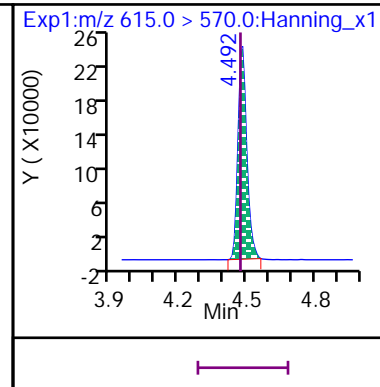
D 62 d9-EtFOSE



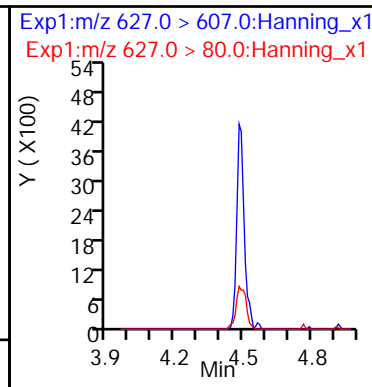
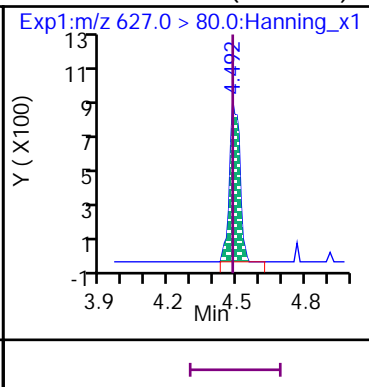
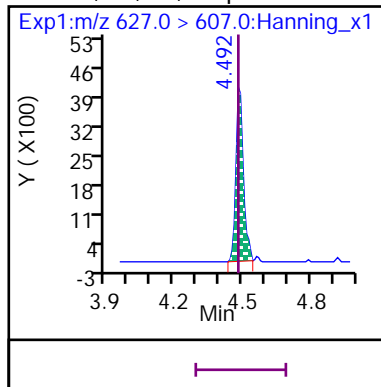
11 Perfluoro-n-dodecanoic acid (PFDoA)



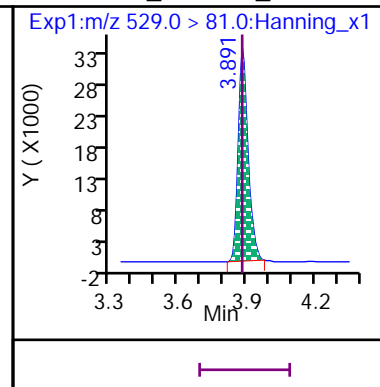
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

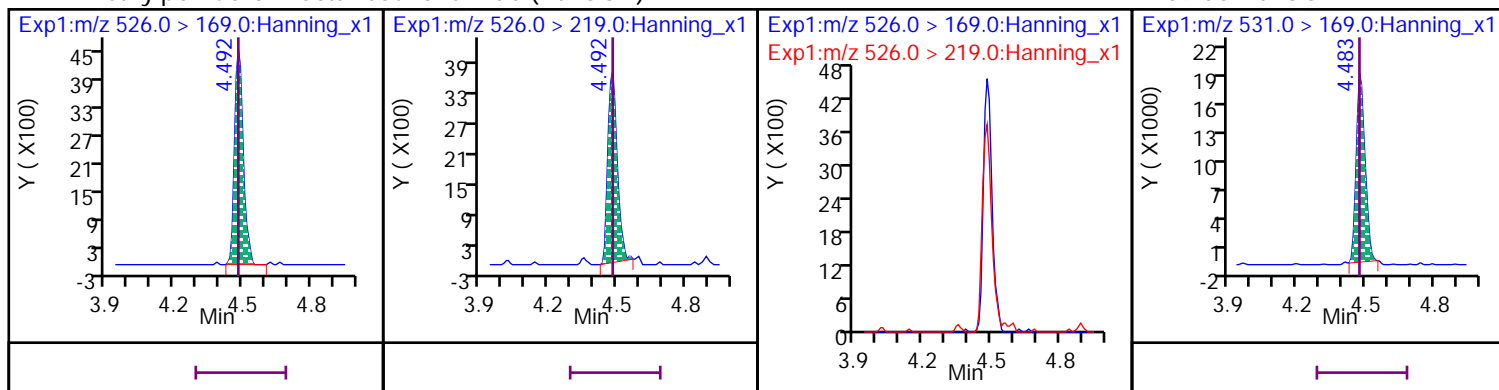


D 65 13C2\_8:2 FTS\_2



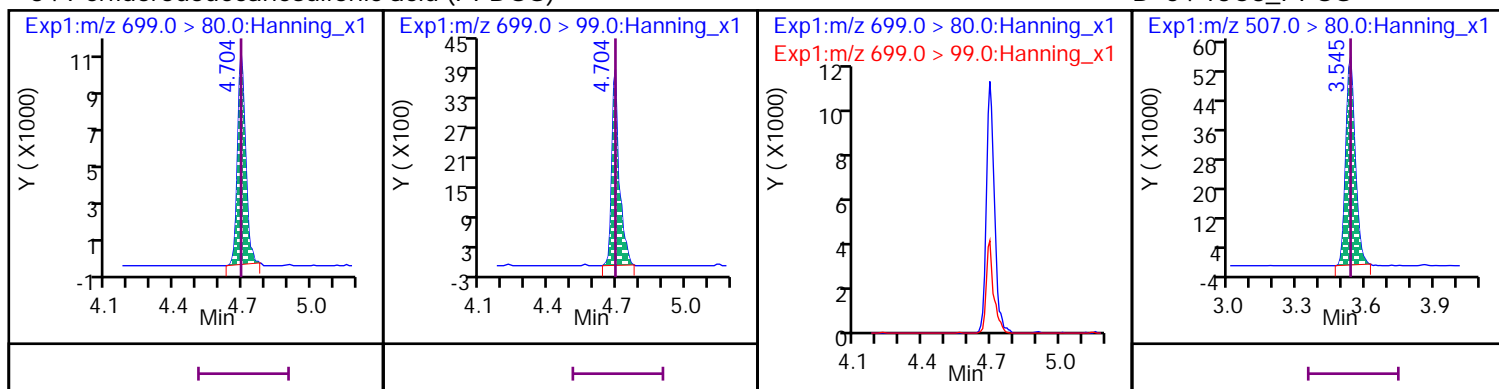
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



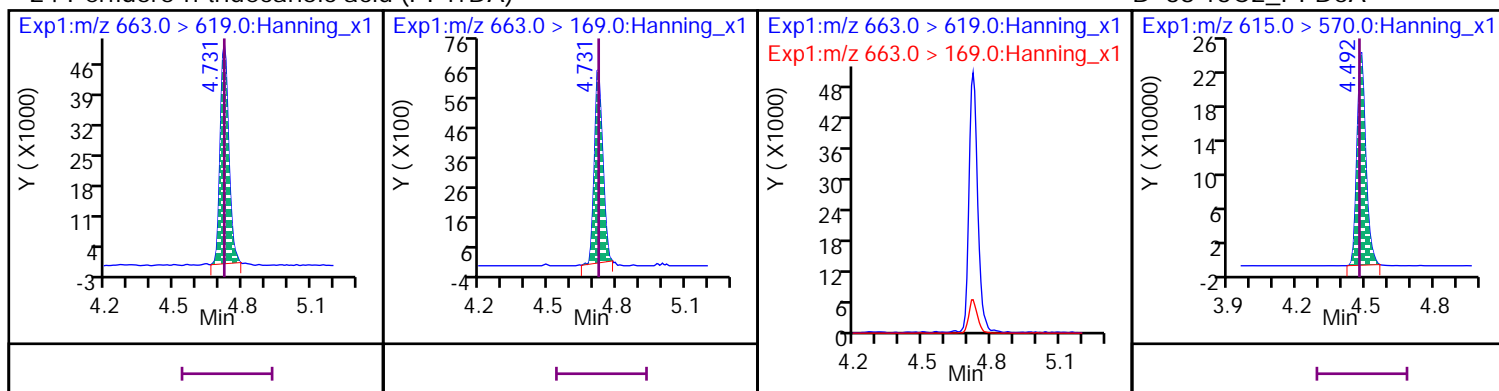
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



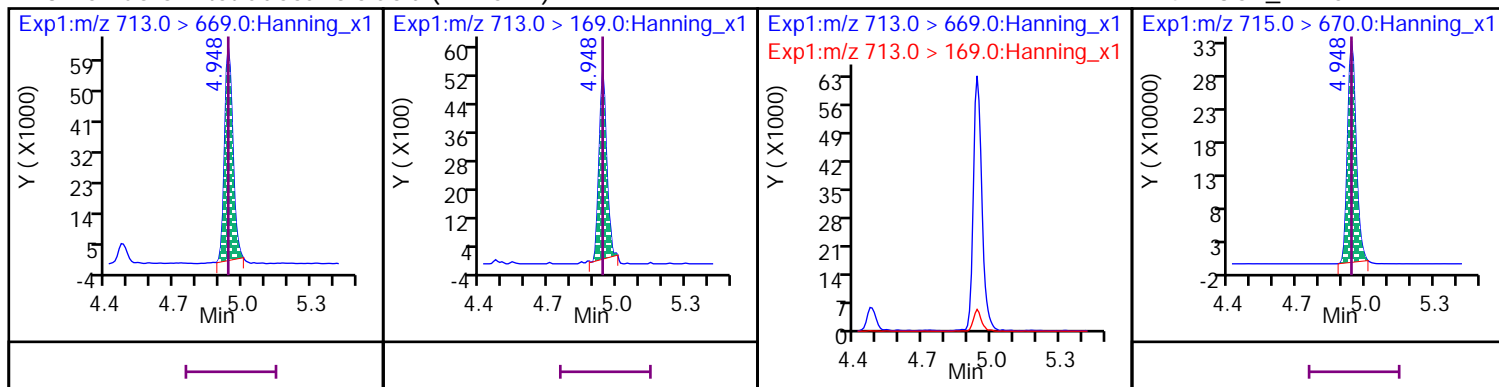
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



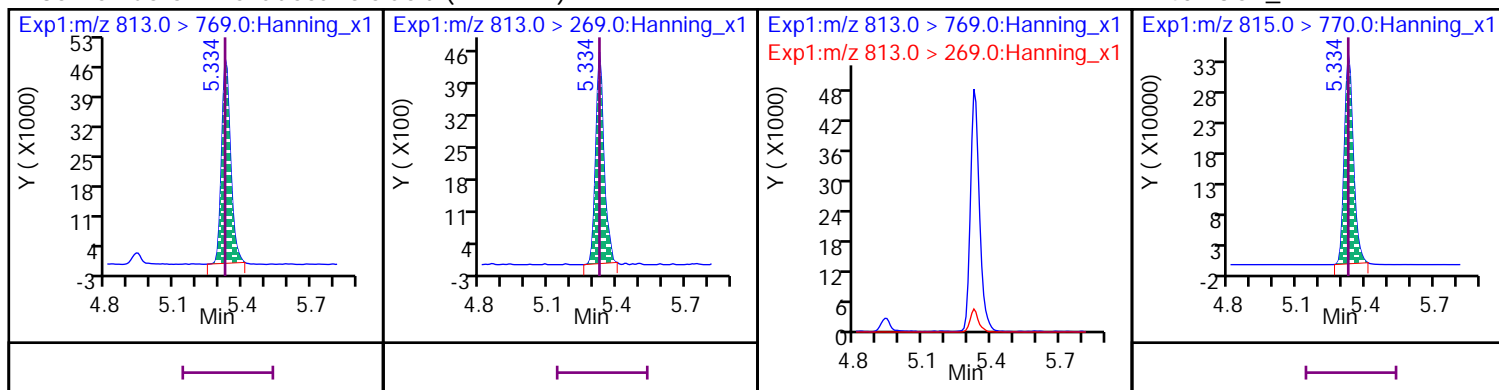
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



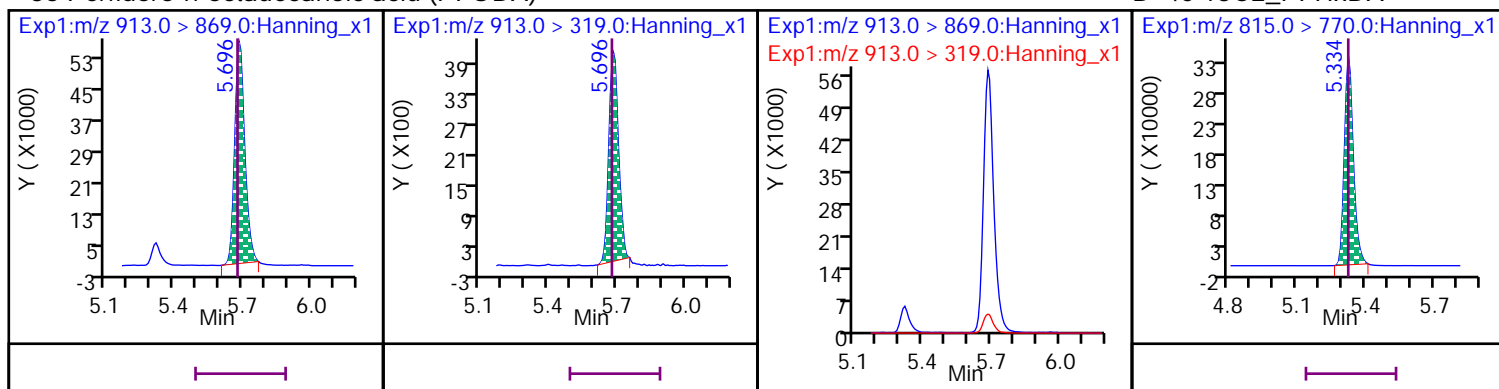
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

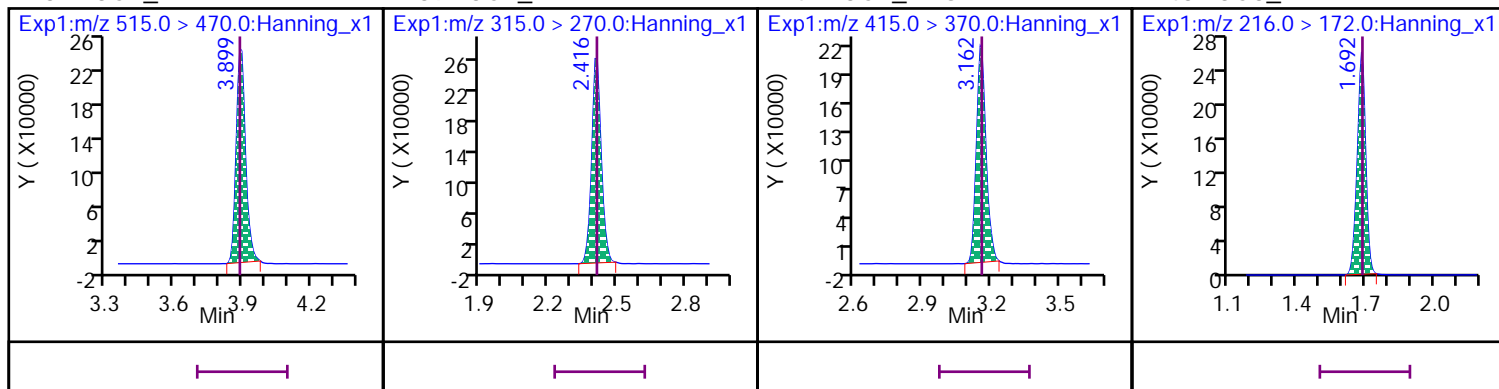


\* 37 13C2\_PFDA

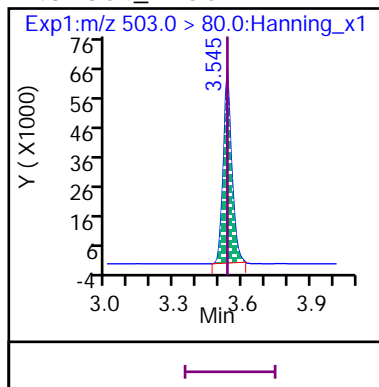
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720008.d

Injection Date: 17-Dec-2020 12:43:32

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 200\_SVLC-1221

Sample Info: ICAL 200\_SVLC-1221

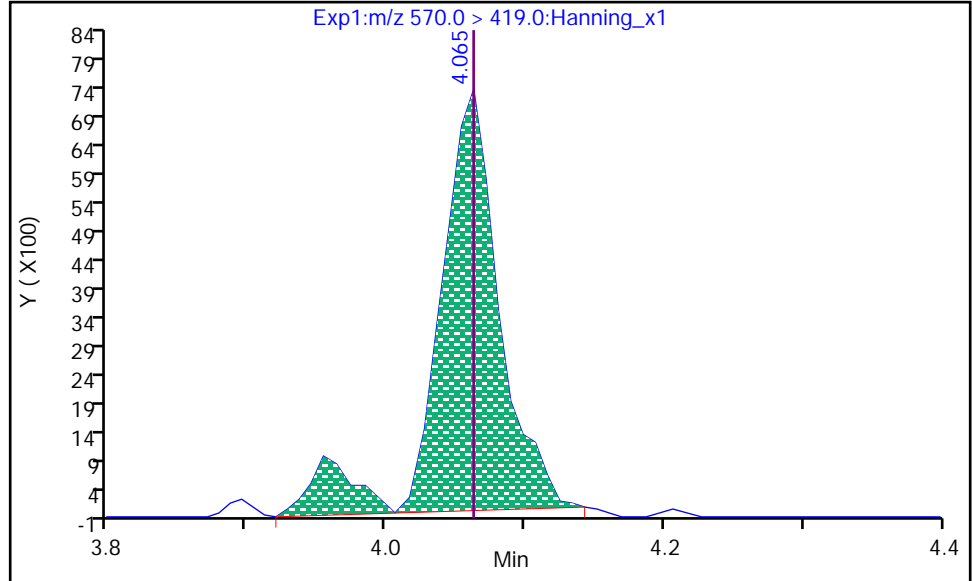
Dil. Factor: 1

Operator: Stephen E. Somerville

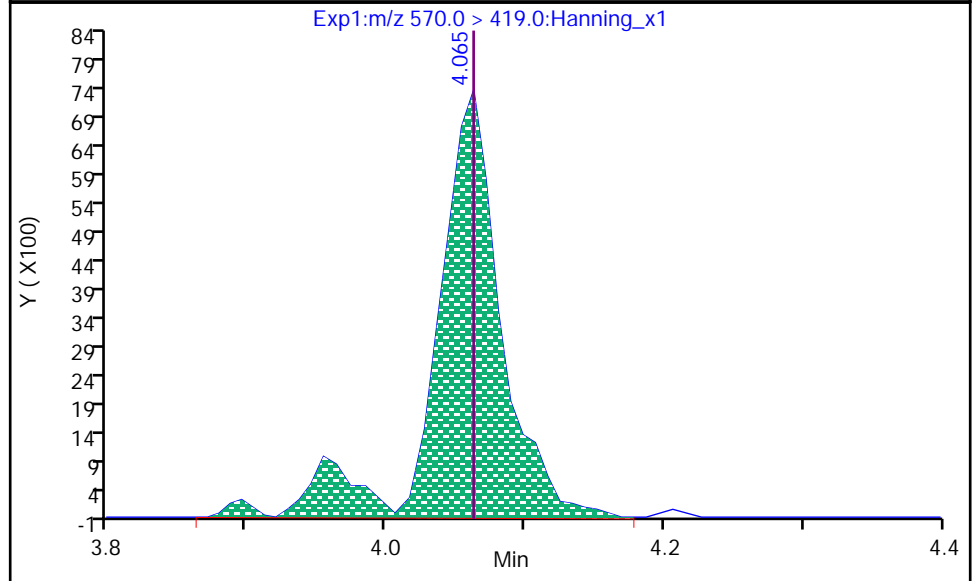
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.065  
Area: 22493  
Amount: 207.26  
Amount Units: ng/L

Processing Integration Results



RT: 4.065  
Area: 24498  
Amount: 222.54  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:10

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d  
 Injection Date: 17-Dec-2020 12:54:06 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 4 Auto Sampler: 4  
 Sample Info: ICAL 500\_SVLC-1222 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.690	1.696	0	706020	22	>100:1			1000.00	1017.98	96	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/1	332397	23	>100:1			500.00	472.70		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.062	2.072	0	686828	19	>100:1			1000.00	998.46	94.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/1	337453	25	>100:1			500.00	488.67		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	237792	17	>100:1			1000.00	1032.84	96	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	112525	16	>100:1	Target = 3.50		442.00	401.35		
298.9 > 99	44	2.125	2.125		31405	16	>100:1	3.58 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/0	88761	19	>100:1	Target = 3.10		469.00	430.31		
349 > 99	44	2.459	2.459		30551	21	>100:1	2.90 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	116793	20	>100:1			5000.00	4824.50	92.4	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	22151	18		Target = 1.80		467.00	475.17		
327 > 81	63	2.388	2.388		12675	21	93:1	1.74 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	746858	19	>100:1			1000.00	1013.28	96.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	356914	20	>100:1	Target = 18.34		500.00	484.05		
313 > 119	49	2.423	2.423		19380	16	>100:1	18.41 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1360808	19	>100:1			5000.00	5109.02	96.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.539	0/0	191755	25	>100:1	Target = 0.81		1000.00	980.66		
285 > 185	66	2.530	2.539		226814	18	>100:1	0.84 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	615843	20	>100:1			1000.00	1015.16	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	326766	20	>100:1	Target = 3.70		500.00	511.54		
363 > 169	47	2.781	2.790		81459	21	>100:1	4.01 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	177317	19	>100:1			1000.00	1035.56	98.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	73859	25	>100:1	Target = 3.21	0.17	455.00	392.85		
399 > 99	45	2.808	2.799		22408	16	87:1	3.29 (1.60-4.81)					
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	512996	19	>100:1	Target = 2.97		471.00	455.69		
377 > 85	45	2.827	2.827		165834	18	>100:1	3.09 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.176	3.169	1/0	73941	23	>100:1	Target = 3.08		476.00	459.03		
449 > 99	45	3.169	3.169		24975	25	>100:1	2.96 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	105177	25	>100:1			5000.00	5461.36	101	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	18208	22	>100:1	Target = 1.80		474.00	401.37		
427 > 81	64	3.135	3.135		10315	32	56:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	612816	25	>100:1			1000.00	1035.40	93.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	1/1	302064	22	>100:1	Target = 2.87		500.00	483.51		
413 > 169	53	3.169	3.169		103034	21	>100:1	2.93 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	149008	20	>100:1			1000.00	993.86	96.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	81969	38	>100:1	Target = 3.84	0.26	464.00	464.22		
499 > 99	54	3.545	3.545		20217	37	98:1	4.05 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/0	231609	22	>100:1			466.00	461.71		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	50413	18	>100:1	Target = 3.07		480.00	442.10		
549 > 99	54	3.891	3.891		20817	23	>100:1	2.42 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.207	4.198	1/0	50144	17	>100:1	Target = 3.03		482.00	463.70		
599 > 99	54	4.198	4.198		19495	20	>100:1	2.57 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	193040	17	>100:1			471.00	456.17		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	53473	18	>100:1	Target = 3.33		484.00	446.99		
699 > 99	54	4.704	4.704		18453	20	>100:1	2.89 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	769495	21	>100:1			1000.00	1024.68	97.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	367390	21	>100:1	Target = 6.16		500.00	477.43		
463 > 169	56	3.545	3.545		61446	22	>100:1	5.97 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	328216	20	>100:1			1000.00	1060.25	99.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	160438	21	>100:1			500.00	496.04		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	96787	19	>100:1			5000.00	5217.59	104	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	16908	18	>100:1	Target = 1.95		479.00	425.09		
527 > 81	65	3.891	3.891		10128	25	36:1	1.66 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	19906	17	>100:1	Target = 3.14		482.00	445.00		
627 > 80	65	4.492	4.492		6411	19	67:1	3.10 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	685807	21	>100:1			1000.00	1033.88	98.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	336009	20	>100:1	Target = 15.94		500.00	498.63		
513 > 169	51	3.899	3.899		15544	13	>100:1	21.61 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	713379	19	>100:1			5000.00	4969.92	93.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	56256	32	>100:1	Target = 1.33	0.09	500.00	513.30		M
570 > 483	58	4.065	4.065		39759	31	>100:1	1.41 (0.66-1.99)	0.19				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	710894	19	>100:1			5000.00	5352.53	96.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/0	66323	32	>100:1	Target = 1.58	0.13	500.00	468.55		
584 > 526	60	4.218	4.217		41879	31	>100:1	1.58 (0.79-2.37)	0.18				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	625031	17	>100:1			1000.00	988.86	92.1	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	273549	17	>100:1	Target = 15.50		500.00	465.65		
563 > 169	52	4.218	4.217		16210	15	69:1	16.87 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	110965	15	>100:1			1000.00	1025.48	94.6	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	49699	15	>100:1			500.00	476.67		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	46102	14	>100:1			1000.00	871.22	83.9	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	27401	20	>100:1	Target = 1.12		500.00	526.82		
512 > 219	57	4.328	4.318		27087	15	>100:1	1.01 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	131192	18	>100:1			1000.00	1046.23	108	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	52319	17	>100:1			500.00	448.25		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	617850	16	>100:1			1000.00	1020.70	95.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	313202	16	>100:1	Target = 10.85		500.00	500.58		
613 > 169	38	4.492	4.492		28793	24	>100:1	10.87 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.724	4.731	0/-1	299656	22	>100:1	Target = 8.37		500.00	492.41		
663 > 169	38	4.731	4.731		34403	22	>100:1	8.71 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	45944	16	>100:1			1000.00	935.83	89.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	26818	15	>100:1	Target = 1.03		500.00	534.28		
526 > 219	59	4.501	4.492		24603	14	>100:1	1.09 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	856925	20	>100:1			1000.00	1017.19	96.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	363719	21	42:1	Target = 12.11		500.00	489.87		
713 > 169	42	4.948	4.948		29417	18	>100:1	12.36 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	910723	19	>100:1			1000.00	1005.03	99.7	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	288509	18	88:1	Target = 11.48		500.00	484.84		
813 > 269	40	5.334	5.334		26566	17	>100:1	10.86 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	390009	24	41:1	Target = 13.88		500.00	483.77		
913 > 319	40	5.696	5.689		28458	33	>100:1	13.70 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	674242	18	>100:1					92.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	712364	19	>100:1					94.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	1	603232	24	>100:1					93.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	635147	23	>100:1					95.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	161217	22	>100:1					99.2	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d

Injection Date: 17-Dec-2020 12:54:06

Inst. ID: LCMSMS02

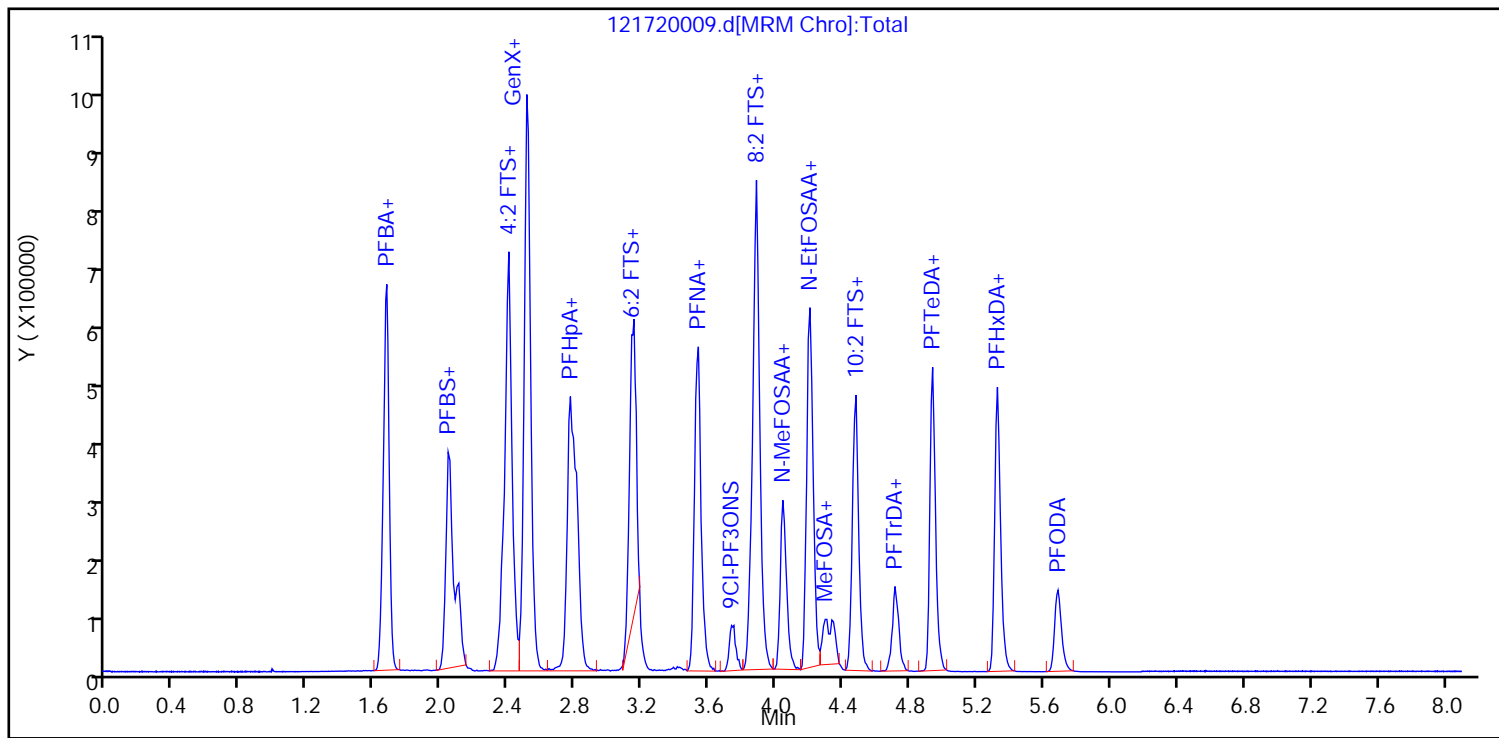
Client ID:

Lab ID: ICAL 500\_SVLC-1222

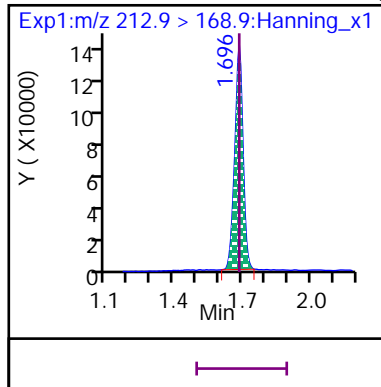
Sample Info: ICAL 500\_SVLC-1222

Dil. Factor: 1

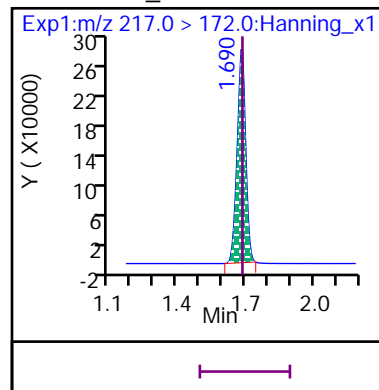
Operator: Stephen E. Somerville



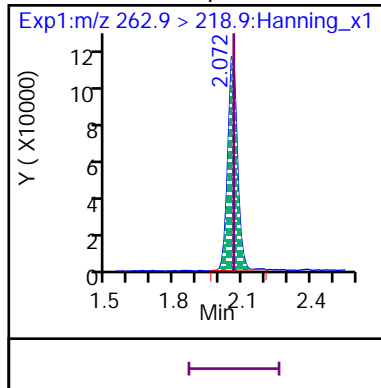
8 Perfluoro-n-butanoic acid (PFBA)



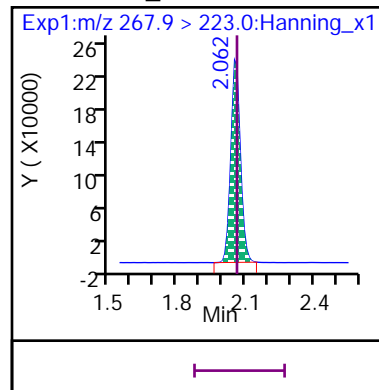
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

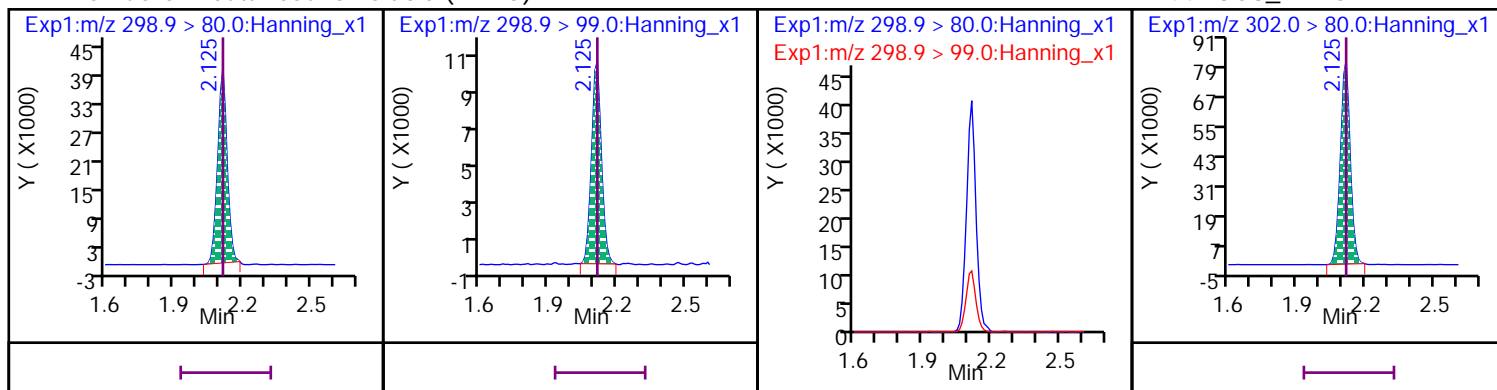


D 50 13C5\_PFPeA



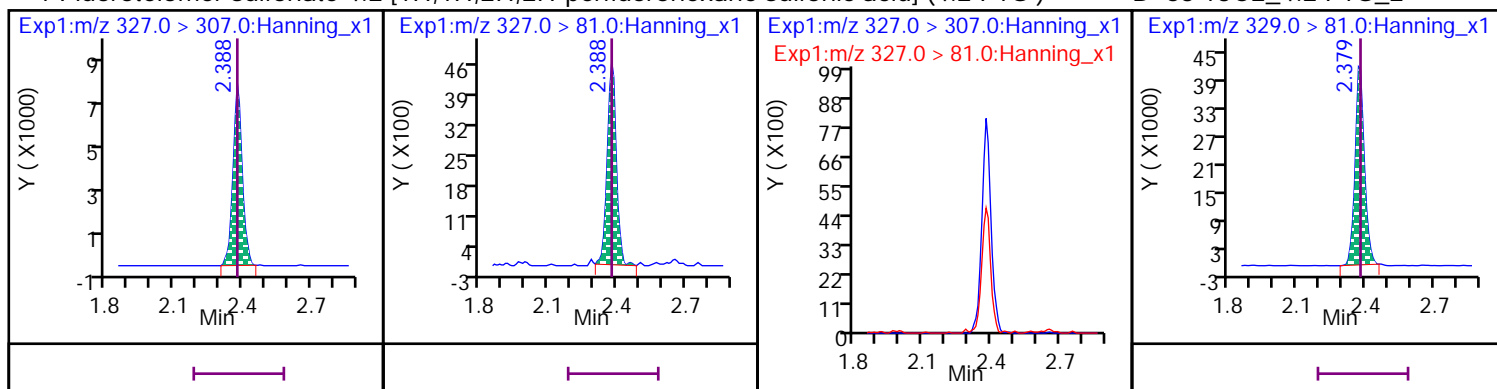
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



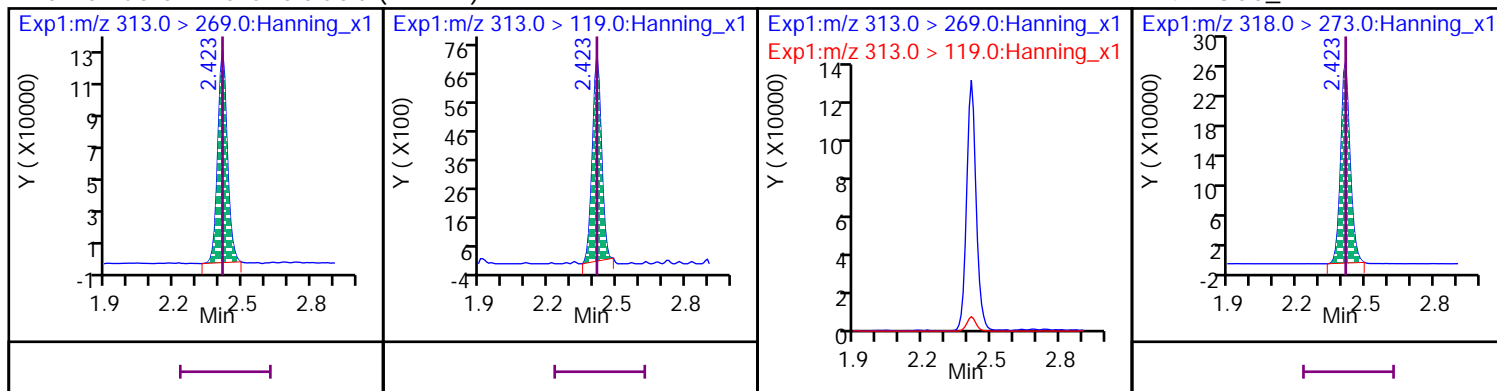
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



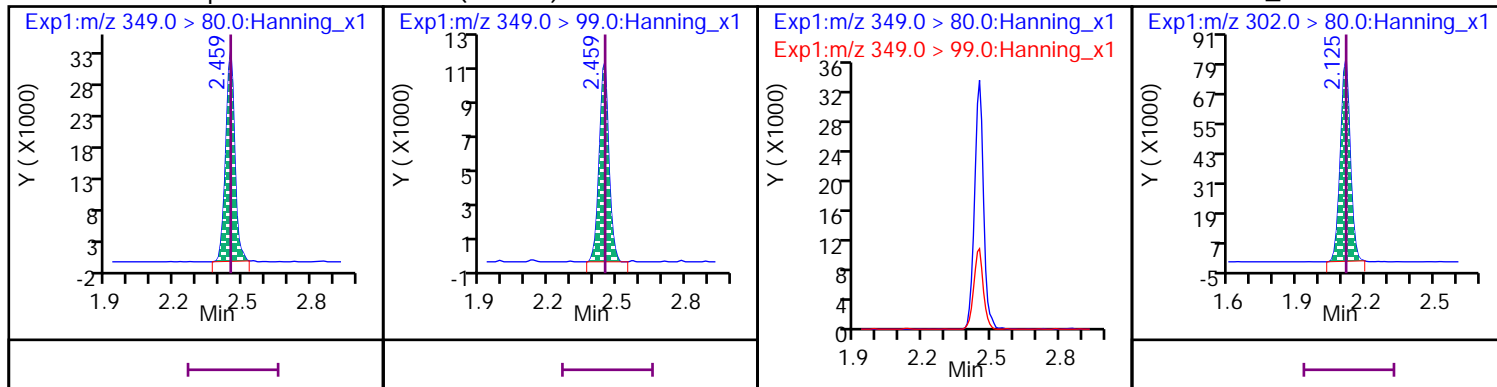
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



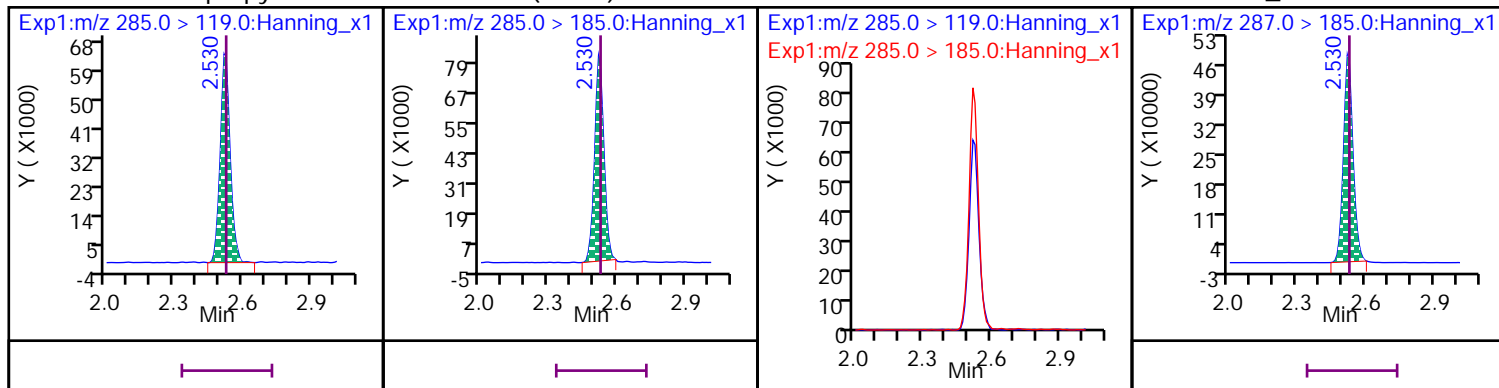
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



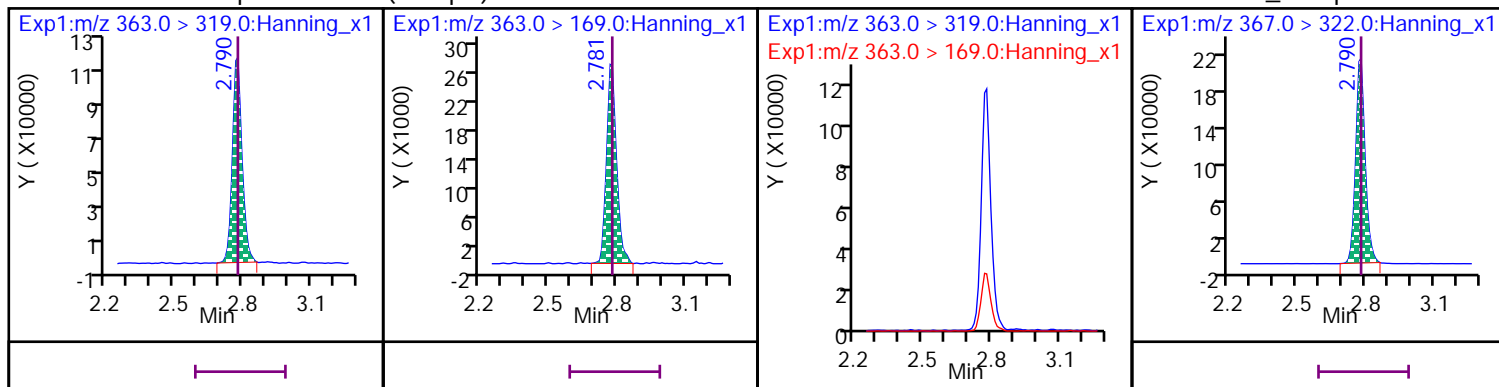
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



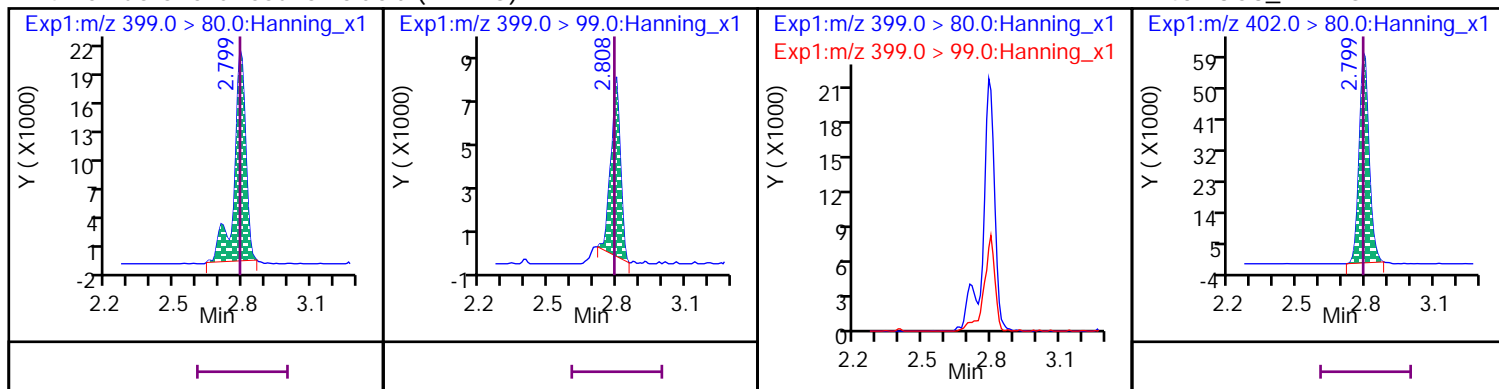
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



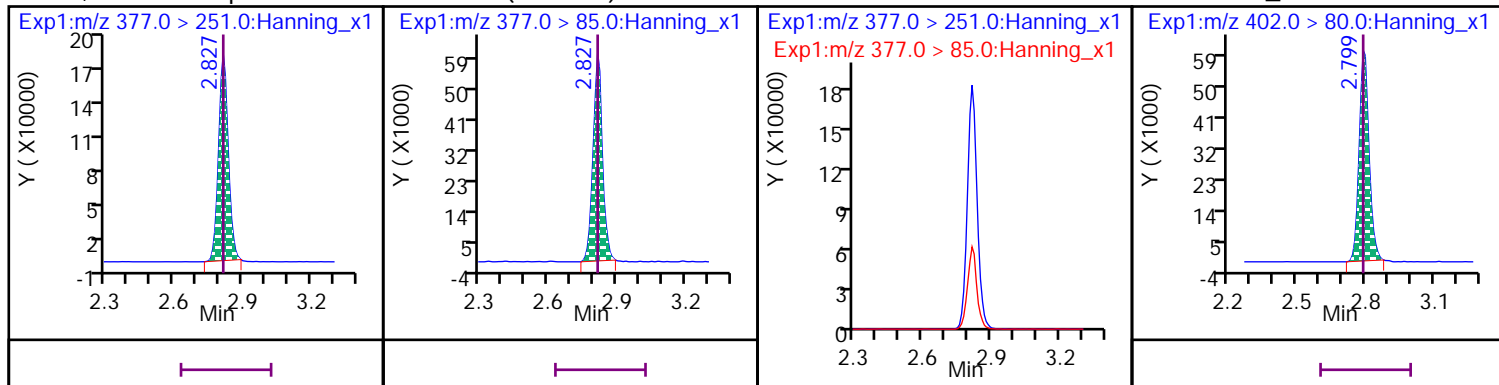
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



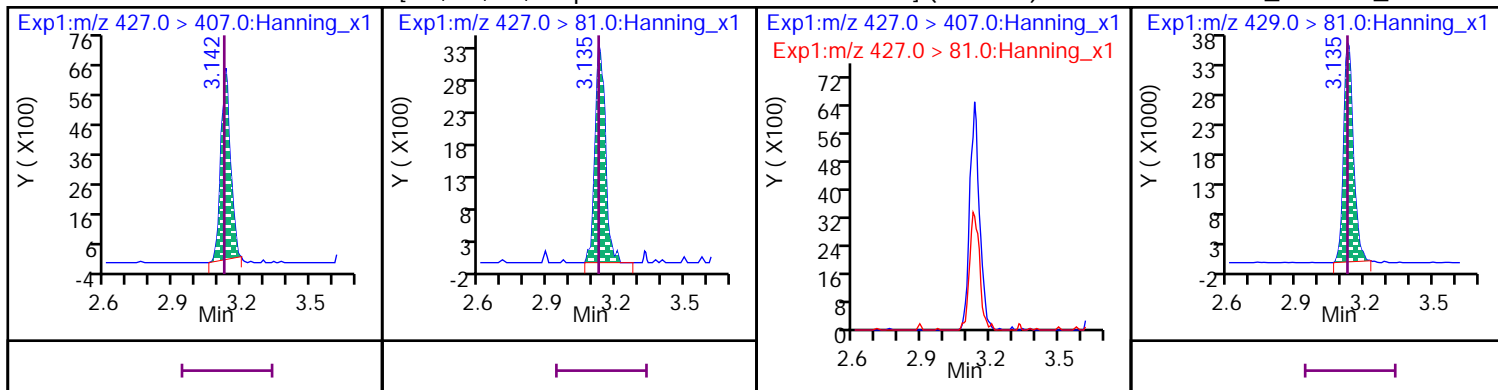
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



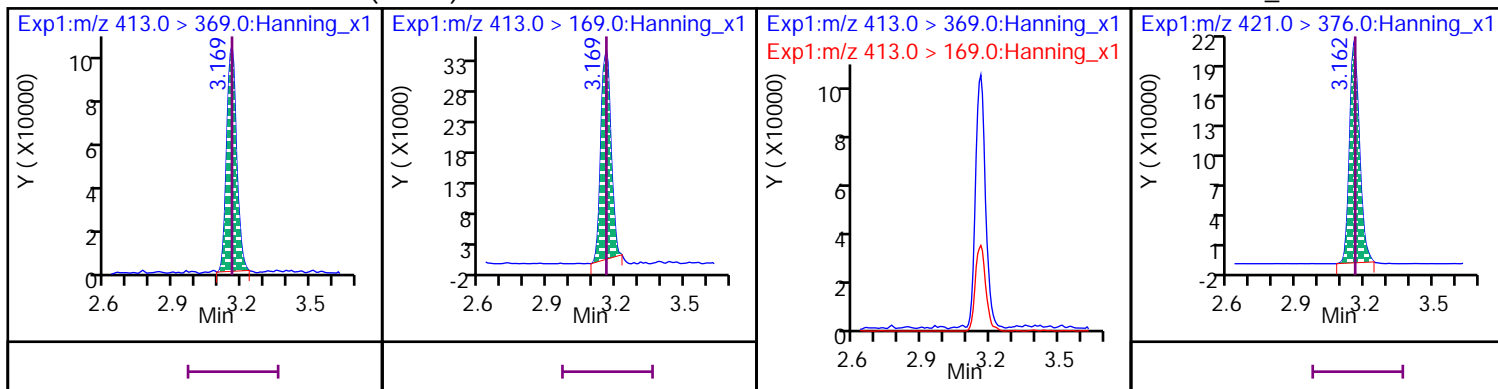
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



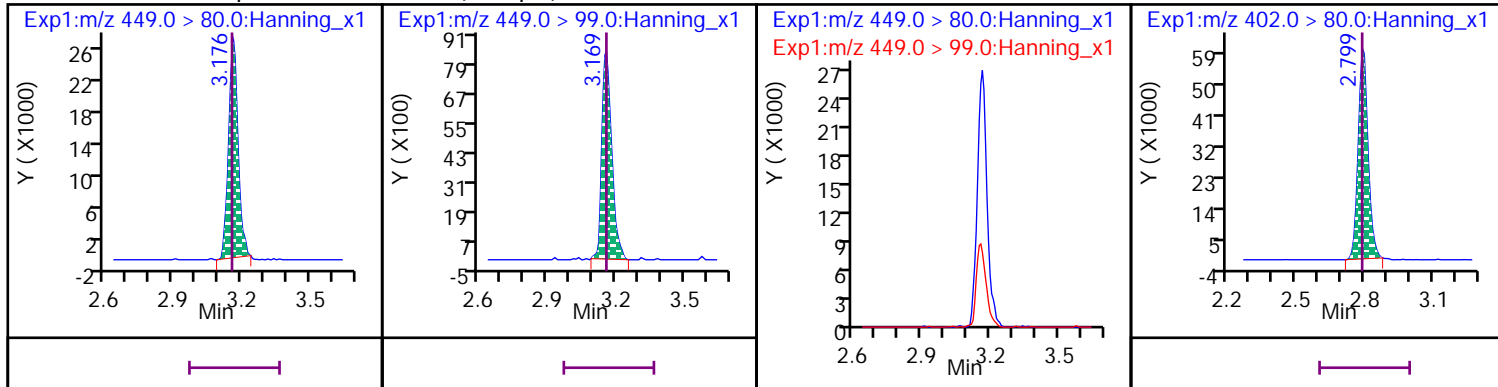
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



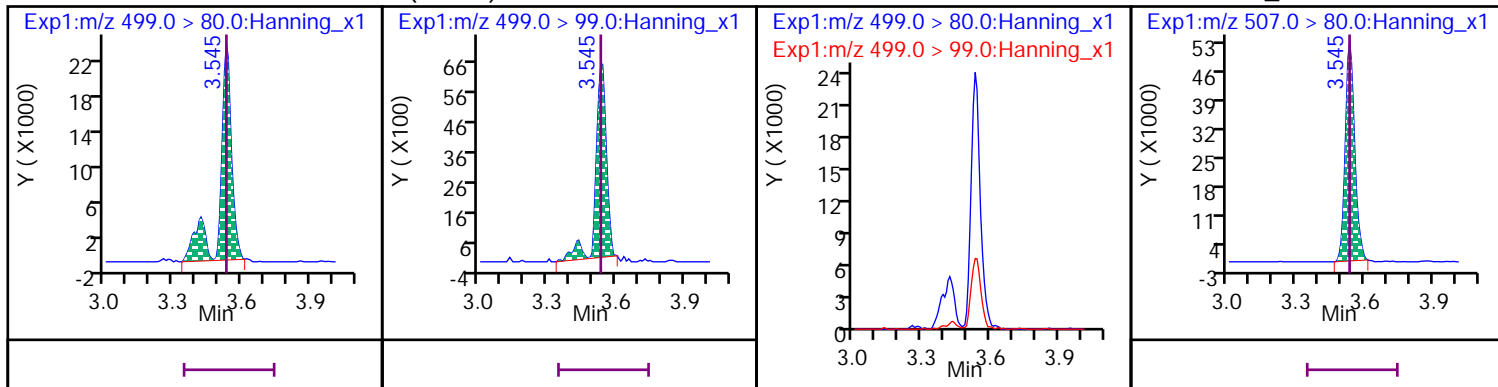
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

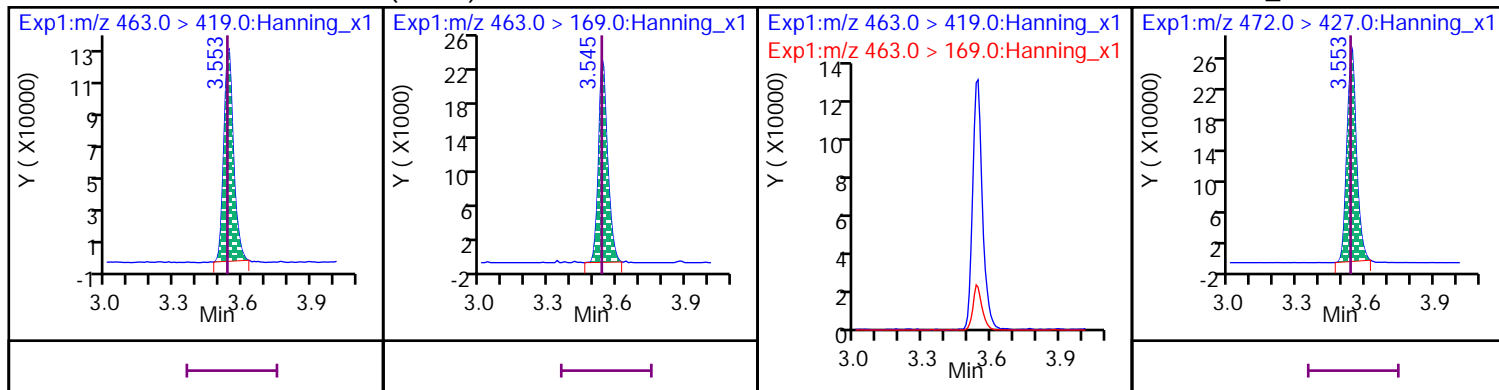
D 54 13C8\_PFOS





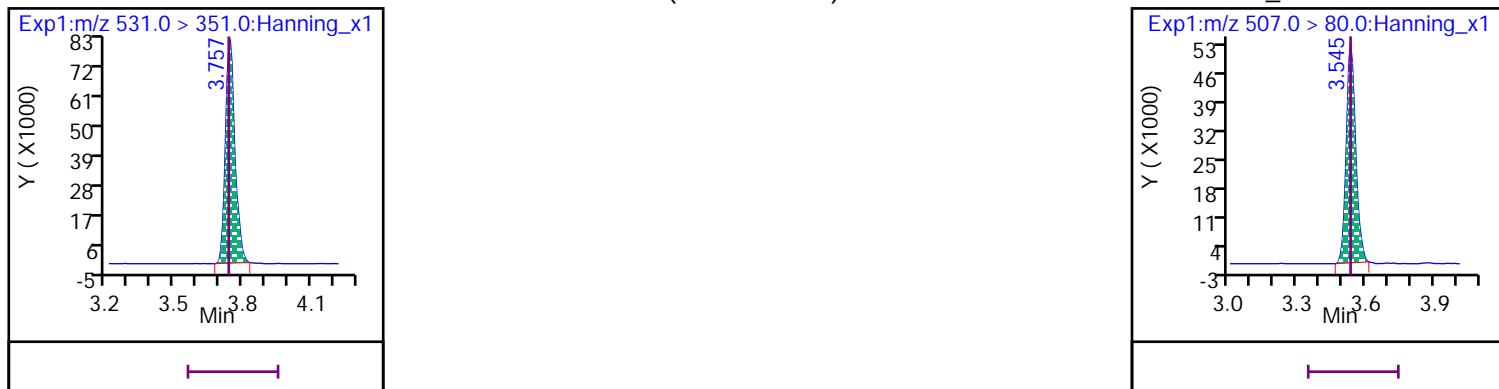
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



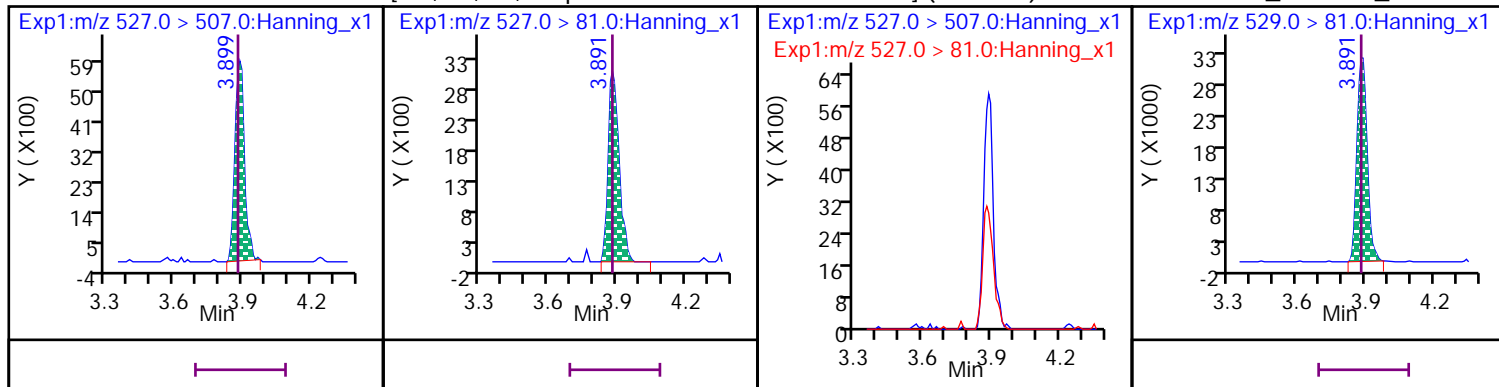
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



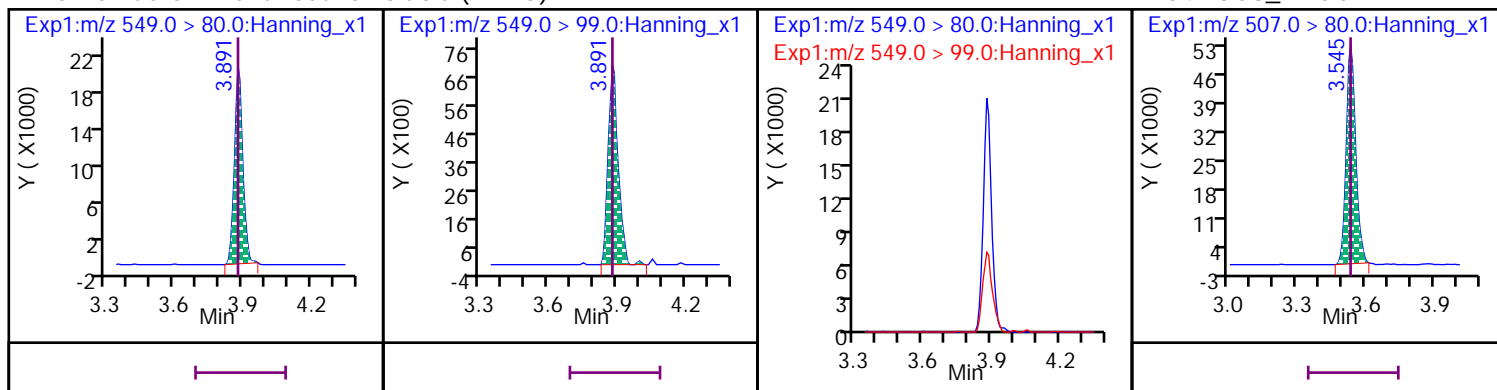
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



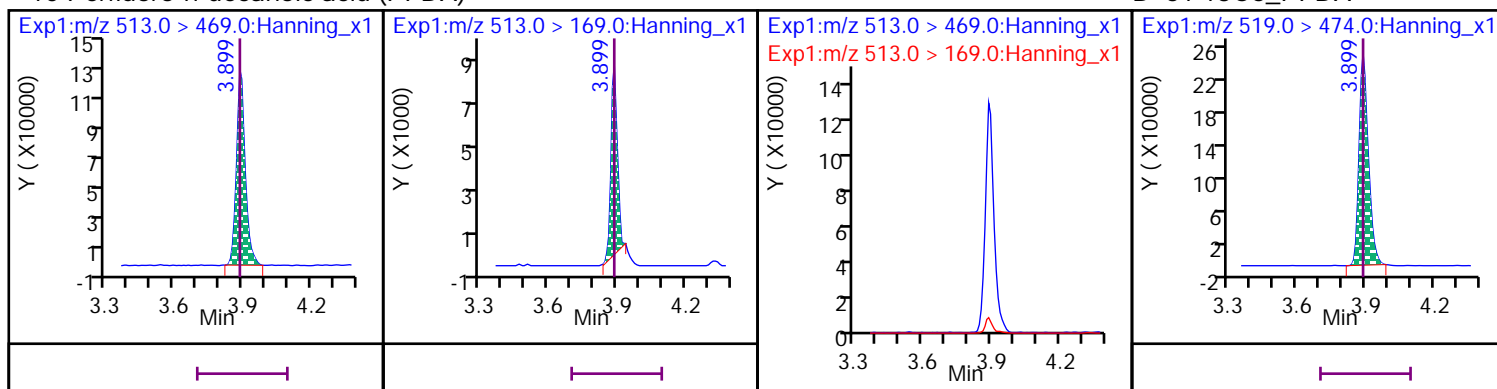
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



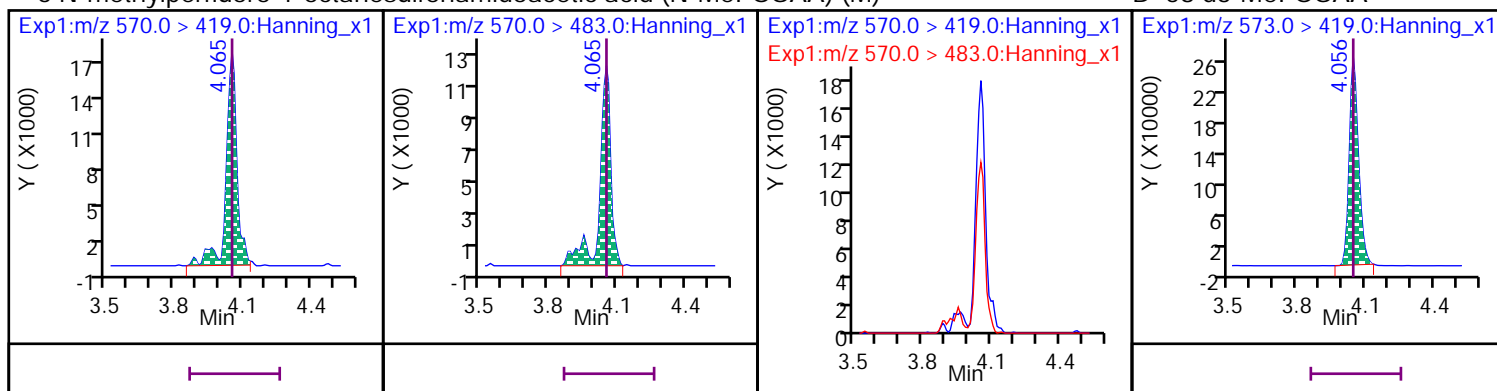
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



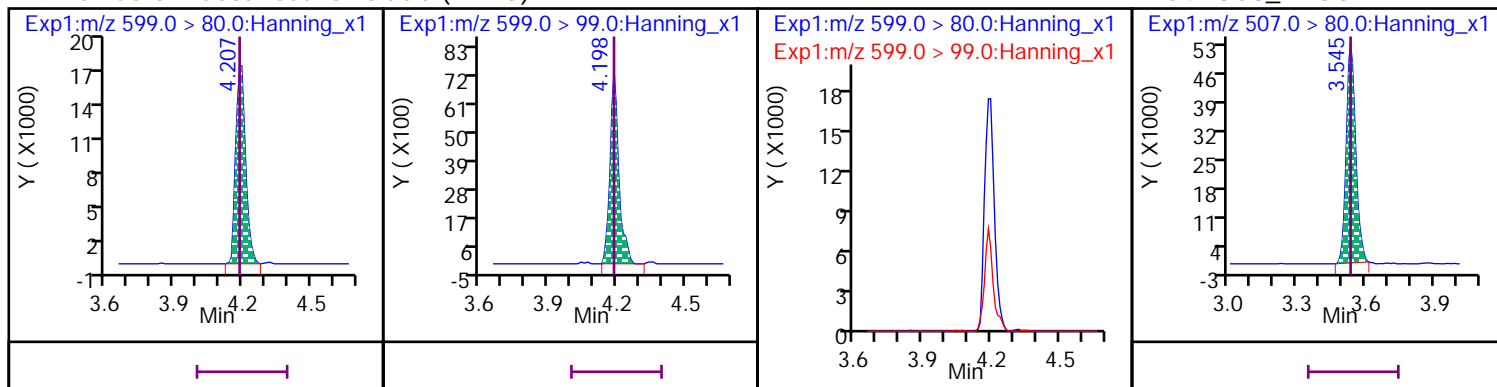
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



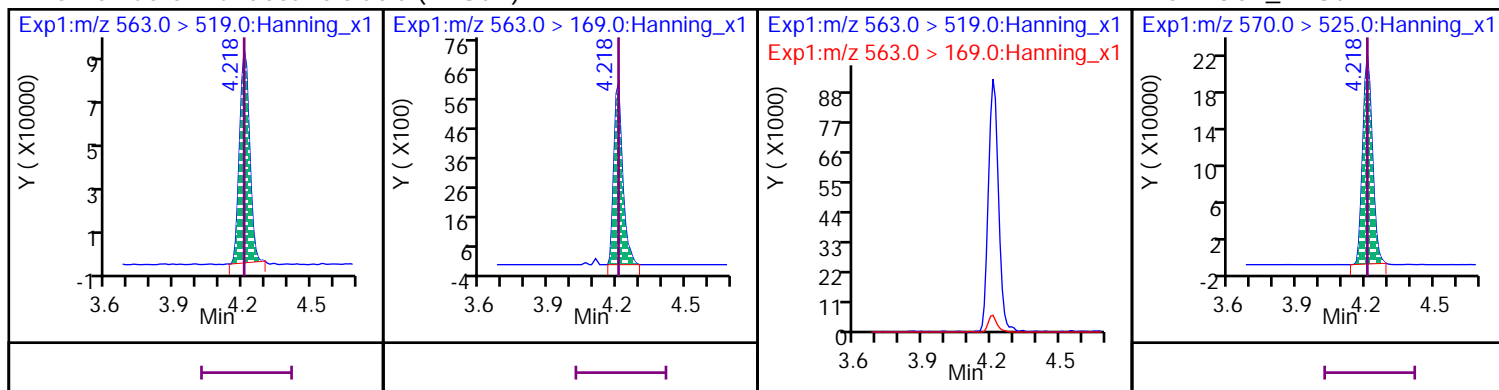
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



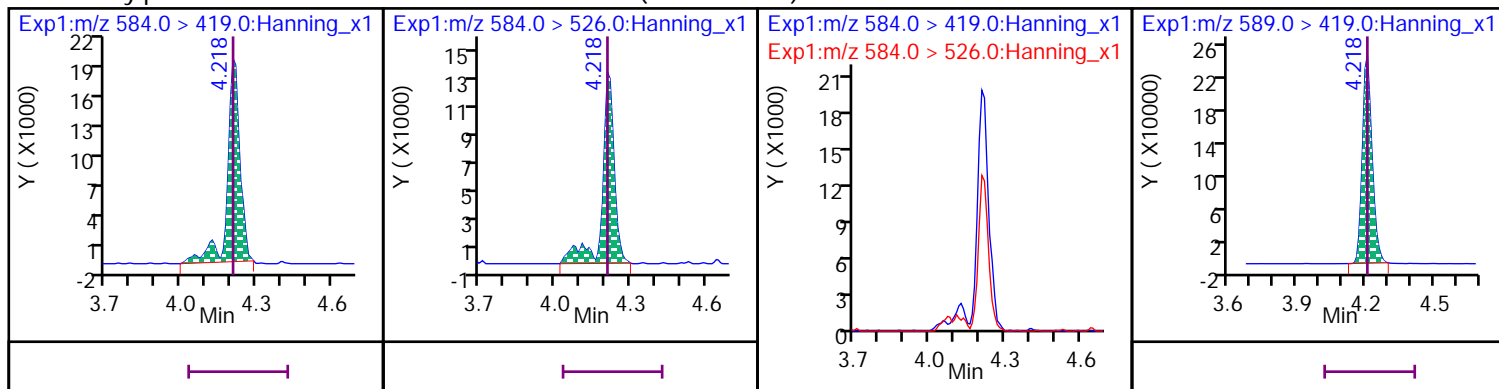
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



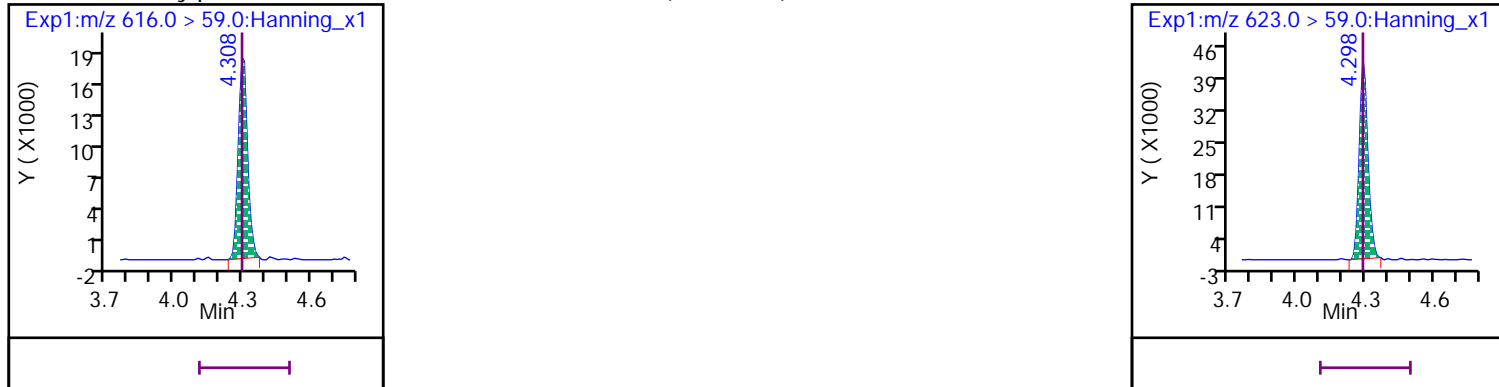
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



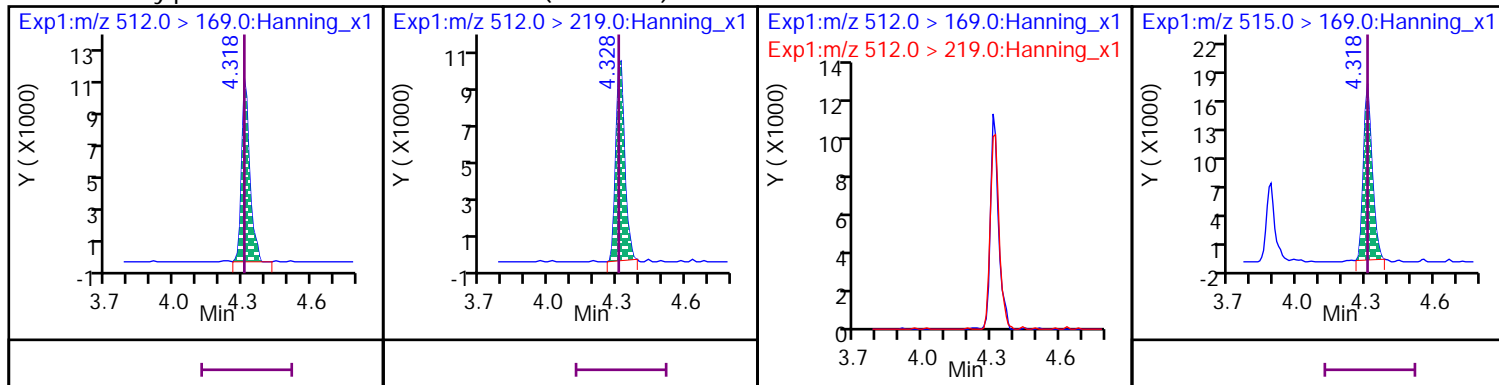
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

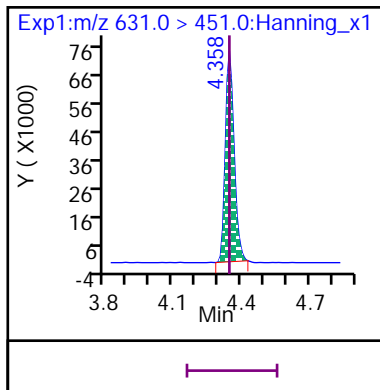


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

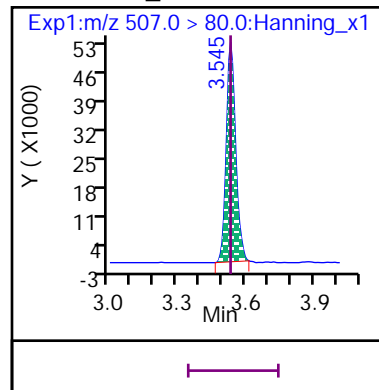
D 57 d3-MeFOSA



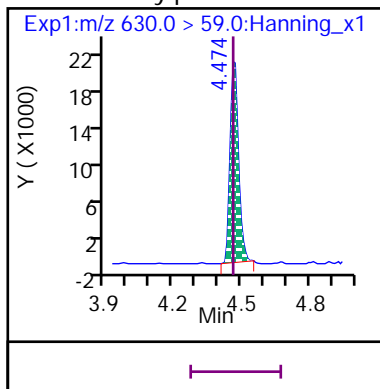
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



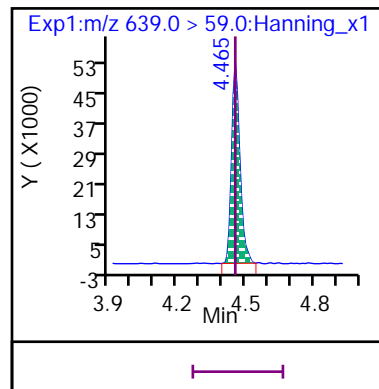
D 54 13C8\_PFOS



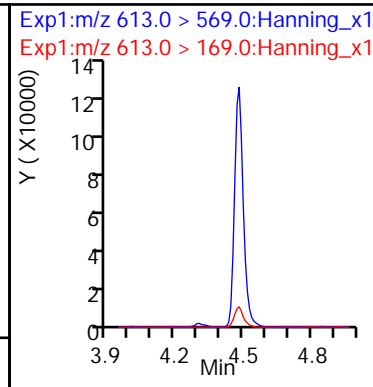
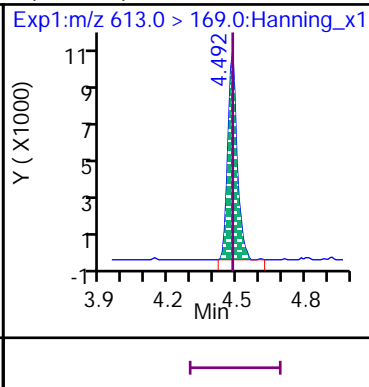
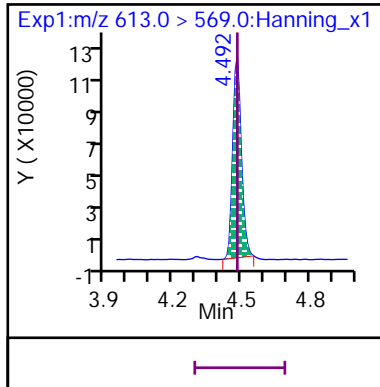
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



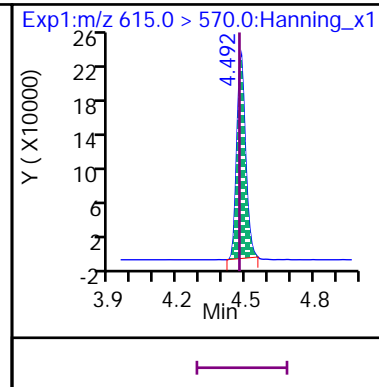
D 62 d9-EtFOSE



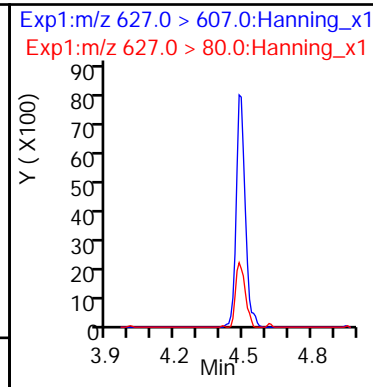
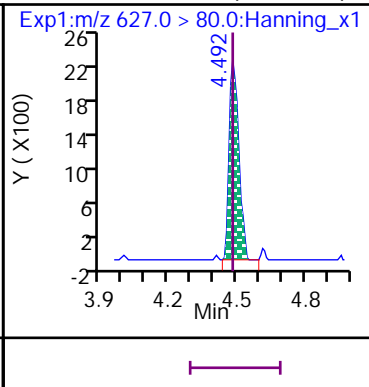
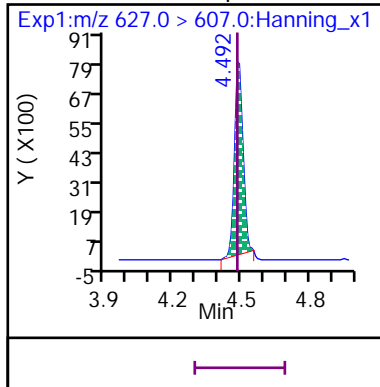
11 Perfluoro-n-dodecanoic acid (PFDoA)



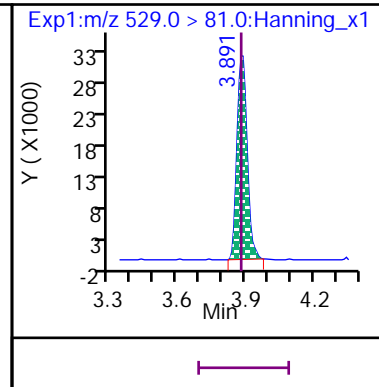
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

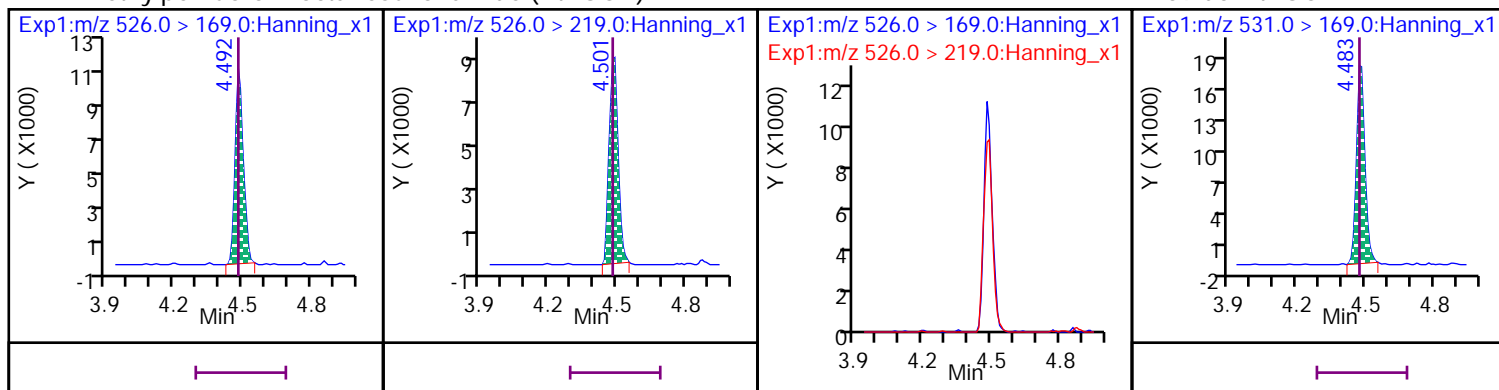


D 65 13C2\_8:2 FTS\_2



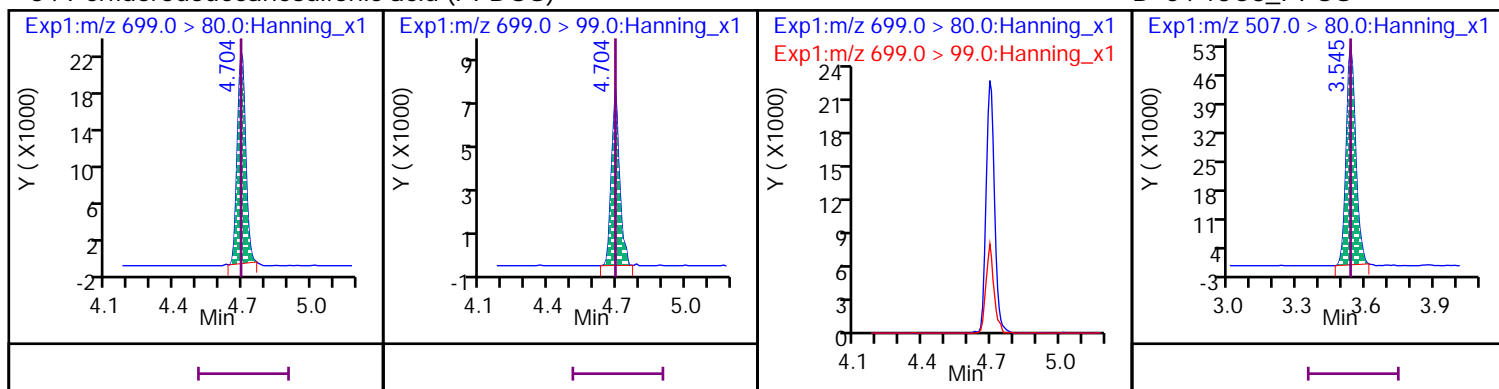
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



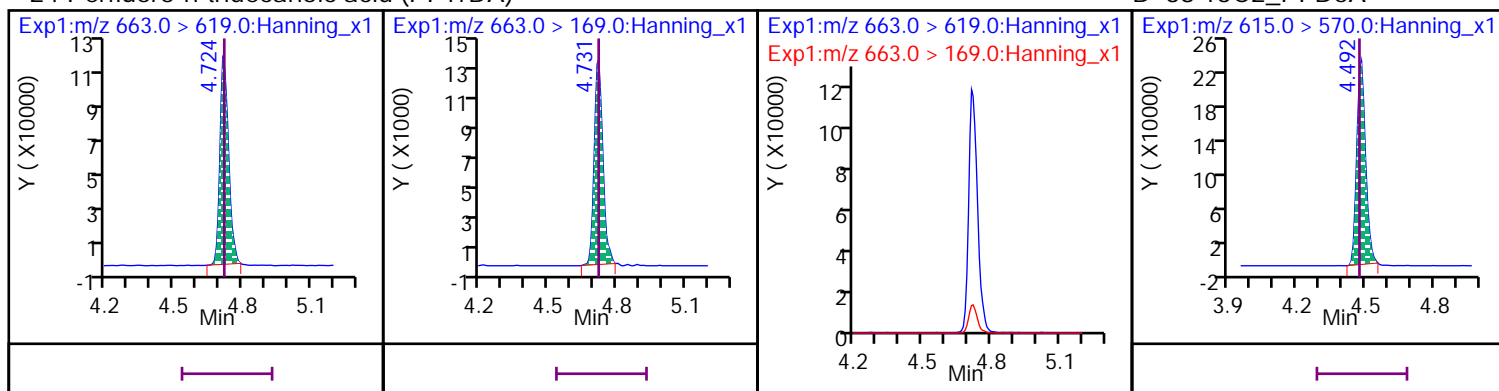
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



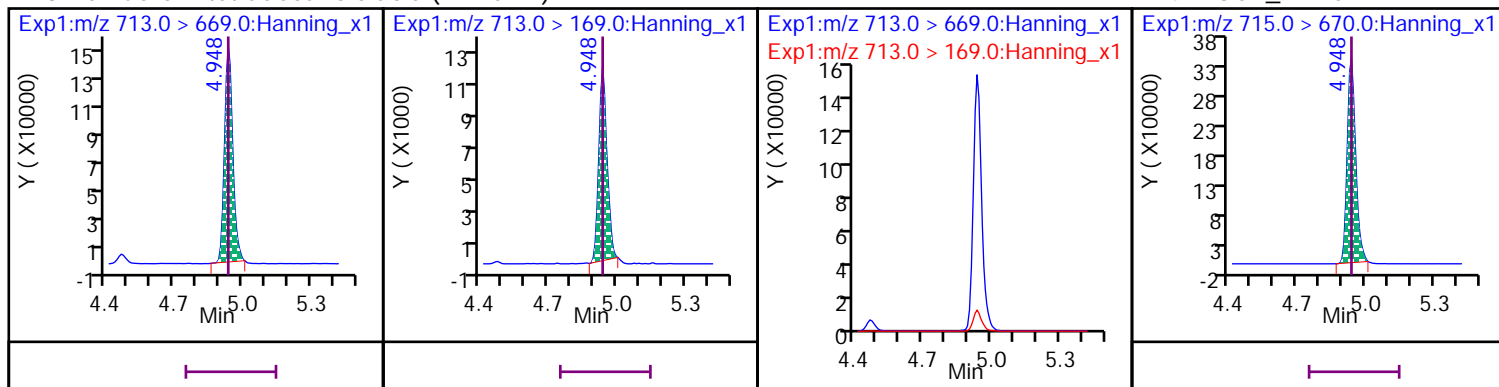
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



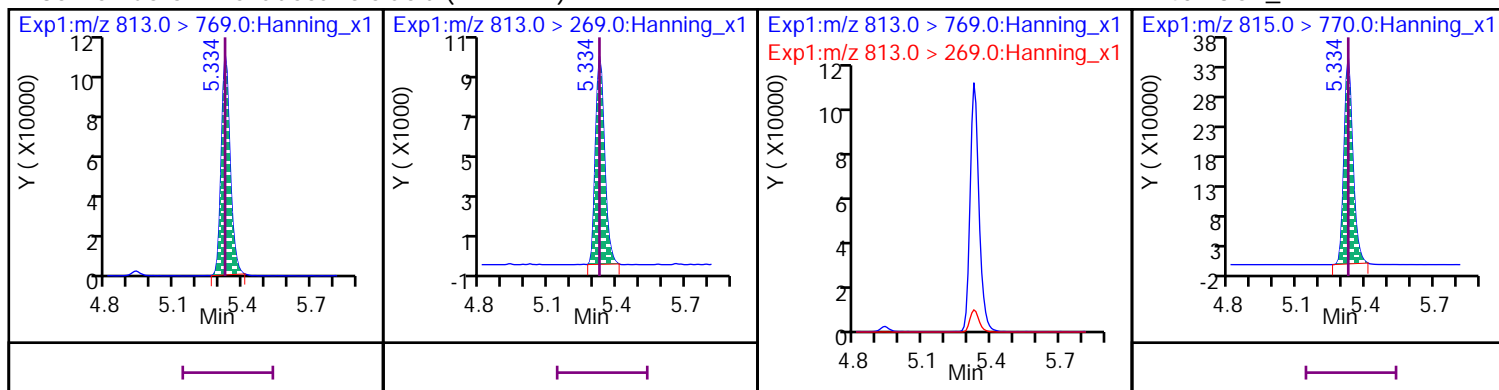
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



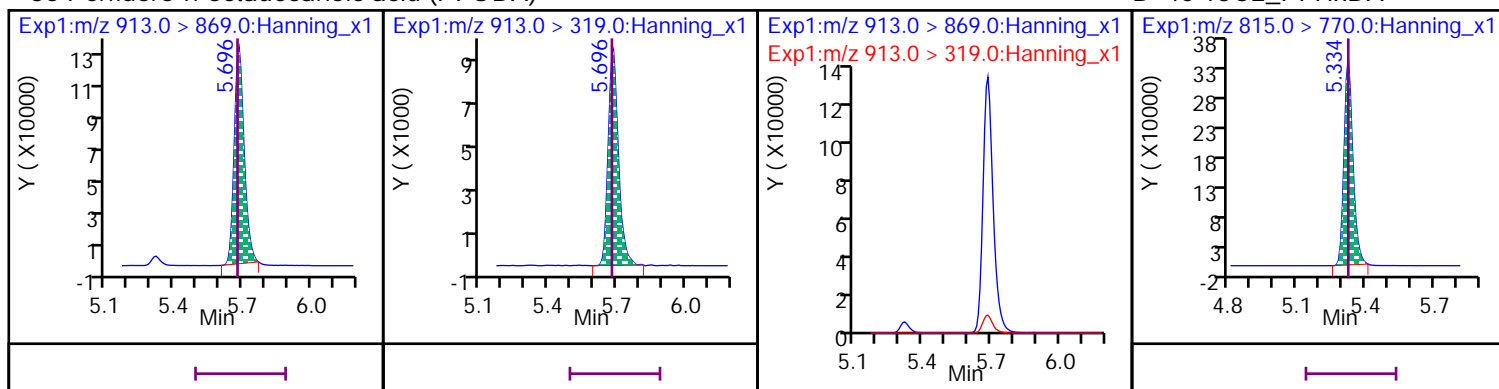
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

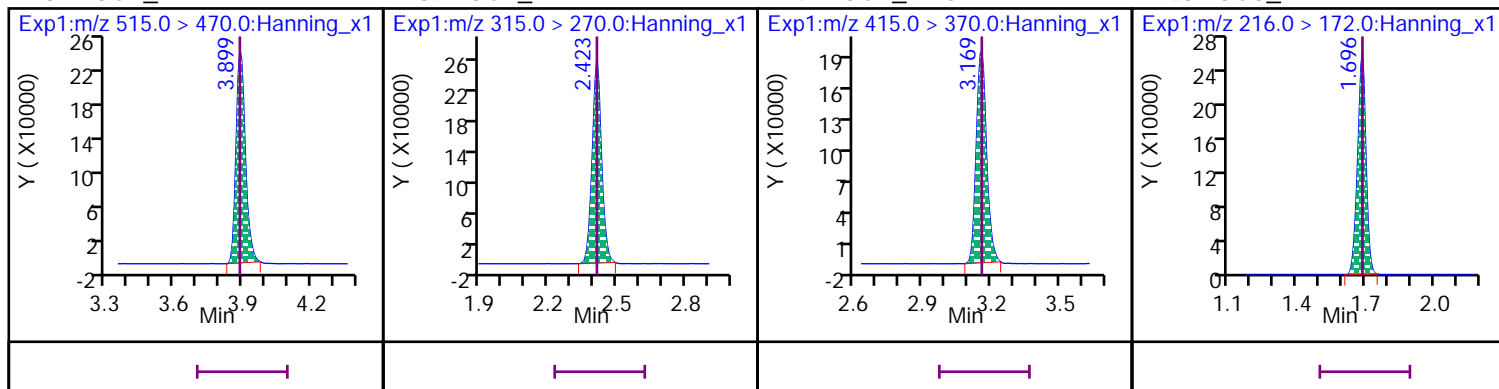


\* 37 13C2\_PFDA

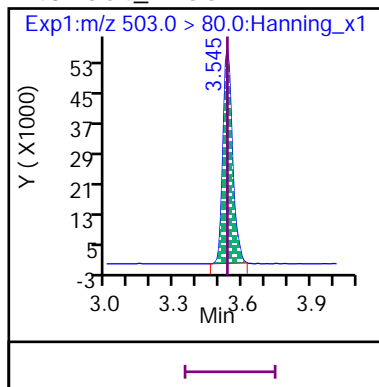
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720009.d

Injection Date: 17-Dec-2020 12:54:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 500\_SVLC-1222

Sample Info: ICAL 500\_SVLC-1222

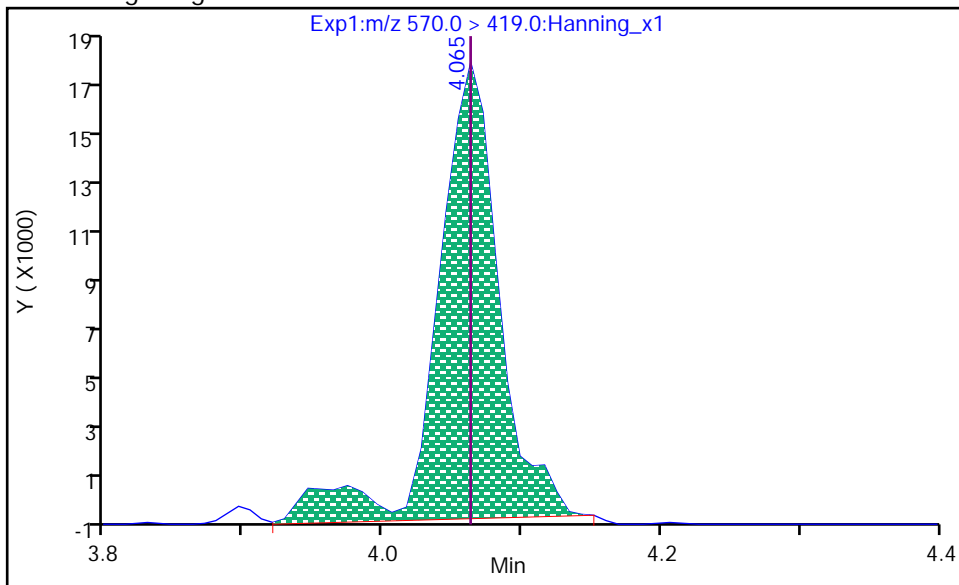
Dil. Factor: 1

Operator: Stephen E. Somerville

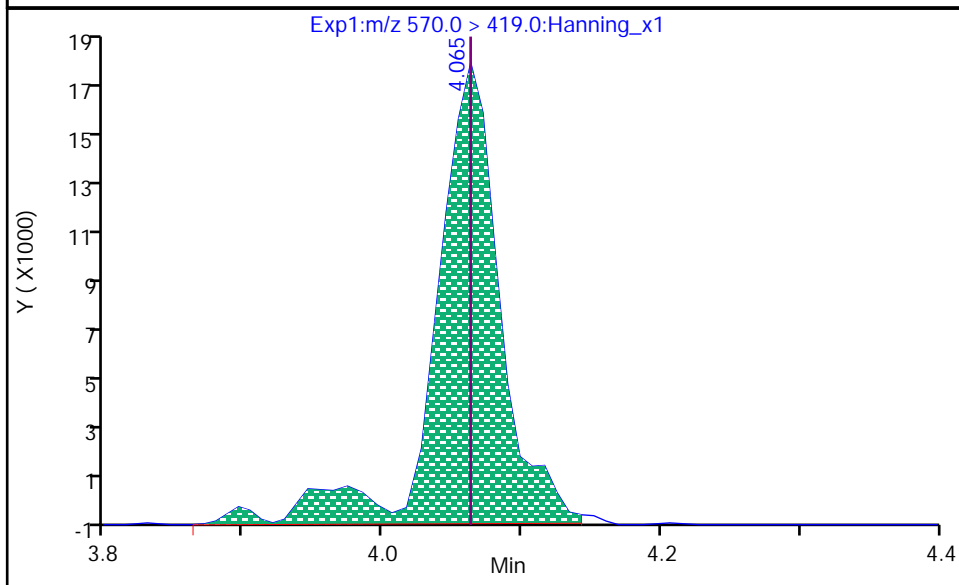
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.065  
Area: 53507  
Amount: 490.68  
Amount Units: ng/L



RT: 4.065  
Area: 56256  
Amount: 513.30  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:15

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d  
 Injection Date: 17-Dec-2020 13:04:45 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 5 Auto Sampler: 5  
 Sample Info: ICAL 1000\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	0	735341	23	>100:1			1000.00	1060.25	100	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	0/0	675182	23	>100:1			1000.00	921.88		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	728206	18	>100:1			1000.00	1058.61	100	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	686112	17	>100:1			1000.00	937.12		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	0	247575	17	>100:1			1000.00	1075.33	100	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	0/0	232775	17	>100:1	Target = 3.50		884.00	797.45		
298.9 > 99	44	2.125	2.125		69482	18	>100:1	3.35 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	0/0	183101	19	>100:1	Target = 3.10		938.00	852.59		
349 > 99	44	2.459	2.459		59145	19	>100:1	3.09 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	0	126464	19	>100:1			5000.00	5223.99	100	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/0	41896	20	>100:1	Target = 1.80		934.00	829.99		
327 > 81	63	2.388	2.388		25526	19	>100:1	1.64 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	0	774364	19	>100:1			1000.00	1050.60	100	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	717878	19	>100:1	Target = 18.34		1000.00	939.00		
313 > 119	49	2.423	2.423		42194	19	>100:1	17.01 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.539	2.539	0	1412202	19	>100:1			5000.00	5301.97	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	0/0	370236	19	>100:1	Target = 0.81		2000.00	1824.52		
285 > 185	66	2.530	2.539		467709	19	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	0	616003	19	>100:1			1000.00	1015.42	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	0/0	628754	20	>100:1	Target = 3.70		1000.00	984.03		
363 > 169	47	2.781	2.790		165588	19	>100:1	3.79 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	0	179294	19	>100:1			1000.00	1047.10	100	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	0/0	170607	27		Target = 3.21	0.16	910.00	897.44		
399 > 99	45	2.808	2.799		44788	17	>100:1	3.80 (1.60-4.81)					
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	0/0	1019991	20	>100:1	Target = 2.97		942.00	896.06		
377 > 85	45	2.827	2.827		342557	19	>100:1	2.97 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	0/0	152183	23	>100:1	Target = 3.08		952.00	934.35		
449 > 99	45	3.176	3.169		49093	22	>100:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	0	104623	26	>100:1			5000.00	5432.59	100	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.135	0/0	41503	26	>100:1	Target = 1.80		948.00	957.24		
427 > 81	64	3.142	3.135		23393	21	>100:1	1.77 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	0	654941	23	>100:1			1000.00	1106.57	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	0/0	612741	24	>100:1	Target = 2.87		1000.00	917.72		
413 > 169	53	3.162	3.169		214663	24	>100:1	2.85 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	0	154357	20	>100:1			1000.00	1029.54	100	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	0/0	158302	42	>100:1	Target = 3.84	0.25	928.00	865.46		
499 > 99	54	3.545	3.545		23262	22	37:1	6.80 (1.92-5.76)	0.28				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.750	3.750	0/0	452834	22	>100:1			932.00	871.44		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	0/0	112920	18	>100:1	Target = 3.07		960.00	955.94		
549 > 99	54	3.891	3.891		37193	19	>100:1	3.03 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	0/0	102196	16	>100:1	Target = 3.03		964.00	912.29		
599 > 99	54	4.198	4.198		37280	19		2.74 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.357	4.357	0/0	393178	17	>100:1			942.00	896.92		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	0/0	119463	17	>100:1	Target = 3.33		968.00	964.01		
699 > 99	54	4.697	4.704		37699	20	>100:1	3.16 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	0	792377	21	>100:1			1000.00	1055.15	100	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	0/0	731878	21	>100:1	Target = 6.16		1000.00	923.62		
463 > 169	56	3.545	3.545		118228	23	>100:1	6.19 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	0	330552	21	>100:1			1000.00	1067.80	100	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	0/0	320737	22	>100:1			1000.00	984.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	0	93314	21				5000.00	5030.37	100	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	0/0	36480	25	>100:1	Target = 1.95		958.00	972.14		
527 > 81	65	3.899	3.891		17278	18	52:1	2.11 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	0/0	41301	18	>100:1	Target = 3.14		964.00	957.64		
627 > 80	65	4.501	4.492		13527	24		3.05 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	0	698114	20	>100:1			1000.00	1052.44	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	0/0	632287	18	>100:1	Target = 15.94		1000.00	921.75		
513 > 169	51	3.899	3.899		47809	17	>100:1	13.22 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	0	762102	19	>100:1			5000.00	5309.36	100	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	0/0	109367	34		Target = 1.33	0.12	1000.00	934.11		
570 > 483	58	4.065	4.065		81085	32	>100:1	1.34 (0.66-1.99)	0.22				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	1	738335	18	>100:1			5000.00	5559.14	100	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	1/0	136930	32	>100:1	Target = 1.58	0.13	1000.00	931.40		
584 > 526	60	4.228	4.217		79831	31	>100:1	1.71 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	1	678701	17	>100:1			1000.00	1073.77	100	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/0	608820	19	>100:1	Target = 15.50		1000.00	954.42		
563 > 169	52	4.217	4.217		37923	17		16.05 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	0	117292	16	>100:1			1000.00	1083.95	100	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	0/0	97845	15	>100:1			1000.00	887.82		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	0	54969	17	>100:1			1000.00	1038.78	100	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	0/0	61867	19	>100:1	Target = 1.12		1000.00	997.59		
512 > 219	57	4.318	4.318		52269	15	>100:1	1.18 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	0	121851	19	>100:1			1000.00	971.73	100	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	0/0	107879	16	>100:1			1000.00	995.12		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	0	649290	18				1000.00	1072.64	100	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	0/0	597463	18	>100:1	Target = 10.85		1000.00	908.67		
613 > 169	38	4.492	4.492		57676	16		10.35 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	0/0	598919	19	>100:1	Target = 8.37		1000.00	936.53		
663 > 169	38	4.724	4.731		69927	19	>100:1	8.56 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	0	51517	20	>100:1			1000.00	1049.34	100	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	0/0	54660	17	>100:1	Target = 1.03		1000.00	971.16		
526 > 219	59	4.492	4.492		50571	17	>100:1	1.08 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	0	887372	18	>100:1			1000.00	1053.33	100	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	0/0	724347	20	91:1	Target = 12.11		1000.00	942.10		
713 > 169	42	4.948	4.948		64136	18	>100:1	11.29 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	0	913664	18	>100:1			1000.00	1008.28	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	0/0	565232	19	>100:1	Target = 11.48		1000.00	946.82		
813 > 269	40	5.334	5.334		49405	18	>100:1	11.44 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	0/0	783793	24	81:1	Target = 13.88		1000.00	969.09		
913 > 319	40	5.689	5.689		56611	24	>100:1	13.84 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	0	726117	19	>100:1					100	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	752645	18	>100:1					100	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	0	644116	25	>100:1					100	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	0	665854	23	>100:1					100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	0	162438	22	>100:1					100	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720010.d

Injection Date: 17-Dec-2020 13:04:45

Inst. ID: LCMSMS02

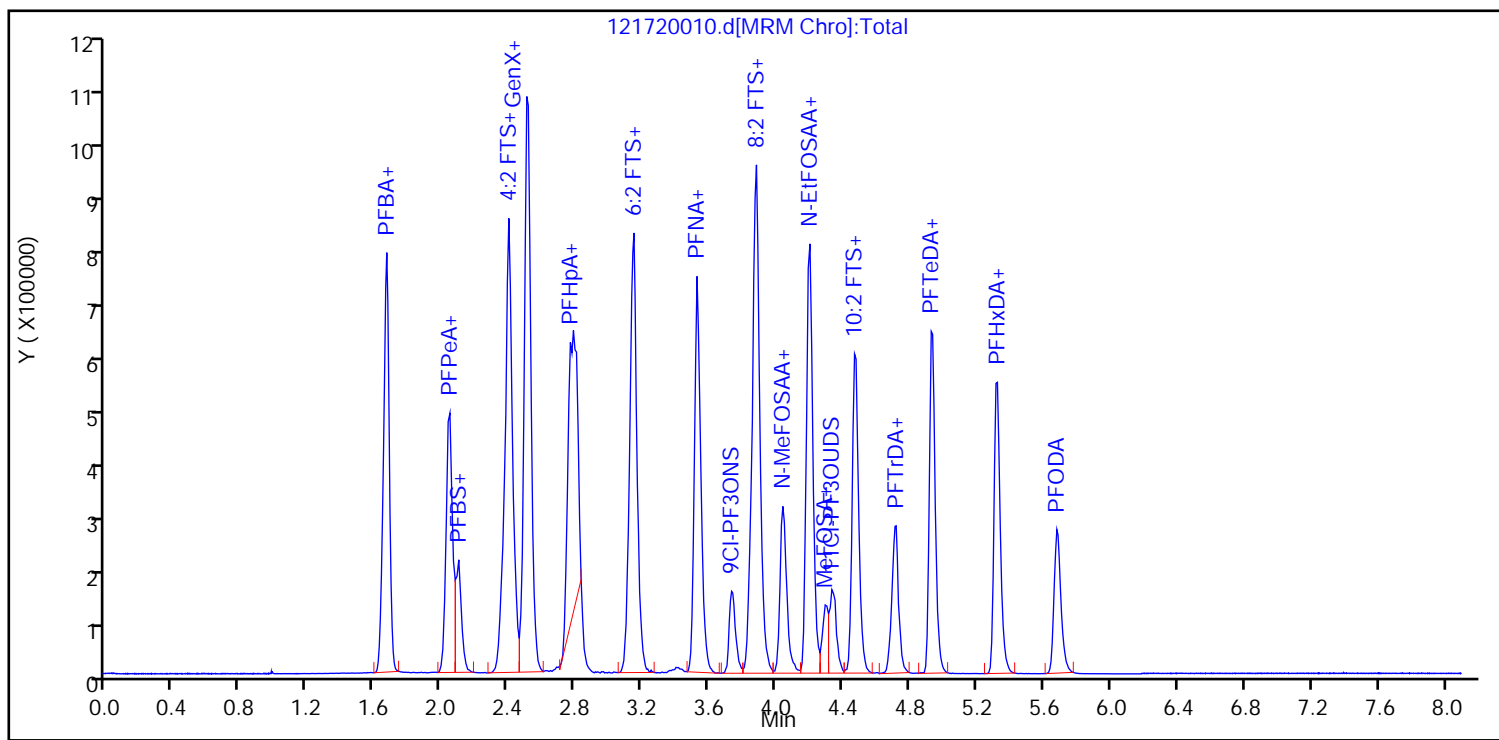
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Lab ID: ICAL 1000\_SVLC-1248

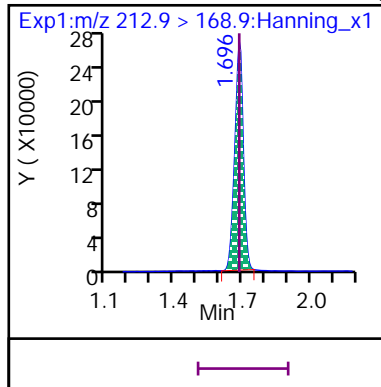
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Dil. Factor: 1

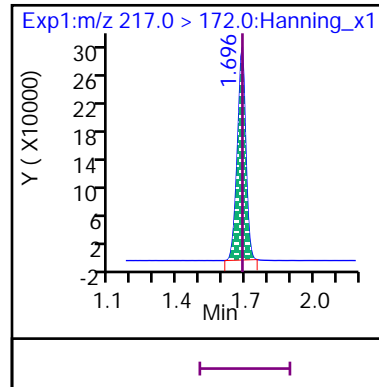
Operator: Stephen E. Somerville



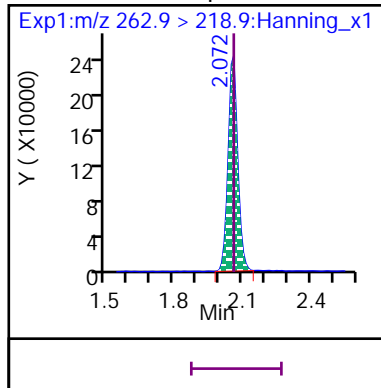
8 Perfluoro-n-butanoic acid (PFBA)



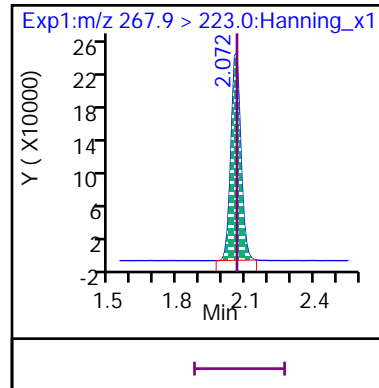
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

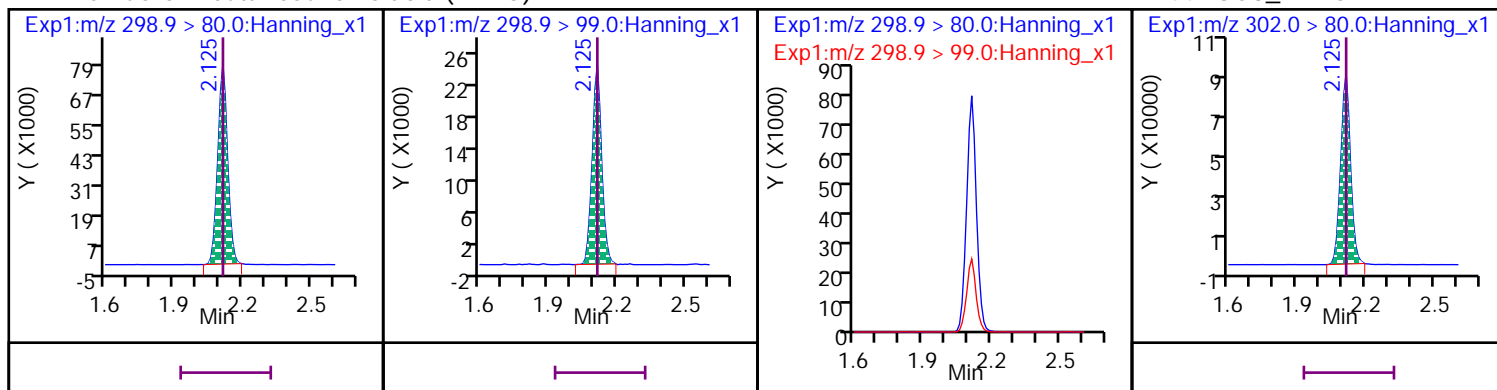


D 50 13C5\_PFPeA



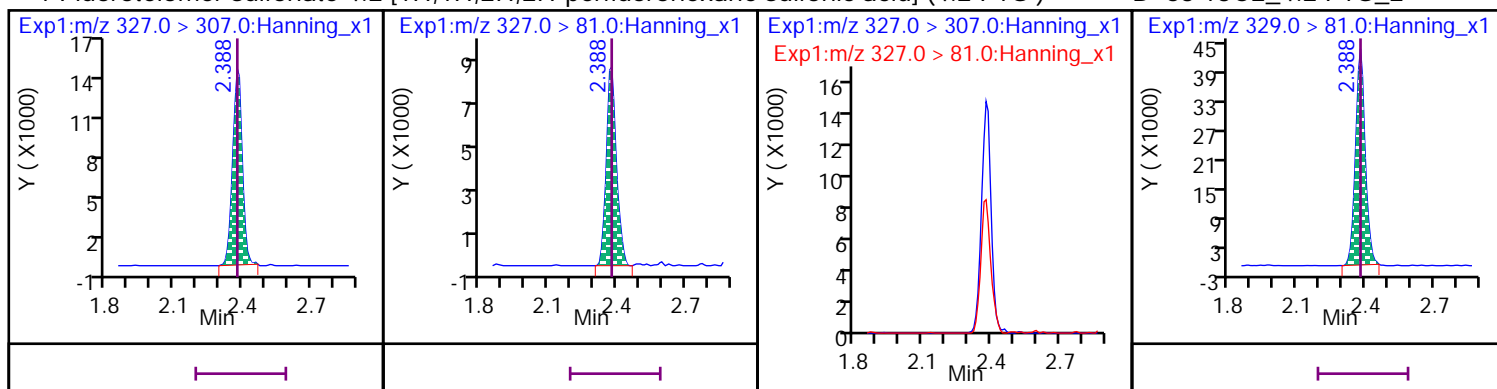
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



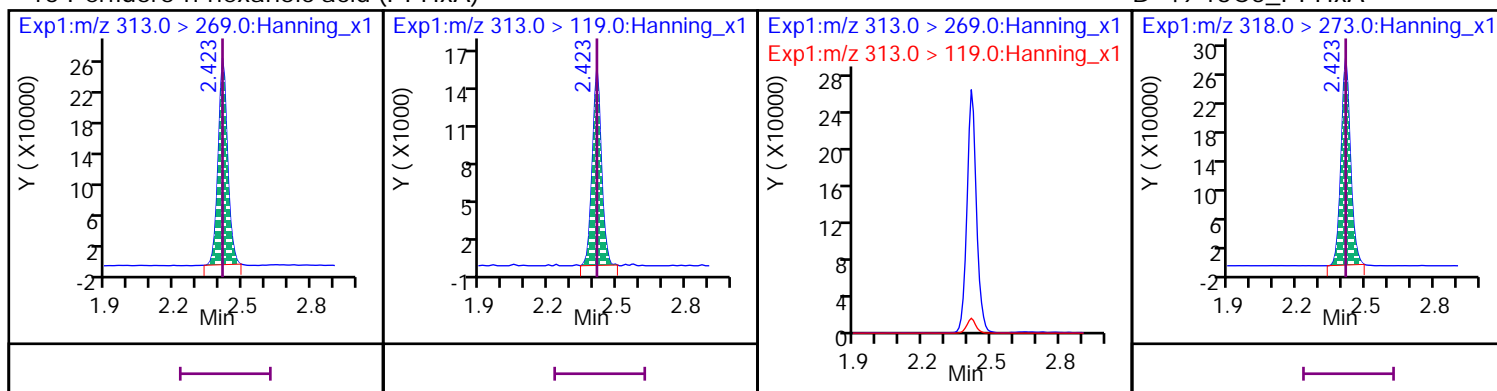
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



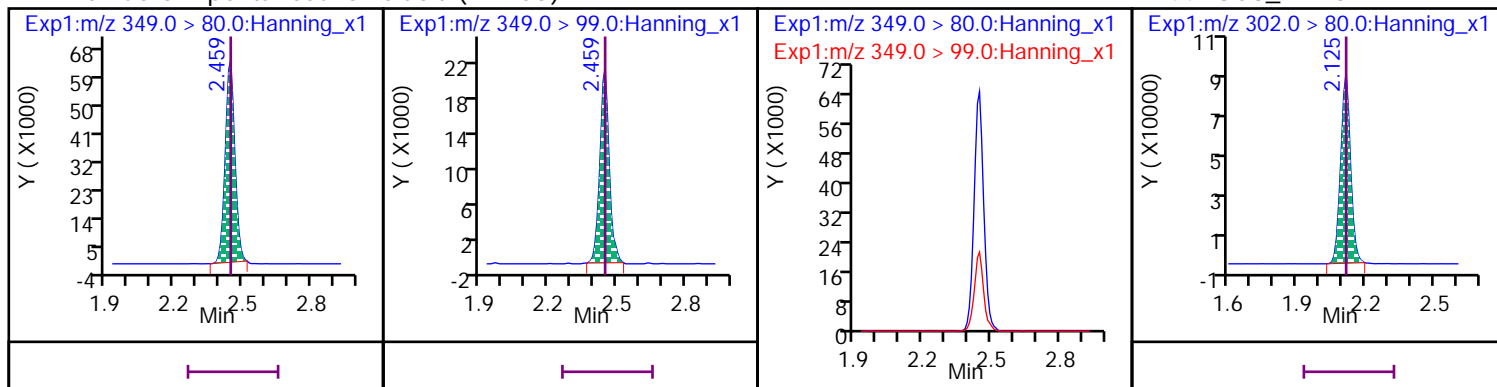
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



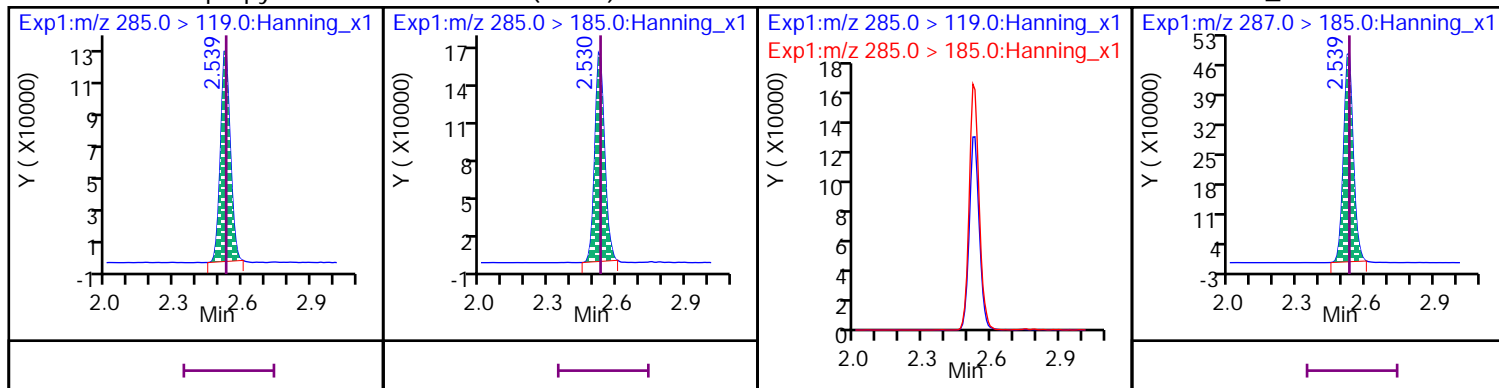
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



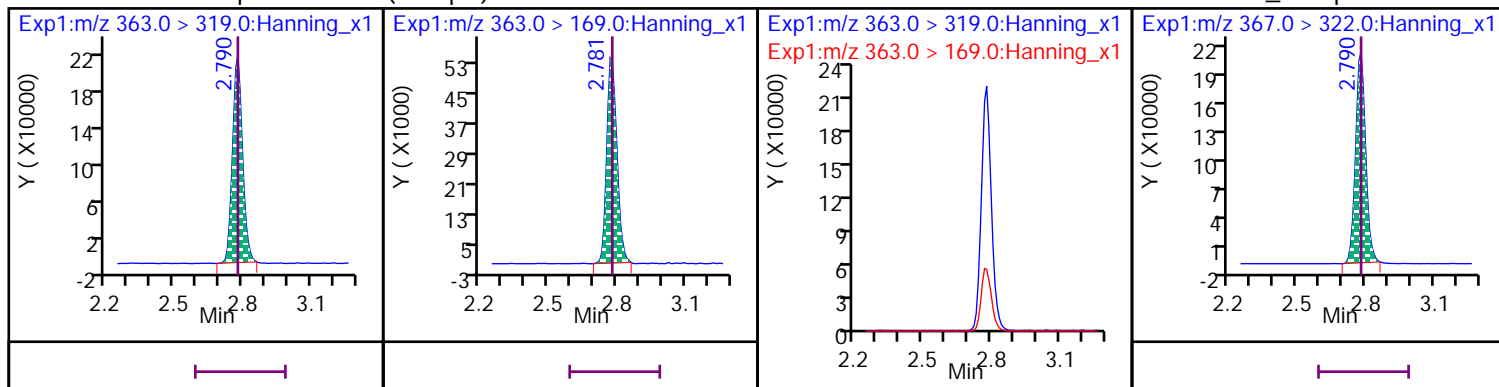
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



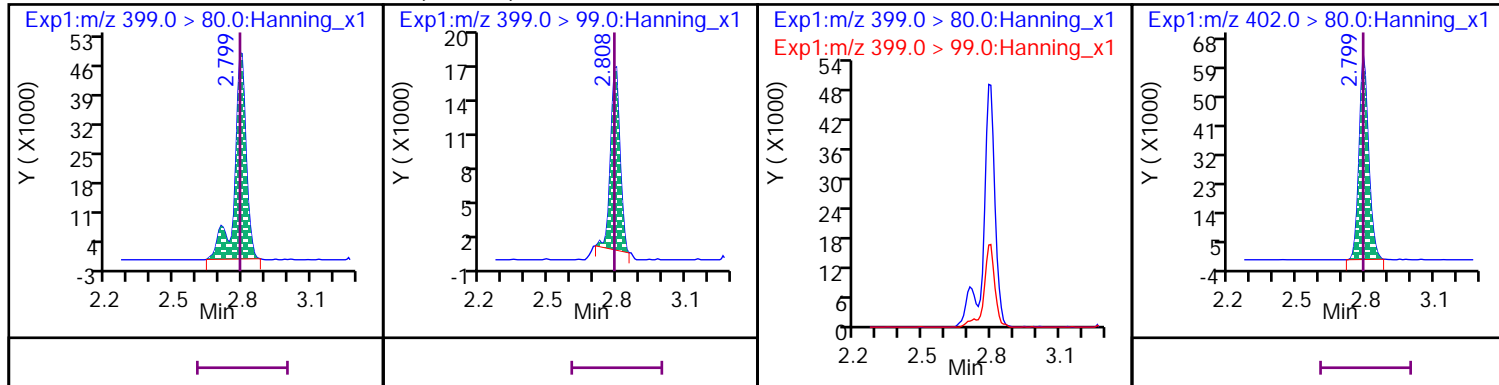
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



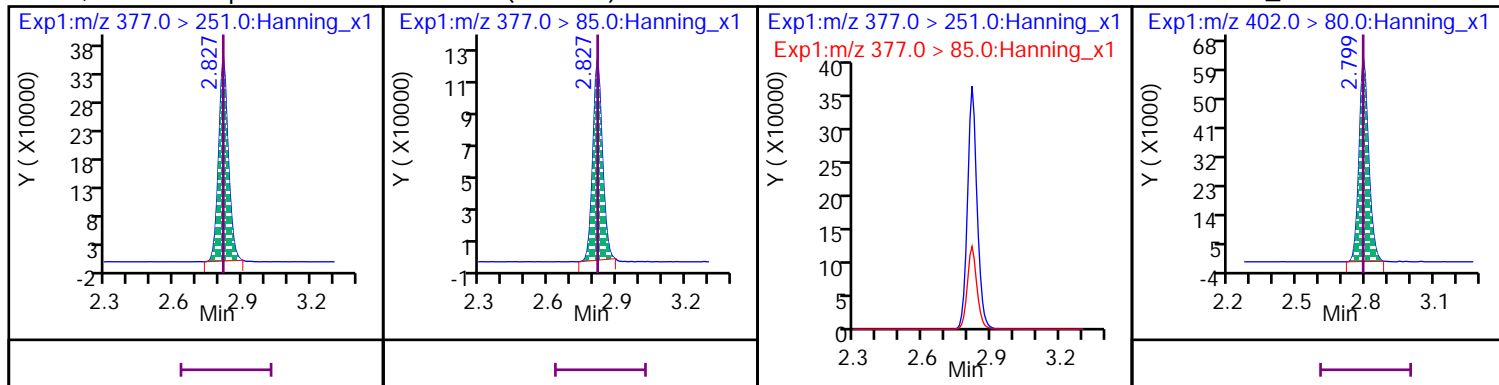
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



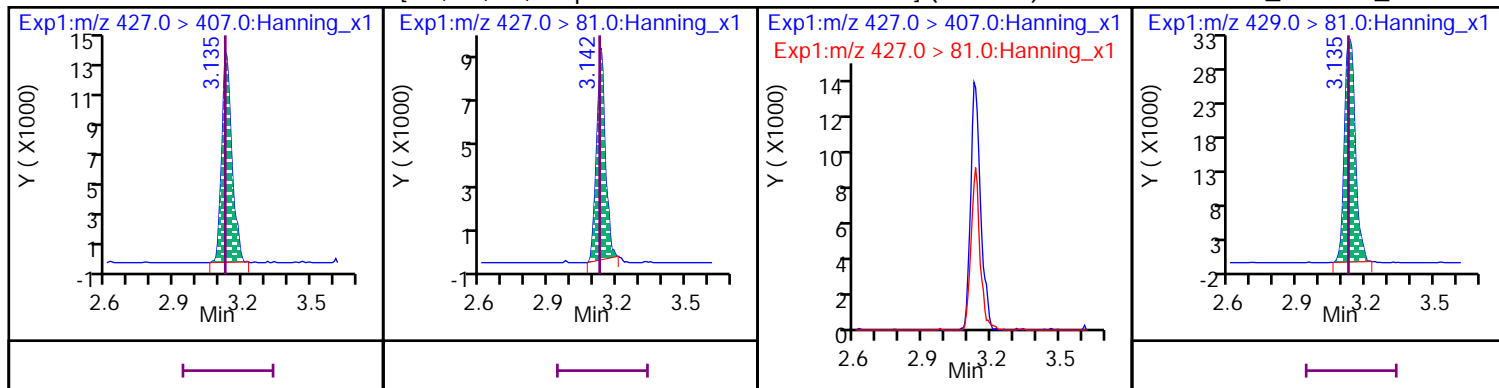
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



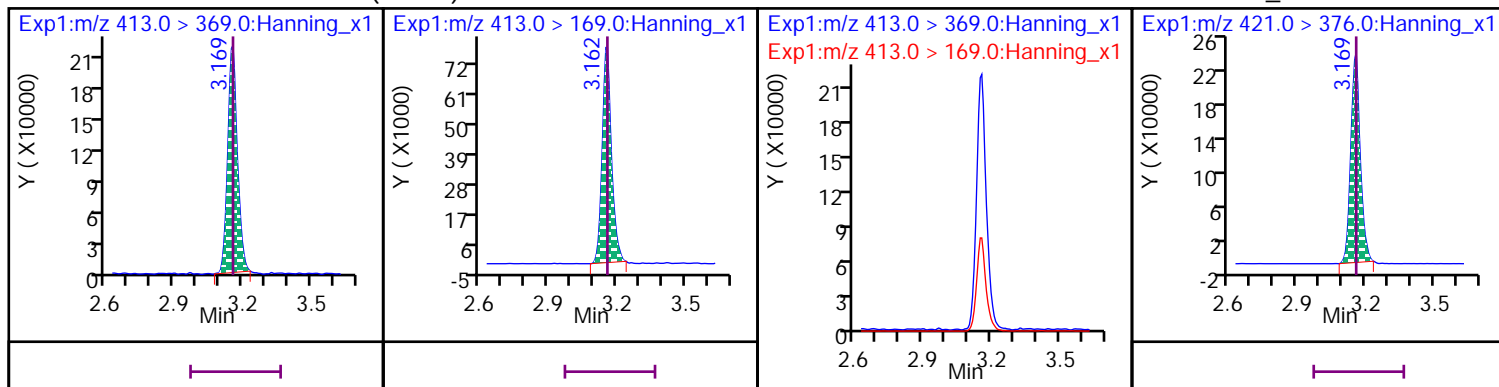
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



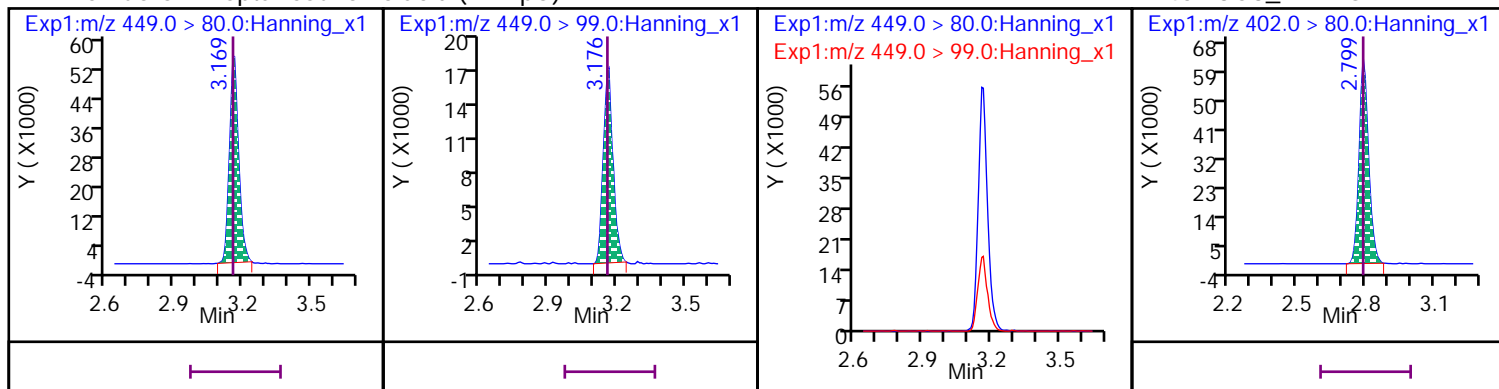
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



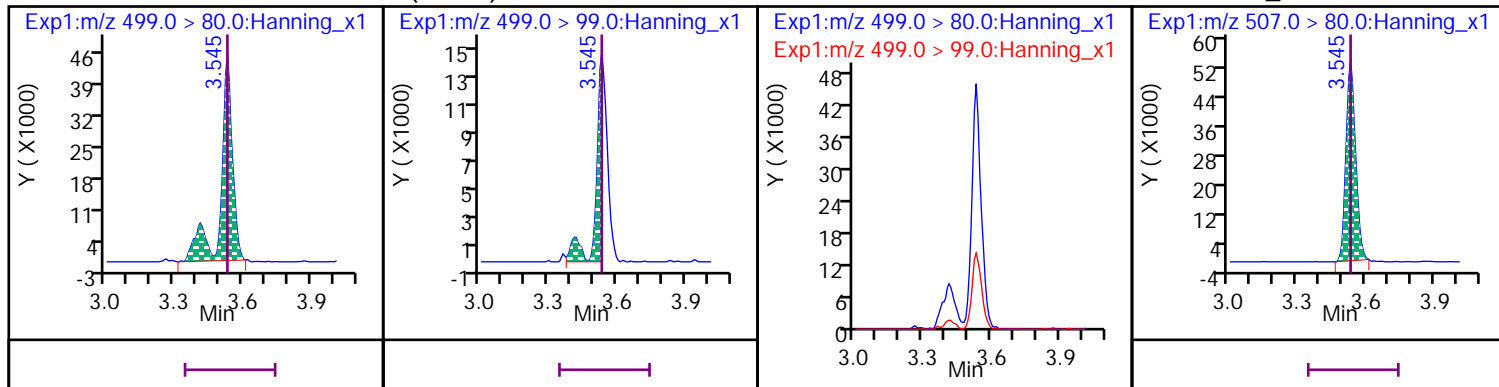
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



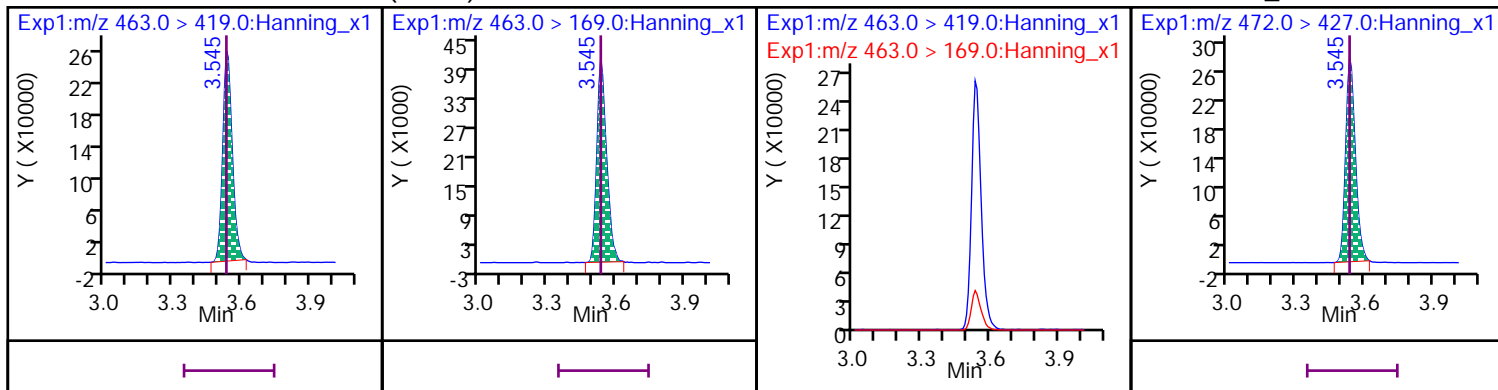
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



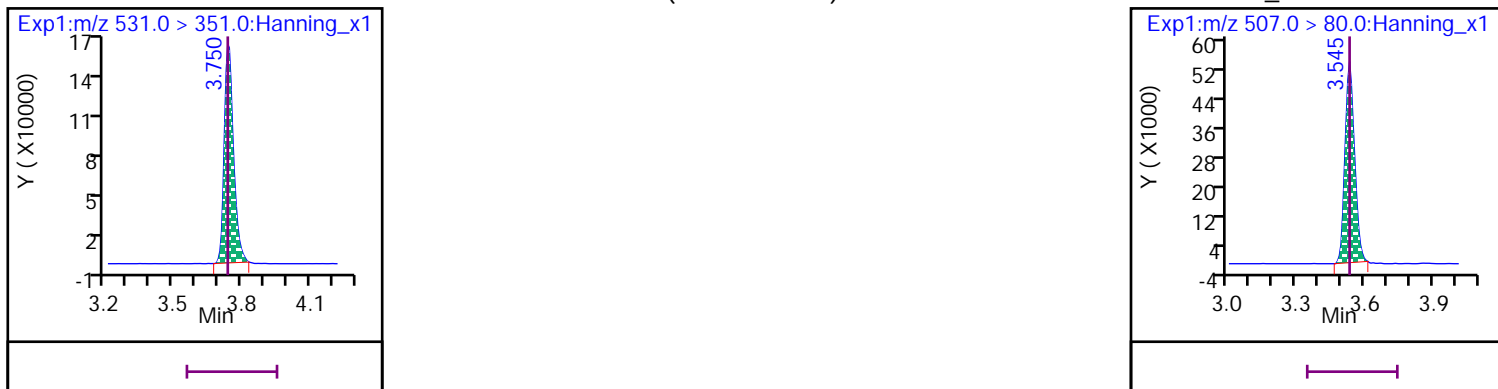
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



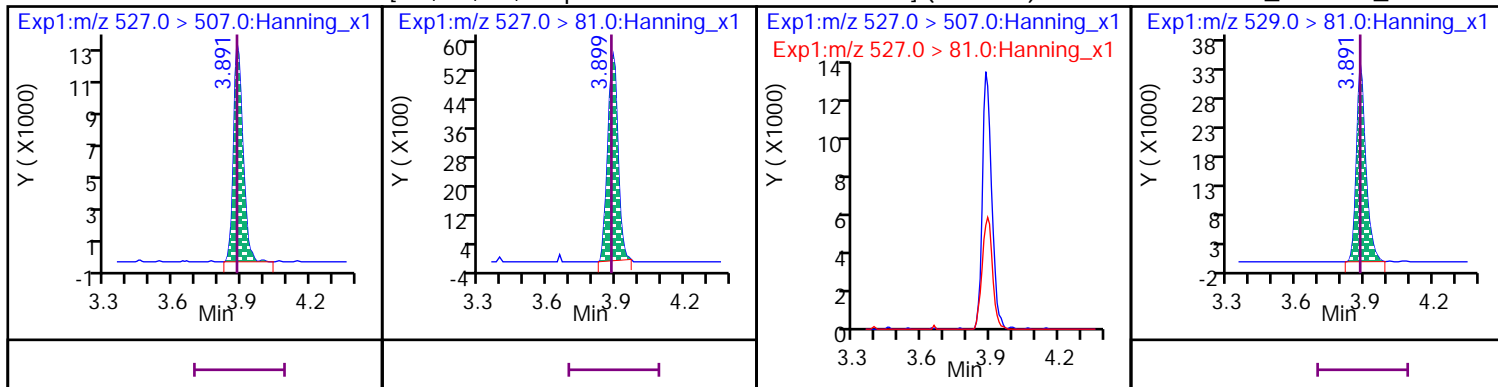
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

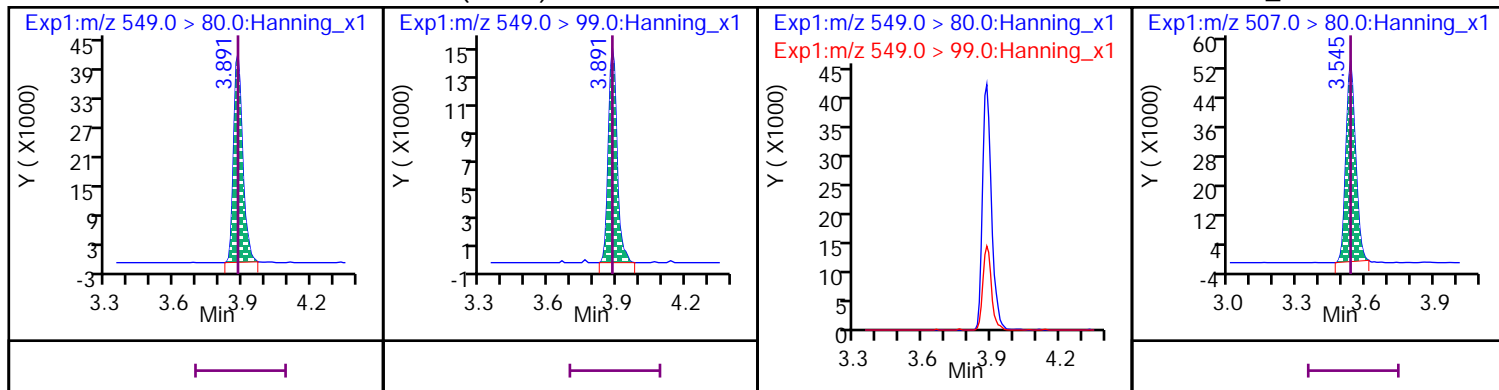
D 65 13C2\_8:2 FTS\_2





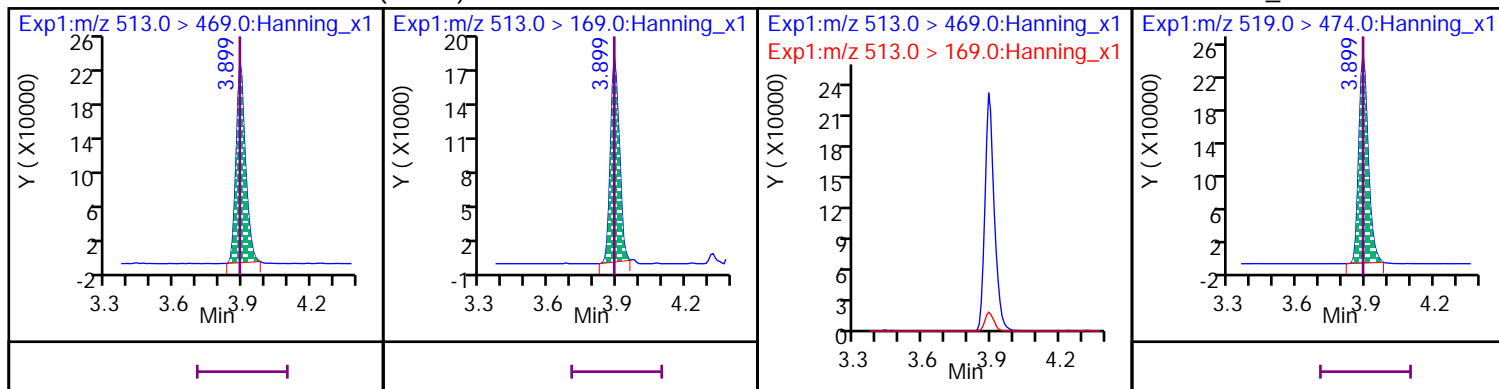
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



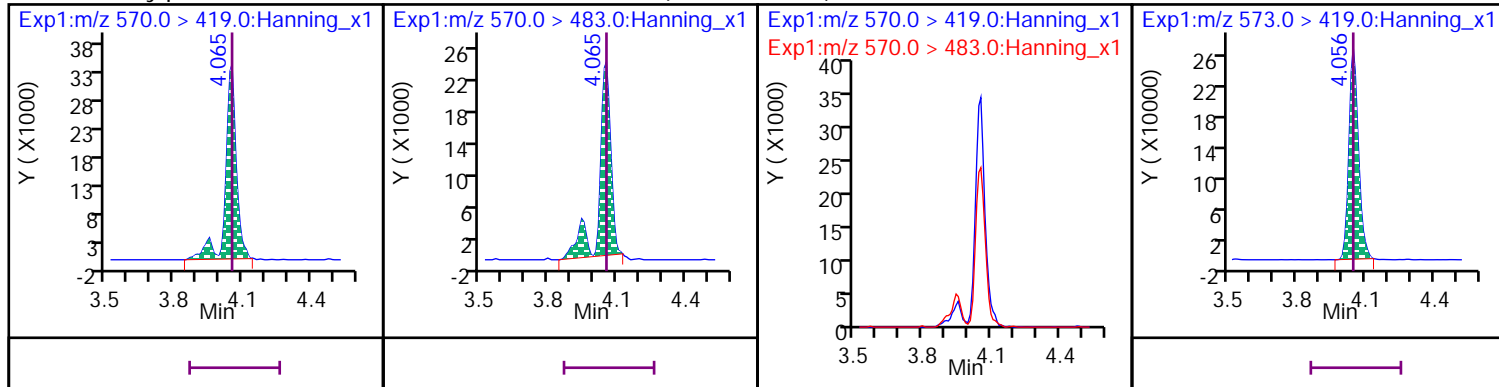
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



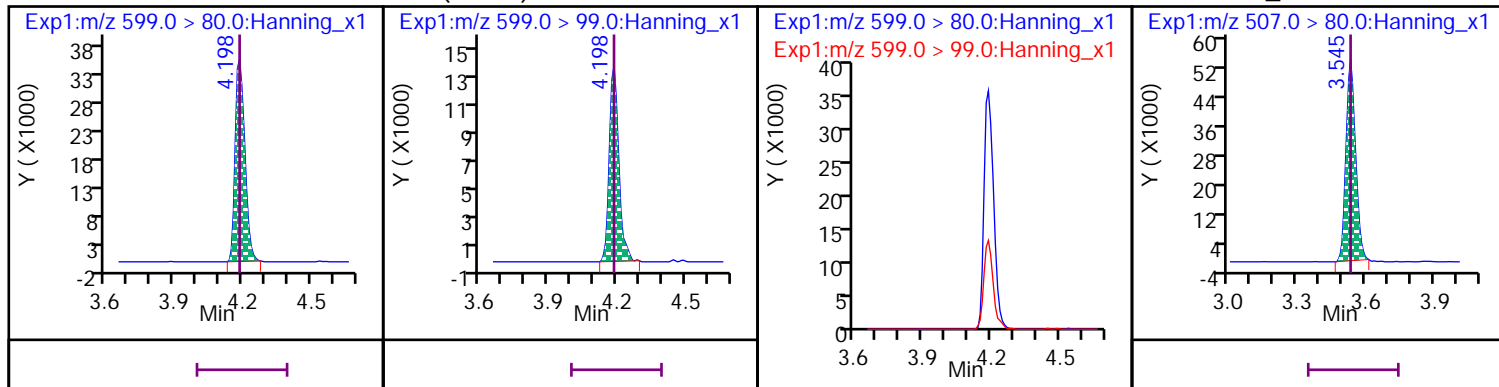
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



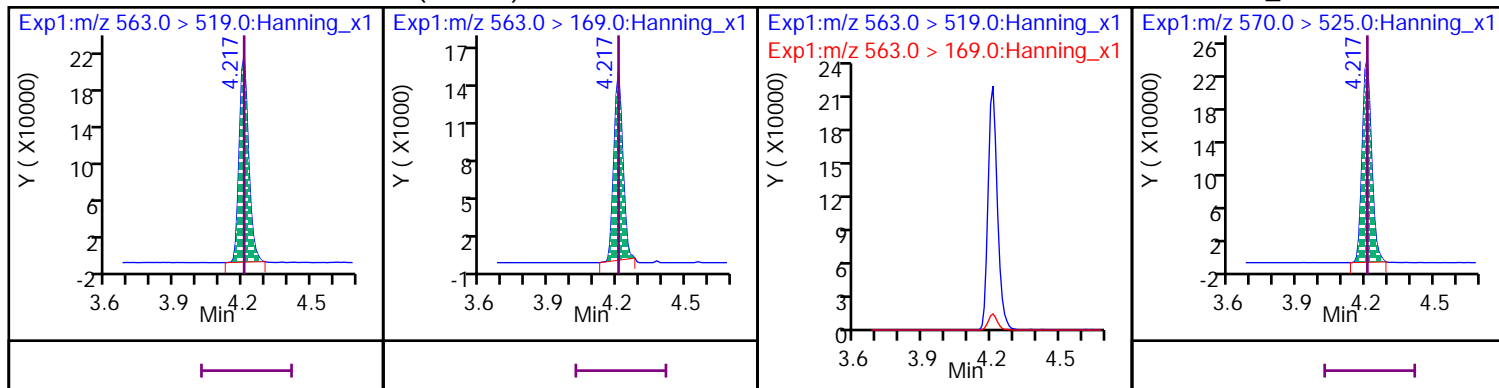
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



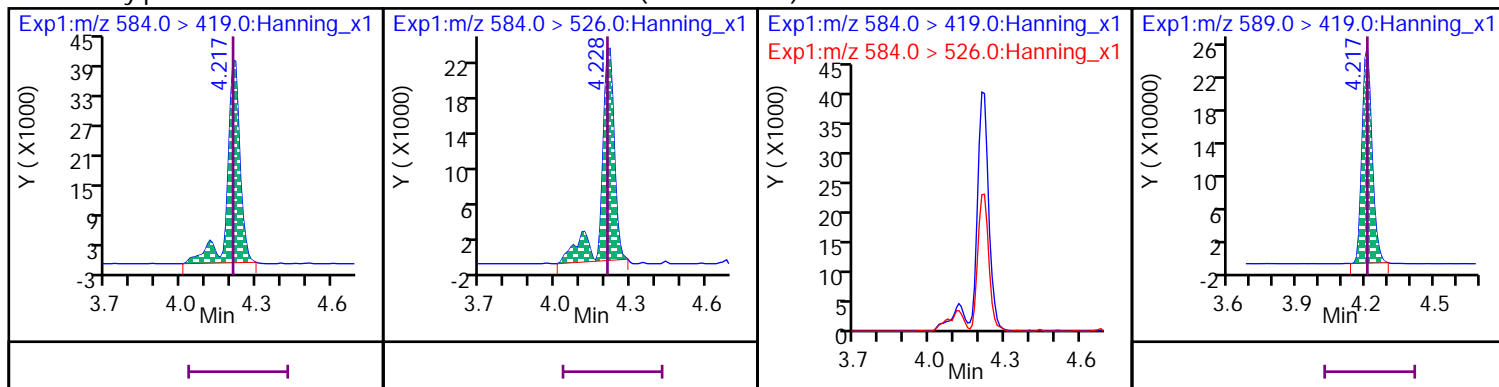
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



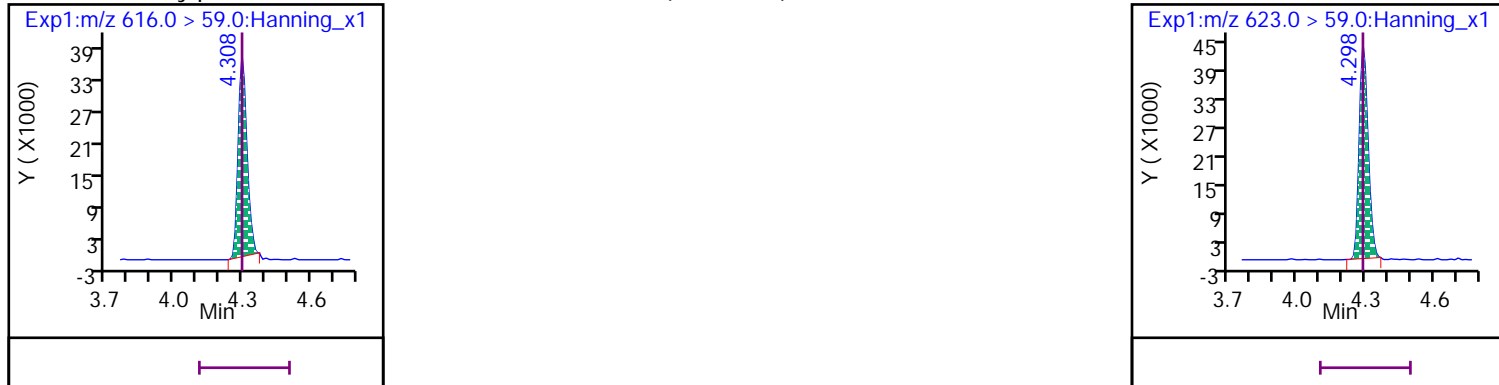
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



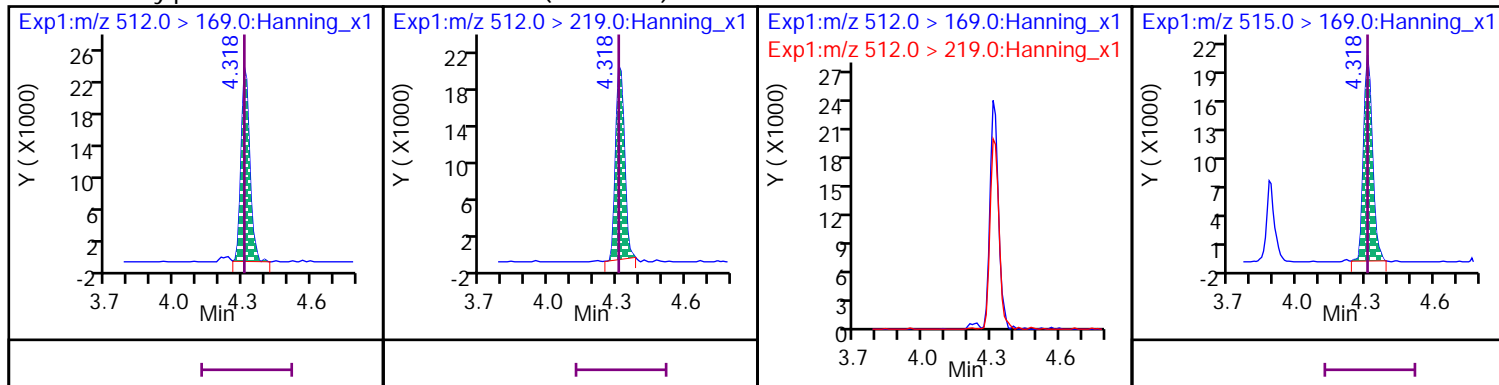
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

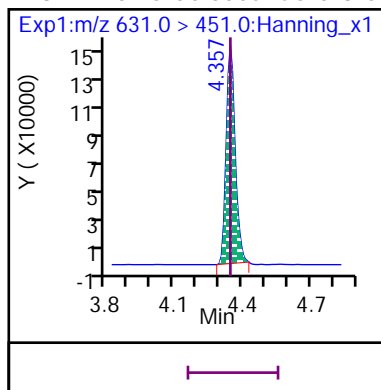


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

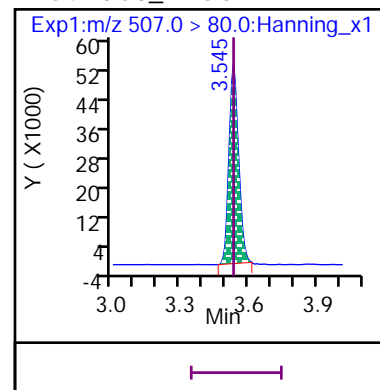
D 57 d3-MeFOSA



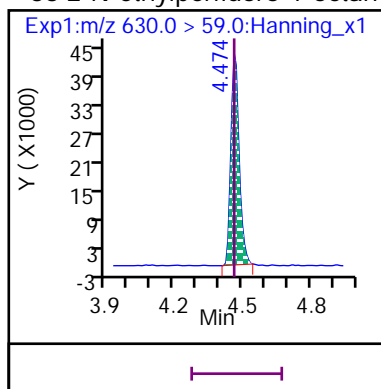
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



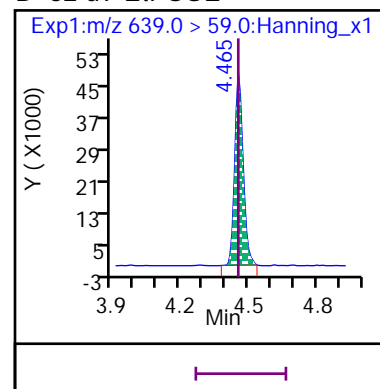
## D 54 13C8\_PFOS



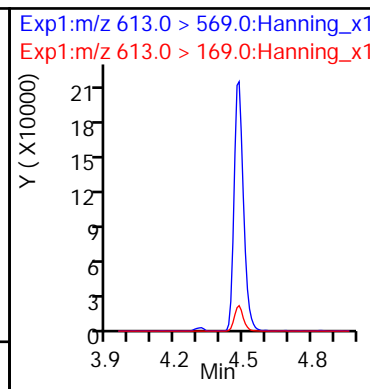
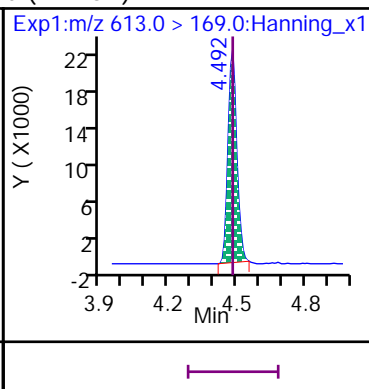
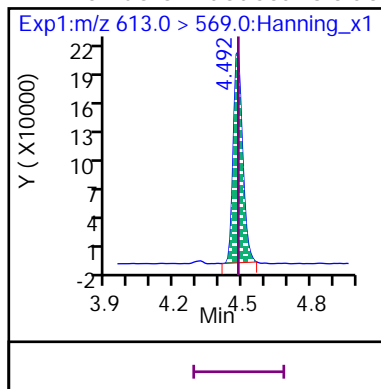
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



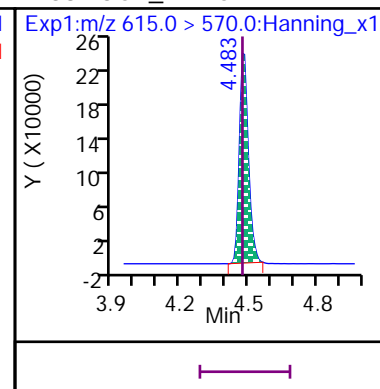
## D 62 d9-EtFOSE



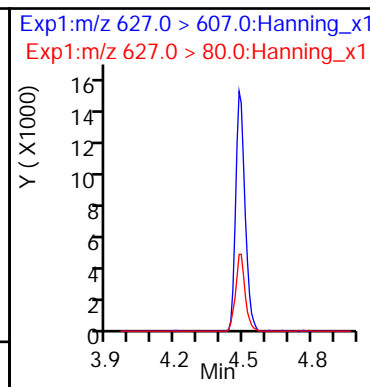
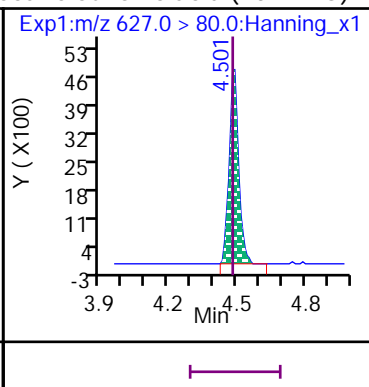
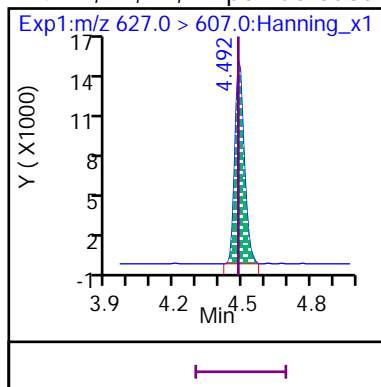
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



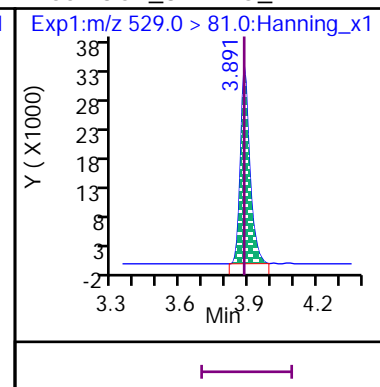
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

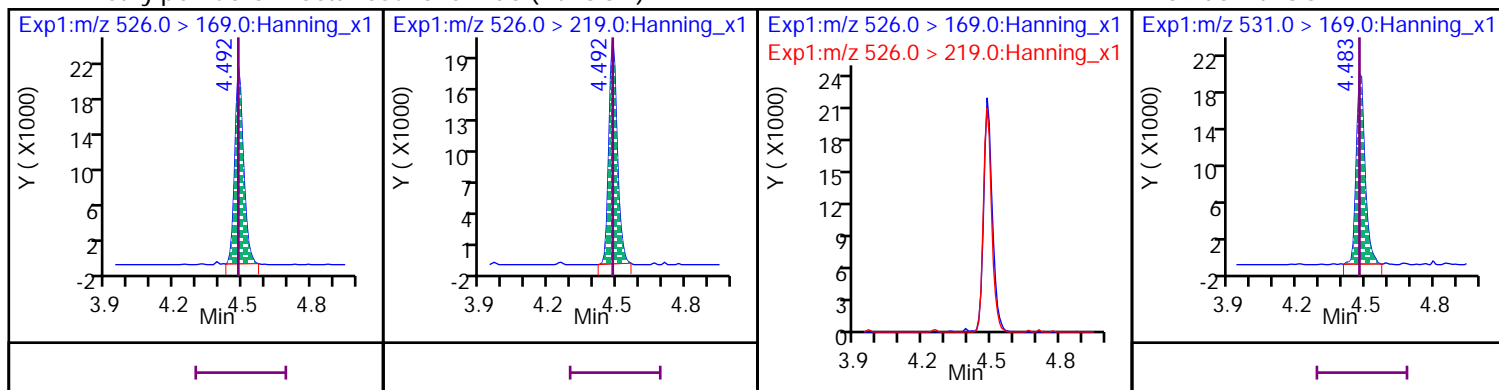


## D 65 13C2\_8:2 FTS\_2



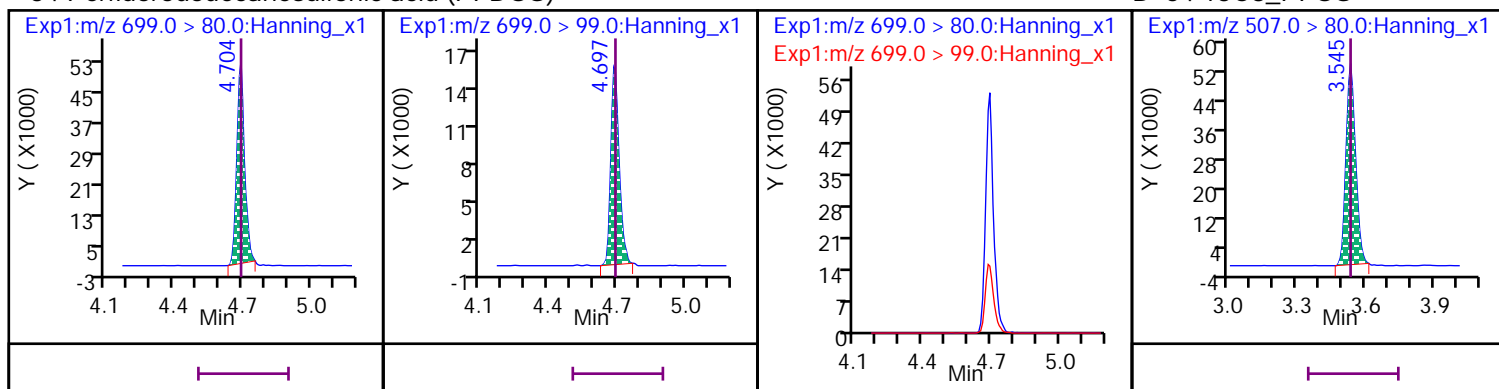
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



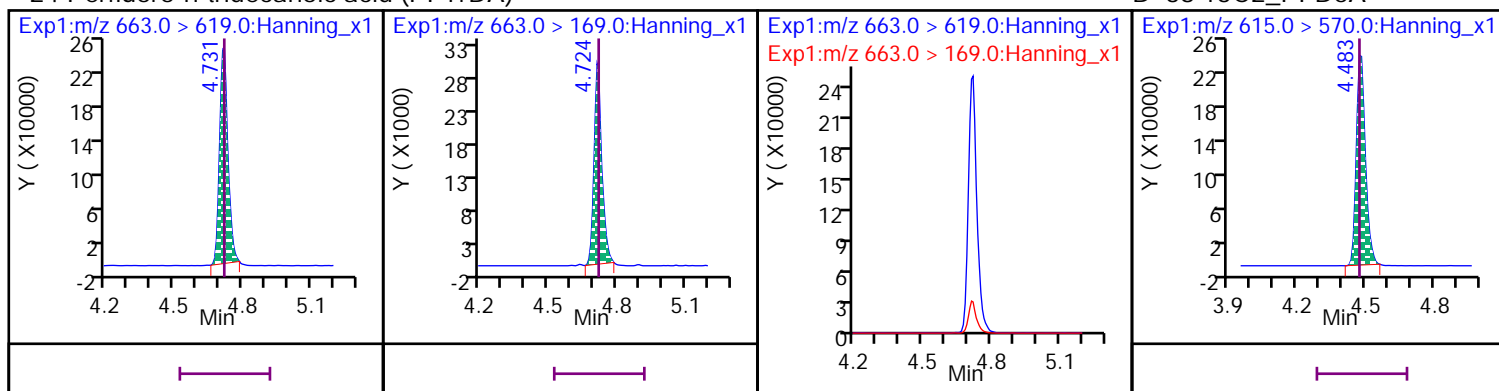
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



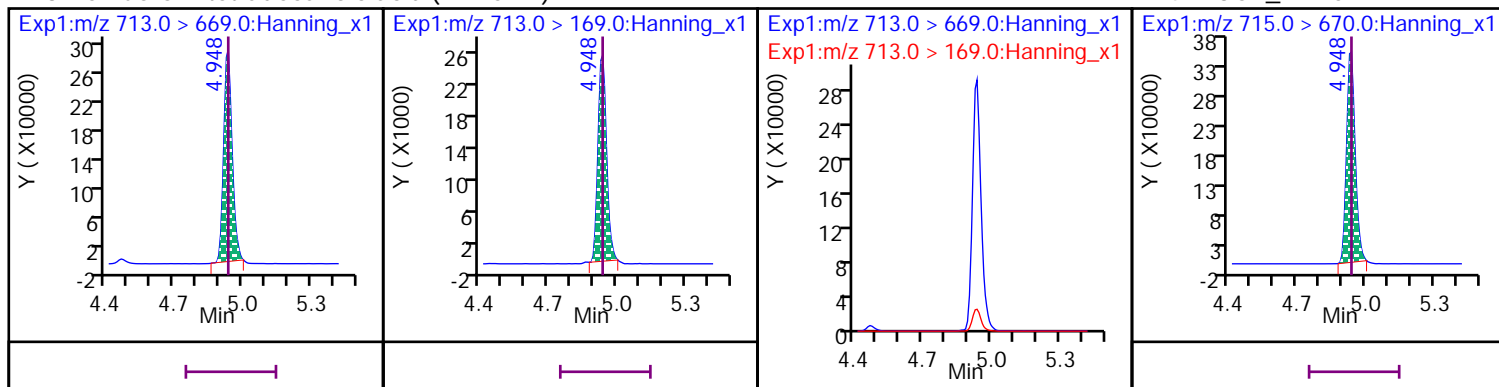
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



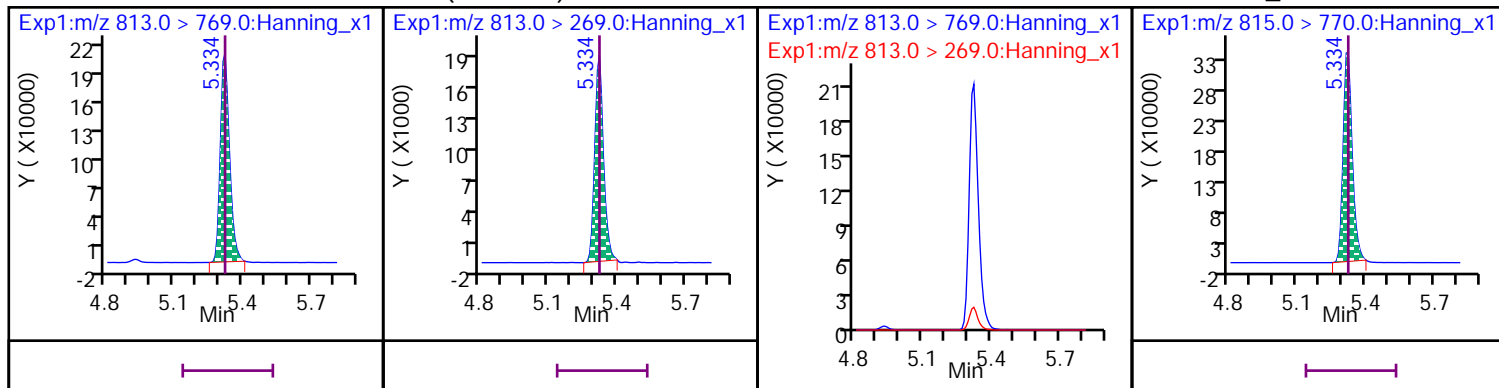
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



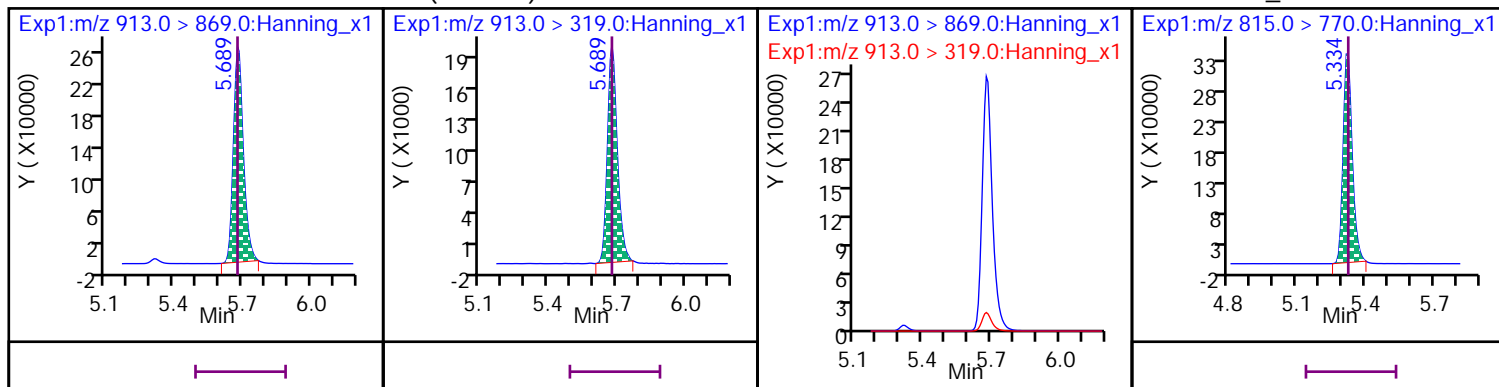
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

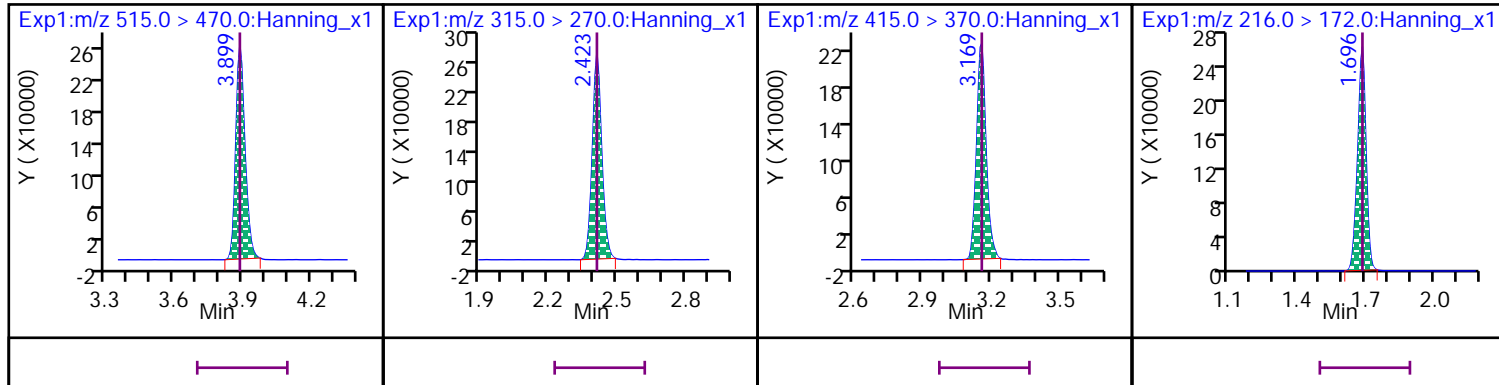


\* 37 13C2\_PFDA

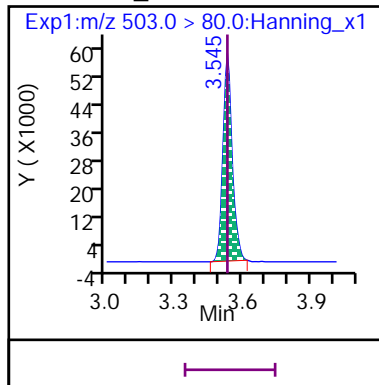
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720011.d  
 Injection Date: 17-Dec-2020 13:15:20 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 6 Auto Sampler: 6  
 Sample Info: ICAL 2000\_SVLC-1224 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	690771	23	>100:1			1000.00	995.99	93.9	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	1369790	23	>100:1			2000.00	1990.96		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	707649	18	>100:1			1000.00	1028.73	97.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	1355901	17	>100:1			2000.00	1905.74		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	234029	17	>100:1			1000.00	1016.50	94.5	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	473501	17	>100:1	Target = 3.50		1768.00	1716.02		
298.9 > 99	44	2.125	2.125		138363	17	>100:1	3.42 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/0	361613	20	>100:1	Target = 3.10		1876.00	1781.27		
349 > 99	44	2.459	2.459		119484	19	>100:1	3.02 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.388	1	117645	20	>100:1			5000.00	4859.69	93	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/0	90211	20		Target = 1.80		1868.00	1921.12		
327 > 81	63	2.388	2.388		50713	20	>100:1	1.77 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	730846	20	>100:1			1000.00	991.56	94.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	1427984	20	>100:1	Target = 18.34		2000.00	1979.05		
313 > 119	49	2.423	2.423		81047	21	>100:1	17.61 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1335856	20	>100:1			5000.00	5015.34	94.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.539	2.539	1/1	745633	21	>100:1	Target = 0.81		4000.00	3884.48		
285 > 185	66	2.539	2.539		919494	19	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.790	0	620403	19	>100:1			1000.00	1022.68	101	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/1	1233089	20	>100:1	Target = 3.70		2000.00	1916.16		
363 > 169	47	2.790	2.790		335065	19	>100:1	3.68 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	169221	20	>100:1			1000.00	988.27	94.4	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	331697	25	>100:1	Target = 3.21	0.16	1820.00	1848.69		
399 > 99	45	2.799	2.799		103327	28	>100:1	3.21 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	2039948	19	>100:1	Target = 2.97		1884.00	1898.77		
377 > 85	45	2.827	2.827		691343	19	>100:1	2.95 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	287358	22	>100:1	Target = 3.08		1904.00	1869.29		
449 > 99	45	3.169	3.169		92732	23	>100:1	3.09 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	99626	28	>100:1			5000.00	5173.12	95.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	78944	27	>100:1	Target = 1.80		1896.00	1941.09		
427 > 81	64	3.135	3.135		42430	20	>100:1	1.86 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	599661	23	>100:1			1000.00	1013.17	91.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	1218307	24	>100:1	Target = 2.87		2000.00	1992.90		
413 > 169	53	3.162	3.169		418424	23	>100:1	2.91 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	150186	21	>100:1			1000.00	1001.72	97.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/1	305729	40	>100:1	Target = 3.84	0.26	1856.00	1717.89		
499 > 99	54	3.537	3.545		92841	37	>100:1	3.29 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/1	929018	21	>100:1			1864.00	1837.47		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/1	219044	19	>100:1	Target = 3.07		1920.00	1905.85		
549 > 99	54	3.882	3.891		83562	20	>100:1	2.62 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/1	214195	19	>100:1	Target = 3.03		1928.00	1965.19		
599 > 99	54	4.198	4.198		71705	17	>100:1	2.98 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/1	777834	17	>100:1			1884.00	1823.68		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/1	224258	19	>100:1	Target = 3.33		1936.00	1859.92		
699 > 99	54	4.704	4.704		72042	18	>100:1	3.11 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	746906	20	>100:1			1000.00	994.60	94.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	1474929	22	>100:1	Target = 6.16		2000.00	1974.66		
463 > 169	56	3.545	3.545		242200	21	>100:1	6.08 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	312166	18	>100:1			1000.00	1008.41	94.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	614554	19	>100:1			2000.00	1997.74		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	87412	19				5000.00	4712.20	93.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	69164	19	>100:1	Target = 1.95		1916.00	1984.81		
527 > 81	65	3.882	3.891		35651	24	>100:1	1.94 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	86394	17	>100:1	Target = 3.14		1928.00	2138.46		
627 > 80	65	4.492	4.492		28288	23		3.05 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	682060	18	>100:1			1000.00	1028.23	97.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	1310983	19	>100:1	Target = 15.94		2000.00	1956.14		
513 > 169	51	3.899	3.899		94119	17	>100:1	13.92 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	735121	19	>100:1			5000.00	5121.39	96.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.056	4.065	0/-1	217003	35		Target = 1.33	0.12	2000.00	1921.46		
570 > 483	58	4.065	4.065		168949	33	>100:1	1.28 (0.66-1.99)	0.20				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.217	0	659409	18	>100:1			5000.00	4964.88	89.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	1/1	264743	33	>100:1	Target = 1.58	0.12	2000.00	2016.33		
584 > 526	60	4.217	4.217		154555	31	>100:1	1.71 (0.79-2.37)	0.19				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.207	4.217	0	643886	17	>100:1			1000.00	1018.69	94.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/1	1167255	18	>100:1	Target = 15.50		2000.00	1928.80		
563 > 169	52	4.217	4.217		84851	19	>100:1	13.75 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	107248	14	>100:1			1000.00	991.13	91.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	193445	16	>100:1			2000.00	1919.66		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	56560	15	>100:1			1000.00	1068.85	103	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	117911	15	>100:1	Target = 1.12		2000.00	1847.81		
512 > 219	57	4.318	4.318		114362	16	>100:1	1.03 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	121638	16	>100:1			1000.00	970.04	99.8	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	215357	17	>100:1			2000.00	1990.02		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	610527	16	>100:1			1000.00	1008.61	94	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	1229587	16	>100:1	Target = 10.85		2000.00	1988.78		
613 > 169	38	4.492	4.492		113584	19	>100:1	10.82 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	1171366	19	>100:1	Target = 8.37		2000.00	1947.95		
663 > 169	38	4.724	4.731		144444	20	>100:1	8.10 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49582	16	>100:1			1000.00	1009.93	96.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	104861	15	>100:1	Target = 1.03		2000.00	1935.81		
526 > 219	59	4.492	4.492		104490	15	>100:1	1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	833060	18	>100:1			1000.00	988.86	93.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	1395266	18	>100:1	Target = 12.11		2000.00	1933.02		
713 > 169	42	4.948	4.948		124227	17	>100:1	11.23 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	938748	19	>100:1			1000.00	1035.96	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	1164830	20	>100:1	Target = 11.48		2000.00	1899.07		
813 > 269	40	5.334	5.334		103765	20	>100:1	11.22 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	1/0	1586814	24	>100:1	Target = 13.88		2000.00	1909.53		
913 > 319	40	5.689	5.689		113646	23	>100:1	13.96 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	687130	19	>100:1					94.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	712399	20	>100:1					94.7	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	588156	23	>100:1					91.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	635025	23	>100:1					95.4	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.537	3.545	0	153888	20	>100:1					94.7	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720011.d

Injection Date: 17-Dec-2020 13:15:20

Inst. ID: LCMSMS02

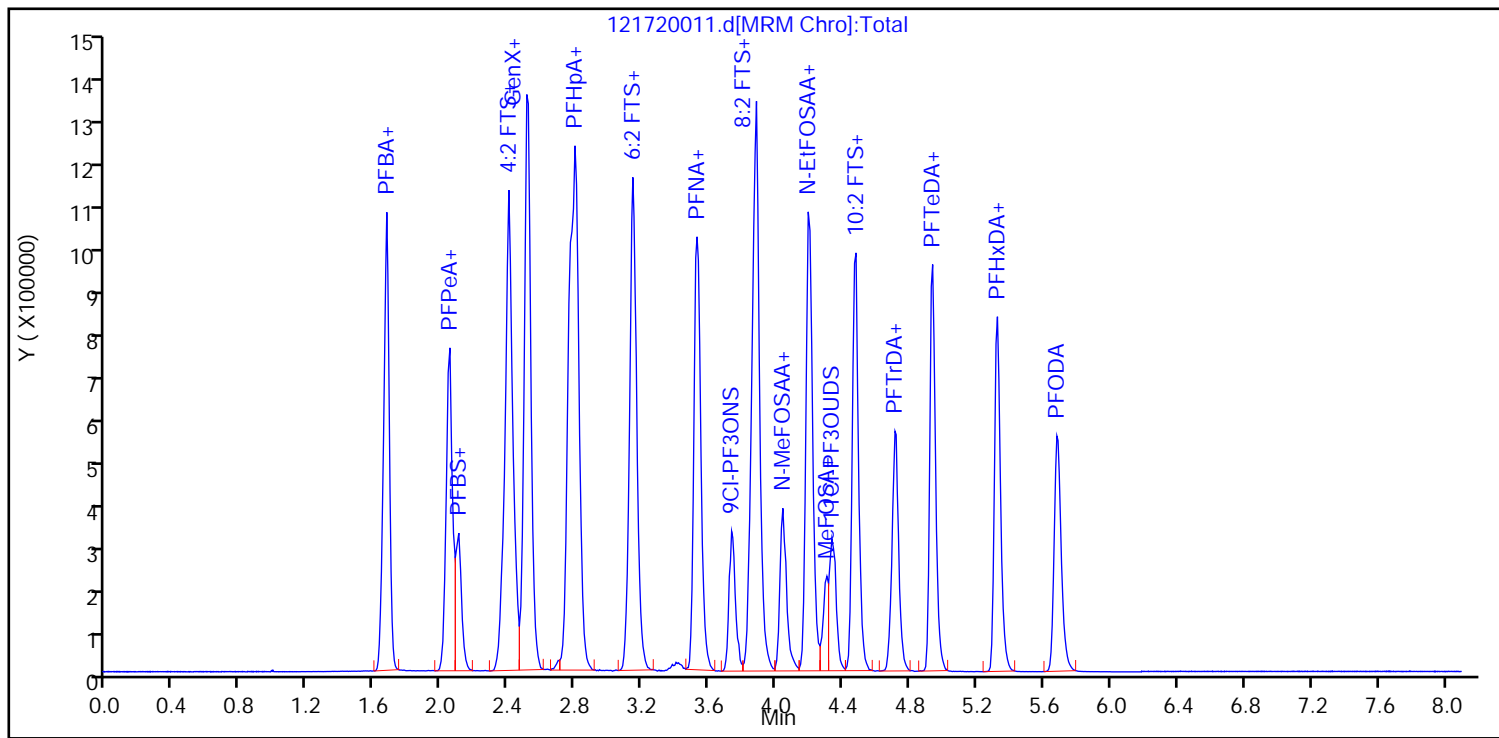
Client ID:

Lab ID: ICAL 2000\_SVLC-1224

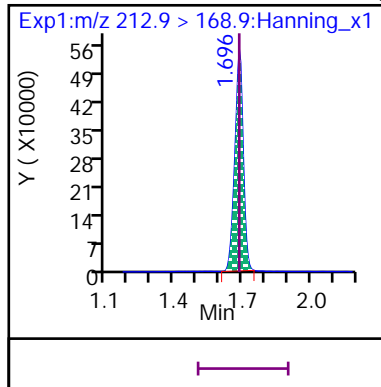
Sample Info: ICAL 2000\_SVLC-1224

Dil. Factor: 1

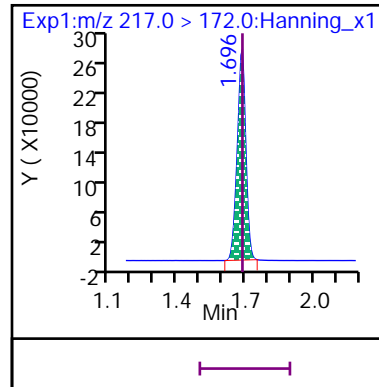
Operator: Stephen E. Somerville



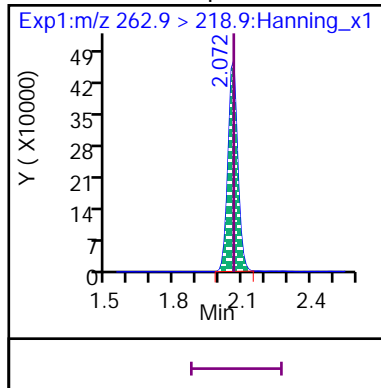
8 Perfluoro-n-butanoic acid (PFBA)



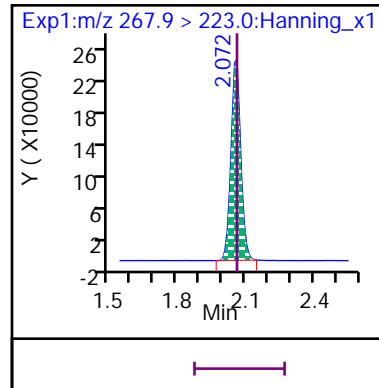
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

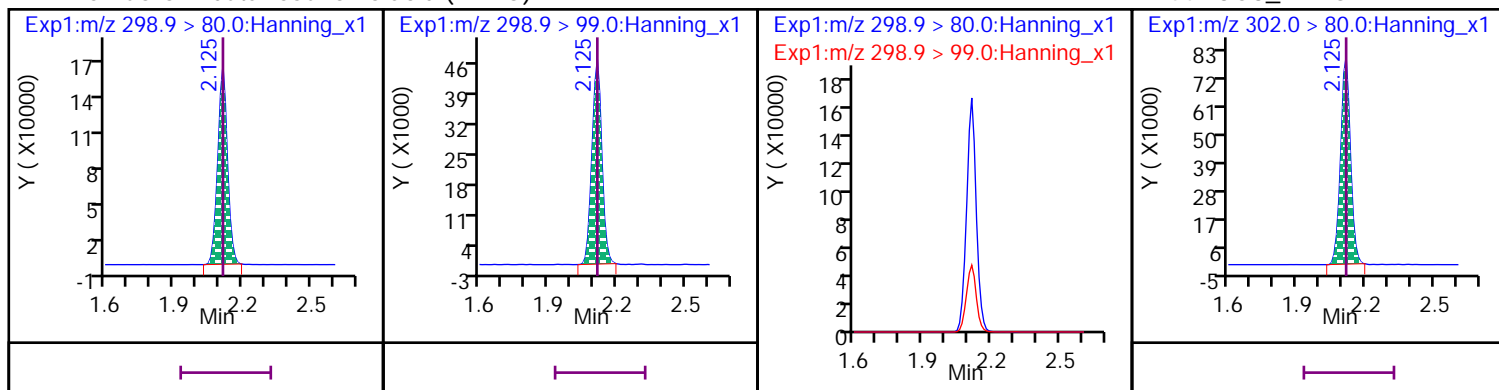


D 50 13C5\_PFPeA



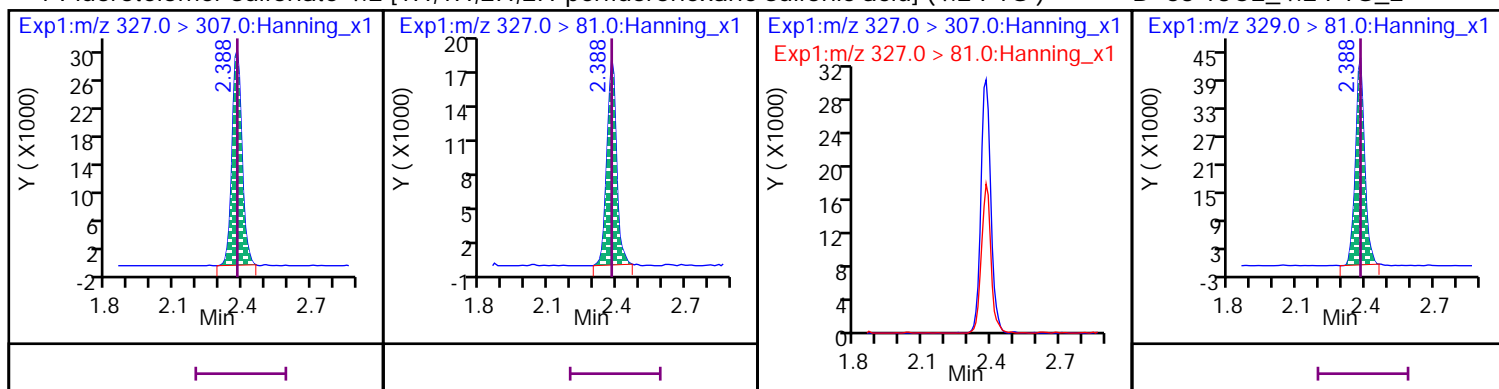
7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



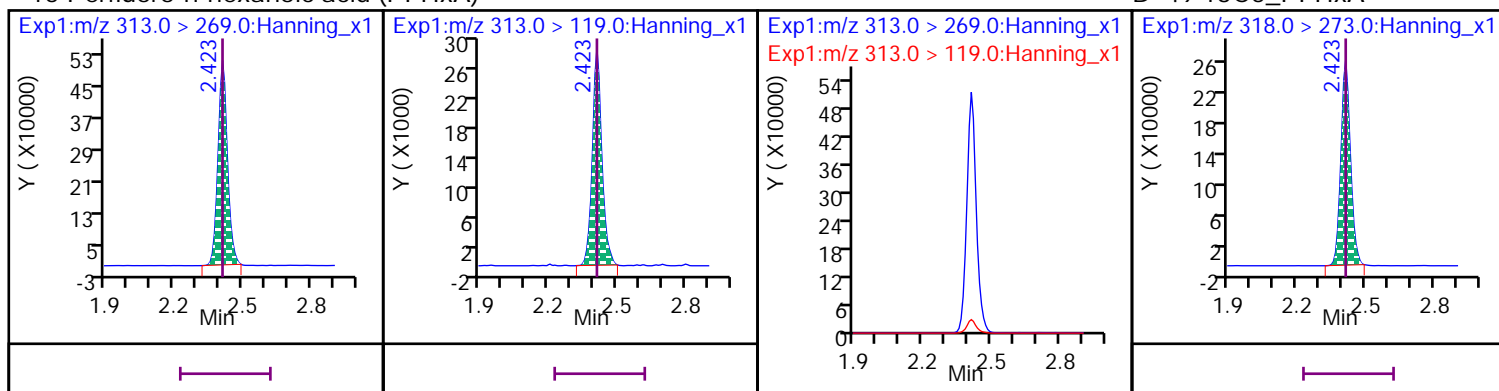
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



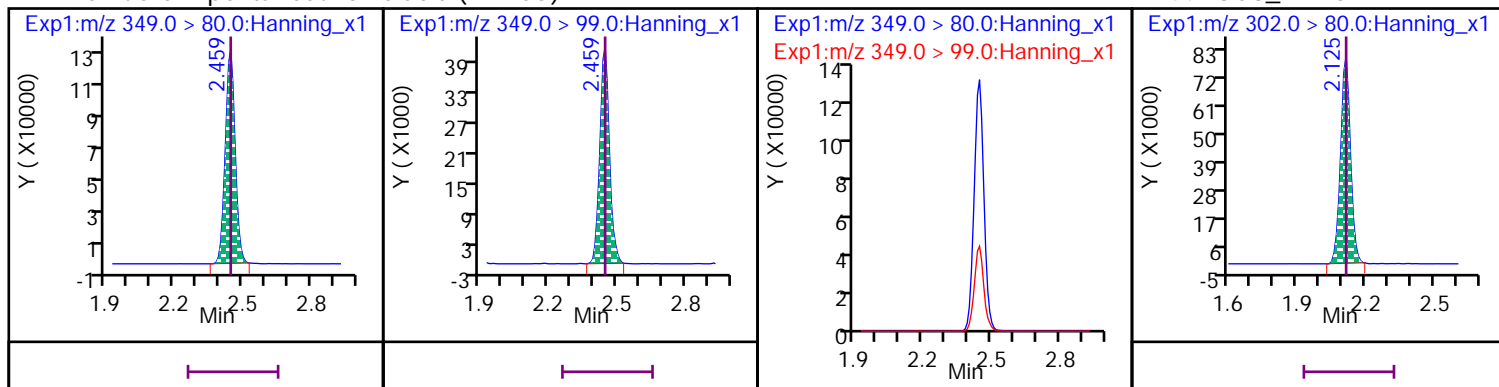
15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



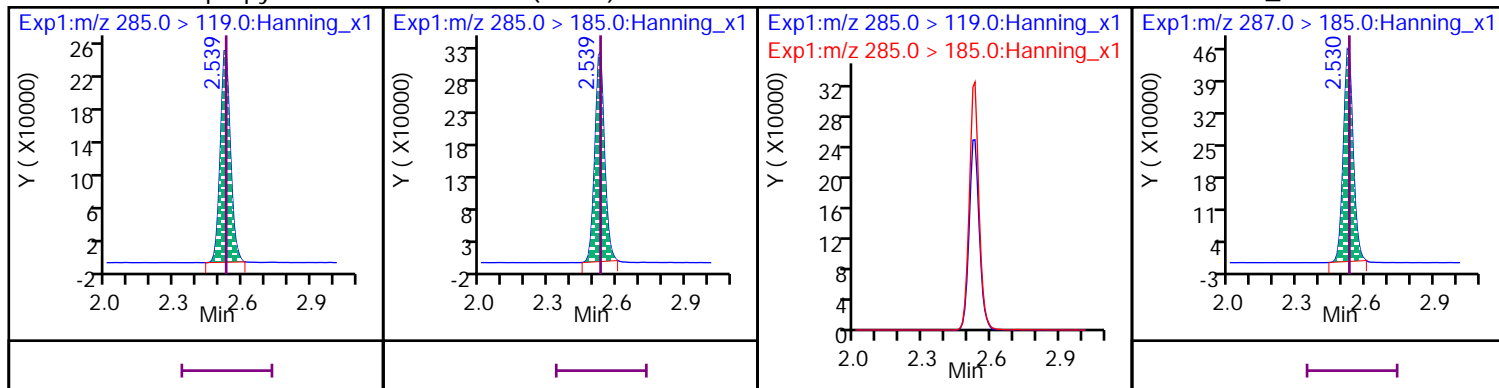
22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



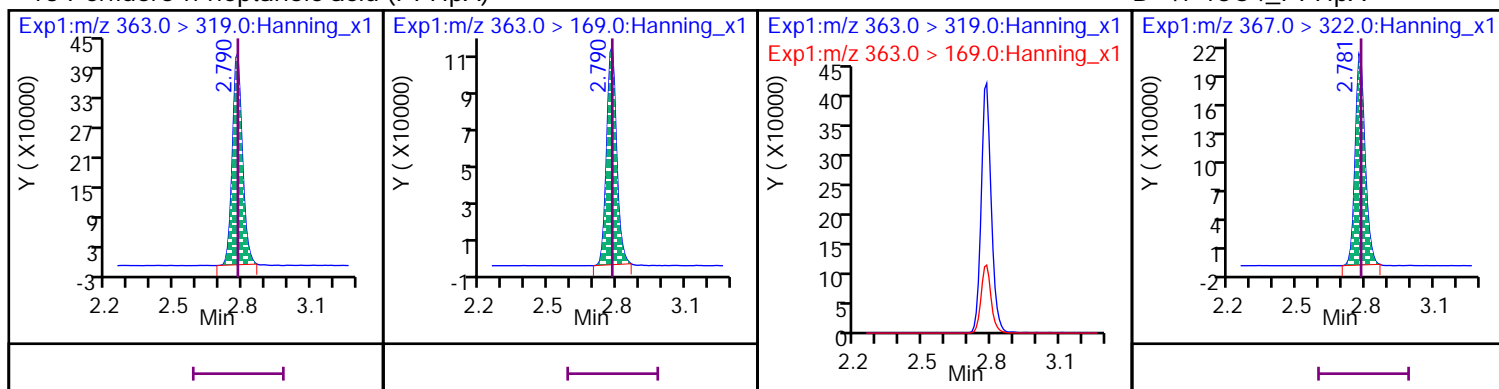
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



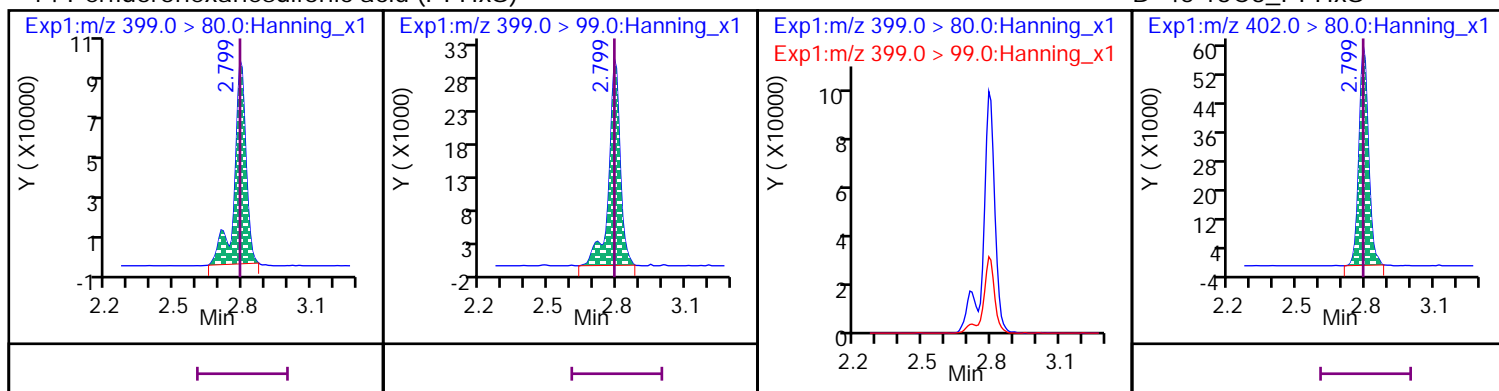
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



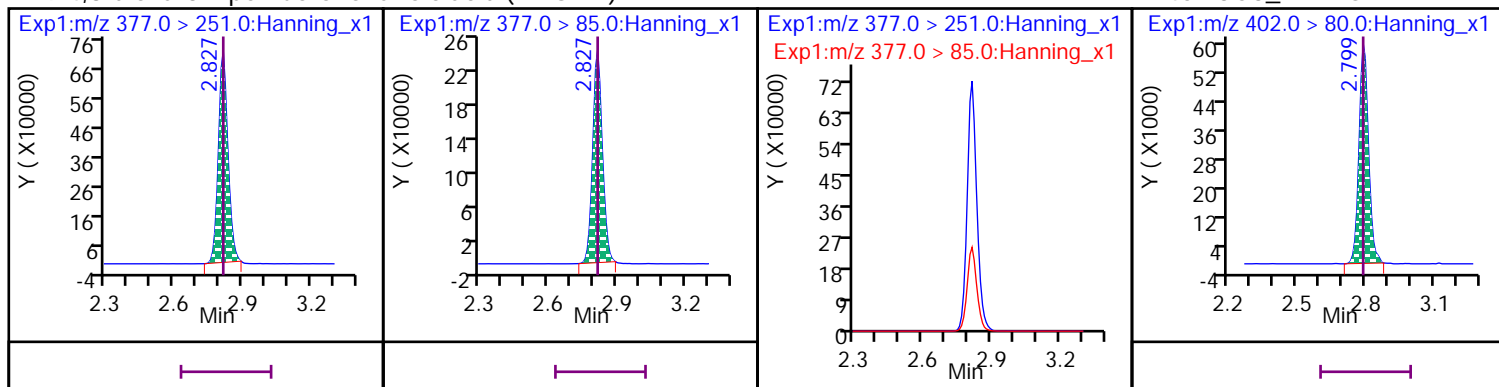
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



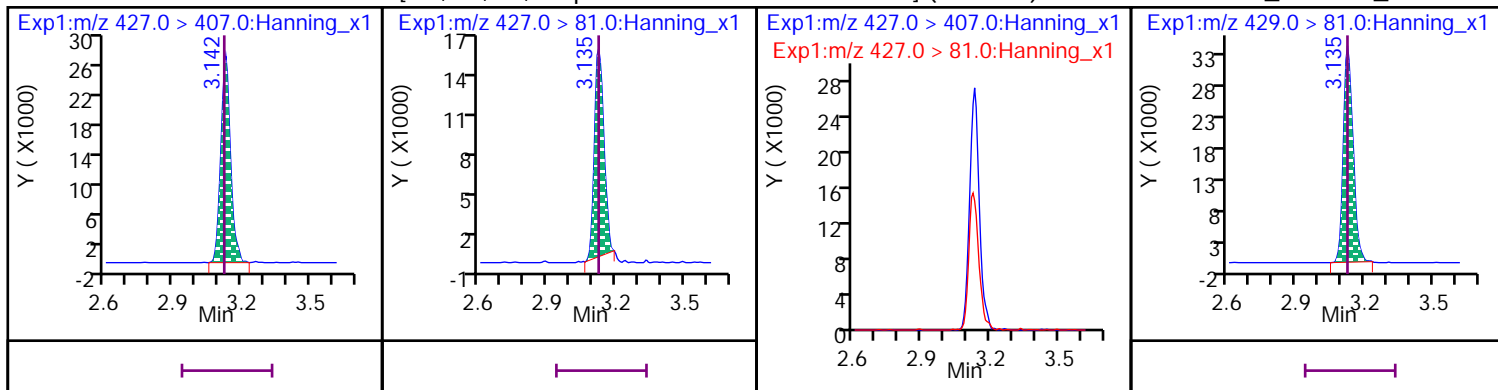
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



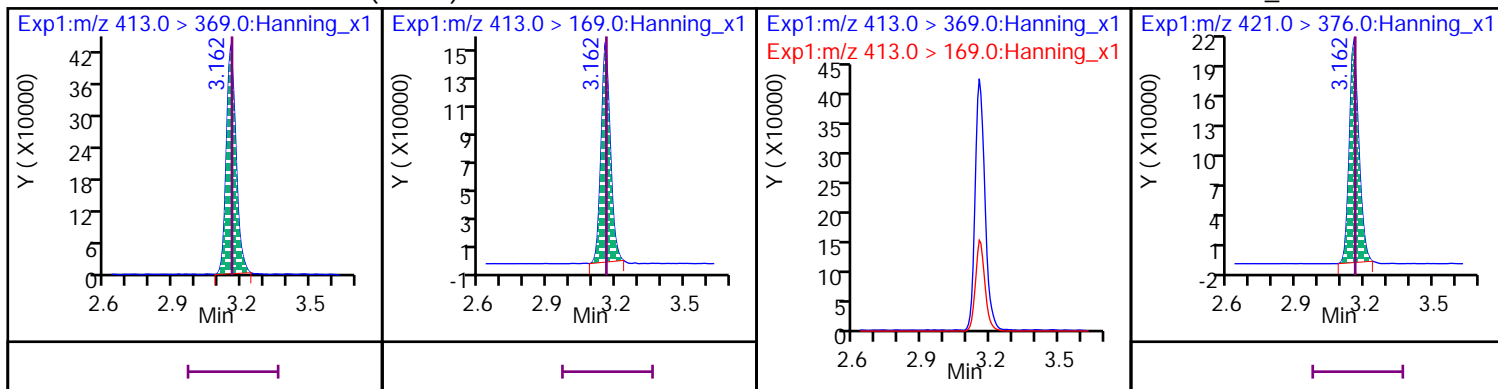
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



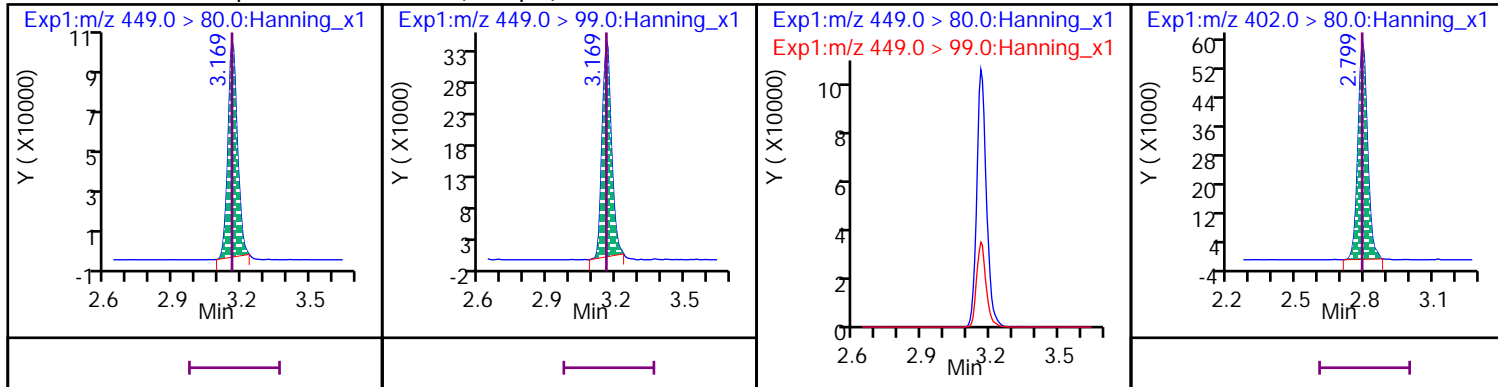
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



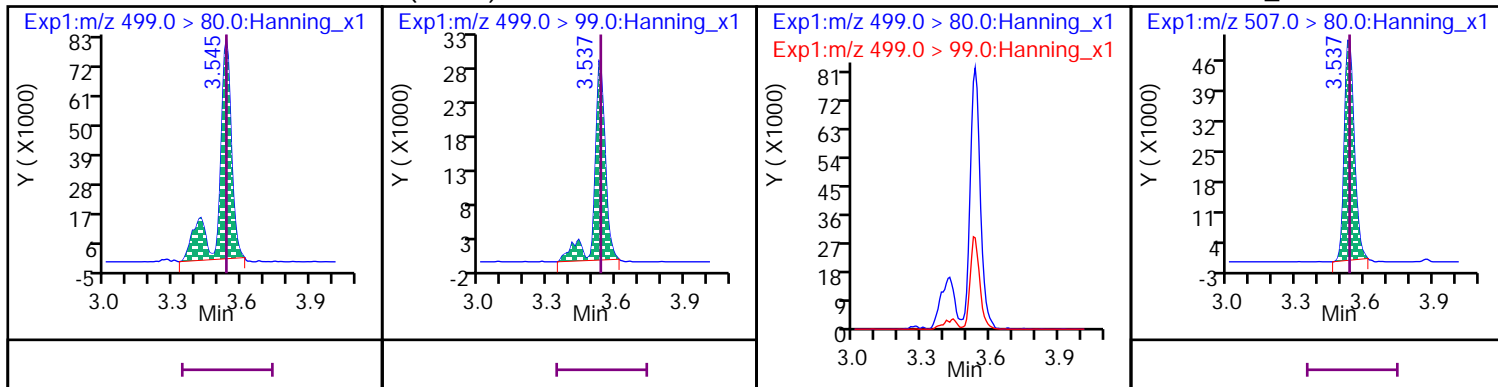
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



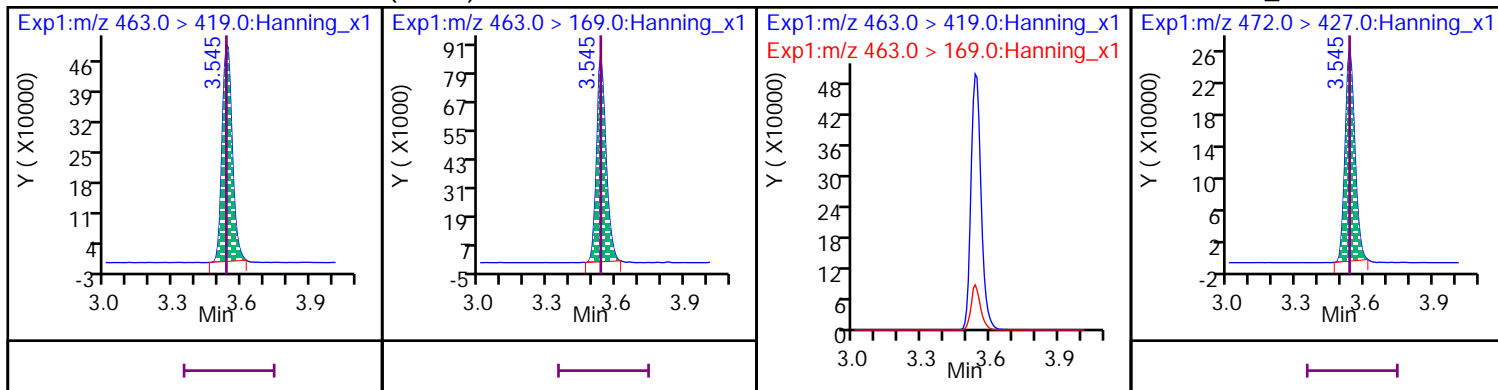
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



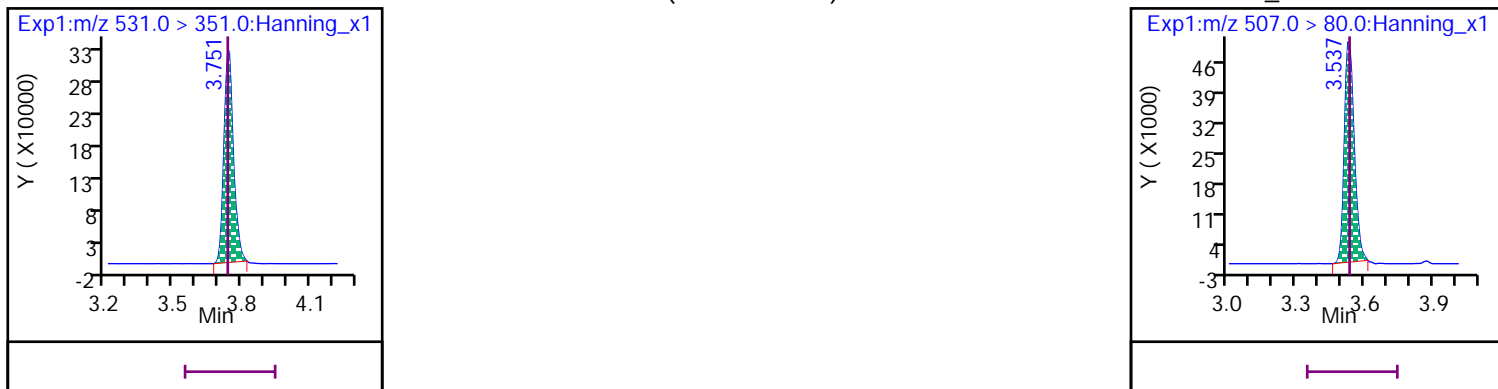
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



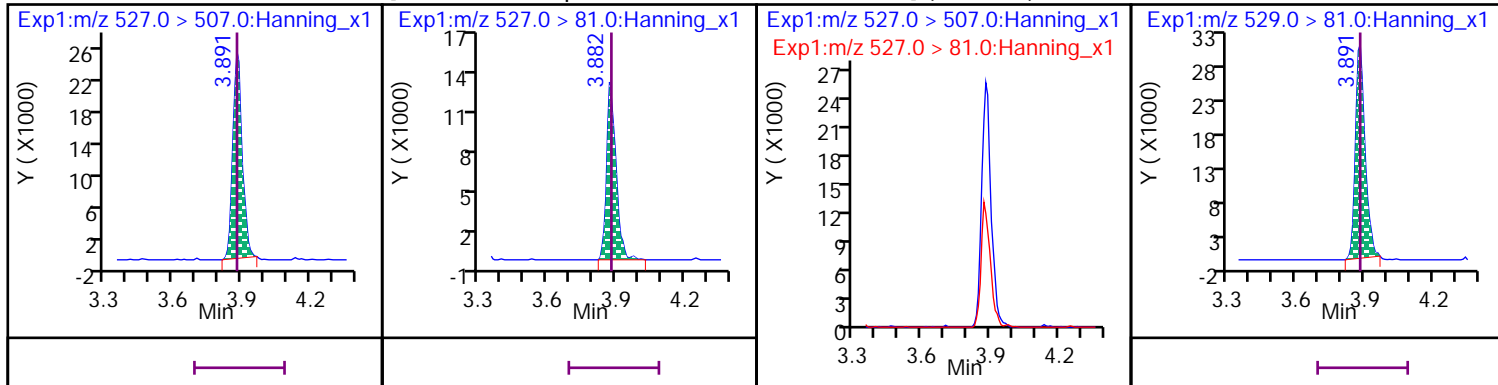
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



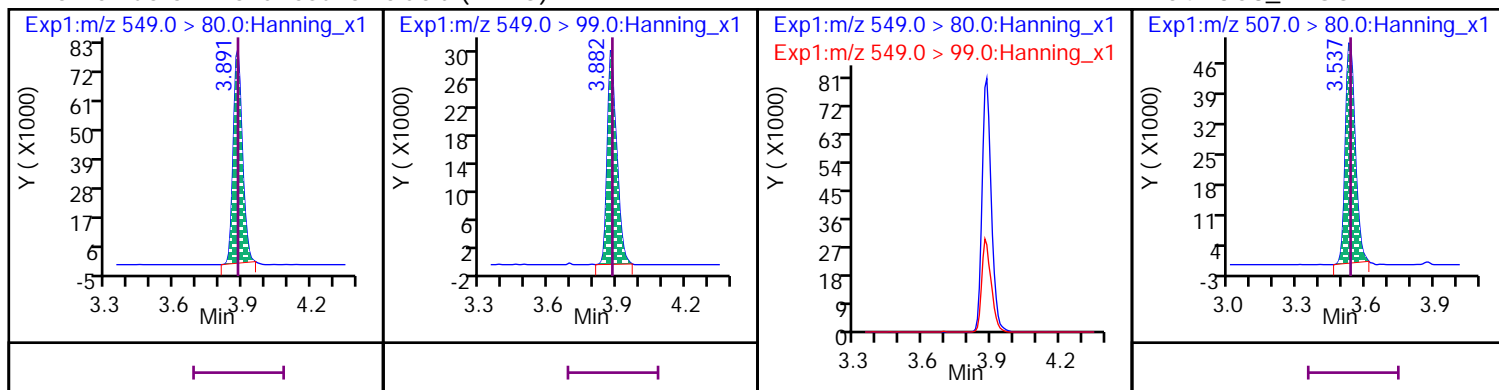
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



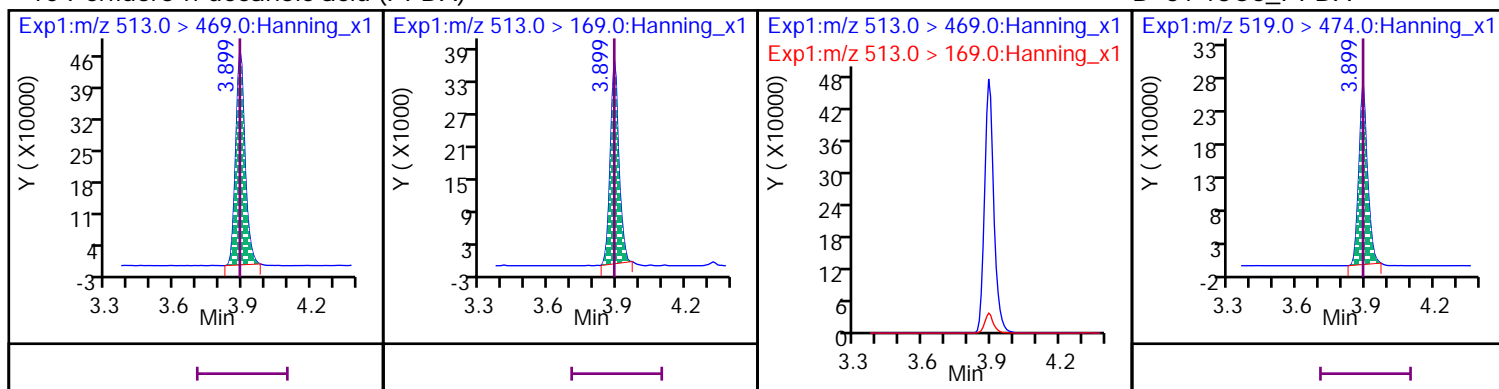
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



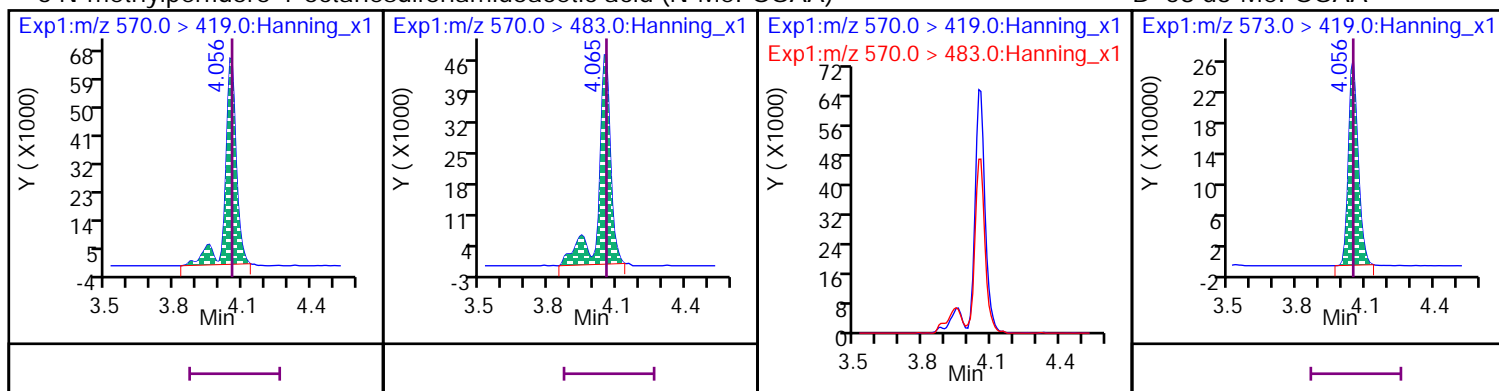
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



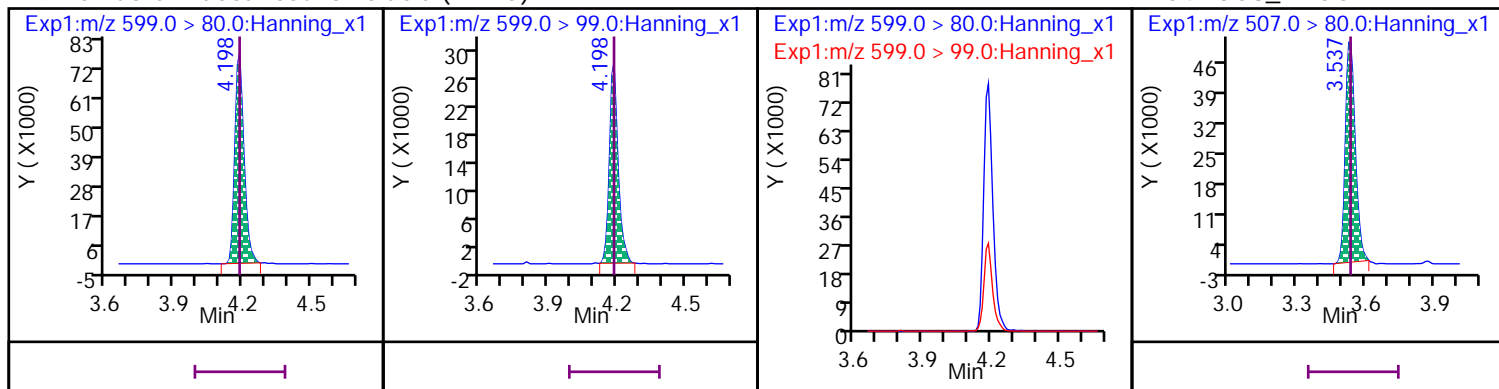
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



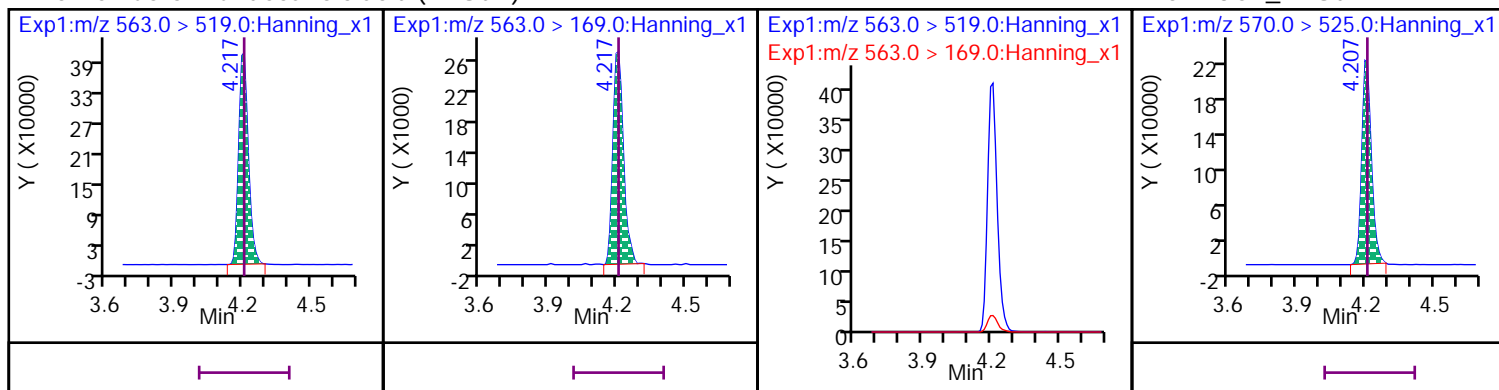
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



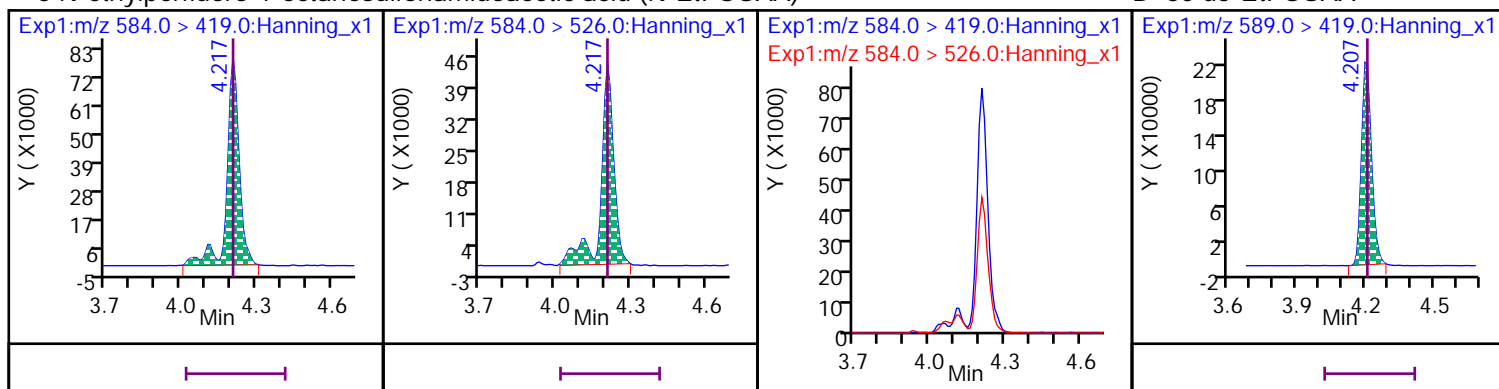
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



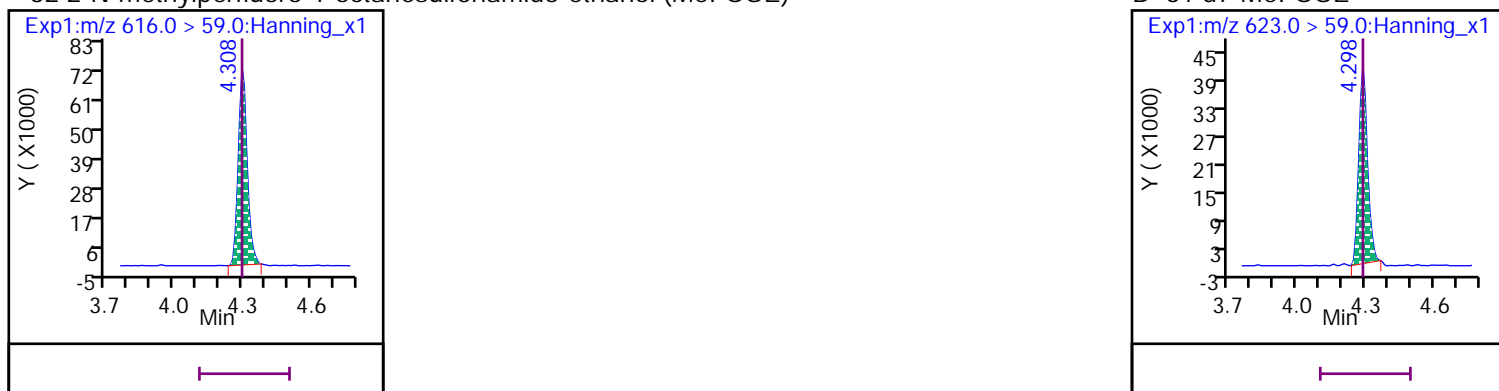
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



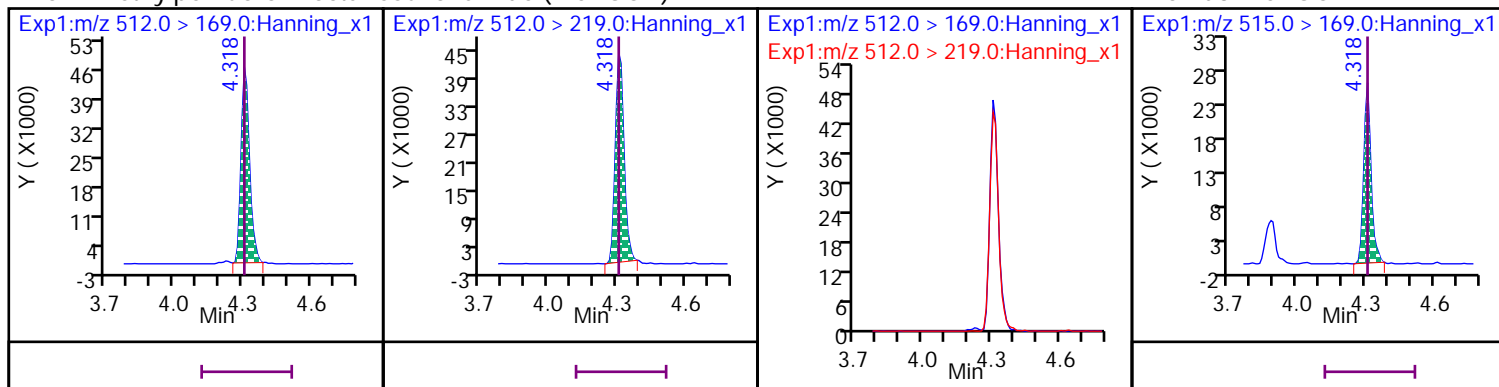
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



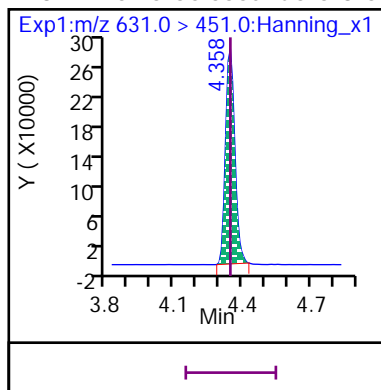
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

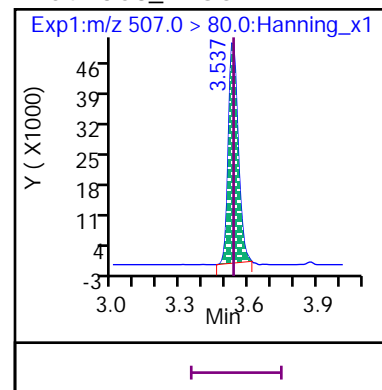




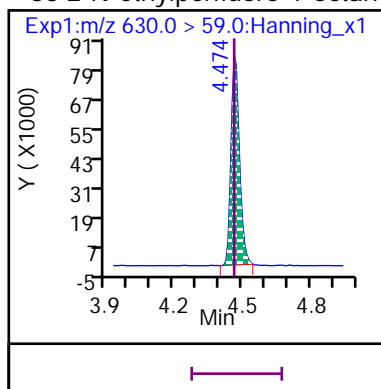
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



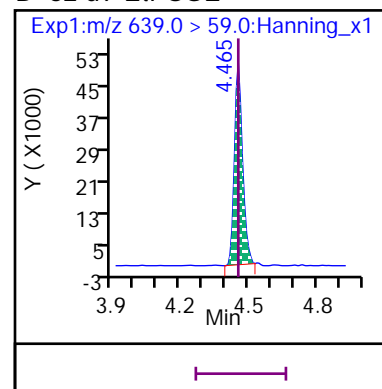
D 54 13C8\_PFOS



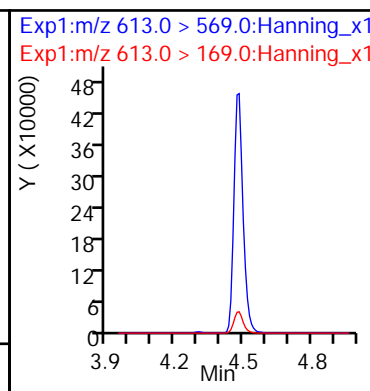
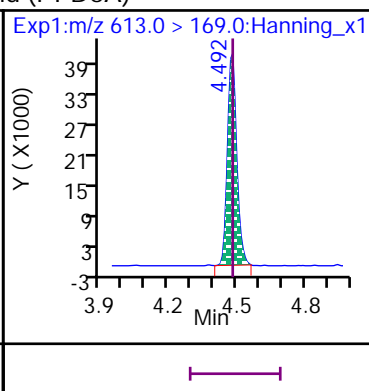
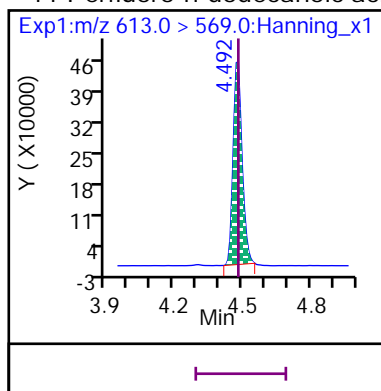
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



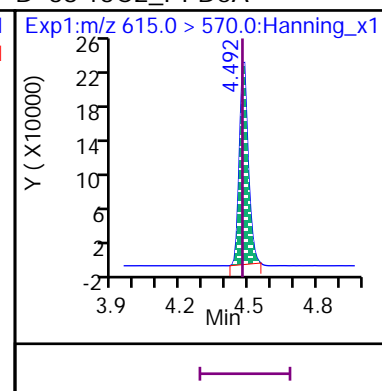
D 62 d9-EtFOSE



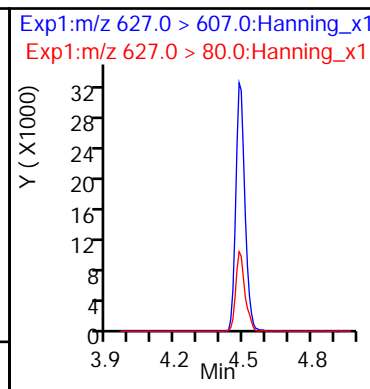
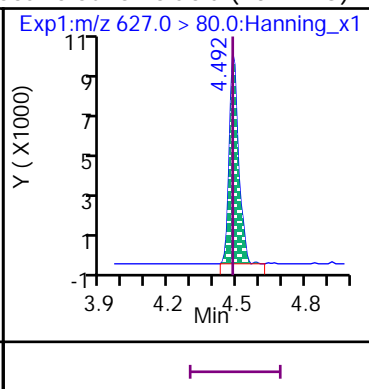
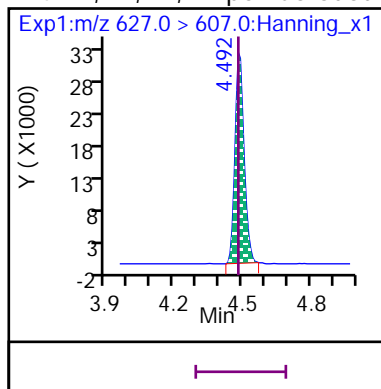
11 Perfluoro-n-dodecanoic acid (PFDoA)



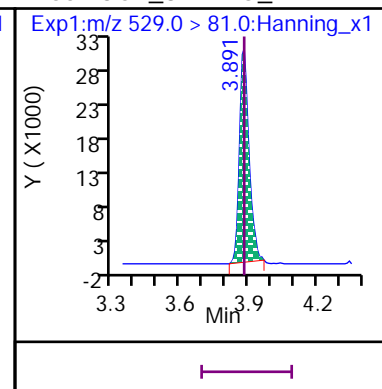
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

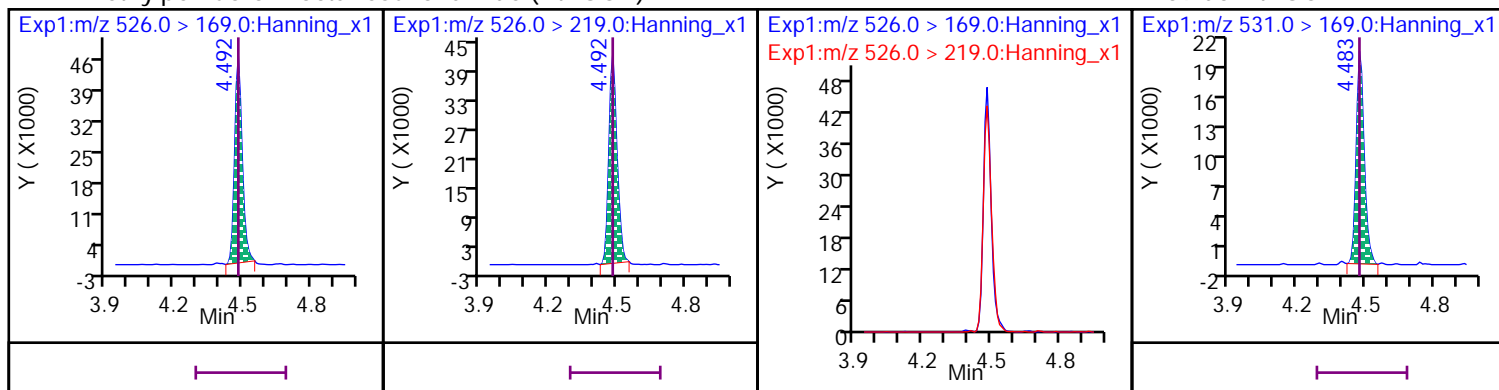


D 65 13C2\_8:2 FTS\_2



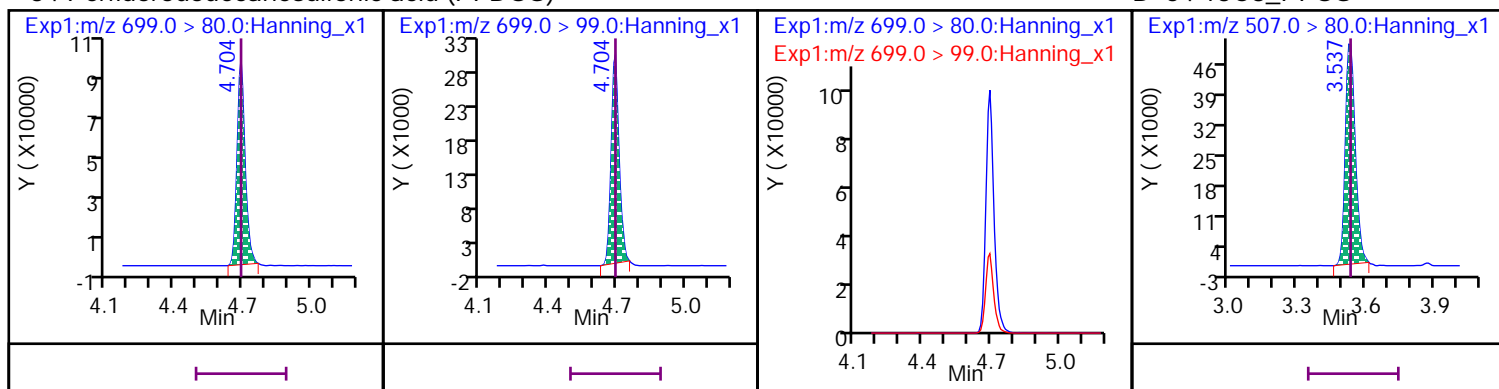
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



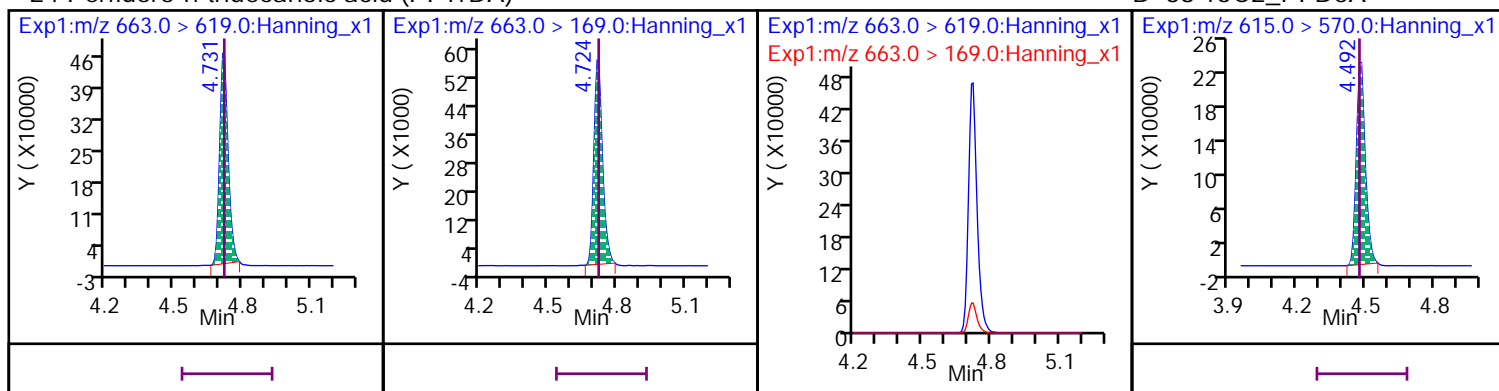
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



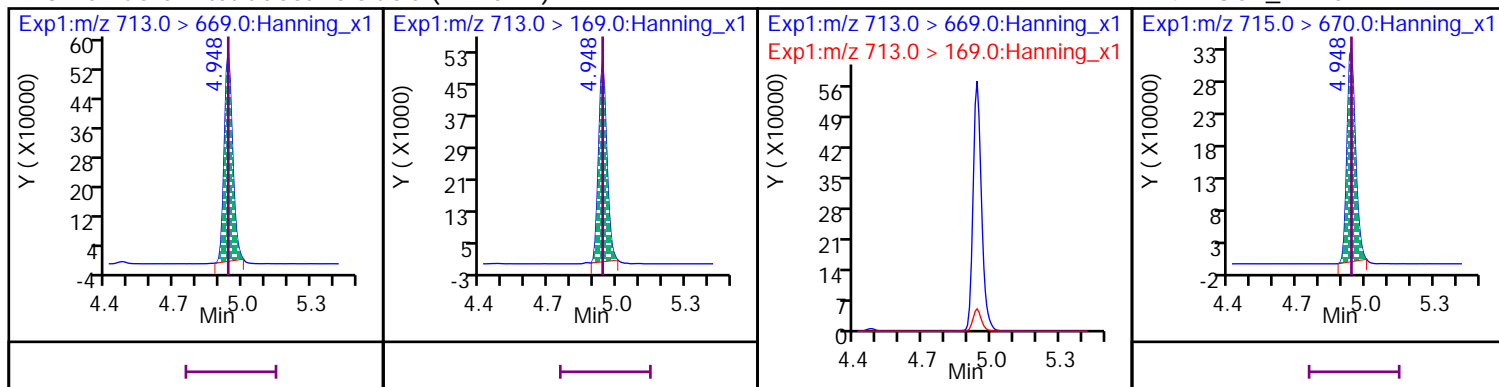
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



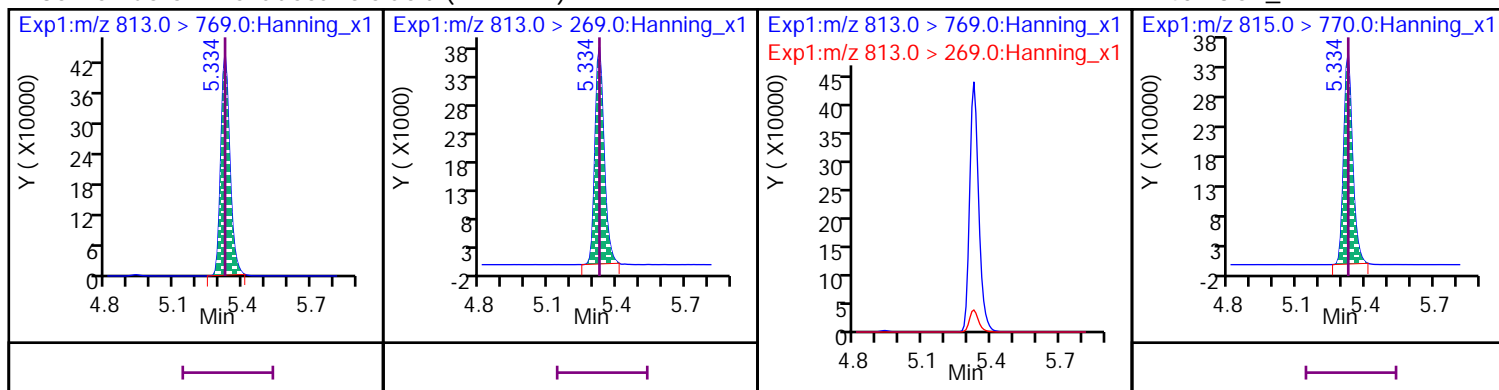
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



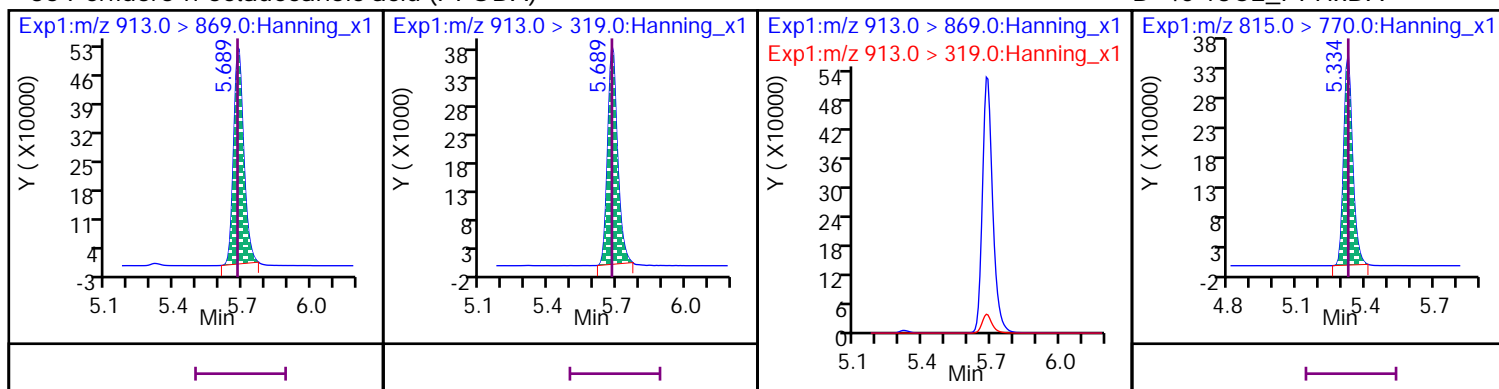
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

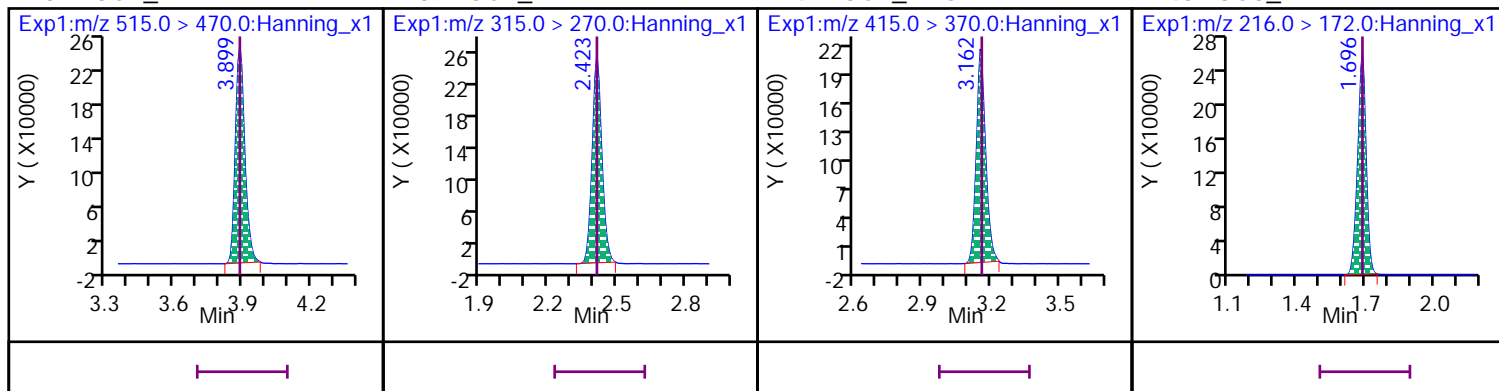


\* 37 13C2\_PFDA

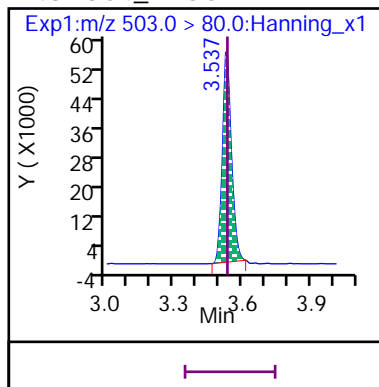
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d  
Injection Date: 17-Dec-2020 13:25:55 Injection Vol: 10.0 uL  
Sample Type: lcal, Level: 7 Auto Sampler: 7  
Sample Info: ICAL 5000\_SVLC-1225 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	689746	23	>100:1			1000.00	994.51	93.8	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.692	1.696	0/0	3419782	22	>100:1			5000.00	4977.97		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	673601	17	>100:1			1000.00	979.23	92.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	3416745	17	>100:1			5000.00	5045.03		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	228127	17	>100:1			1000.00	990.86	92.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	1192471	16	>100:1	Target = 3.50		4420.00	4433.46		
298.9 > 99	44	2.120	2.125		324943	17	>100:1	3.66 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	924332	19		Target = 3.10		4690.00	4670.97		
349 > 99	44	2.460	2.459		293133	19		3.15 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.388	0	119040	18	>100:1			5000.00	4917.32	94.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/1	222209	20	>100:1	Target = 1.80		4670.00	4676.69		
327 > 81	63	2.389	2.388		115910	20	>100:1	1.91 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	727937	20	>100:1			1000.00	987.61	94	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	3598068	19	>100:1	Target = 18.34		5000.00	5006.52		
313 > 119	49	2.425	2.423		180118	19	>100:1	19.97 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1322202	20	>100:1			5000.00	4964.08	93.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	1842769	20	>100:1	Target = 0.81		10000	9699.31		
285 > 185	66	2.532	2.539		2320068	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	623058	20	>100:1			1000.00	1027.05	101	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	3060279	20	>100:1	Target = 3.70		5000.00	4735.26		
363 > 169	47	2.782	2.790		814136	20	>100:1	3.75 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	169479	20				1000.00	989.78	94.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	806242	26	>100:1	Target = 3.21	0.17	4550.00	4486.69		
399 > 99	45	2.800	2.799		248855	24	>100:1	3.23 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	5088509	19	>100:1	Target = 2.97		4710.00	4729.13		
377 > 85	45	2.828	2.827		1657755	19	>100:1	3.06 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	749722	24	>100:1	Target = 3.08		4760.00	4869.59		
449 > 99	45	3.169	3.169		227757	24	>100:1	3.29 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.135	3.135	1	95449	23	>100:1			5000.00	4956.23	91.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	182873	23		Target = 1.80		4740.00	4734.47		
427 > 81	64	3.135	3.135		105682	23	>100:1	1.73 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	595770	23	>100:1			1000.00	1006.60	91	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	2890986	24	>100:1	Target = 2.87		5000.00	4759.93		
413 > 169	53	3.162	3.169		1020861	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	155392	21	>100:1			1000.00	1036.44	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	810961	60	>100:1	Target = 3.84	0.26	4640.00	4404.11		M
499 > 99	54	3.545	3.545		231102	40	>100:1	3.50 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/0	2345953	22	>100:1			4660.00	4484.51		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	517609	19	>100:1	Target = 3.07		4800.00	4352.71		
549 > 99	54	3.891	3.891		189448	18	>100:1	2.73 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	515140	18		Target = 3.03		4820.00	4567.94		
599 > 99	54	4.198	4.198		188241	16	>100:1	2.73 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	1952030	16	>100:1			4710.00	4423.32		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	564101	20		Target = 3.33		4840.00	4521.73		
699 > 99	54	4.704	4.704		178629	19	>100:1	3.15 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	734704	20	>100:1			1000.00	978.35	92.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	3648336	21	>100:1	Target = 6.16		5000.00	4965.58		
463 > 169	56	3.545	3.545		576840	21	>100:1	6.32 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	301964	20	>100:1			1000.00	975.45	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	1472381	19	>100:1			5000.00	4948.01		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	91612	18				5000.00	4938.62	98.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	178203	21	>100:1	Target = 1.95		4790.00	4904.03		
527 > 81	65	3.891	3.891		88024	19		2.02 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	200776	16		Target = 3.14		4820.00	4741.86		
627 > 80	65	4.492	4.492		58638	16	>100:1	3.42 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	666513	20	>100:1			1000.00	1004.80	95.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	3167782	19	>100:1	Target = 15.94		5000.00	4836.95		
513 > 169	51	3.899	3.899		215952	19	>100:1	14.66 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	728018	18	>100:1			5000.00	5071.91	95.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	550648	32	>100:1	Target = 1.33	0.13	5000.00	4923.29		
570 > 483	58	4.056	4.065		391998	36	>100:1	1.40 (0.66-1.99)	0.24				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.218	4.217	1	653728	17	>100:1			5000.00	4922.11	88.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/0	645216	34	>100:1	Target = 1.58	0.05	5000.00	4956.79		M
584 > 526	60	4.218	4.217		410348	37	>100:1	1.57 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.218	4.217	1	627270	19	>100:1			1000.00	992.40	92.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.218	4.217	1/0	2851720	17	>100:1	Target = 15.50		5000.00	4837.07		
563 > 169	52	4.218	4.217		198738	18	>100:1	14.34 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	113389	15	>100:1			1000.00	1047.88	96.7	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	488440	15	>100:1			5000.00	4584.55		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	54589	17	>100:1			1000.00	1031.60	99.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.318	1/0	296904	16	>100:1	Target = 1.12		5000.00	4820.84		
512 > 219	57	4.318	4.318		268904	16	>100:1	1.10 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	130009	18	>100:1			1000.00	1036.79	107	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	540165	16	>100:1			5000.00	4670.04		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	614915	16	>100:1			1000.00	1015.86	94.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	2982859	18	>100:1	Target = 10.85		5000.00	4790.16		
613 > 169	38	4.492	4.492		273421	18	>100:1	10.90 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.724	4.731	0/-1	2915284	20	>100:1	Target = 8.37		5000.00	4813.45		
663 > 169	38	4.731	4.731		344345	19	>100:1	8.46 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	48322	17	>100:1			1000.00	984.27	93.8	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	244938	15	>100:1	Target = 1.03		5000.00	4639.64		
526 > 219	59	4.492	4.492		267341	16	>100:1	0.91 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	829396	20	>100:1			1000.00	984.51	93.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	3638371	19	>100:1	Target = 12.11		5000.00	5062.93		
713 > 169	42	4.948	4.948		298096	20	>100:1	12.20 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	906655	18	>100:1			1000.00	1000.54	99.2	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	2839296	20	>100:1	Target = 11.48		5000.00	4792.88		
813 > 269	40	5.334	5.334		249529	19	>100:1	11.37 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	1/0	3981944	24	>100:1	Target = 13.88		5000.00	4961.38		
913 > 319	40	5.689	5.689		283765	24	>100:1	14.03 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	648368	19	>100:1					89.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	707776	20	>100:1					94	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	567038	23	>100:1					88	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	621648	22	>100:1					93.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.537	3.545	0	143306	19	>100:1					88.2	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

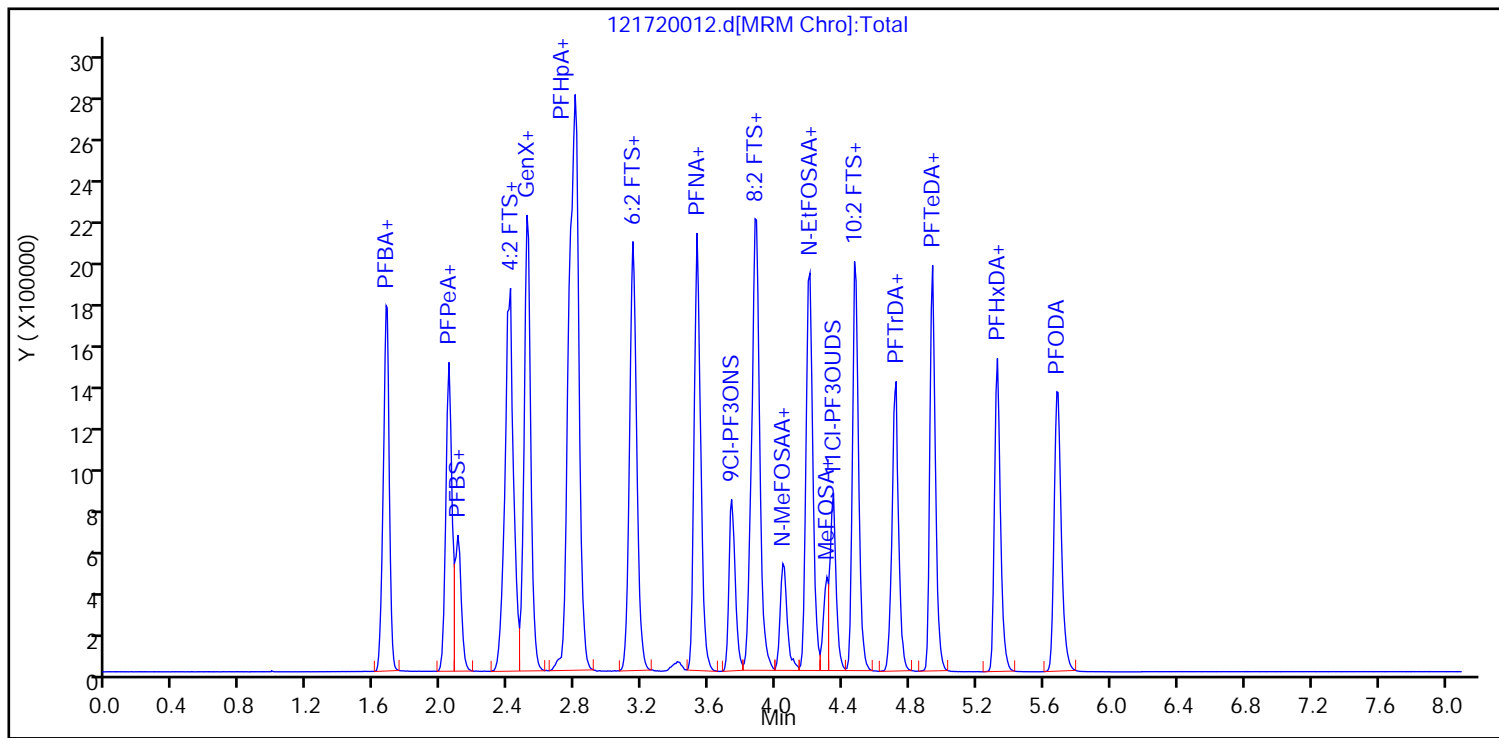
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Lab ID: ICAL 5000\_SVLC-1225

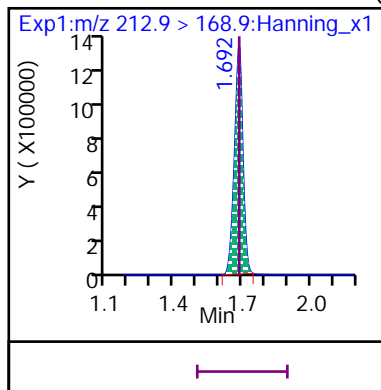
Sample Info: ICAL 5000\_SVLC-1225

Dil. Factor: 1

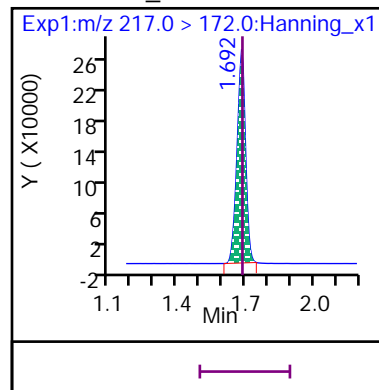
Operator: Stephen E. Somerville



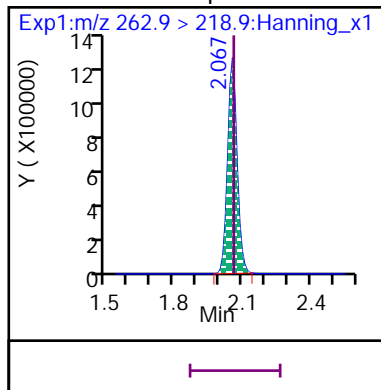
8 Perfluoro-n-butanoic acid (PFBA)



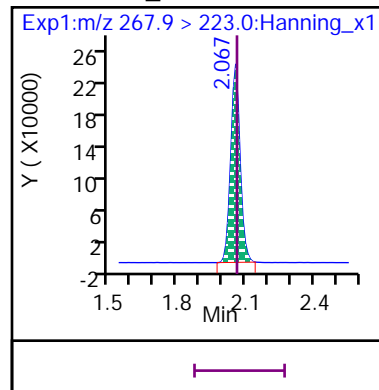
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



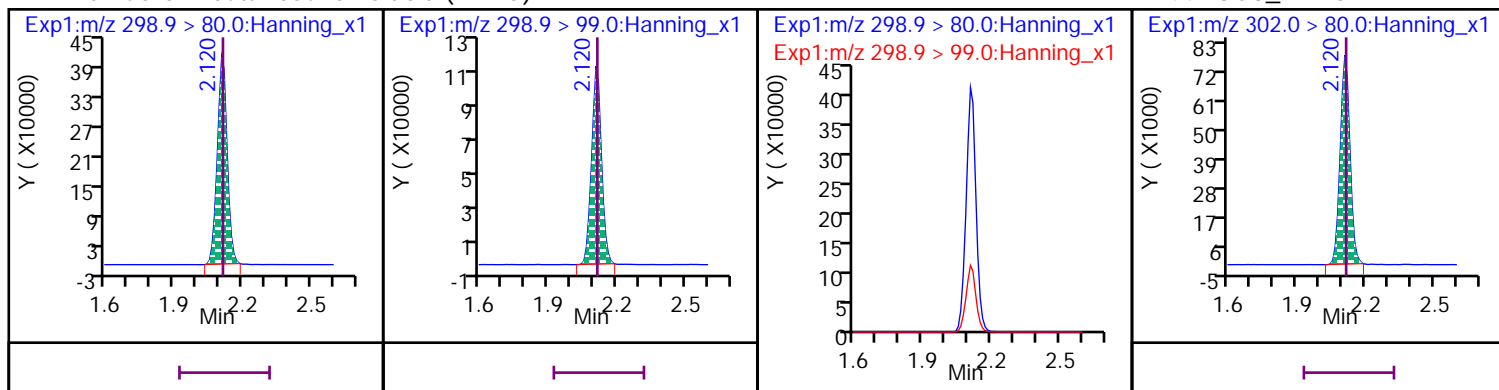
D 50 13C5\_PFPeA





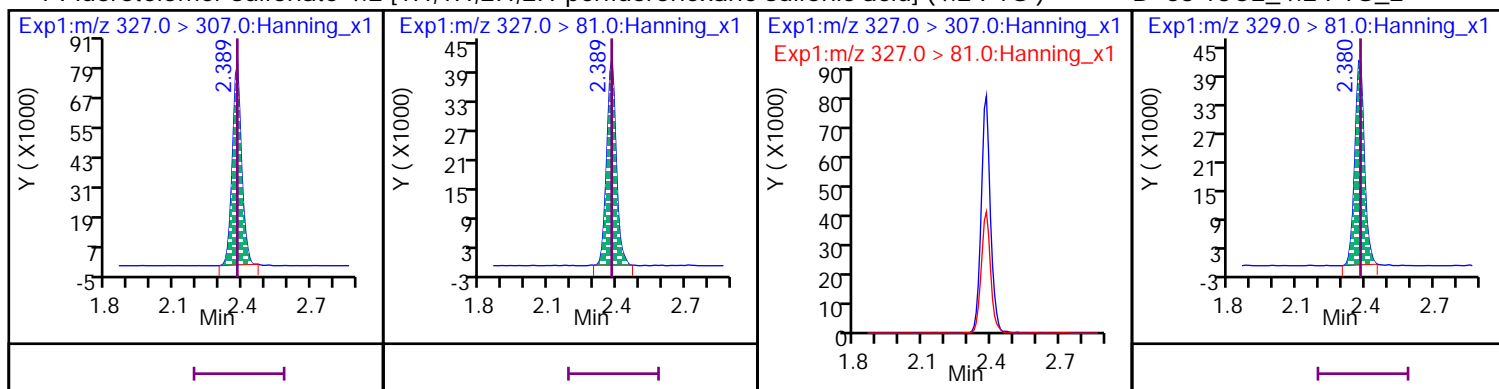
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



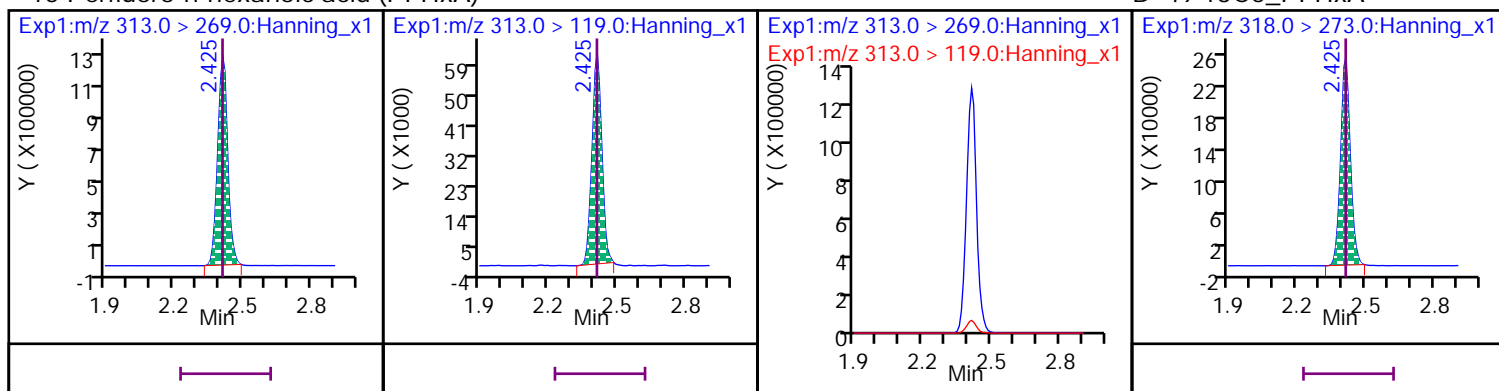
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



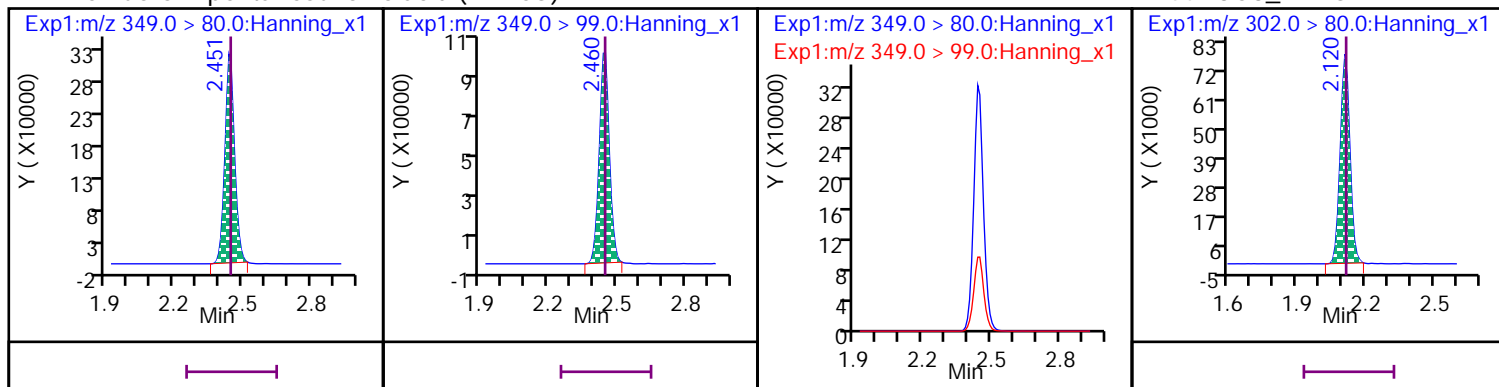
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



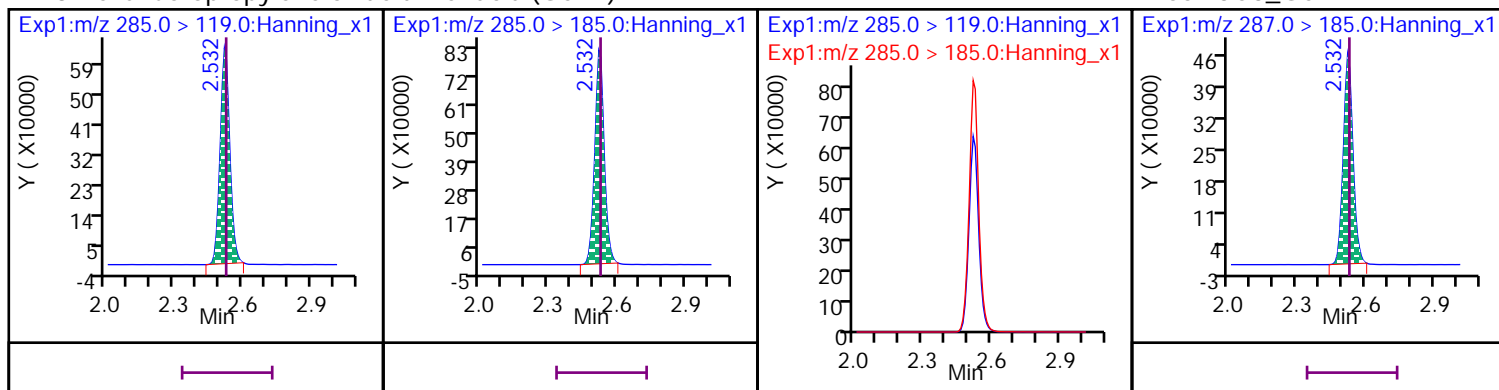
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



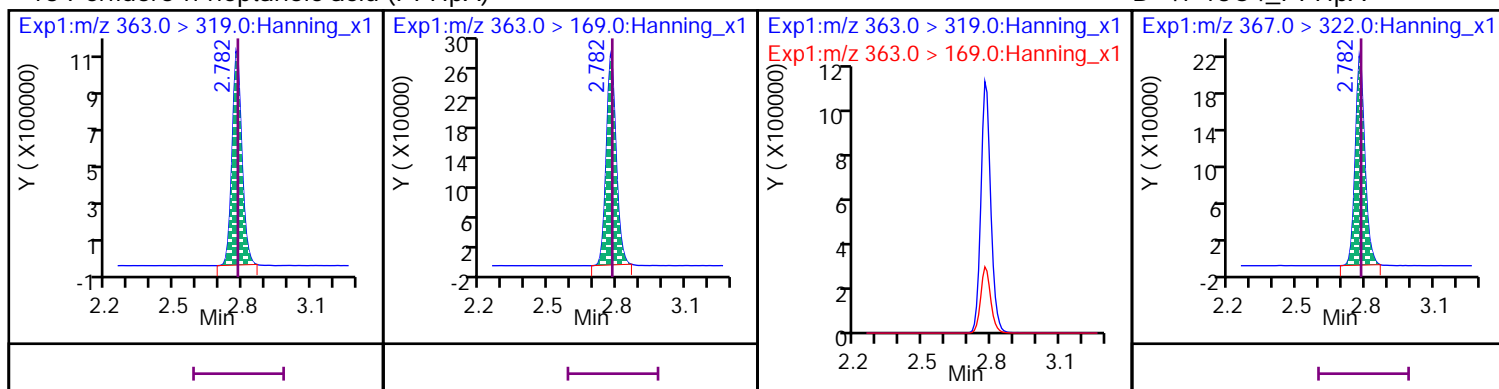
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



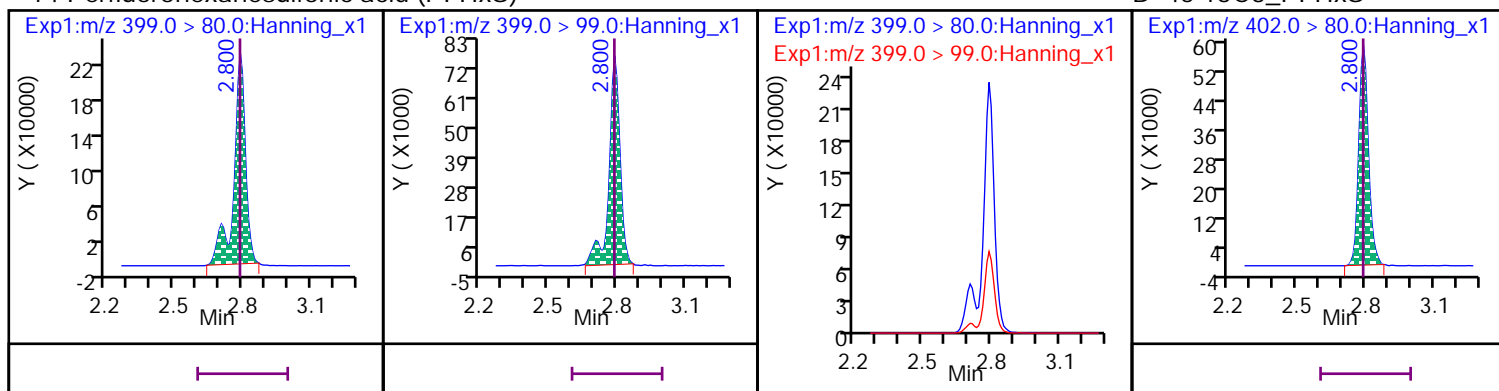
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



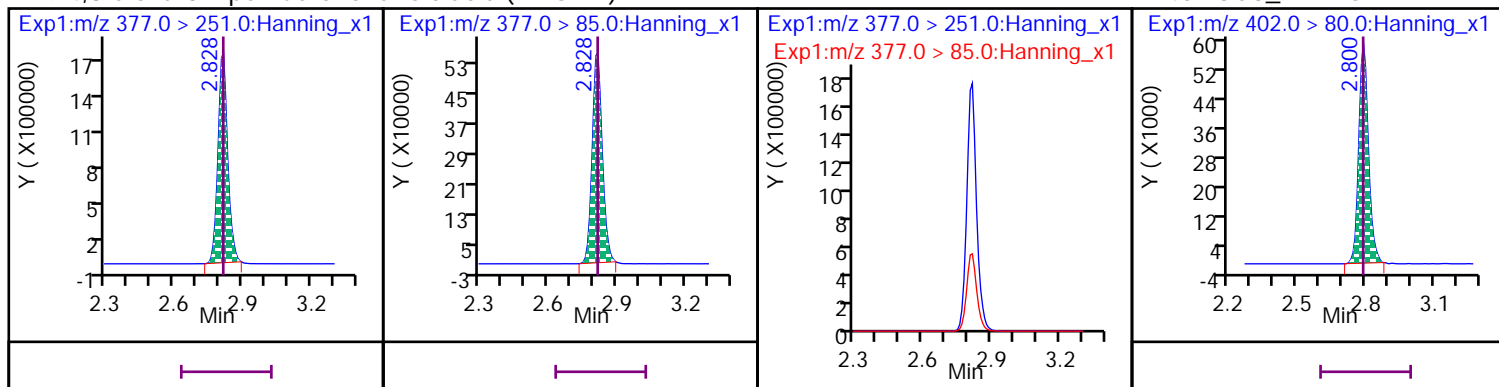
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



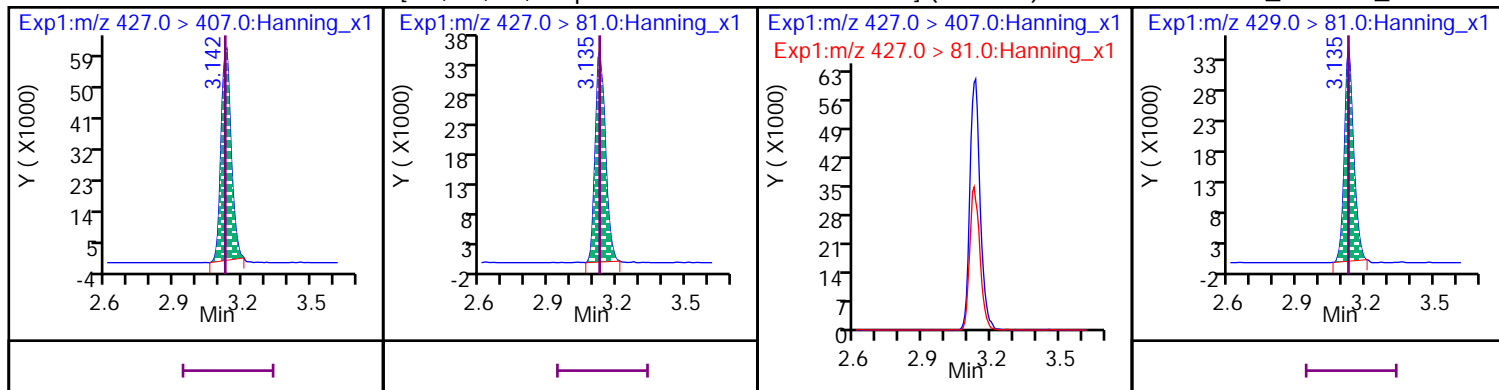
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



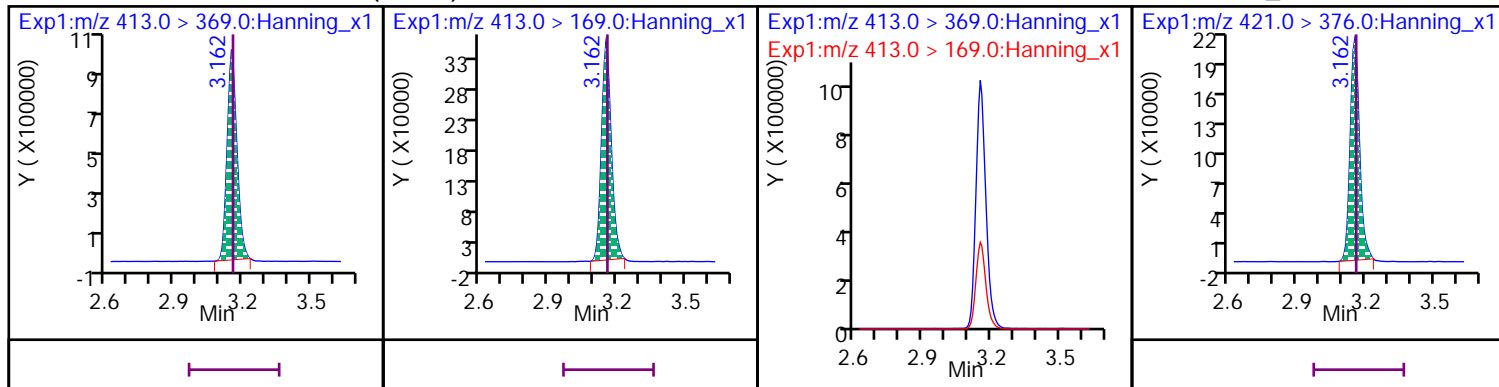
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



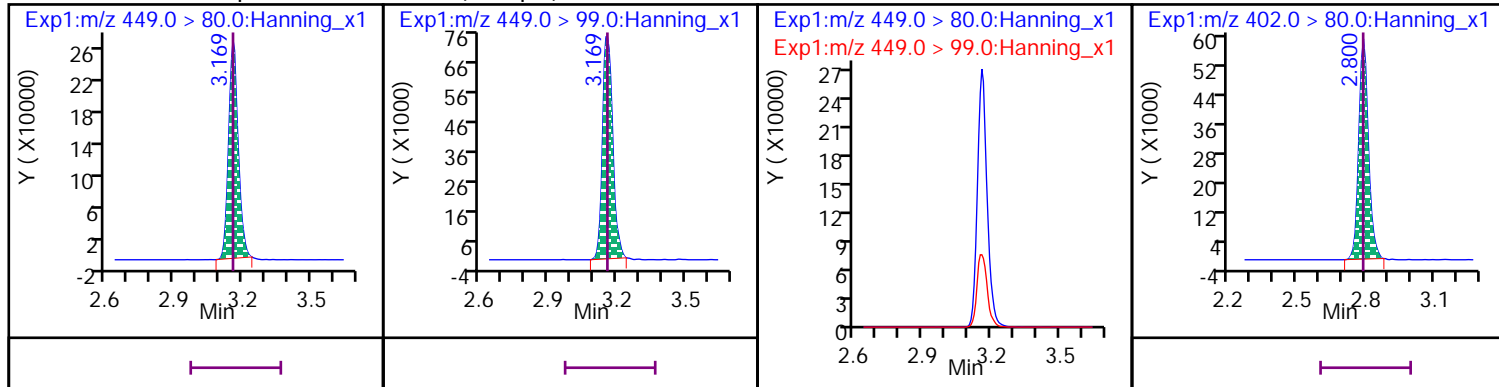
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



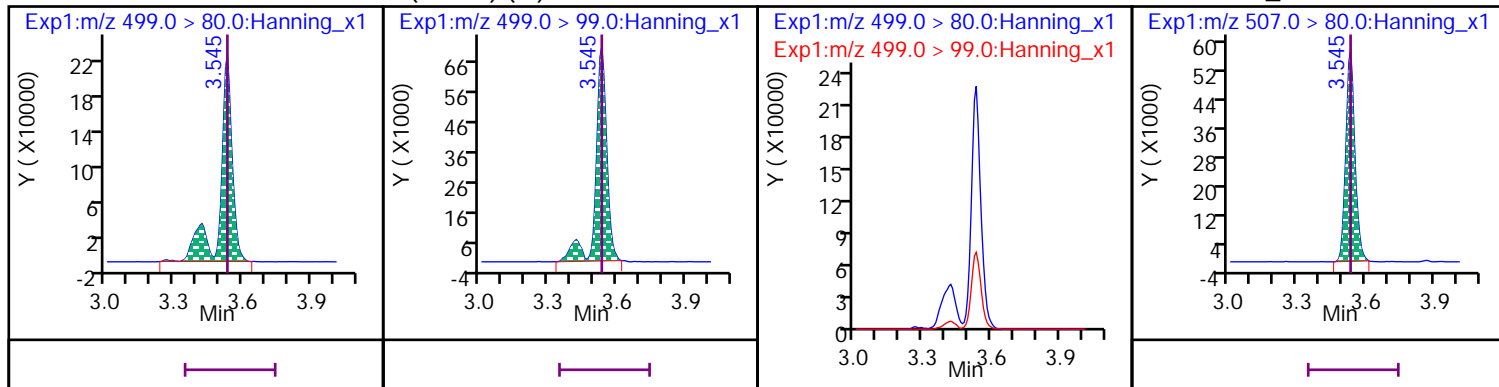
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



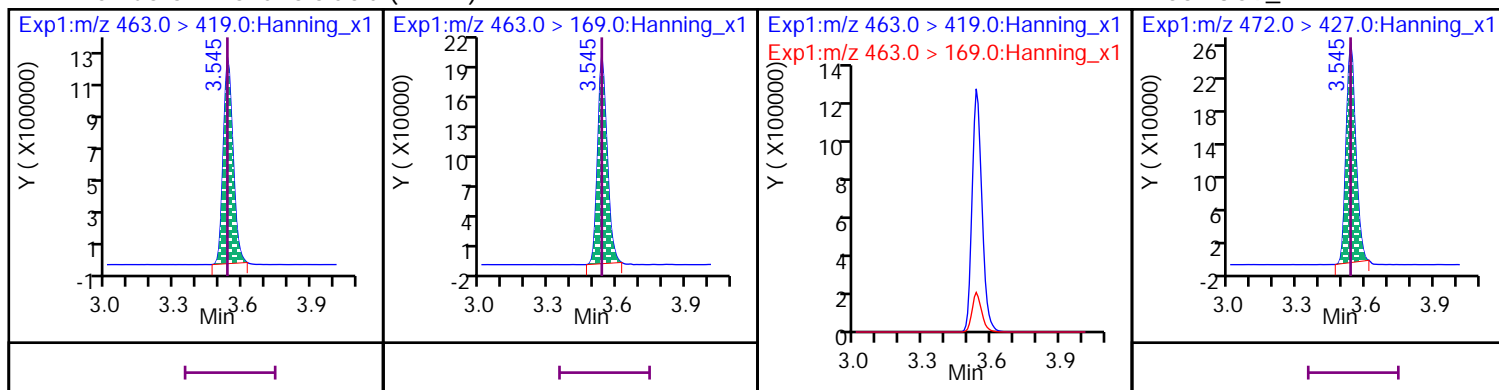
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



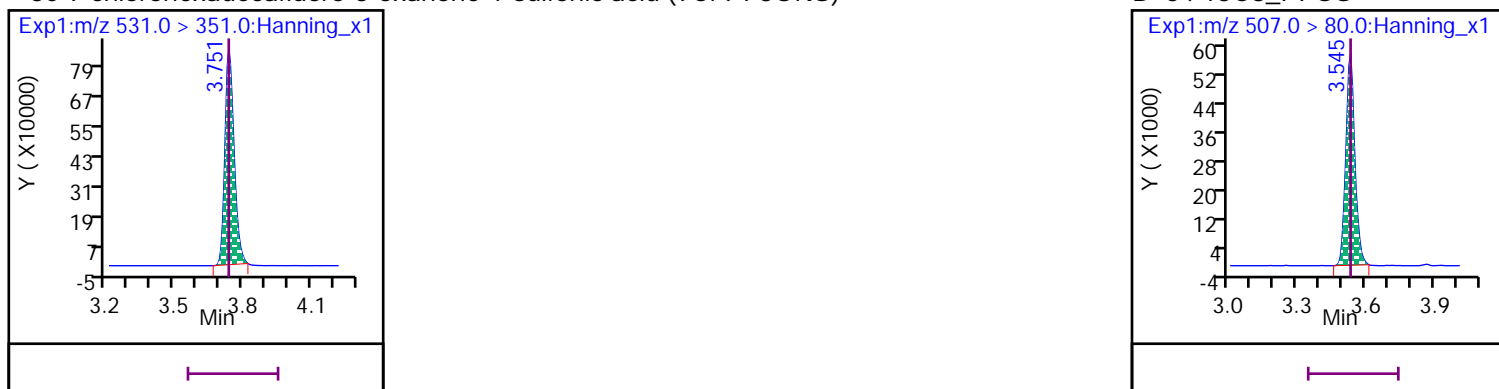
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



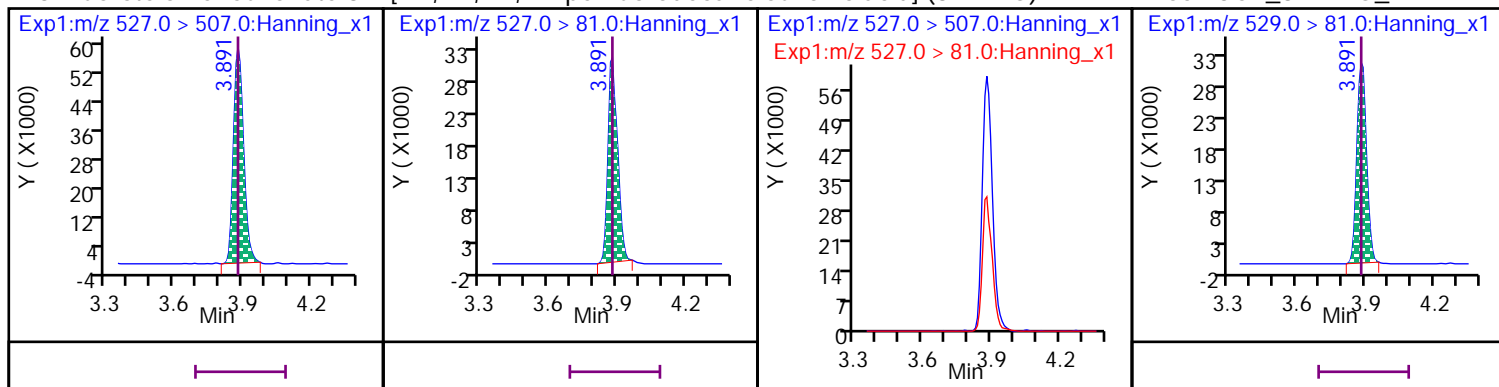
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



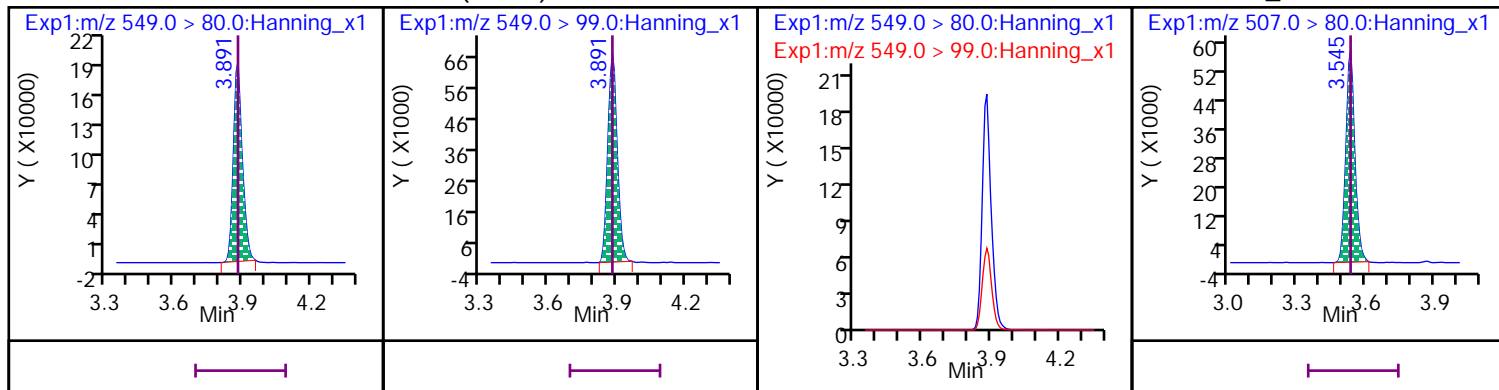
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



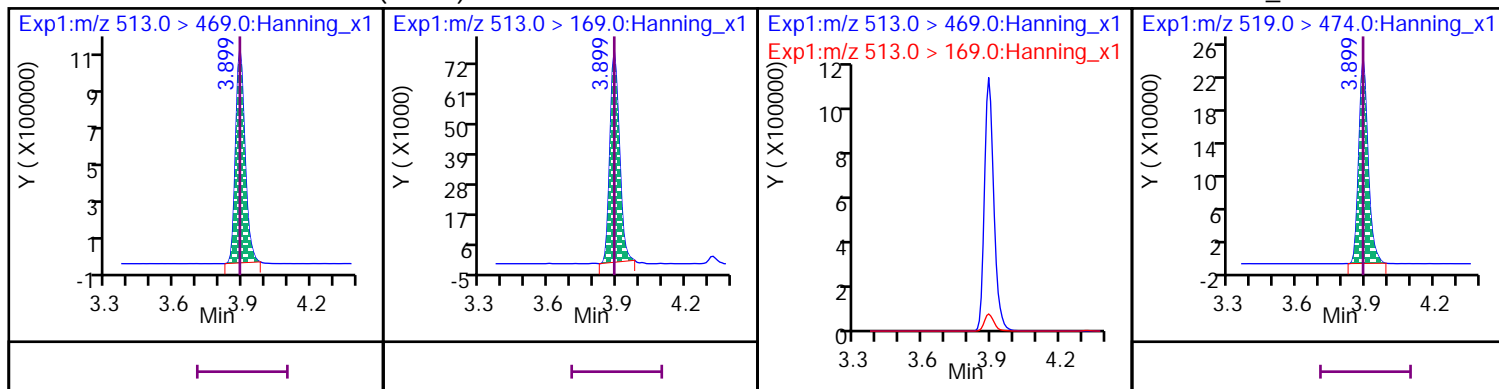
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



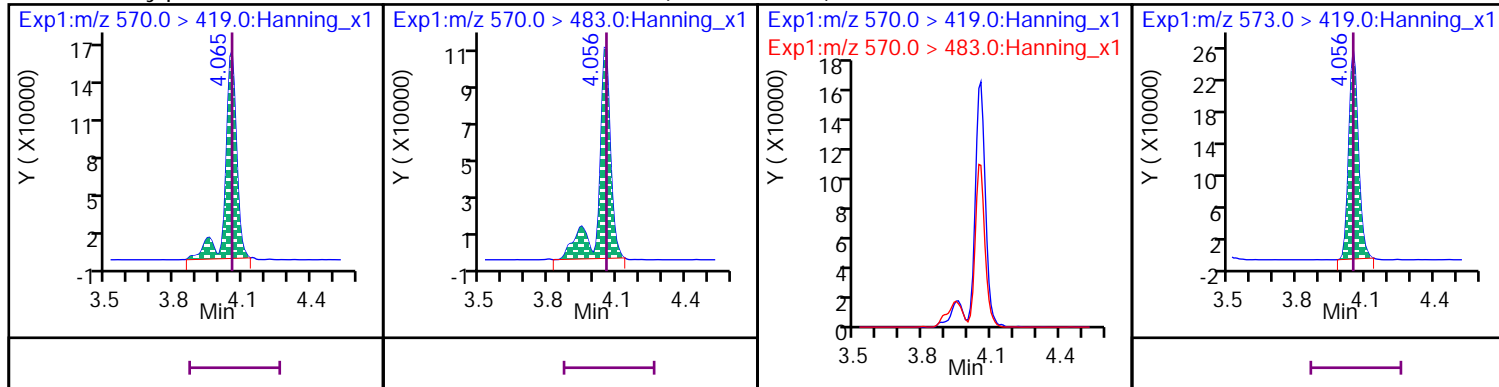
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



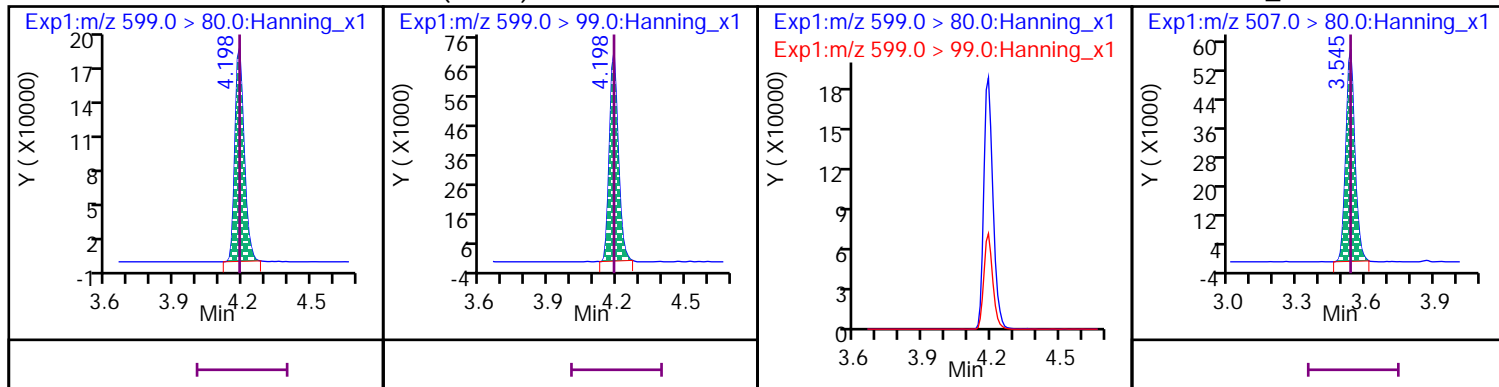
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



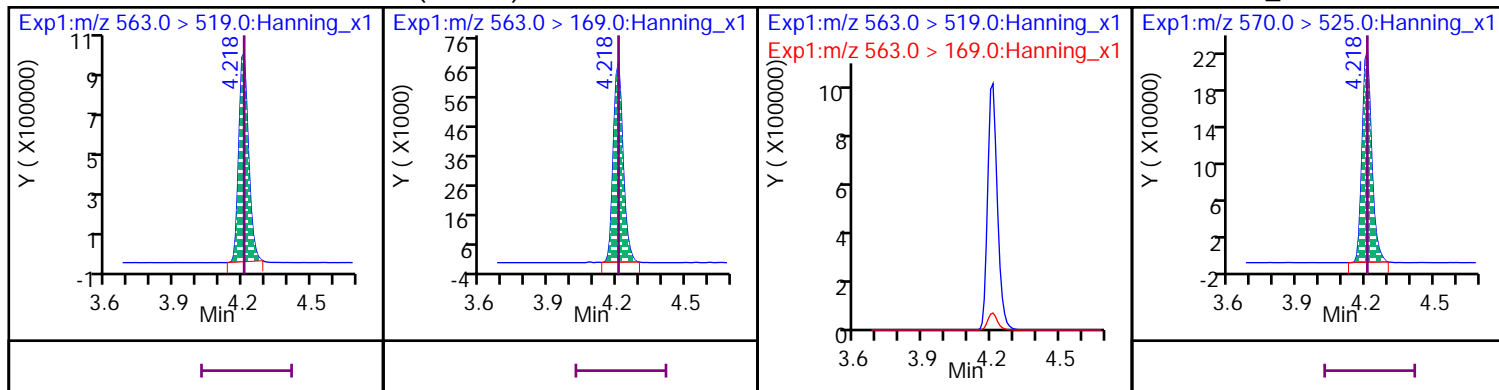
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



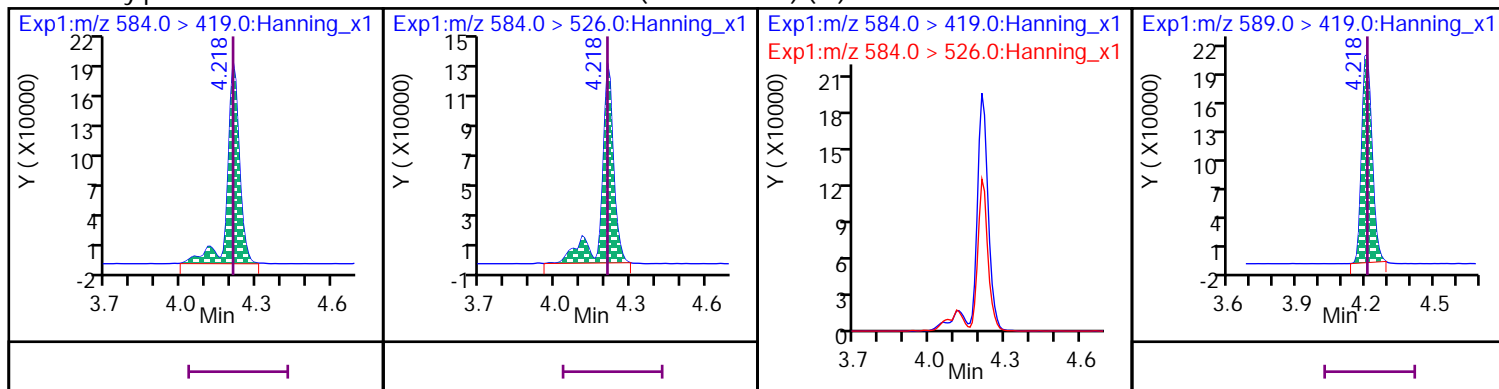
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



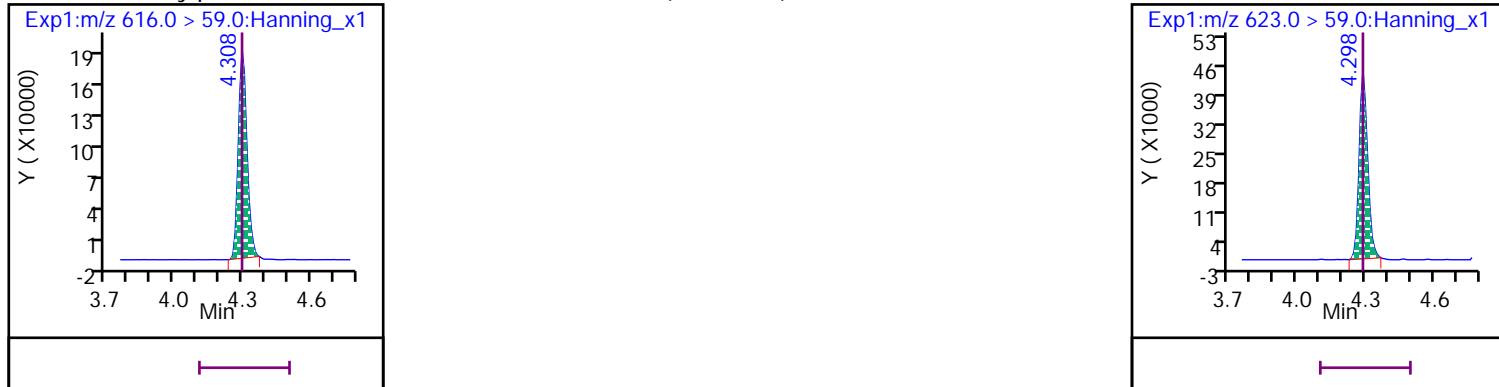
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



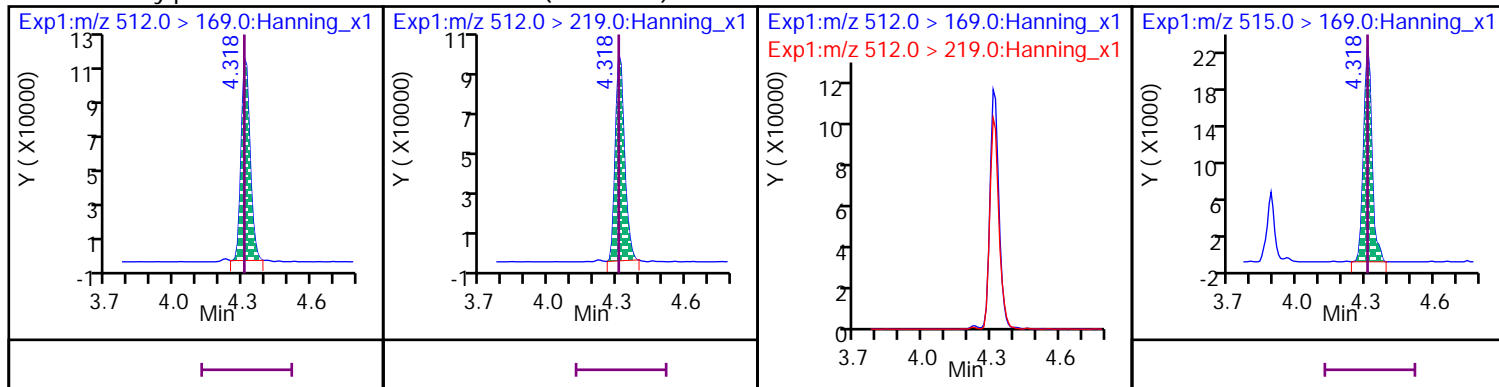
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

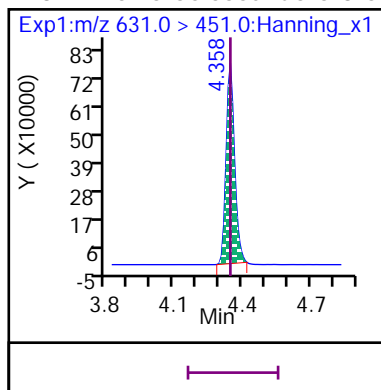


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

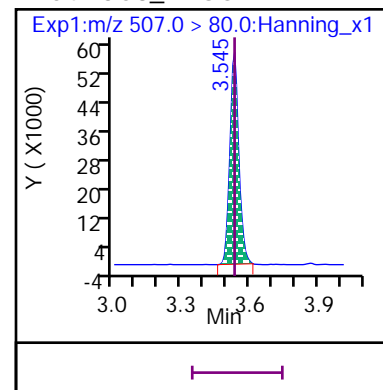
D 57 d3-MeFOSA



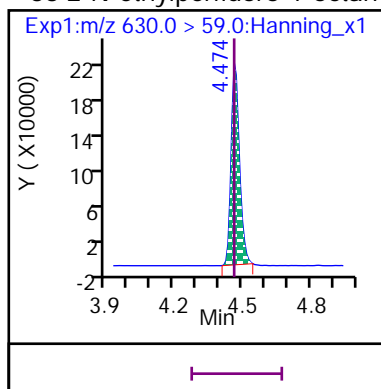
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



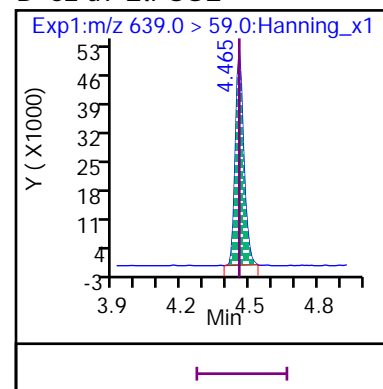
D 54 13C8\_PFOS



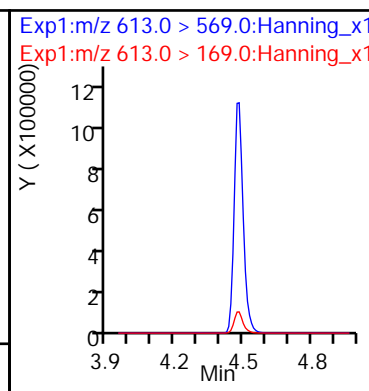
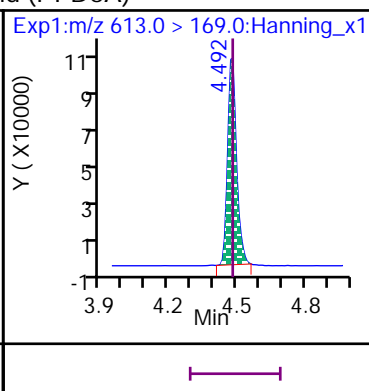
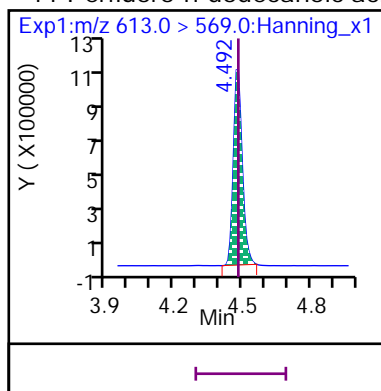
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



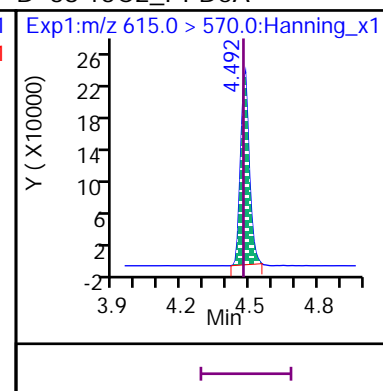
D 62 d9-EtFOSE



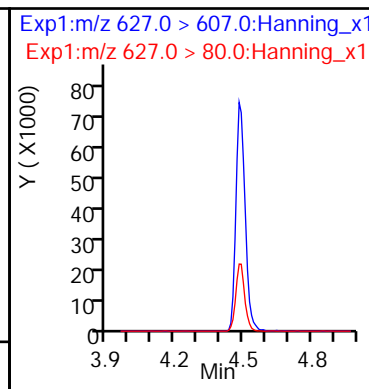
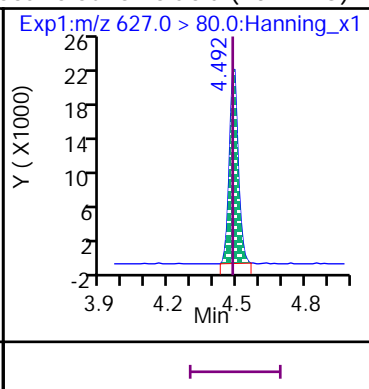
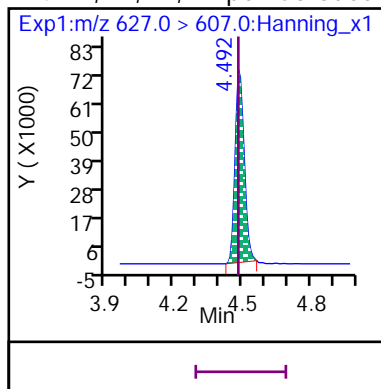
11 Perfluoro-n-dodecanoic acid (PFDoA)



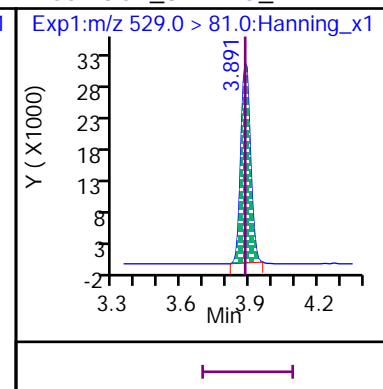
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

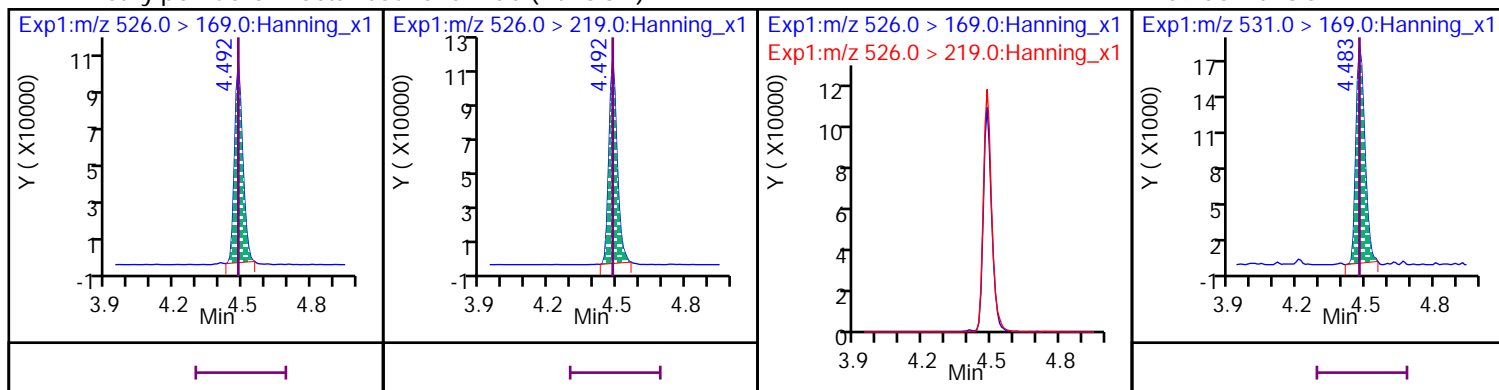


D 65 13C2\_8:2 FTS\_2



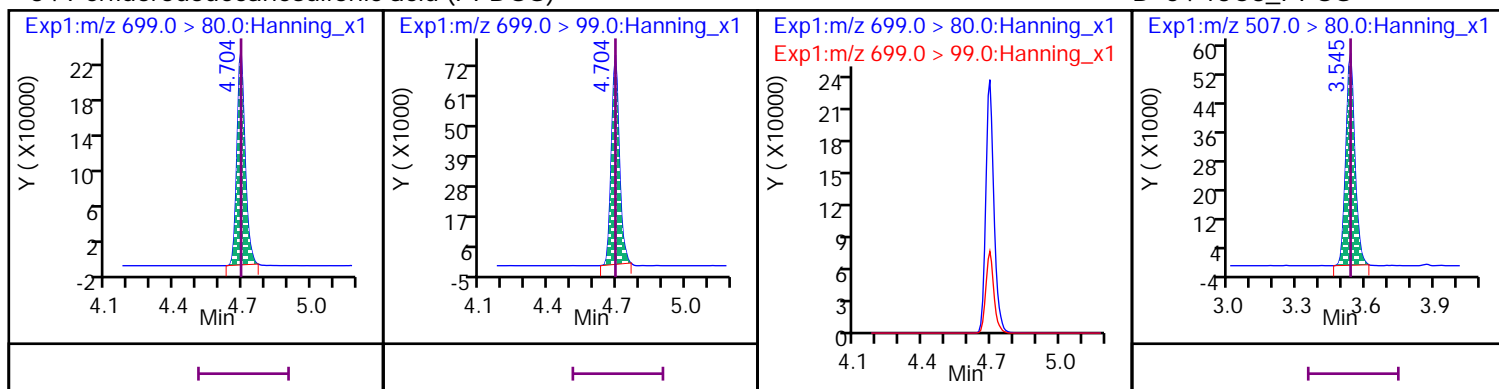
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



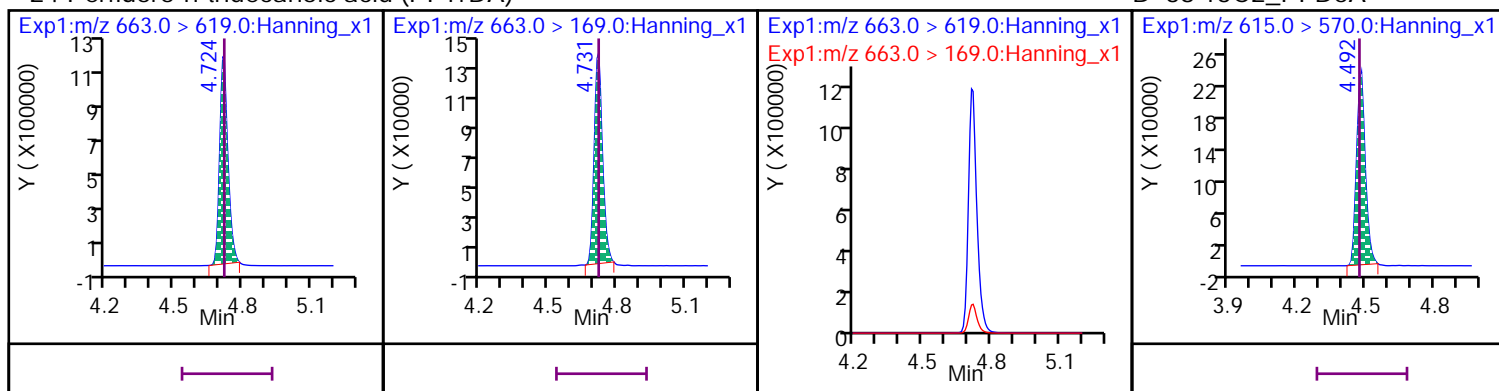
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



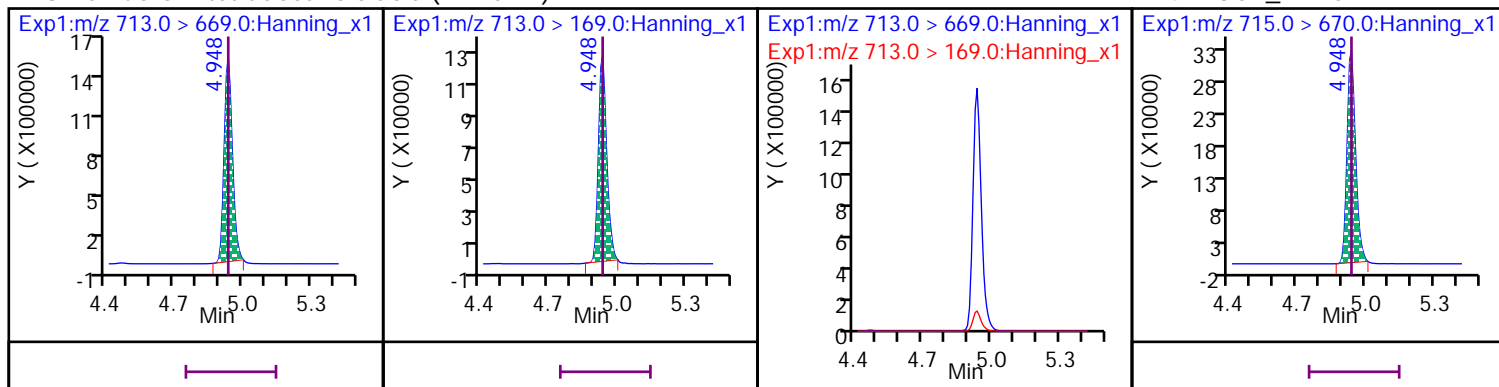
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

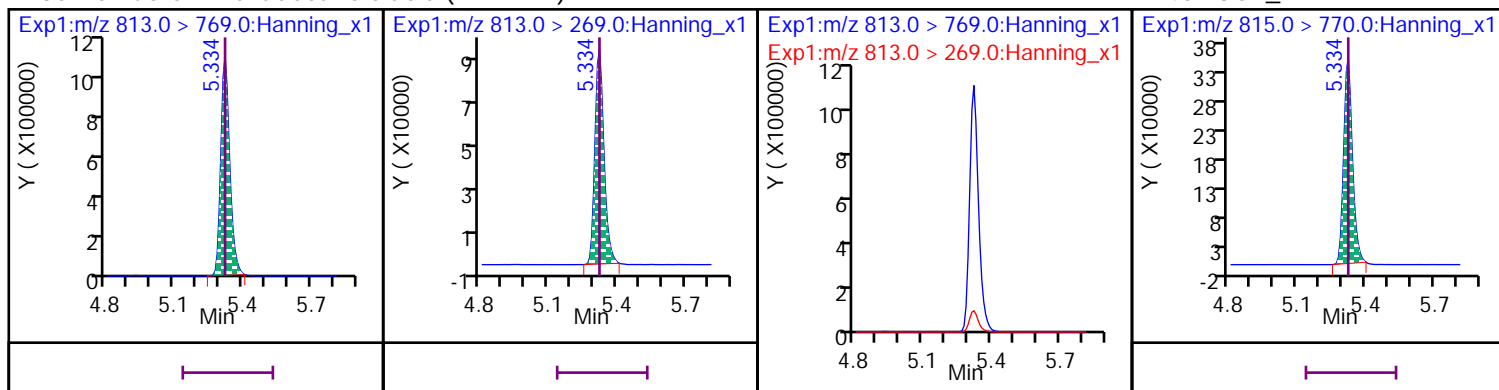
## D 42 13C2\_PFTeDA





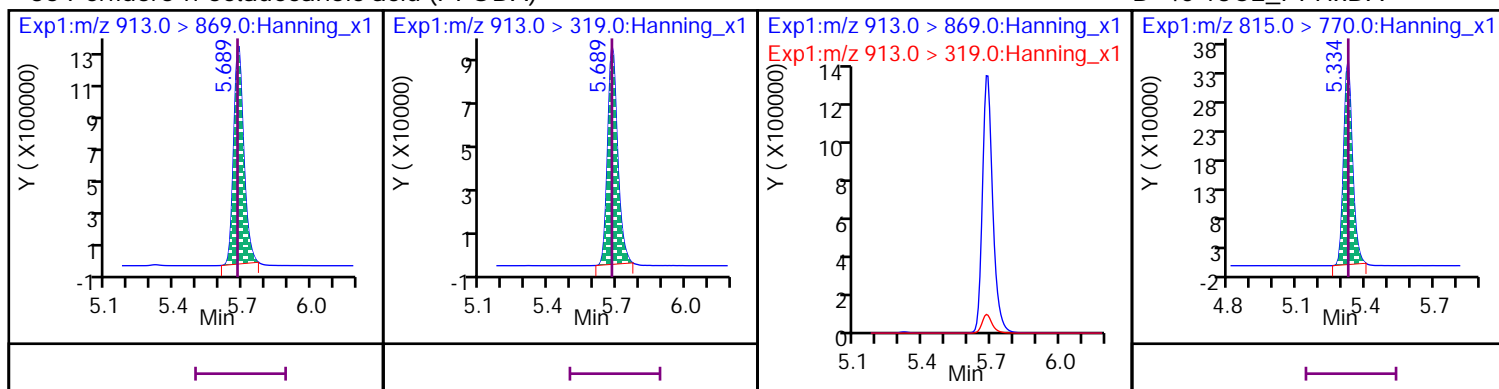
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

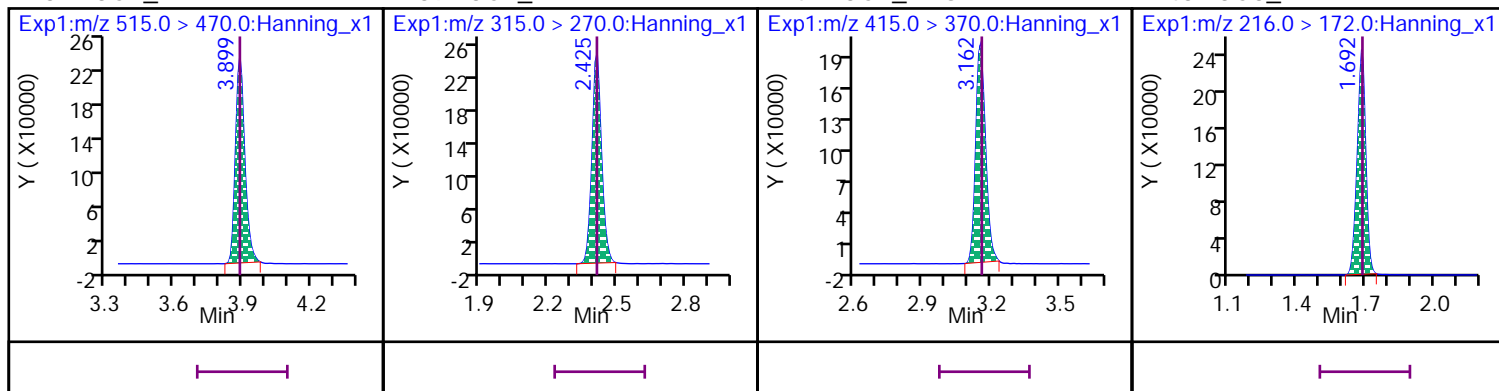


\* 37 13C2\_PFDA

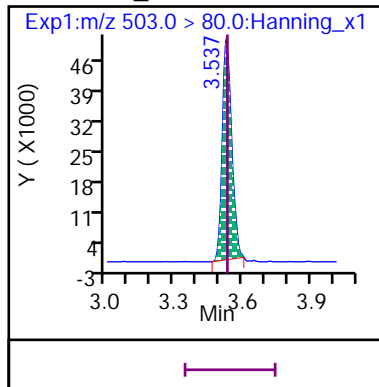
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 5000\_SVLC-1225

Sample Info: ICAL 5000\_SVLC-1225

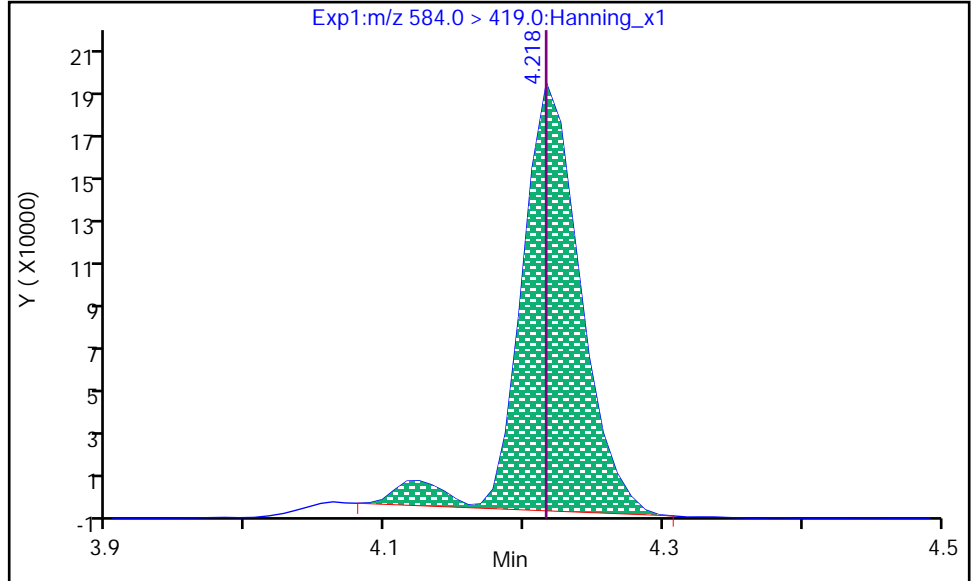
Dil. Factor: 1

Operator: Stephen E. Somerville

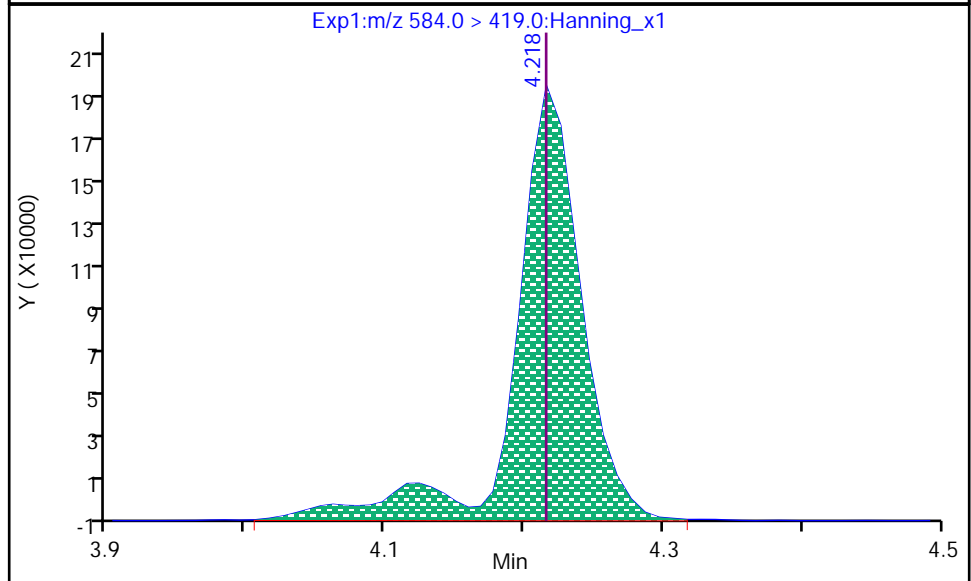
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.218  
Area: 573018  
Amount: 4451.52  
Amount Units: ng/L



RT: 4.218  
Area: 645216  
Amount: 4956.79  
Amount Units: ng/L



Data Editor: matthew.miller, 17-Dec-2020 15:16:51

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720012.d

Injection Date: 17-Dec-2020 13:25:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 5000\_SVLC-1225

Sample Info: ICAL 5000\_SVLC-1225

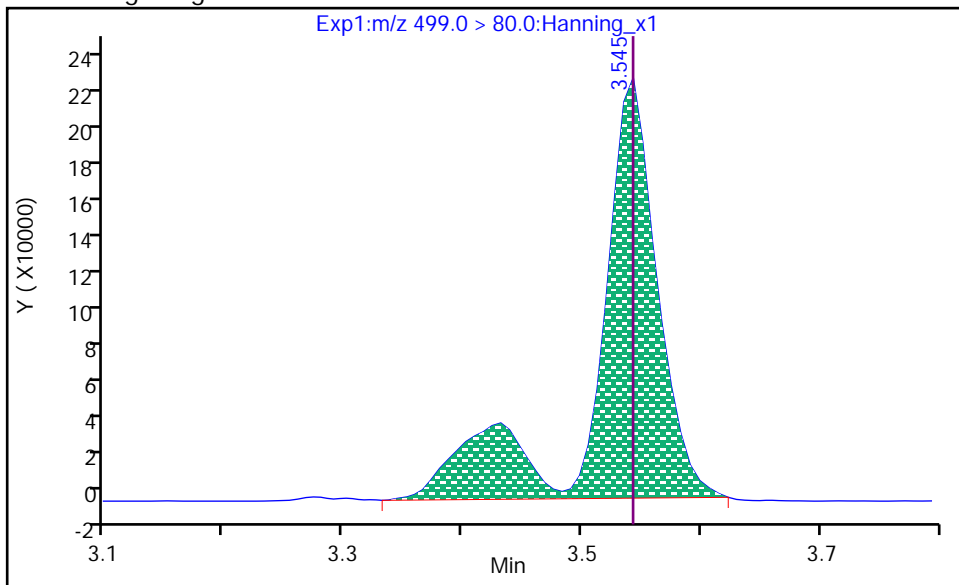
Dil. Factor: 1

Operator: Stephen E. Somerville

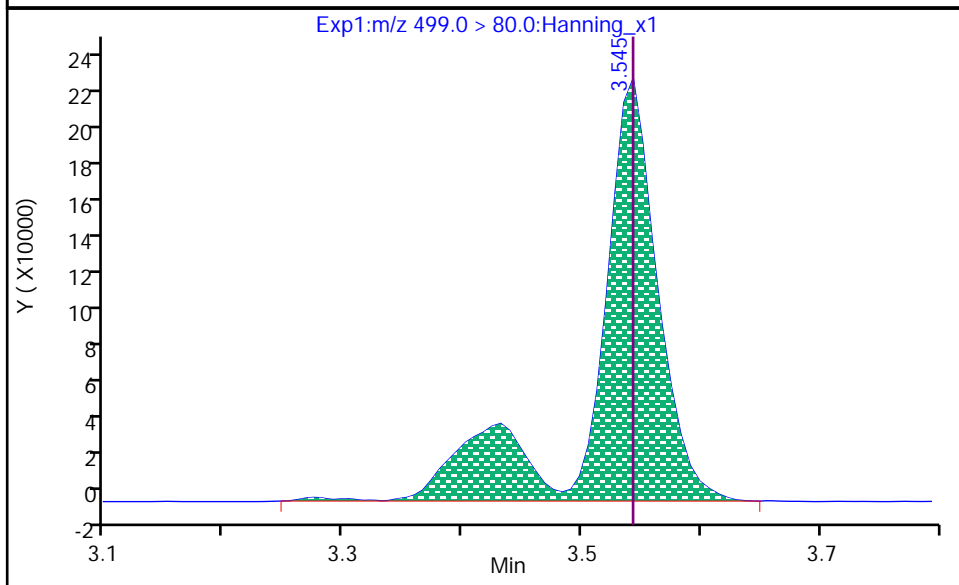
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 789465  
Amount: 4343.82  
Amount Units: ng/L



RT: 3.545  
Area: 810961  
Amount: 4404.11  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:15

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d  
 Injection Date: 17-Dec-2020 13:36:34 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 8 Auto Sampler: 8  
 Sample Info: ICAL 10000\_SVLC-1226 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	665321	23	>100:1			1000.00	959.30	90.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	6682046	23	>100:1			10000	10084		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.062	2.072	0	651811	17	>100:1			1000.00	947.56	89.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/1	6790971	18	>100:1			10000	10362		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	218052	17	>100:1			1000.00	947.10	88.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	2315358	17	>100:1	Target = 3.50		8840.00	9005.95		
298.9 > 99	44	2.125	2.125		654108	17	>100:1	3.53 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.459	0/-1	1865025	20	>100:1	Target = 3.10		9380.00	9860.09		
349 > 99	44	2.450	2.459		613730	20	>100:1	3.03 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	119400	18	>100:1			5000.00	4932.19	94.4	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	448819	19	>100:1	Target = 1.80		9340.00	9417.52		
327 > 81	63	2.388	2.388		244878	20	>100:1	1.83 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	706446	19	>100:1			1000.00	958.45	91.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	6775081	20	>100:1	Target = 18.34		10000	9713.95		
313 > 119	49	2.423	2.423		364236	18	>100:1	18.60 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.539	0	1285178	20	>100:1			5000.00	4825.08	91	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.539	0/0	3663382	20	>100:1	Target = 0.81		20000	19837		
285 > 185	66	2.530	2.539		4666887	20	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.790	0	580132	20	>100:1			1000.00	956.29	94.2	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.790	0/0	6133989	20	>100:1	Target = 3.70		10000	10194		
363 > 169	47	2.781	2.790		1647374	20	>100:1	3.72 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	174169	22	>100:1			1000.00	1017.17	97.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	1618935	27	>100:1	Target = 3.21	0.15	9100.00	8766.68		
399 > 99	45	2.799	2.799		506329	23	>100:1	3.19 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	10167151	19	>100:1	Target = 2.97		9420.00	9194.65		
377 > 85	45	2.827	2.827		3404252	19	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.169	0/-1	1404494	25	>100:1	Target = 3.08		9520.00	8876.82		
449 > 99	45	3.168	3.169		458913	23	>100:1	3.06 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	88549	23	>100:1			5000.00	4597.94	84.6	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.134	3.135	0/-1	371537	23	>100:1	Target = 1.80		9480.00	10403		
427 > 81	64	3.134	3.135		201504	24	>100:1	1.84 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.161	3.169	0	534634	25	>100:1			1000.00	903.30	81.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.169	0/0	5555679	23	>100:1	Target = 2.87		10000	10193		
413 > 169	53	3.168	3.169		1956754	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.543	3.545	0	141411	22				1000.00	943.19	91.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.545	0/0	1590209	64	>100:1	Target = 3.84	0.26	9280.00	9489.82		M
499 > 99	54	3.543	3.545		438881	41	>100:1	3.62 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.756	3.750	1/1	4611854	22	>100:1			9320.00	9687.61		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.890	3.891	0/0	1065551	19	>100:1	Target = 3.07		9600.00	9846.40		
549 > 99	54	3.890	3.891		399238	20	>100:1	2.66 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.197	4.198	0/0	1040398	17	>100:1	Target = 3.03		9640.00	10138		
599 > 99	54	4.197	4.198		374418	17	>100:1	2.77 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.356	4.357	0/0	4032967	16	>100:1			9420.00	10042		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.703	4.704	0/0	1140180	19	>100:1	Target = 3.33		9680.00	10043		
699 > 99	54	4.703	4.704		372190	19	>100:1	3.06 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	718882	22	>100:1			1000.00	957.28	90.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.551	3.545	1/0	7162720	22	>100:1	Target = 6.16		10000	9963.41		
463 > 169	56	3.551	3.545		1131465	21	>100:1	6.33 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.866	0	303539	20	>100:1			1000.00	980.54	91.8	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.866	0/0	2958864	20	>100:1			10000	9891.81		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.890	3.891	0	89940	19				5000.00	4848.48	96.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.890	3.891	0/0	340548	19	>100:1	Target = 1.95		9580.00	9561.82		
527 > 81	65	3.890	3.891		185096	19		1.83 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.500	4.492	1/1	392343	18	>100:1	Target = 3.14		9640.00	9438.49		
627 > 80	65	4.500	4.492		125334	17	>100:1	3.13 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.898	3.899	0	634238	19				1000.00	956.14	90.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.898	3.899	0/0	6342880	20	>100:1	Target = 15.94		10000	10178		
513 > 169	51	3.898	3.899		471315	21	>100:1	13.45 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.055	4.056	0	687461	17	96:1			5000.00	4789.36	90.2	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.064	4.065	0/0	1110966	34	>100:1	Target = 1.33	0.12	10000	10519		
570 > 483	58	4.064	4.065		815836	36	>100:1	1.36 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.216	4.217	0	618761	18	>100:1			5000.00	4658.83	83.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.227	4.217	1/1	1178848	32	>100:1	Target = 1.58	0.13	10000	9568.13		
584 > 526	60	4.227	4.217		744745	39	>100:1	1.58 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.216	4.217	0	592993	19				1000.00	938.17	87.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.216	4.217	0/0	5844692	18	>100:1	Target = 15.50		10000	10487		
563 > 169	52	4.216	4.217		368978	17	>100:1	15.84 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.298	0	98763	15	>100:1			1000.00	912.72	84.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.308	0/0	960536	16	>100:1			10000	10351		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.318	0	52261	14	>100:1			1000.00	987.61	95.1	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.327	4.318	1/1	568014	16	>100:1	Target = 1.12		10000	9633.70		
512 > 219	57	4.327	4.318		536523	17	>100:1	1.05 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.465	0	118273	16	>100:1			1000.00	943.20	97.1	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.474	1/1	1079042	17	>100:1			10000	10255		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.491	4.483	1	581218	18				1000.00	960.19	89.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.491	4.492	0/-1	5646628	17	>100:1	Target = 10.85		10000	9593.63		
613 > 169	38	4.491	4.492		559013	17	>100:1	10.10 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.730	4.731	0/-1	5706994	20	>100:1	Target = 8.37		10000	9969.17		
663 > 169	38	4.730	4.731		699888	20	>100:1	8.15 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.483	0	45122	16	>100:1			1000.00	919.08	87.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.492	0/0	501236	16	>100:1	Target = 1.03		10000	10168		
526 > 219	59	4.491	4.492		504292	16	>100:1	0.99 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.947	4.948	0	823800	19	>100:1			1000.00	977.87	92.8	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.947	4.948	0/0	6967694	21	>100:1	Target = 12.11		10000	9761.66		
713 > 169	42	4.947	4.948		601178	20	>100:1	11.59 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.333	5.334	0	870445	18	>100:1			1000.00	960.58	95.3	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.333	5.334	0/0	5461937	19	>100:1	Target = 11.48		10000	9603.58		
813 > 269	40	5.333	5.334		485407	19	>100:1	11.25 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.694	5.689	1/1	7786374	24	>100:1	Target = 13.88		10000	10105		
913 > 319	40	5.687	5.689		568309	24	>100:1	13.70 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.898	3.899	0	678382	20	>100:1					93.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	719360	20	>100:1					95.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.161	3.169	0	571070	23	>100:1					88.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	642378	22	>100:1					96.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.543	3.545	0	163967	21	>100:1					101	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d

Injection Date: 17-Dec-2020 13:36:34

Inst. ID: LCMSMS02

Client ID:

Lab ID:

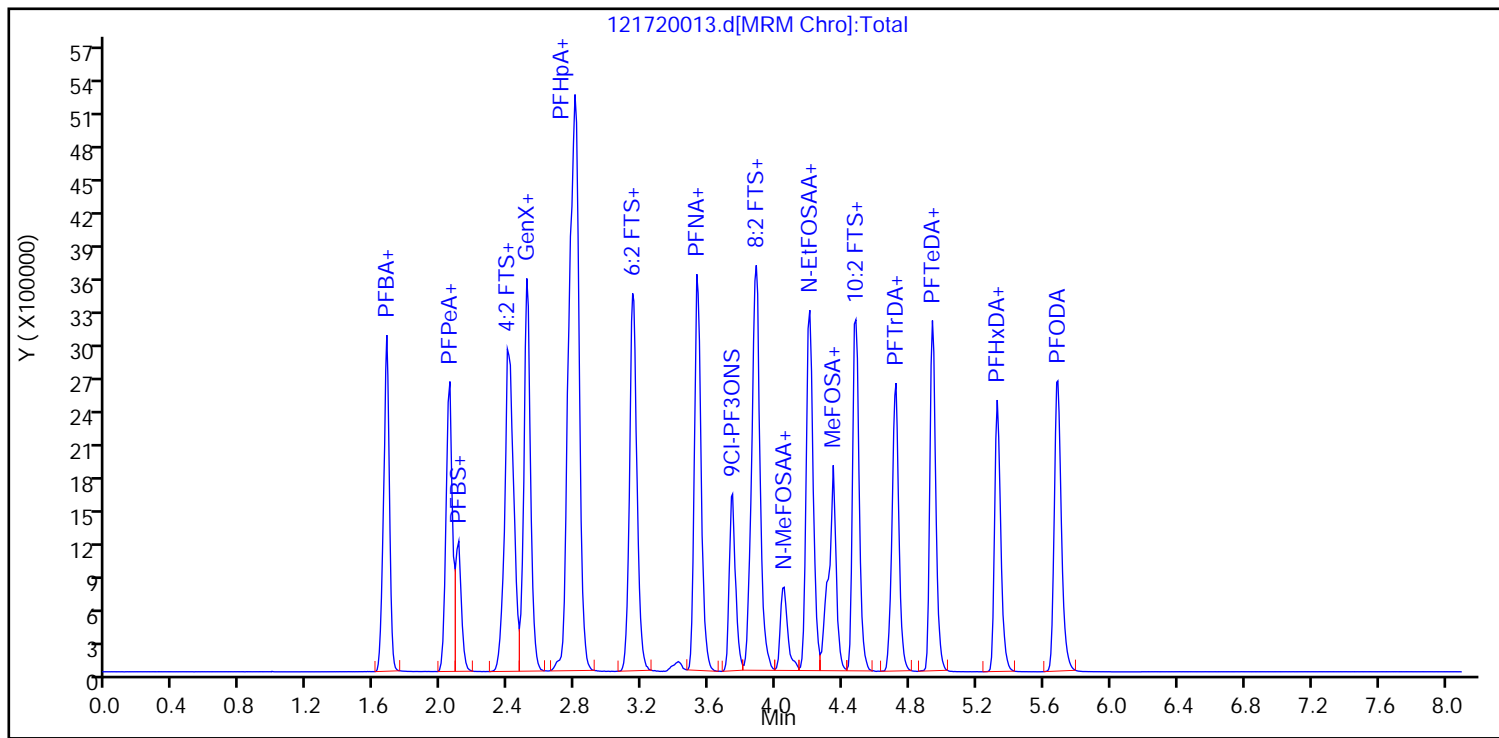
ICAL 10000\_SVLC-1226

Sample Info: ICAL 10000\_SVLC-1226

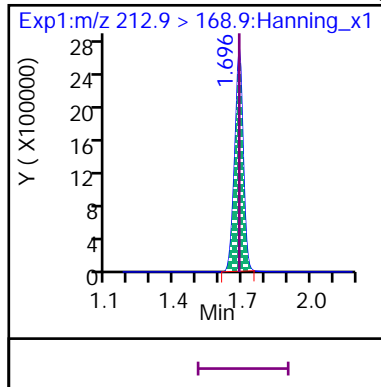
Dil. Factor: 1

Operator:

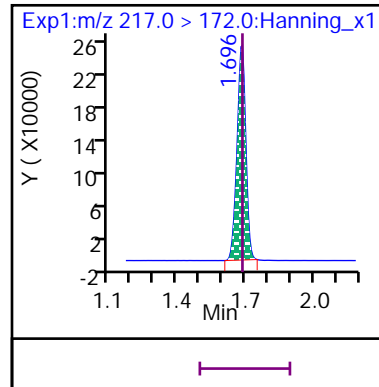
Stephen E. Somerville



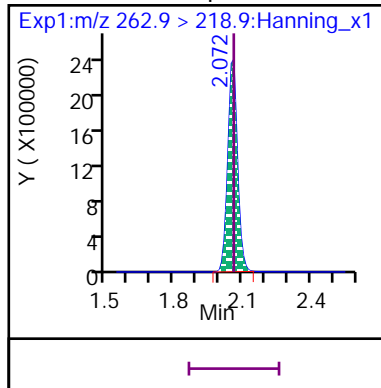
8 Perfluoro-n-butanoic acid (PFBA)



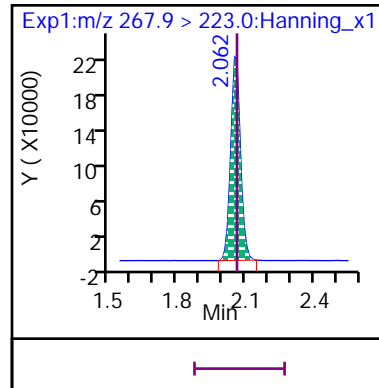
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



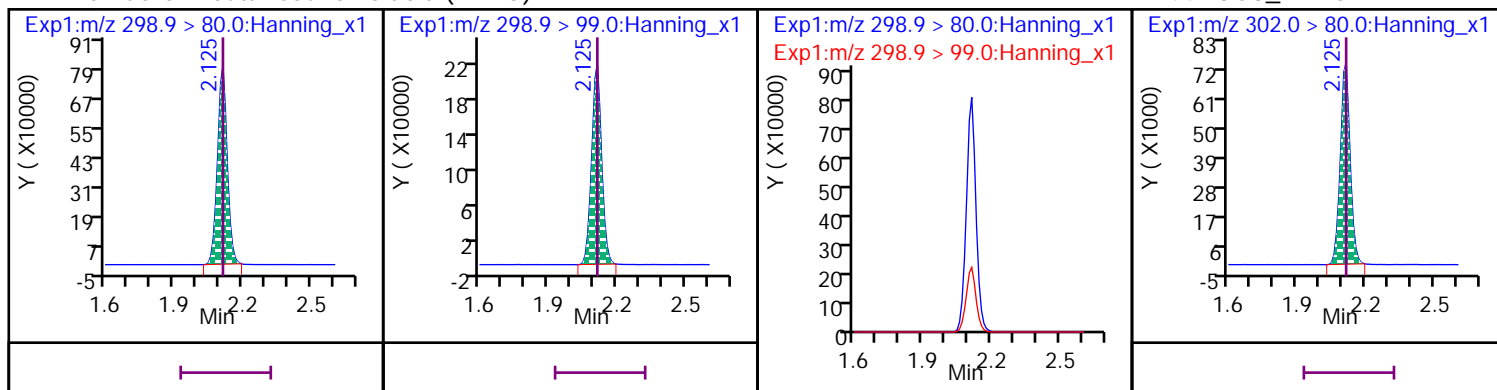
D 50 13C5\_PFPeA





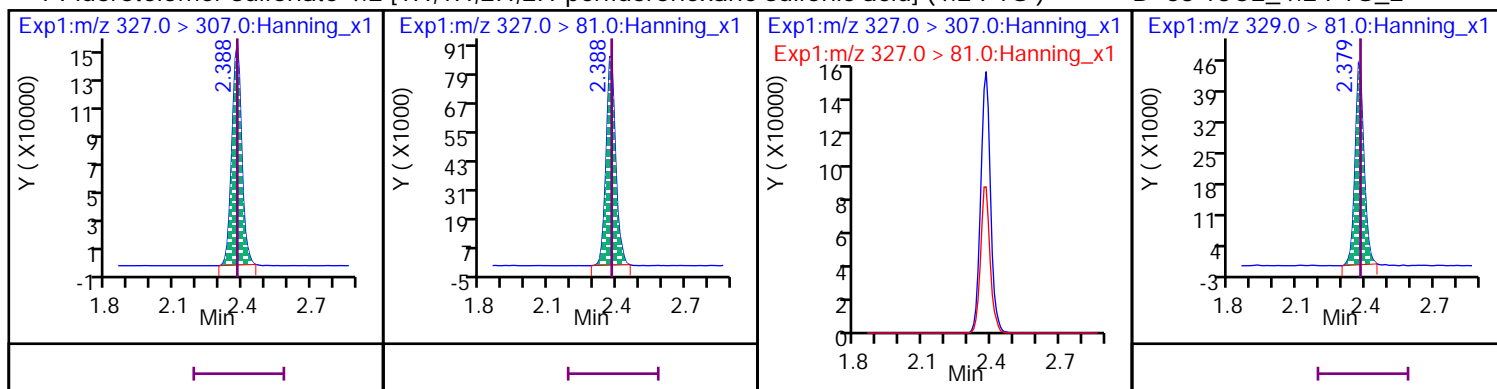
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



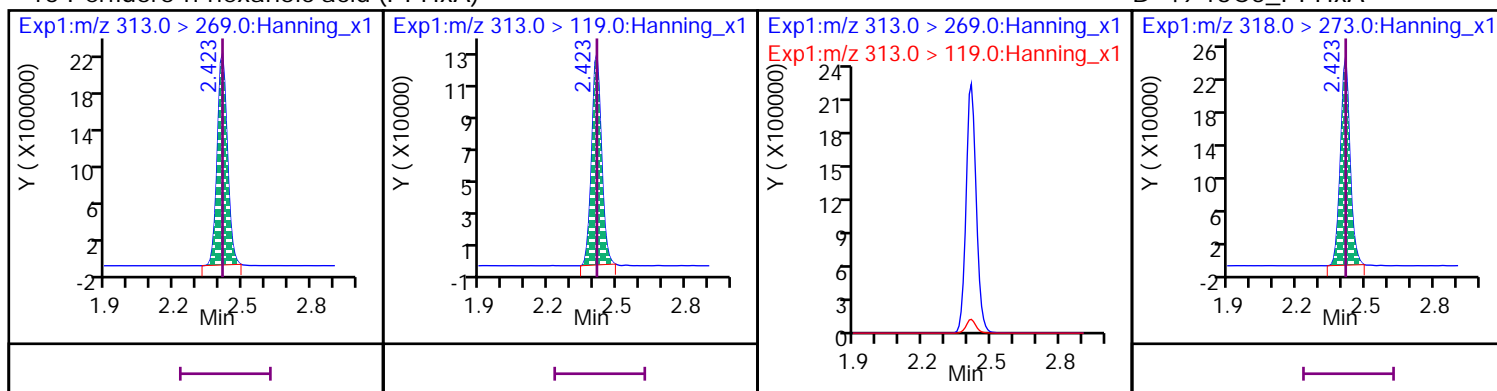
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



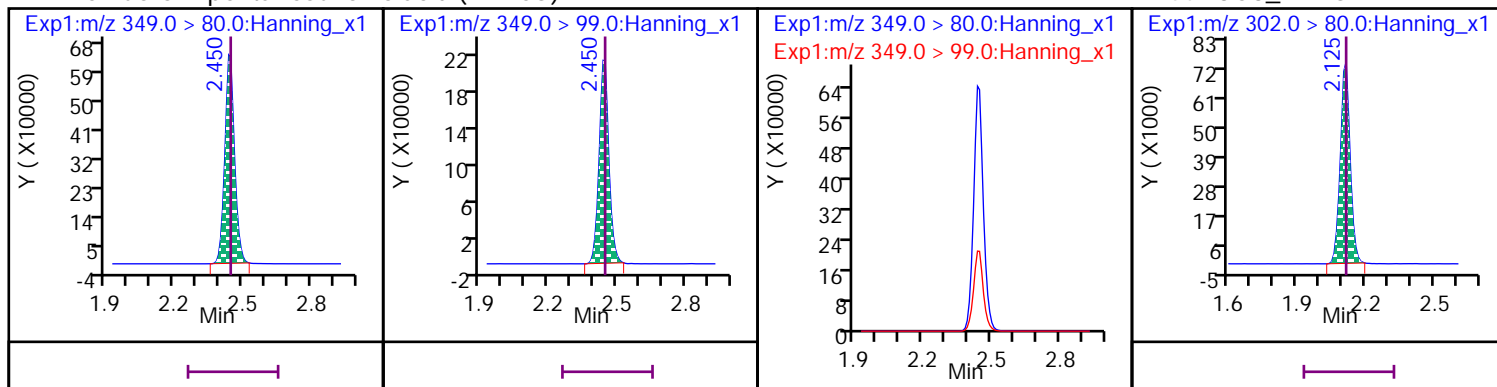
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



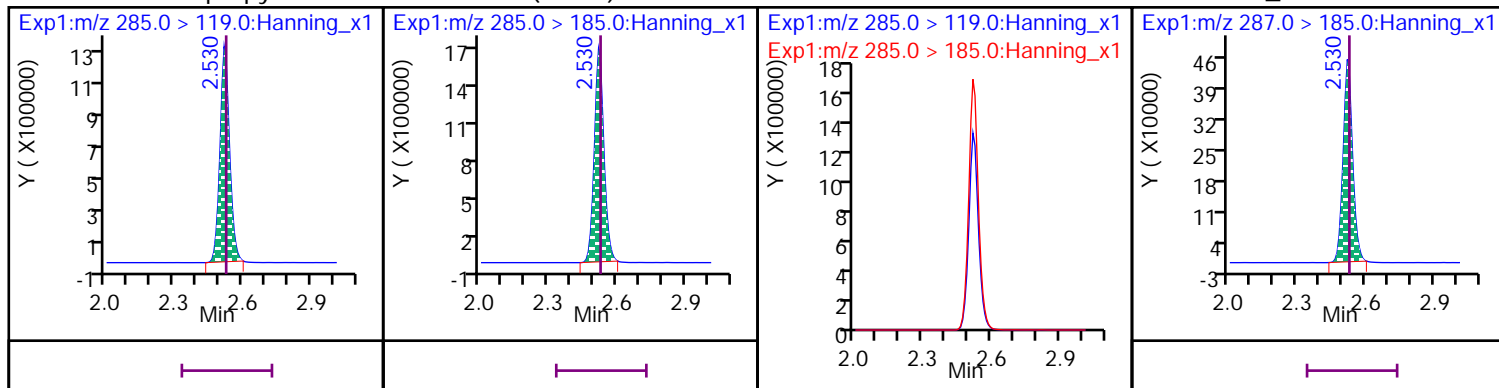
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



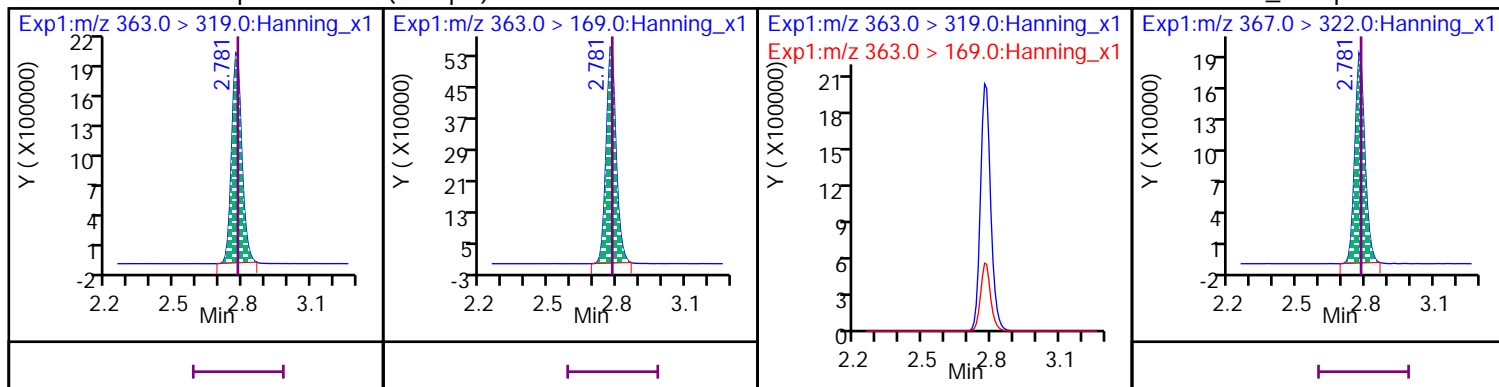
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



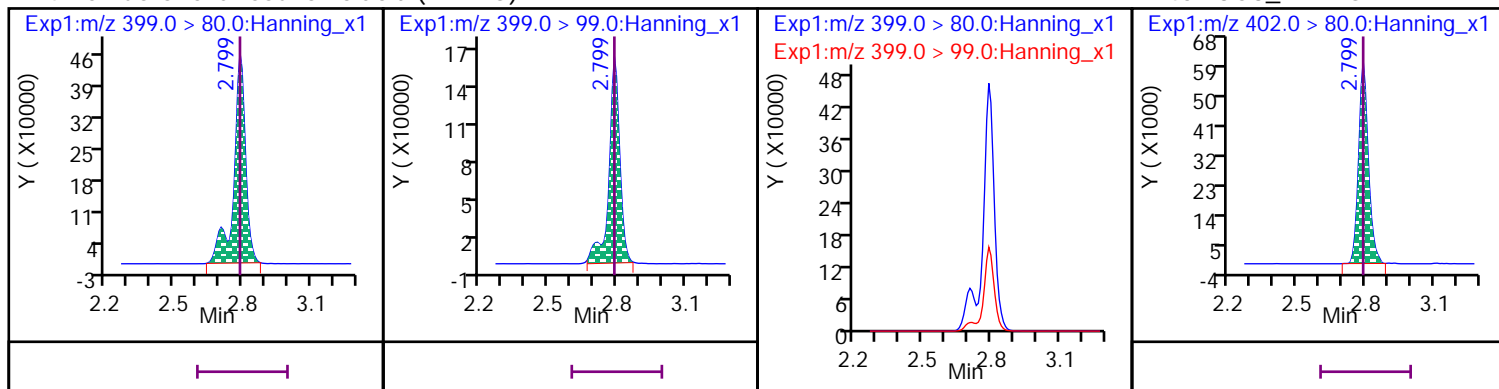
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



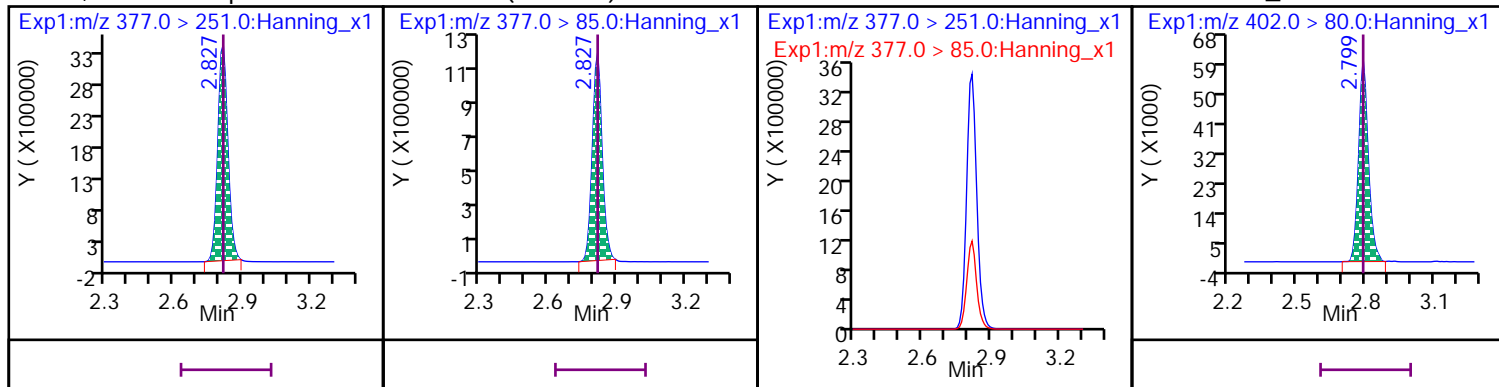
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



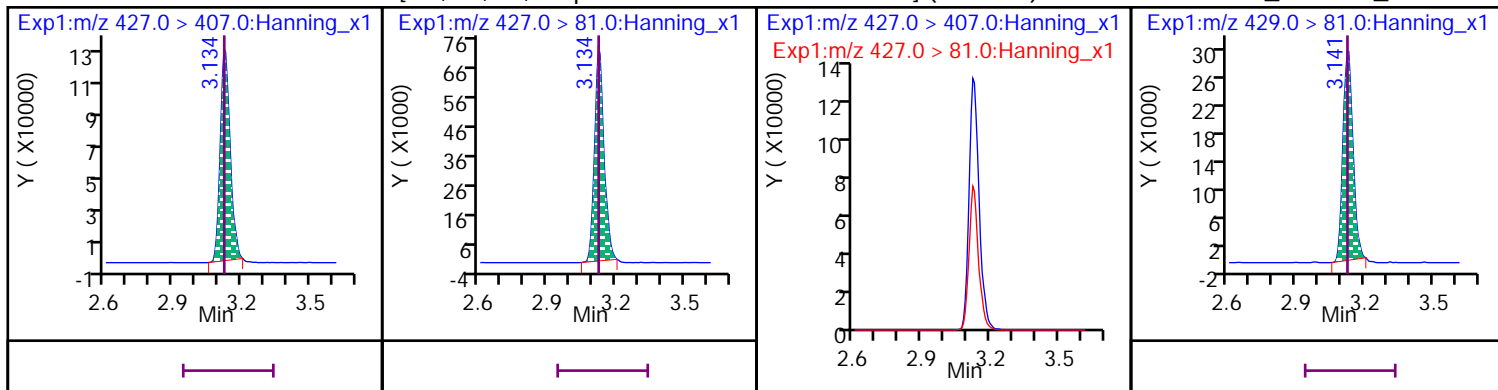
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



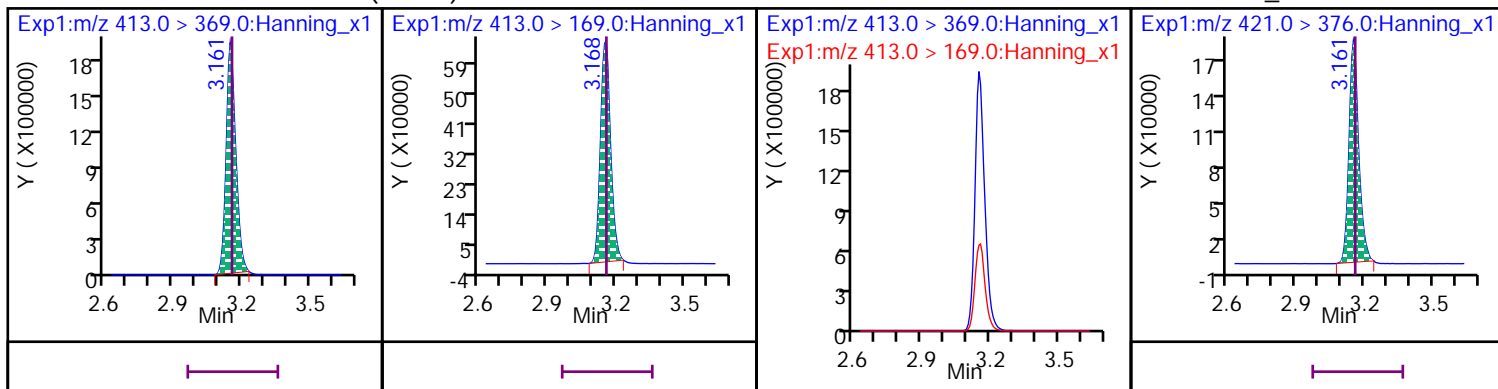
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



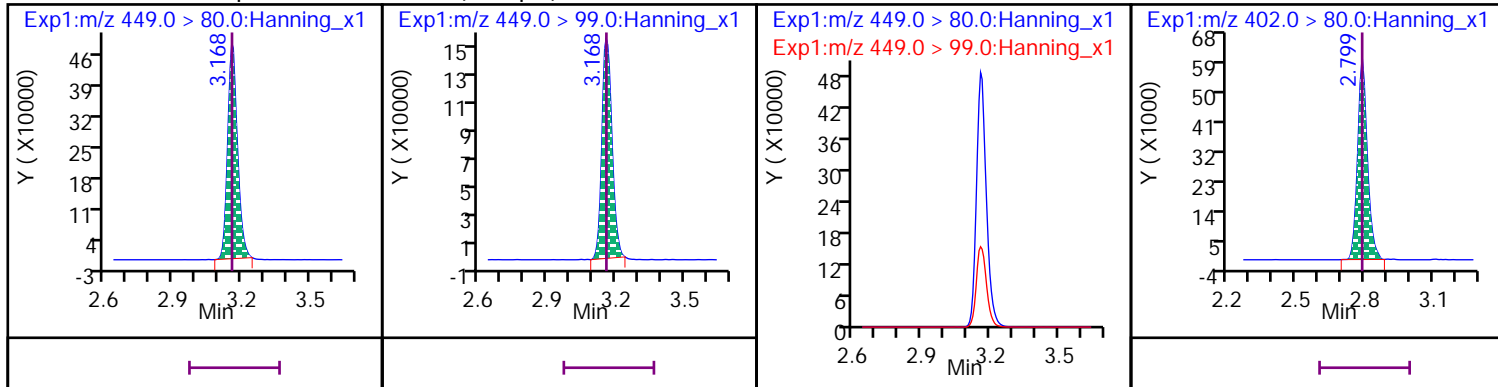
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



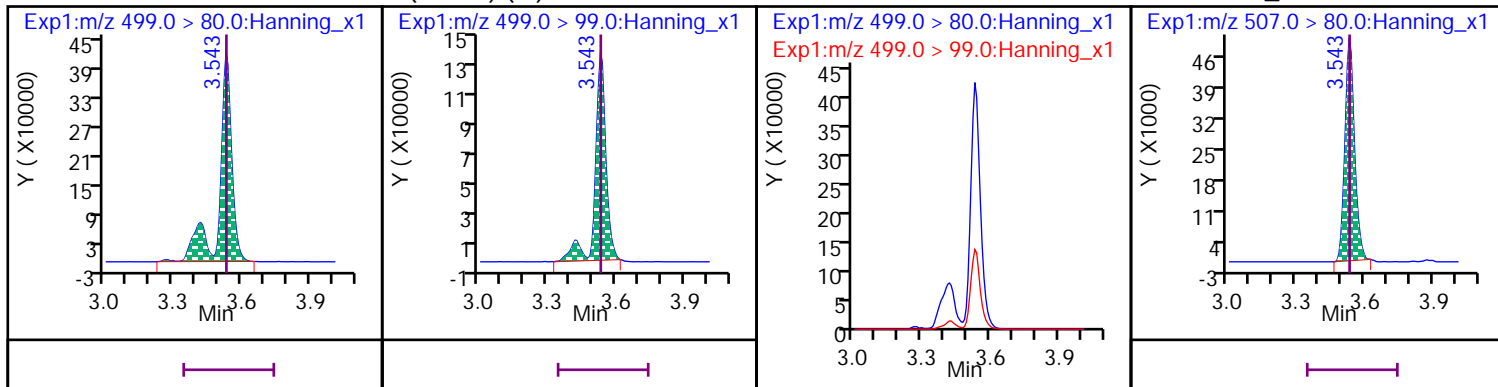
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



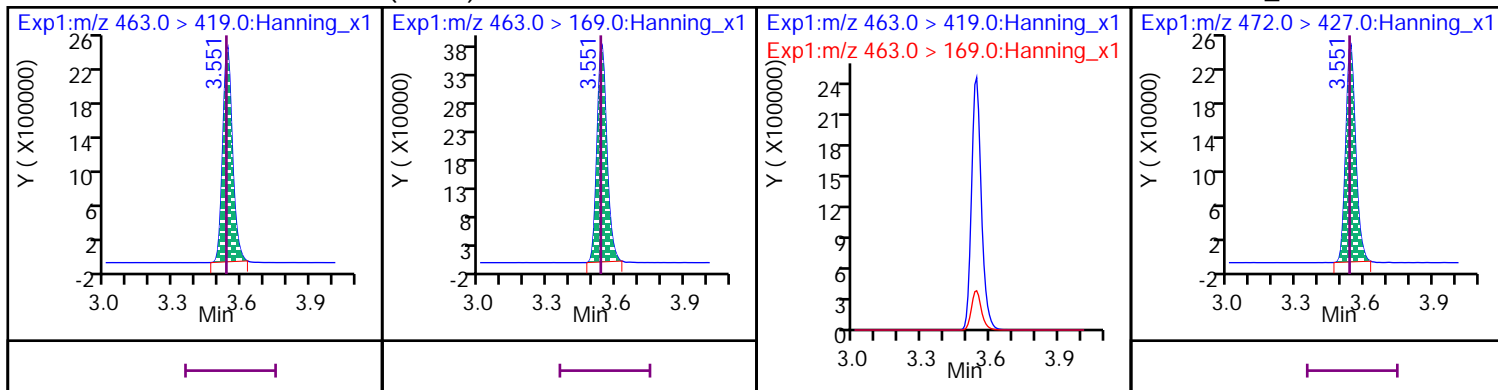
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



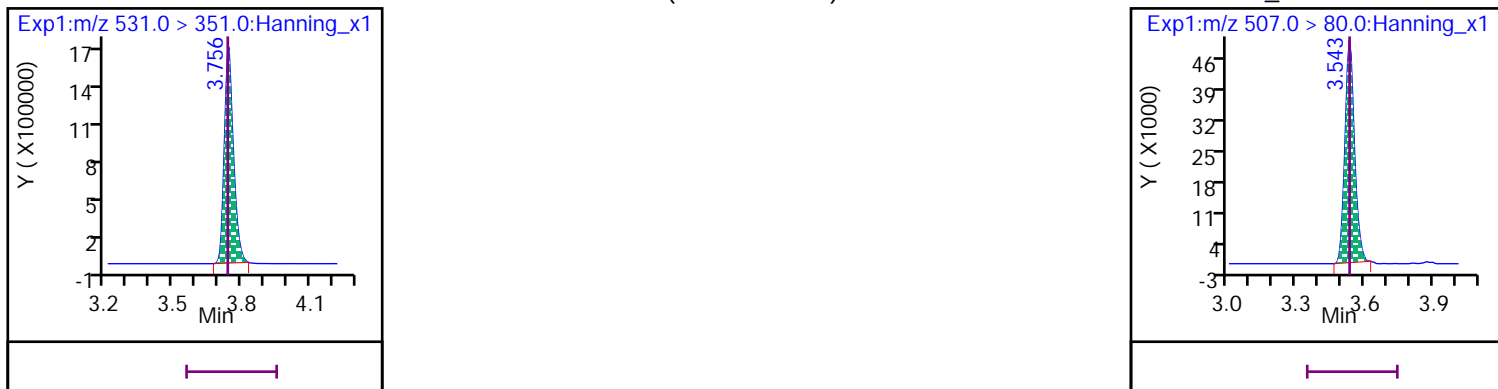
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



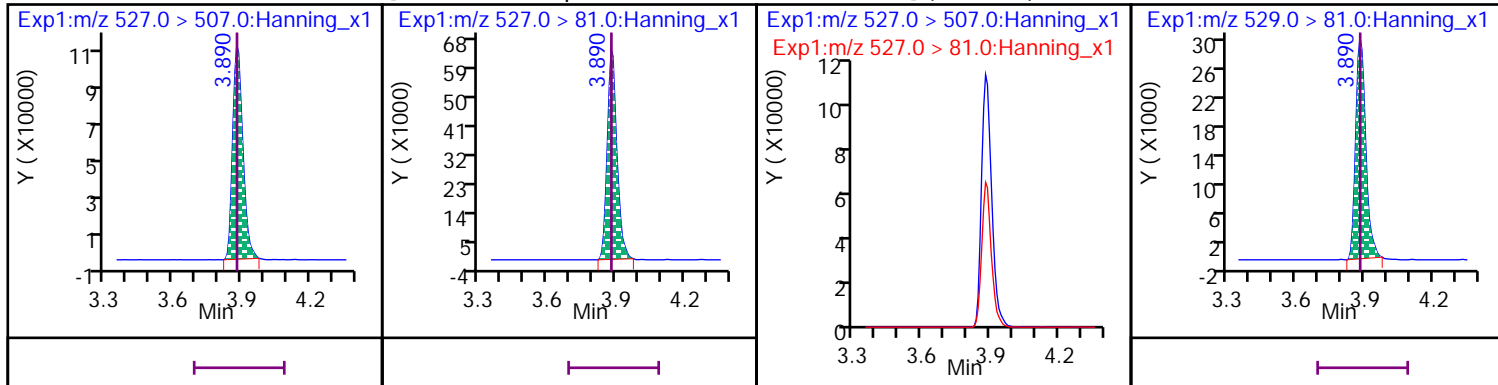
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



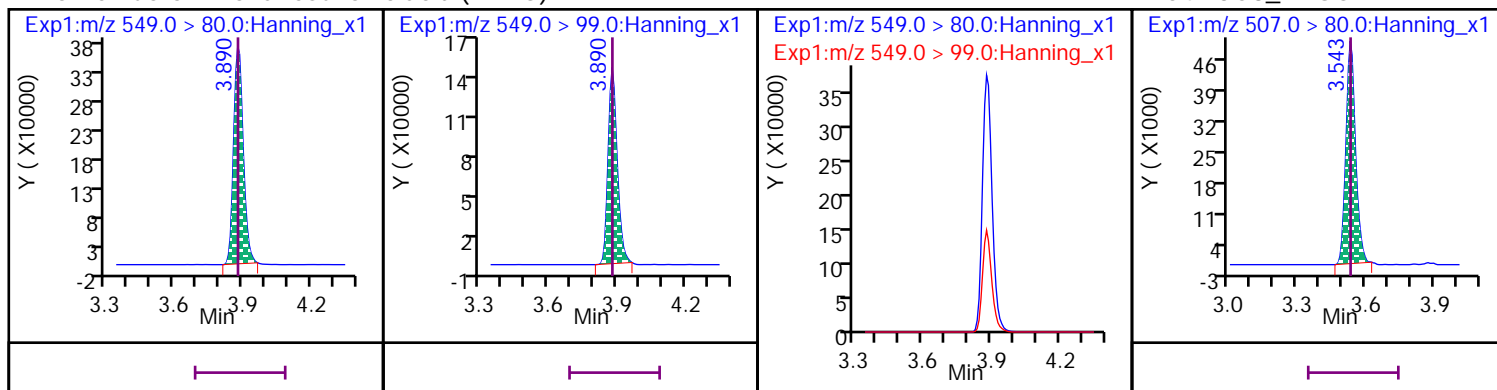
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



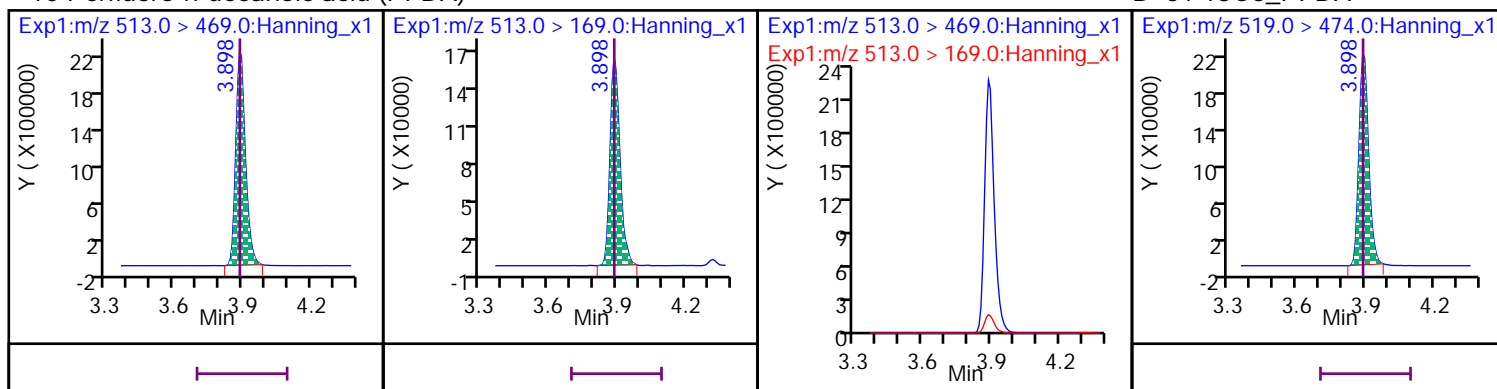
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



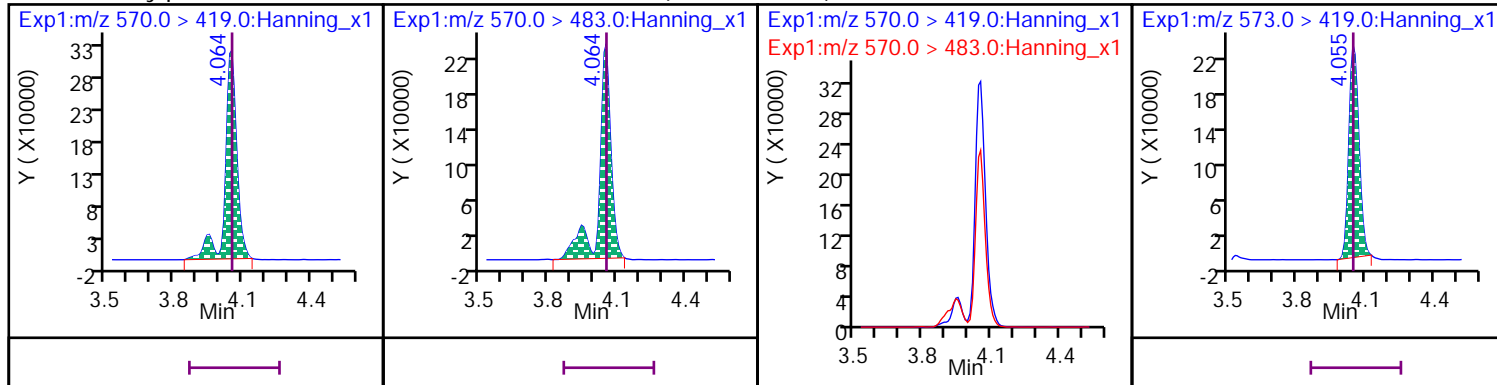
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



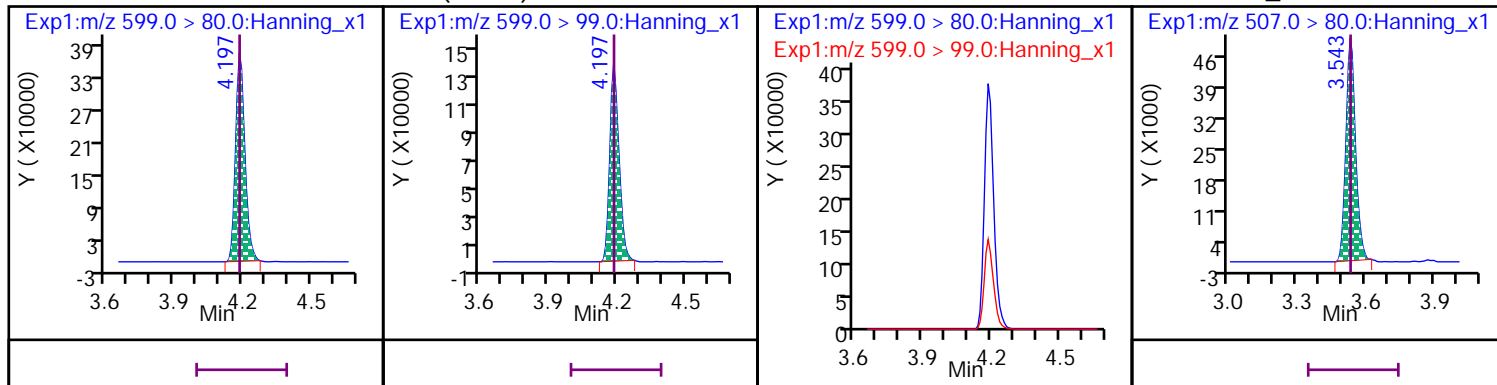
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



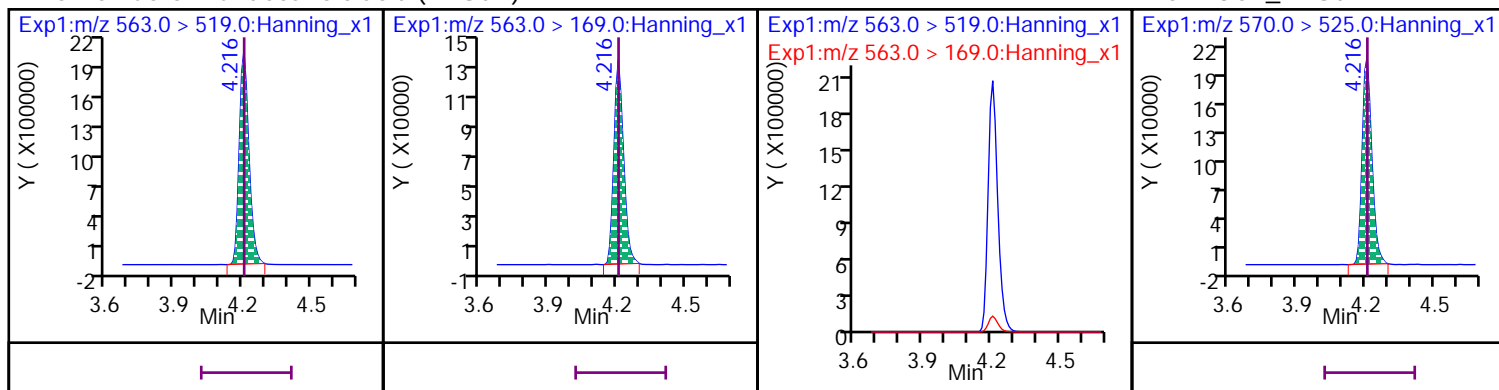
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



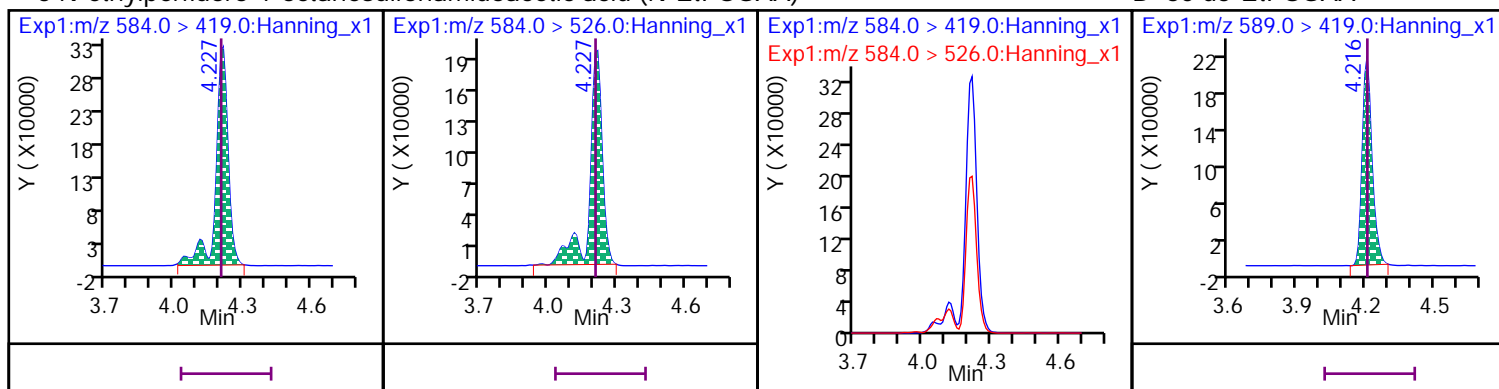
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



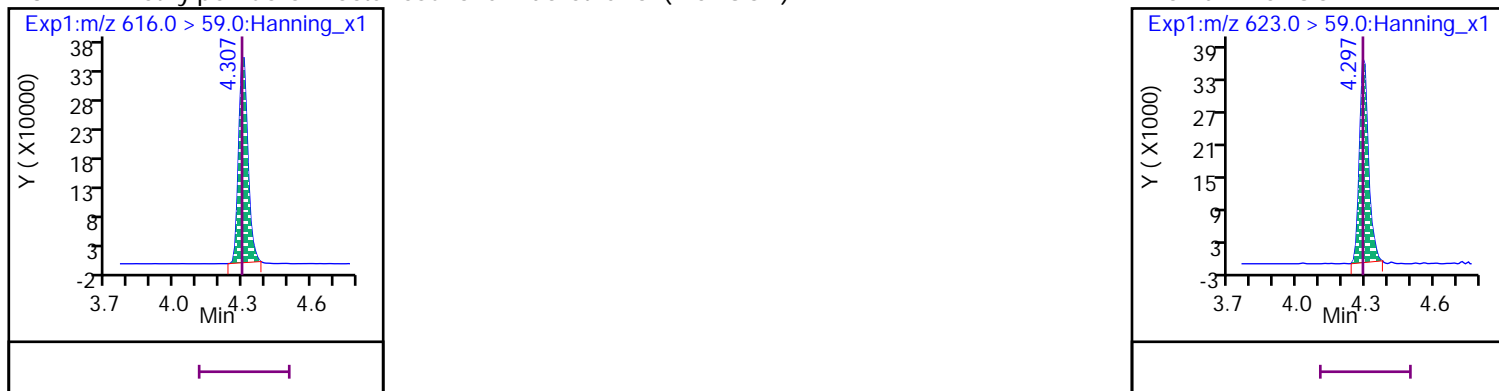
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



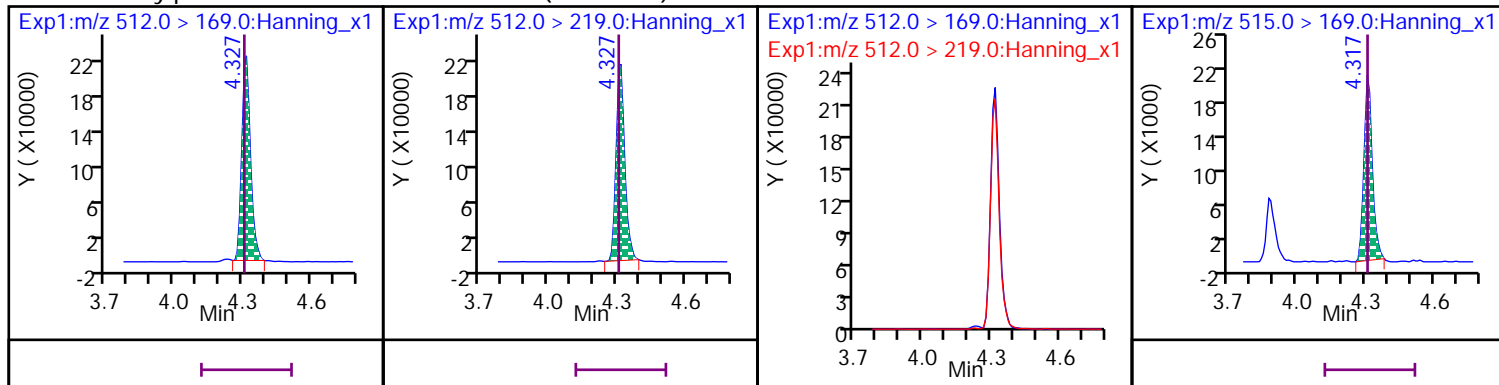
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

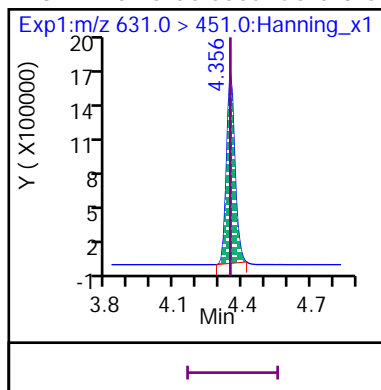


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

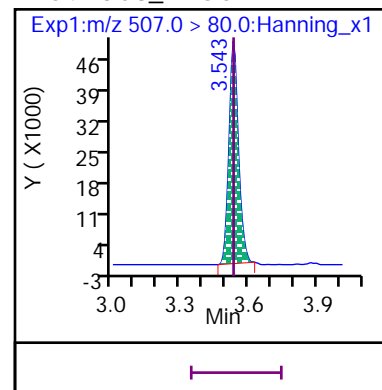
D 57 d3-MeFOSA



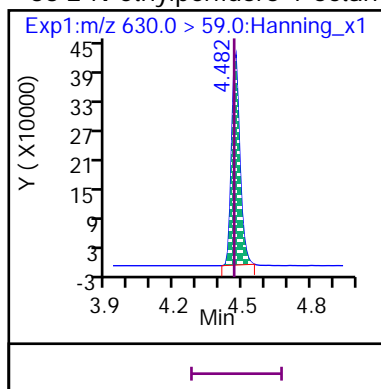
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



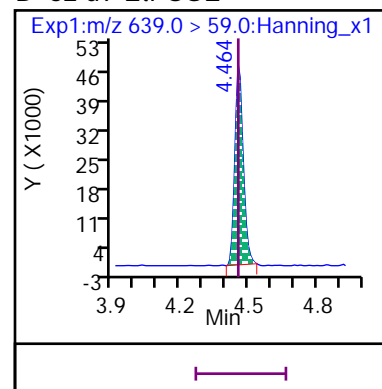
D 54 13C8\_PFOS



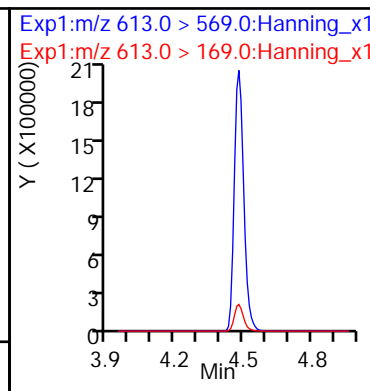
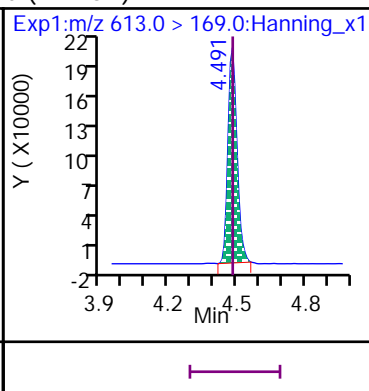
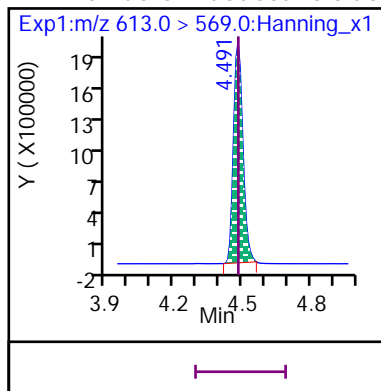
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



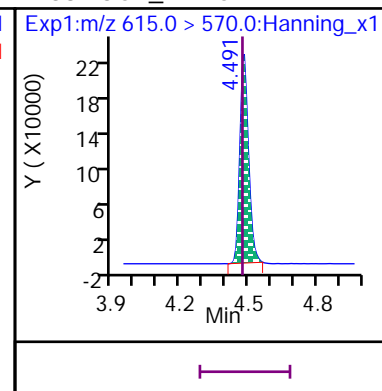
D 62 d9-EtFOSE



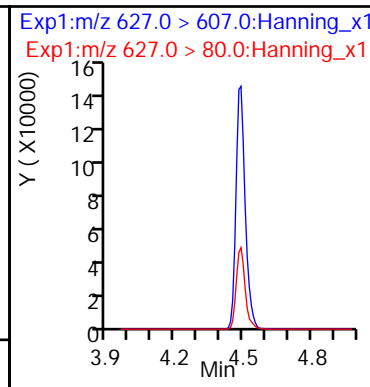
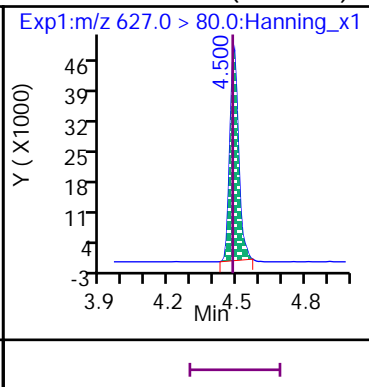
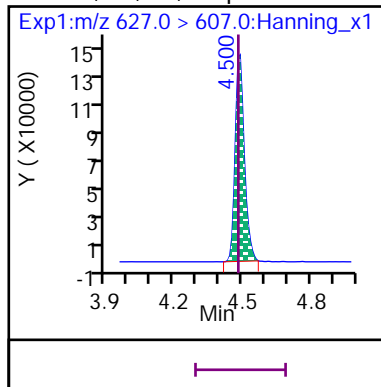
11 Perfluoro-n-dodecanoic acid (PFDoA)



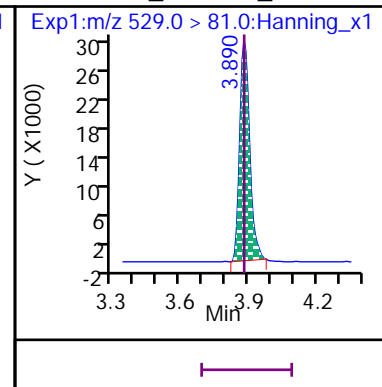
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

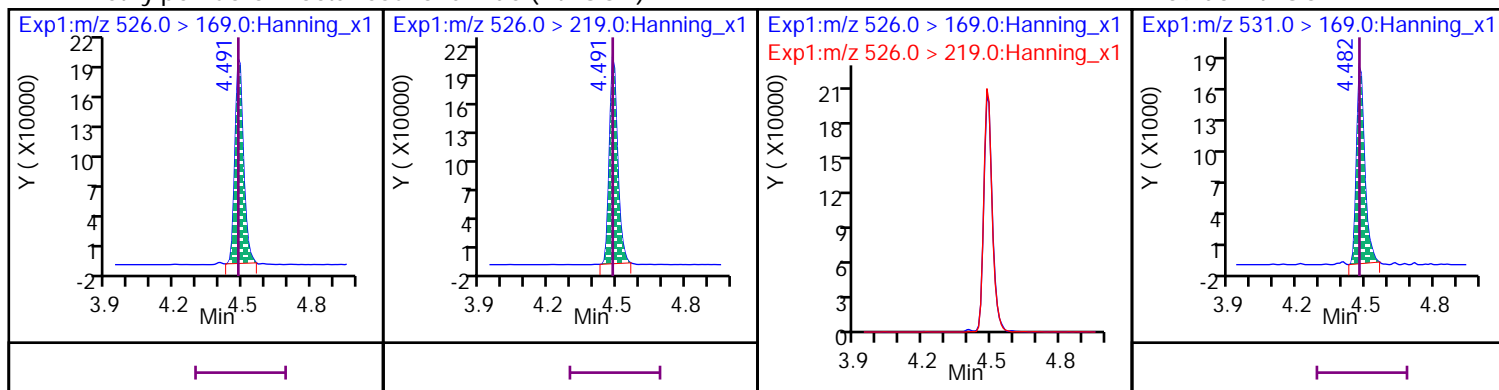


D 65 13C2\_8:2 FTS\_2



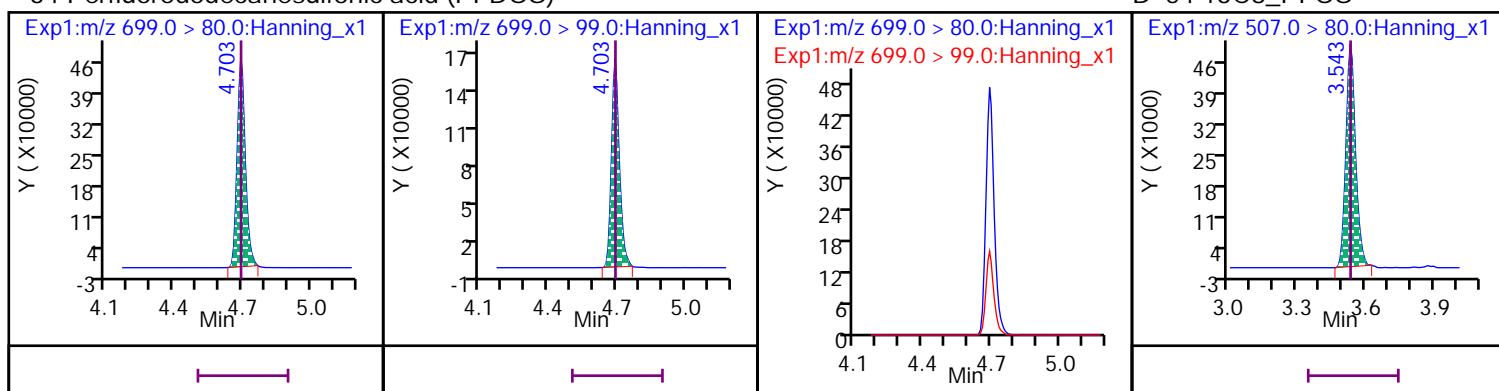
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



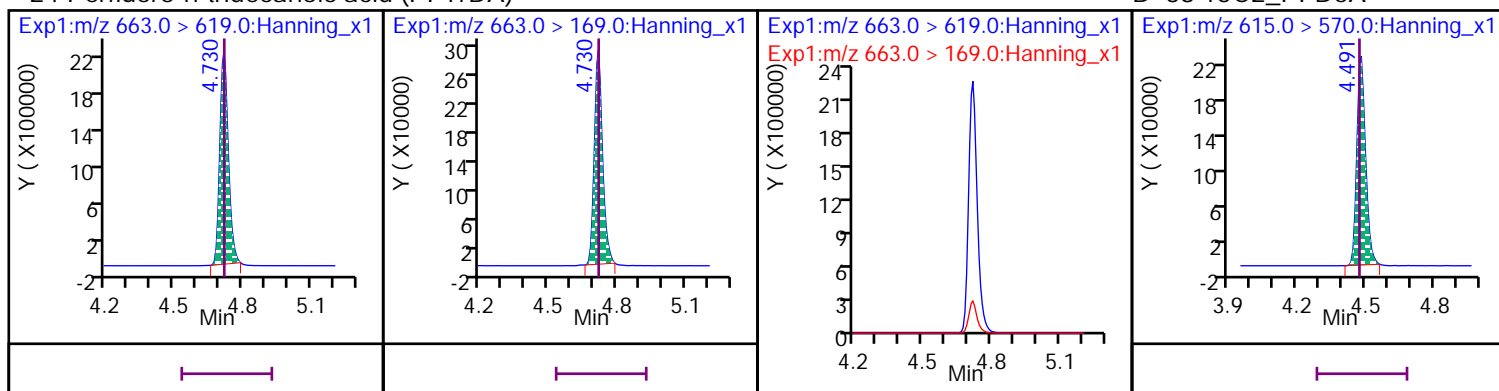
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



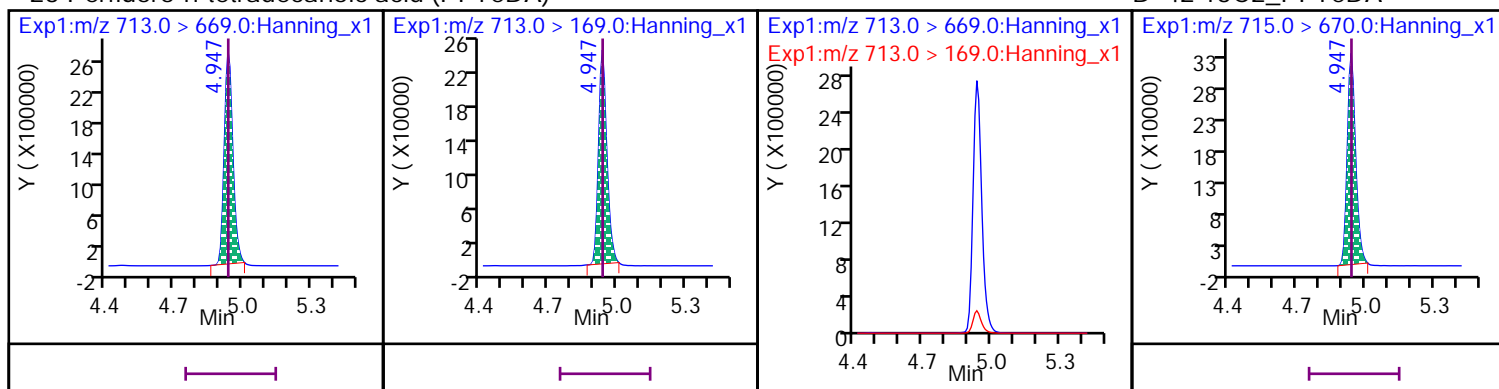
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

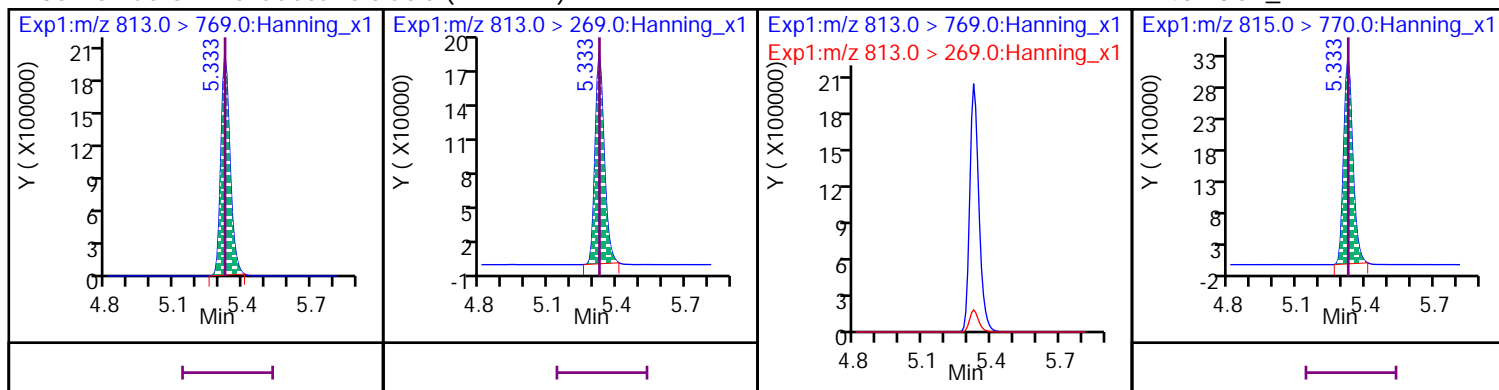
## D 42 13C2\_PFTeDA





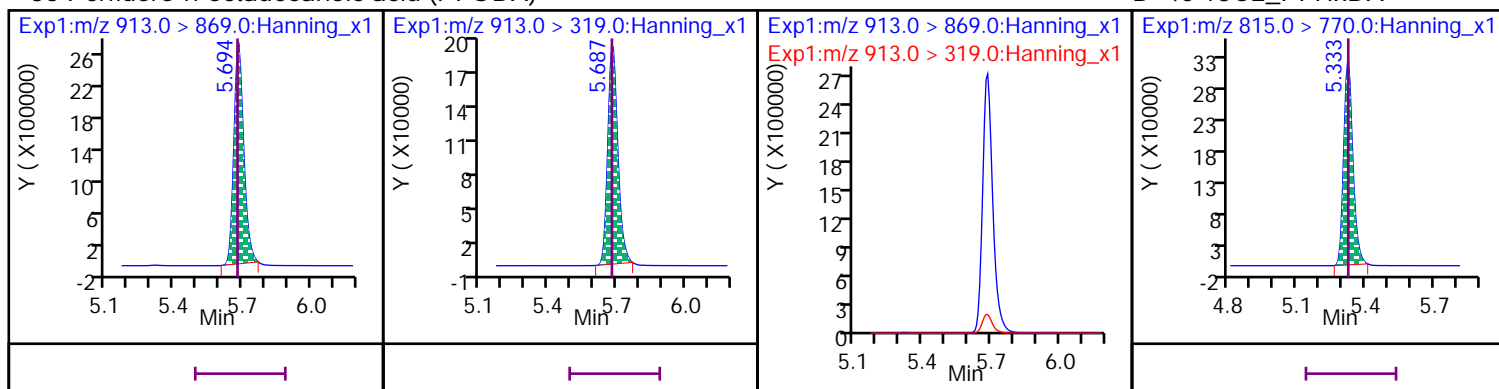
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

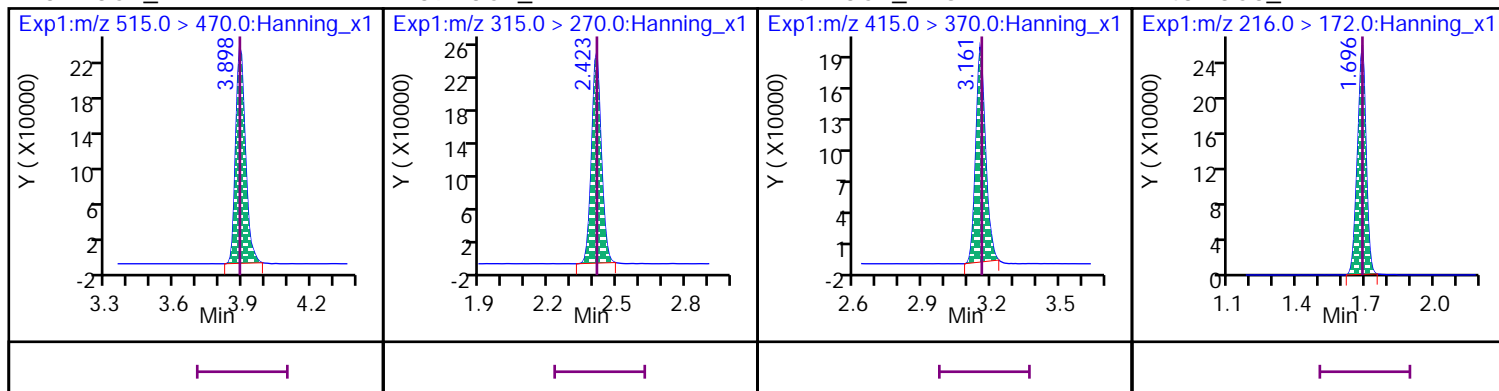


\* 37 13C2\_PFDA

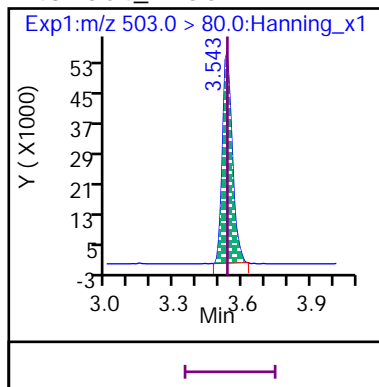
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720013.d

Injection Date: 17-Dec-2020 13:36:34

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 10000\_SVLC-1226

Sample Info: ICAL 10000\_SVLC-1226

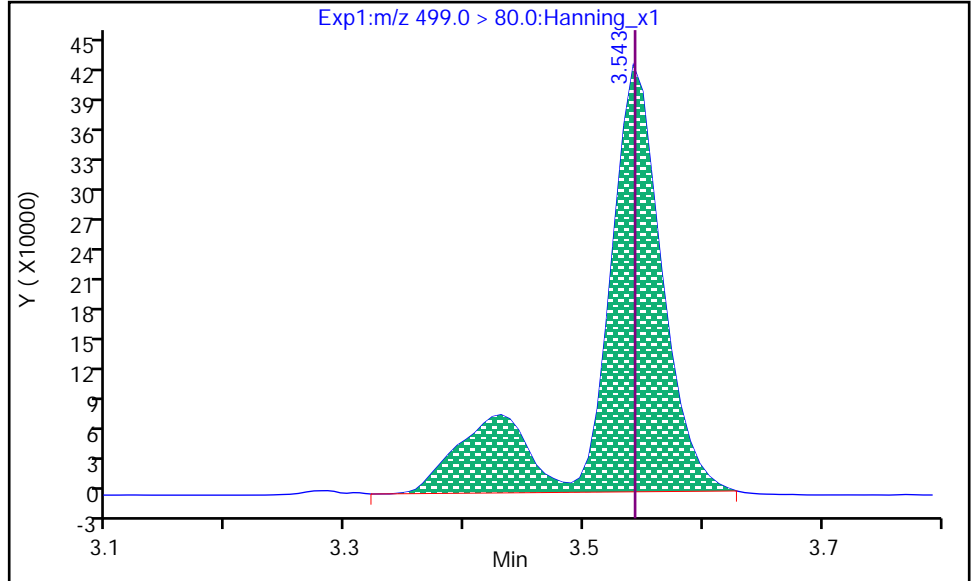
Dil. Factor: 1

Operator: Stephen E. Somerville

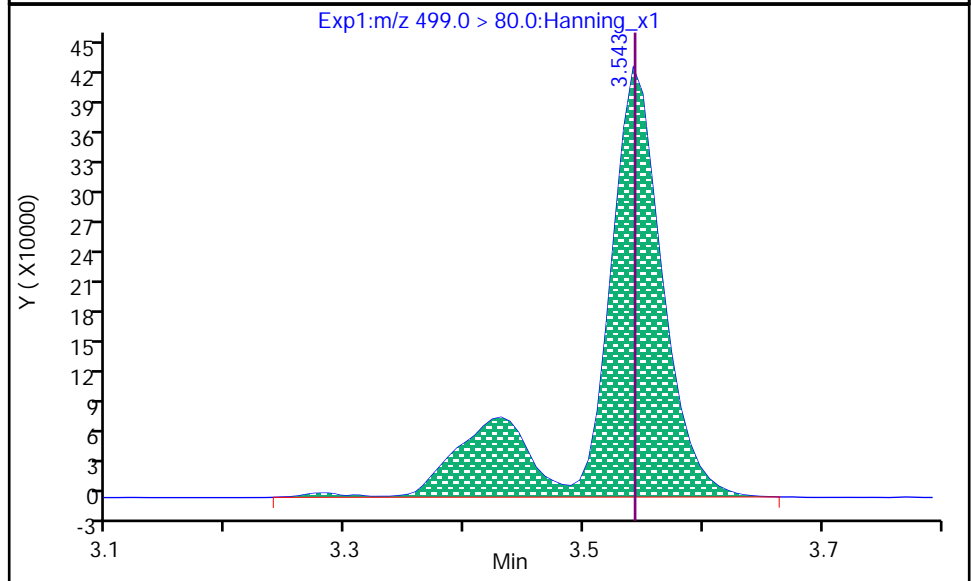
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.543  
Area: 1538391  
Amount: 9277.81  
Amount Units: ng/L



RT: 3.543  
Area: 1590209  
Amount: 9489.82  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:23

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d  
Injection Date: 17-Dec-2020 13:47:15 Injection Vol: 10.0 uL  
Sample Type: Ical, Level: 9 Auto Sampler: 9  
Sample Info: ICAL 15000\_SVLC-1227 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	666524	22	>100:1			1000.00	961.03	90.6	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	9827144	23	>100:1			15000	14803		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	663206	18	>100:1			1000.00	964.12	91.1	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	9839633	17	>100:1			15000	14757		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	218164	17	>100:1			1000.00	947.59	88.1	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	3471337	16	>100:1	Target = 3.50		13260	13495		
298.9 > 99	44	2.120	2.125		950786	16	>100:1	3.65 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	2732060	19	>100:1	Target = 3.10		14070	14437		
349 > 99	44	2.451	2.459		891411	19	>100:1	3.06 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	117401	20	>100:1			5000.00	4849.61	92.8	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.388	0/-1	700424	20		Target = 1.80		14010	14947		
327 > 81	63	2.389	2.388		359323	19	>100:1	1.94 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	680161	19	>100:1			1000.00	922.79	87.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	10314185	20	>100:1	Target = 18.34		15000	15360		
313 > 119	49	2.424	2.423		539071	19	>100:1	19.13 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1232123	18	>100:1			5000.00	4625.89	87.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.539	0/0	5473439	20	>100:1	Target = 0.81		30000	30915		
285 > 185	66	2.531	2.539		6844238	20	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.791	2.790	1	569084	20	>100:1			1000.00	938.08	92.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/-1	8899240	19	>100:1	Target = 3.70		15000	15076		
363 > 169	47	2.782	2.790		2385602	20	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.799	1	157718	27	>100:1			1000.00	921.10	88	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.799	1/0	2357954	28	>100:1	Target = 3.21	0.16	13650	14100		
399 > 99	45	2.800	2.799		734466	25	>100:1	3.21 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	14639276	20	>100:1	Target = 2.97		14130	14620		
377 > 85	45	2.828	2.827		4990640	20	>100:1	2.93 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.176	3.169	1/0	2040587	24	>100:1	Target = 3.08		14280	14242		
449 > 99	45	3.176	3.169		639128	24	>100:1	3.19 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.142	3.135	1	93776	23	>100:1			5000.00	4869.36	89.6	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.142	3.135	1/0	528953	23	>100:1	Target = 1.80		14220	13995		
427 > 81	64	3.142	3.135		300117	24	>100:1	1.76 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.169	3.169	0	540395	23	>100:1			1000.00	913.04	82.5	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.169	3.169	0/0	8294244	24	>100:1	Target = 2.87		15000	15056		
413 > 169	53	3.169	3.169		2817783	24	>100:1	2.94 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	140164	19	>100:1			1000.00	934.87	90.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/0	2401122	64	>100:1	Target = 3.84	0.27	13920	14457		M
499 > 99	54	3.545	3.545		658264	39	>100:1	3.64 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/0	7132279	22	>100:1			13980	15115		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.891	3.891	1/0	1527466	19	>100:1	Target = 3.07		14400	14240		
549 > 99	54	3.899	3.891		534303	20	>100:1	2.85 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.198	4.198	1/0	1561930	17	>100:1	Target = 3.03		14460	15355		
599 > 99	54	4.198	4.198		552442	17	>100:1	2.82 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/0	5555764	17	>100:1			14130	13957		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.704	4.704	1/0	1710650	19	>100:1	Target = 3.33		14520	15202		
699 > 99	54	4.704	4.704		522503	18	>100:1	3.27 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.553	3.545	1	712934	20	>100:1			1000.00	949.36	90	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.553	3.545	1/0	10223367	22	>100:1	Target = 6.16		15000	14339		
463 > 169	56	3.553	3.545		1703495	21	>100:1	6.00 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.874	3.866	1	302106	20	>100:1			1000.00	975.91	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.874	3.866	1/0	4348697	20	>100:1			15000	14607		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.899	3.891	1	87098	18	>100:1			5000.00	4695.27	93.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.899	3.891	1/0	513089	21	>100:1	Target = 1.95		14370	14886		
527 > 81	65	3.891	3.891		267531	18	>100:1	1.91 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.501	4.492	1/0	567999	18	>100:1	Target = 3.14		14460	14110		
627 > 80	65	4.501	4.492		173331	18		3.27 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.907	3.899	1	618084	20	>100:1			1000.00	931.79	88.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.907	3.899	1/0	9369624	20	>100:1	Target = 15.94		15000	15428		
513 > 169	51	3.907	3.899		692722	20	>100:1	13.52 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	696167	18	69:1			5000.00	4850.01	91.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.065	4.065	1/0	1599526	34	>100:1	Target = 1.33	0.12	15000	14956		
570 > 483	58	4.065	4.065		1235143	33	>100:1	1.29 (0.66-1.99)	0.22				

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	1	600812	17	>100:1			5000.00	4523.69	81.4	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.228	4.217	1/0	1739580	33	>100:1	Target = 1.58	0.15	15000	14541		
584 > 526	60	4.228	4.217		1098135	31	>100:1	1.58 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	1	600565	18	>100:1			1000.00	950.15	88.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.217	4.217	1/0	8350413	17	>100:1	Target = 15.50		15000	14794		
563 > 169	52	4.217	4.217		578317	18	>100:1	14.43 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	106887	15	>100:1			1000.00	987.79	91.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	1435117	16	>100:1			15000	14290		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.318	1	58102	15	>100:1			1000.00	1097.99	106	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.328	4.318	1/0	863864	15	>100:1	Target = 1.12		15000	13179		
512 > 219	57	4.328	4.318		802425	15	>100:1	1.07 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.465	1	120117	17	>100:1			1000.00	957.91	98.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/0	1649195	17	>100:1			15000	15432		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.492	4.483	1	526602	17	>100:1			1000.00	869.96	81.1	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.492	4.492	1/0	8292794	17	>100:1	Target = 10.85		15000	15551		
613 > 169	38	4.492	4.492		791057	17	>100:1	10.48 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.731	4.731	1/0	8352213	20	>100:1	Target = 8.37		15000	16103		
663 > 169	38	4.731	4.731		1011491	20	>100:1	8.25 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.492	4.483	1	48687	18	>100:1			1000.00	991.70	94.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	722634	17	>100:1	Target = 1.03		15000	13586		
526 > 219	59	4.492	4.492		740958	18	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	822708	20	>100:1			1000.00	976.57	92.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/0	10429810	21	>100:1	Target = 12.11		15000	14631		
713 > 169	42	4.948	4.948		893504	21	>100:1	11.67 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	883988	19	>100:1			1000.00	975.53	96.8	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	7973247	20	>100:1	Target = 11.48		15000	13804		
813 > 269	40	5.334	5.334		722415	19	>100:1	11.03 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.689	5.689	0/-1	11528747	24	>100:1	Target = 13.88		15000	14733		
913 > 319	40	5.689	5.689		853976	24	>100:1	13.50 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.907	3.899	1	640826	20	>100:1					88.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	727334	19	>100:1					96.6	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.169	3.169	0	533004	25	>100:1					82.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	606649	22	>100:1					91.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	156417	21	>100:1					96.3	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Injection Date: 17-Dec-2020 13:47:15

Inst. ID: LCMSMS02

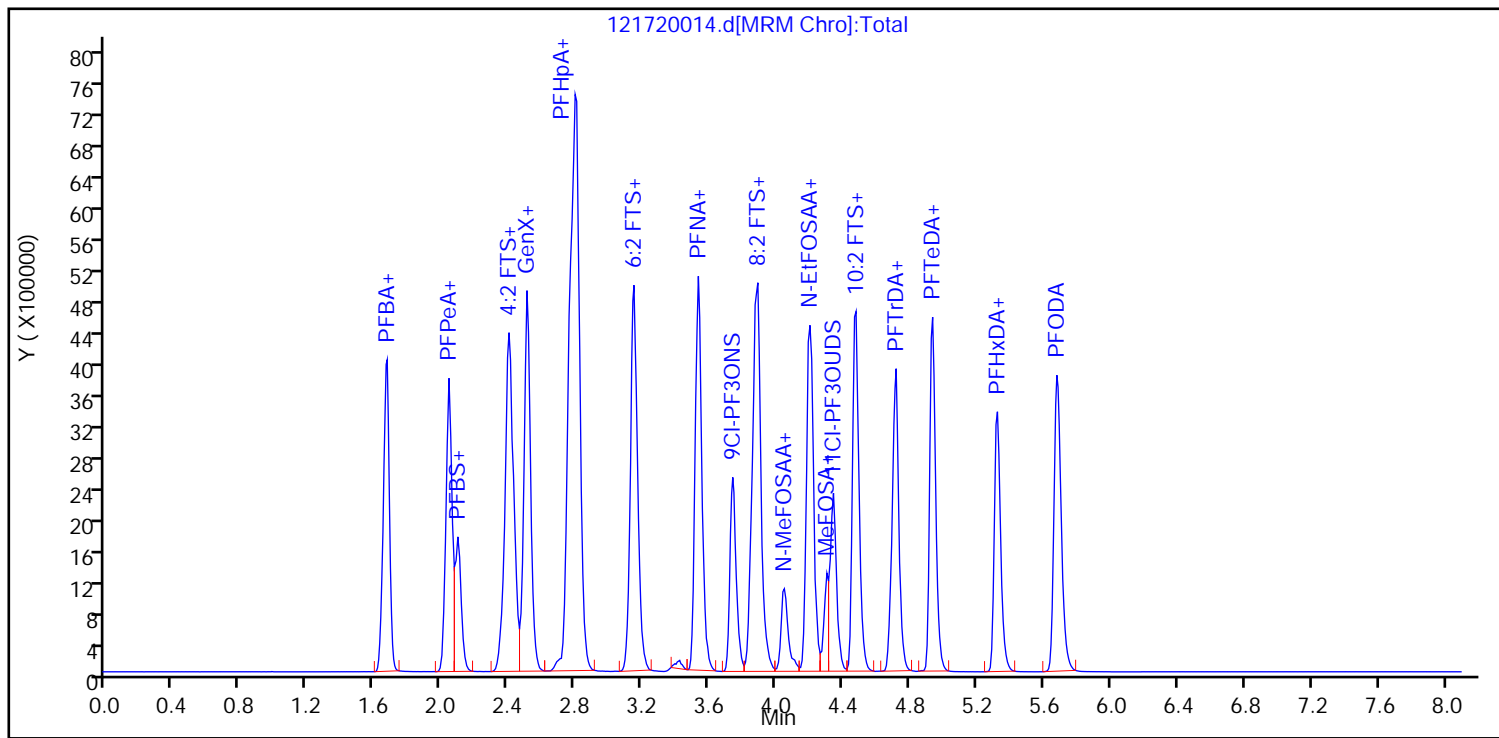
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Lab ID: ICAL 15000\_SVLC-1227

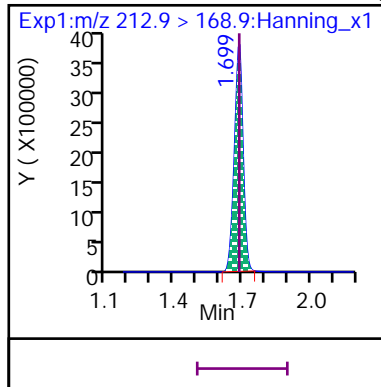
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Dil. Factor: 1

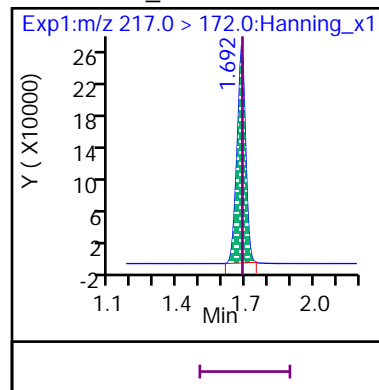
Operator: Stephen E. Somerville



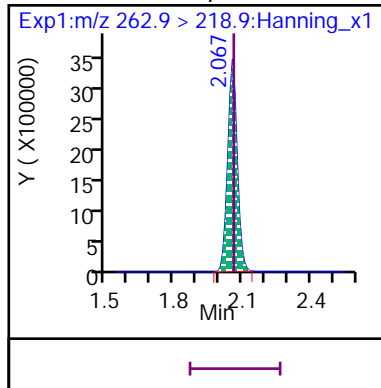
8 Perfluoro-n-butanoic acid (PFBA)



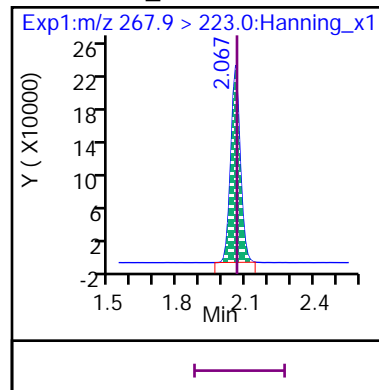
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

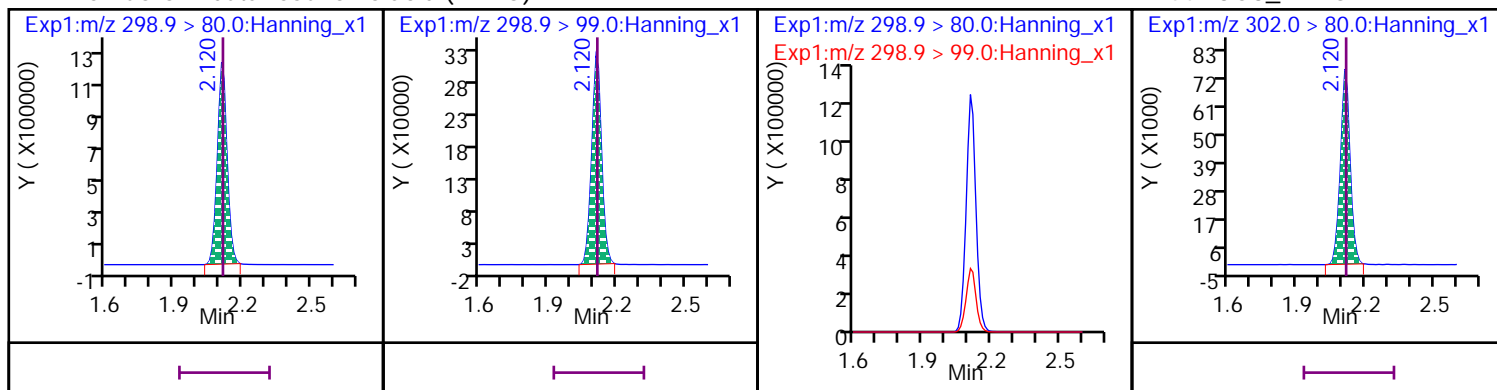


D 50 13C5\_PFPeA



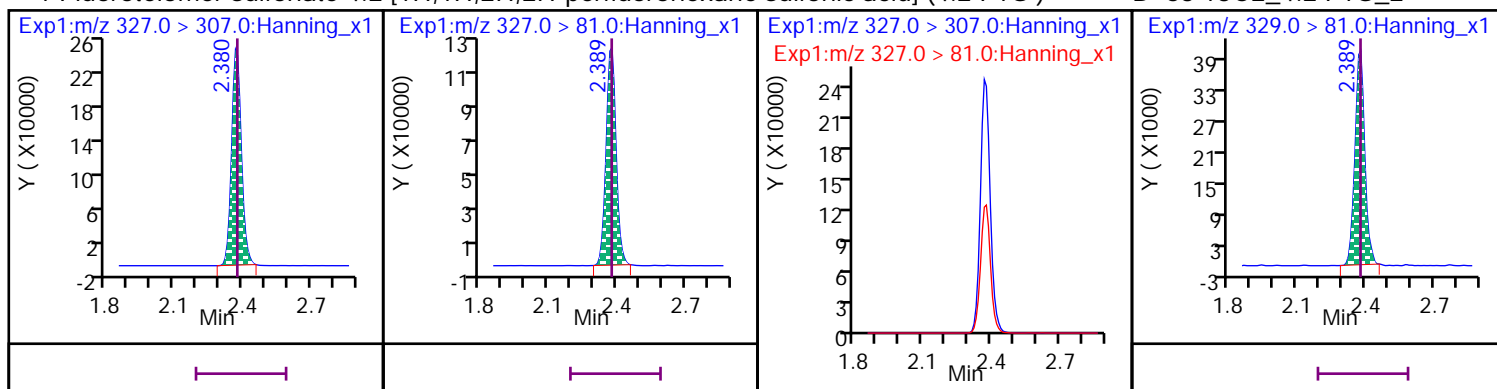
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



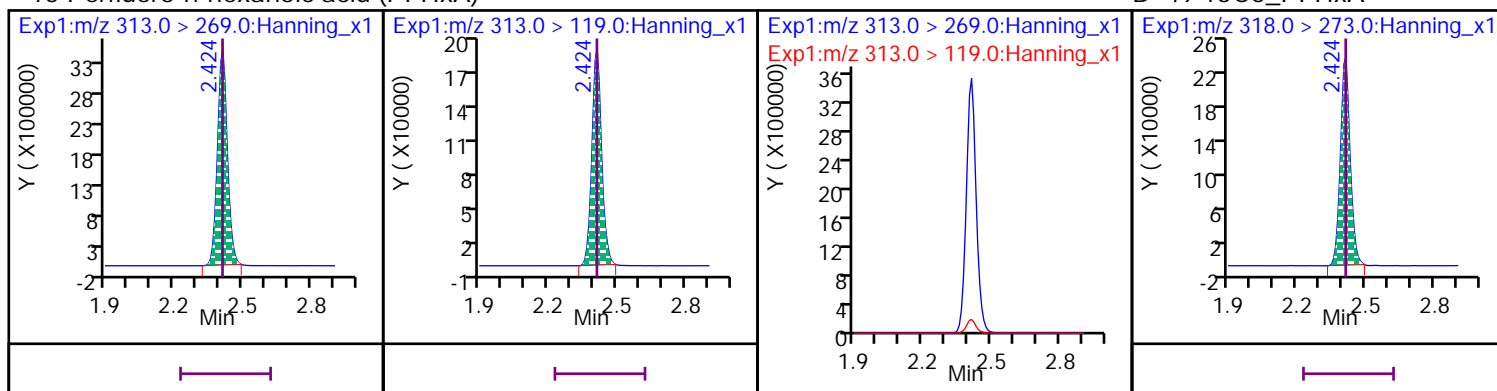
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



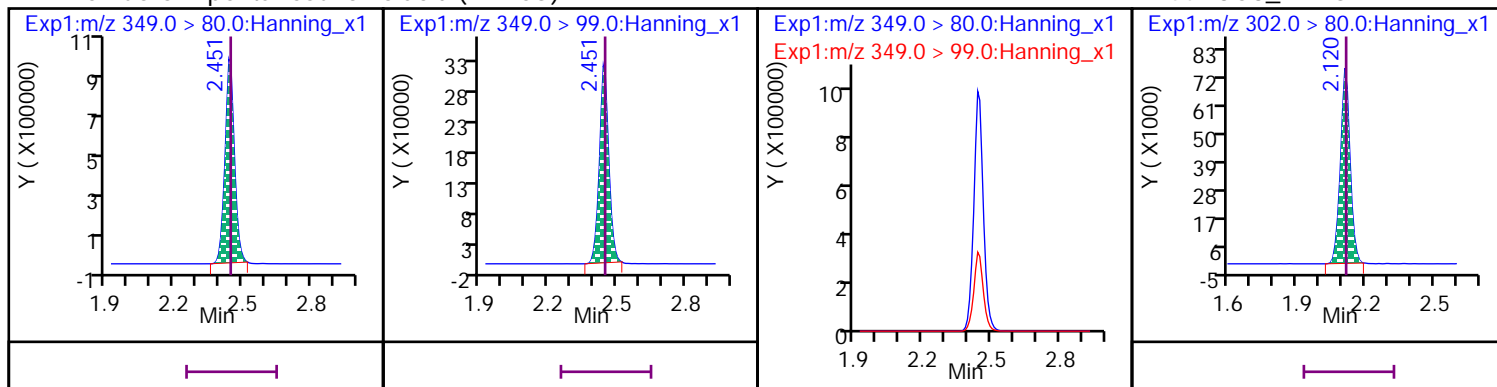
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

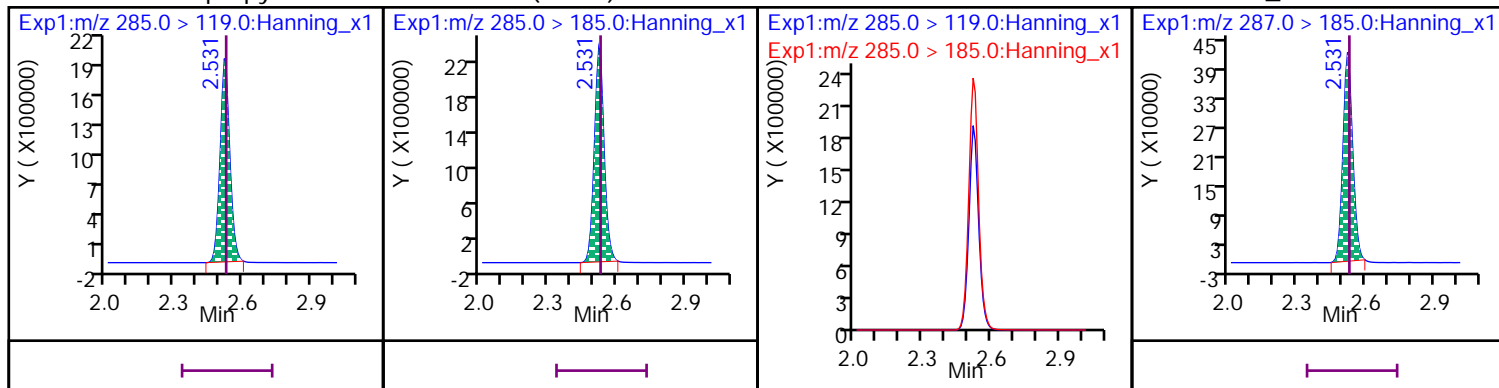
D 44 13C3\_PFBS





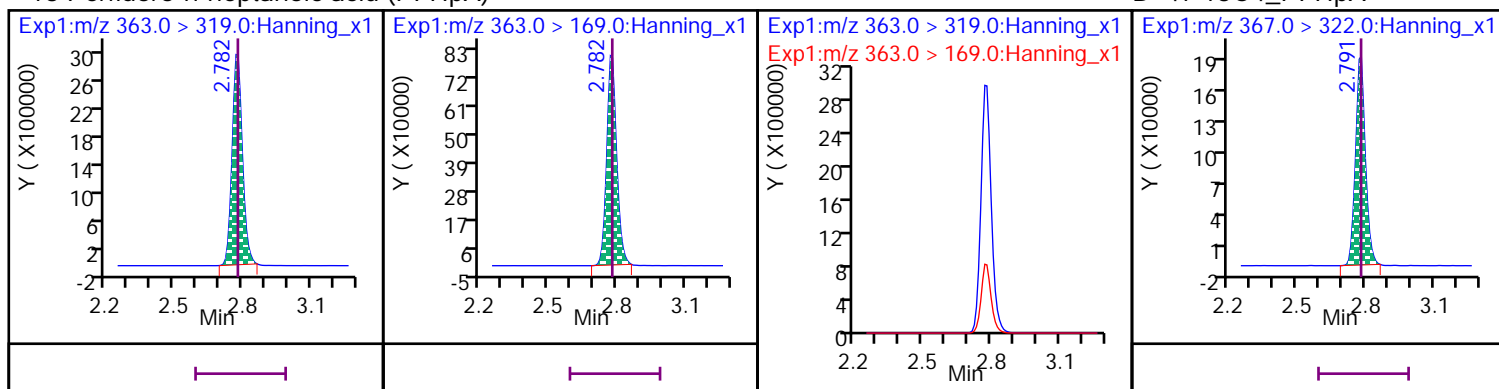
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



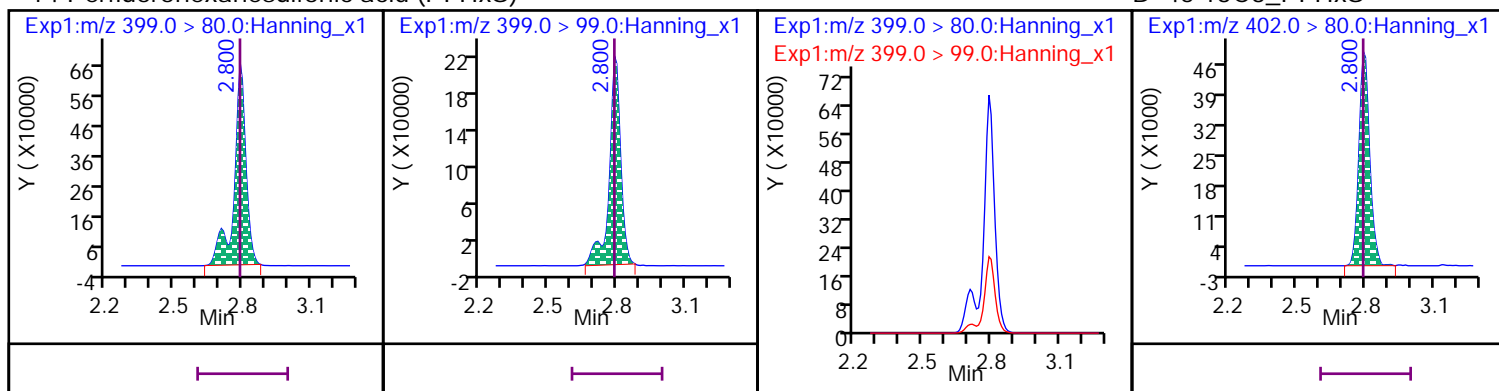
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



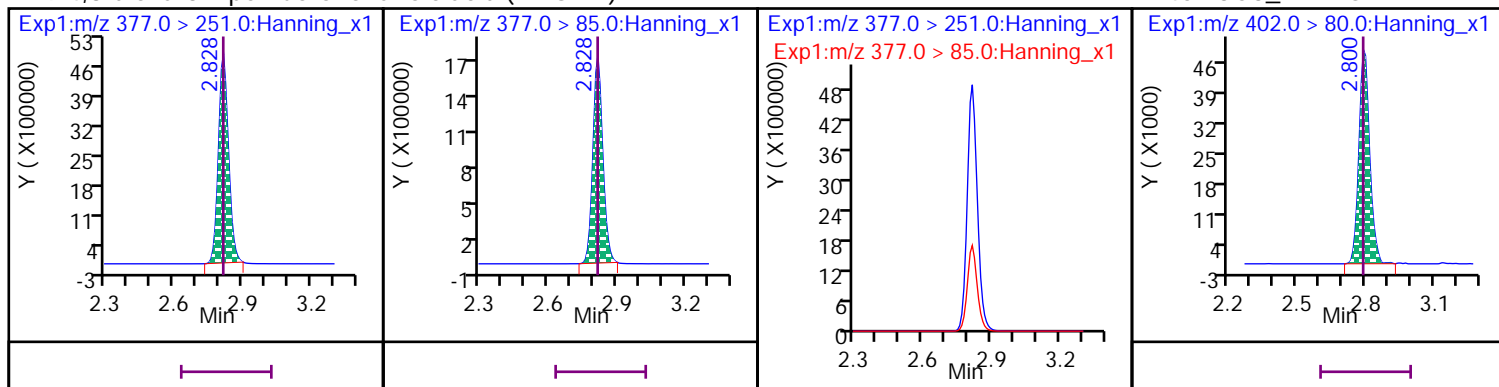
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



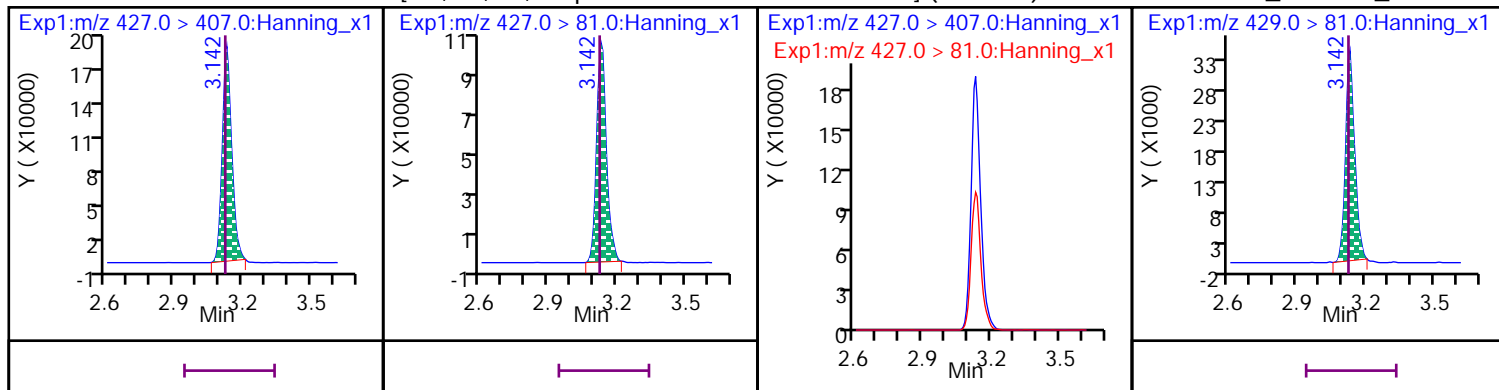
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



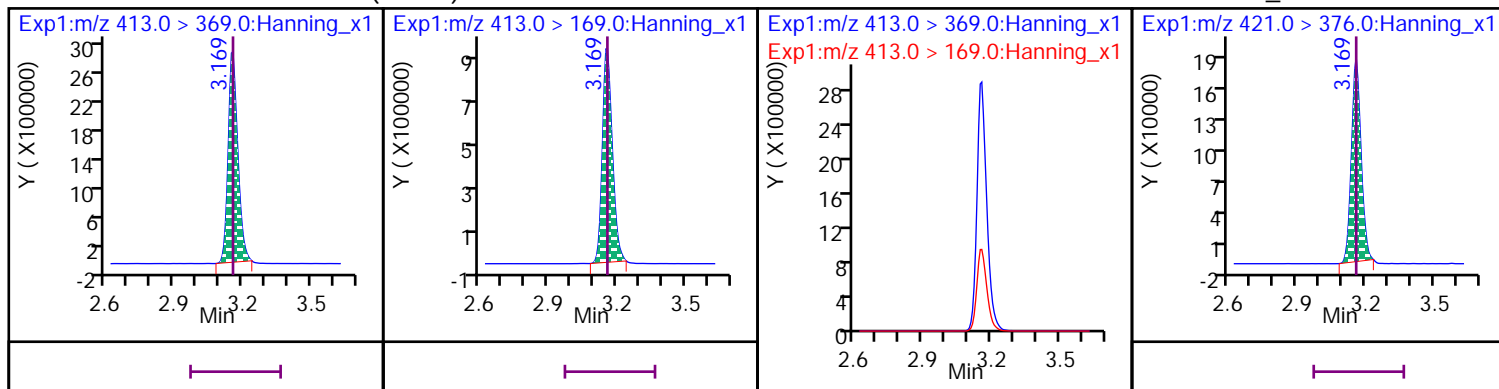
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



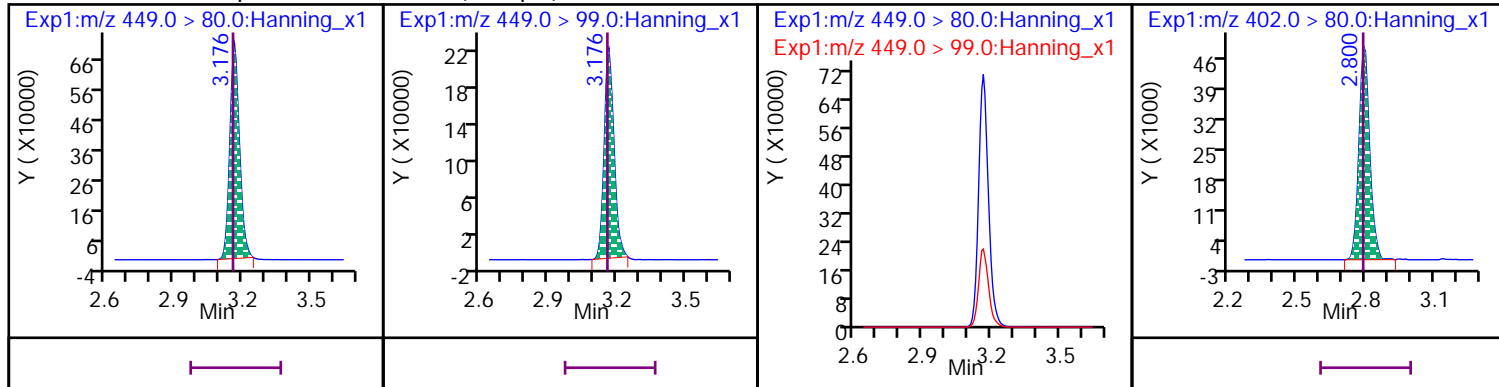
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



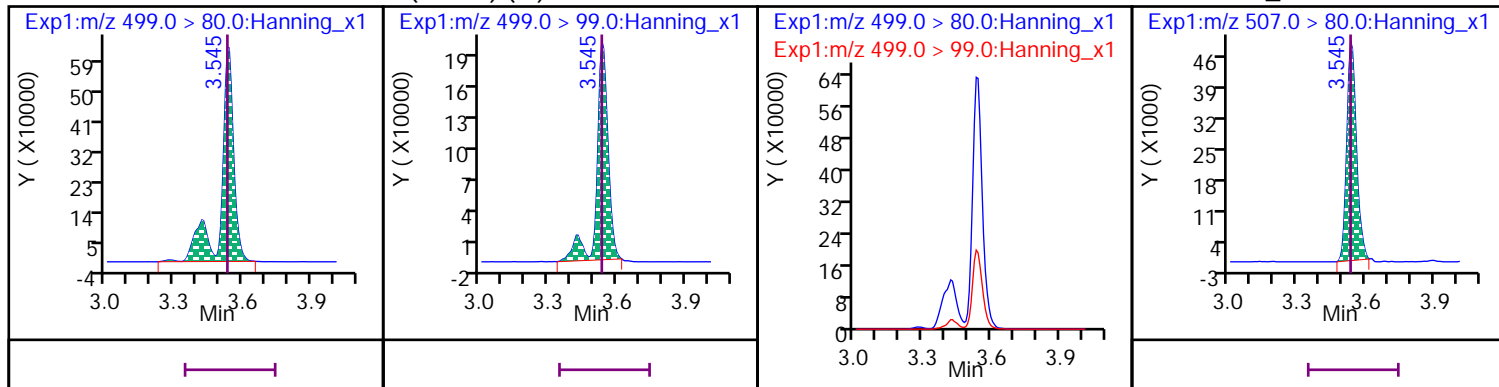
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



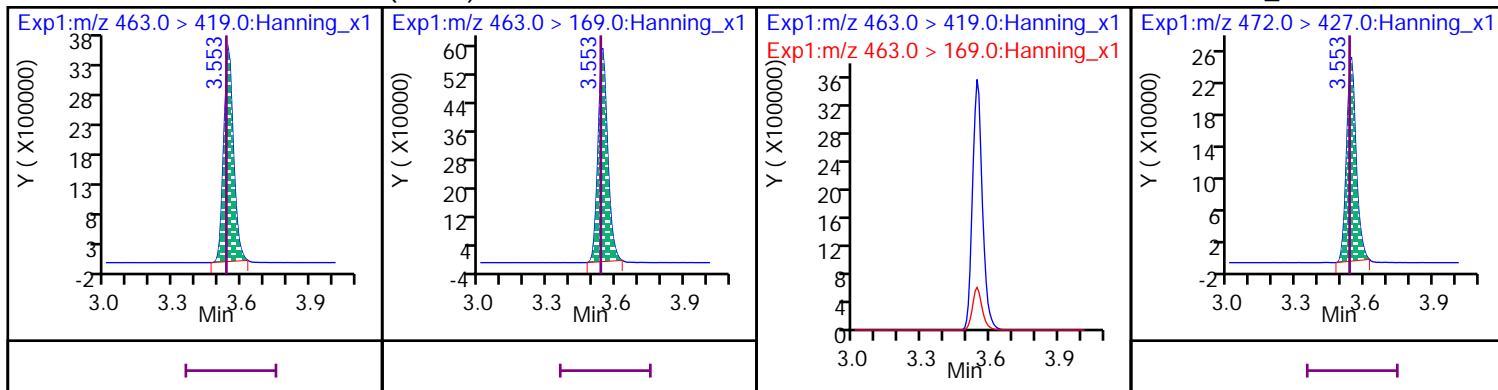
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



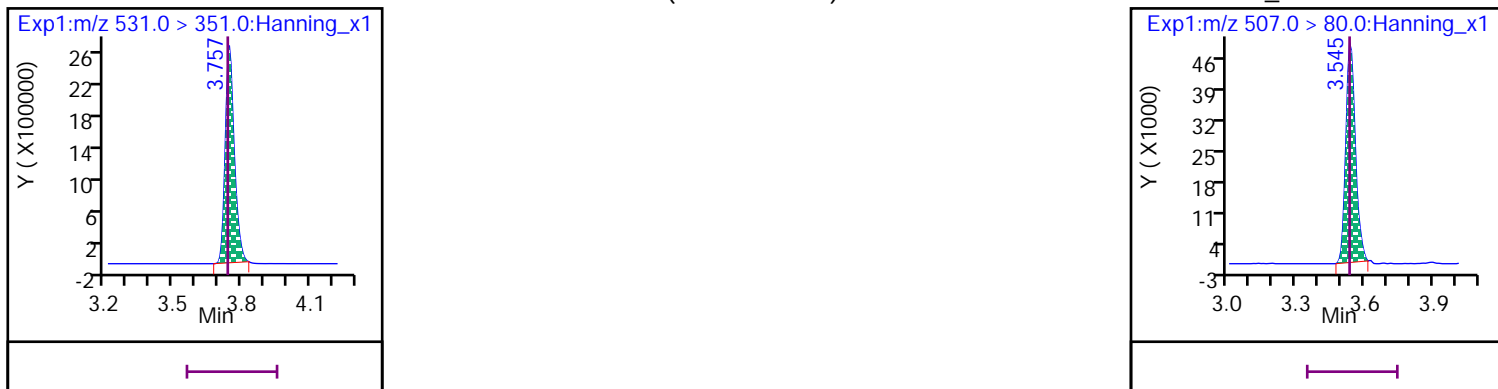
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



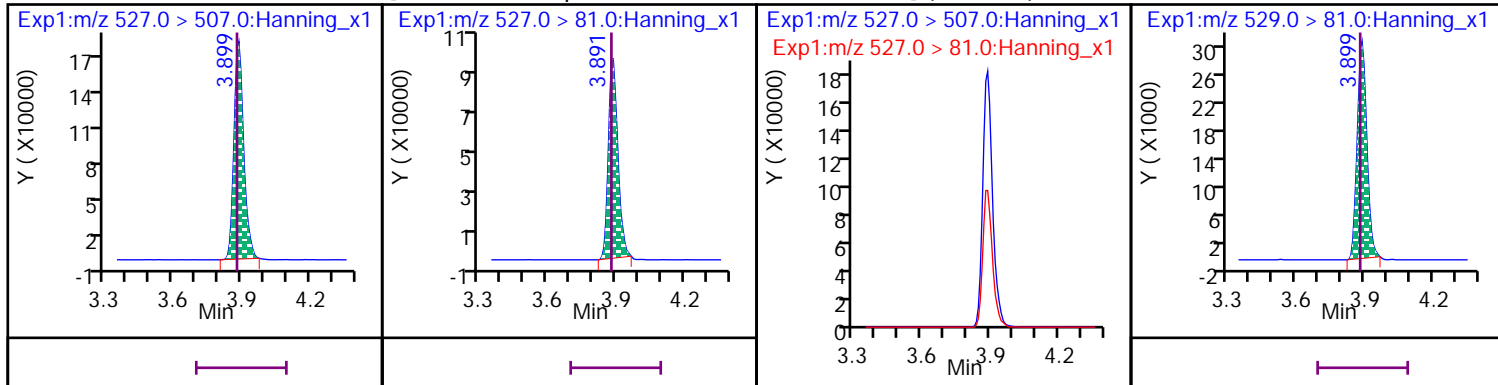
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



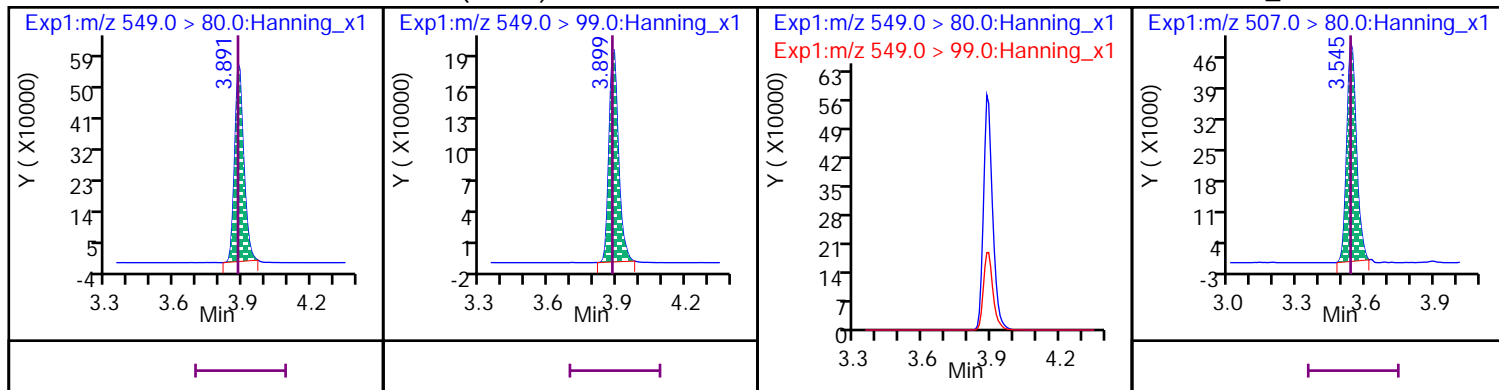
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



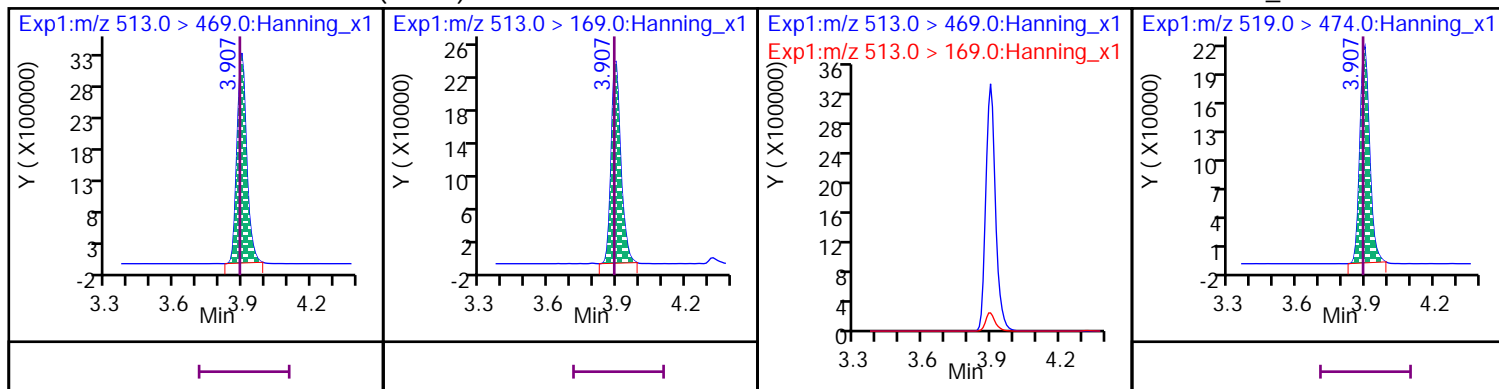
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



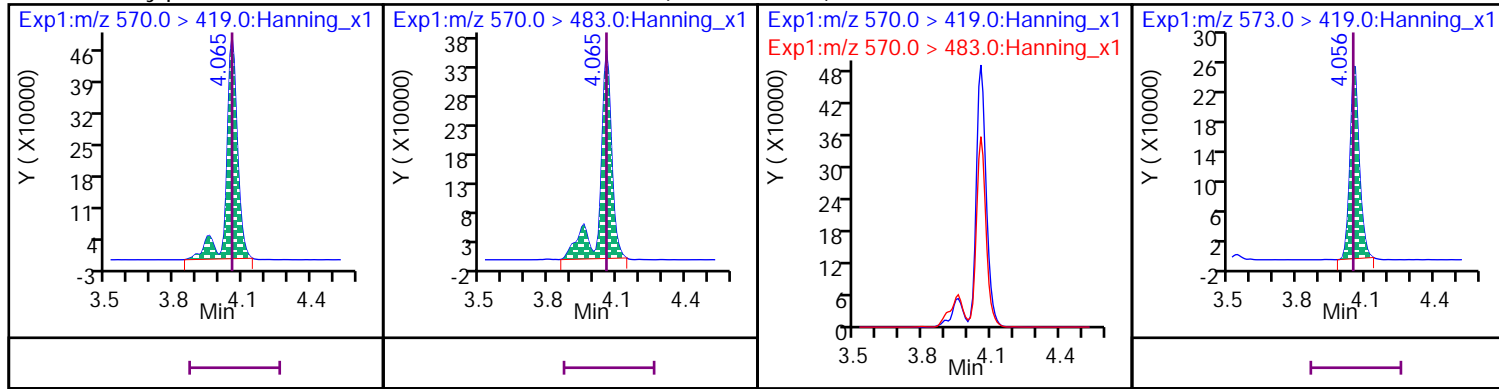
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



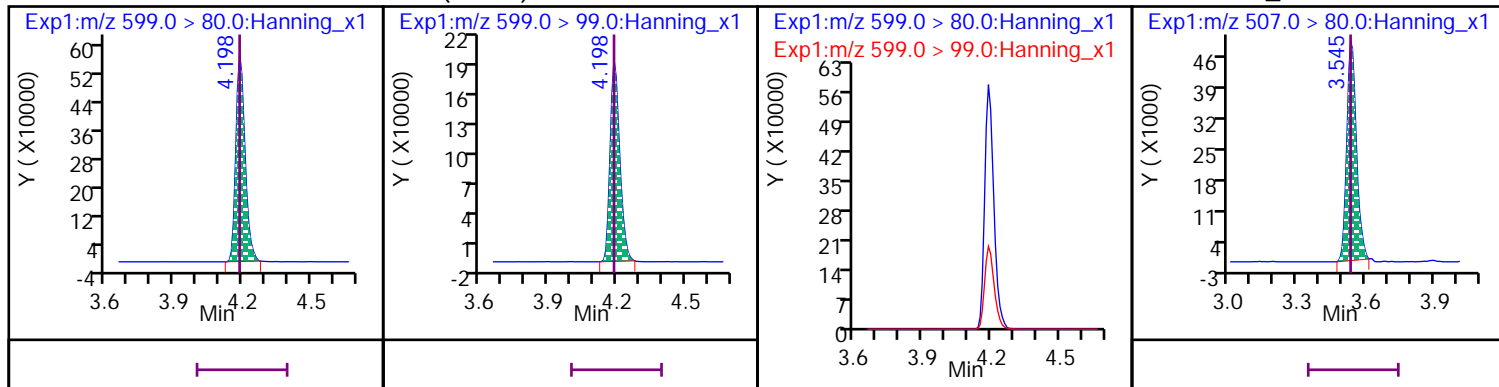
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



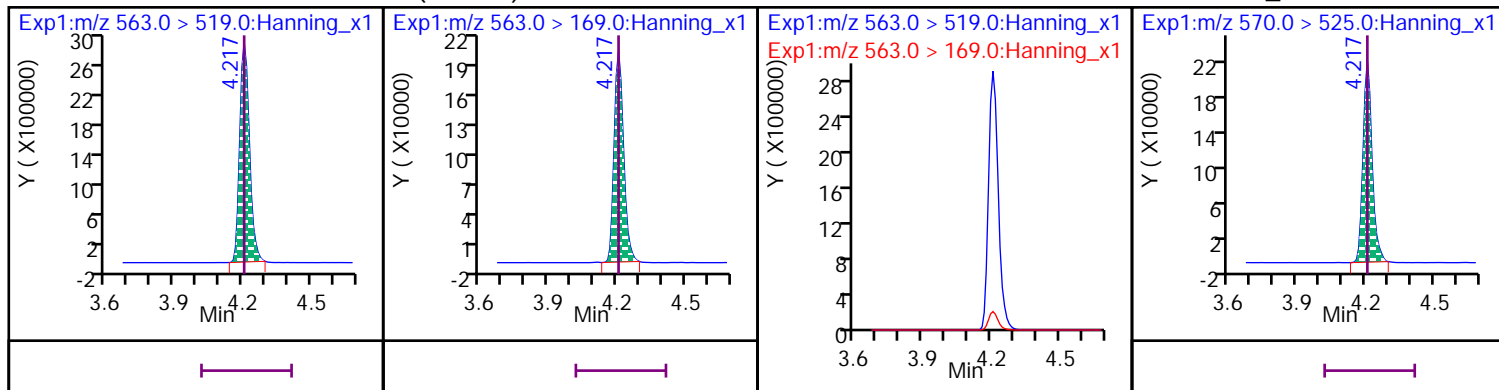
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



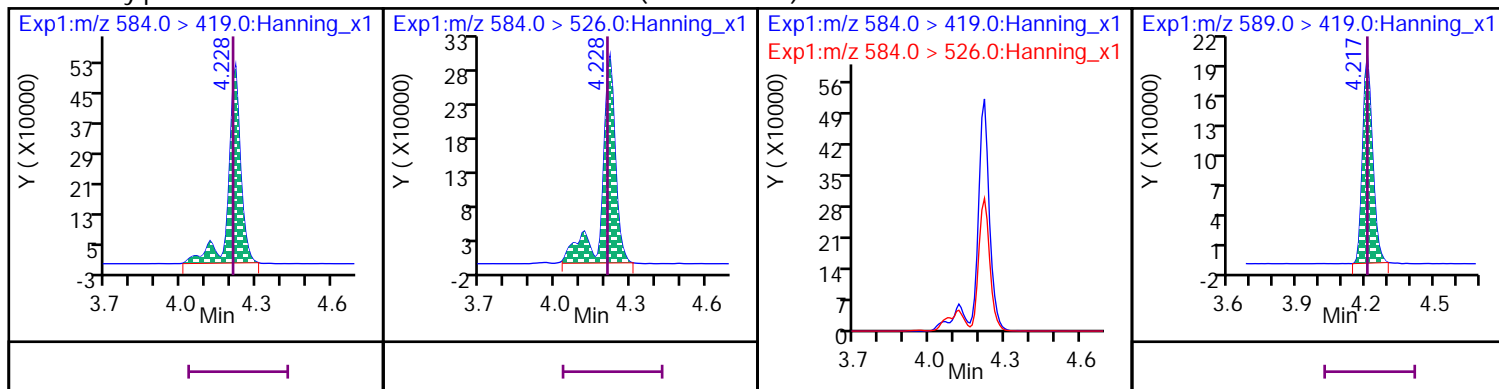
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



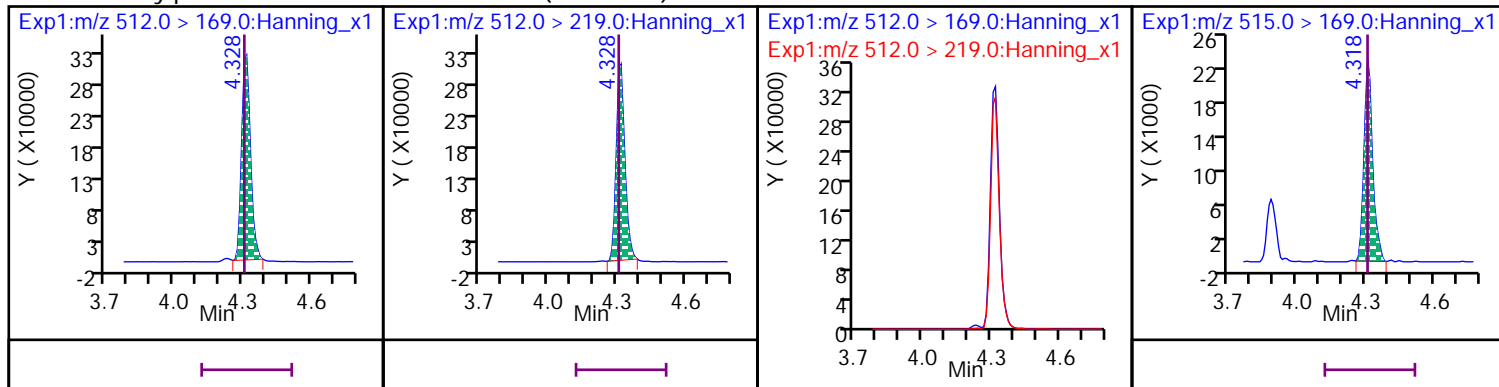
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

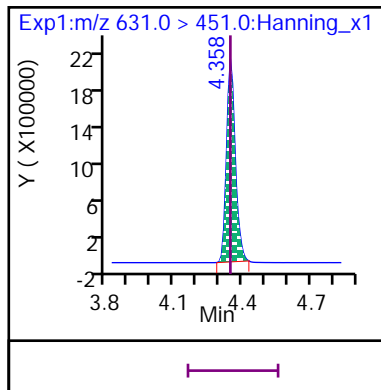


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

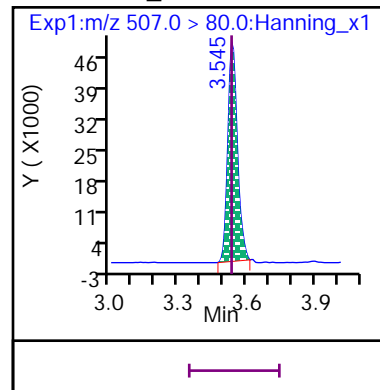
D 57 d3-MeFOSA



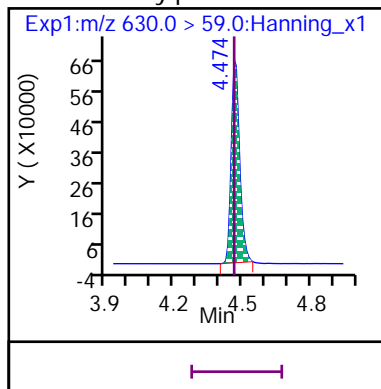
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



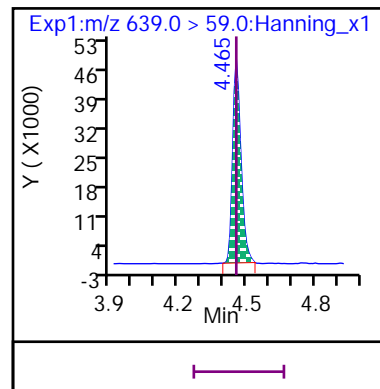
D 54 13C8\_PFOS



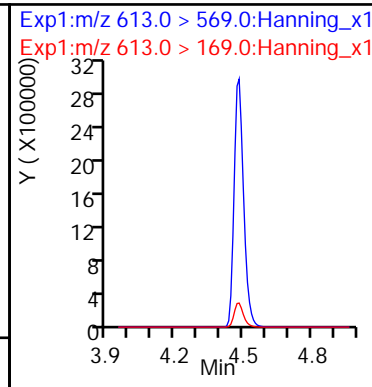
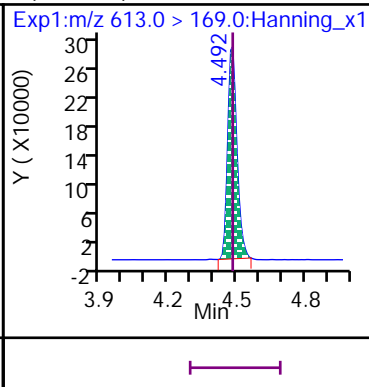
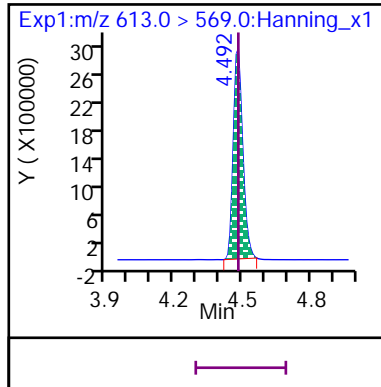
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



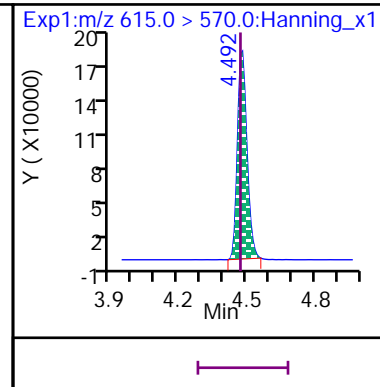
D 62 d9-EtFOSE



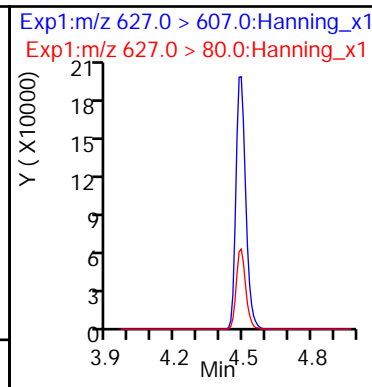
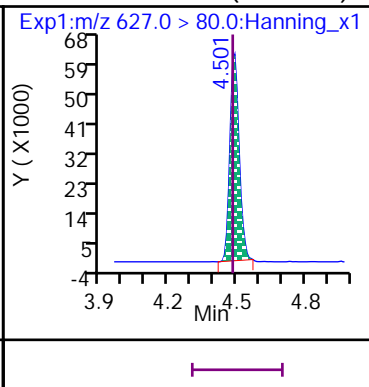
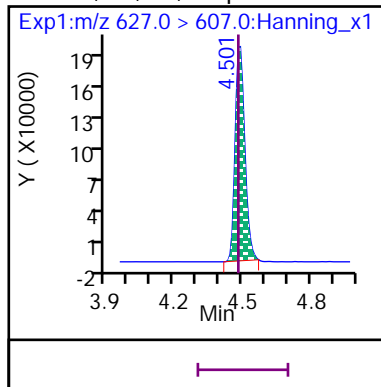
11 Perfluoro-n-dodecanoic acid (PFDoA)



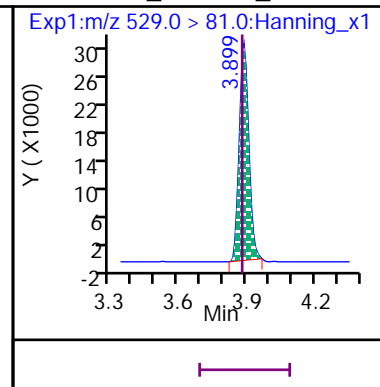
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

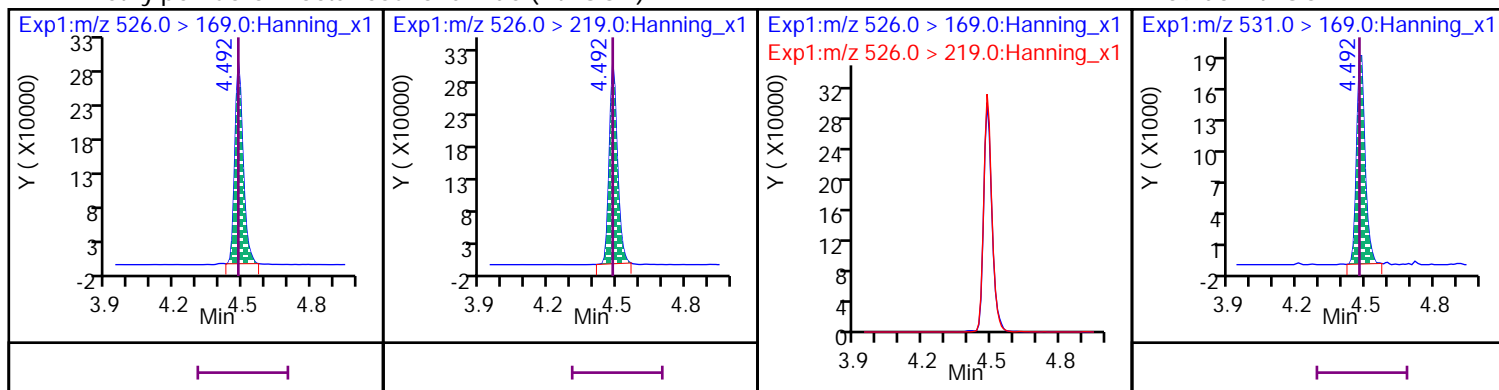


D 65 13C2\_8:2 FTS\_2



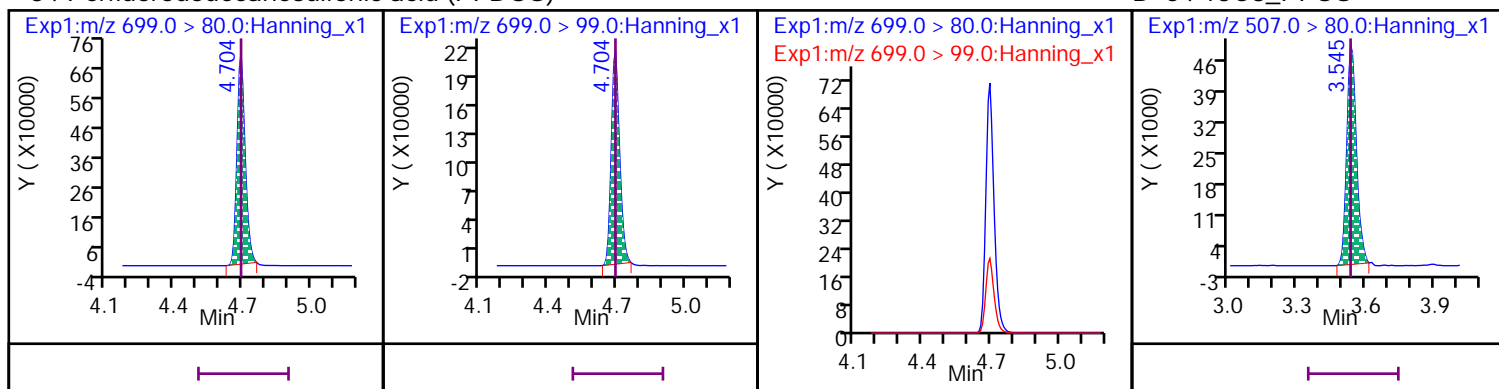
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



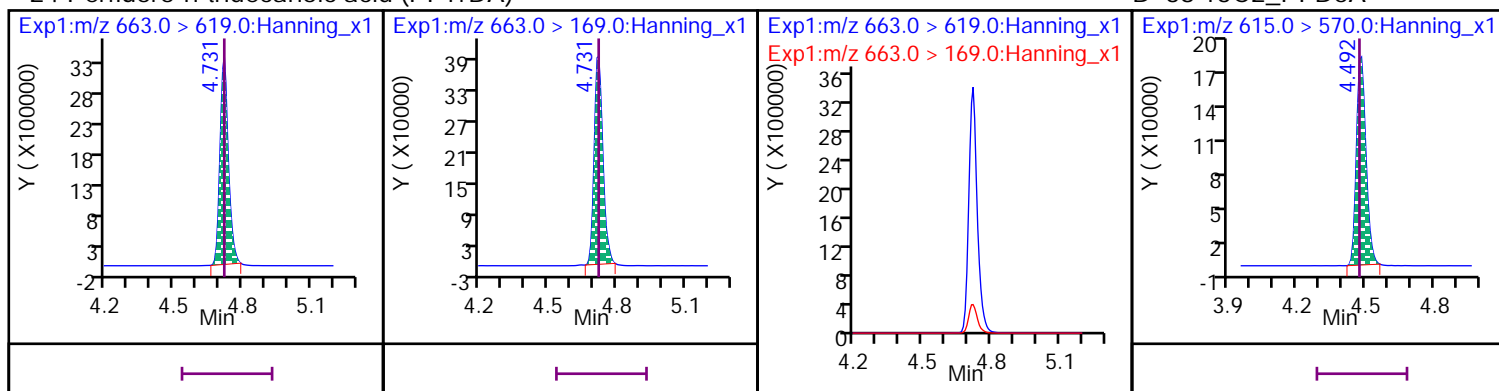
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



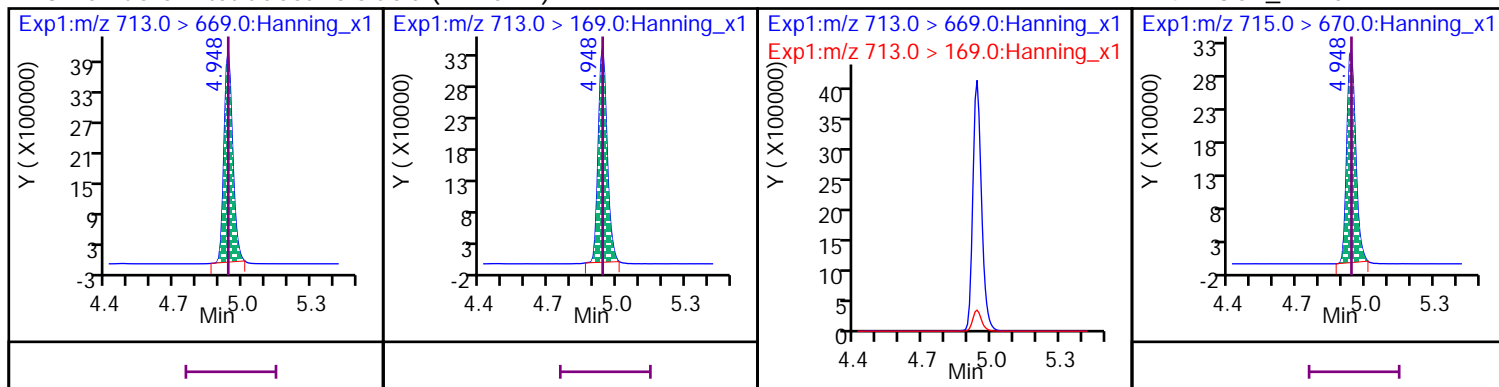
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



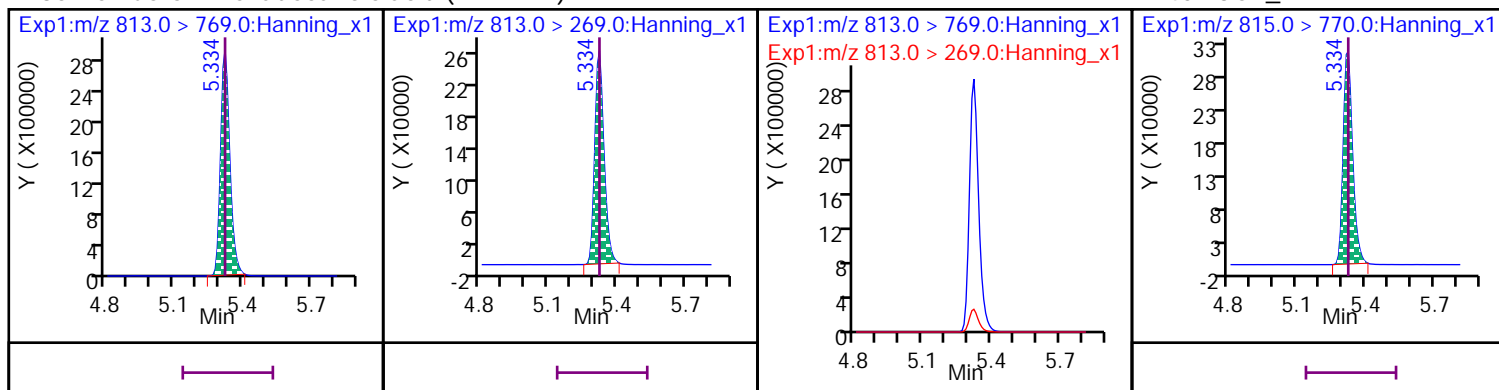
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



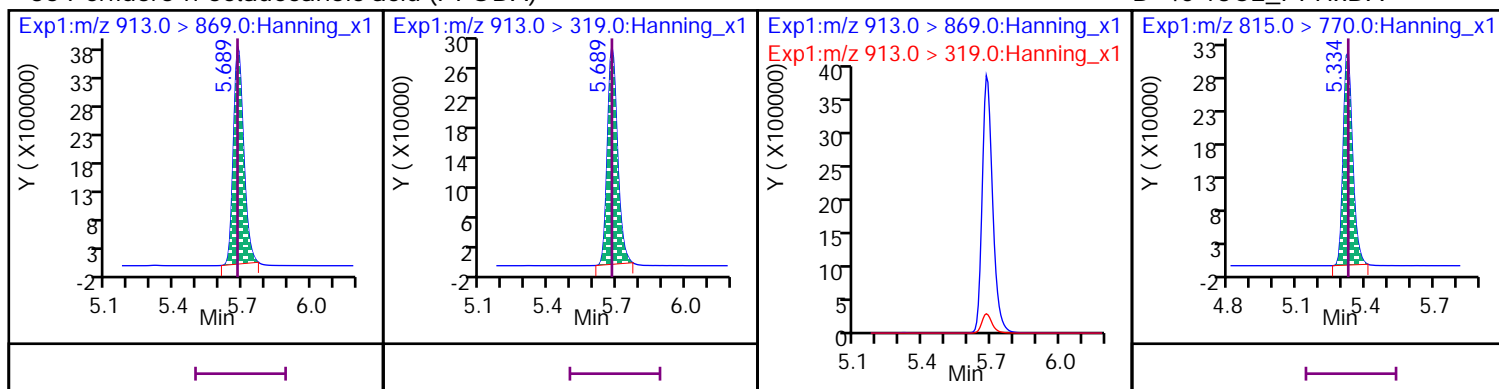
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

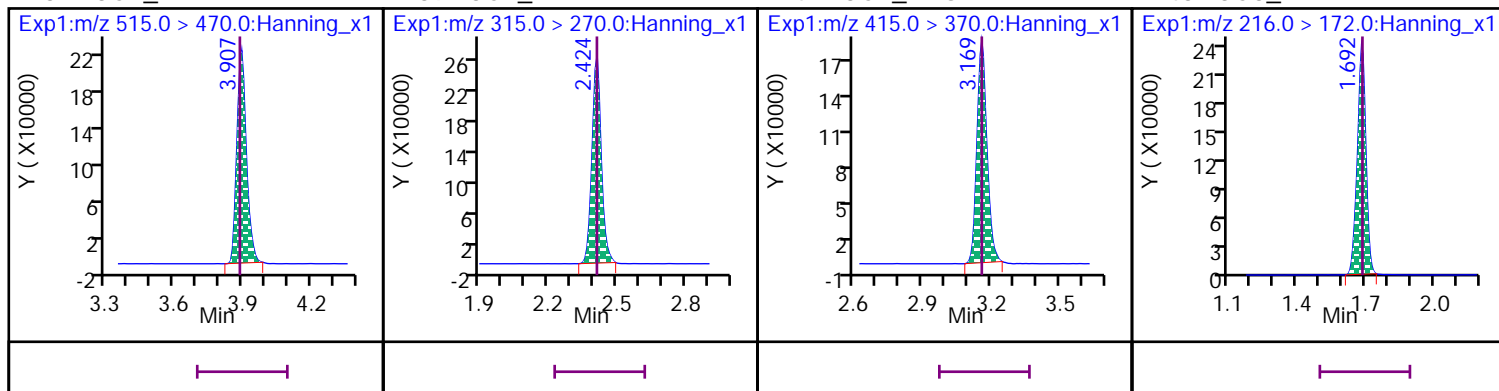


\* 37 13C2\_PFDA

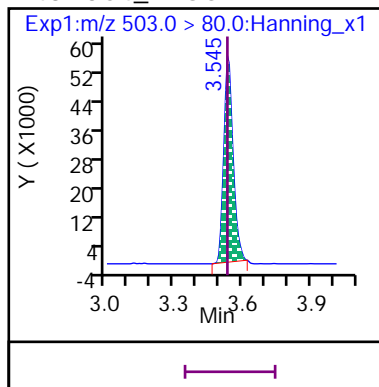
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720014.d

Injection Date: 17-Dec-2020 13:47:15

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 15000\_SVLC-1227

Sample Info: ICAL 15000\_SVLC-1227

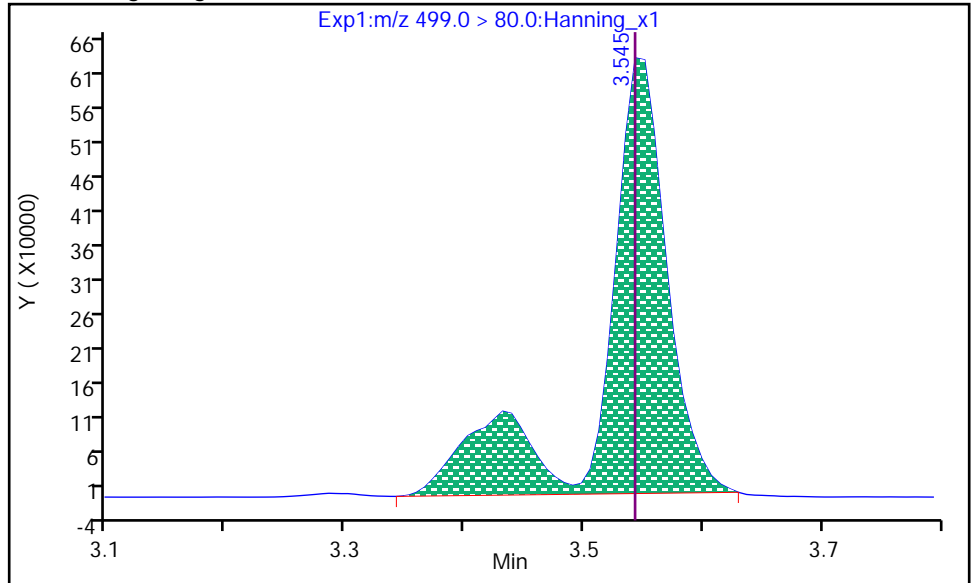
Dil. Factor: 1

Operator: Stephen E. Somerville

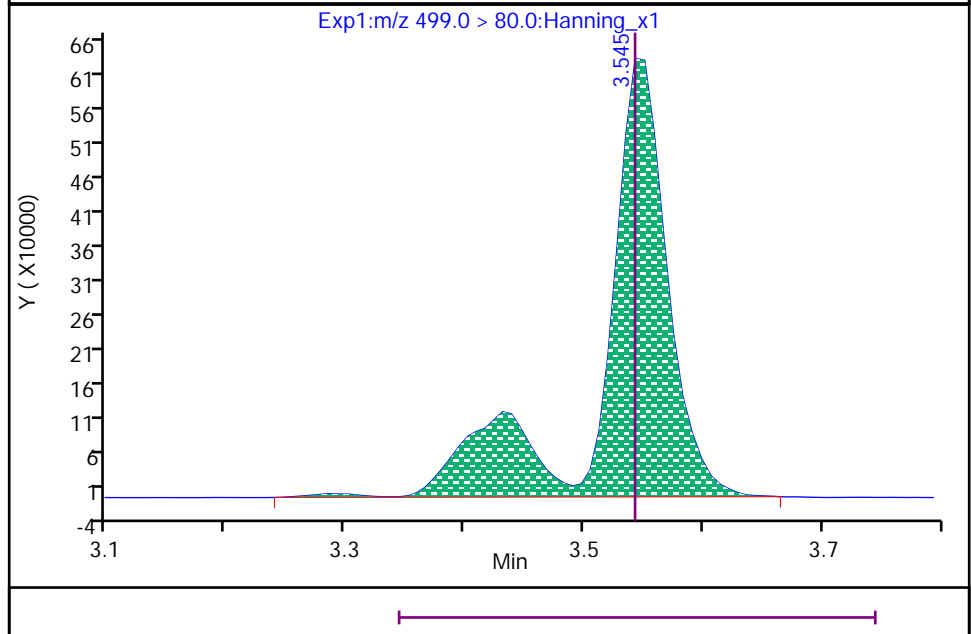
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 2327456  
Amount: 14114  
Amount Units: ng/L



RT: 3.545  
Area: 2401122  
Amount: 14457  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:30

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d  
 Injection Date: 17-Dec-2020 13:57:55 Injection Vol: 10.0 uL  
 Sample Type: Ical, Level: 10 Auto Sampler: 10  
 Sample Info: ICAL 20000\_SVLC-1228 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.693	1.696	0	670075	22	>100:1			1000.00	966.15	91.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	13025794	23	>100:1			20000	19517		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	649876	16	>100:1			1000.00	944.74	89.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	12792943	17	>100:1			20000	19579		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	220082	16	>100:1			1000.00	955.92	88.9	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.120	2.125	0/0	4687642	18	>100:1	Target = 3.50		17680	18065		
298.9 > 99	44	2.120	2.125		1270618	16	>100:1	3.68 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.459	0/0	3788032	19		Target = 3.10		18760	19842		
349 > 99	44	2.451	2.459		1211114	19	>100:1	3.12 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.388	0	125554	18	>100:1			5000.00	5186.40	99.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/1	908357	18	>100:1	Target = 1.80		18680	18126		
327 > 81	63	2.389	2.388		465233	19	>100:1	1.95 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	703908	20	>100:1			1000.00	955.01	90.9	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.423	1/0	13671450	19	>100:1	Target = 18.34		20000	19672		
313 > 119	49	2.425	2.423		730813	19	>100:1	18.70 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1284072	20	>100:1			5000.00	4820.92	90.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.539	0/0	7308102	20	>100:1	Target = 0.81		40000	39608		
285 > 185	66	2.532	2.539		9123862	20	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.790	0	609009	20	>100:1			1000.00	1003.89	98.9	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.790	0/0	11978188	19	>100:1	Target = 3.70		20000	18962		
363 > 169	47	2.782	2.790		3259573	19	>100:1	3.67 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.801	2.799	1	153282	19	>100:1			1000.00	895.19	85.5	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.801	2.799	1/0	3091076	28	>100:1	Target = 3.21	0.20	18200	19019		
399 > 99	45	2.801	2.799		1002424	25	>100:1	3.08 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.828	2.827	1/0	19754392	21	>100:1	Target = 2.97		18840	20299		
377 > 85	45	2.828	2.827		6850495	19	>100:1	2.88 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.169	3.169	1/0	2590841	24	>100:1	Target = 3.08		19040	18606		
449 > 99	45	3.169	3.169		858330	24	>100:1	3.01 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.136	3.135	1	89950	25	>100:1			5000.00	4670.69	86	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.136	3.135	1/0	722713	25	>100:1	Target = 1.80		18960	19947		
427 > 81	64	3.136	3.135		380946	23	>100:1	1.89 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.162	3.169	0	535572	23	>100:1			1000.00	904.89	81.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.162	3.169	0/0	10485888	24	>100:1	Target = 2.87		20000	19205		
413 > 169	53	3.162	3.169		3816512	25	>100:1	2.74 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.537	3.545	0	145625	19	>100:1			1000.00	971.29	94.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.545	3.545	1/1	3340366	65	>100:1	Target = 3.84	0.26	18560	19357		M
499 > 99	54	3.545	3.545		918527	39	>100:1	3.63 (1.92-5.76)	0.12				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.751	3.750	1/1	9237909	22	>100:1			18640	18844		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.883	3.891	0/0	2041151	21	>100:1	Target = 3.07		19200	18316		
549 > 99	54	3.891	3.891		725525	20	>100:1	2.81 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.188	4.198	0/0	1951749	17	>100:1	Target = 3.03		19280	18468		
599 > 99	54	4.188	4.198		745570	19	>100:1	2.61 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.358	4.357	1/1	7819762	17	>100:1			18840	18908		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.697	4.704	0/0	2271201	19	>100:1	Target = 3.33		19360	19427		
699 > 99	54	4.697	4.704		731085	19	>100:1	3.10 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	726828	21	>100:1			1000.00	967.86	91.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.545	3.545	1/0	14144518	21	>100:1	Target = 6.16		20000	19460		
463 > 169	56	3.545	3.545		2265972	21	>100:1	6.24 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.866	3.866	1	286198	20	>100:1			1000.00	924.52	86.6	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.866	3.866	1/0	5864519	20	>100:1			20000	20794		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	92635	20				5000.00	4993.76	99.3	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.891	3.891	1/0	679202	19	>100:1	Target = 1.95		19160	18531		
527 > 81	65	3.891	3.891		362505	20	>100:1	1.87 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.492	4.492	1/0	755148	17		Target = 3.14		19280	17638		
627 > 80	65	4.492	4.492		230501	16		3.27 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.899	3.899	1	638714	19	>100:1			1000.00	962.89	91.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.899	3.899	1/0	11882751	20	>100:1	Target = 15.94		20000	18934		
513 > 169	51	3.899	3.899		898257	20	>100:1	13.22 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.056	4.056	1	733711	20	49:1			5000.00	5111.57	96.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.056	4.065	0/-1	2232283	33	>100:1	Target = 1.33	0.11	20000	19804		
570 > 483	58	4.056	4.065		1659506	33	>100:1	1.34 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.207	4.217	0	556076	19	>100:1			5000.00	4186.86	75.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/1	2255329	33	>100:1	Target = 1.58	0.14	20000	20369		
584 > 526	60	4.218	4.217		1423459	33	>100:1	1.58 (0.79-2.37)	0.25				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.207	4.217	0	591898	17	>100:1			1000.00	936.44	87.2	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.207	4.217	0/0	10456451	17	>100:1	Target = 15.50		20000	18796		
563 > 169	52	4.207	4.217		772432	17	>100:1	13.53 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.298	1	110386	16	>100:1			1000.00	1020.13	94.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.308	1/0	1976969	15	>100:1			20000	19061		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.319	4.318	1	52621	15	>100:1			1000.00	994.41	95.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.318	1/0	1153715	16	>100:1	Target = 1.12		20000	19434		
512 > 219	57	4.319	4.318		1104600	15	>100:1	1.04 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.465	0	129932	18	>100:1			1000.00	1036.18	107	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.474	1/1	2138227	17	>100:1			20000	18497		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	1	573941	16	>100:1			1000.00	948.17	88.4	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.483	4.492	0/-1	10629213	18	>100:1	Target = 10.85		20000	18288		
613 > 169	38	4.483	4.492		1032339	17	>100:1	10.29 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.725	4.731	0/-1	10906551	20	>100:1	Target = 8.37		20000	19294		
663 > 169	38	4.725	4.731		1321952	19	>100:1	8.25 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	49215	16	>100:1			1000.00	1002.45	95.5	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.492	1/0	1041046	16	>100:1	Target = 1.03		20000	19362		
526 > 219	59	4.492	4.492		1036700	19	>100:1	1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.940	4.948	0	837427	19	>100:1			1000.00	994.05	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.948	4.948	1/1	13577068	21	>100:1	Target = 12.11		20000	18712		
713 > 169	42	4.948	4.948		1187683	21	>100:1	11.43 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.334	5.334	1	886840	19	>100:1			1000.00	978.67	97.1	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.334	5.334	1/0	10474146	19	>100:1	Target = 11.48		20000	18076		
813 > 269	40	5.334	5.334		976974	19	>100:1	10.72 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.688	5.689	0/-1	15583360	26	>100:1	Target = 13.88		20000	19850		
913 > 319	40	5.688	5.689		1159653	24	>100:1	13.43 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	655979	20	>100:1					90.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	724179	19	>100:1					96.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	567967	24	>100:1					88.2	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.693	1.696	0	622072	23	>100:1					93.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.545	3.545	1	162431	21	>100:1					100	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d

Injection Date: 17-Dec-2020 13:57:55

Inst. ID: LCMSMS02

Client ID:

Lab ID:

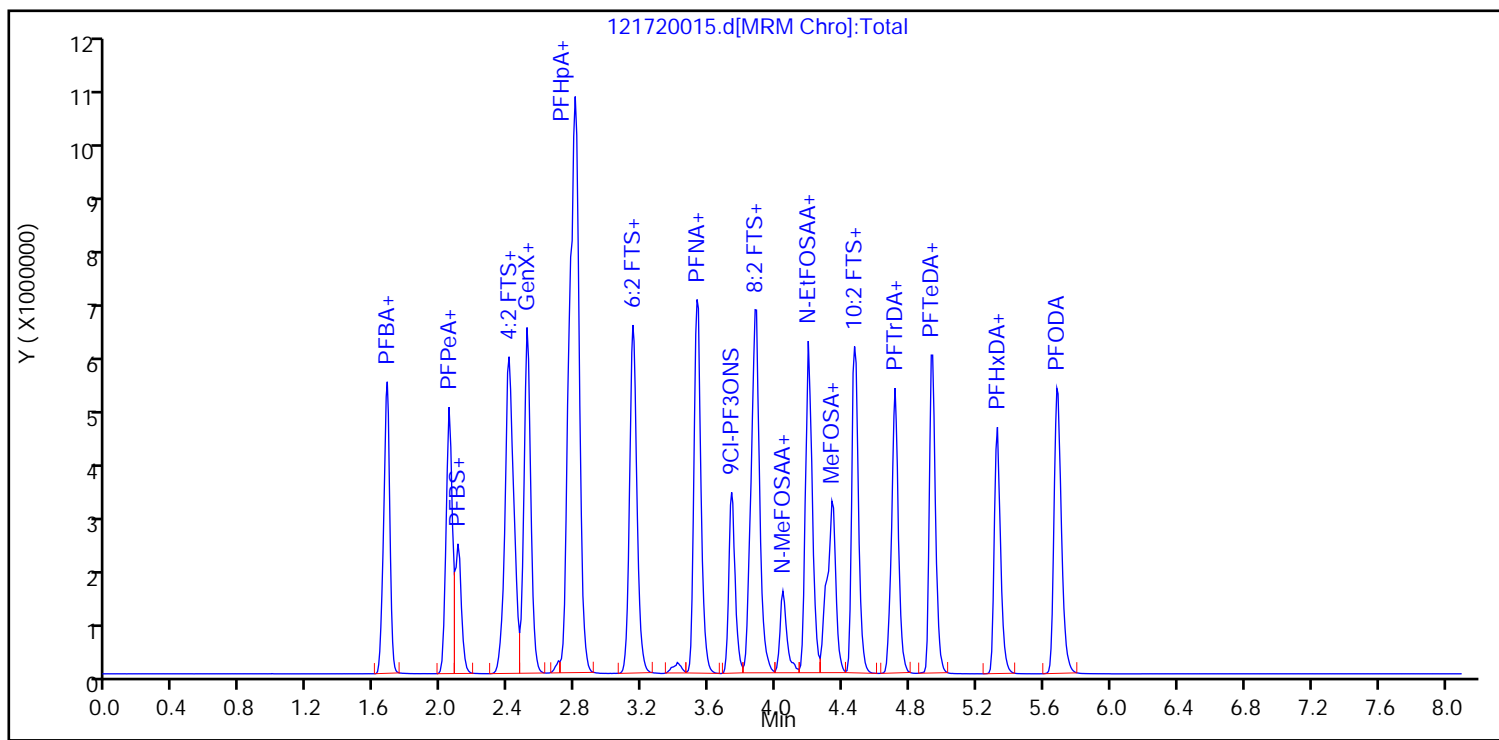
ICAL 20000\_SVLC-1228

Sample Info: ICAL 20000\_SVLC-1228

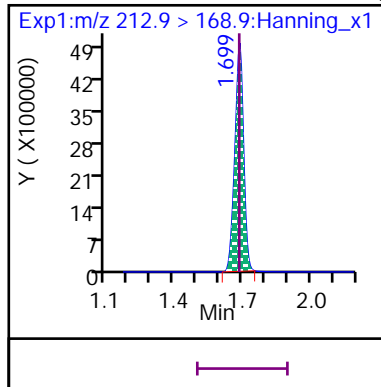
Dil. Factor: 1

Operator:

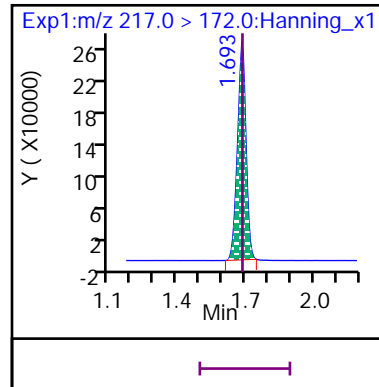
Stephen E. Somerville



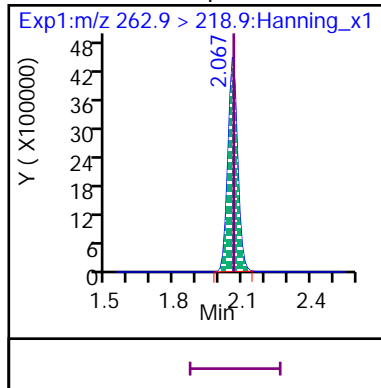
8 Perfluoro-n-butanoic acid (PFBA)



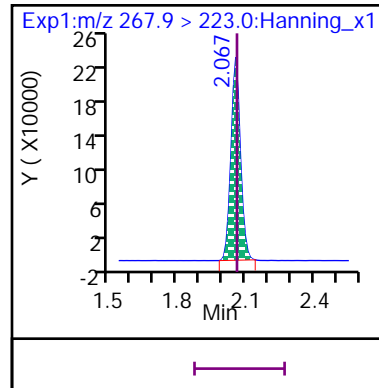
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

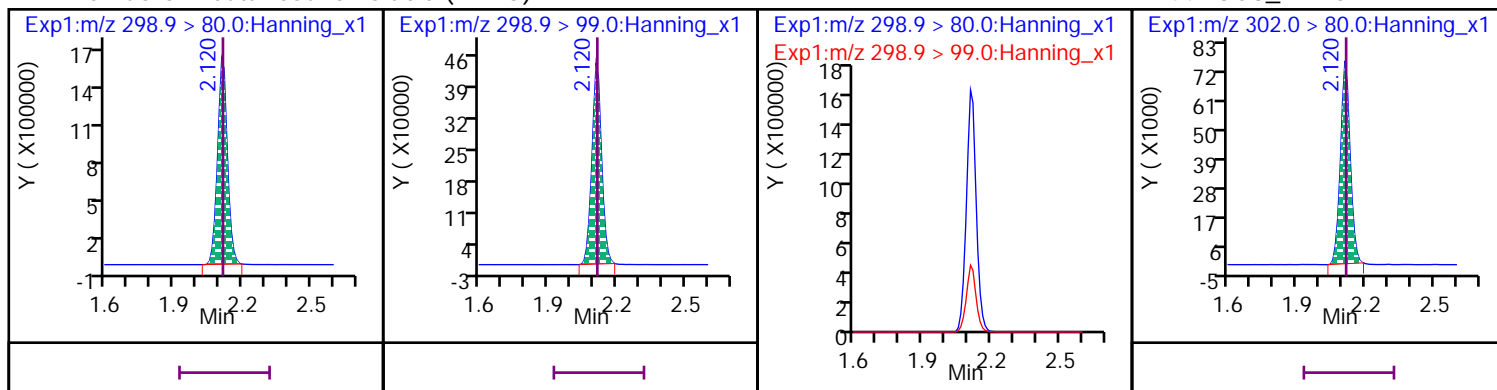


D 50 13C5\_PFPeA



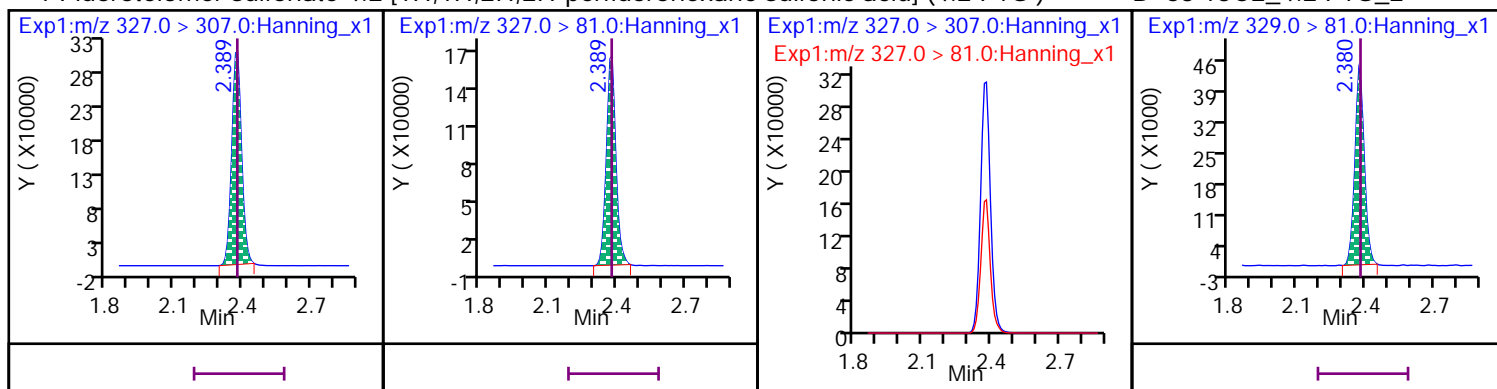
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



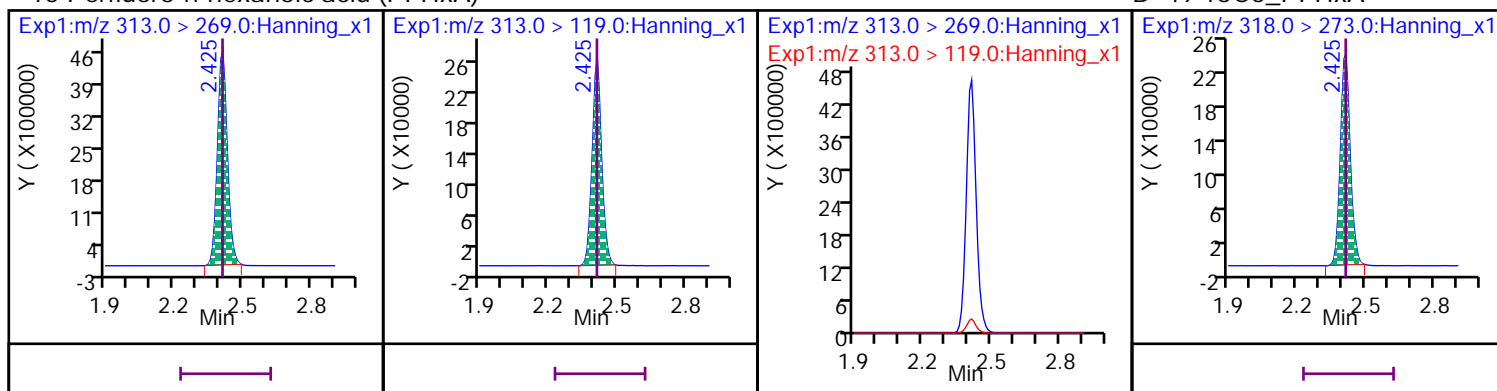
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



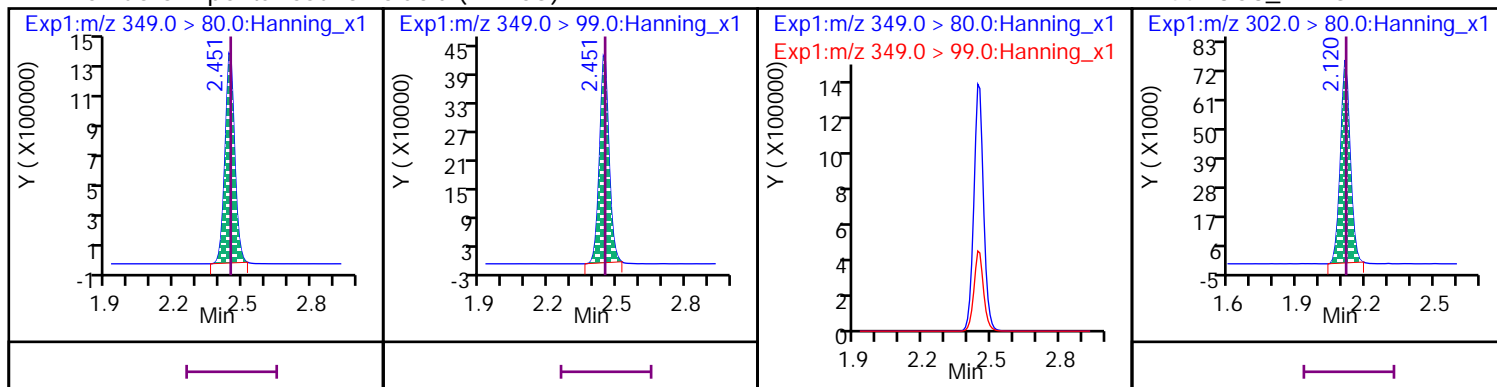
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



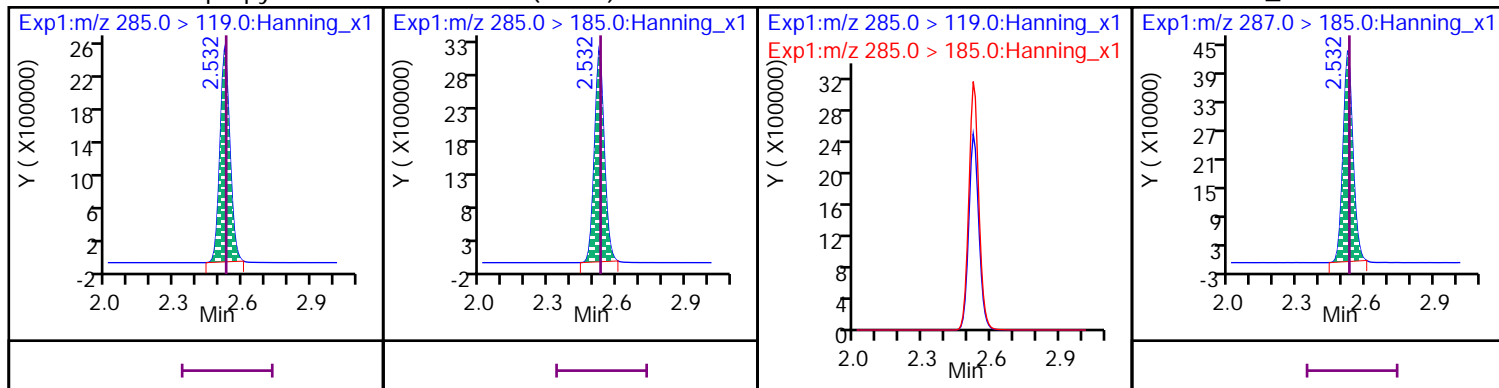
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



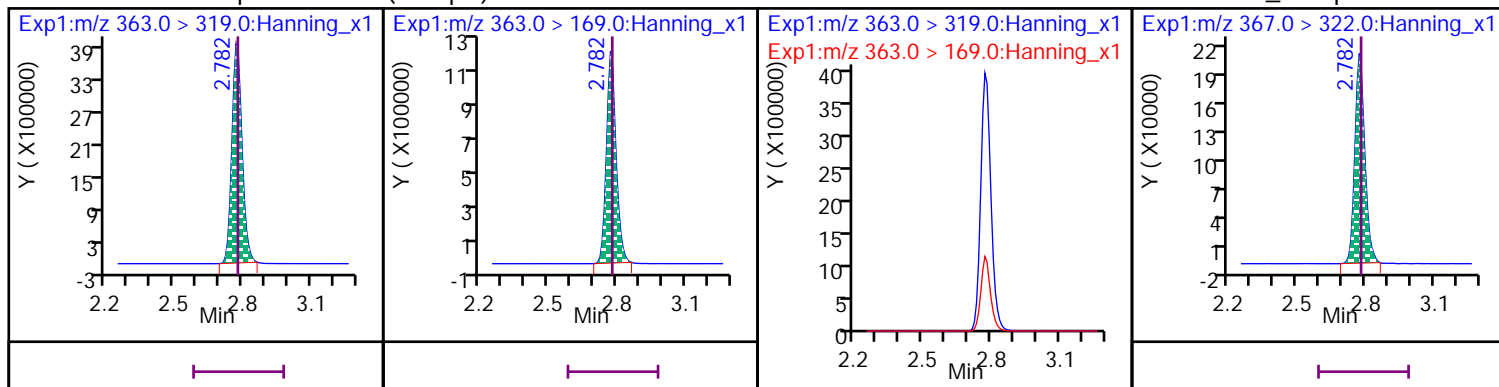
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



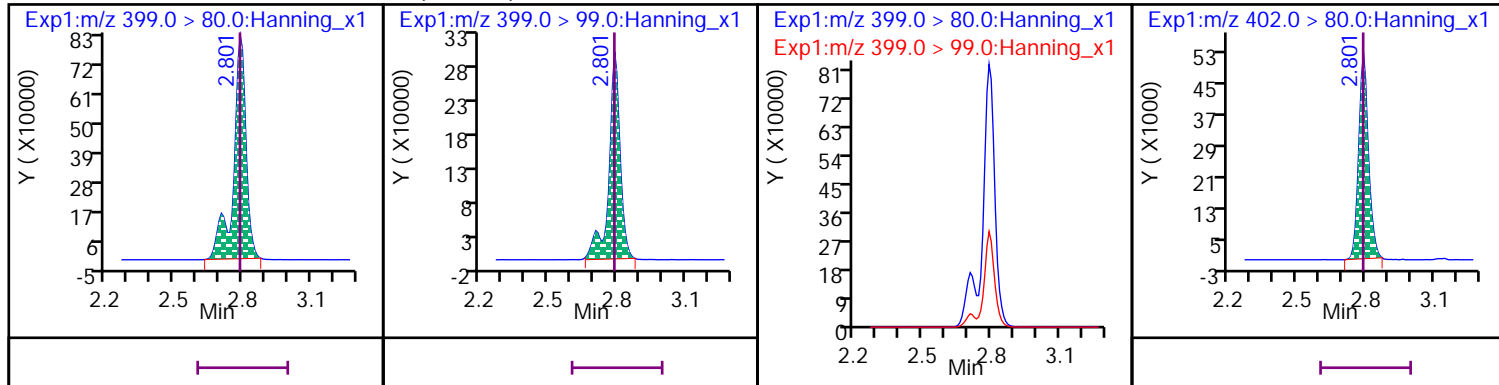
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



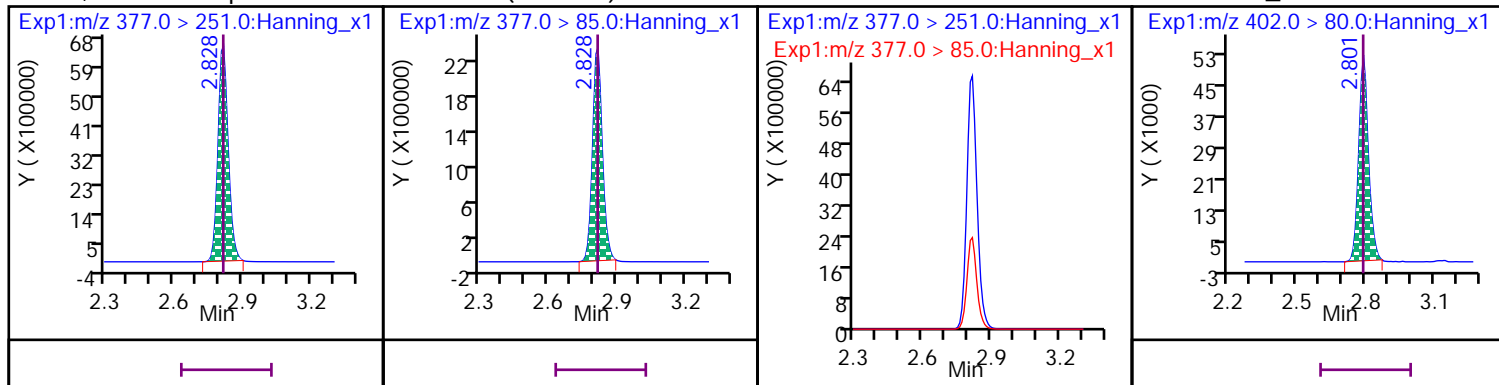
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

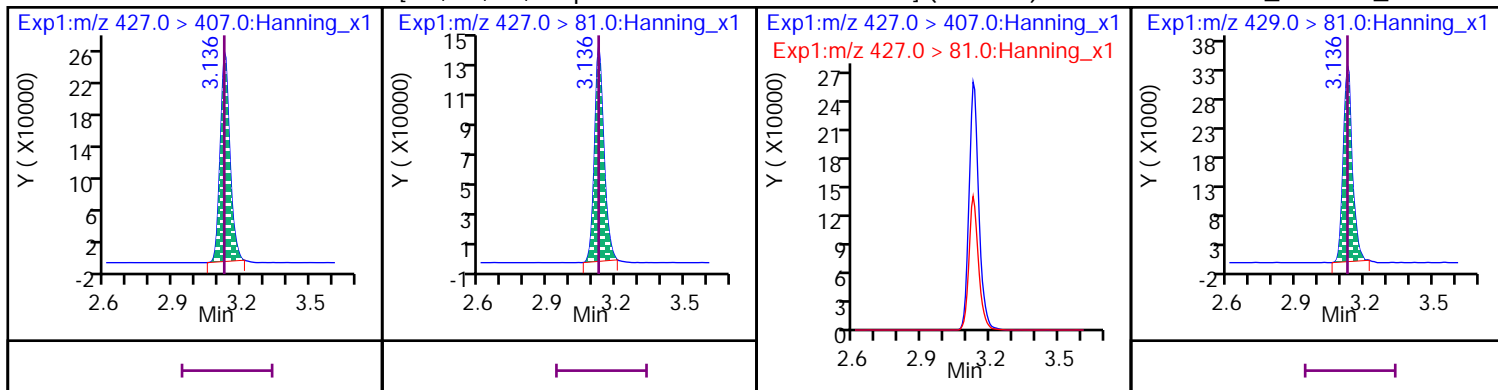
D 45 13C3\_PFHxS





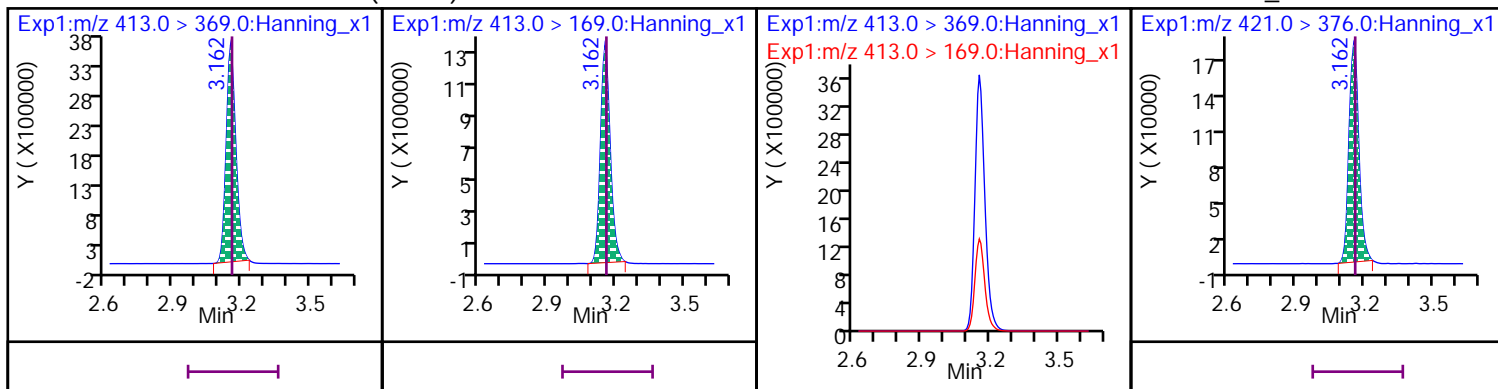
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



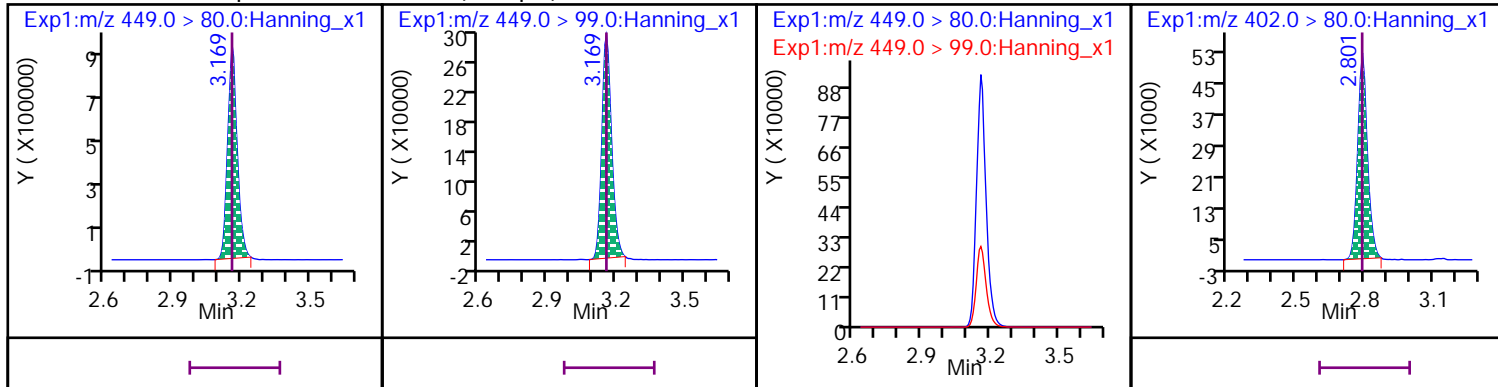
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



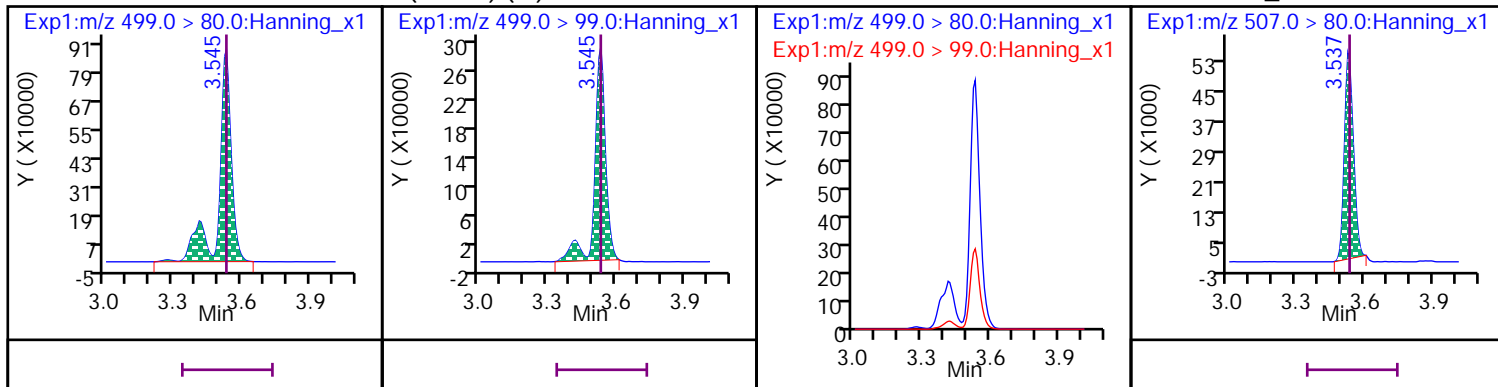
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



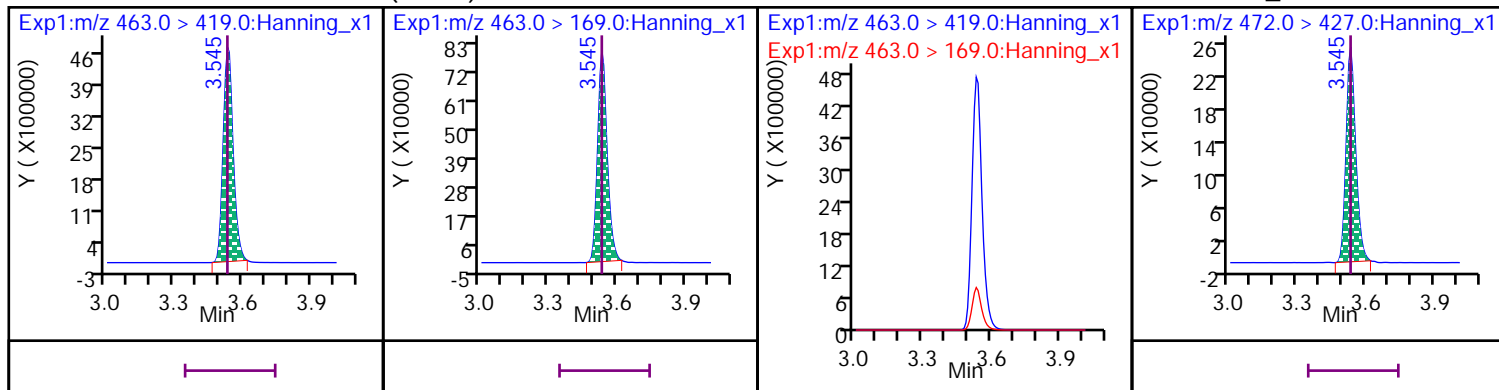
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



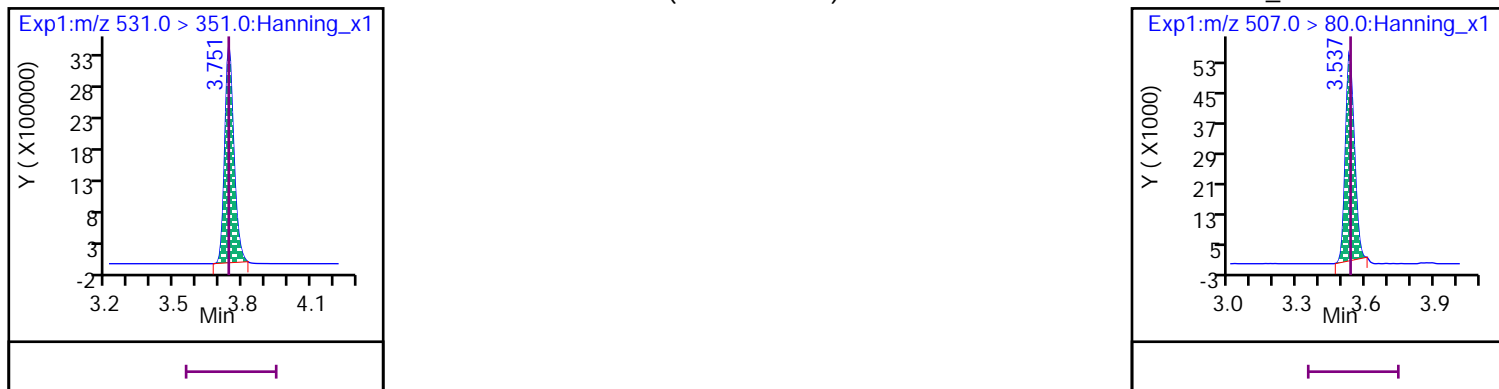
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



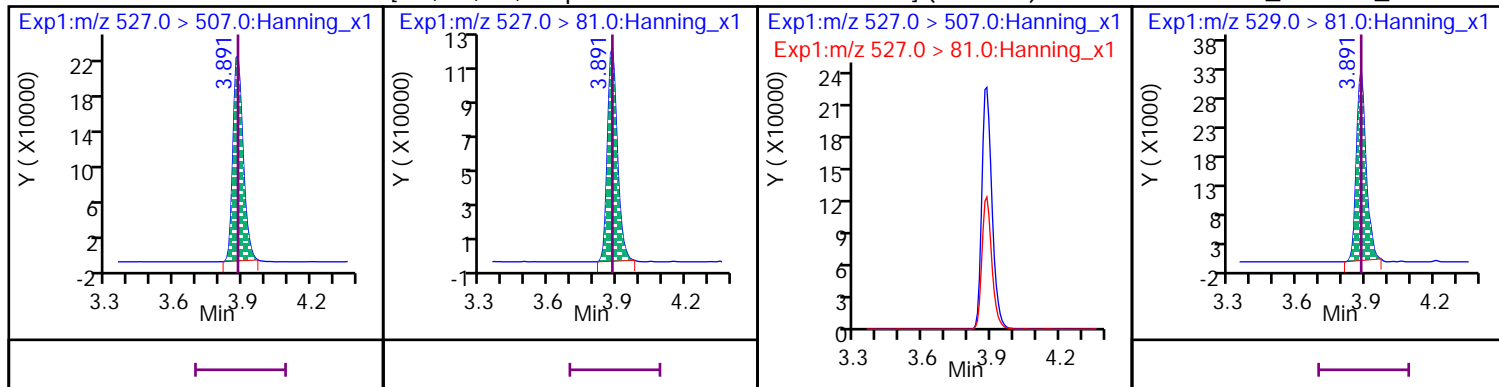
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



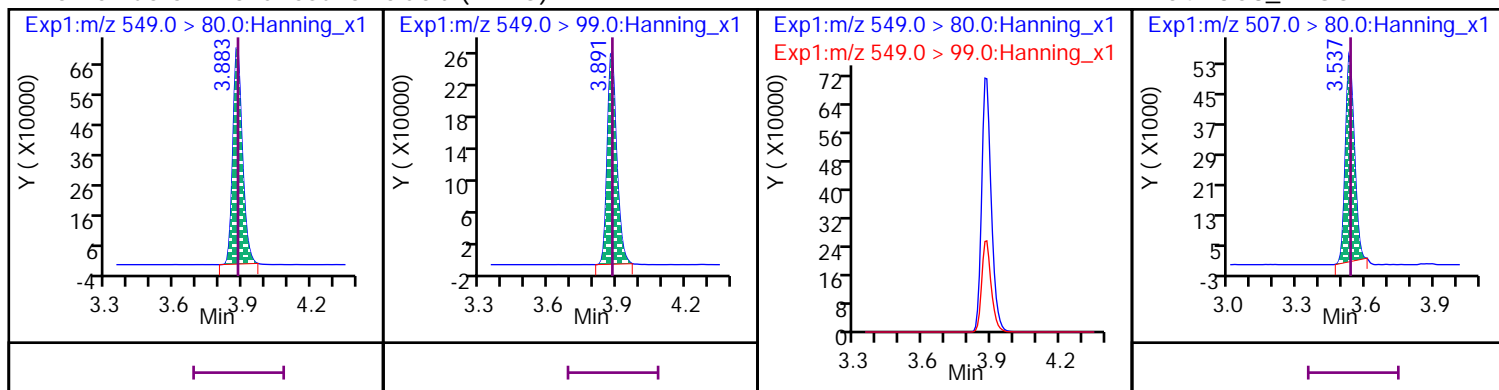
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



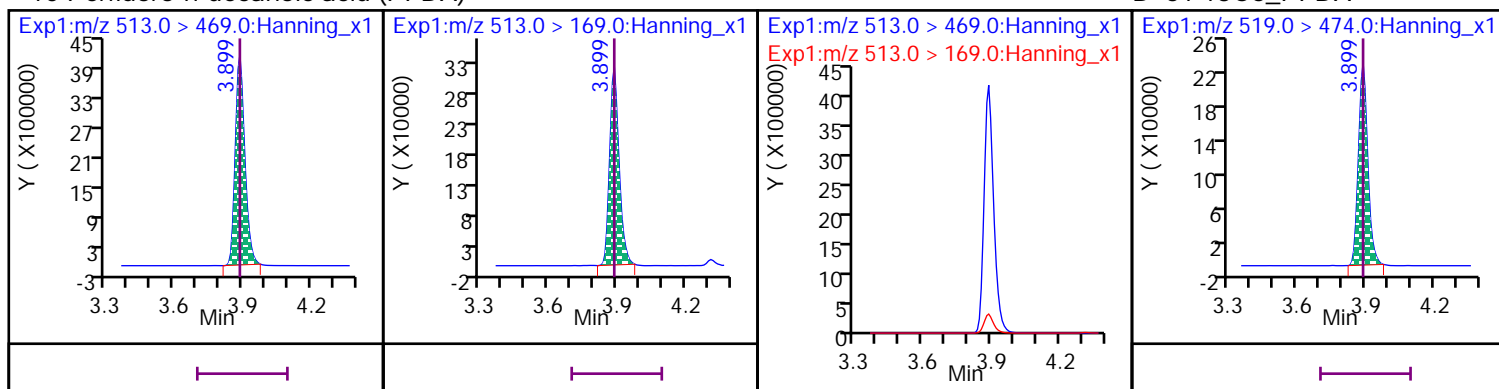
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



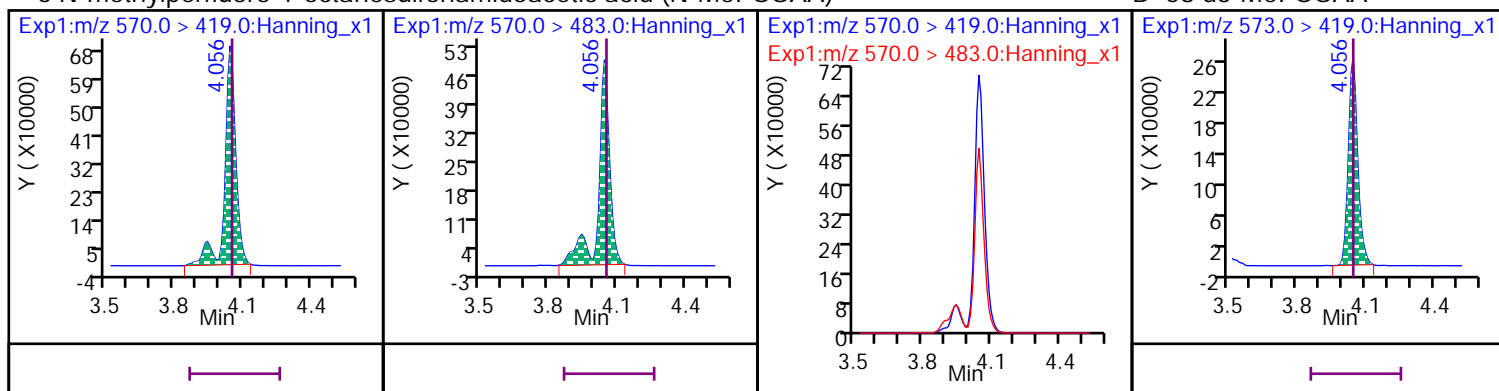
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



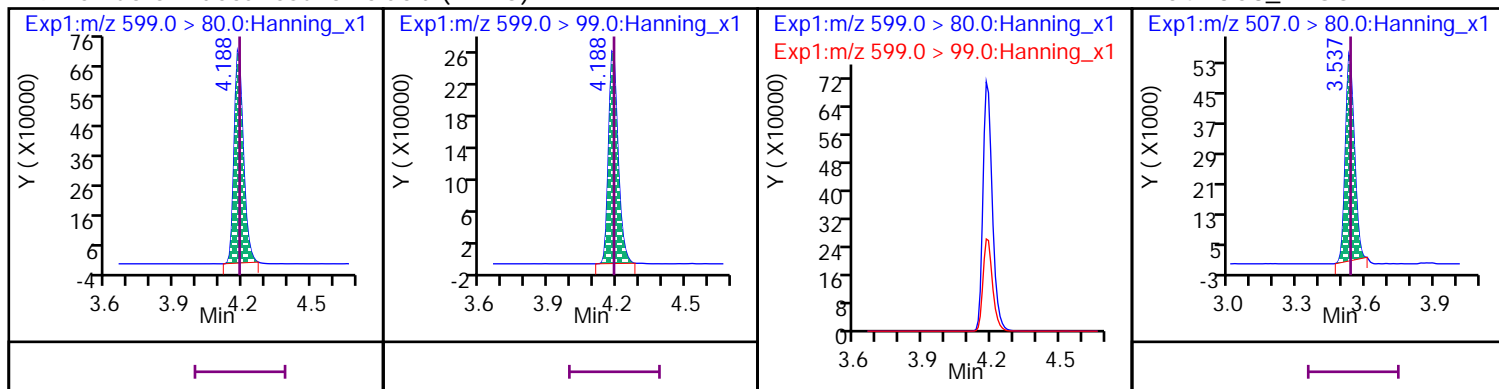
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



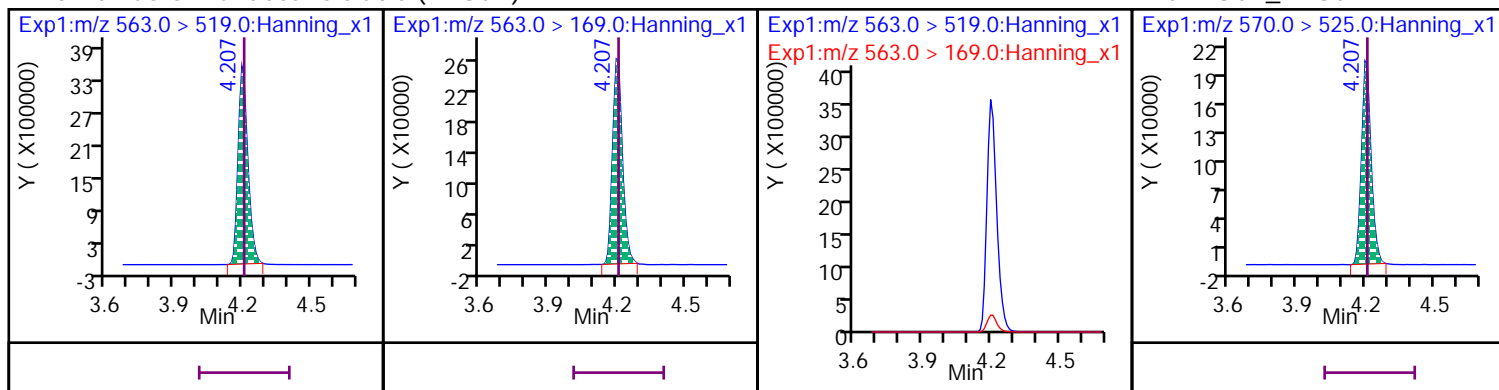
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



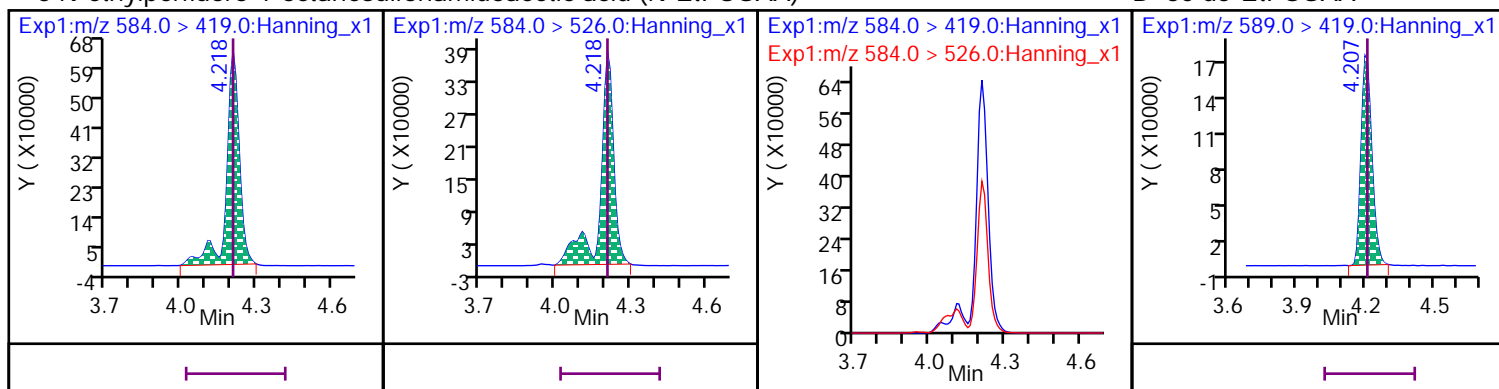
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



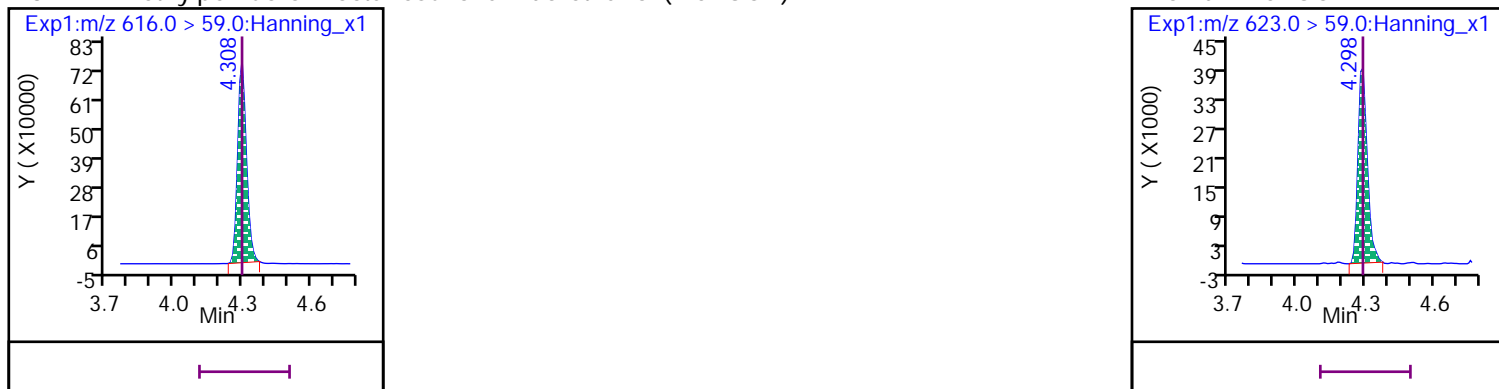
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



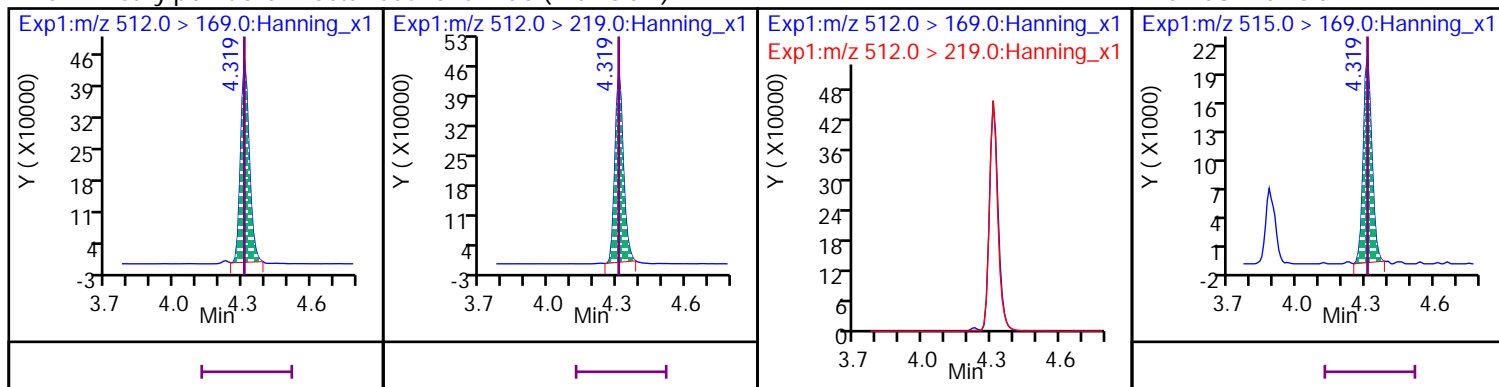
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

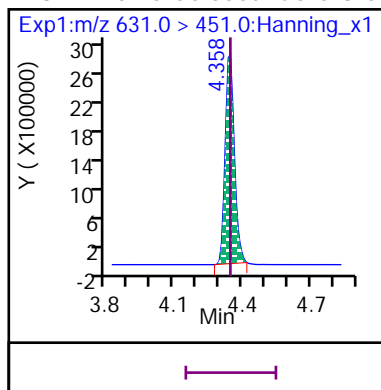


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

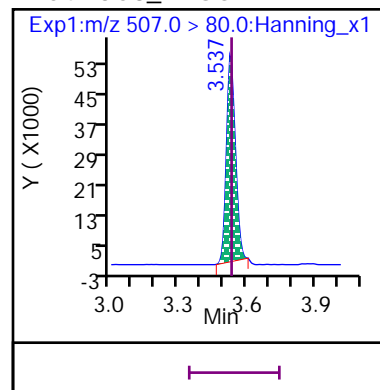
D 57 d3-MeFOSA



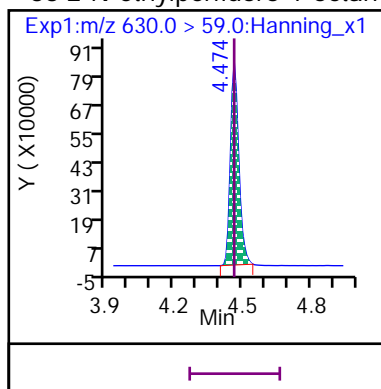
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



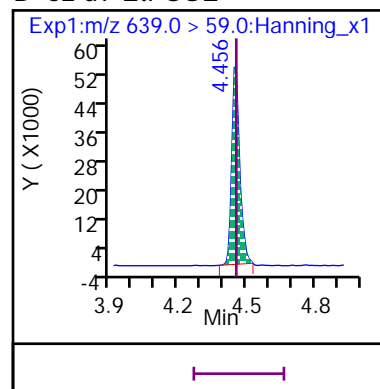
D 54 13C8\_PFOS



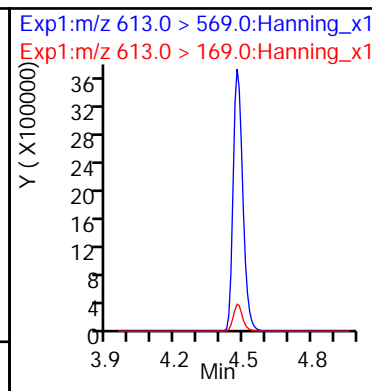
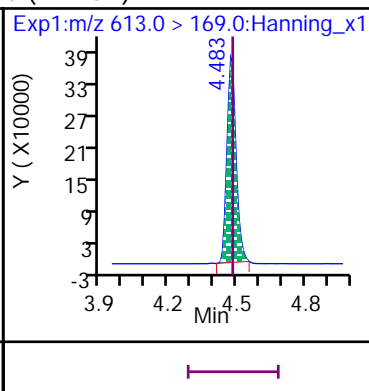
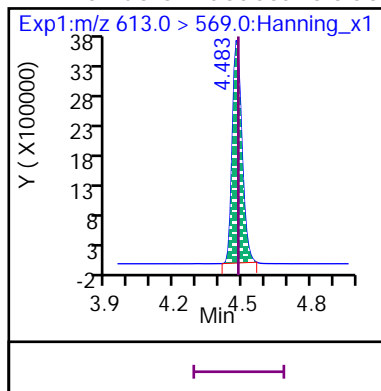
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



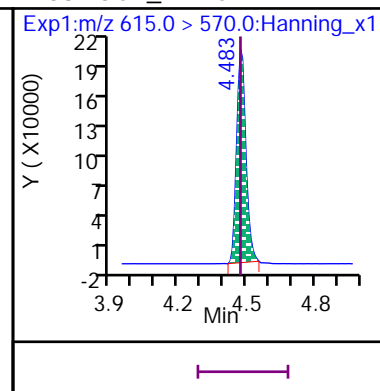
D 62 d9-EtFOSE



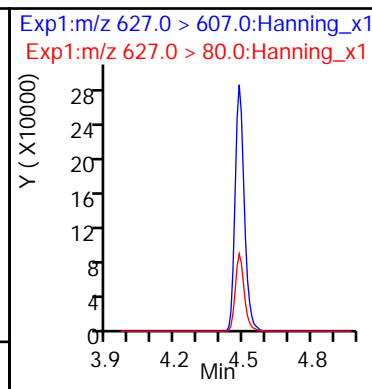
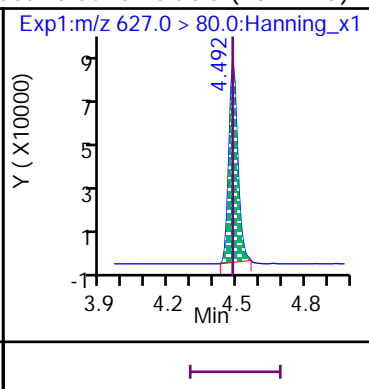
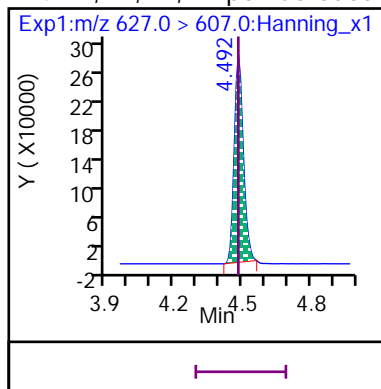
11 Perfluoro-n-dodecanoic acid (PFDoA)



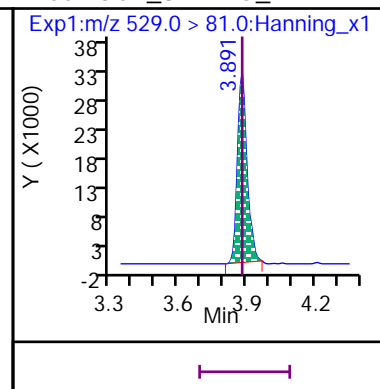
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

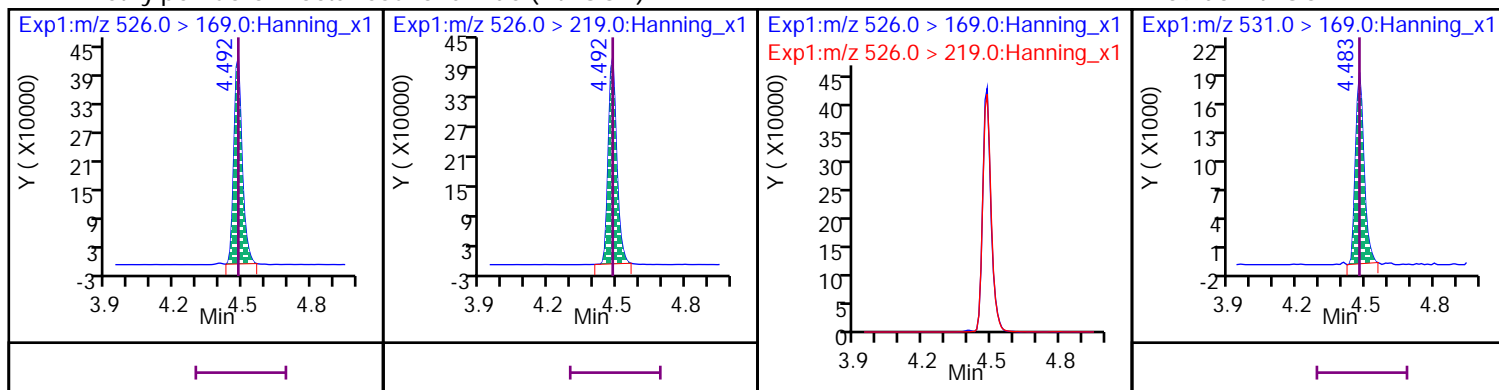


D 65 13C2\_8:2 FTS\_2



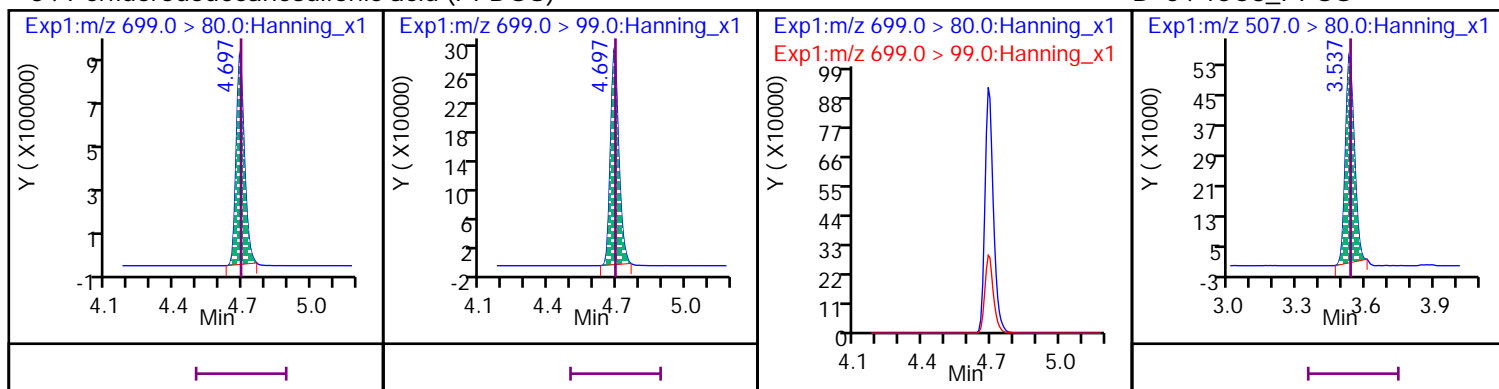
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



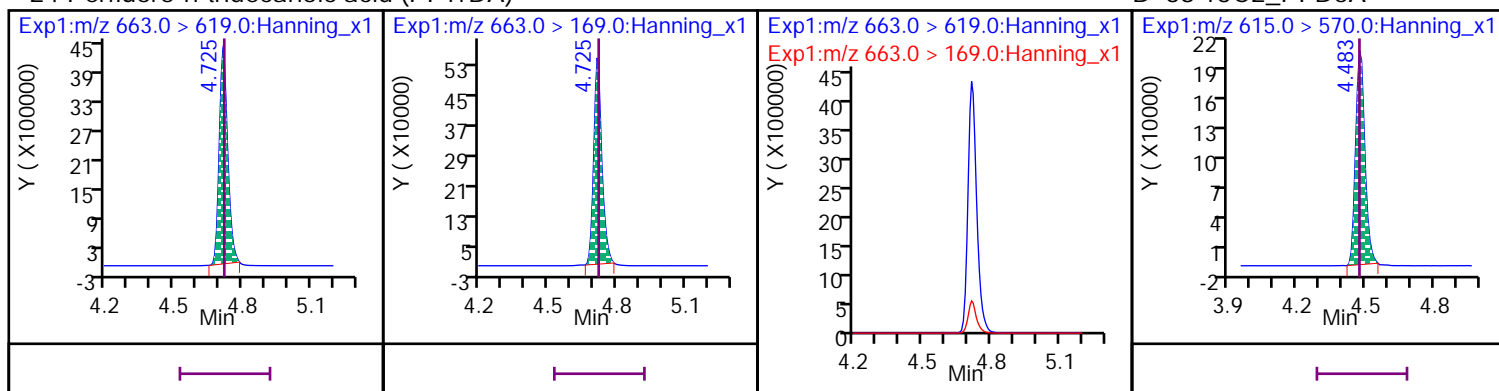
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



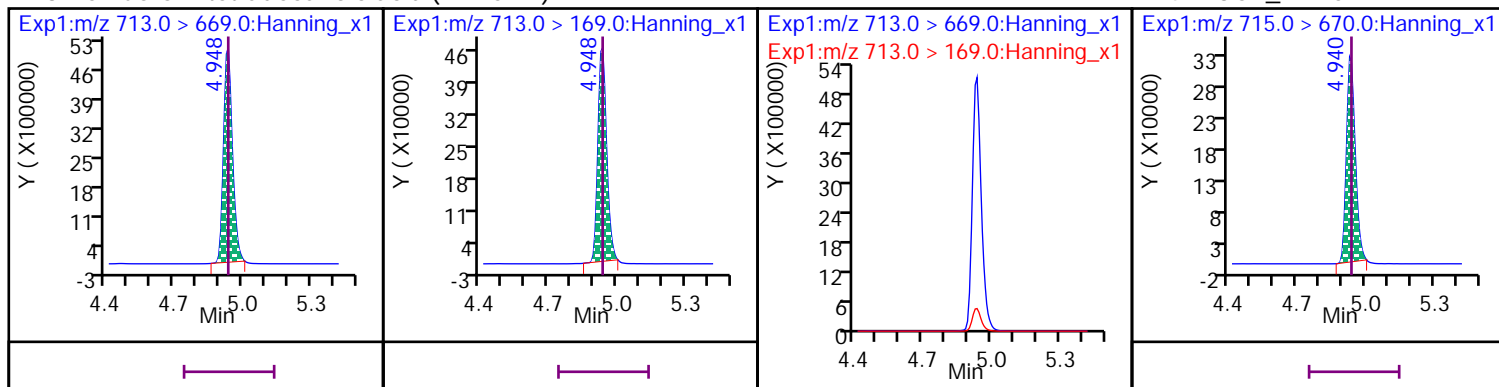
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



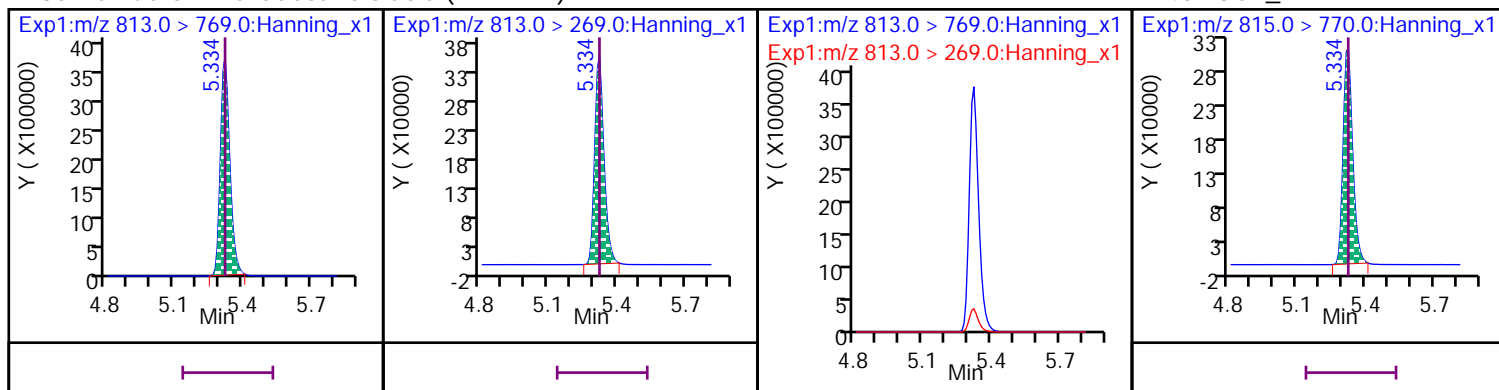
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



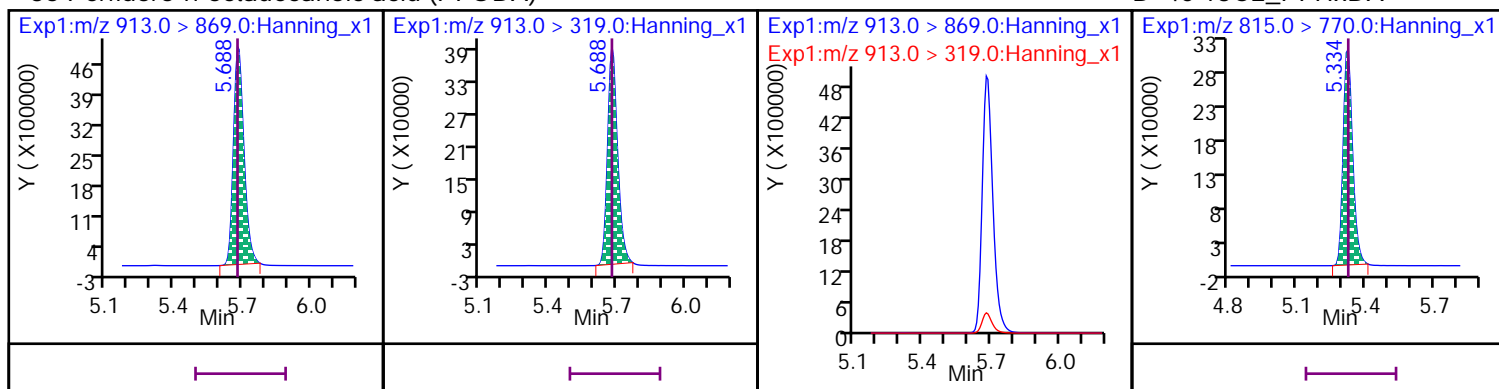
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

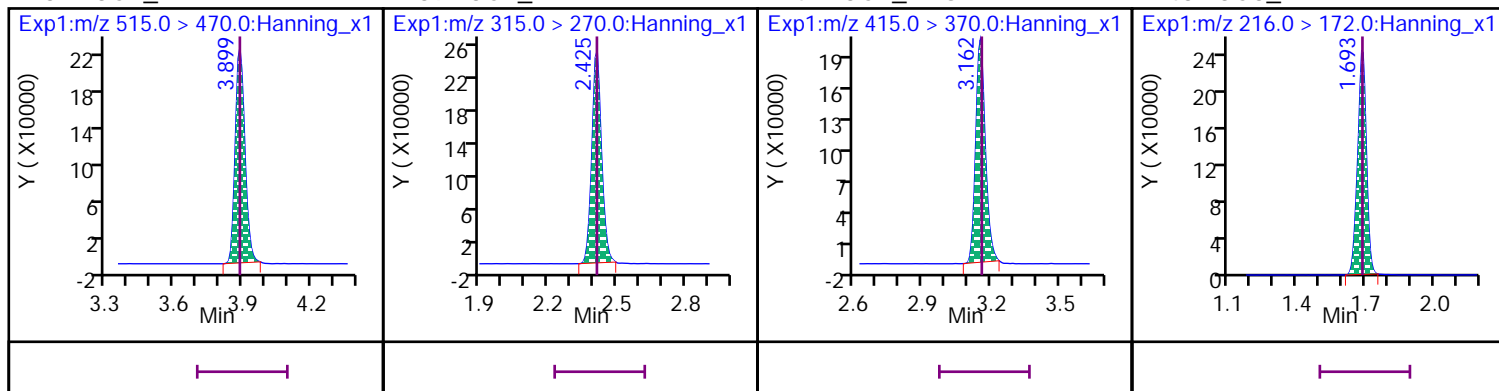


\* 37 13C2\_PFDA

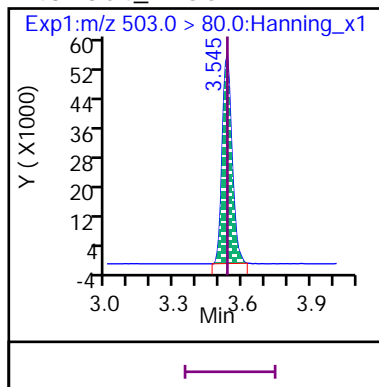
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720015.d

Injection Date: 17-Dec-2020 13:57:55

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICAL 20000\_SVLC-1228

Sample Info: ICAL 20000\_SVLC-1228

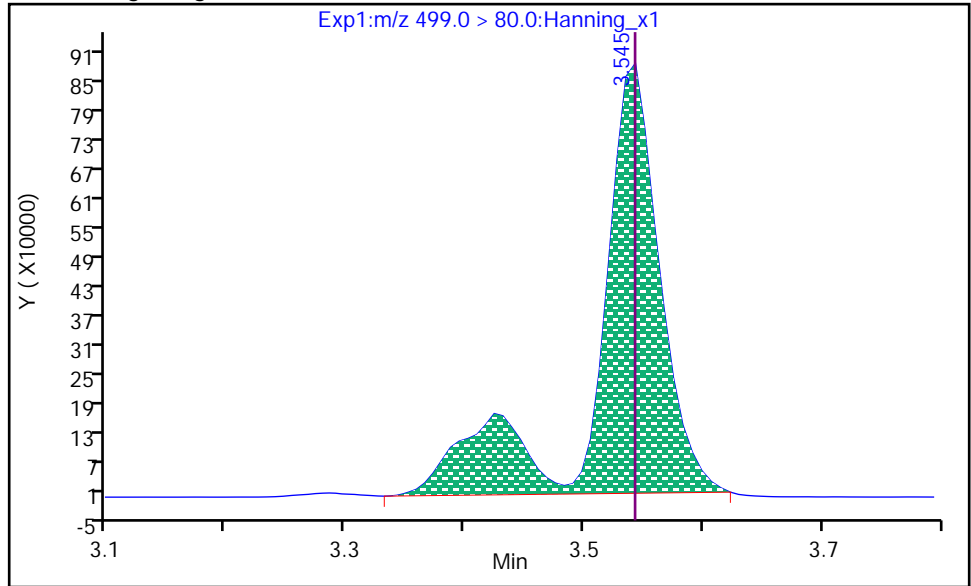
Dil. Factor: 1

Operator: Stephen E. Somerville

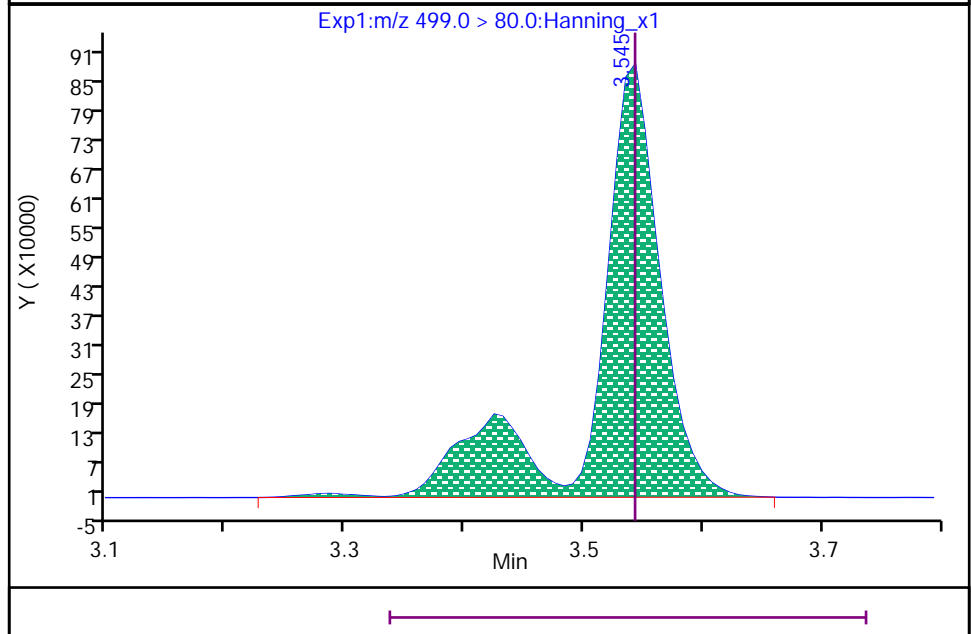
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.545  
Area: 3213533  
Amount: 18696  
Amount Units: ng/L



RT: 3.545  
Area: 3340366  
Amount: 19357  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:16:38

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d  
Injection Date: 17-Dec-2020 14:08:35 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 11  
Lab Sample ID: IBLK A Lab Prep. Batch:  
Sample Info: IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA</b>	CAS: SESI-0111												
217 > 172		1.692	1.696	0	720620	22	>100:1			1001.00	1039.03	98	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>	CAS: 375-22-4												U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>	CAS: SESI-0112												
267.9 > 223		2.067	2.072	0	739146	17	>100:1			1001.00	1074.52	102	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>	CAS: 2706-90-3												U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBS</b>	CAS: SESI-0116												
302 > 80		2.120	2.125	0	251085	16	>100:1			1001.00	1090.58	101	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS)</b>	CAS: 375-73-5												U
298.9 > 80	44		2.125		ND								
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS)</b>	CAS: 2706-91-4												U
349 > 80	44		2.459		ND								
<b>D 63 13C2_4:2 FTS_2</b>	CAS: SESI-0104												
329 > 81		2.380	2.388	0	122855	20	>100:1			5005.00	5074.91	97.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)</b>	CAS: 757124-72-4												U
327 > 307	63		2.388		ND								
<b>D 49 13C5_PFHxA</b>	CAS: SESI-0113												
318 > 273		2.425	2.423	1	759718	19	>100:1			1001.00	1030.73	98.1	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>	CAS: 307-24-4												U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>	CAS: SESI-0121												
287 > 185		2.532	2.539	0	1347116	18	>100:1			5005.00	5057.62	95.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>	CAS: 13252-13-6												U
285 > 119	66		2.539		ND								
<b>D 47 13C4_PFHpA</b>	CAS: SESI-0114												
367 > 322		2.782	2.790	0	642310	20	>100:1			1001.00	1058.79	104	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>	CAS: 375-85-9												U
363 > 319	47		2.790		ND								
<b>D 45 13C3_PFHxS</b>	CAS: SESI-0096												
402 > 80		2.801	2.799	1	187413	21				1001.00	1094.52	105	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>	CAS: 355-46-4												U
399 > 80	45		2.799		ND								
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)</b>	CAS: 919005-14-4												U
377 > 251	45		2.827		ND								
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS)</b>	CAS: 375-92-8												U
449 > 80	45		3.169		ND								
<b>D 64 13C2_6:2 FTS_2</b>	CAS: SESI-0105												
429 > 81		3.135	3.135	1	102859	25	>100:1			5005.00	5340.99	98.3	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)</b>	CAS: 27619-97-2												U
427 > 407	64		3.135		ND								

Data File: \\organel\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA</b>	<b>CAS: SESI-0097</b>												
421 > 376		3.162	3.169	0	631632	24	>100:1			1001.00	1067.19	96.4	
<b>20 Perfluoro-n-octanoic acid (PFOA)</b>	<b>CAS: 335-67-1</b>												
413 > 369	53		3.169		ND								U
<b>D 54 13C8_PFOS</b>	<b>CAS: SESI-0098</b>												
507 > 80		3.545	3.545	1	155998	19	>100:1			1001.00	1040.48	101	
<b>18 Perfluorooctanesulfonic acid (PFOS)</b>	<b>CAS: 1763-23-1</b>												
499 > 80	54		3.545		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)</b>	<b>CAS: 756426-58-1</b>												
531 > 351	54		3.750		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS)</b>	<b>CAS: 68259-12-1</b>												
549 > 80	54		3.891		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS)</b>	<b>CAS: 335-77-3</b>												
599 > 80	54		4.198		ND								U
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)</b>	<b>CAS: 763051-92-9</b>												
631 > 451	54	4.358	4.357	1/0	1406	20	15:1			3.1768	3.1768		
<b>34 Perfluorododecanesulfonic acid (PFDOS)</b>	<b>CAS: 79780-39-5</b>												
699 > 80	54		4.704		ND								U
<b>D 56 13C9_PFNA</b>	<b>CAS: SESI-0099</b>												
472 > 427		3.545	3.545	1	789130	21	>100:1			1001.00	1050.82	99.6	
<b>17 Perfluoro-n-nonanoic acid (PFNA)</b>	<b>CAS: 375-95-1</b>												
463 > 419	56		3.545		ND								U
<b>D 55 13C8_PFOA</b>	<b>CAS: SESI-0107</b>												
506 > 78		3.866	3.866	1	319134	18	>100:1			1001.00	1030.91	96.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA)</b>	<b>CAS: 754-91-6</b>												
498 > 78	55		3.866		ND								U
<b>D 65 13C2_8:2 FTS_2</b>	<b>CAS: SESI-0106</b>												
529 > 81		3.891	3.891	1	95879	19	>100:1			5005.00	5168.64	103	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)</b>	<b>CAS: 39108-34-4</b>												
527 > 507	65		3.891		ND								U
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)</b>	<b>CAS: 120226-60-0</b>												
627 > 607	65		4.492		ND								U
<b>D 51 13C6_PFDA</b>	<b>CAS: SESI-0115</b>												
519 > 474		3.899	3.899	1	704949	20	>100:1			1001.00	1062.74	101	
<b>10 Perfluoro-n-decanoic acid (PFDA)</b>	<b>CAS: 335-76-2</b>												
513 > 469	51		3.899		ND								U
<b>D 58 d3-MeFOSAA</b>	<b>CAS: SESI-0102</b>												
573 > 419		4.056	4.056	1	720944	18	>100:1			5005.00	5022.62	94.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)</b>	<b>CAS: 2355-31-9</b>												
570 > 419	58		4.065		ND								U
<b>D 60 d5-EtFOSAA</b>	<b>CAS: SESI-0110</b>												
589 > 419		4.207	4.217	0	727040	17	>100:1			5005.00	5474.09	98.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)</b>	<b>CAS: 2991-50-6</b>												
584 > 419	60		4.217		ND								U
<b>D 52 13C7_PFUdA</b>	<b>CAS: SESI-0117</b>												
570 > 525		4.207	4.217	0	644782	18	>100:1			1001.00	1020.10	95	
<b>25 Perfluoro-n-undecanoic acid (PFUdA)</b>	<b>CAS: 2058-94-8</b>												
563 > 519	52		4.217		ND								U
<b>D 61 d7-MeFOSE</b>	<b>CAS: SESI-0129</b>												
623 > 59		4.298	4.298	1	115262	20	>100:1			1001.00	1065.19	98.3	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)</b>	<b>CAS: 24448-09-7</b>												
616 > 59	61		4.308		ND								U
<b>D 57 d3-MeFOSA</b>	<b>CAS: SESI-0109</b>												
515 > 169		4.318	4.318	1	50845	15	86:1			1001.00	960.85	92.5	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)</b>	<b>CAS: 31506-32-8</b>												
512 > 169	57		4.318		ND								U
<b>D 62 d9-EtFOSE</b>	<b>CAS: SESI-0130</b>												
639 > 59		4.465	4.465	1	118730	17	>100:1			1001.00	946.84	97.4	

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62	4.474			ND								
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.483	4.483	1	680403	17	>100:1			1001.00	1124.04	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38	4.492			ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38	4.731			ND								
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.483	1	52282	16	>100:1			1001.00	1064.93	101	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.501	4.492	1/0	1080	11	12:1	Target = 1.08		18.927	18.927		
526 > 219	59	4.492	4.492		1693	22	19:1	0.63 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.948	4.948	1	871016	18	>100:1			1001.00	1033.92	98.2	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42	4.948			ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.335	5.334	1	914527	19	>100:1			1001.00	1009.23	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.335	5.334	1/0	7917	17	9.0:1	Target = 11.43		13.263	13.263		
813 > 269	40	5.343	5.334		837	19	8.6:1	9.45 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.696	5.689	1/0	5527	13	4.1:1	Target = 13.84		6.8340	6.8340		M
913 > 319	40	5.675	5.689		450	15	11:1	12.28 (6.92-20.76)					M
<b>* 37 13C2_PFDA</b>													
515 > 470		3.899	3.899	1	732833	19	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.423	1	830273	19	>100:1					110	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.169	0	628179	24	>100:1					97.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.692	1.696	0	681258	22	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.545	3.545	1	168271	23	>100:1					104	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

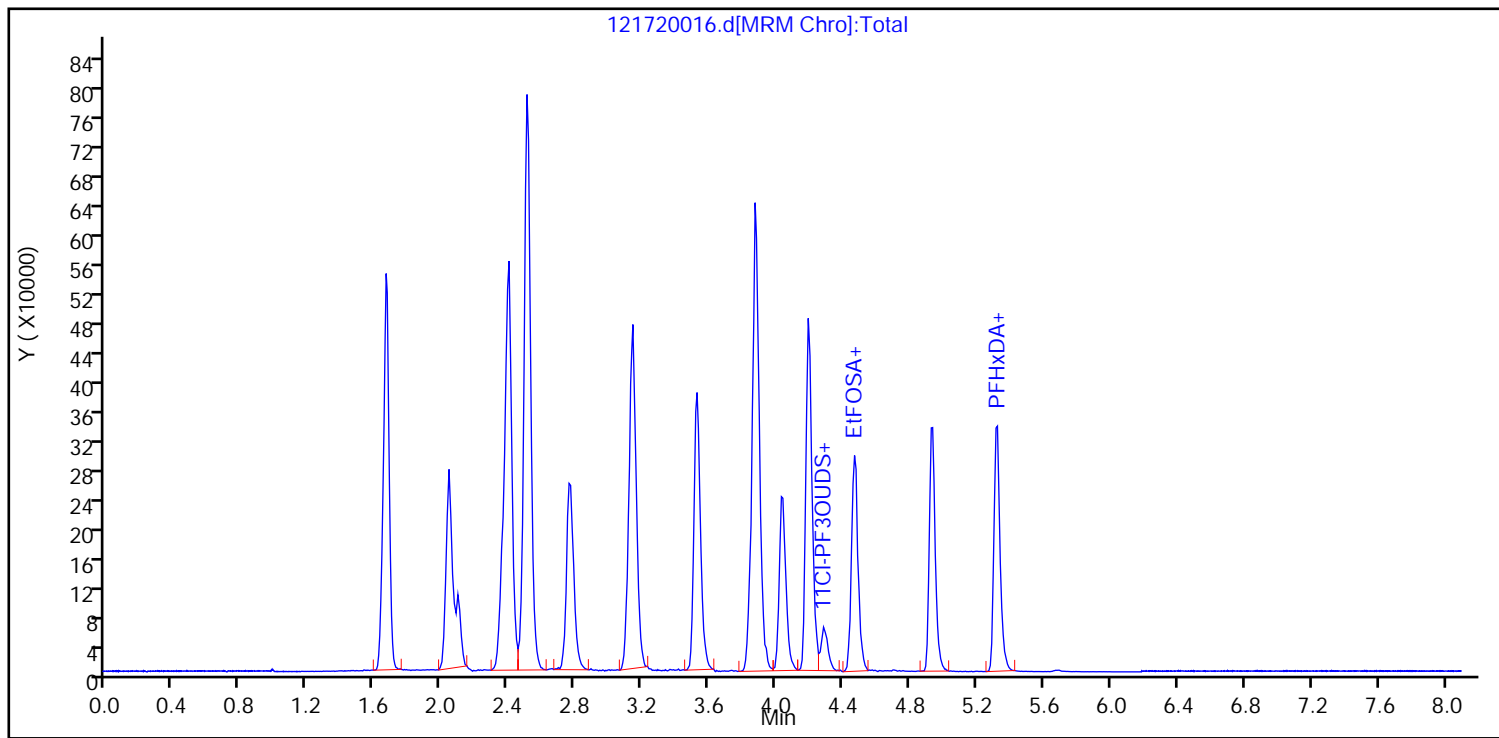
Client ID:

Lab ID: IBLK A

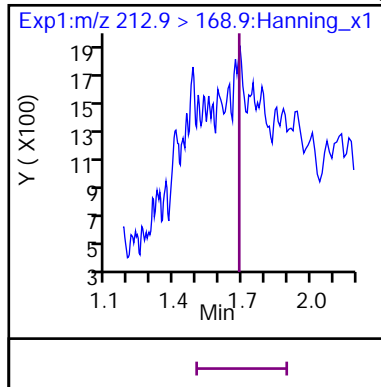
Sample Info: IBLK A

Dil. Factor: 1

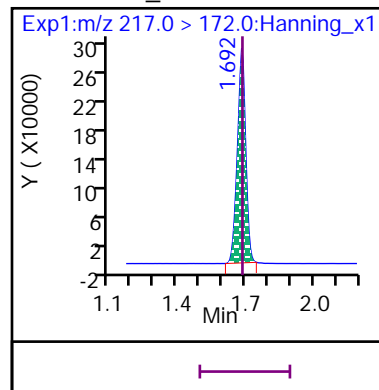
Operator: Stephen E. Somerville



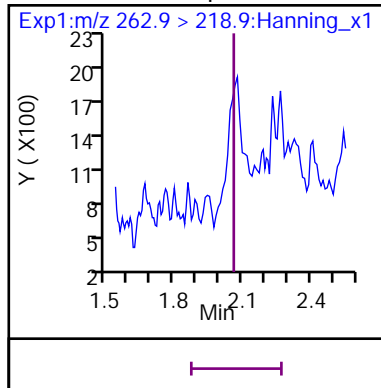
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



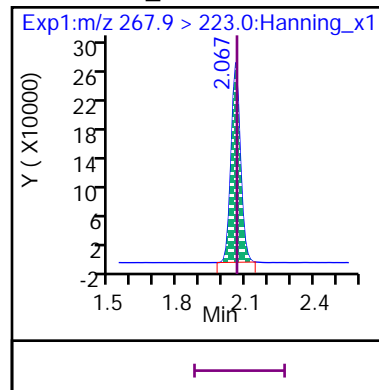
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

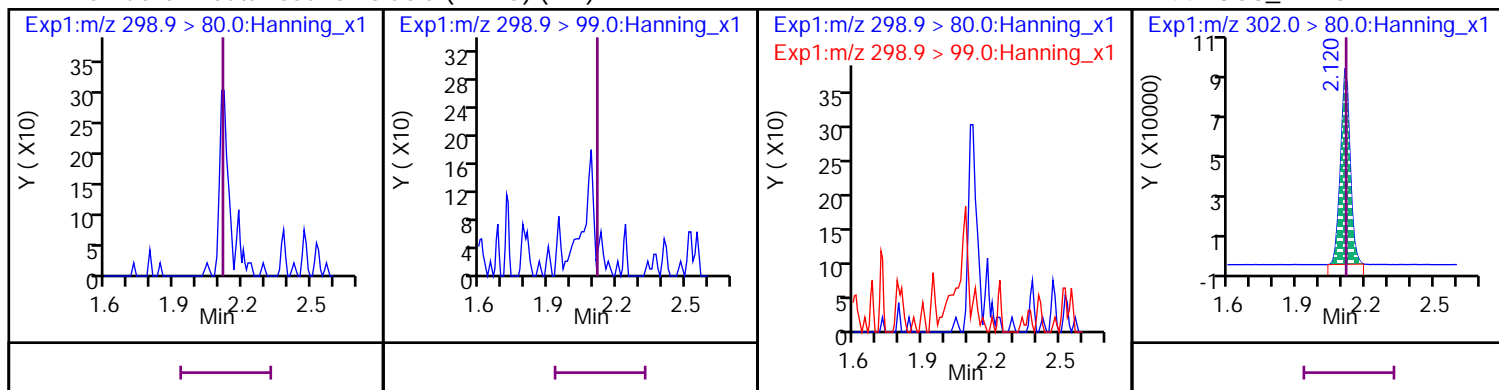


D 50 13C5\_PFPeA



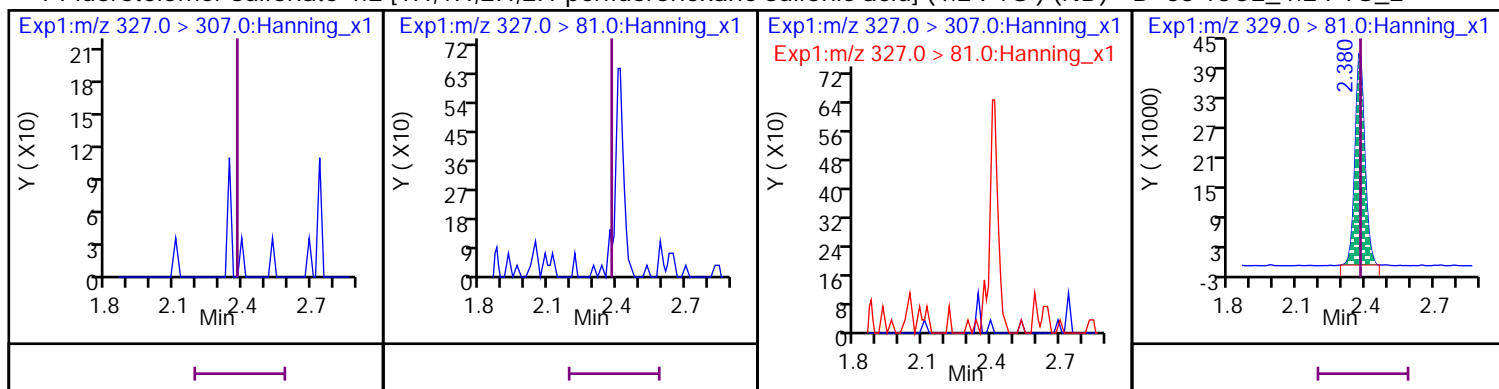
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



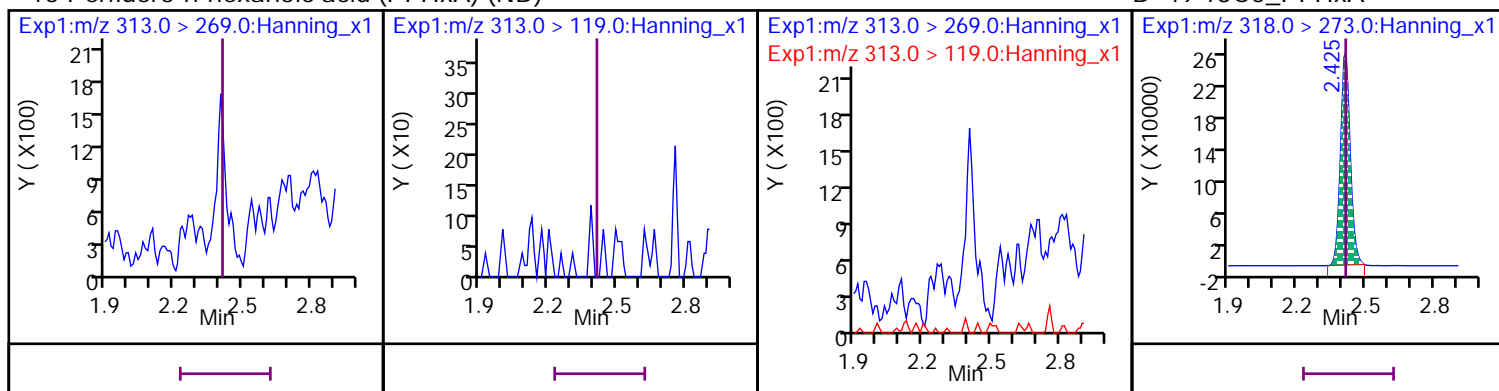
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



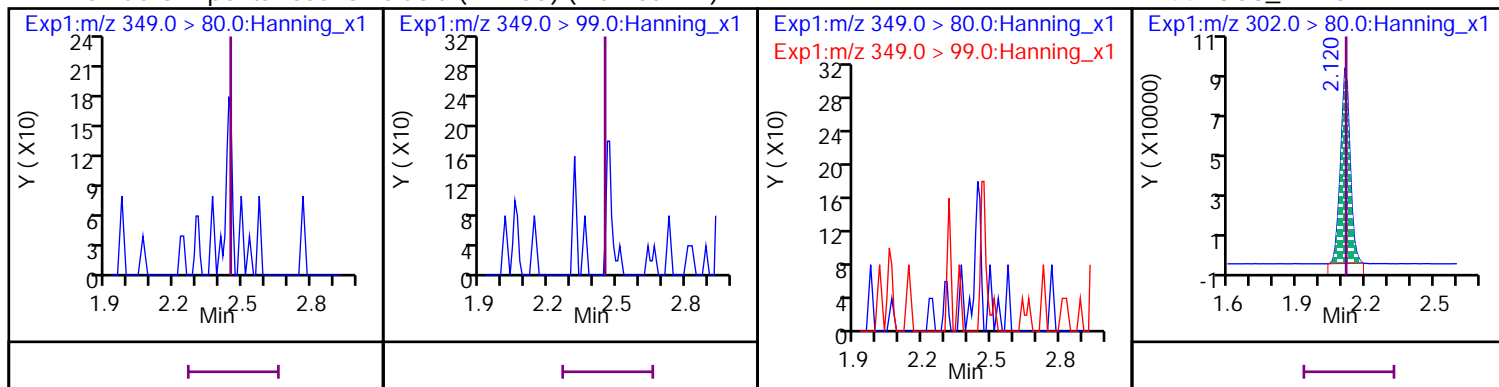
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



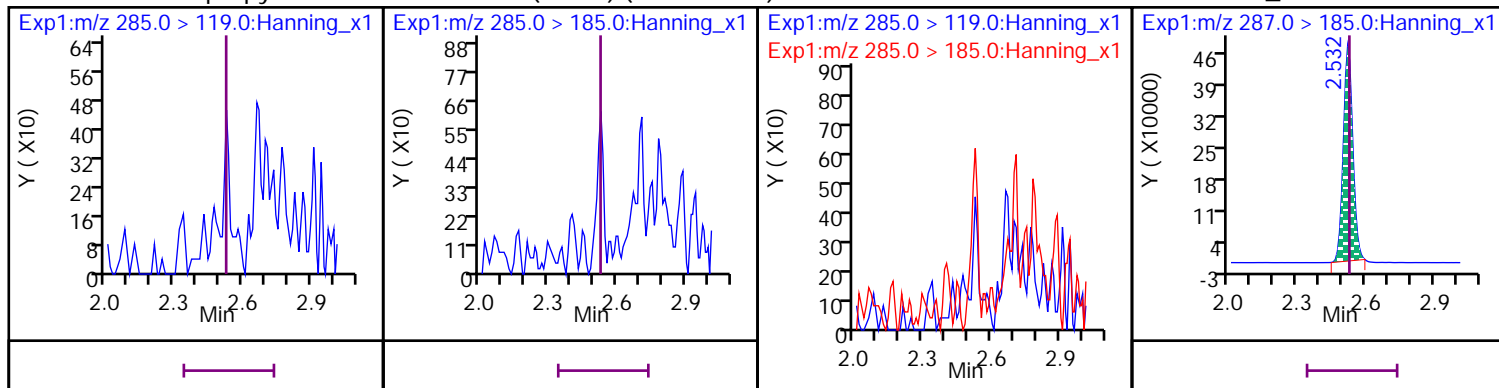
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (Marked ND)

D 44 13C3\_PFBS



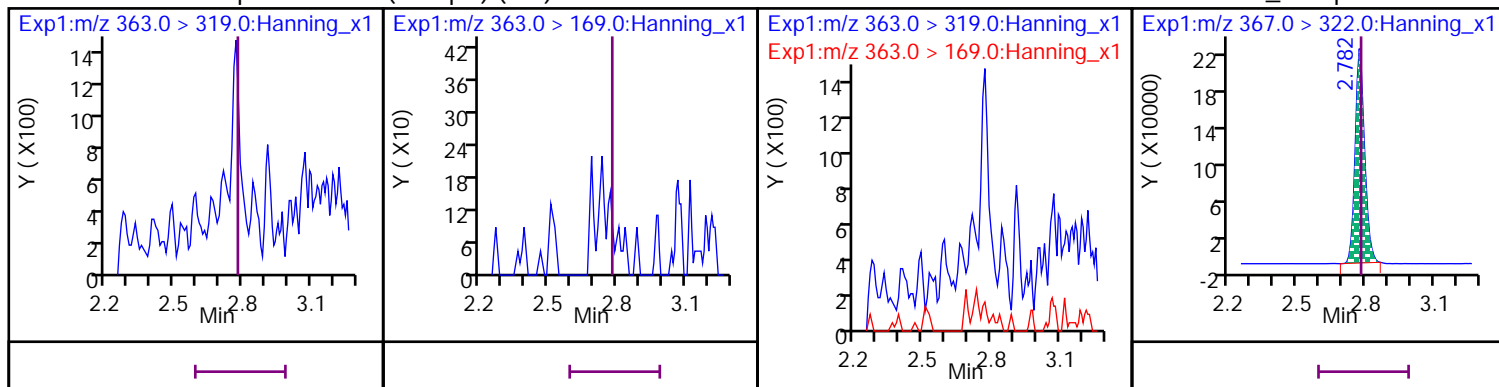
## 28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



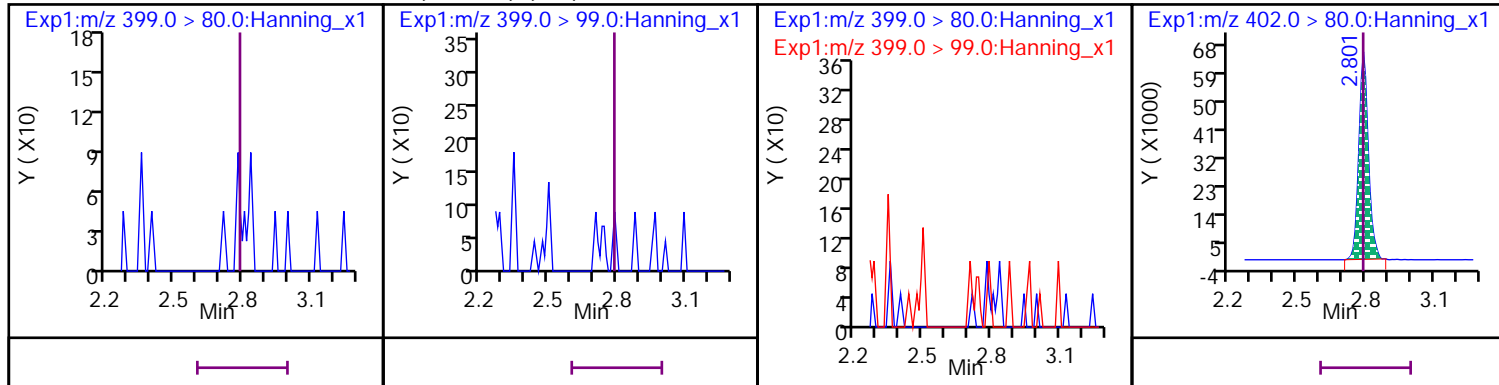
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



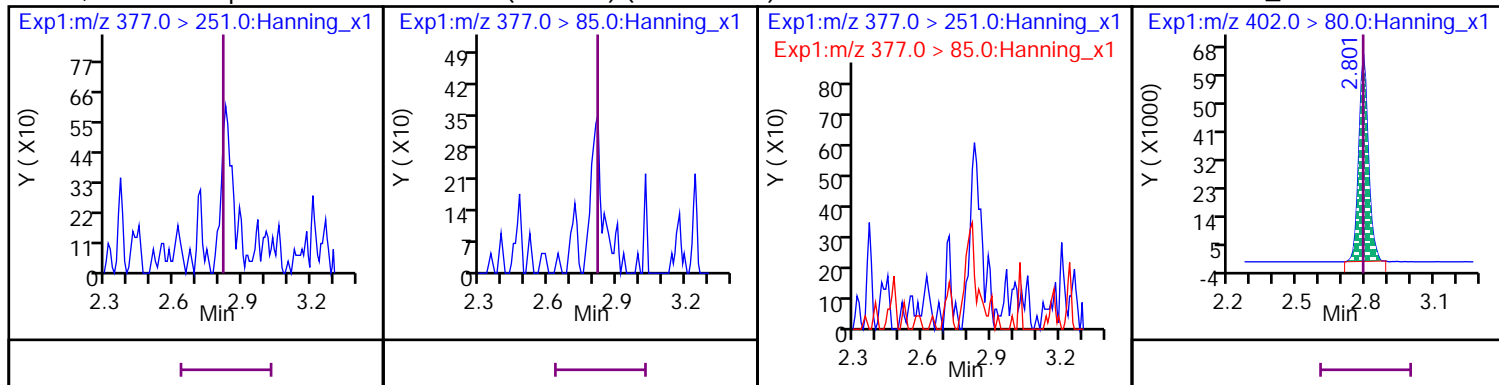
## 14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS

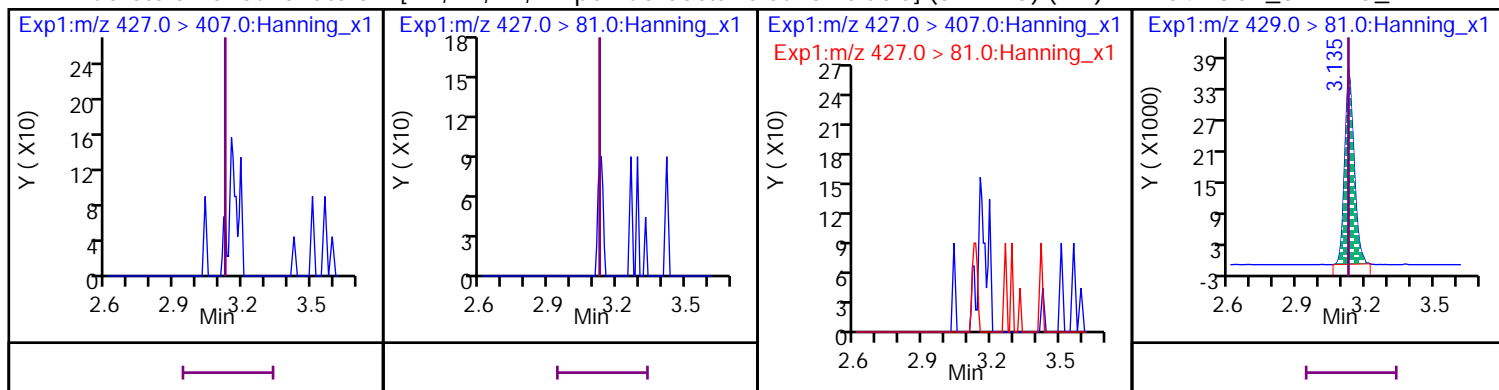


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (Marked ND)

D 45 13C3\_PFHxS

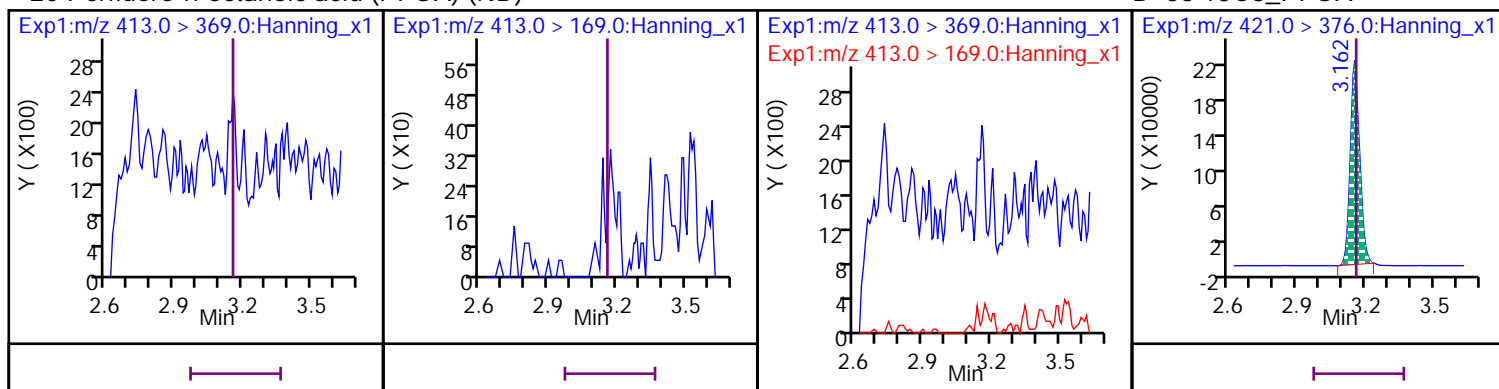


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



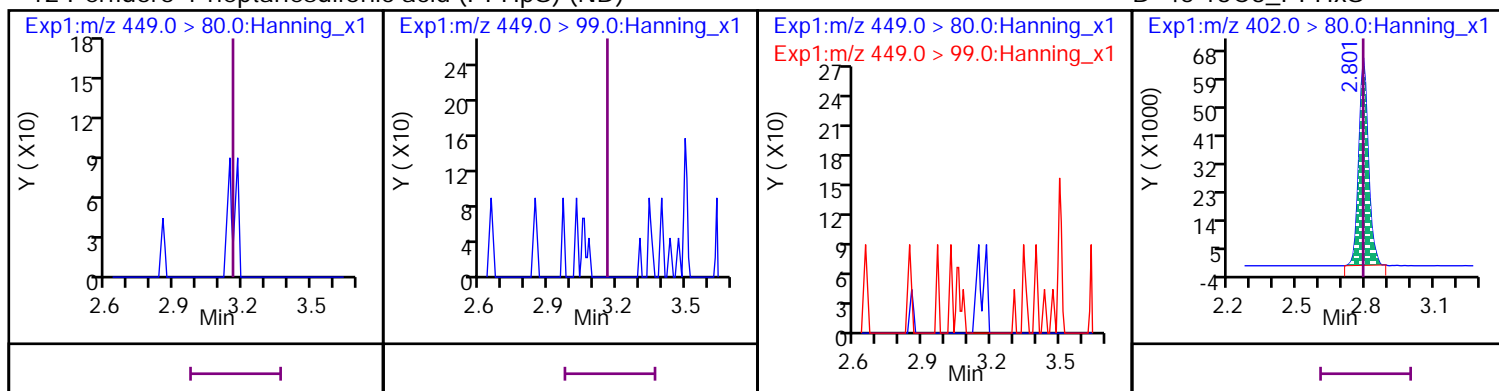
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



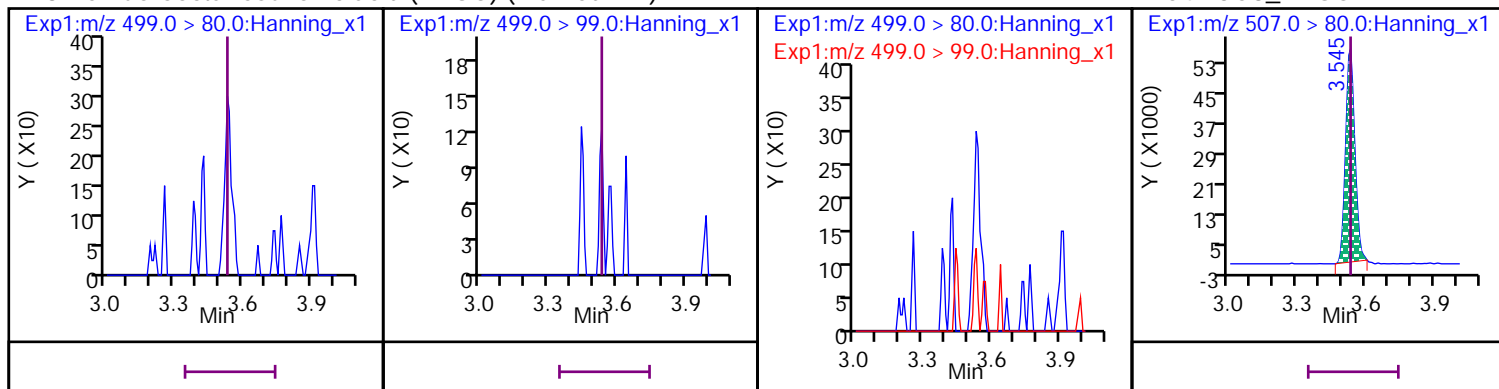
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



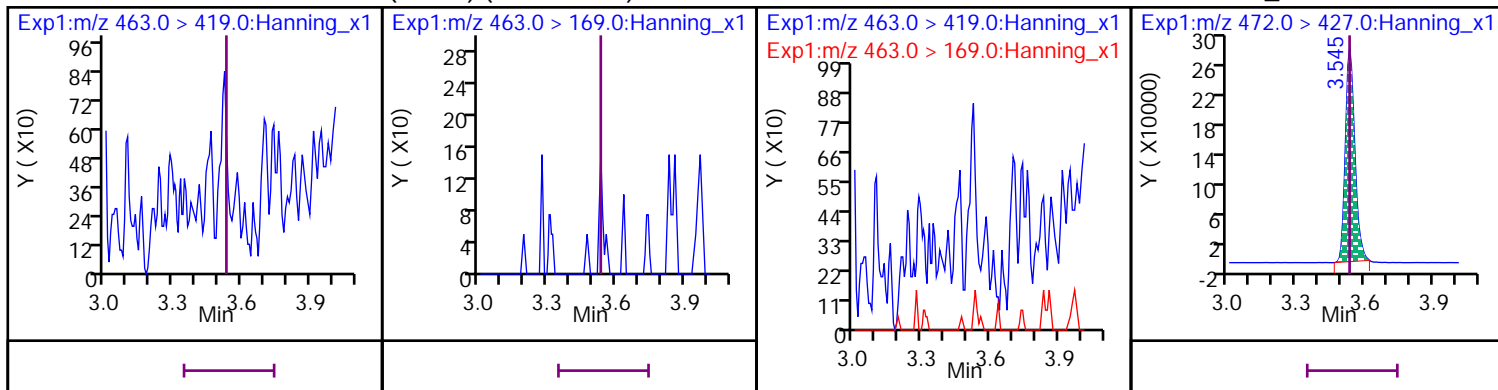
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)

D 56 13C9\_PFNA



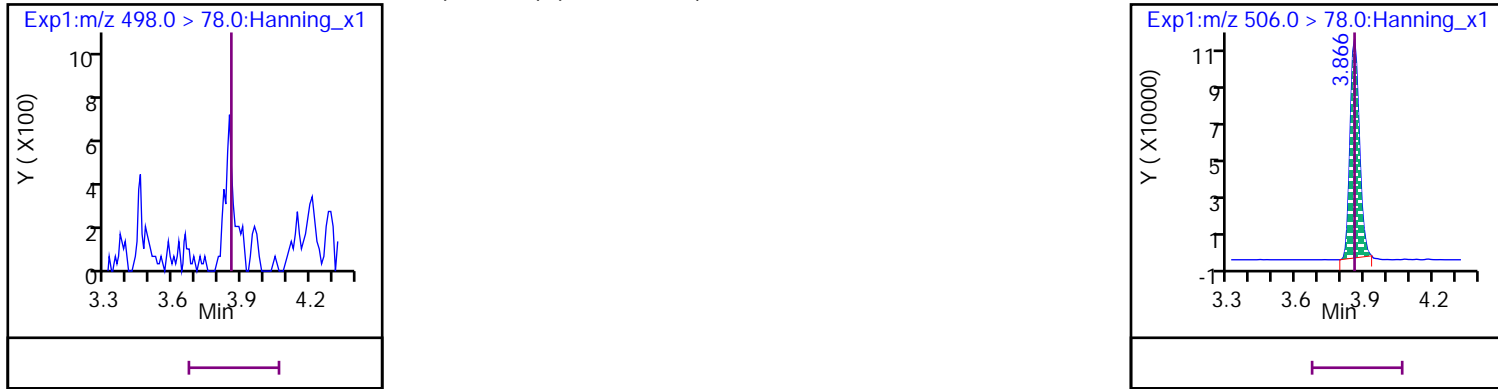
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



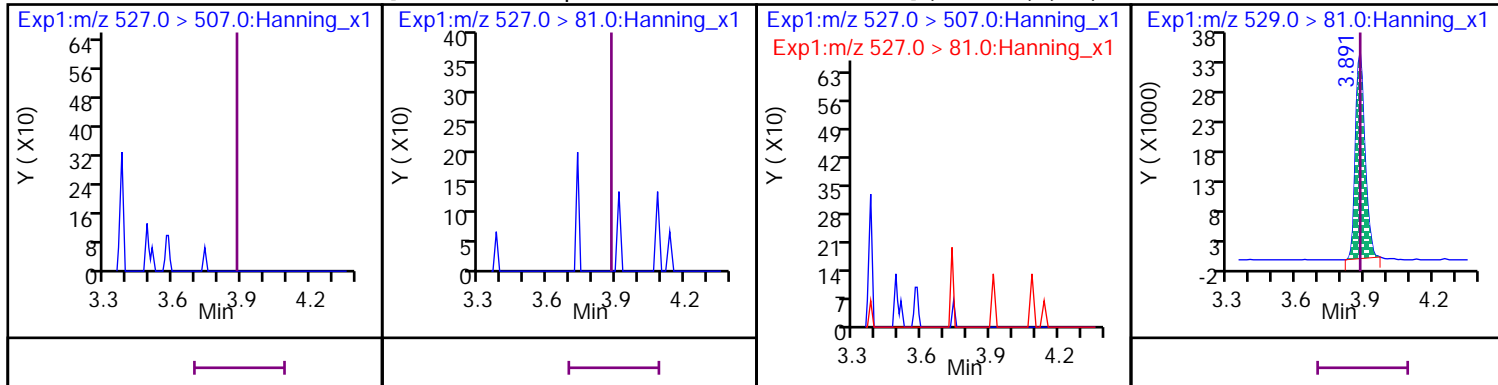
19 Perfluoro-1-octanesulfonamide (PFOSA) (Marked ND)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

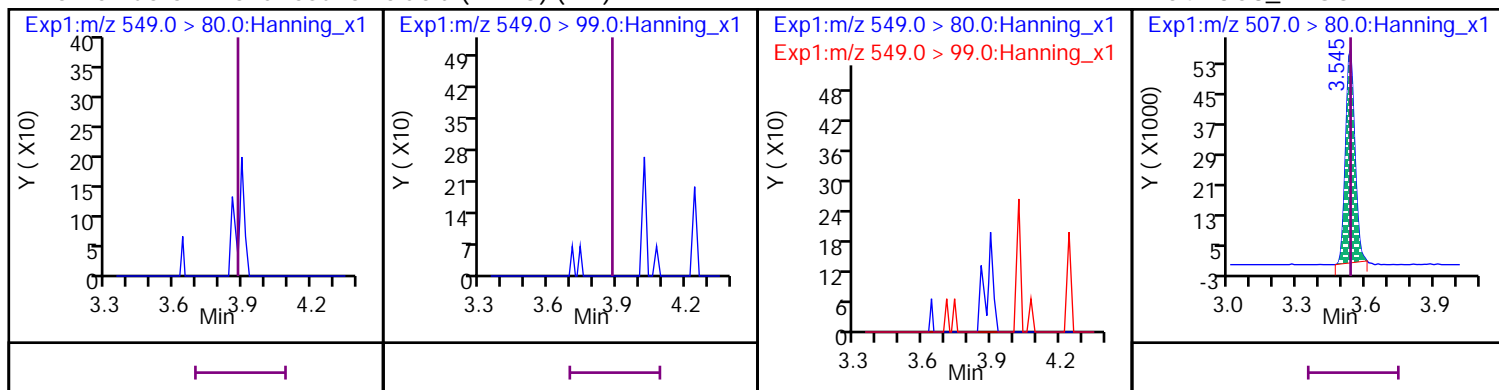
D 65 13C2\_8:2 FTS\_2





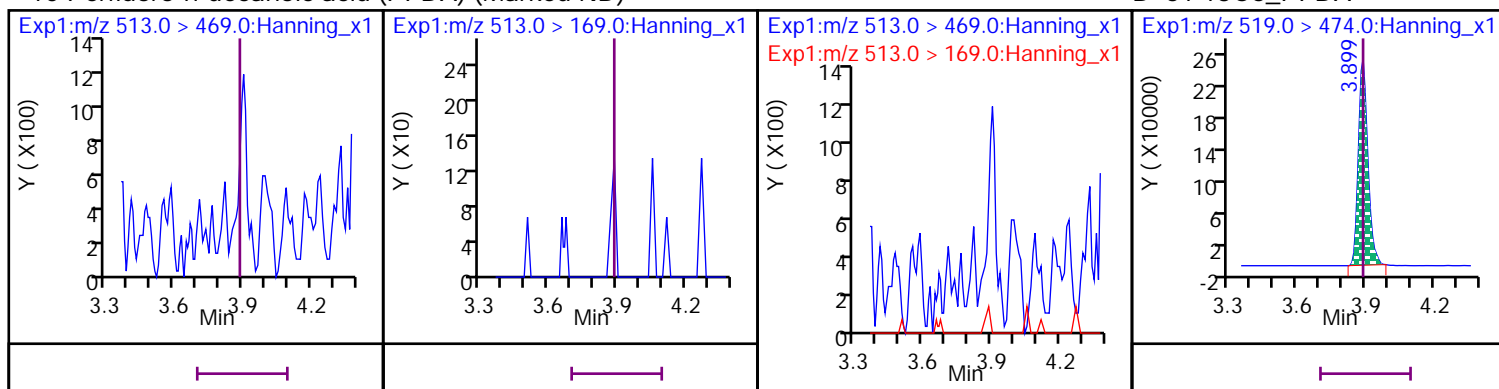
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



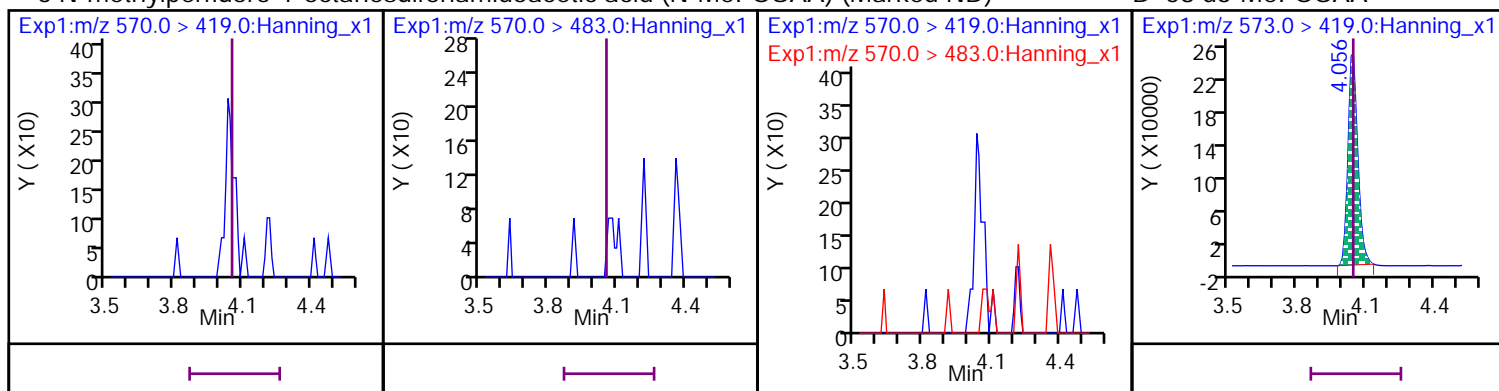
10 Perfluoro-n-decanoic acid (PFDA) (Marked ND)

D 51 13C6\_PFDA



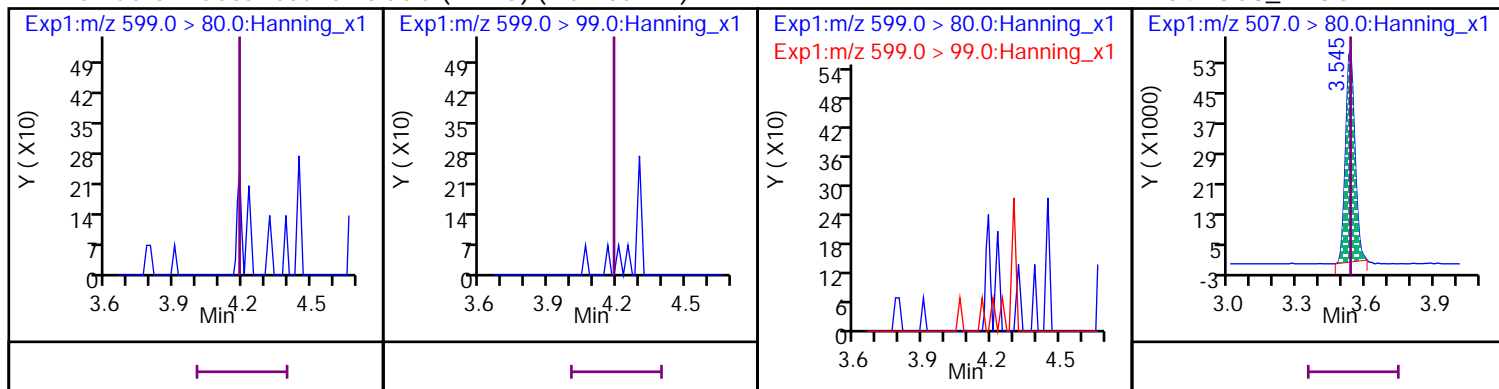
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



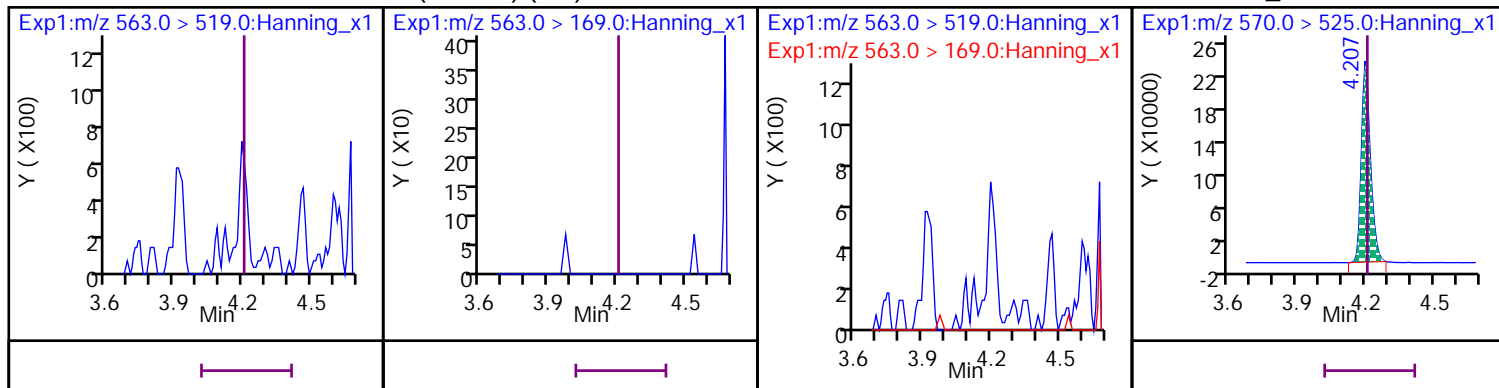
9 Perfluoro-1-decanesulfonic acid (PFDS) (Marked ND)

D 54 13C8\_PFOS



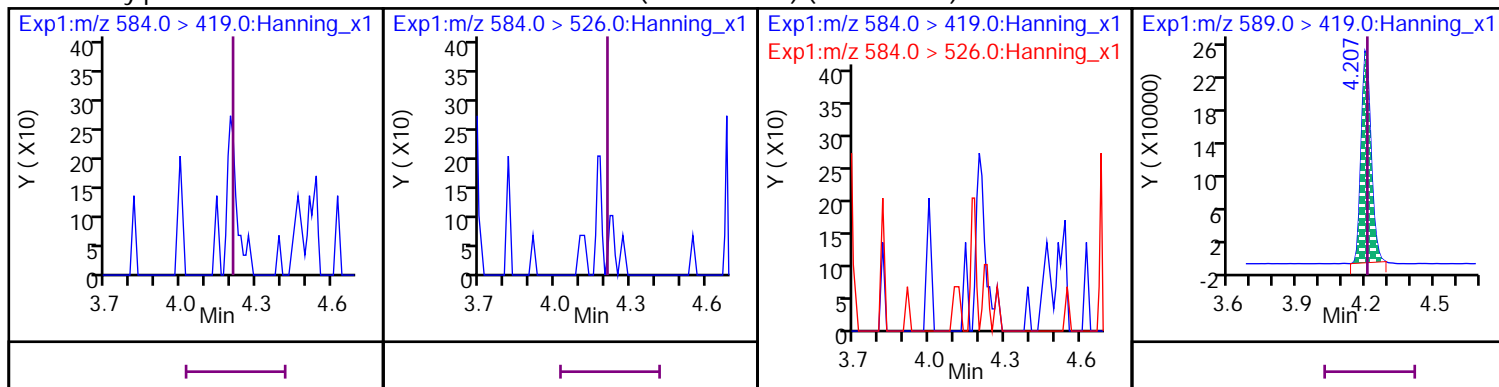
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



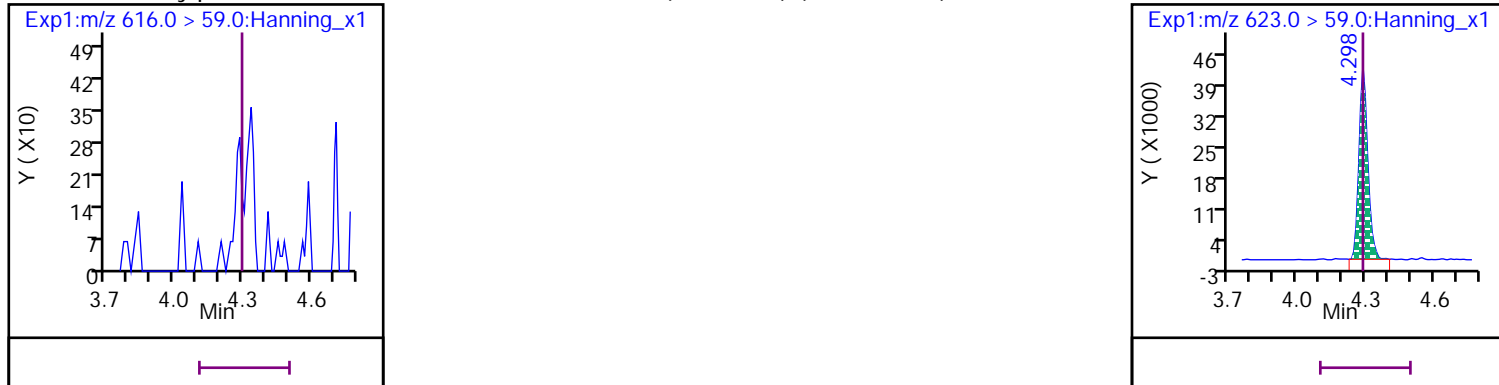
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (Marked ND)

D 60 d5-EtFOSAA



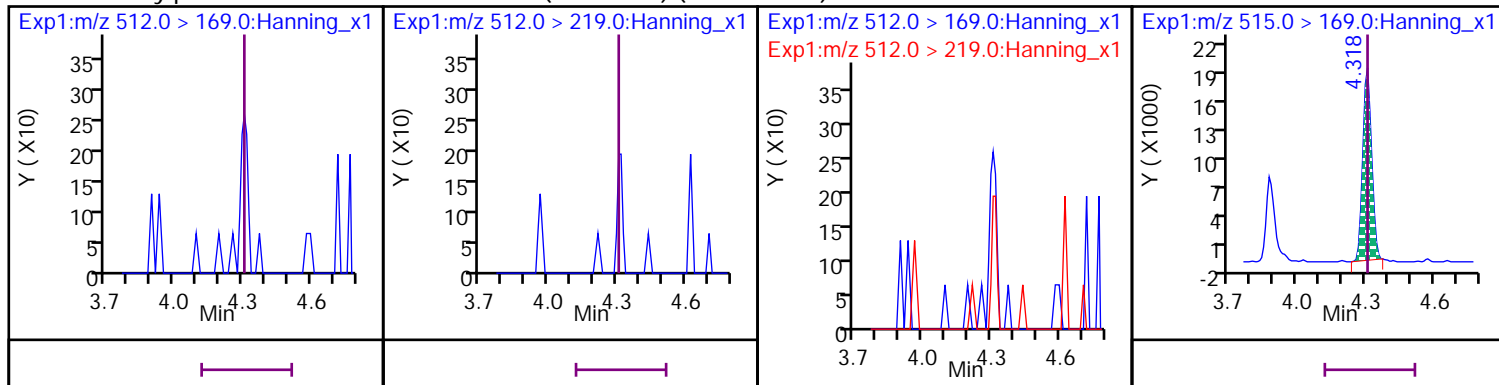
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

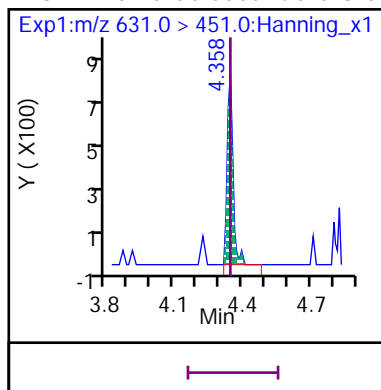


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (Marked ND)

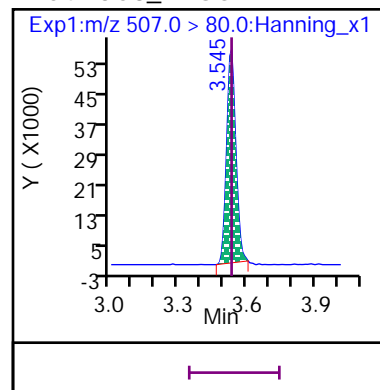
D 57 d3-MeFOSA



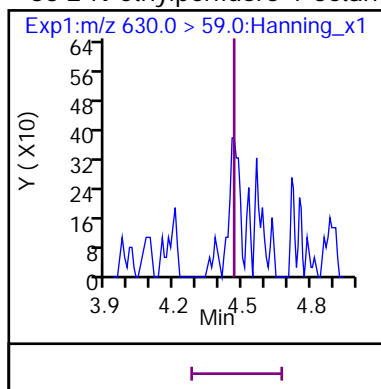
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



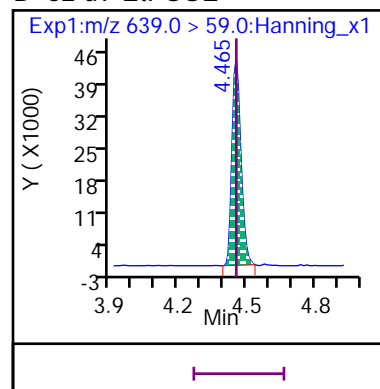
D 54 13C8\_PFOS



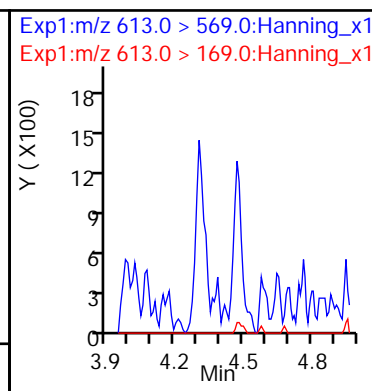
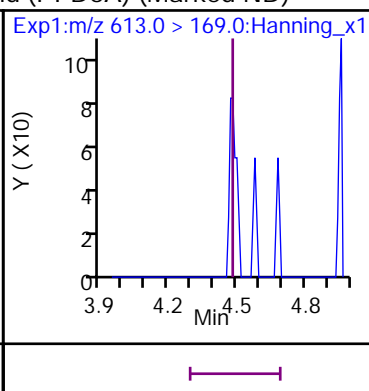
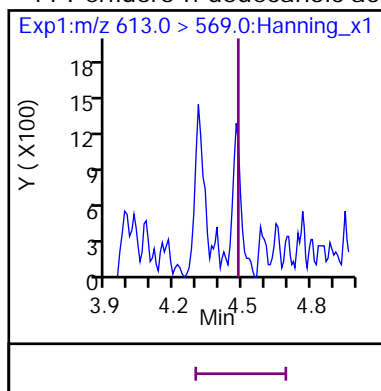
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (Marked ND)



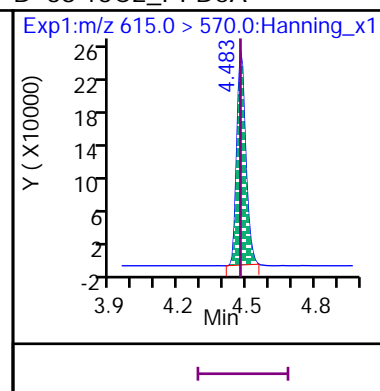
D 62 d9-EtFOSE



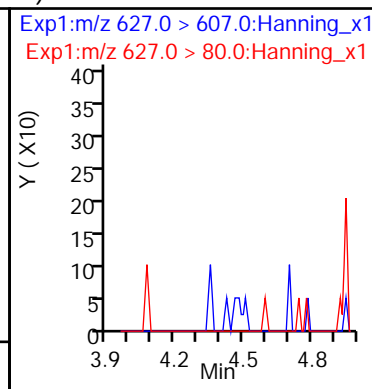
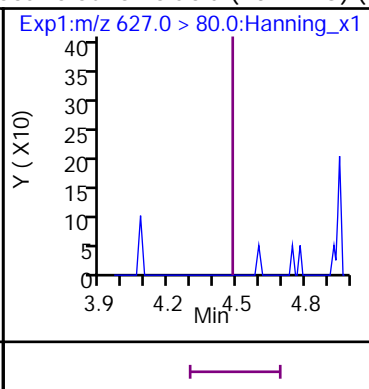
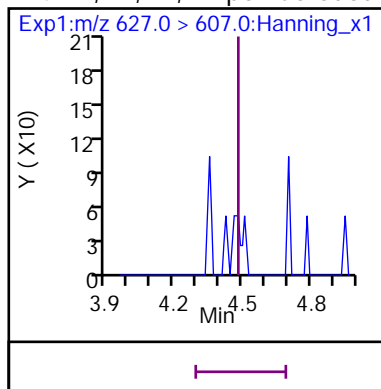
11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



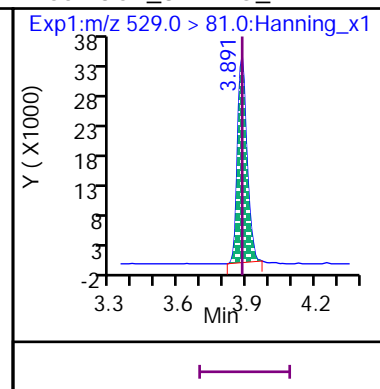
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

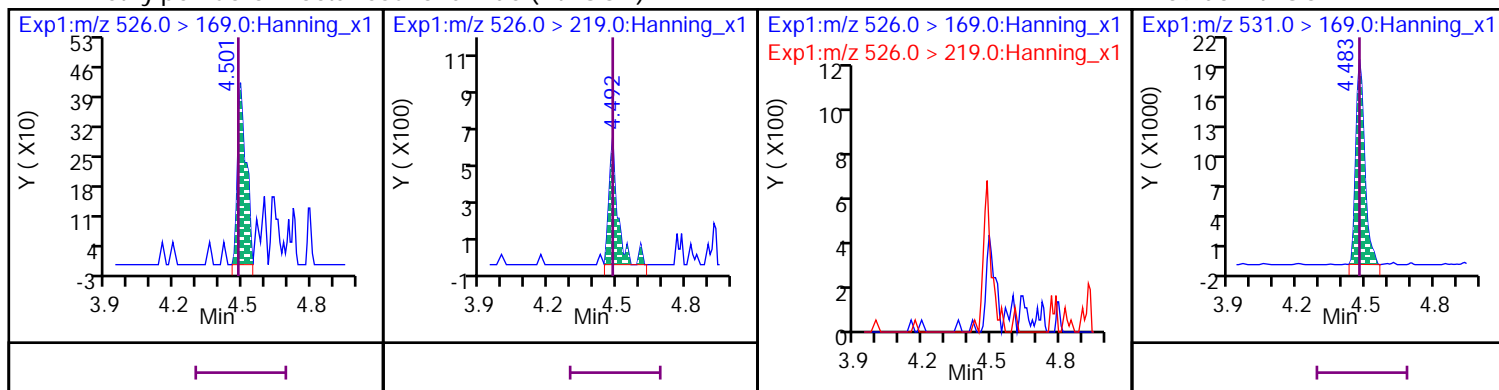


D 65 13C2\_8:2 FTS\_2



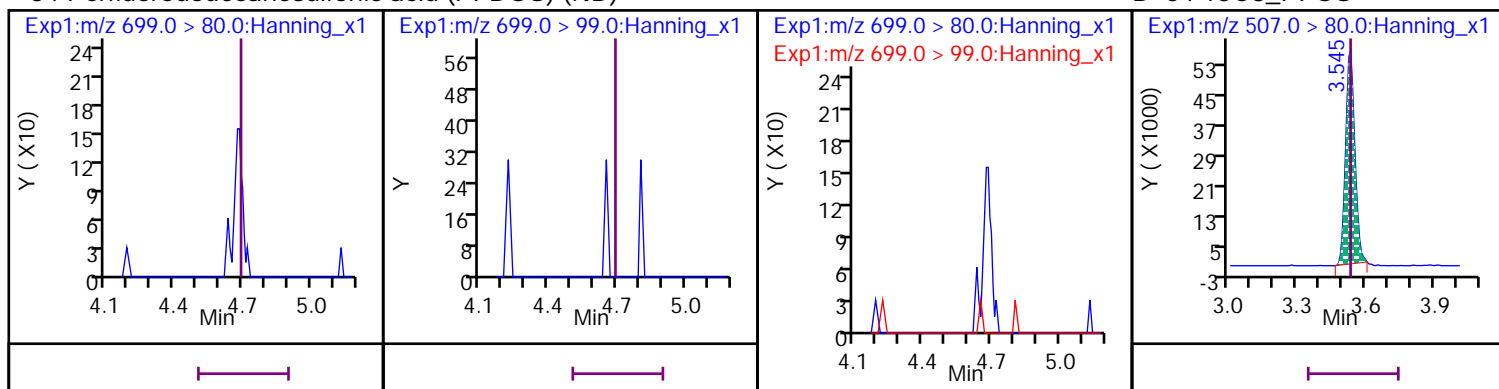
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



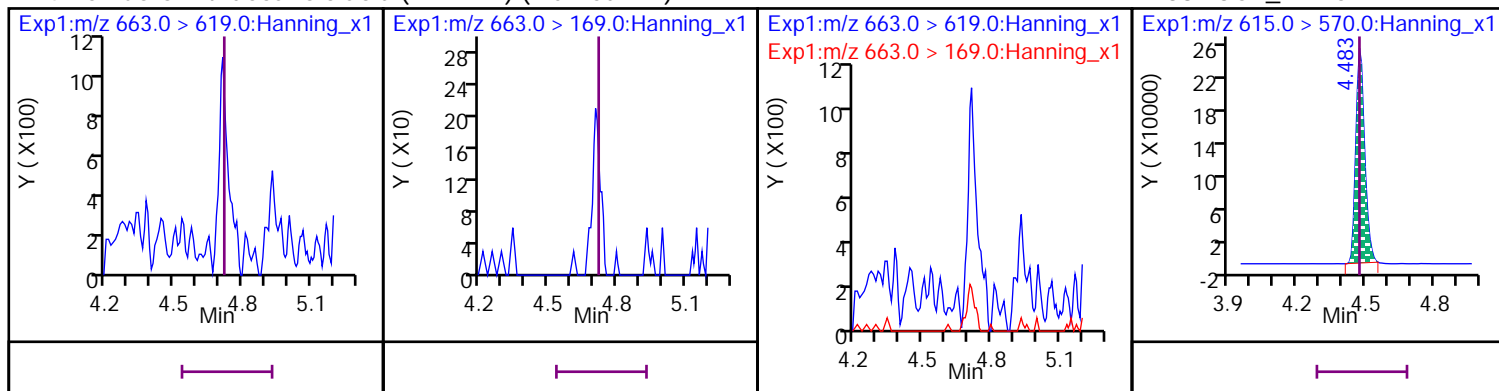
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

## D 54 13C8\_PFOS



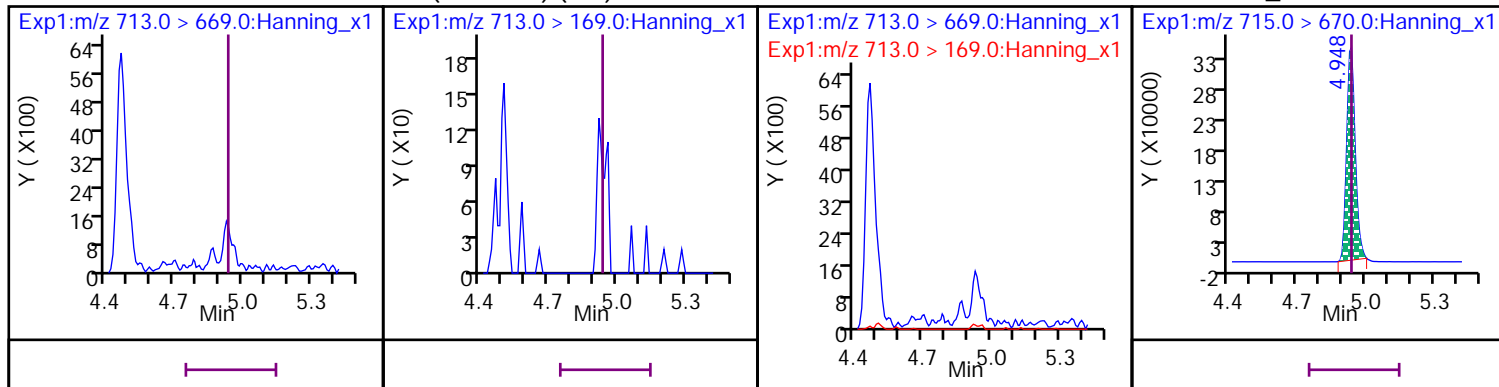
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (Marked ND)

## D 38 13C2\_PFDaA



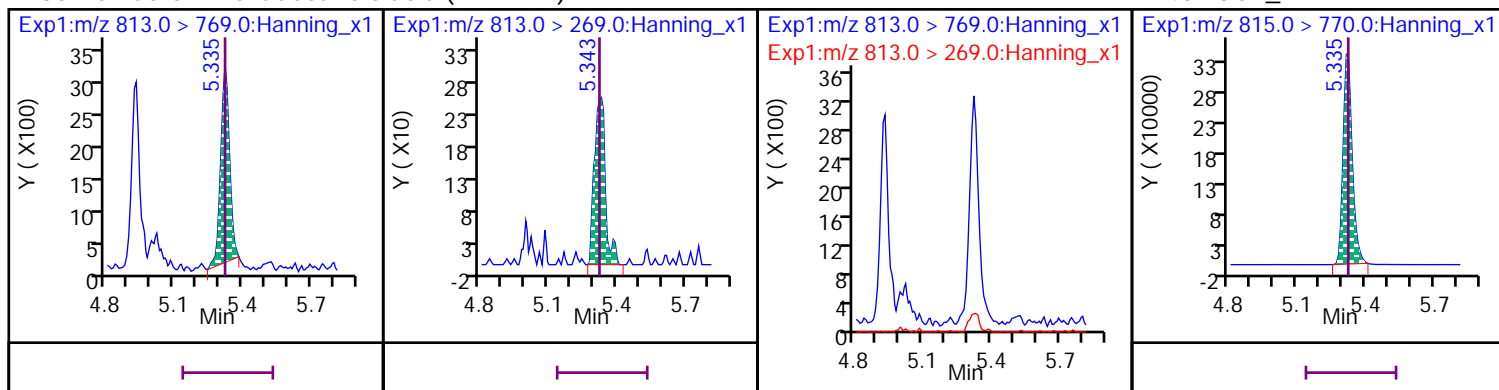
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

## D 42 13C2\_PFTeDA



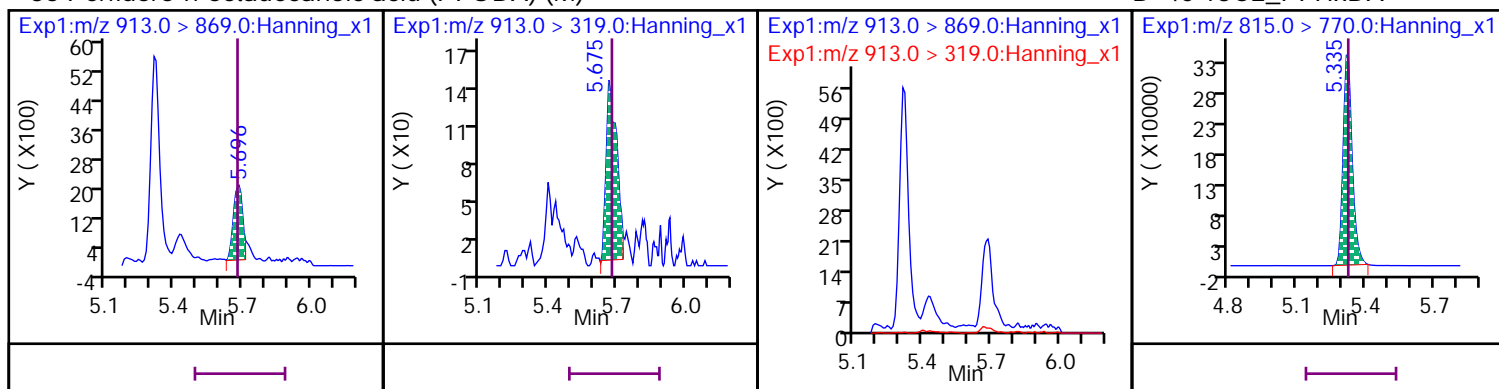
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (M)

D 40 13C2\_PFHxDA

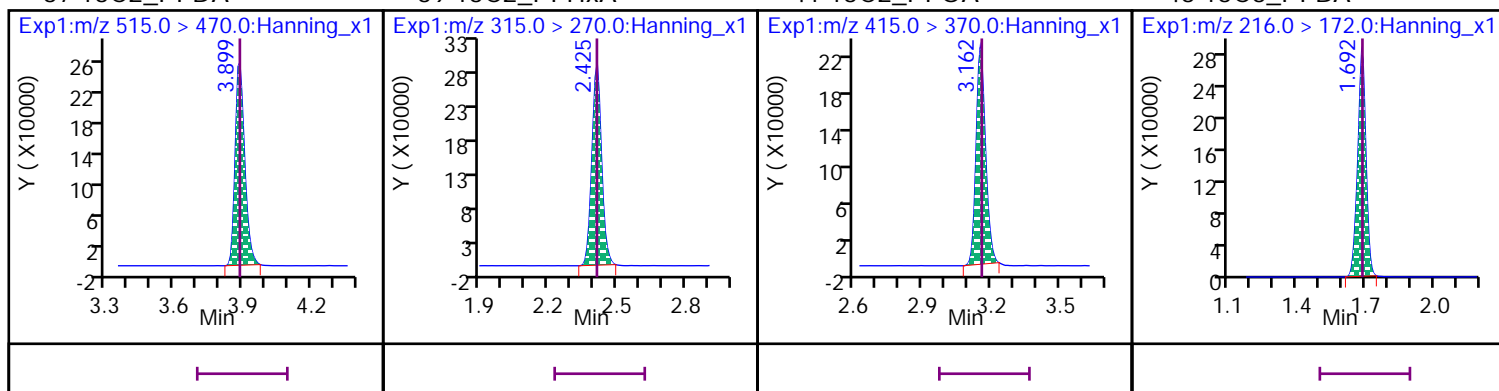


\* 37 13C2\_PFDA

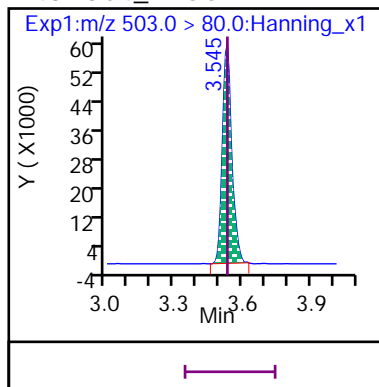
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

Client ID:

Lab ID: IBLK A

Sample Info: IBLK A

Dil. Factor: 1

Operator: Stephen E. Somerville

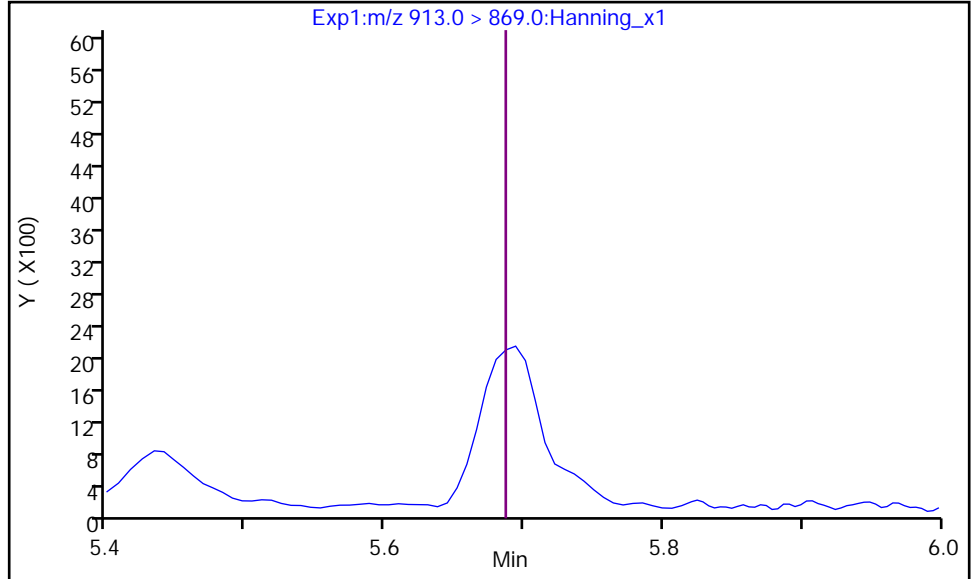
36 PFODA, CAS: 16517-11-6

Not Detected

Expected RT: 5.689

RT Window: 5.489-5.889

Processing Integration Results

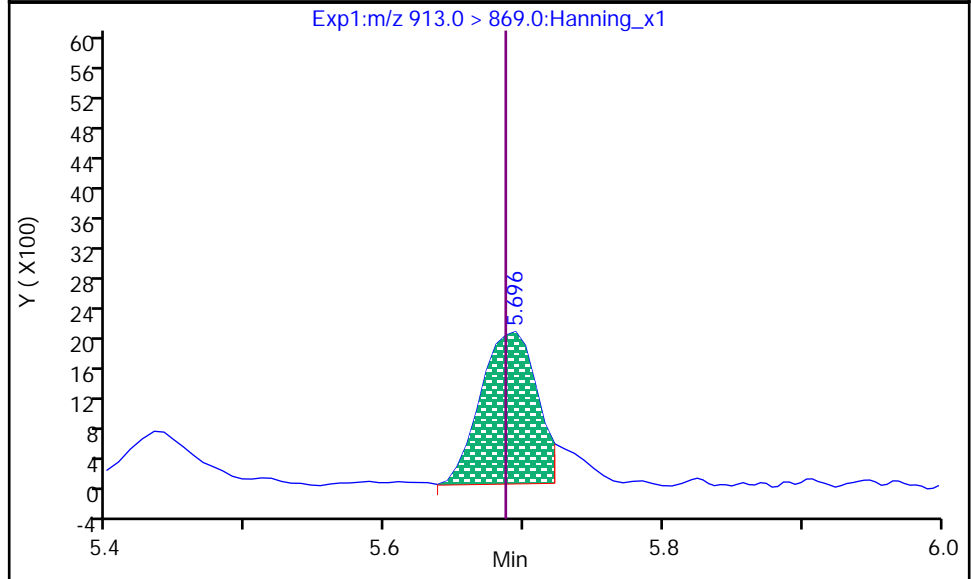


RT: 5.696

Area: 5527

Amount: 6.8340

Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:25

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720016.d

Injection Date: 17-Dec-2020 14:08:35

Inst. ID: LCMSMS02

Client ID:

Lab ID: IBLK A

Sample Info: IBLK A

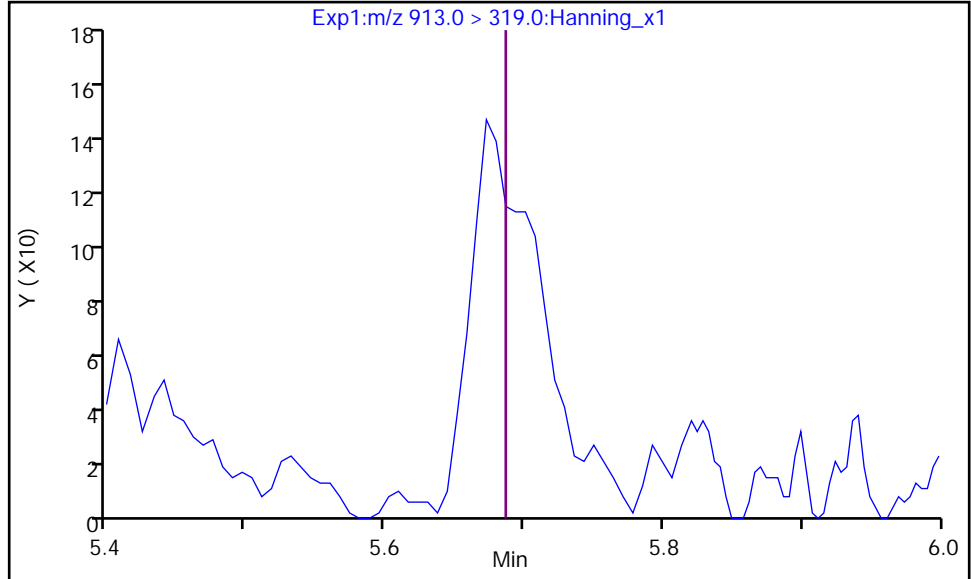
Dil. Factor: 1

Operator: Stephen E. Somerville

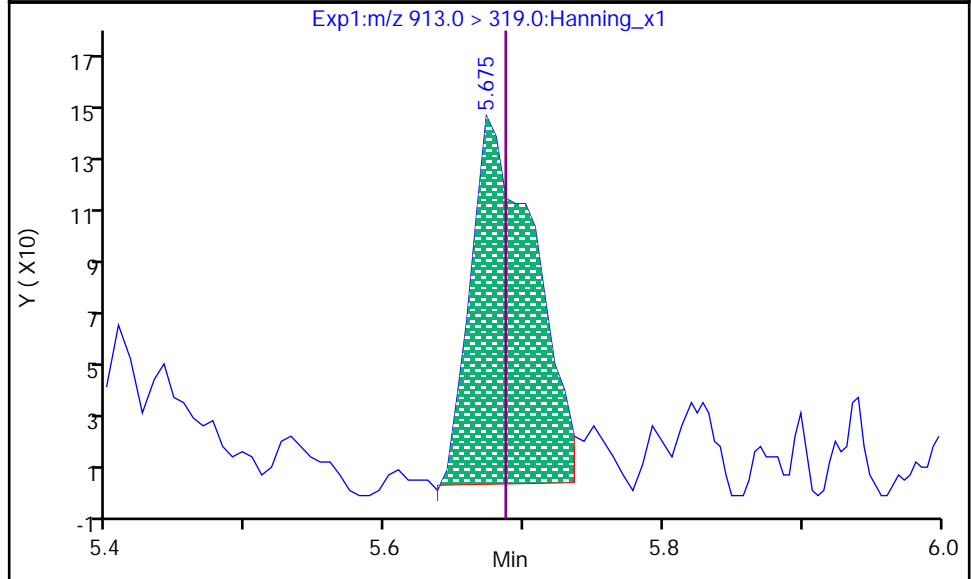
36 PFODA, CAS: 16517-11-6

Not Detected  
Expected RT: 5.689  
RT Window: 5.489-5.889

Processing Integration Results



RT: 5.675  
Area: 450  
Amount: 6.8340  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:28  
Audit Action: Mint  
Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Initial Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d  
Injection Date: 17-Dec-2020 14:19:09 Injection Vol: 10.0 uL  
Sample Type: ICV Auto Sampler: 12  
Sample Info: ICV 500\_SVLC-1202 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	512.21	102	70 - 130
D 46 13C4_PFBFA	735341	643365			87.5	50 - 150
D 50 13C5_PFPeA	728206	651160			89.4	50 - 150
21 PFPeA			500.00	500.16	100	70 - 130
7 PFBS			442.50	456.05	103	70 - 130
D 44 13C3_PFBFS	247575	212100			85.7	50 - 150
1 4:2 FTS			467.50	422.49	90.4	70 - 130
D 63 13C2_4:2 FTS_2	126464	126006			99.6	50 - 150
D 49 13C5_PFHxA	774364	685028			88.5	50 - 150
15 PFHxA			500.00	499.42	99.9	70 - 130
22 PFPeS			470.00	482.04	103	70 - 130
28 GenX			2500.00	2442.01	97.7	70 - 130
D 66 13C3_GenX	1412202	1290991			91.4	50 - 150
D 47 13C4_PFHpA	616003	545911			88.6	50 - 150
13 PFHpA			500.00	530.93	106	70 - 130
D 45 13C3_PFHxS	179294	170363			95	50 - 150
14 PFHxS			456.00	451.51	99	70 - 130
29 ADONA			2355.00	2277.41	96.7	70 - 130
D 64 13C2_6:2 FTS_2	104623	96230			92	50 - 150
2 6:2 FTS			475.00	446.09	93.9	70 - 130
20 PFOA			500.00	507.71	102	70 - 130
D 53 13C8_PFOA	654941	554312			84.6	50 - 150
12 PFHpS			475.00	477.92	101	70 - 130
18 PFOS			462.75	456.80	98.7	70 - 130
17 PFNA			500.00	530.27	106	70 - 130
D 56 13C9_PFNA	792377	707712			89.3	50 - 150
D 54 13C8_PFOS	154357	140776			91.2	50 - 150
30 9CI-PF3ONS			2330.00	2303.83	98.9	70 - 130
D 55 13C8_PFOSA	330552	308618			93.4	50 - 150
19 PFOSA			500.00	494.28	98.9	70 - 130
16 PFNS			480.00	473.30	98.6	70 - 130
D 65 13C2_8:2 FTS_2	93314	86455			92.6	50 - 150
3 8:2 FTS			480.00	512.60	107	70 - 130
10 PFDA			500.00	521.43	104	70 - 130
D 51 13C6_PFDA	698114	632221			90.6	50 - 150
D 58 d3-MeFOSAA	762102	665192			87.3	50 - 150



Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	608.79	122	70 - 130
9 PFDS			482.50	507.23	105	70 - 130
5 N-EtFOSAA			500.00	473.18	94.6	70 - 130
25 PFUdA			500.00	492.40	98.5	70 - 130
D 60 d5-EtFOSAA	738335	687855			93.2	50 - 150
D 52 13C7_PFUdA	678701	604183			89	50 - 150
D 61 d7-MeFOSE	117292	104869			89.4	50 - 150
D 57 d3-MeFOSA	54969	52474			95.5	50 - 150
31 11Cl-PF3OUDS			2355.00	2228.58	94.6	70 - 130
D 62 d9-EtFOSE	121851	121349			99.6	50 - 150
D 59 d5-EtFOSA	51517	54509			106	50 - 150
D 38 13C2_PFDoA	649290	602249			92.8	50 - 150
4 10:2 FTS			2410.00	3205.61	133	70 - 130
11 PFDoA			500.00	529.03	106	70 - 130
24 PFTrDA			500.00	537.17	107	70 - 130
23 PFTeDA			500.00	528.05	106	70 - 130
D 42 13C2_PFTeDA	887372	779838			87.9	50 - 150
D 40 13C2_PFHxDA	913664	843023			92.3	50 - 150

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d  
Injection Date: 17-Dec-2020 14:19:09 Injection Vol: 10.0 uL  
Sample Type: ICV Auto Sampler: 12  
Sample Info: ICV 500\_SVLC-1202 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.691	1.696	0	643365	22	>100:1			1000.00	927.64	87.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.698	1.696	1/1	328216	23	>100:1			500.00	512.21		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.066	2.072	0	651160	17	>100:1			1000.00	946.61	89.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.066	2.072	0/0	327449	18	>100:1			500.00	500.16		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.119	2.125	0	212100	16	>100:1			1000.00	921.25	85.7	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.119	2.125	0/0	114046	18	>100:1	Target = 3.50		442.50	456.05		
298.9 > 99	44	2.119	2.125		33662	17	>100:1	3.38 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.459	1/1	88688	19		Target = 3.10		470.00	482.04		
349 > 99	44	2.450	2.459		30745	20	>100:1	2.88 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.388	0	126006	20	>100:1			5000.00	5205.07	99.6	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.379	2.388	0/0	21249	18	>100:1	Target = 1.80		467.50	422.49		
327 > 81	63	2.388	2.388		10322	19	61:1	2.05 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	685028	20	>100:1			1000.00	929.39	88.5	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	337767	18	>100:1	Target = 18.34		500.00	499.42		
313 > 119	49	2.424	2.423		16063	19	65:1	21.02 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.539	0	1290991	19	>100:1			5000.00	4846.90	91.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.539	0/0	453005	19	>100:1	Target = 0.81		2500.00	2442.01		
285 > 185	66	2.531	2.539		580531	19	>100:1	0.78 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.790	2.790	1	545911	19	>100:1			1000.00	899.88	88.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.790	2.790	1/0	300642	19	>100:1	Target = 3.70		500.00	530.93		
363 > 169	47	2.790	2.790		77231	18	>100:1	3.89 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.799	1	170363	20				1000.00	994.94	95	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.799	1/0	81558	27	>100:1	Target = 3.21	0.19	456.00	451.51		
399 > 99	45	2.799	2.799		24780	19	46:1	3.29 (1.60-4.81)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.827	2.827	1/0	2463258	19	>100:1	Target = 2.97		2355.00	2277.41		
377 > 85	45	2.827	2.827		812746	19	>100:1	3.03 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.175	3.169	1/0	73964	23	>100:1	Target = 3.08		475.00	477.92		
449 > 99	45	3.175	3.169		22064	28	>100:1	3.35 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.141	3.135	1	96230	22	>100:1			5000.00	4996.78	92	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.135	1/0	18390	17		Target = 1.80		475.00	446.09		M
427 > 81	64	3.148	3.135		12835	27	>100:1	1.43 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.168	3.169	0	554312	22	>100:1			1000.00	936.55	84.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.168	3.169	0/0	286903	22	>100:1	Target = 2.87		500.00	507.71		
413 > 169	53	3.168	3.169		95151	23	>100:1	3.01 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.543	3.545	0	140776	22				1000.00	938.95	91.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.543	3.545	0/0	76202	40	>100:1	Target = 3.84	0.27	462.75	456.80		
499 > 99	54	3.543	3.545		23683	40		3.21 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.757	3.750	1/1	1091829	20	>100:1			2330.00	2303.83		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.898	3.891	1/1	50989	14		Target = 3.07		480.00	473.30		M
549 > 99	54	3.890	3.891		18212	16	77:1	2.79 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.197	4.198	0/0	51821	17	>100:1	Target = 3.03		482.50	507.23		
599 > 99	54	4.197	4.198		15980	13	45:1	3.24 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.357	4.357	0/0	890977	17	>100:1			2355.00	2228.58		
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.551	3.545	1	707712	21	>100:1			1000.00	942.41	89.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.551	3.545	1/0	375289	23	>100:1	Target = 6.16		500.00	530.27		
463 > 169	56	3.551	3.545		59121	19	>100:1	6.34 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.865	3.866	0	308618	19	>100:1			1000.00	996.94	93.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.866	0/0	150323	18	>100:1			500.00	494.28		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.890	3.891	0	86455	18	>100:1			5000.00	4660.61	92.6	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorododecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.898	3.891	1/1	18094	13	87:1	Target = 1.95		480.00	512.60		M
527 > 81	65	3.898	3.891		8875	22	39:1	2.03 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.491	4.492	0/0	128089	17	>100:1	Target = 3.14		2410.00	3205.61		
627 > 80	65	4.491	4.492		40301	17	>100:1	3.17 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.898	3.899	0	632221	19	>100:1			1000.00	953.10	90.6	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.898	3.899	0/0	323924	20	>100:1	Target = 15.94		500.00	521.43		
513 > 169	51	3.898	3.899		21233	18	>100:1	15.25 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.055	4.056	0	665192	18	>100:1			5000.00	4634.21	87.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.064	4.065	0/0	62214	28	>100:1	Target = 1.33		500.00	608.79		
570 > 483	58	4.055	4.065		39696	17		1.56 (0.66-1.99)					
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.217	4.217	0	687855	19	>100:1			5000.00	5179.06	93.2	

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.217	4.217	0/0	64809	16	>100:1	Target = 1.58		500.00	473.18		
584 > 526	60	4.217	4.217		42015	16	>100:1	1.54 (0.79-2.37)					
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.217	4.217	0	604183	18				1000.00	955.87	89	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.206	4.217	0/0	279615	18	>100:1	Target = 15.50		500.00	492.40		
563 > 169	52	4.206	4.217		17415	23	43:1	16.05 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.298	0	104869	15	>100:1			1000.00	969.14	89.4	
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.318	0	52474	15	>100:1			1000.00	991.63	95.5	
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.465	0	121349	19	>100:1			1000.00	967.73	99.6	
<b>D 38 13C2_PFD0A CAS: SESI-0118</b>													
615 > 570		4.482	4.483	0	602249	17				1000.00	994.93	92.8	
<b>11 Perfluoro-n-dodecanoic acid (PFD0A) CAS: 307-55-1</b>													
613 > 569	38	4.482	4.492	0/0	322647	16	>100:1	Target = 10.85		500.00	529.03		
613 > 169	38	4.482	4.492		30334	15	>100:1	10.63 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.723	4.731	0/0	318637	21	>100:1	Target = 8.37		500.00	537.17		
663 > 169	38	4.723	4.731		36831	15	>100:1	8.65 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.483	0	54509	15	>100:1			1000.00	1110.29	106	
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.939	4.948	0	779838	19	>100:1			1000.00	925.69	87.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.939	4.948	0/0	356796	21	55:1	Target = 12.11		500.00	528.05		
713 > 169	42	4.939	4.948		29979	19	>100:1	11.90 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.325	5.334	0	843023	19	>100:1			1000.00	930.32	92.3	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.898	3.899	0	677376	18	>100:1					93.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	701658	19	>100:1					93.2	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.168	3.169	0	602537	24	>100:1					93.5	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.696	1	638097	23	>100:1					95.8	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.543	3.545	0	159151	22	>100:1					98	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

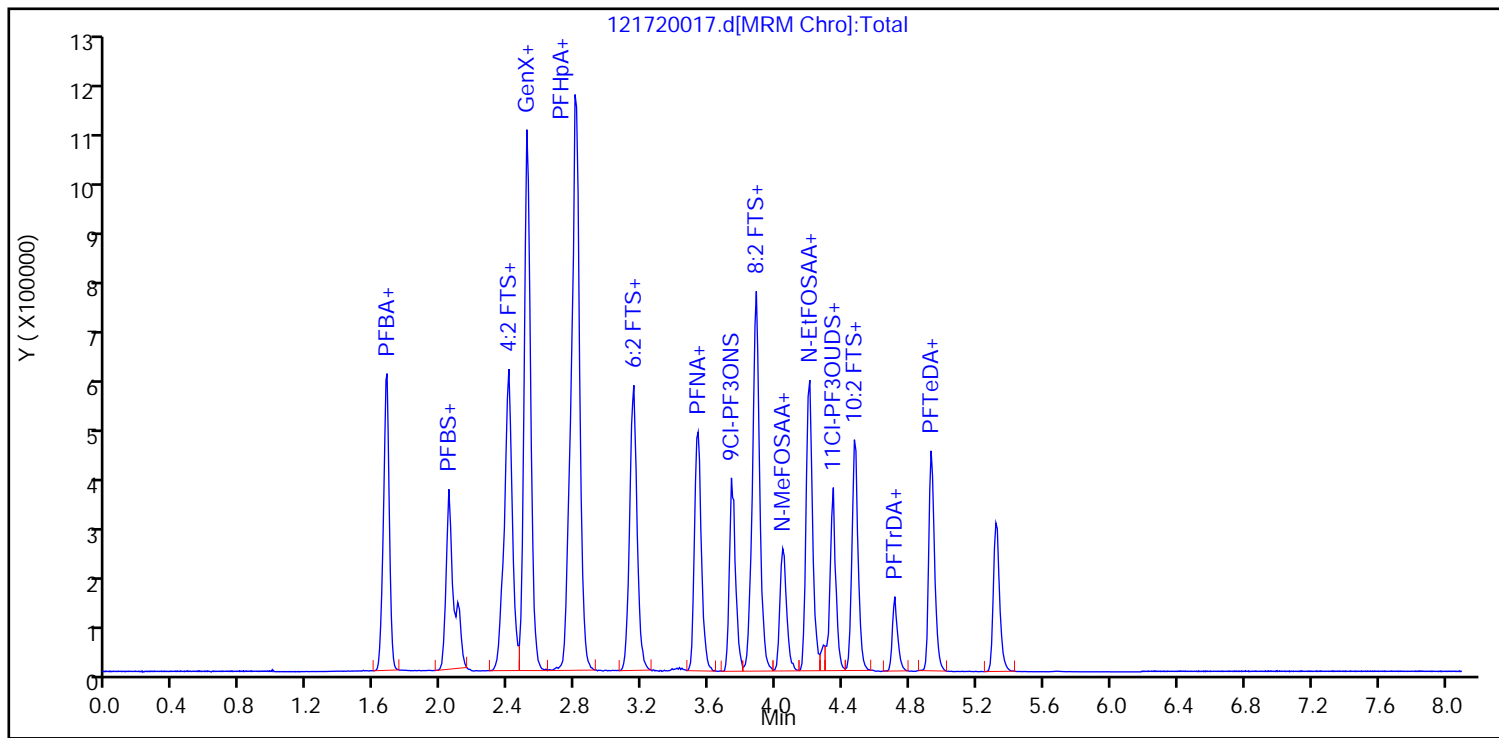
Client ID:

Lab ID: ICV 500\_SVLC-1202

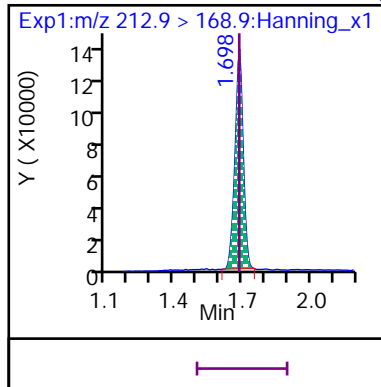
Sample Info: ICV 500\_SVLC-1202

Dil. Factor: 1

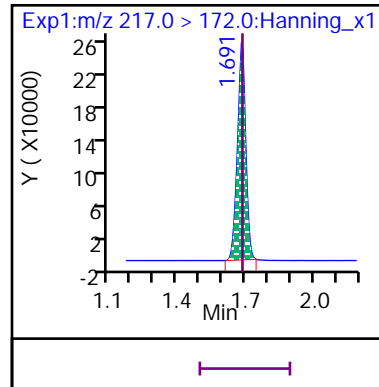
Operator: Stephen E. Somerville



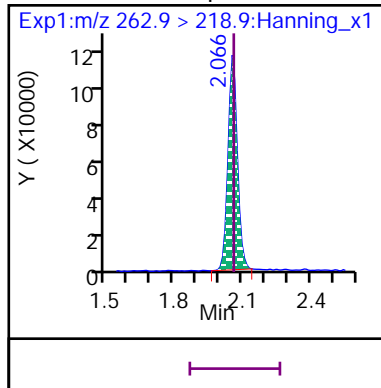
8 Perfluoro-n-butanoic acid (PFBA)



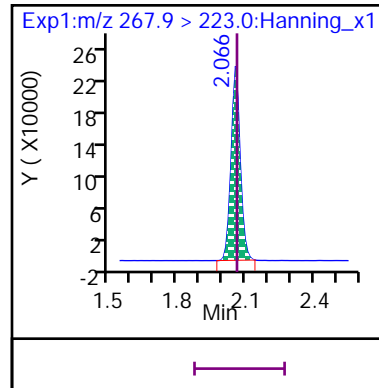
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

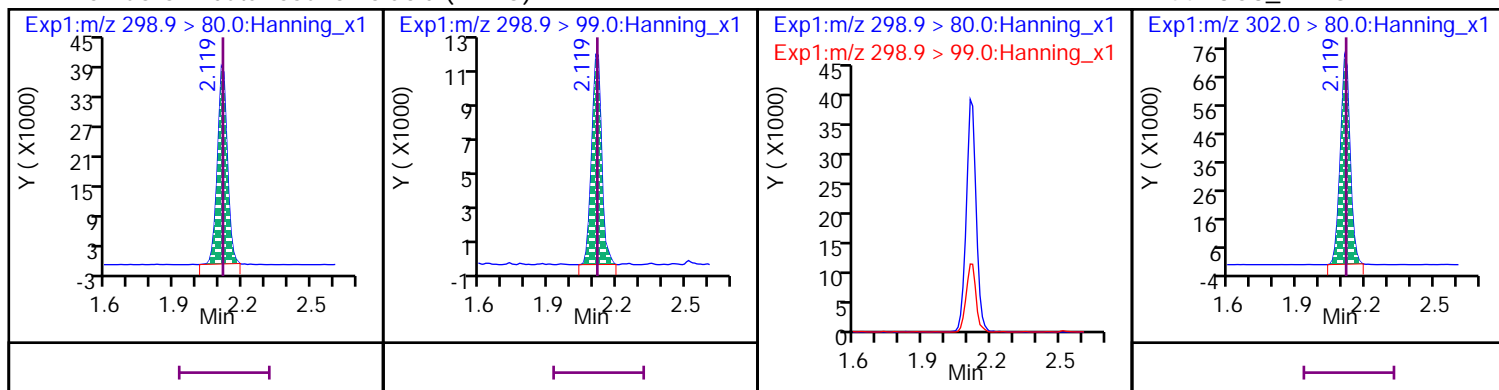


D 50 13C5\_PFPeA



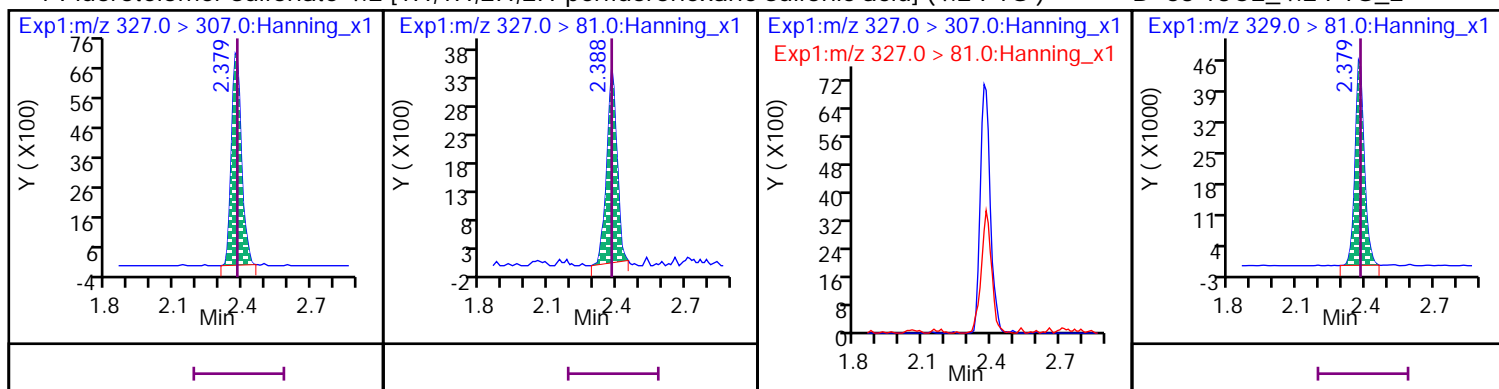
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



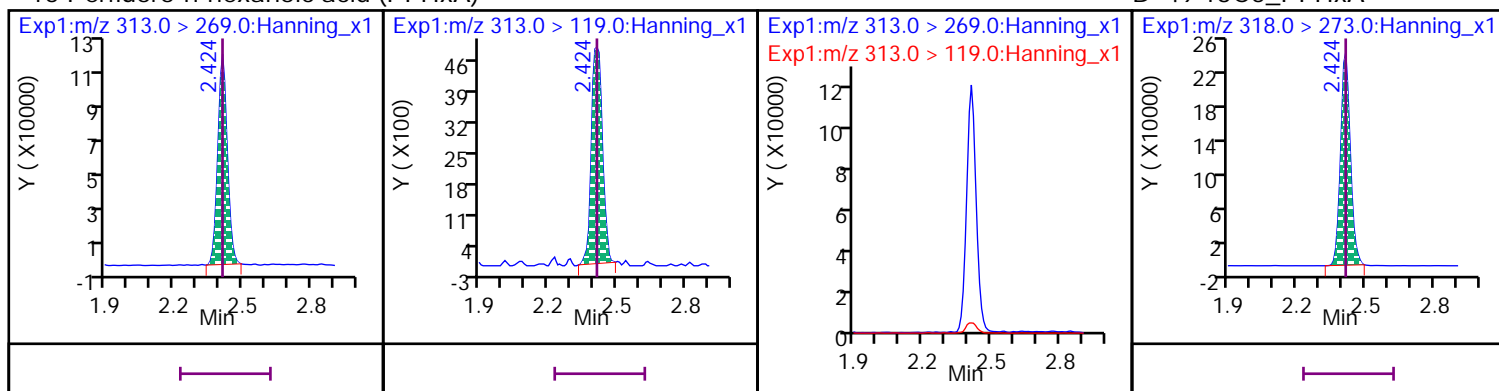
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



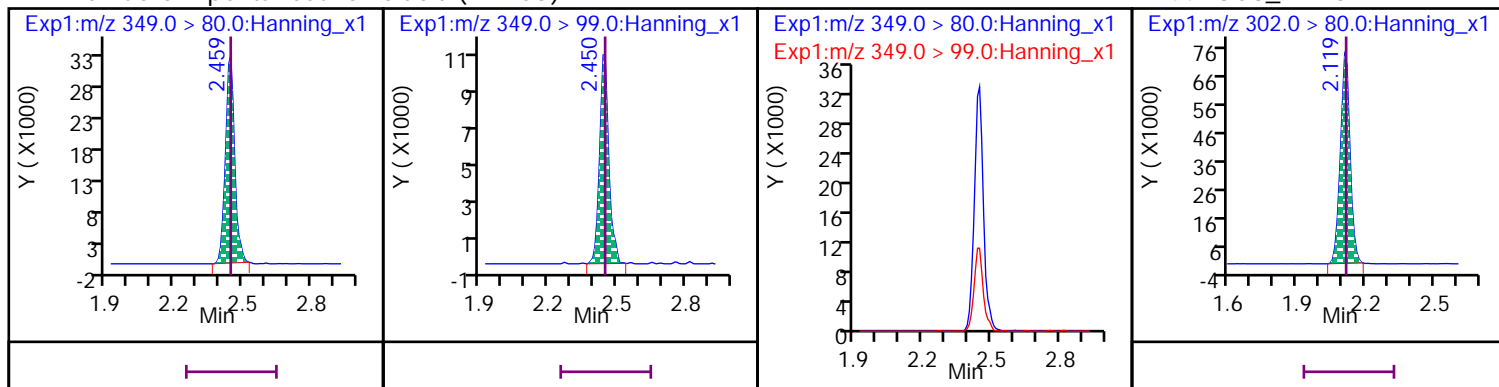
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



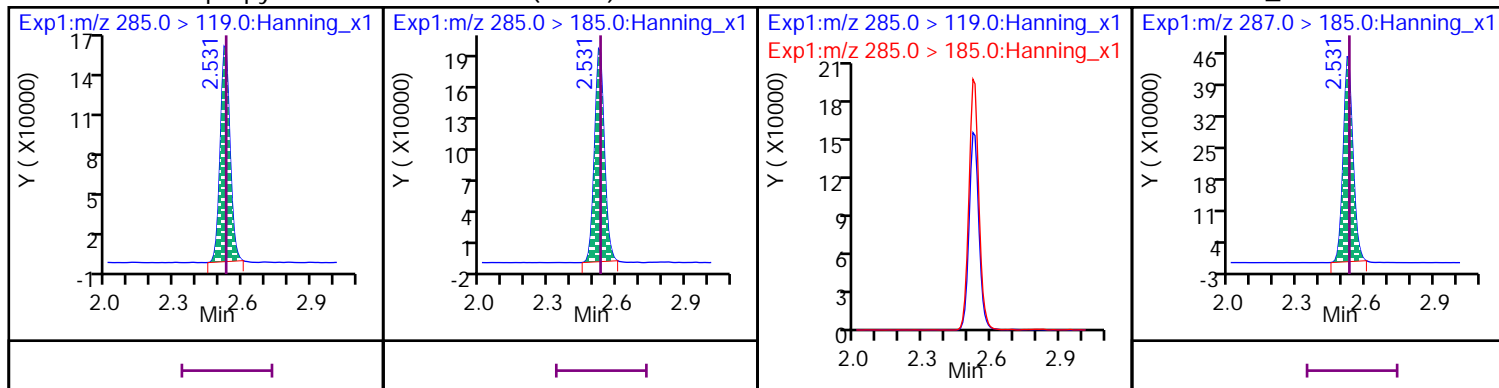
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



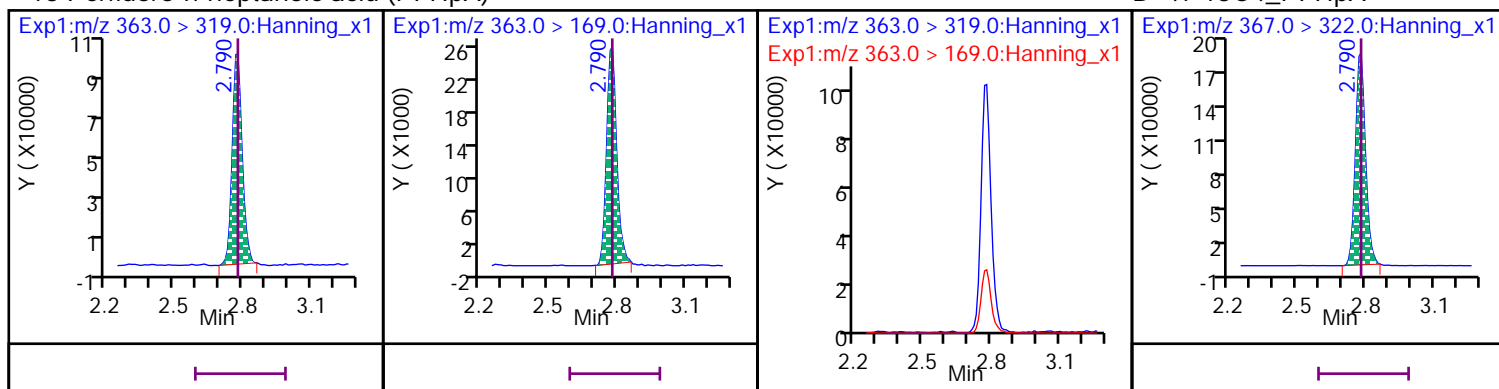
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



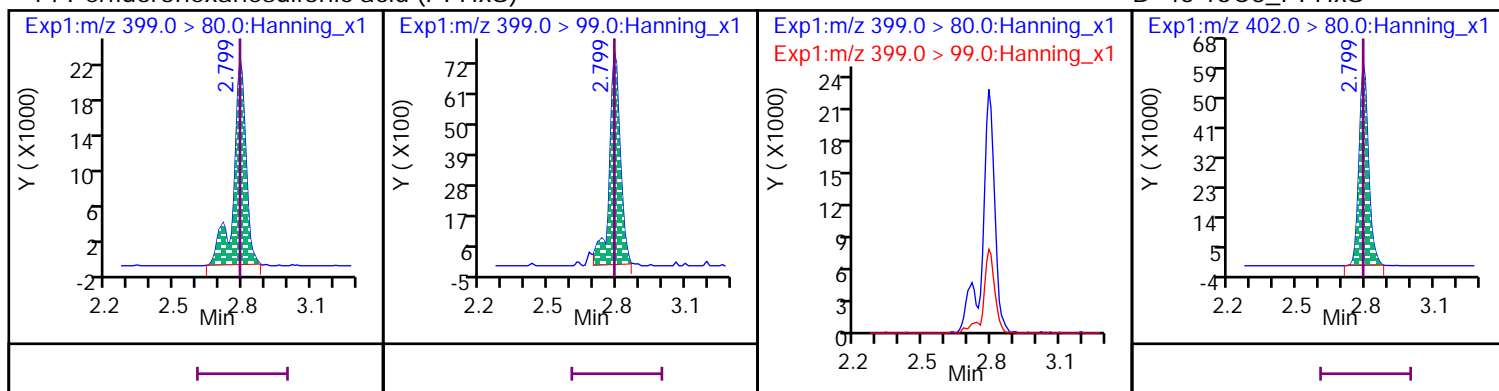
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



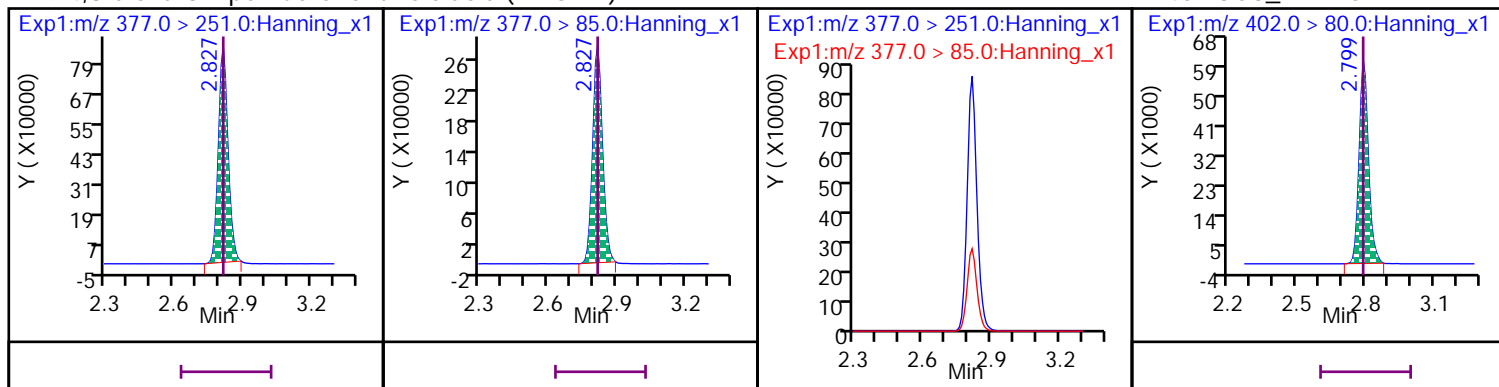
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS

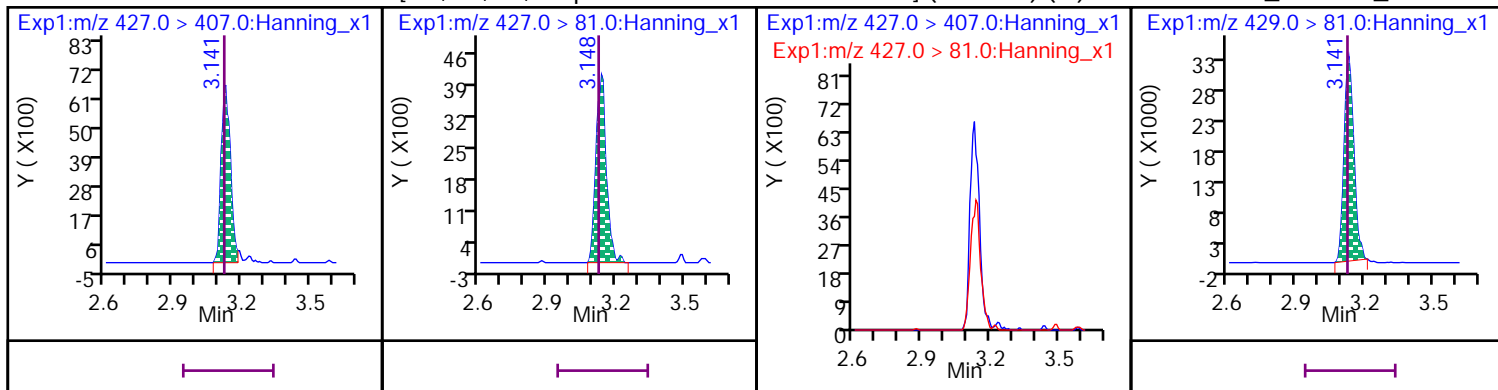


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS

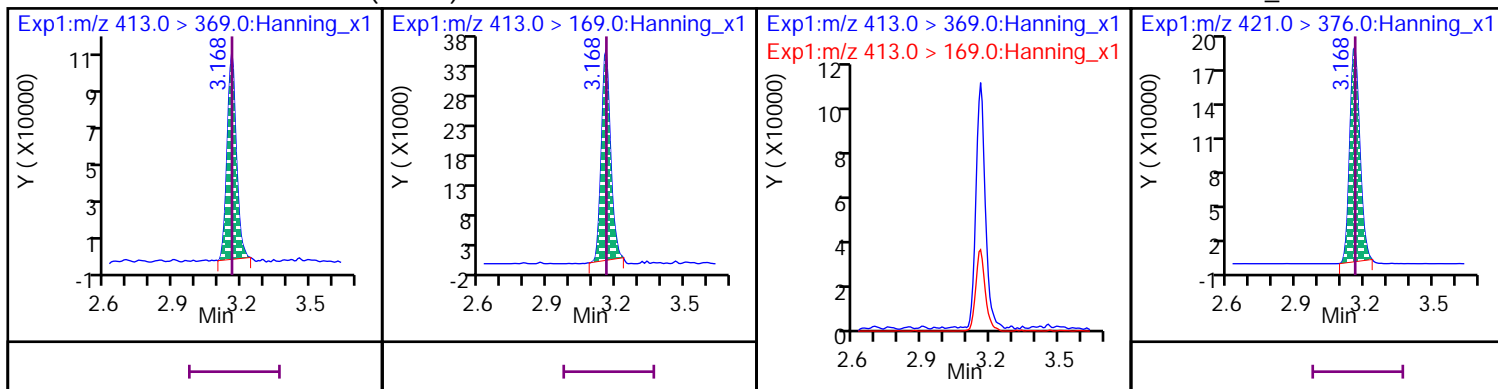


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M) D 64 13C2\_6:2 FTS\_2



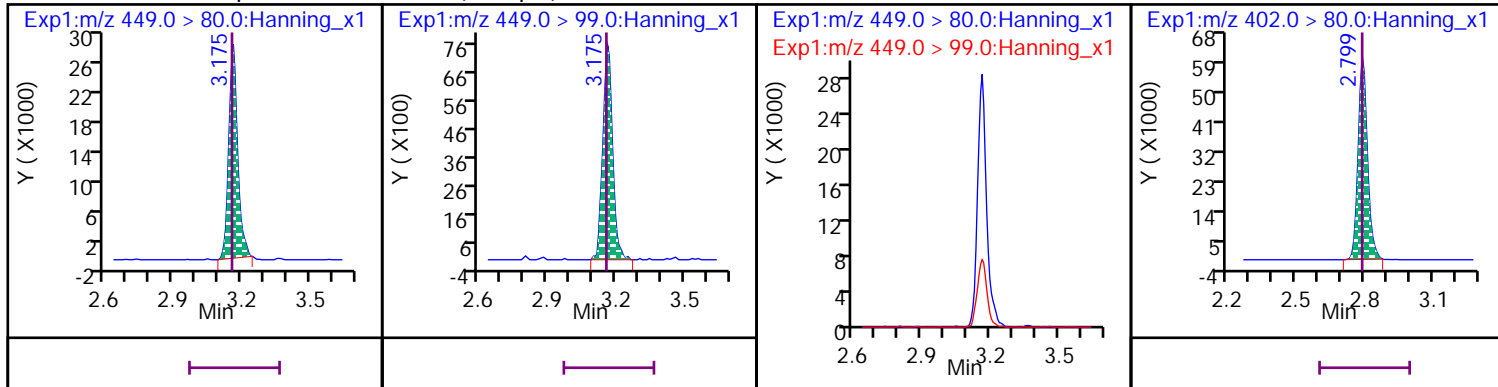
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



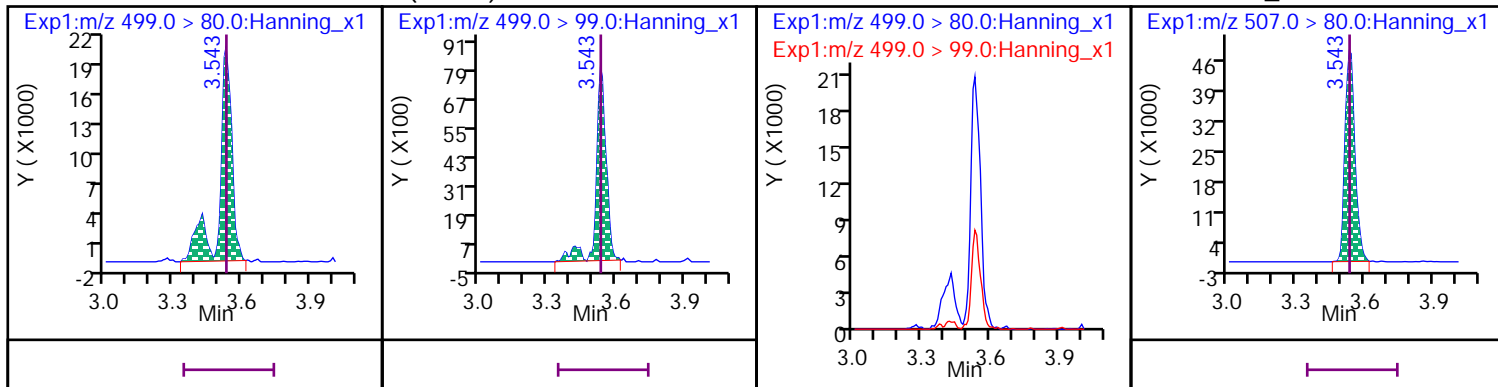
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

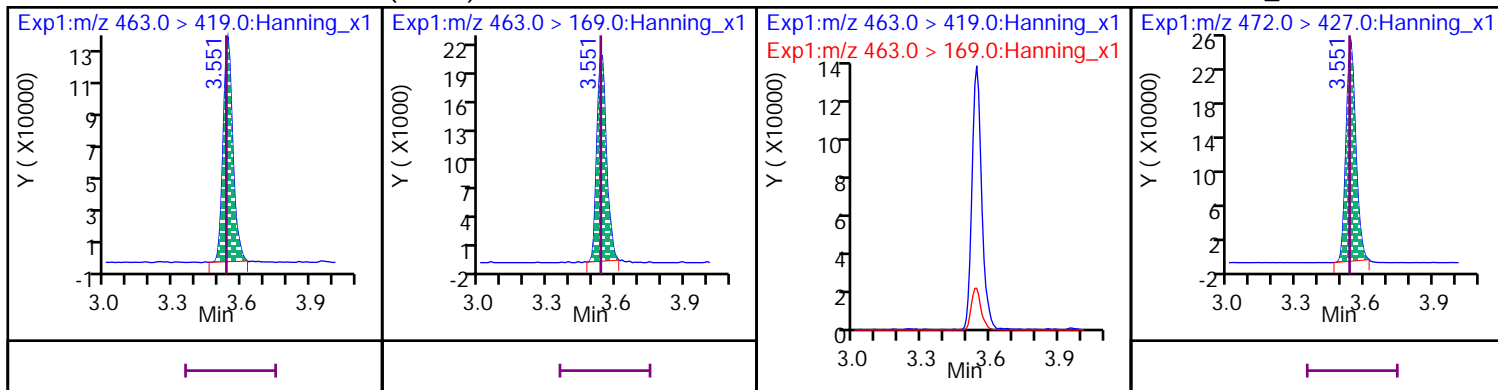
D 54 13C8\_PFOS





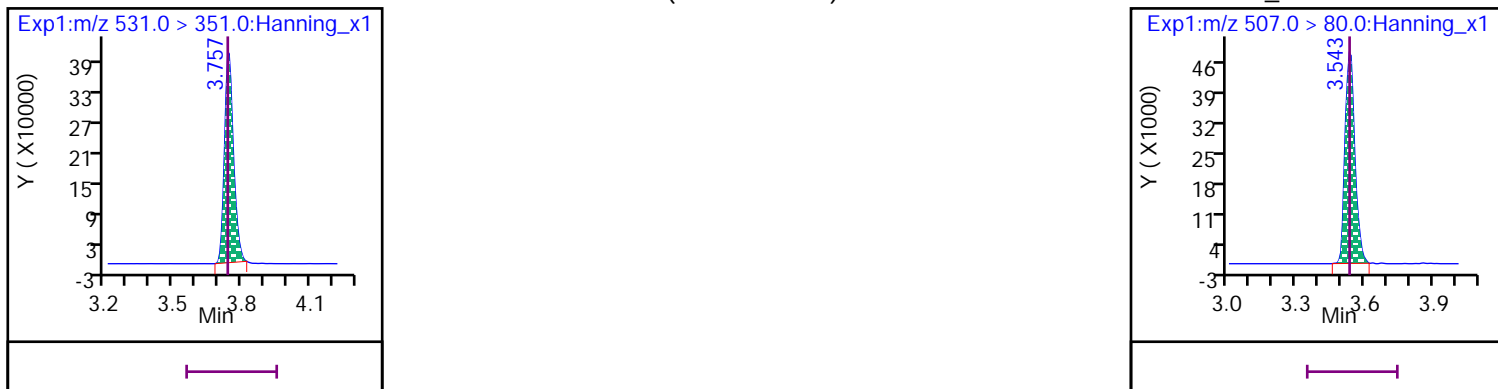
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



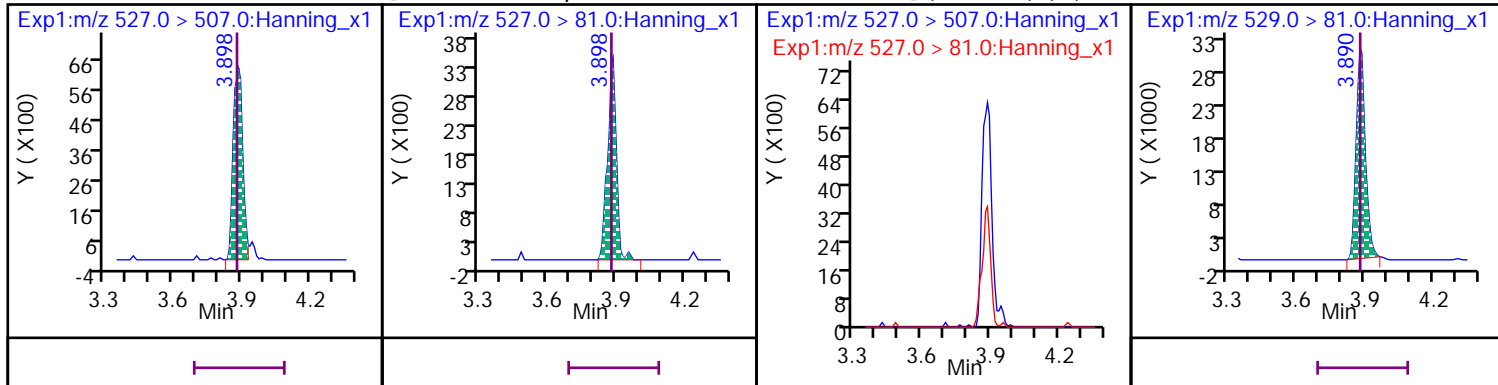
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



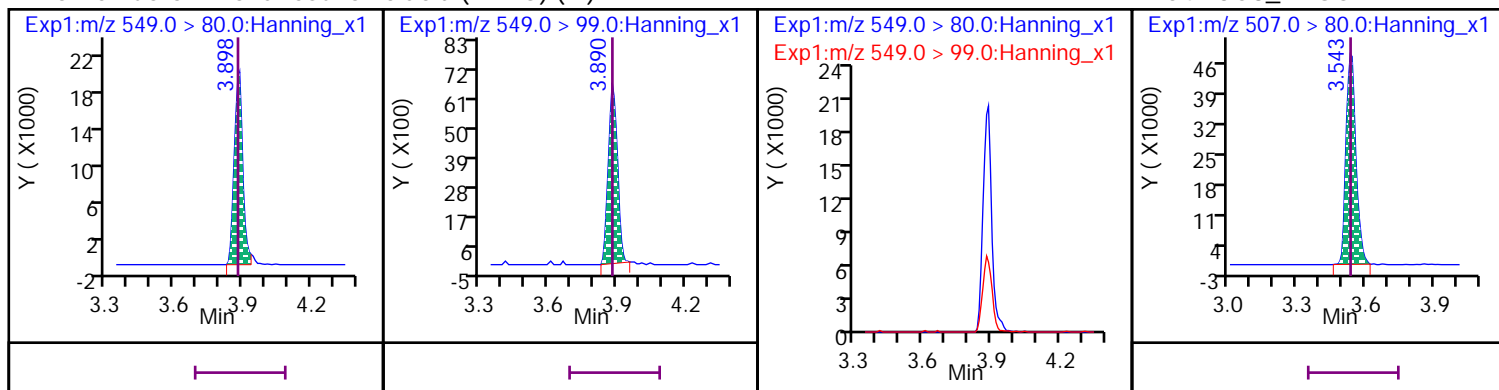
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



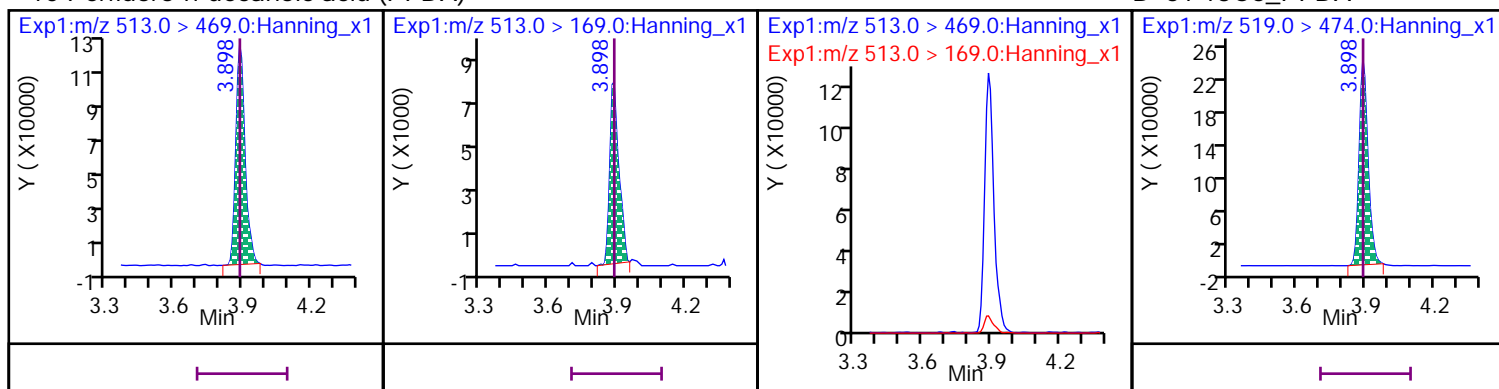
16 Perfluoro-1-nonanesulfonic acid (PFNS) (M)

D 54 13C8\_PFOS



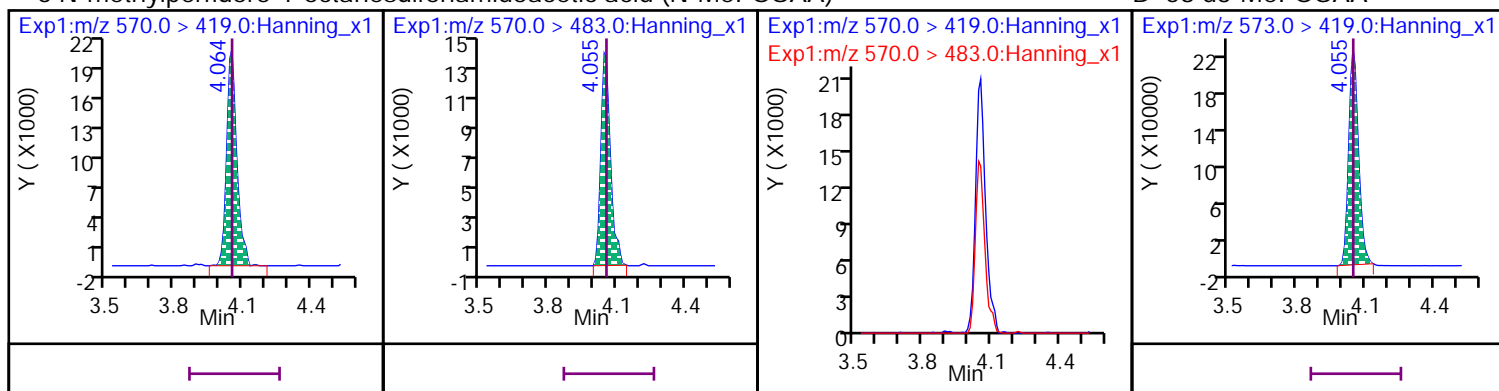
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



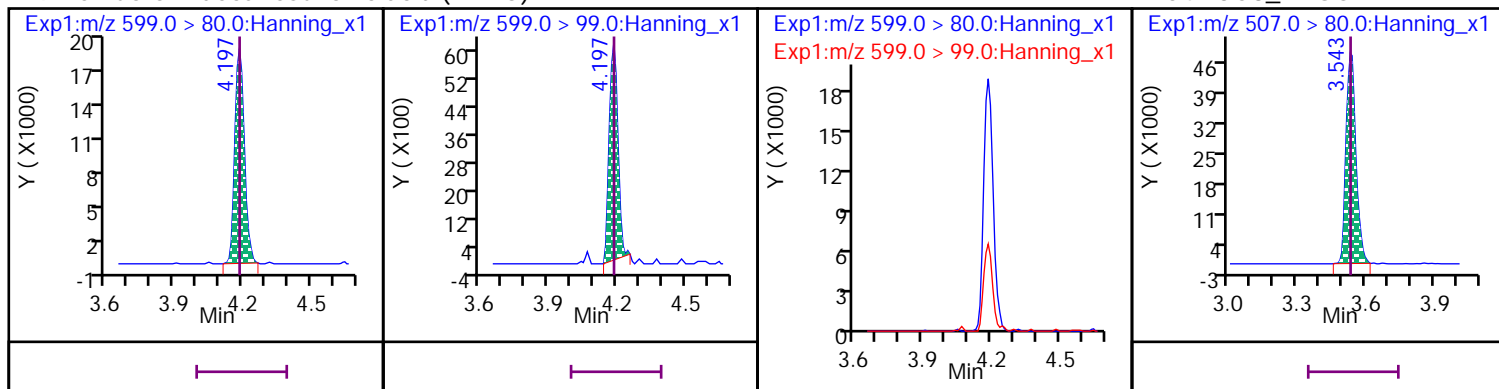
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



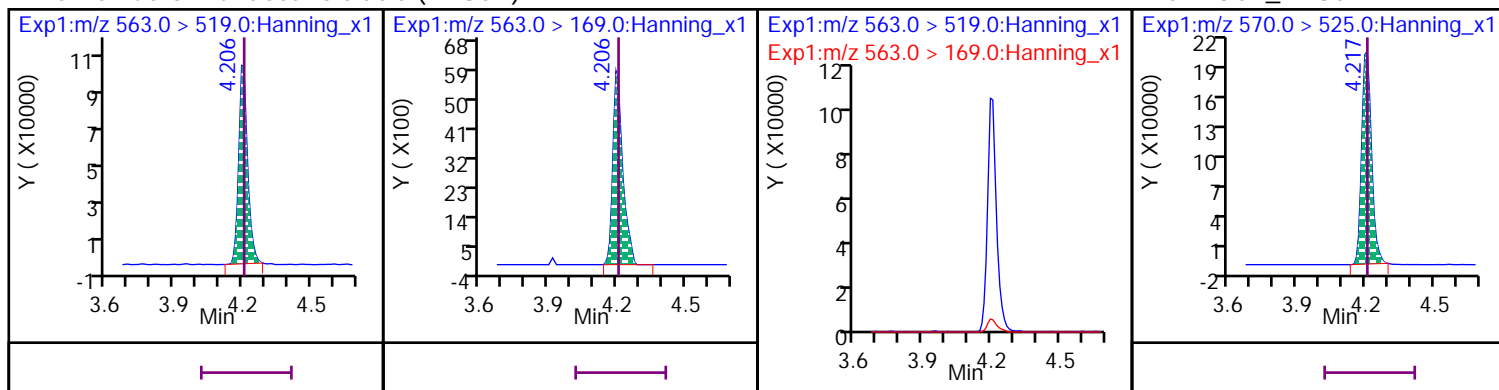
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



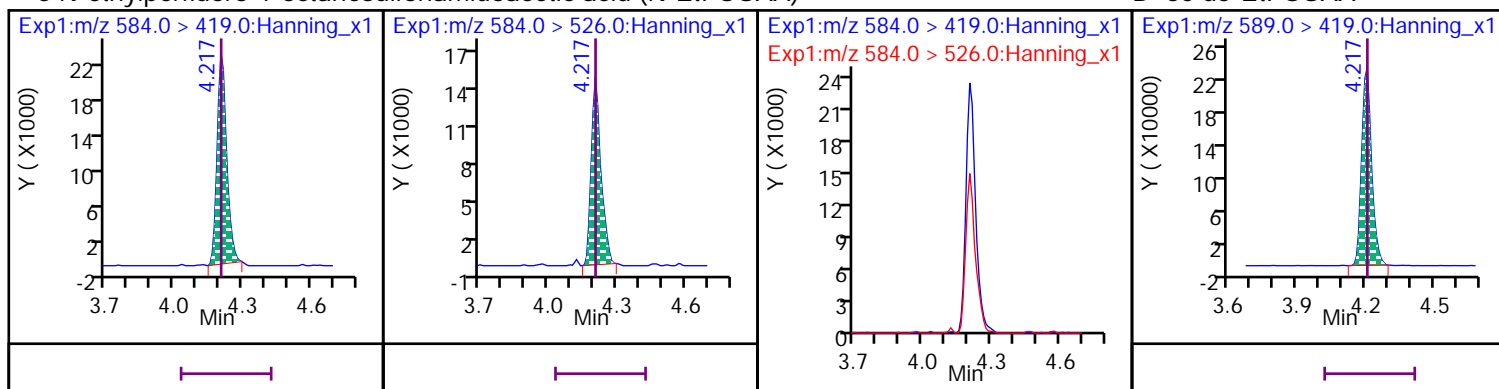
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUDa



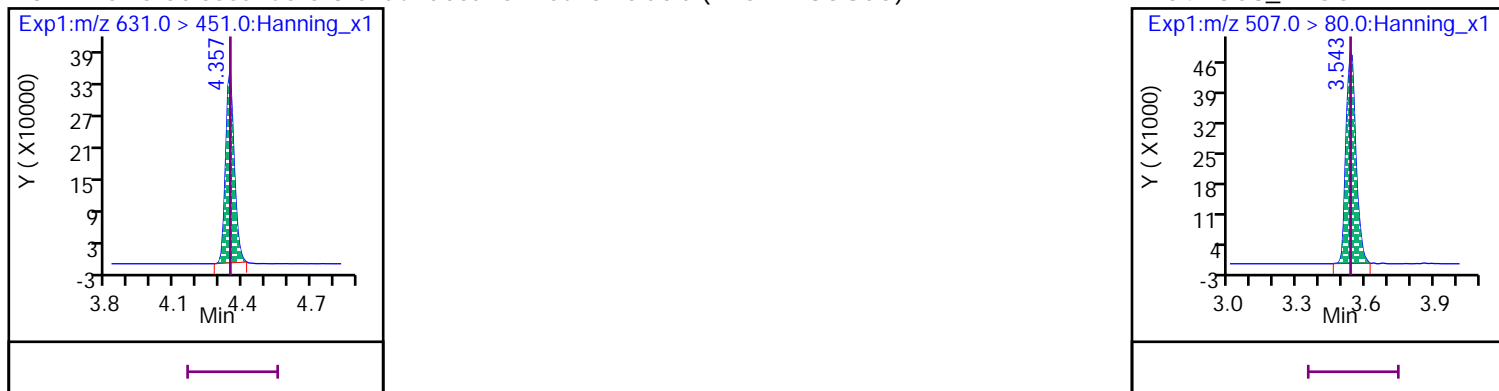
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



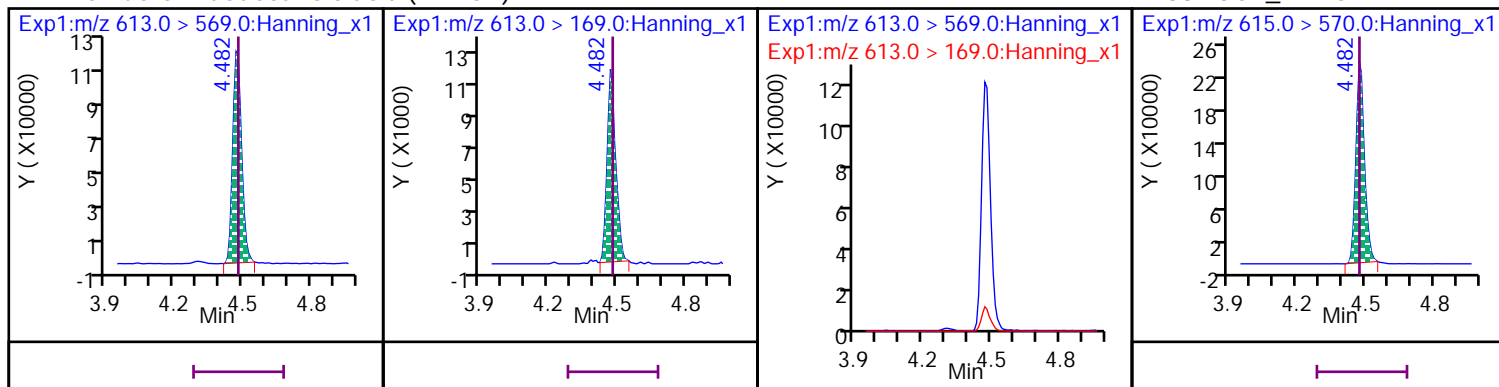
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)

D 54 13C8\_PFOS



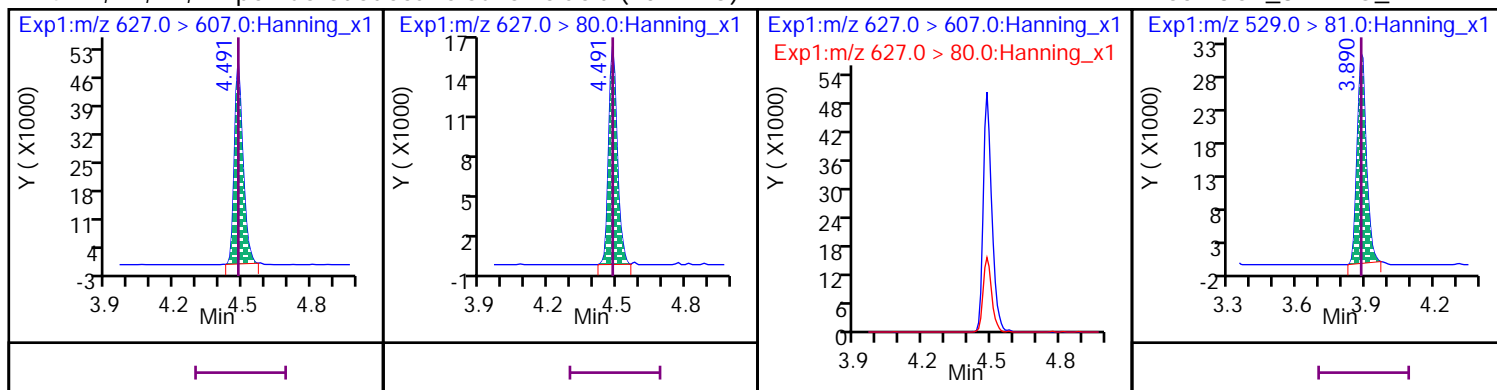
## 11 Perfluoro-n-dodecanoic acid (PFDaA)

D 38 13C2\_PFDaA



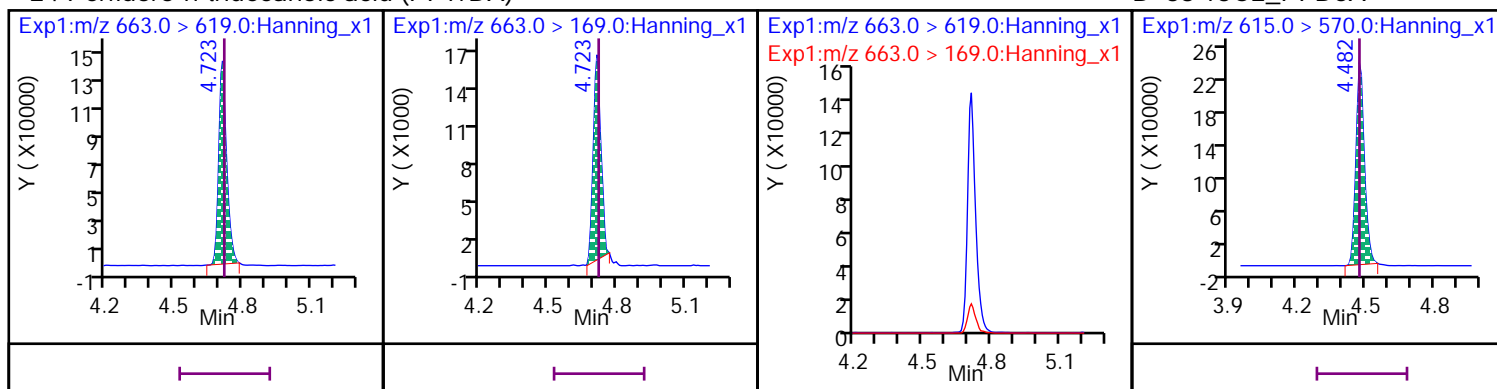
## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

## D 65 13C2\_8:2 FTS\_2



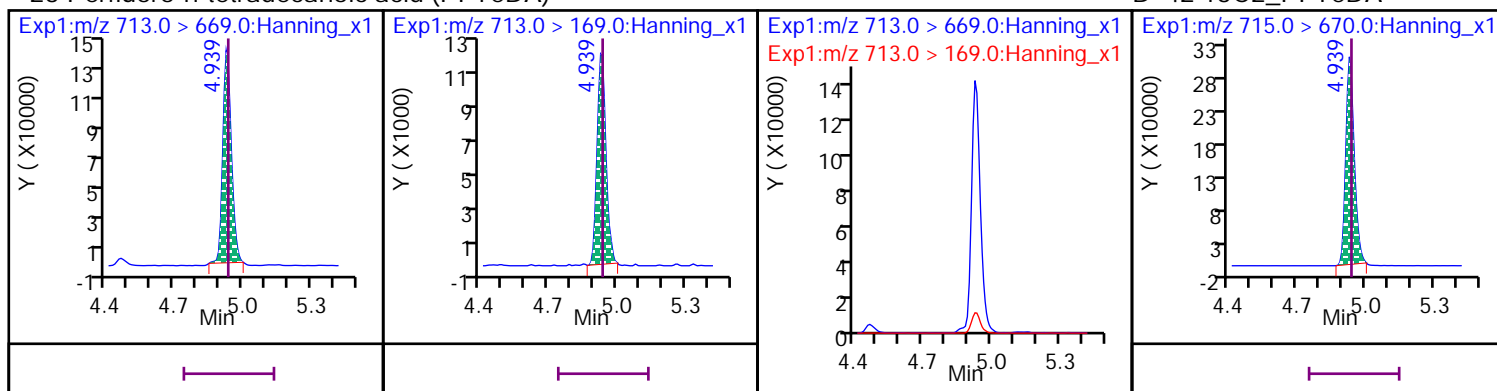
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTTeDA)

## D 42 13C2\_PFTeDA

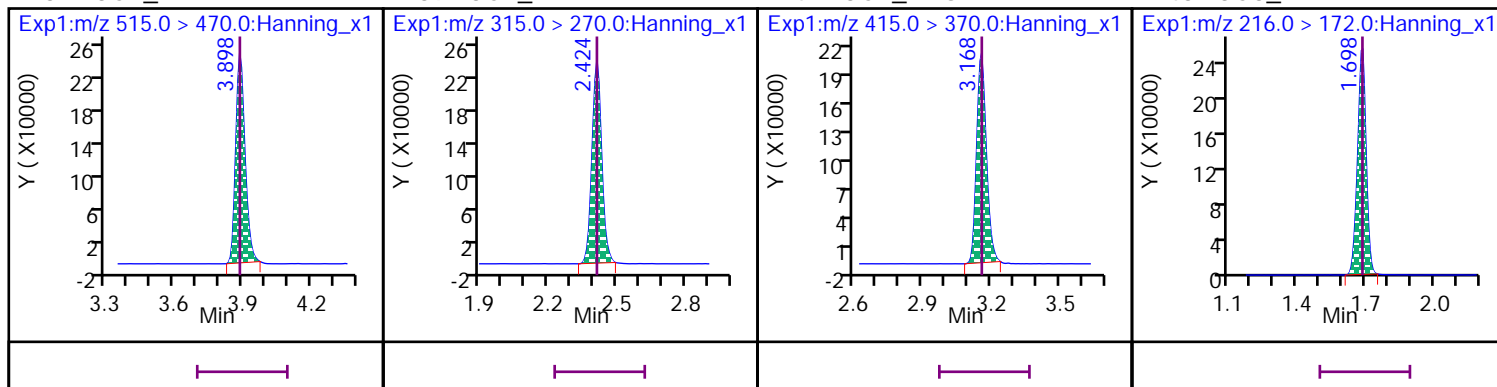


## \* 37 13C2\_PFDA

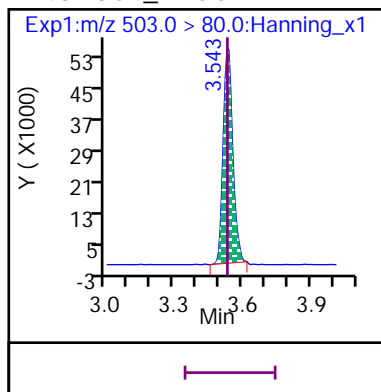
## \* 39 13C2\_PFHxA

## \* 41 13C2\_PFOA

## \* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

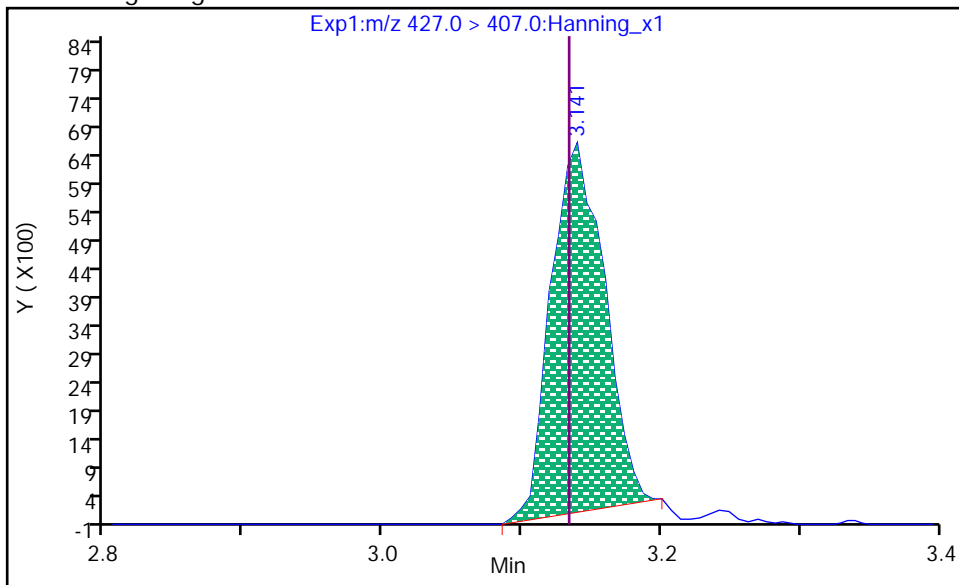
Dil. Factor: 1

Operator: Stephen E. Somerville

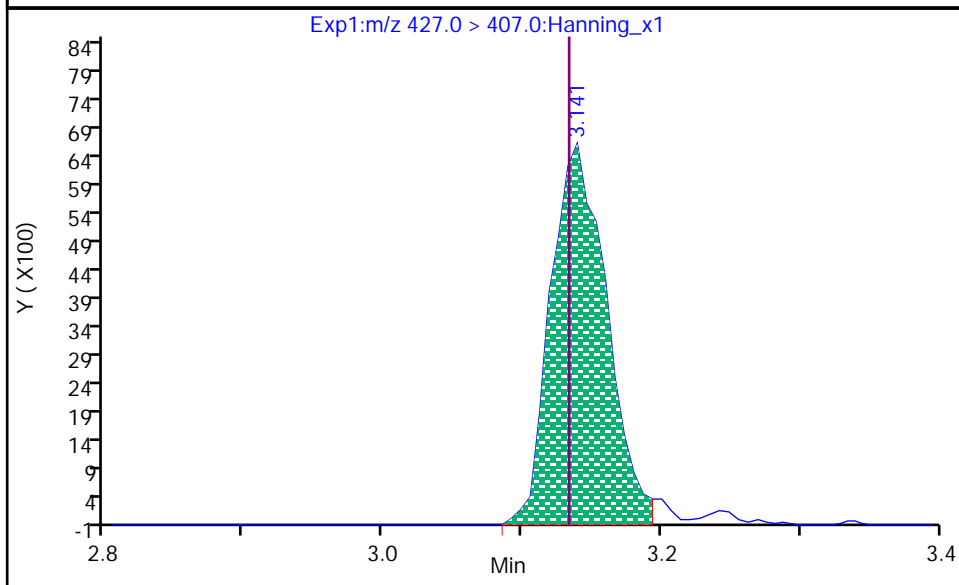
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

RT: 3.141  
Area: 17032  
Amount: 411.01  
Amount Units: ng/L



RT: 3.141  
Area: 18390  
Amount: 446.09  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:17:54

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

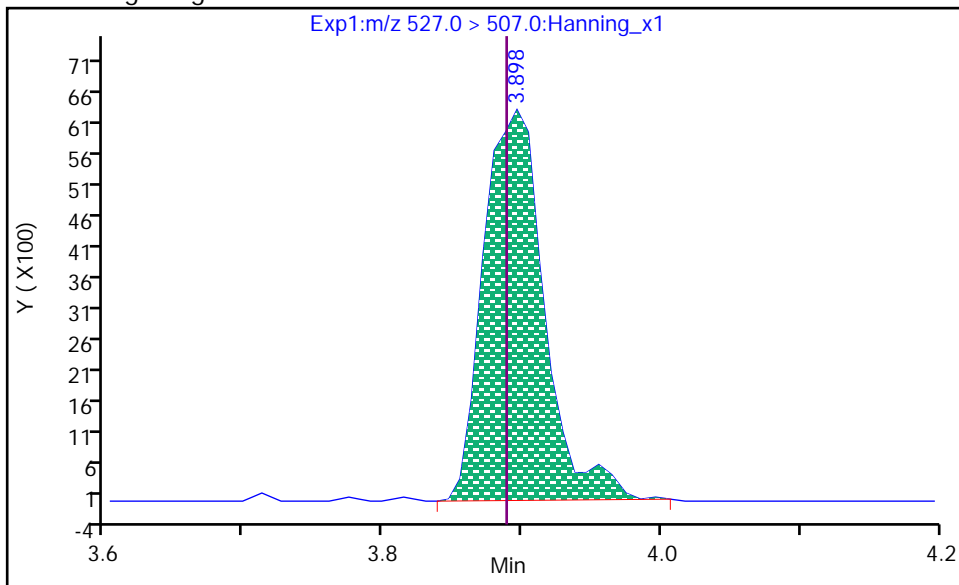
Dil. Factor: 1

Operator: Stephen E. Somerville

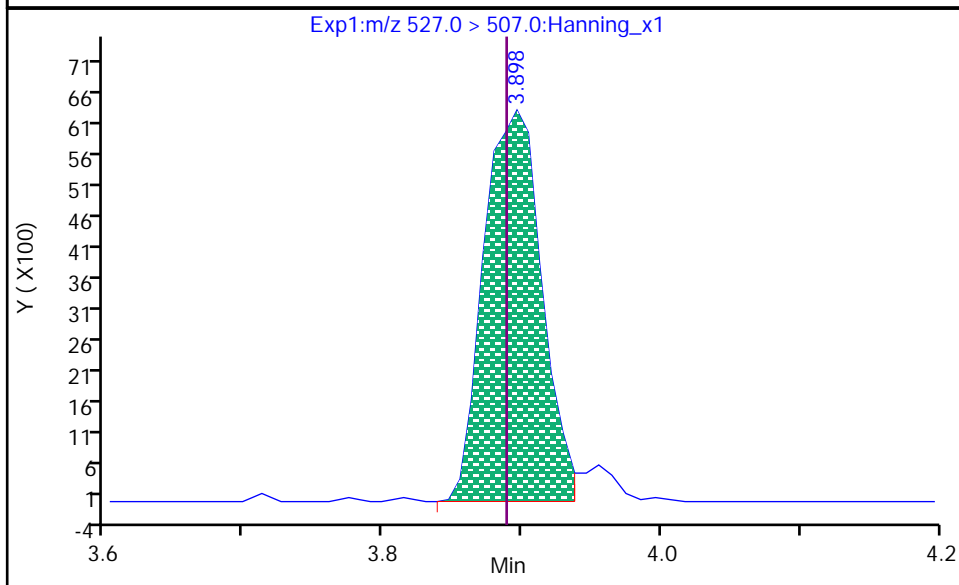
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.898  
Area: 19021  
Amount: 539.73  
Amount Units: ng/L



RT: 3.898  
Area: 18094  
Amount: 512.60  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:18:05

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720017.d

Injection Date: 17-Dec-2020 14:19:09

Inst. ID: LCMSMS02

Client ID:

Lab ID: ICV 500\_SVLC-1202

Sample Info: ICV 500\_SVLC-1202

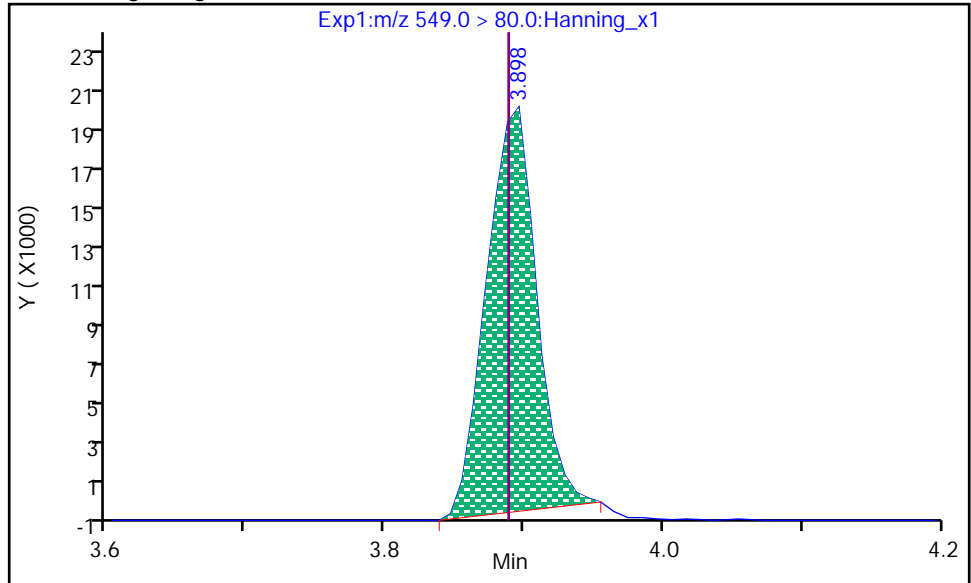
Dil. Factor: 1

Operator: Stephen E. Somerville

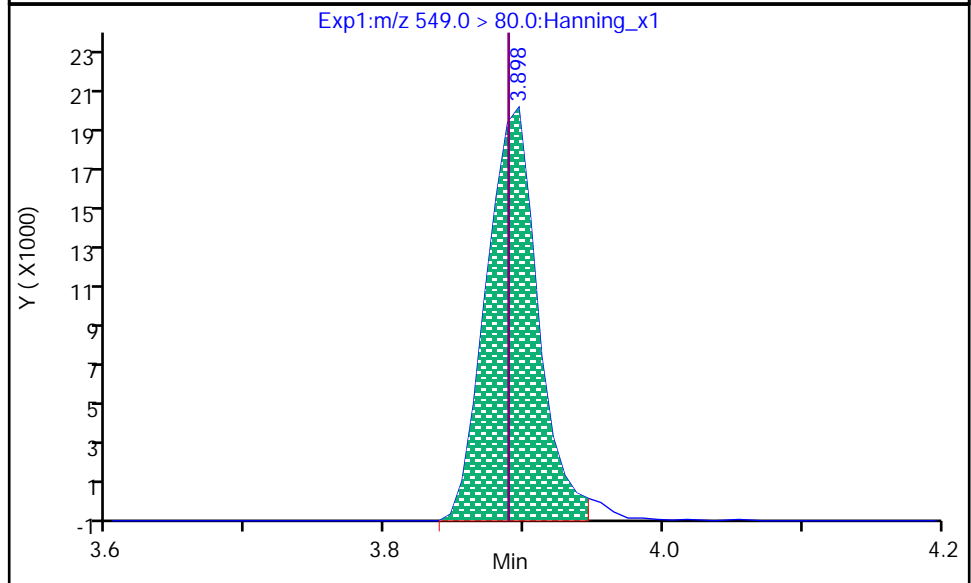
16 PFNS, CAS: 68259-12-1

Processing Integration Results

RT: 3.898  
Area: 48422  
Amount: 449.47  
Amount Units: ng/L



RT: 3.898  
Area: 50989  
Amount: 473.30  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:18:14

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d  
 Injection Date: 17-Dec-2020 14:29:42 Injection Vol: 10.0 uL  
 Sample Type: CheckStd Auto Sampler: 13  
 Sample Info: ISOMER CHECK\_SVLC-1189 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Stephen E. Somerville  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.693	1.696	0	665750	23	>100:1			1000.00	959.91	90.5	
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	665744	18	>100:1			1000.00	967.81	91.4	
<b>D 44 13C3_PFBs CAS: SESI-0116</b>													
302 > 80		2.120	2.125	0	225554	17	>100:1			1000.00	979.69	91.1	
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.388	1	109159	17	>100:1			5000.00	4509.15	86.3	
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.423	1	694964	19	>100:1			1000.00	942.87	89.7	
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.539	0	1237526	19	>100:1			5000.00	4646.17	87.6	
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.792	2.790	1	570788	18	>100:1			1000.00	940.89	92.7	
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.801	2.799	1	169210	20				1000.00	988.21	94.4	
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.136	3.135	1	81816	22	>100:1			5000.00	4248.33	78.2	
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.163	3.169	0	557445	23	>100:1			1000.00	941.85	85.1	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.163	3.169	0/0	5462959	44	>100:1	Target = 2.85	0.17	10000	9613.01		
413 > 169	53	3.163	3.169		2033553	36	>100:1	2.68 (1.42-4.28)	0.23				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.545	3.545	1	147658	22	>100:1			1000.00	984.85	95.7	
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.545	3.545	1	682696	22	>100:1			1000.00	909.09	86.2	
<b>D 55 13C8_PFOSA CAS: SESI-0107</b>													
506 > 78		3.867	3.866	1	287269	21	>100:1			1000.00	927.98	86.9	
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.891	3.891	1	89668	16	>100:1			5000.00	4833.82	96.1	
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.891	3.899	0	628227	20	>100:1			1000.00	947.08	90	
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.057	4.056	1	723448	19	>100:1			5000.00	5040.07	94.9	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.057	4.065	0/-1	1244979	33	>100:1	Target = 1.34	0.13	10000	11202		
570 > 483	58	4.057	4.065		943967	34	>100:1	1.31 (0.67-2.02)	0.24				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.208	4.217	0	734221	17	>100:1			5000.00	5528.16	99.4	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.218	4.217	1/1	1556003	34	>100:1	Target = 1.71	0.10	10000	10643		M
584 > 526	60	4.218	4.217		946015	34	>100:1	1.64 (0.85-2.57)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 52 13C7_PFUdA</b>		<b>CAS: SESI-0117</b>											
570 > 525		4.208	4.217	0	615250	18				1000.00	973.38	90.7	
<b>D 61 d7-MeFOSE</b>		<b>CAS: SESI-0129</b>											
623 > 59		4.299	4.298	1	108995	18	>100:1			1000.00	1007.27	92.9	
<b>D 57 d3-MeFOSA</b>		<b>CAS: SESI-0109</b>											
515 > 169		4.319	4.318	1	49951	22	>100:1			1000.00	943.95	90.9	
<b>D 62 d9-EtFOSE</b>		<b>CAS: SESI-0130</b>											
639 > 59		4.458	4.465	0	126181	18	>100:1			1000.00	1006.26	104	
<b>D 38 13C2_PFDoA</b>		<b>CAS: SESI-0118</b>											
615 > 570		4.485	4.483	1	677017	18				1000.00	1118.45	104	
<b>D 59 d5-EtFOSA</b>		<b>CAS: SESI-0108</b>											
531 > 169		4.485	4.483	1	47545	16	>100:1			1000.00	968.44	92.3	
<b>D 42 13C2_PFTeDA</b>		<b>CAS: SESI-0119</b>											
715 > 670		4.941	4.948	0	884306	18	>100:1			1000.00	1049.69	99.7	
<b>D 40 13C2_PFHxDA</b>		<b>CAS: SESI-0103</b>											
815 > 770		5.327	5.334	0	819475	19	>100:1			1000.00	904.33	89.7	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.891	3.899	0	648561	20	>100:1					89.3	
<b>* 39 13C2_PFHxA</b>		<b>CAS: SESI-0120</b>											
315 > 270		2.425	2.423	1	676716	19	>100:1					89.9	
<b>* 41 13C2_PFOA</b>		<b>CAS: 864071-08-9</b>											
415 > 370		3.163	3.169	0	577829	22	>100:1					89.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	608048	23	>100:1					91.3	
<b>* 48 13C4_PFOS</b>		<b>CAS: 2795-39-3</b>											
503 > 80		3.537	3.545	0	139201	19						85.7	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d

Injection Date: 17-Dec-2020 14:29:42

Inst. ID: LCMSMS02

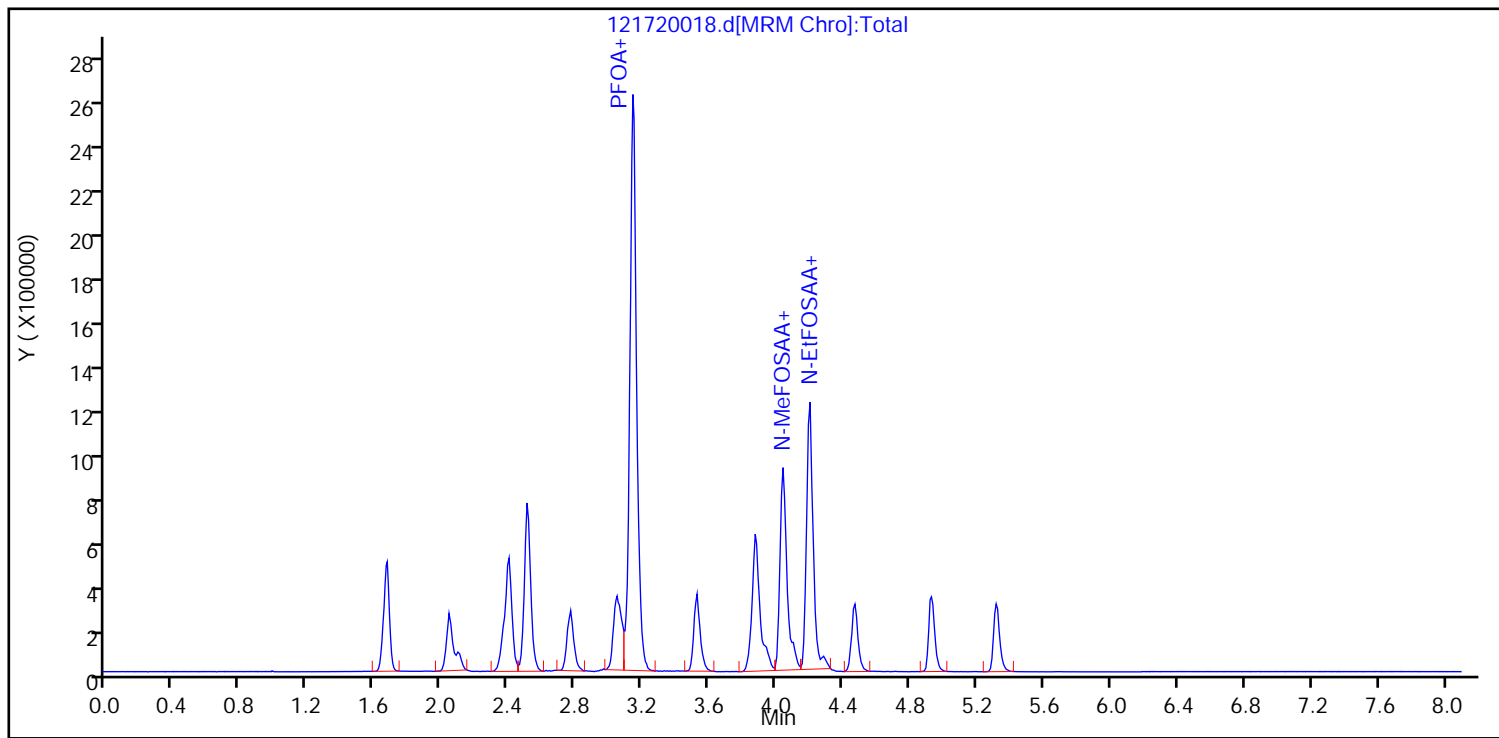
Client ID:

Lab ID: ISOMER CHECK\_SVLC-1189

Sample Info: ISOMER CHECK\_SVLC-1189

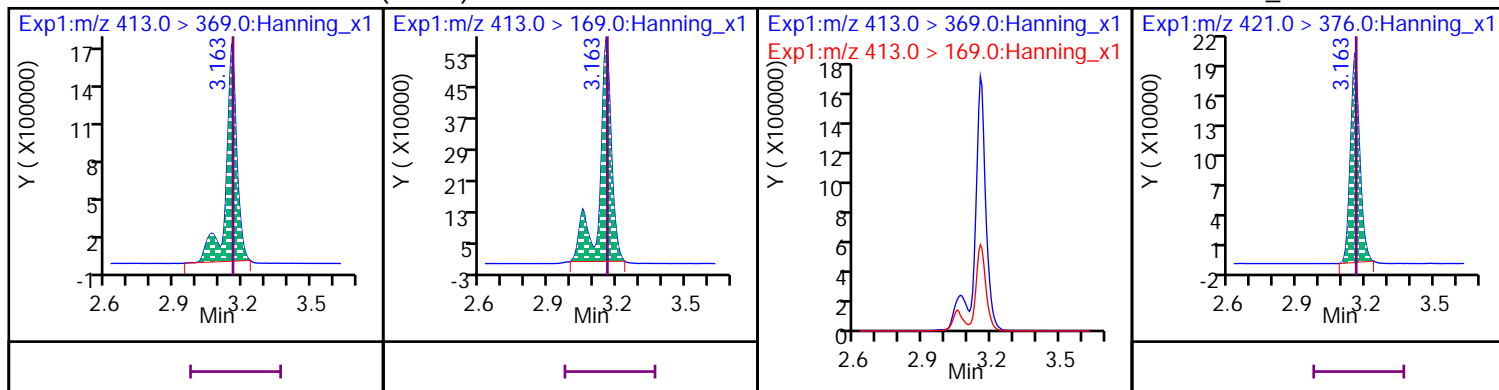
Dil. Factor: 1

Operator: Stephen E. Somerville



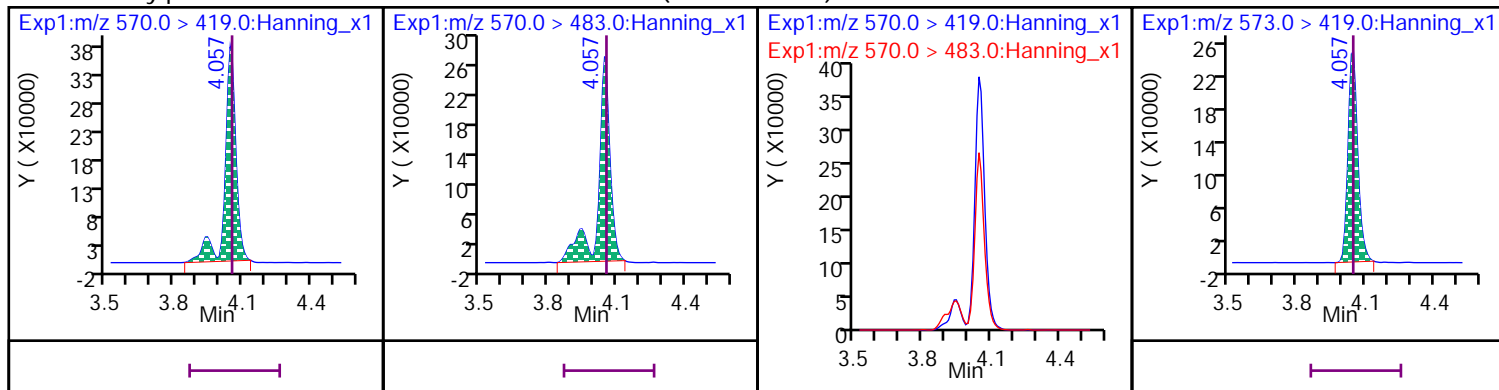
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



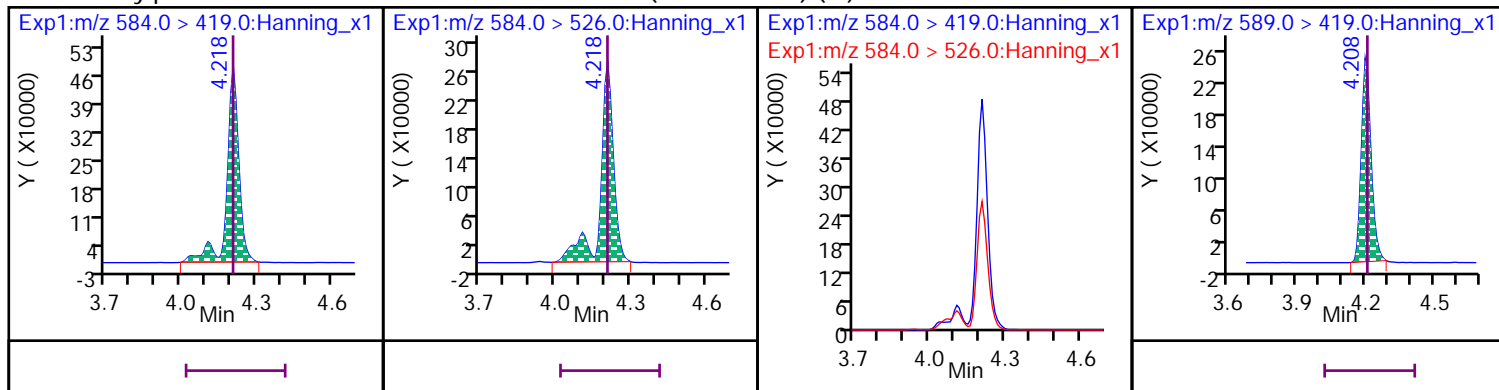
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA

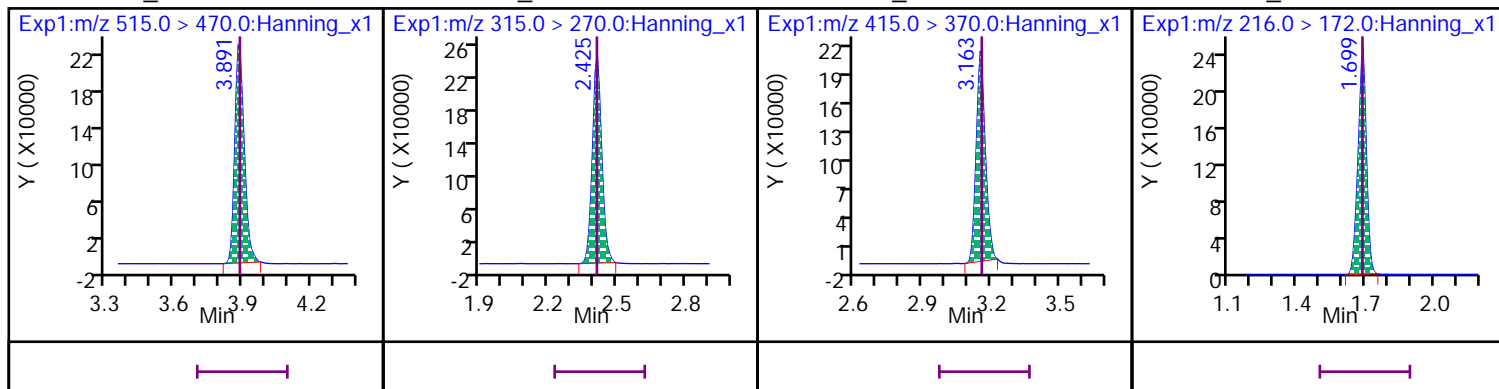


\* 37 13C2\_PFDA

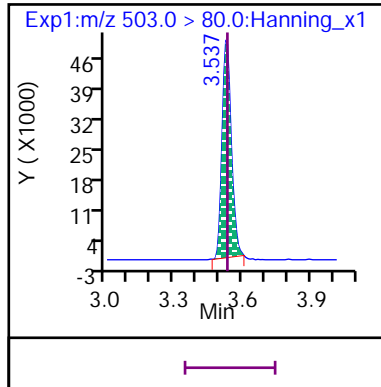
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b\121720018.d

Injection Date: 17-Dec-2020 14:29:42

Inst. ID: LCMSMS02

Client ID:

Lab ID: ISOMER CHECK\_SVLC-1189

Sample Info: ISOMER CHECK\_SVLC-1189

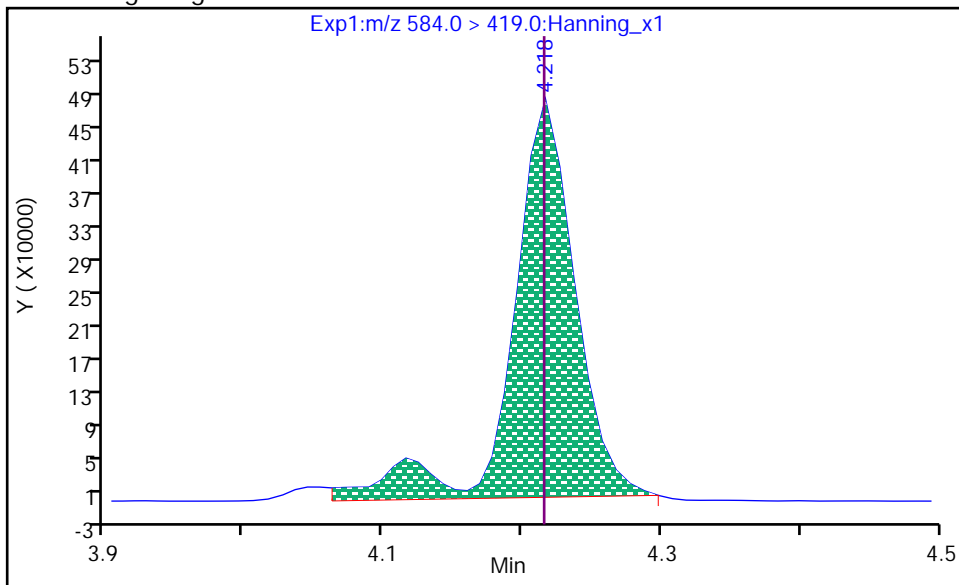
Dil. Factor: 1

Operator: Stephen E. Somerville

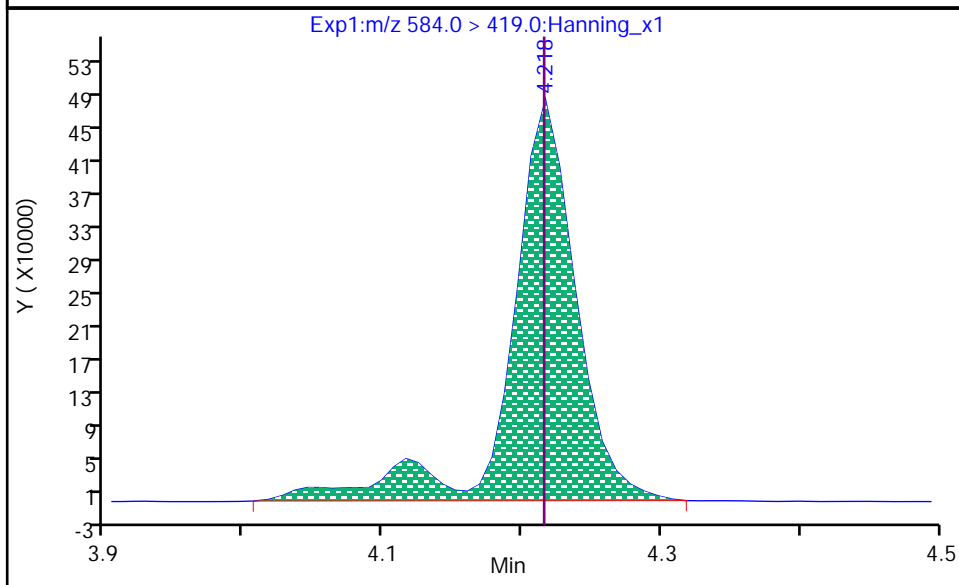
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.218  
Area: 1484300  
Amount: 10153  
Amount Units: ng/L



RT: 4.218  
Area: 1556003  
Amount: 10643  
Amount Units: ng/L



Data Editor: stephen.somerville, 17-Dec-2020 18:05:13

Audit Action: Mint

Audit Reason: Isomers

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d  
Injection Date: 28-Dec-2020 09:55:50 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	100.55	101	70 - 130
D 46 13C4_PFBFA	735341	649747			88.4	50 - 150
D 50 13C5_PFPeA	728206	665996			91.5	50 - 150
21 PFPeA			100.00	104.97	105	70 - 130
7 PFBS			88.400	93.422	106	70 - 130
D 44 13C3_PFBFS	247575	238207			96.2	50 - 150
1 4:2 FTS			93.400	95.316	102	70 - 130
D 63 13C2_4:2 FTS_2	126464	144067			114	50 - 150
D 49 13C5_PFHxA	774364	743582			96	50 - 150
15 PFHxA			100.00	99.817	99.8	70 - 130
22 PFPeS			93.800	92.565	98.7	70 - 130
28 GenX			200.00	193.32	96.7	70 - 130
D 66 13C3_GenX	1412202	1401050			99.2	50 - 150
D 47 13C4_PFHpA	616003	633684			103	50 - 150
13 PFHpA			100.00	100.59	101	70 - 130
D 45 13C3_PFHxS	179294	174146			97.1	50 - 150
14 PFHxS			91.000	107.33	118	70 - 130
29 ADONA			94.200	97.542	104	70 - 130
D 64 13C2_6:2 FTS_2	104623	104346			99.7	50 - 150
2 6:2 FTS			94.800	87.996	92.8	70 - 130
20 PFOA			100.00	95.965	96	70 - 130
D 53 13C8_PFOA	654941	628007			95.9	50 - 150
12 PFHpS			95.200	105.08	110	70 - 130
18 PFOS			92.800	96.831	104	70 - 130
17 PFNA			100.00	108.15	108	70 - 130
D 56 13C9_PFNA	792377	767623			96.9	50 - 150
D 54 13C8_PFOS	154357	152445			98.8	50 - 150
30 9CI-PF3ONS			93.200	92.655	99.4	70 - 130
D 55 13C8_PFOSA	330552	308857			93.4	50 - 150
19 PFOSA			100.00	106.85	107	70 - 130
16 PFNS			96.000	101.76	106	70 - 130
D 65 13C2_8:2 FTS_2	93314	100453			108	50 - 150
3 8:2 FTS			95.800	89.303	93.2	70 - 130
10 PFDA			100.00	110.16	110	70 - 130
D 51 13C6_PFDA	698114	672868			96.4	50 - 150
D 58 d3-MeFOSAA	762102	791564			104	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	94.755	94.8	70 - 130
9 PFDS			96.400	112.71	117	70 - 130
5 N-EtFOSAA			100.00	117.38	117	70 - 130
25 PFUdA			100.00	89.560	89.6	70 - 130
D 60 d5-EtFOSAA	738335	731651			99.1	50 - 150
D 52 13C7_PFUdA	678701	643525			94.8	50 - 150
D 61 d7-MeFOSE	117292	105402			89.9	50 - 150
32 MeFOSE			100.00	93.380	93.4	70 - 130
26 MeFOSA			100.00	84.122	84.1	70 - 130
D 57 d3-MeFOSA	54969	51840			94.3	50 - 150
31 11Cl-PF3OUDS			94.200	102.70	109	70 - 130
D 62 d9-EtFOSE	121851	137116			113	50 - 150
33 EtFOSE			100.00	98.410	98.4	70 - 130
D 59 d5-EtFOSA	51517	50284			97.6	50 - 150
D 38 13C2_PFDoA	649290	611364			94.2	50 - 150
4 10:2 FTS			96.400	97.637	101	70 - 130
27 EtFOSA			100.00	110.11	110	70 - 130
11 PFDoA			100.00	100.68	101	70 - 130
34 PFDOS			96.800	102.62	106	70 - 130
24 PFTrDA			100.00	97.339	97.3	70 - 130
23 PFTeDA			100.00	105.62	106	70 - 130
D 42 13C2_PFTeDA	887372	813074			91.6	50 - 150
35 PFHxDA			100.00	114.46	114	70 - 130
D 40 13C2_PFHxDA	913664	935525			102	50 - 150
36 PFODA			100.00	99.302	99.3	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d  
 Injection Date: 28-Dec-2020 09:55:50 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 95  
 Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.696	1.696	1	649747	24	>100:1			1000.00	936.84	88.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.696	1.696	1/0	65071	24	35:1			100.00	100.55		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	1	665996	17	>100:1			1000.00	968.18	91.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	1/0	70291	16	81:1			100.00	104.97		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	238207	16	>100:1			1000.00	1034.64	96.2	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.125	2.125	1/0	26238	16	>100:1	Target = 3.50		88.400	93.422		
298.9 > 99	44	2.115	2.125		6952	15	41:1	3.77 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	19127	18	>100:1	Target = 3.10		93.800	92.565		
349 > 99	44	2.450	2.450		6359	19	73:1	3.00 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.379	0	144067	19	>100:1			5000.00	5951.14	114	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/1	5481	16	61:1	Target = 1.80		93.400	95.316		
327 > 81	63	2.397	2.388		3709	19	15:1	1.47 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	743582	20	>100:1			1000.00	1008.83	96	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	73278	17	>100:1	Target = 18.34		100.00	99.817		
313 > 119	49	2.415	2.423		3952	17	39:1	18.54 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1401050	21	>100:1			5000.00	5260.11	99.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	38920	22	>100:1	Target = 0.81		200.00	193.32		
285 > 185	66	2.530	2.530		45121	18	>100:1	0.86 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	-1	633684	20	>100:1			1000.00	1044.57	103	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.772	-1/0	66119	20	>100:1	Target = 3.70		100.00	100.59		
363 > 169	47	2.772	2.772		17345	17	89:1	3.81 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	174146	20	>100:1			1000.00	1017.04	97.1	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	19817	26	>100:1	Target = 3.21	0.10	91.000	107.33		M
399 > 99	45	2.790	2.790		4757	23	19:1	4.16 (1.60-4.81)	0.23				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.808	2.808	-1/-1	107845	27	>100:1	Target = 2.97		94.200	97.542		
377 > 85	45	2.818	2.808		36338	17	>100:1	2.96 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	16624	22	80:1	Target = 3.08		95.200	105.08		
449 > 99	45	3.154	3.154		4746	23	21:1	3.50 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.114	3.114	-1	104346	23	>100:1			5000.00	5418.21	99.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.128	0/1	4912	23	55:1	Target = 1.80		94.800	87.996		M
427 > 81	64	3.128	3.128		3590	25	37:1	1.36 (0.90-2.71)					M
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.141	3.141	-1	628007	24	>100:1			1000.00	1061.07	95.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	-1/0	61439	21	34:1	Target = 2.87		100.00	95.965		
413 > 169	53	3.148	3.148		25407	27	>100:1	2.41 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.520	3.520	-1	152445	21	>100:1			1000.00	1016.78	98.8	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.520	-1/0	17492	42	>100:1	Target = 3.84	0.31	92.800	96.831		
499 > 99	54	3.520	3.520		3807	34	16:1	4.59 (1.92-5.76)	0.20				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.722	3.722	-1/0	47551	27	>100:1			93.200	92.655		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	-1/0	11872	19	64:1	Target = 3.07		96.000	101.76		
549 > 99	54	3.857	3.865		5222	11		2.27 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.169	4.169	-1/0	12470	16	65:1	Target = 3.03		96.400	112.71		
599 > 99	54	4.161	4.169		4183	16	12:1	2.98 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.317	4.317	-2/-1	44462	18	>100:1			94.200	102.70		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.663	4.663	-2/-1	12560	17	>100:1	Target = 3.33		96.800	102.62		
699 > 99	54	4.672	4.663		3450	15		3.64 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.520	3.520	-1	767623	23	>100:1			1000.00	1022.18	96.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.520	3.520	-1/0	83020	23	>100:1	Target = 6.16		100.00	108.15		
463 > 169	56	3.520	3.520		12678	25	70:1	6.54 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.849	3.849	-1	308857	21	>100:1			1000.00	997.72	93.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.841	3.841	-1/0	32521	18	>100:1			100.00	106.85		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.857	3.857	-2	100453	22	>100:1			5000.00	5415.22	108	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorododecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.873	0/2	4215	17		Target = 1.95		95.800	89.303		M
527 > 81	65	3.849	3.873		2042	18	17:1	2.06 (0.97-2.93)					M
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.455	4.455	-2/0	4533	26		Target = 3.14		96.400	97.637		
627 > 80	65	4.455	4.455		1943	18	14:1	2.33 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.865	3.865	-2	672868	22	>100:1			1000.00	1014.38	96.4	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	-1/1	72834	20	>100:1	Target = 15.94		100.00	110.16		
513 > 169	51	3.873	3.873		5337	17	44:1	13.64 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.029	4.029	-1	791564	19	>100:1			5000.00	5514.61	104	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.029	4.029	-2/-1	11523	33	44:1	Target = 1.33	0.07	100.00	94.755		
570 > 483	58	4.018	4.029		10473	29		1.10 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.178	4.178	-2	731651	18	>100:1			5000.00	5508.81	99.1	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.187	4.187	0/2	17100	39	55:1	Target = 1.58	0.09	100.00	117.38		M
584 > 526	60	4.187	4.187		8220	27	24:1	2.08 (0.79-2.37)	0.14				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.178	4.178	-2	643525	17	>100:1			1000.00	1018.12	94.8	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.178	4.178	-2/0	54169	15	>100:1	Target = 15.50		100.00	89.560		
563 > 169	52	4.178	4.178		3514	20	34:1	15.41 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.287	4.287	0	105402	16	>100:1			1000.00	974.07	89.9	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.297	4.297	0/0	9248	11	37:1			100.00	93.380		M
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.307	4.307	0	51840	17	>100:1			1000.00	979.65	94.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	0/0	4920	15	43:1	Target = 1.12		100.00	84.122		
512 > 219	57	4.307	4.317		4157	12	35:1	1.18 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.455	0	137116	17	>100:1			1000.00	1093.47	113	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.464	4.464	0/0	12005	25	64:1			100.00	98.410		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	-1	611364	19				1000.00	1009.99	94.2	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.446	4.446	-2/-1	62330	19	35:1	Target = 10.85		100.00	100.68		
613 > 169	38	4.446	4.446		5732	21	64:1	10.87 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.688	4.688	-2/-1	58613	21	>100:1	Target = 8.37		100.00	97.339		
663 > 169	38	4.688	4.688		7478	25	>100:1	7.83 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.473	4.473	0	50284	16	>100:1			1000.00	1024.23	97.6	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	0/0	6049	22	68:1	Target = 1.03		100.00	110.11		
526 > 219	59	4.482	4.482		4966	21	43:1	1.21 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.906	4.906	-2	813074	19	>100:1			1000.00	965.14	91.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.906	4.906	-2/0	74407	19	10:1	Target = 12.11		100.00	105.62		
713 > 169	42	4.906	4.906		6442	17	>100:1	11.55 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.282	5.282	-3	935525	18	>100:1			1000.00	1032.40	102	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.282	5.282	-3/0	69963	21	21:1	Target = 11.48		100.00	114.46		
813 > 269	40	5.282	5.282		5976	17	>100:1	11.70 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.625	5.625	-3/0	82236	25	9.6:1	Target = 13.88		100.00	99.302		
913 > 319	40	5.625	5.625		5894	33	>100:1	13.95 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.873	-1	732310	21	>100:1					101	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	731022	19	>100:1					97.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	-1	599453	24	>100:1					93.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.696	1.696	1	609619	24	>100:1					91.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	-1	163036	21	>100:1					100	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID:

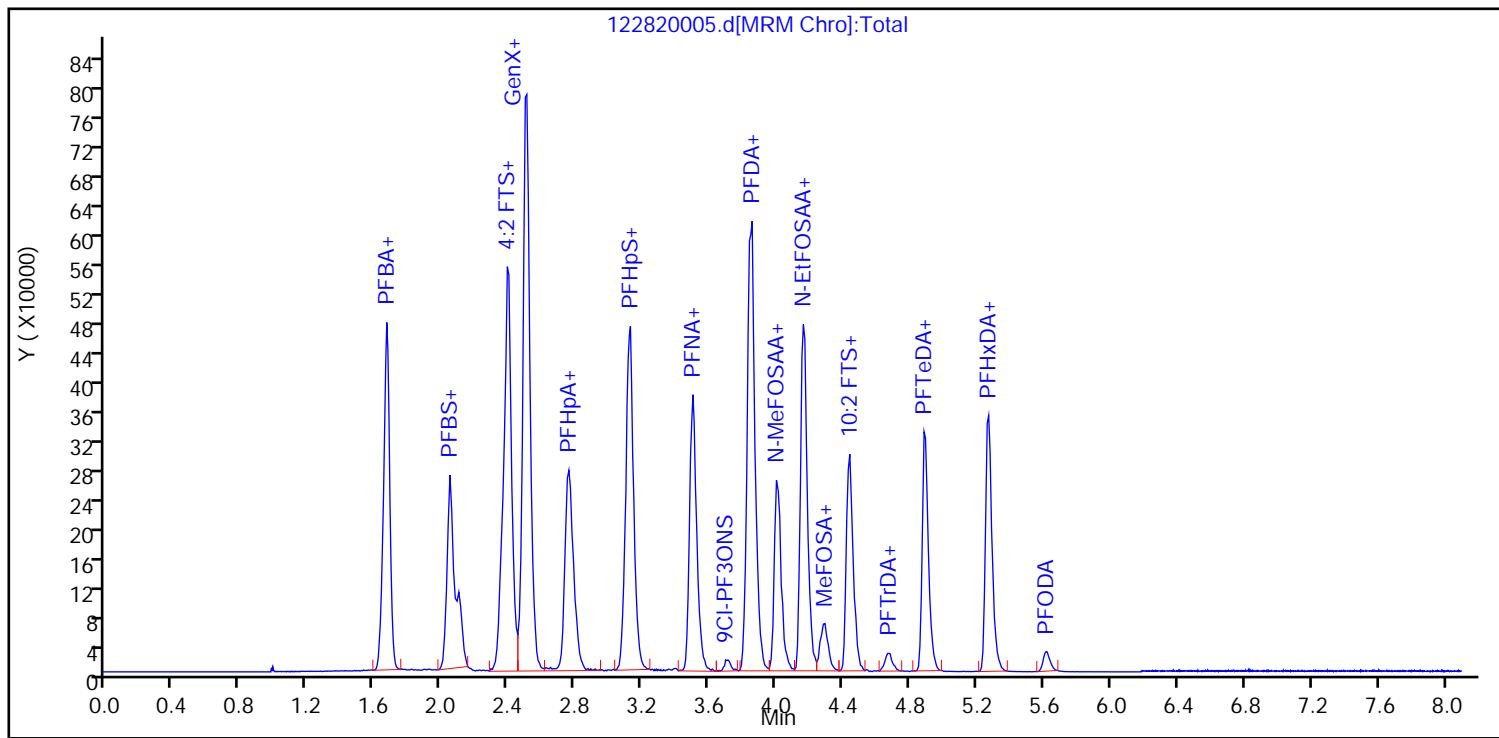
ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

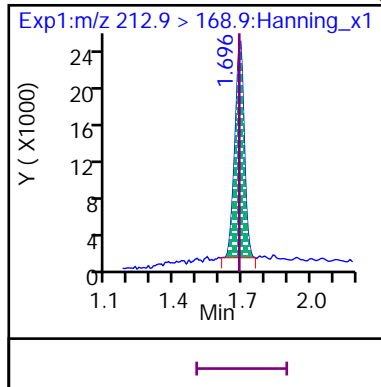
Dil. Factor: 1

Operator:

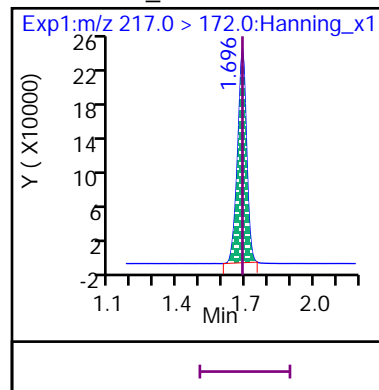
Matthew M. Miller



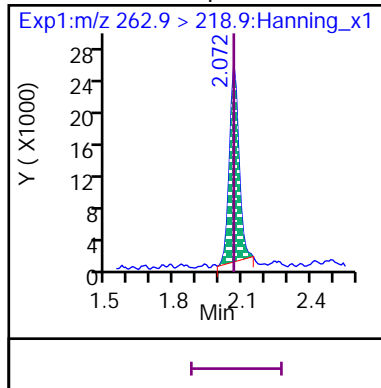
8 Perfluoro-n-butanoic acid (PFBA)



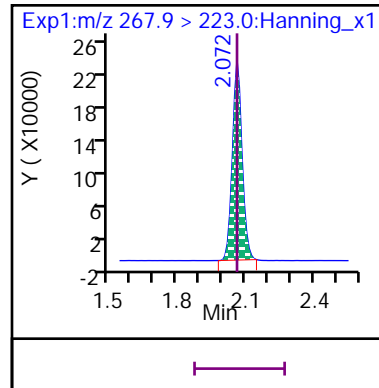
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

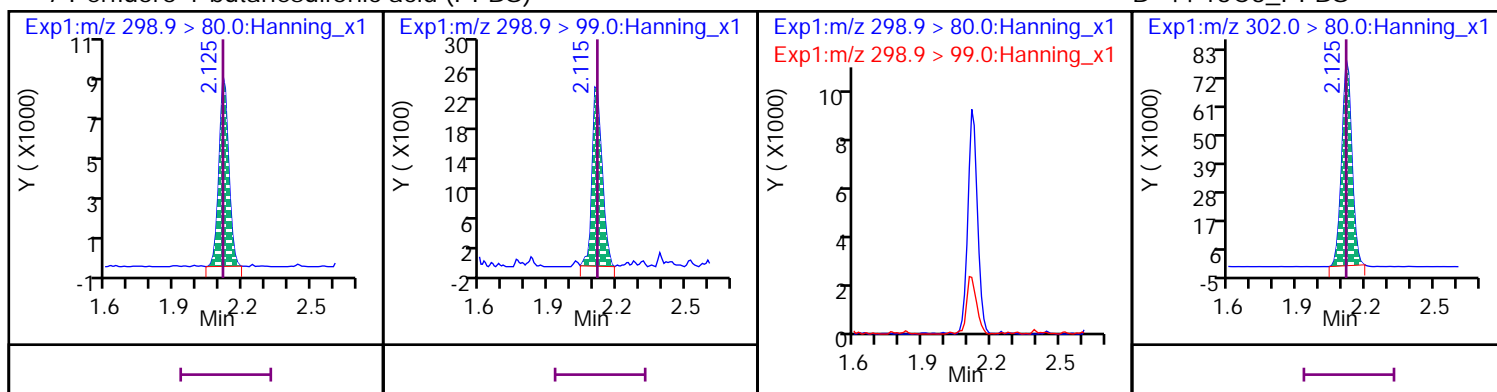


D 50 13C5\_PFPeA



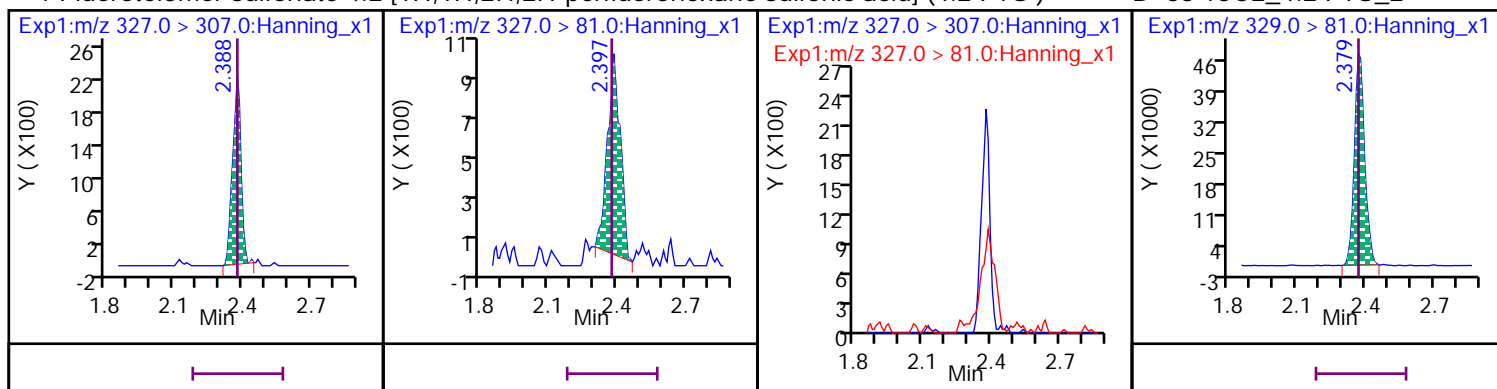
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



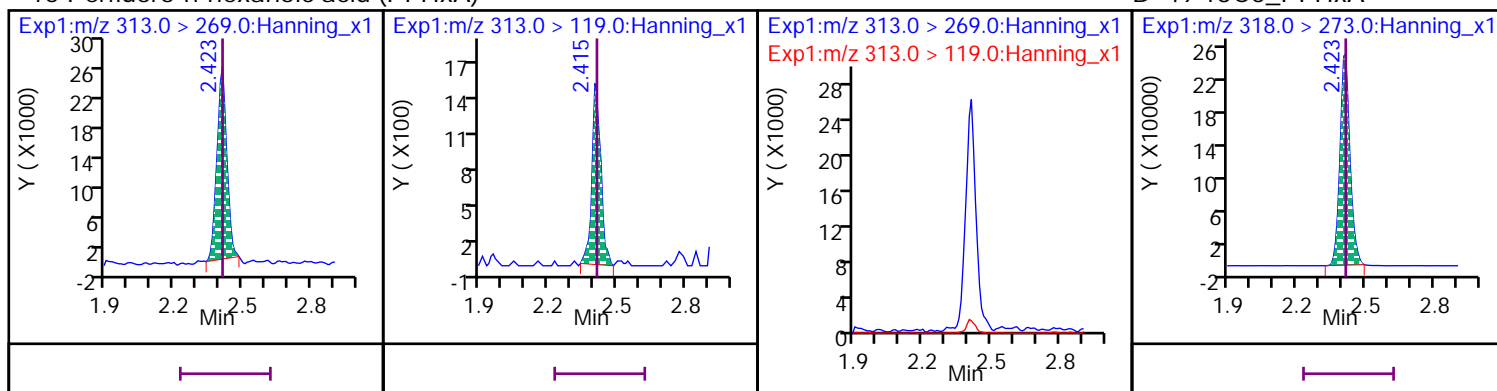
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



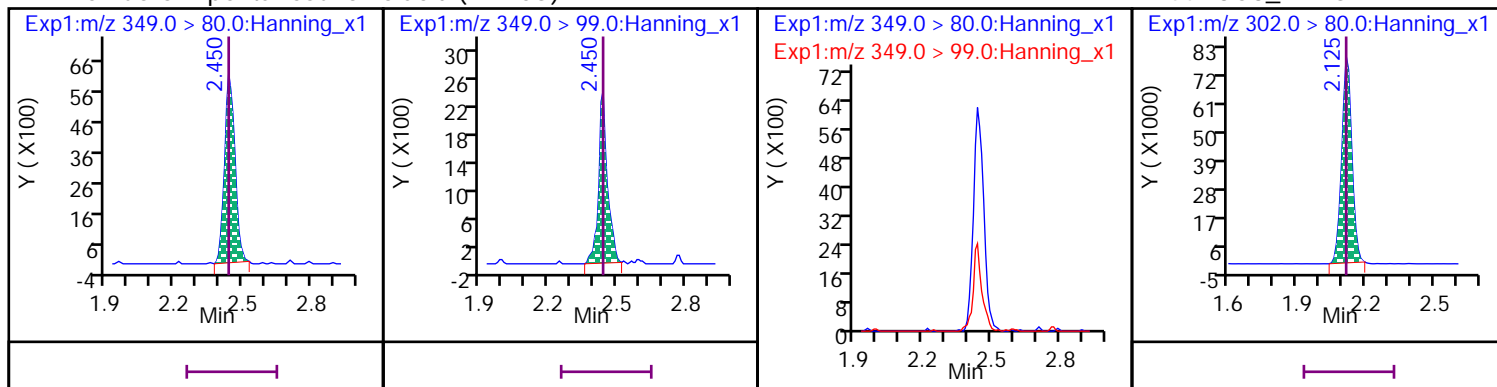
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



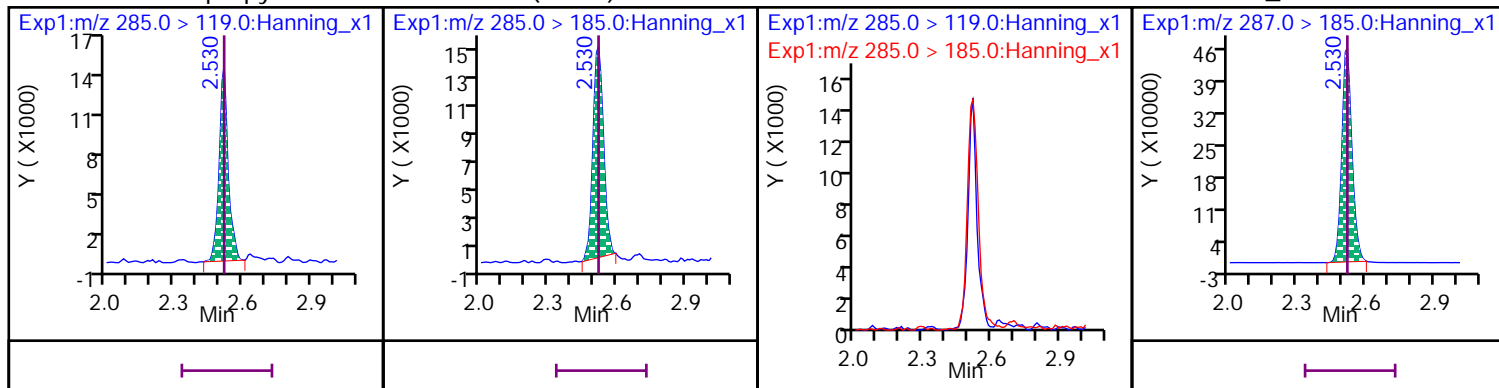
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



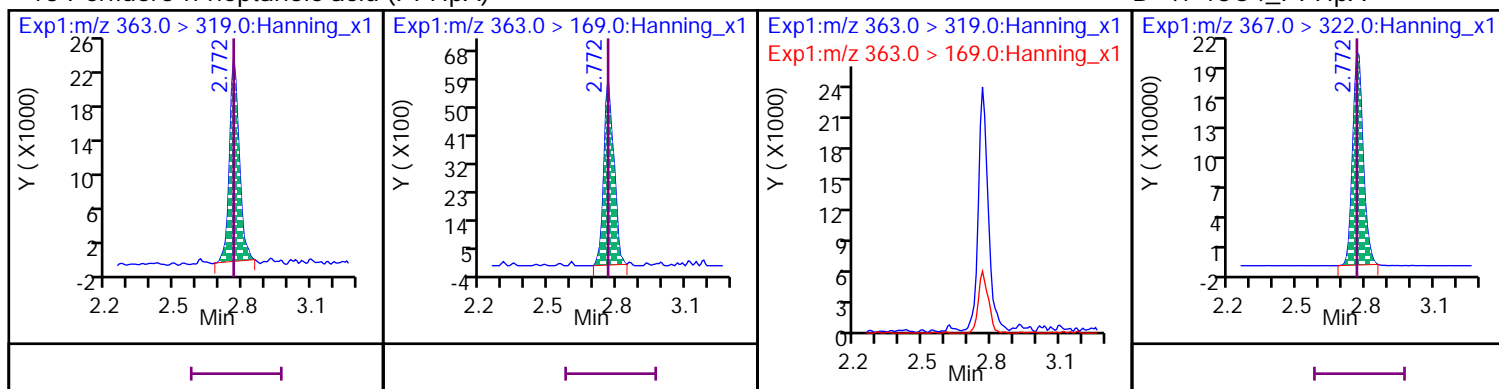
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



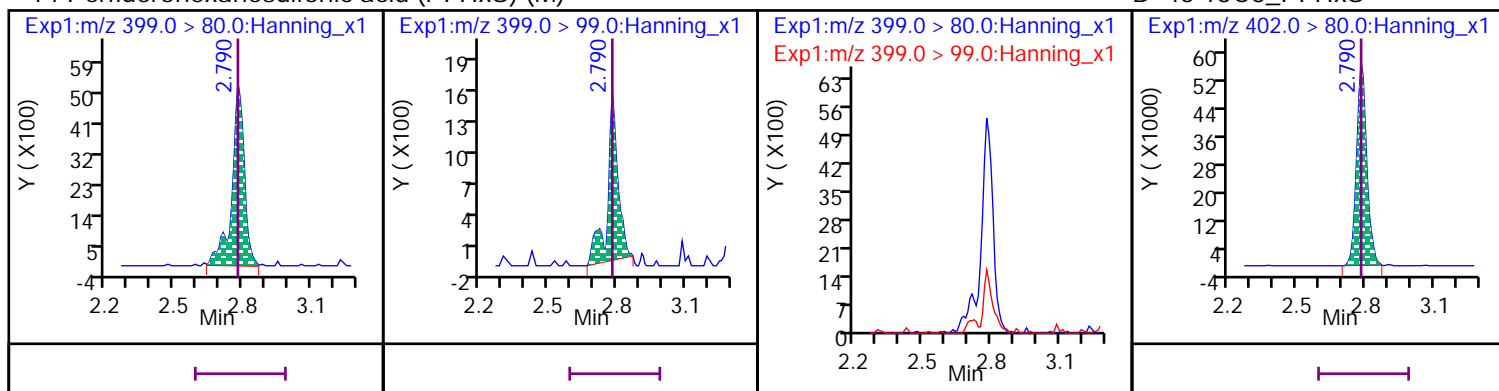
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



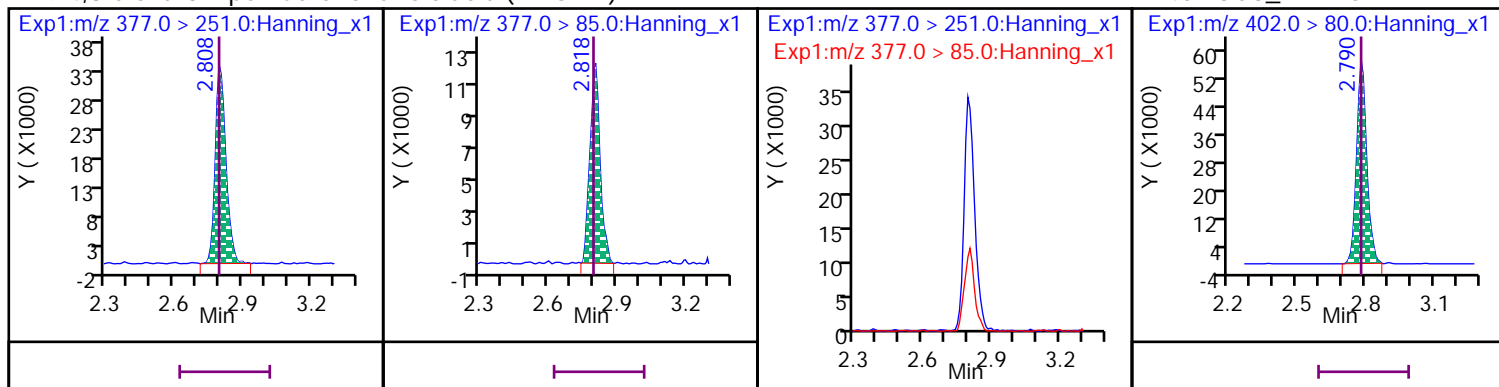
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS

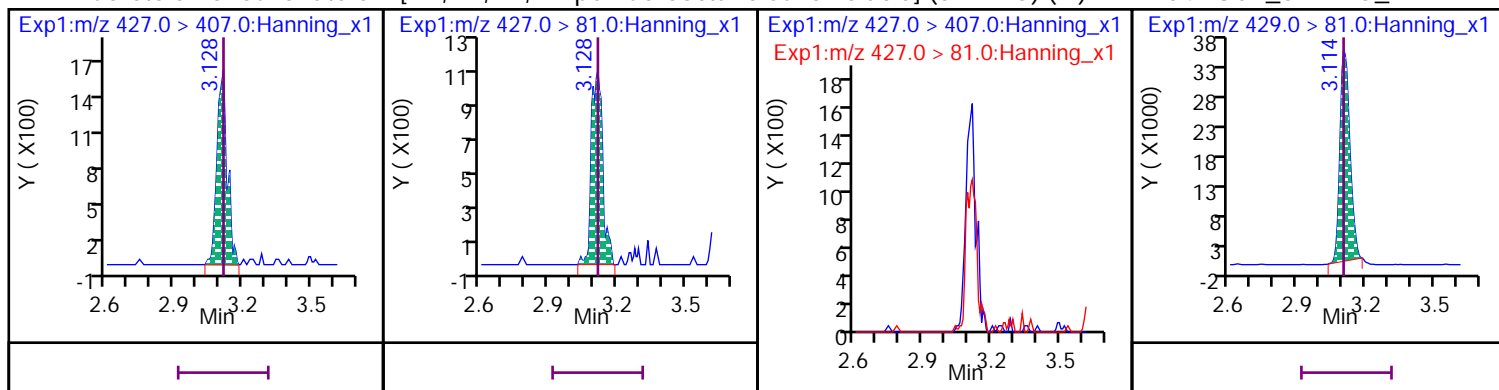


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS

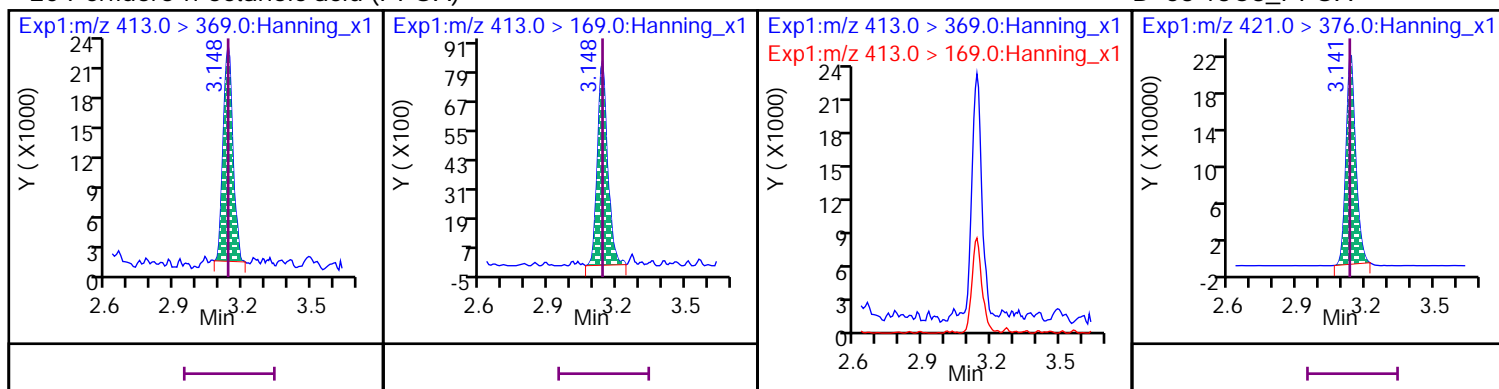


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (M) D 64 13C2\_6:2 FTS\_2



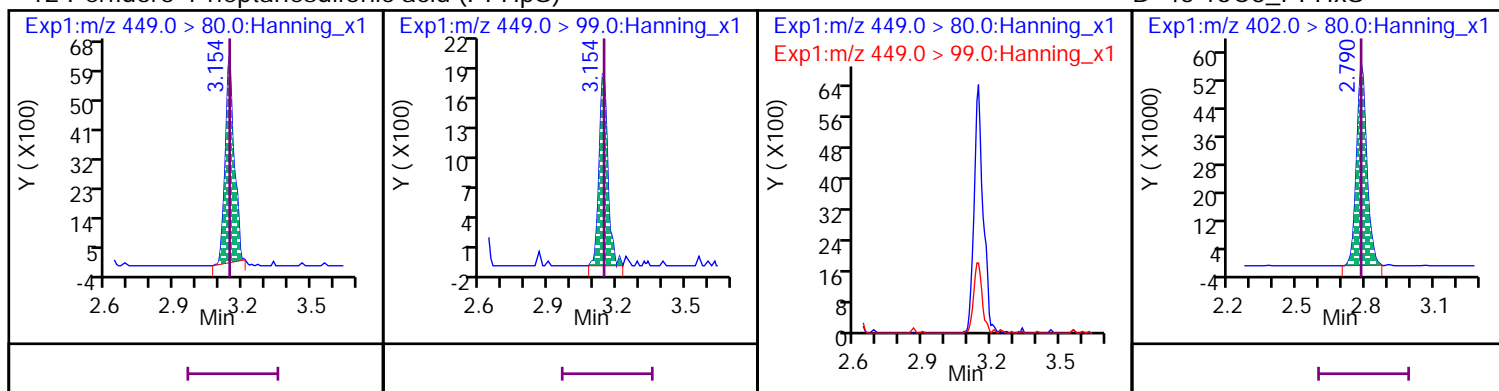
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



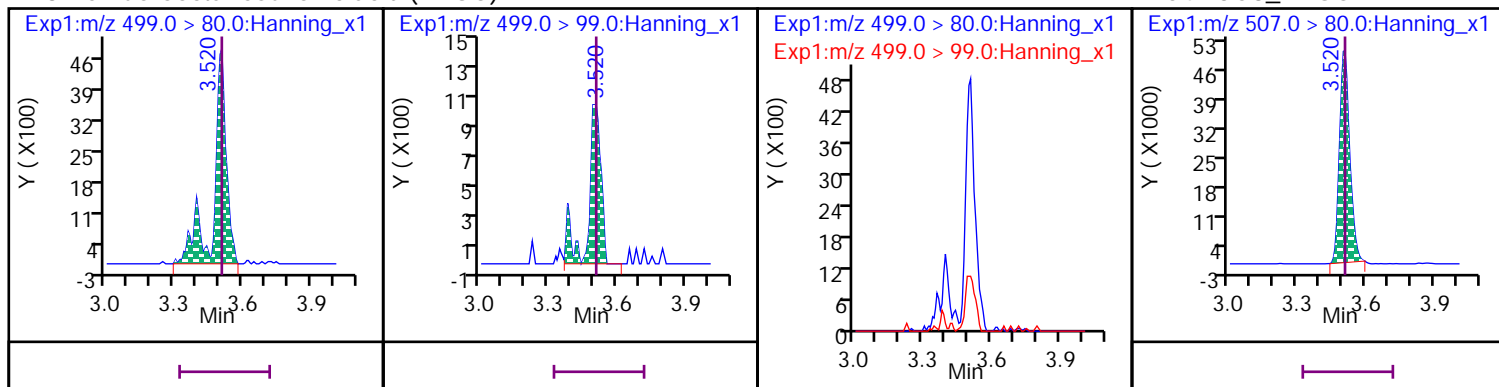
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



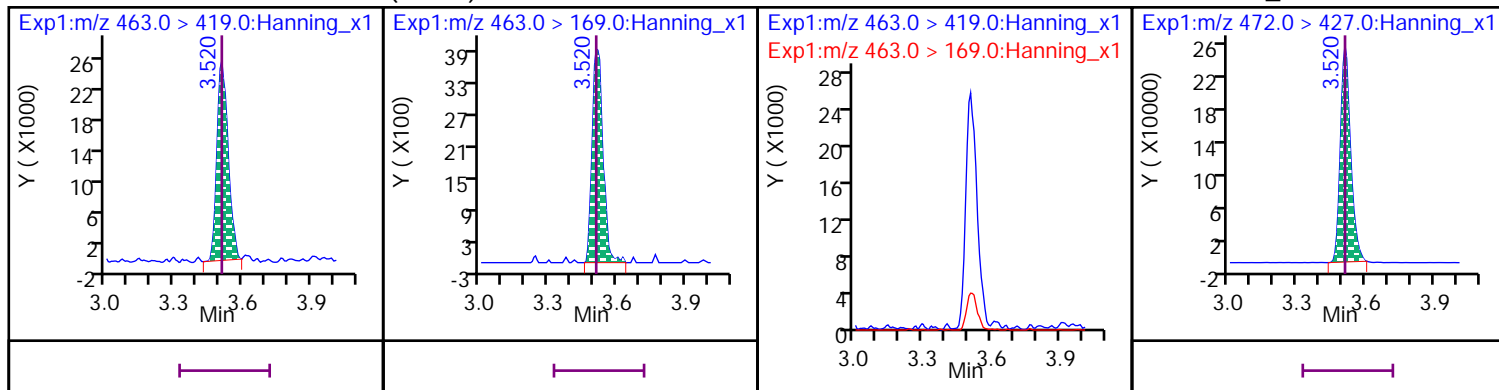
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



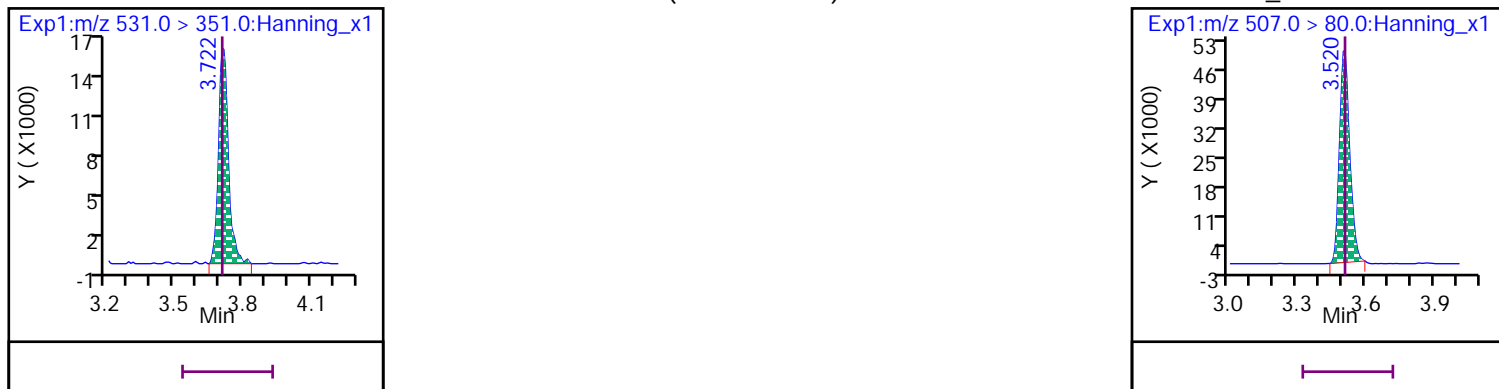
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



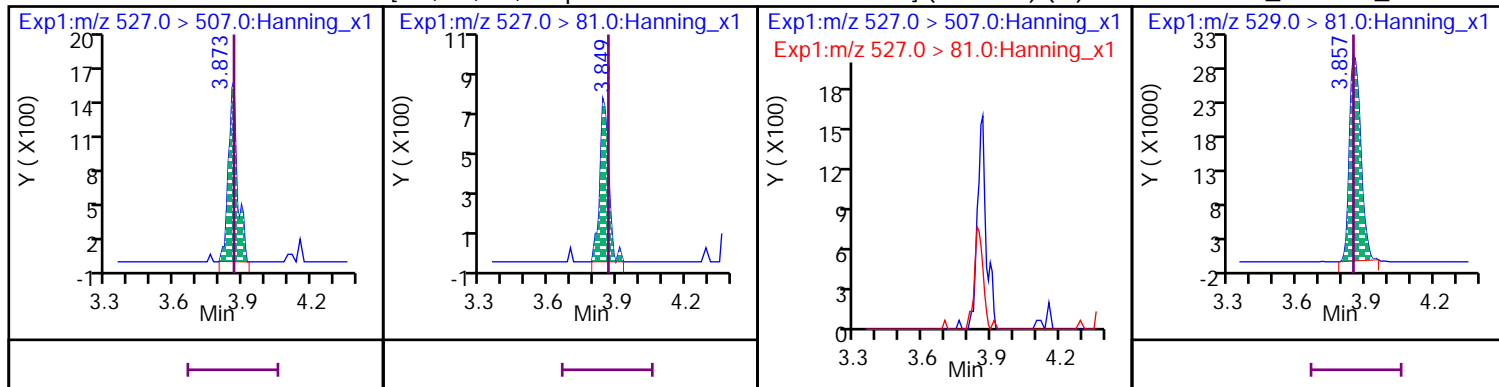
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

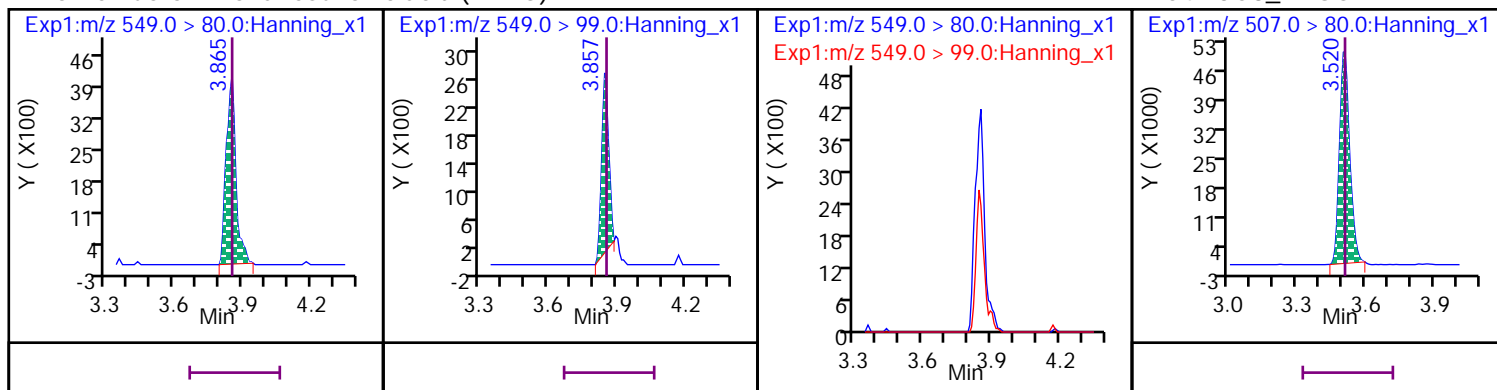
D 65 13C2\_8:2 FTS\_2





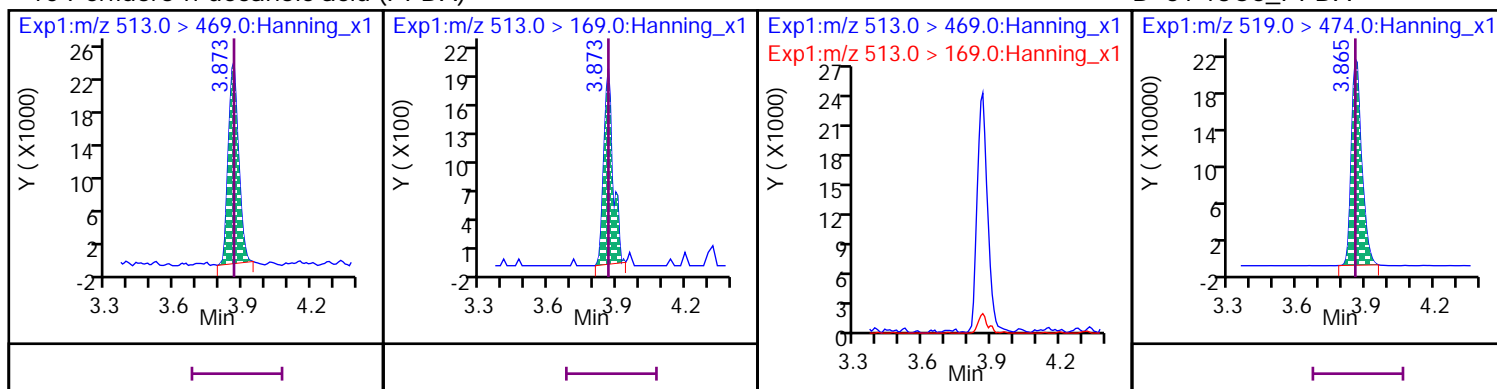
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



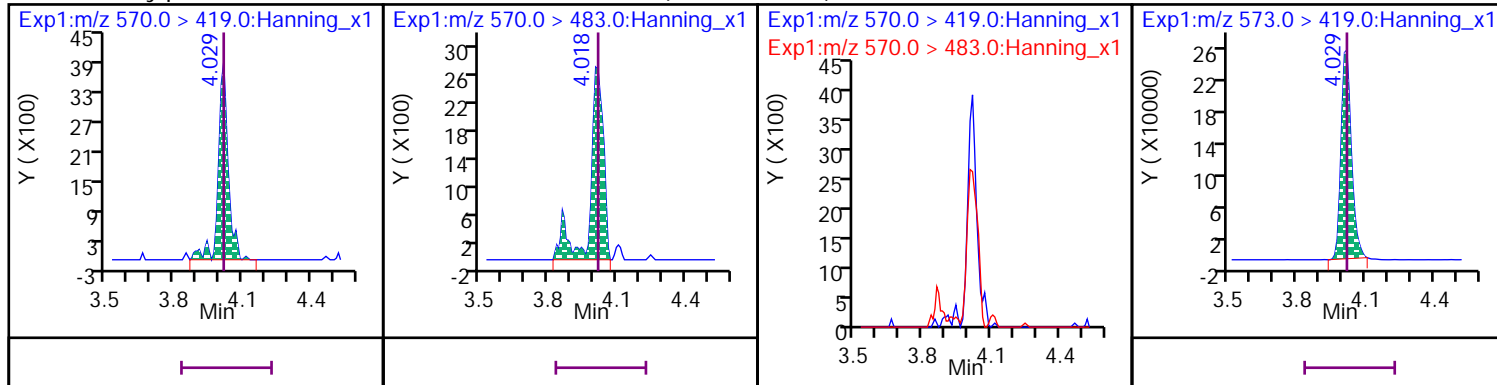
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



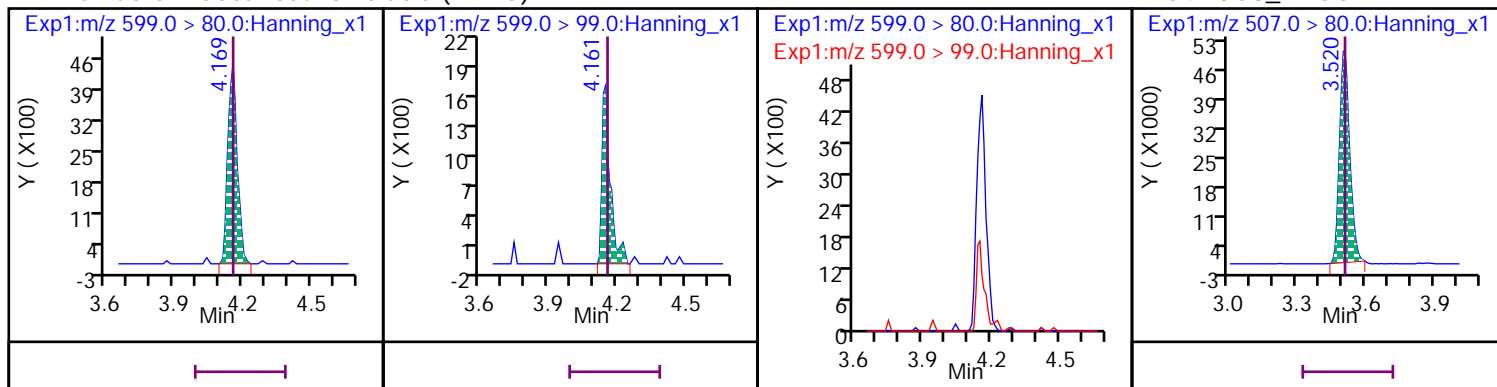
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



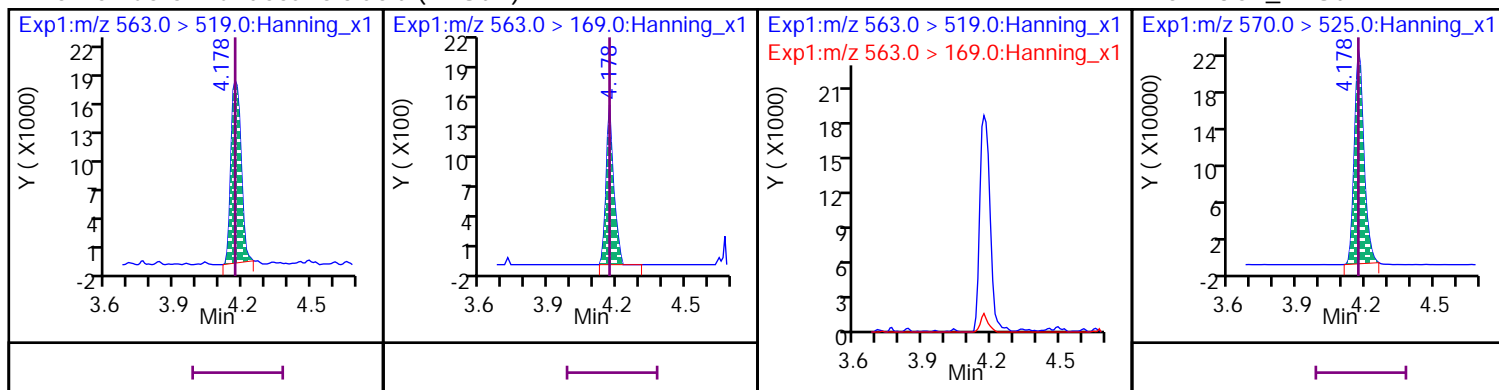
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



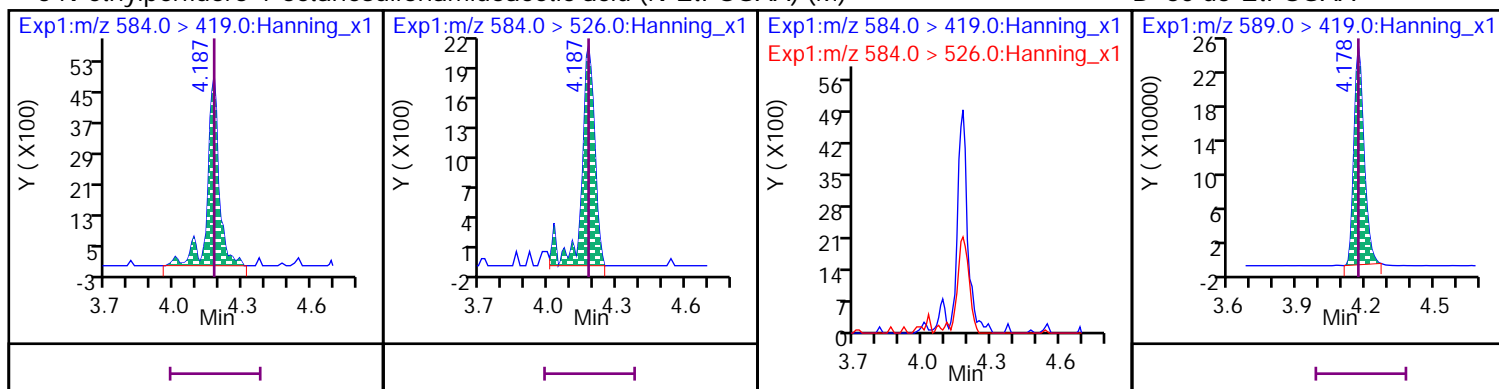
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



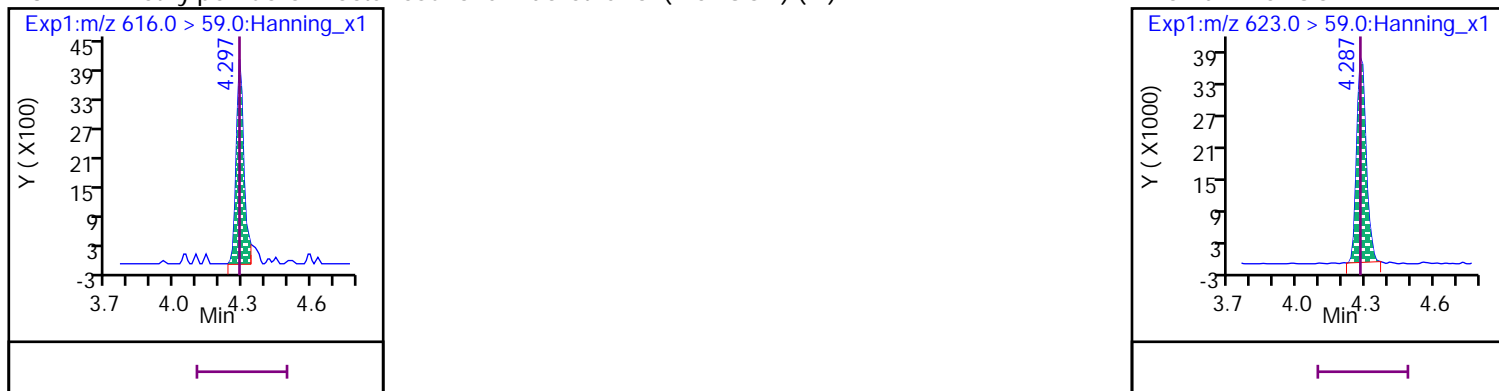
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



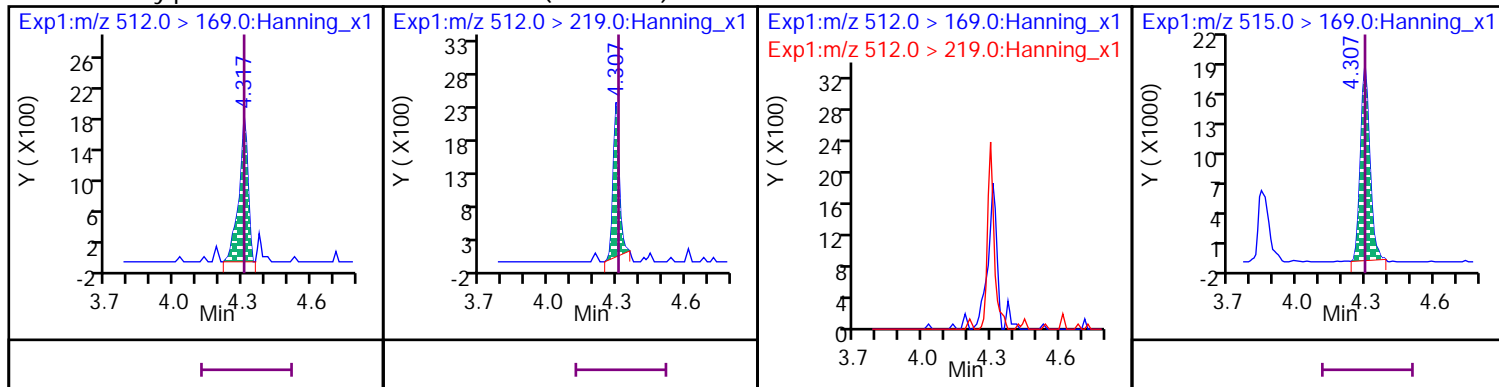
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (M)

D 61 d7-MeFOSE

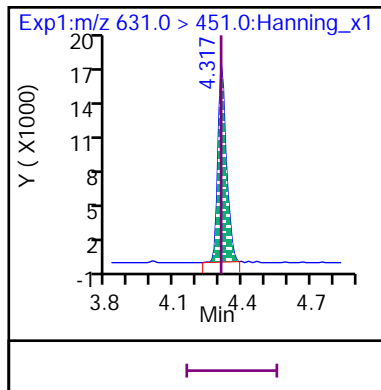


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

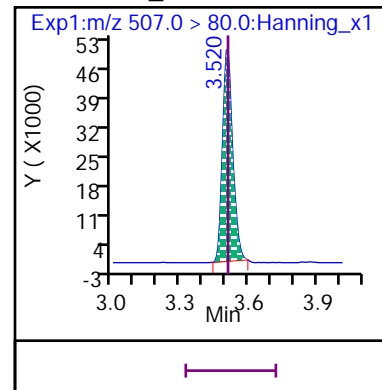
D 57 d3-MeFOSA



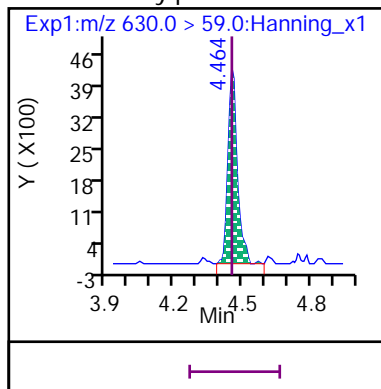
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



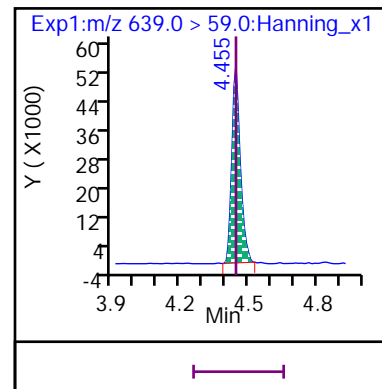
D 54 13C8\_PFOS



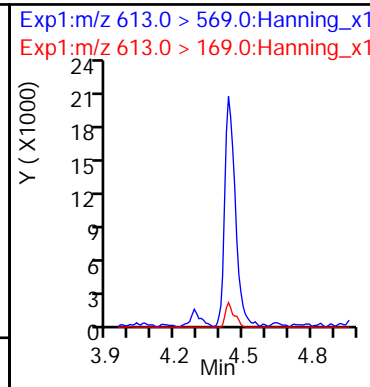
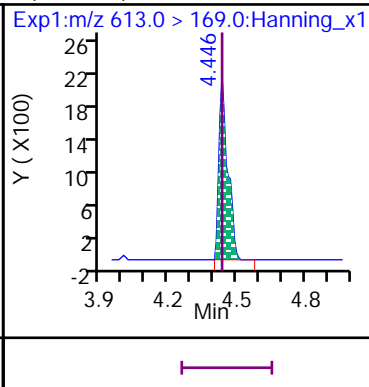
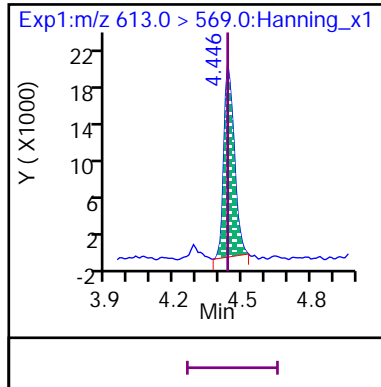
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



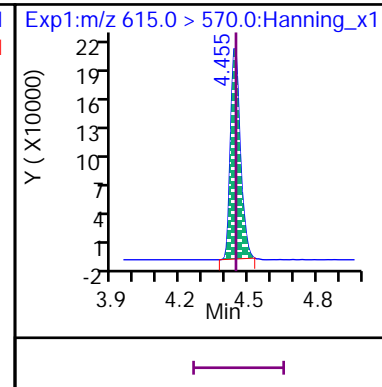
D 62 d9-EtFOSE



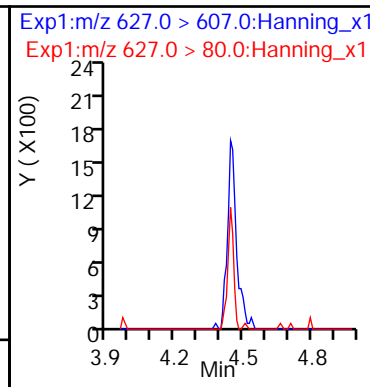
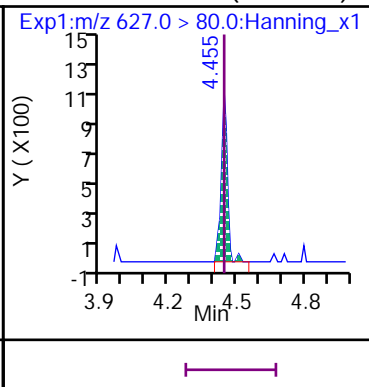
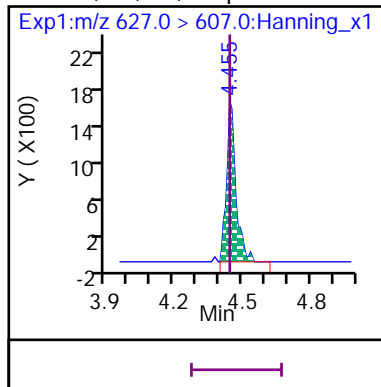
11 Perfluoro-n-dodecanoic acid (PFDoA)



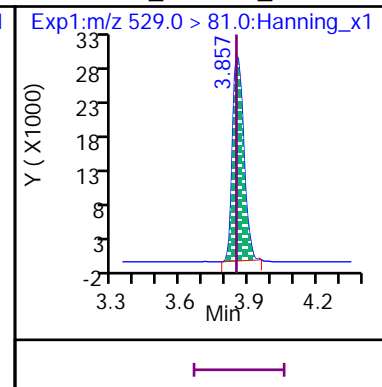
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

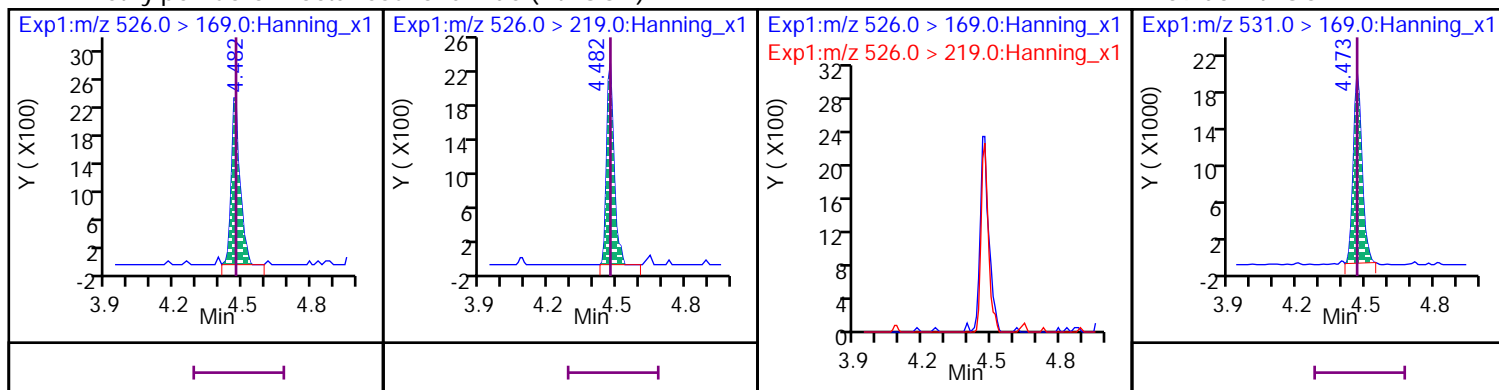


D 65 13C2\_8:2 FTS\_2



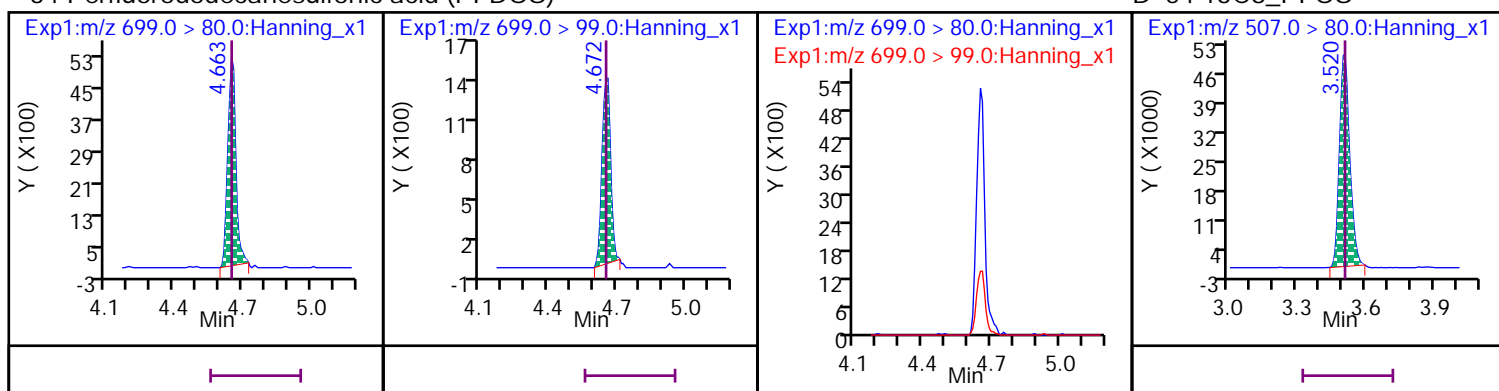
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



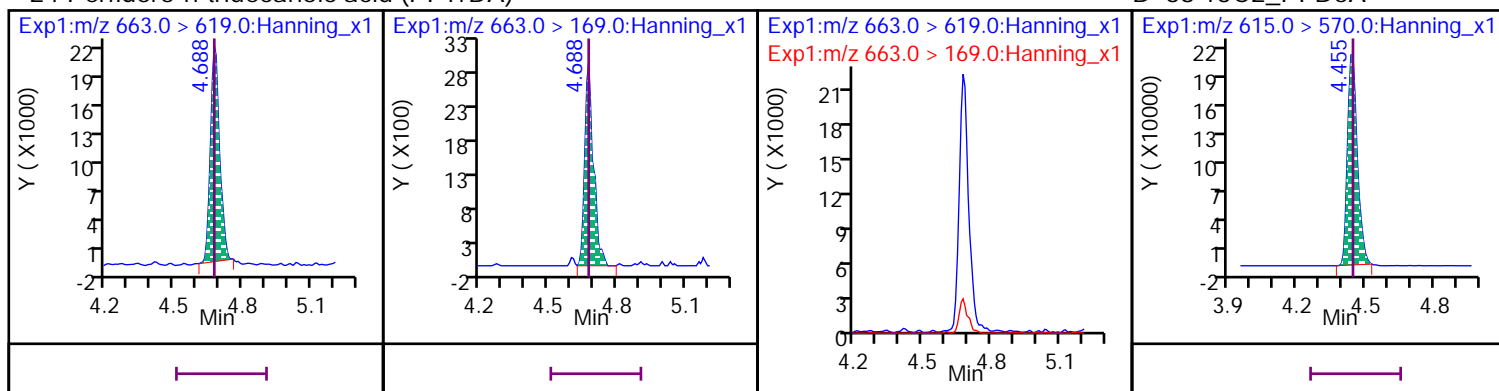
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



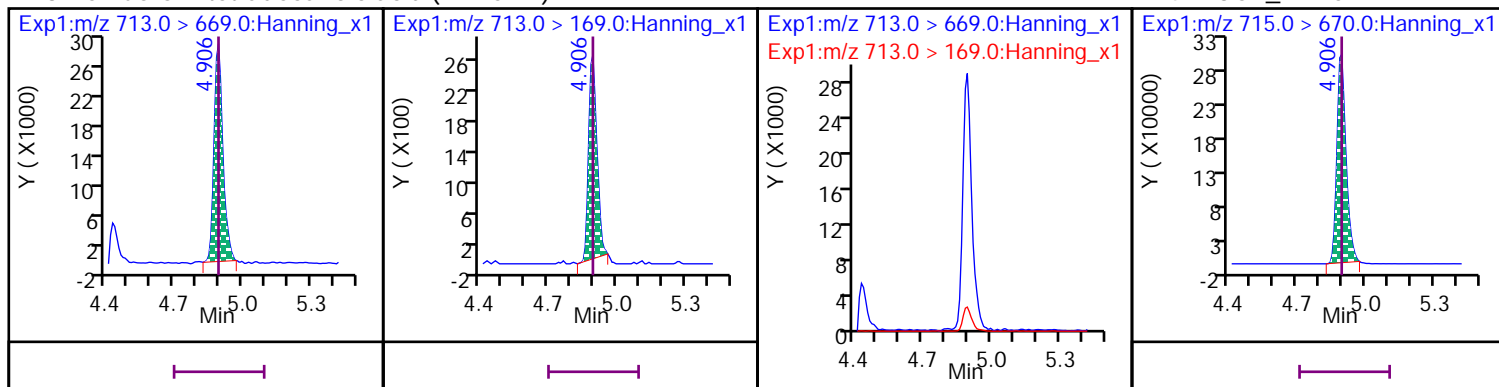
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



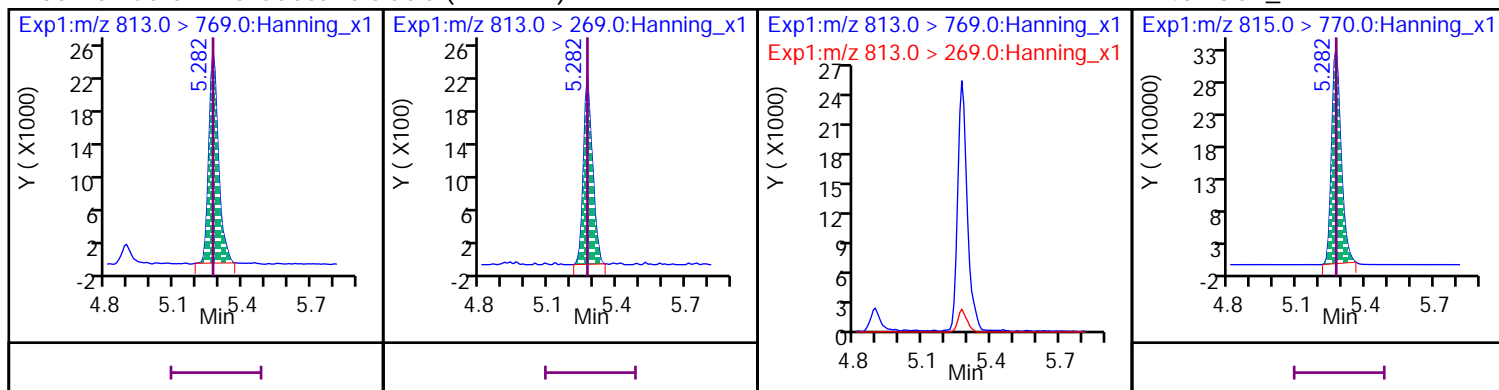
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



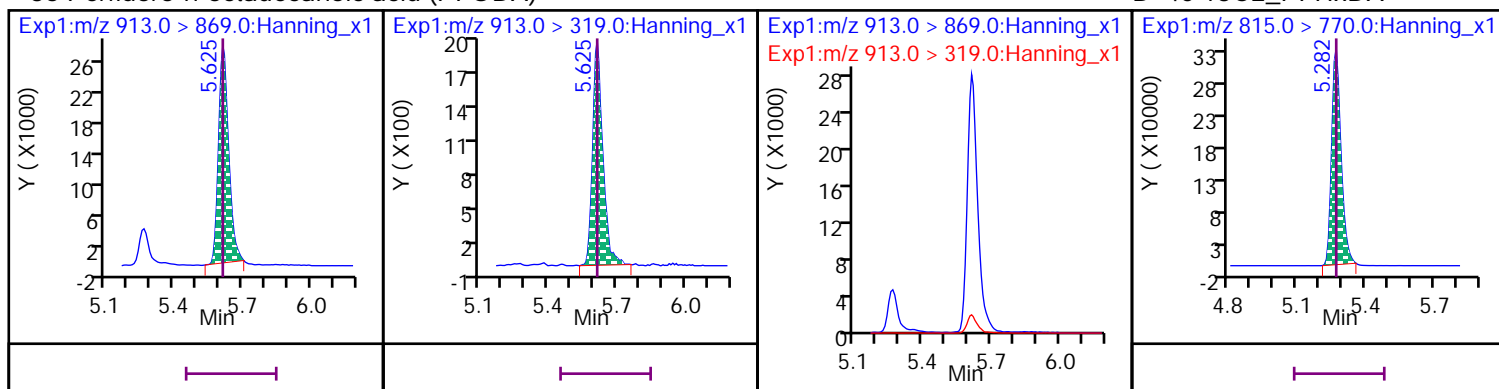
## 35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



## 36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

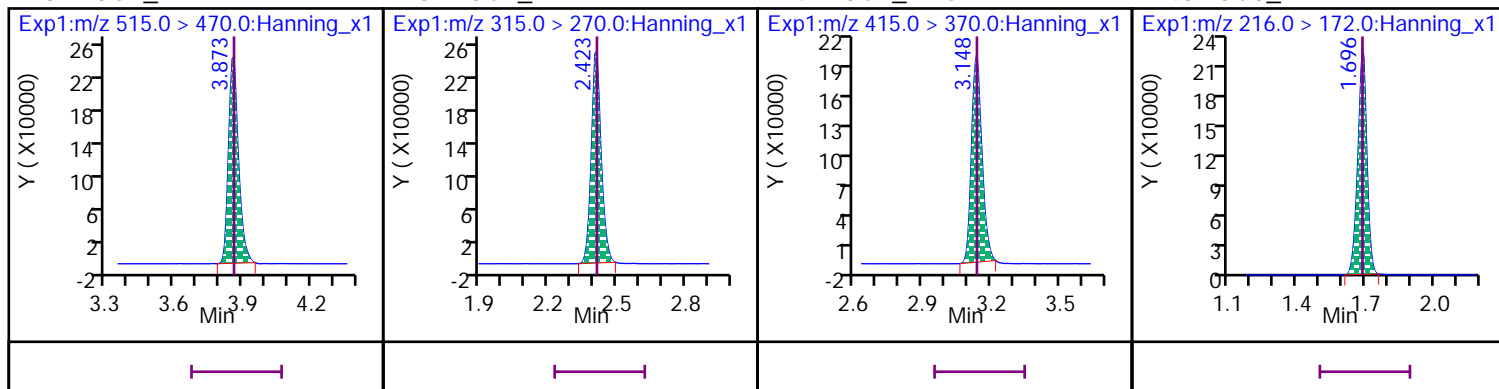


## \* 37 13C2\_PFDA

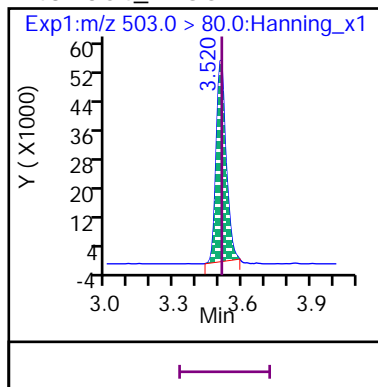
## \* 39 13C2\_PFHxA

## \* 41 13C2\_PFOA

## \* 43 13C3\_PFBA



## \* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

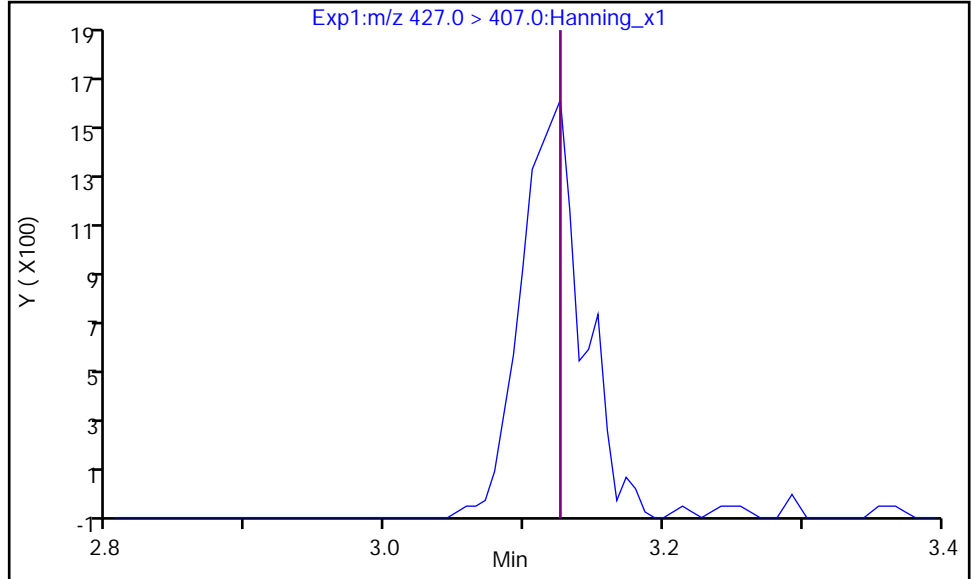
Dil. Factor: 1

Operator: Matthew M. Miller

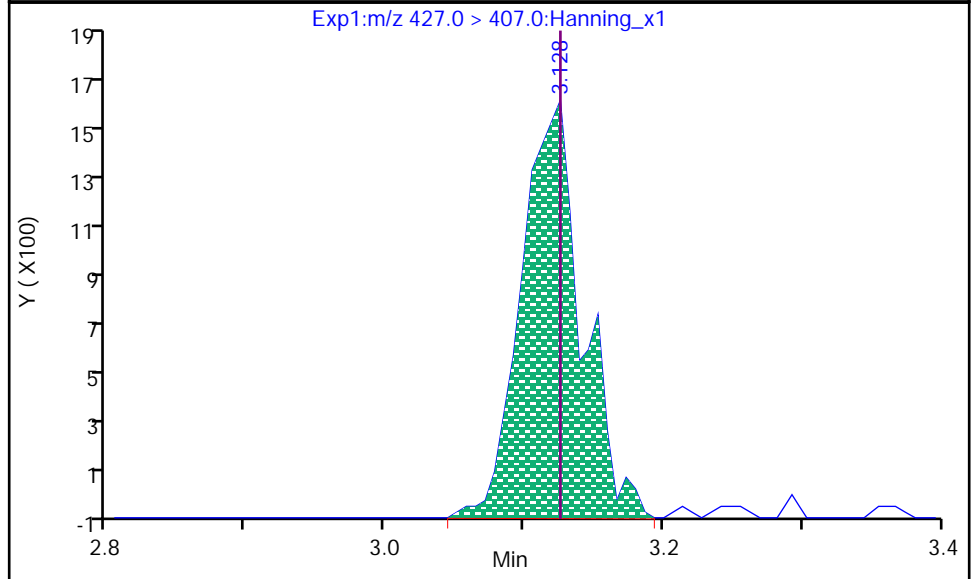
2 6:2 FTS, CAS: 27619-97-2

Not Detected  
Expected RT: 3.128  
RT Window: 2.914-3.314

Processing Integration Results



RT: 3.128  
Area: 4912  
Amount: 87.996  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:11  
Audit Action: Mint  
Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

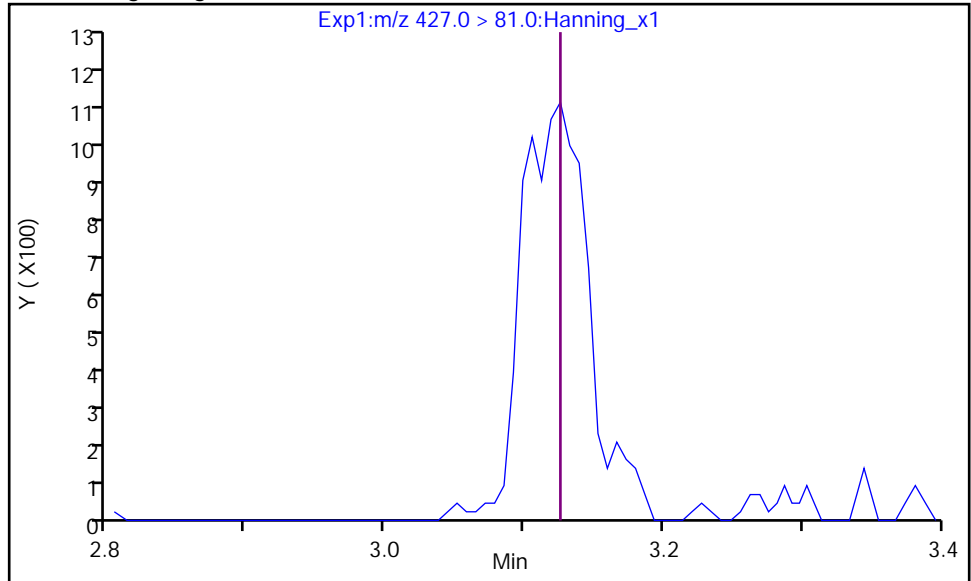
Dil. Factor: 1

Operator: Matthew M. Miller

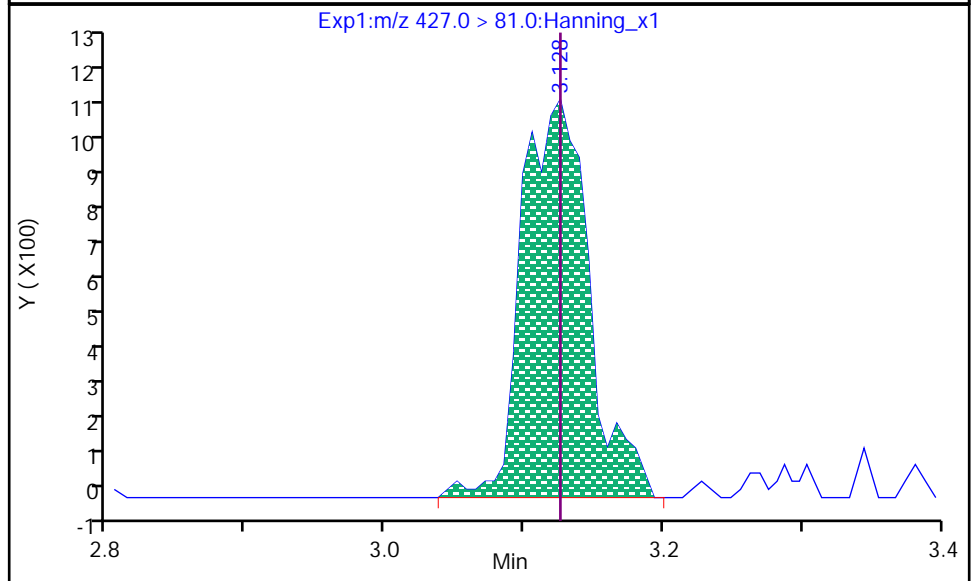
2 6:2 FTS, CAS: 27619-97-2

Processing Integration Results

Not Detected  
Expected RT: 3.128  
RT Window: 2.914-3.314



RT: 3.128  
Area: 3590  
Amount: 87.996  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:15

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

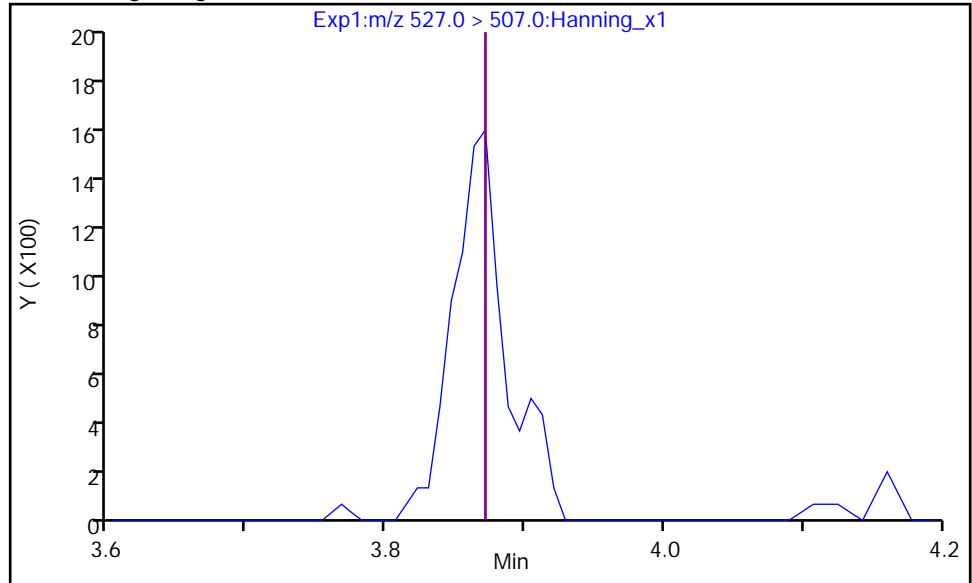
Dil. Factor: 1

Operator: Matthew M. Miller

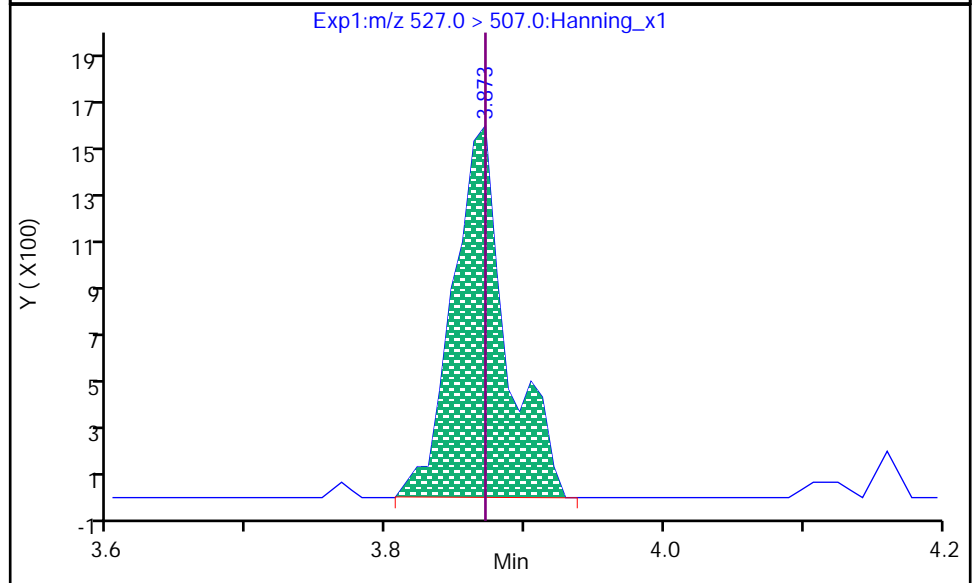
3 8:2 FTS, CAS: 39108-34-4

Not Detected  
Expected RT: 3.873  
RT Window: 3.657-4.057

Processing Integration Results



RT: 3.873  
Area: 4215  
Amount: 89.303  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:19

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

Dil. Factor: 1

Operator: Matthew M. Miller

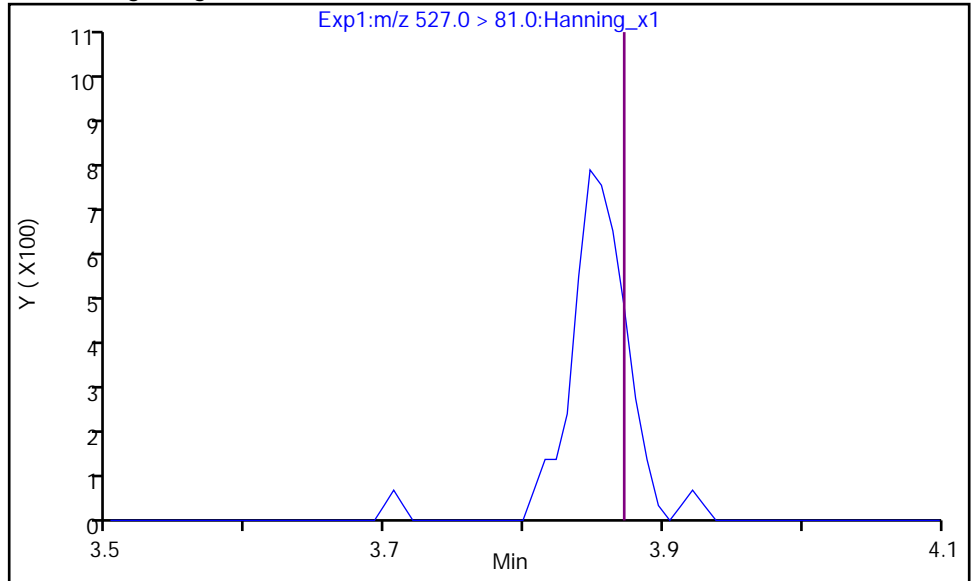
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

Not Detected

Expected RT: 3.873

RT Window: 3.657-4.057

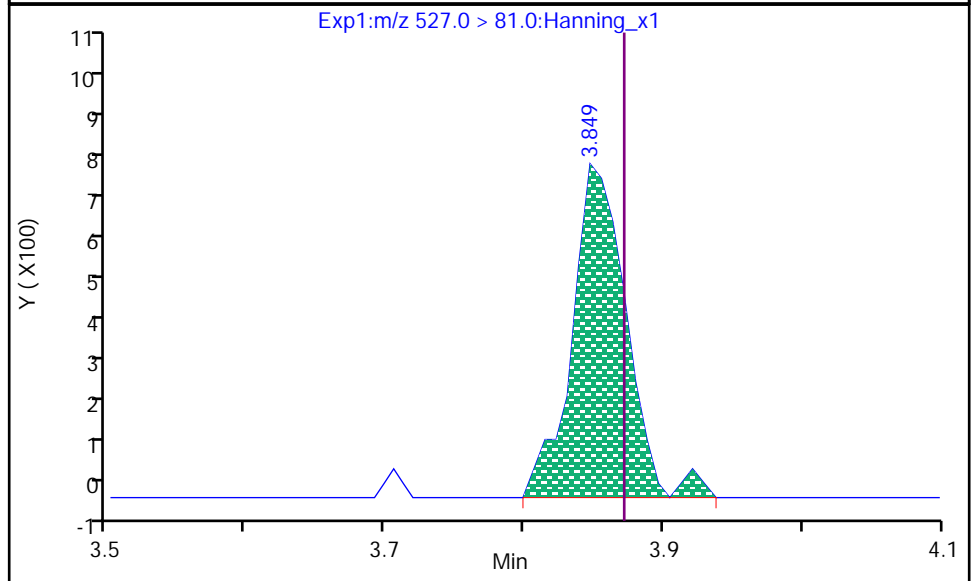


RT: 3.849

Area: 2042

Amount: 89.303

Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:22

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

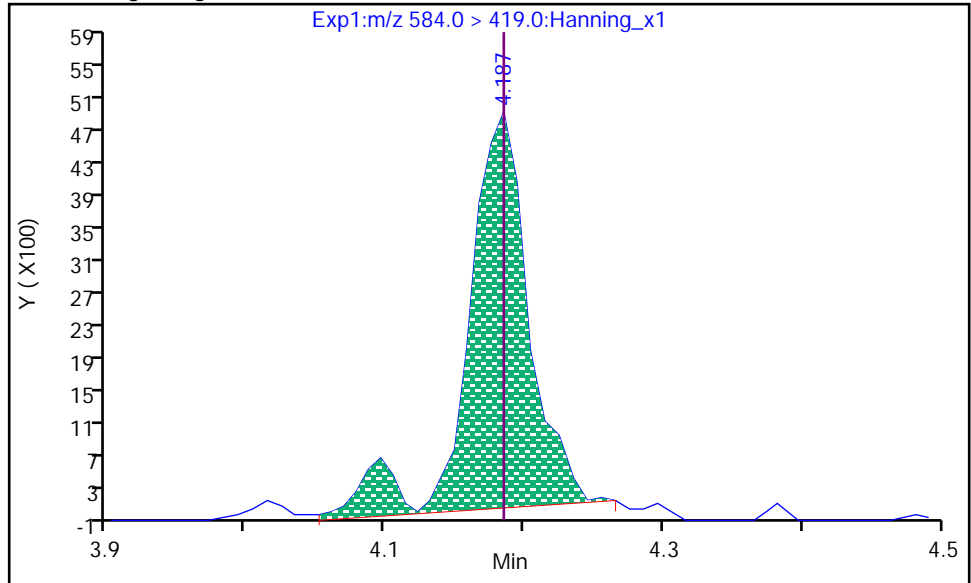
Dil. Factor: 1

Operator: Matthew M. Miller

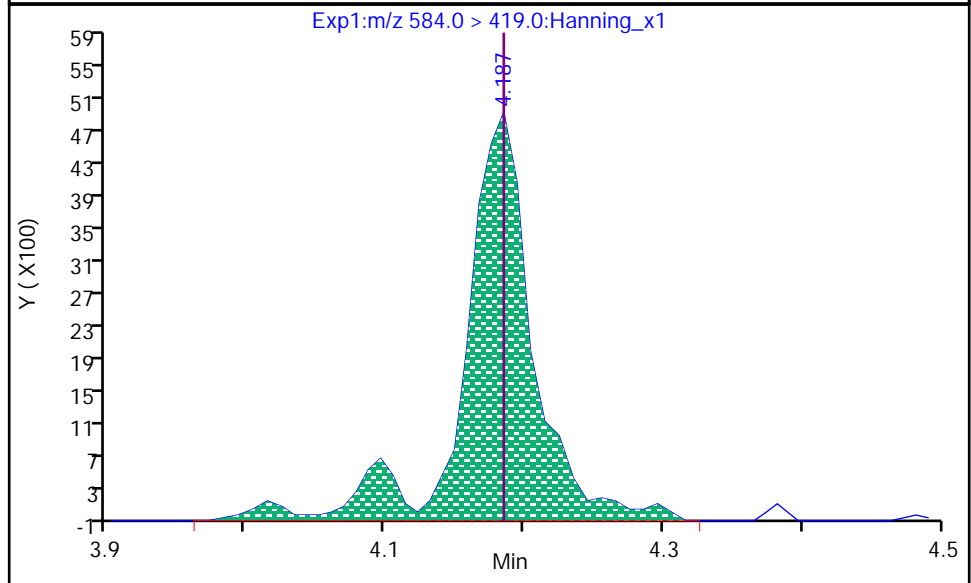
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.187  
Area: 14675  
Amount: 100.73  
Amount Units: ng/L



RT: 4.187  
Area: 17100  
Amount: 117.38  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:41

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

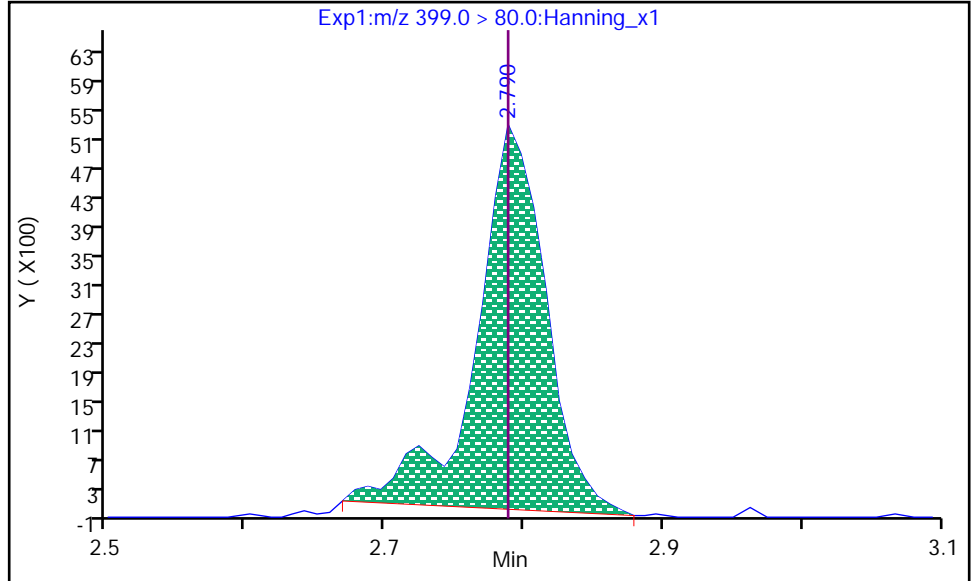
Dil. Factor: 1

Operator: Matthew M. Miller

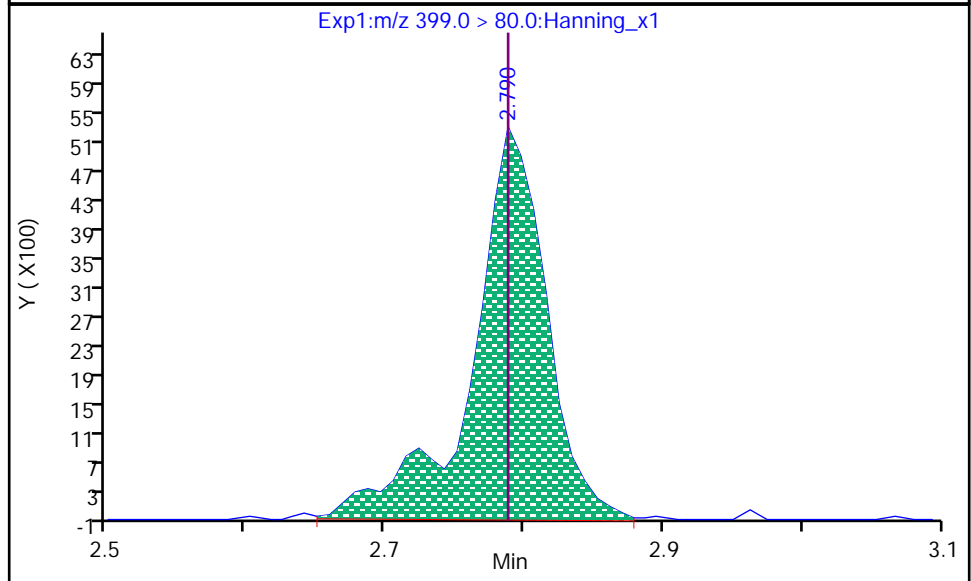
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.790  
Area: 18148  
Amount: 98.286  
Amount Units: ng/L



RT: 2.790  
Area: 19817  
Amount: 107.33  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:24:55

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820005.d

Injection Date: 28-Dec-2020 09:55:50

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

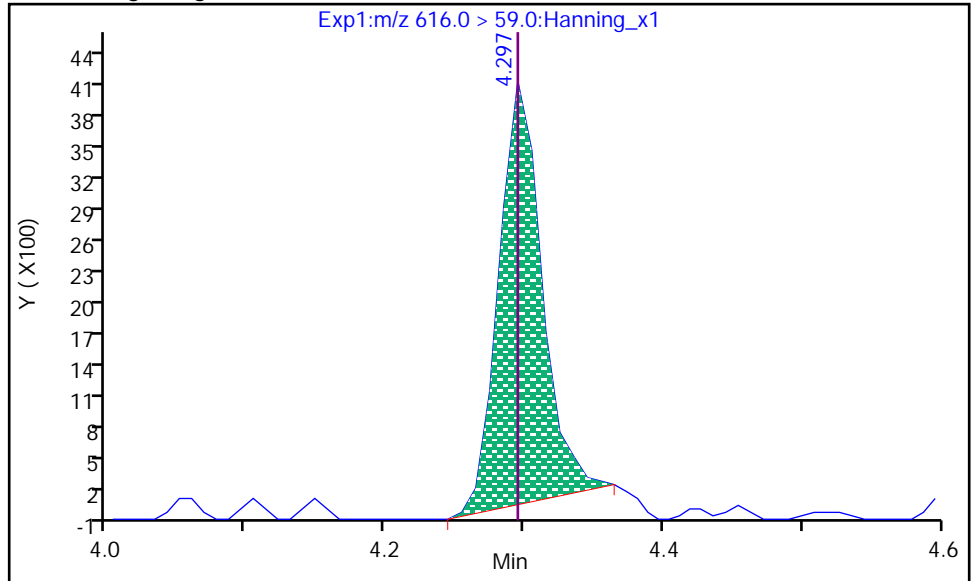
Dil. Factor: 1

Operator: Matthew M. Miller

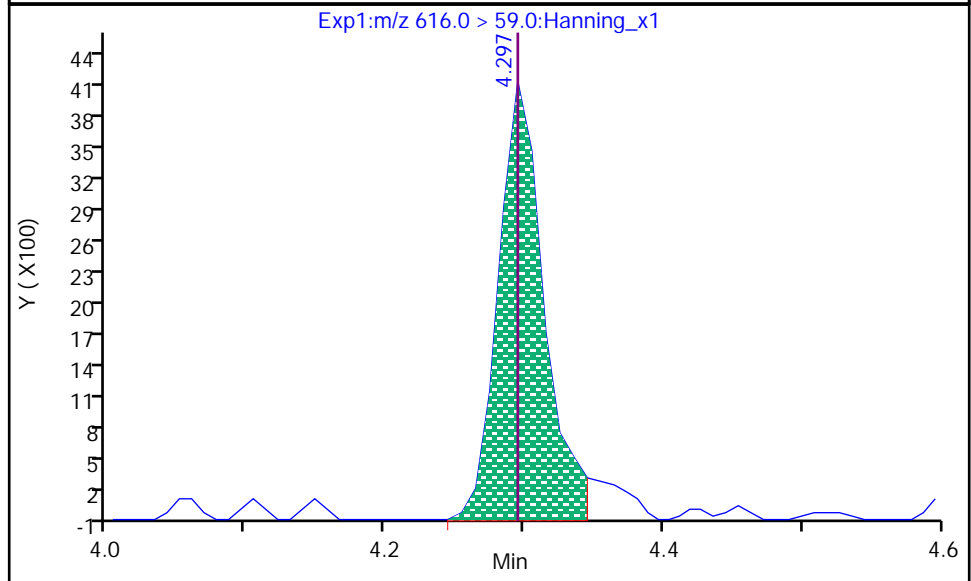
32 MeFOSE, CAS: 24448-09-7

Processing Integration Results

RT: 4.297  
Area: 8440  
Amount: 85.222  
Amount Units: ng/L



RT: 4.297  
Area: 9248  
Amount: 93.380  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:08

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d  
Injection Date: 28-Dec-2020 10:06:27 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	210.82	105	70 - 130
D 46 13C4_PFBFA	649747	652120			100	50 - 150
D 50 13C5_PFPeA	665996	666466			100	50 - 150
21 PFPeA			200.00	203.38	102	70 - 130
7 PFBS			176.80	179.29	101	70 - 130
D 44 13C3_PFBFS	238207	245386			103	50 - 150
1 4:2 FTS			186.80	190.44	102	70 - 130
D 63 13C2_4:2 FTS_2	144067	134387			93.3	50 - 150
D 49 13C5_PFHxA	743582	734191			98.7	50 - 150
15 PFHxA			200.00	209.63	105	70 - 130
22 PFPeS			187.60	193.82	103	70 - 130
28 GenX			400.00	392.36	98.1	70 - 130
D 66 13C3_GenX	1401050	1374029			98.1	50 - 150
D 47 13C4_PFHpA	633684	618982			97.7	50 - 150
13 PFHpA			200.00	215.23	108	70 - 130
D 45 13C3_PFHxS	174146	177773			102	50 - 150
14 PFHxS			182.00	210.81	116	70 - 130
29 ADONA			188.40	186.60	99	70 - 130
D 64 13C2_6:2 FTS_2	104346	107490			103	50 - 150
2 6:2 FTS			189.60	161.57	85.2	70 - 130
20 PFOA			200.00	213.38	107	70 - 130
D 53 13C8_PFOA	628007	617933			98.4	50 - 150
12 PFHpS			190.40	200.73	105	70 - 130
18 PFOS			185.60	176.38	95	70 - 130
17 PFNA			200.00	204.02	102	70 - 130
D 56 13C9_PFNA	767623	740499			96.5	50 - 150
D 54 13C8_PFOS	152445	158270			104	50 - 150
30 9CI-PF3ONS			186.40	185.39	99.5	70 - 130
D 55 13C8_PFOA	308857	324597			105	50 - 150
19 PFOSA			200.00	211.44	106	70 - 130
16 PFNS			192.00	212.65	111	70 - 130
D 65 13C2_8:2 FTS_2	100453	101506			101	50 - 150
3 8:2 FTS			191.60	182.43	95.2	70 - 130
10 PFDA			200.00	189.92	95	70 - 130
D 51 13C6_PFDA	672868	721482			107	50 - 150
D 58 d3-MeFOSAA	791564	801442			101	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	206.70	103	70 - 130
9 PFDS			192.80	198.82	103	70 - 130
5 N-EtFOSAA			200.00	184.90	92.5	70 - 130
25 PFUdA			200.00	197.52	98.8	70 - 130
D 60 d5-EtFOSAA	731651	729766			99.7	50 - 150
D 52 13C7_PFUdA	643525	609738			94.7	50 - 150
D 61 d7-MeFOSE	105402	97975			93	50 - 150
32 MeFOSE			200.00	212.13	106	70 - 130
26 MeFOSA			200.00	215.55	108	70 - 130
D 57 d3-MeFOSA	51840	50658			97.7	50 - 150
31 11Cl-PF3OUDS			188.40	188.91	100	70 - 130
D 62 d9-EtFOSE	137116	128851			94	50 - 150
33 EtFOSE			200.00	179.01	89.5	70 - 130
D 59 d5-EtFOSA	50284	52717			105	50 - 150
D 38 13C2_PFDoA	611364	639628			105	50 - 150
4 10:2 FTS			192.80	199.66	104	70 - 130
27 EtFOSA			200.00	185.70	92.8	70 - 130
11 PFDoA			200.00	206.49	103	70 - 130
34 PFDOS			193.60	204.36	106	70 - 130
24 PFTrDA			200.00	199.00	99.5	70 - 130
23 PFTeDA			200.00	195.88	97.9	70 - 130
D 42 13C2_PFTeDA	813074	856900			105	50 - 150
35 PFHxDA			200.00	205.68	103	70 - 130
D 40 13C2_PFHxDA	935525	936899			100	50 - 150
36 PFODA			200.00	197.63	98.8	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d  
 Injection Date: 28-Dec-2020 10:06:27 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 96  
 Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.692	1.696	0	652120	24	>100:1			1000.00	940.26	100	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/1	136929	23	74:1			200.00	210.82		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	666466	18	>100:1			1000.00	968.86	100	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.072	1/1	136279	18	>100:1			200.00	203.38		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	245386	17	>100:1			1000.00	1065.83	103	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/0	51872	16	>100:1	Target = 3.50		176.80	179.29		
298.9 > 99	44	2.130	2.125		14156	19	96:1	3.66 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.450	1/0	41256	19	>100:1	Target = 3.10		187.60	193.82		
349 > 99	44	2.451	2.450		12015	15	>100:1	3.43 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.379	1	134387	19	>100:1			5000.00	5551.27	93.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.371	2.388	-1/-2	10215	28	58:1	Target = 1.80		186.80	190.44		
327 > 81	63	2.389	2.388		6556	19	36:1	1.55 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.423	0	734191	20	>100:1			1000.00	996.09	98.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/1	151947	17	>100:1	Target = 18.34		200.00	209.63		
313 > 119	49	2.424	2.423		8327	17	50:1	18.24 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.530	1	1374029	19	>100:1			5000.00	5158.66	98.1	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.523	2.530	0/-1	77467	18	>100:1	Target = 0.81		400.00	392.36		
285 > 185	66	2.531	2.530		101733	20	>100:1	0.76 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	618982	20	>100:1			1000.00	1020.33	97.7	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	138189	20	>100:1	Target = 3.70		200.00	215.23		
363 > 169	47	2.773	2.772		33316	19	>100:1	4.14 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	177773	18	>100:1			1000.00	1038.22	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	39735	28	>100:1	Target = 3.21	0.14	182.00	210.81		M
399 > 99	45	2.782	2.790		9403	28	77:1	4.22 (1.60-4.81)	0.10				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.808	1/0	210609	20	>100:1	Target = 2.97		188.40	186.60		
377 > 85	45	2.809	2.808		70609	19	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.149	3.154	0/-1	32416	30	>100:1	Target = 3.08		190.40	200.73		
449 > 99	45	3.149	3.154		9745	18	99:1	3.32 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	107490	25	>100:1			5000.00	5581.46	103	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.115	3.128	-1/-2	8241	20	100:1	Target = 1.80		189.60	161.57		
427 > 81	64	3.115	3.128		5498	21	36:1	1.49 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	617933	25	>100:1			1000.00	1044.04	98.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	134417	24	77:1	Target = 2.87		200.00	213.38		
413 > 169	53	3.142	3.148		43163	25	>100:1	3.11 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.513	3.520	0	158270	26	>100:1			1000.00	1055.63	104	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.506	3.520	0/0	33080	48	>100:1	Target = 3.84	0.30	185.60	176.38		
499 > 99	54	3.513	3.520		11508	31	42:1	2.87 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.718	3.722	0/0	98780	20	>100:1			186.40	185.39		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.860	3.865	0/0	25756	20	>100:1	Target = 3.07		192.00	212.65		
549 > 99	54	3.860	3.865		8775	21	48:1	2.93 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.163	4.169	0/0	22837	17	>100:1	Target = 3.03		192.80	198.82		
599 > 99	54	4.163	4.169		9414	16		2.42 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.319	4.317	1/1	84913	17	>100:1			188.40	188.91		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.667	4.663	1/1	25967	17	>100:1	Target = 3.33		193.60	204.36		
699 > 99	54	4.658	4.663		9473	16	87:1	2.74 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.521	3.520	1	740499	22	>100:1			1000.00	986.07	96.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.521	3.520	1/0	151079	21	>100:1	Target = 6.16		200.00	204.02		
463 > 169	56	3.513	3.520		27095	26	>100:1	5.57 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.844	3.849	0	324597	21	>100:1			1000.00	1048.56	105	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.852	3.841	1/1	67635	22	>100:1			200.00	211.44		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.860	3.857	1	101506	19	>100:1			5000.00	5471.98	101	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.852	3.873	-2/-3	7996	24	49:1	Target = 1.95		191.60	182.43		
527 > 81	65	3.860	3.873		5178	16	19:1	1.54 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.449	4.455	0/-1	9367	20	>100:1	Target = 3.14		192.80	199.66		
627 > 80	65	4.449	4.455		3524	18	23:1	2.65 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.868	3.865	1	721482	22	>100:1			1000.00	1087.66	107	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.868	3.873	0/-1	134642	24	>100:1	Target = 15.94		200.00	189.92		
513 > 169	51	3.868	3.873		10209	15	75:1	13.18 (7.97-23.91)					M
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.022	4.029	0	801442	18	>100:1			5000.00	5583.43	101	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.031	4.029	1/1	25450	35	83:1	Target = 1.33	0.14	200.00	206.70		
570 > 483	58	4.031	4.029		19822	33	>100:1	1.28 (0.66-1.99)	0.04				



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	729766	19				5000.00	5494.62	99.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.189	4.187	1/0	26868	33	>100:1	Target = 1.58	0.22	200.00	184.90		
584 > 526	60	4.180	4.187		17521	40		1.53 (0.79-2.37)	0.18				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	609738	18	>100:1			1000.00	964.66	94.7	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.180	4.178	1/0	113196	18	>100:1	Target = 15.50		200.00	197.52		
563 > 169	52	4.180	4.178		8707	22	32:1	13.00 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	97975	17	>100:1			1000.00	905.43	93	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.299	4.297	1/0	19528	16	>100:1			200.00	212.13		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.299	4.307	0	50658	15	>100:1			1000.00	957.31	97.7	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.319	4.317	1/1	12319	21	72:1	Target = 1.12		200.00	215.55		
512 > 219	57	4.309	4.317		10204	13	90:1	1.20 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.449	4.455	0	128851	18	>100:1			1000.00	1027.56	94	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.467	4.464	1/1	20521	14	>100:1			200.00	179.01		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.449	4.455	0	639628	19	>100:1			1000.00	1056.68	105	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.449	4.446	1/1	133752	18	69:1	Target = 10.85		200.00	206.49		
613 > 169	38	4.449	4.446		12132	15	>100:1	11.02 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.691	4.688	1/1	125371	19	>100:1	Target = 8.37		200.00	199.00		
663 > 169	38	4.691	4.688		16027	20	>100:1	7.82 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.467	4.473	0	52717	18	>100:1			1000.00	1073.79	105	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.486	4.482	1/1	10695	19		Target = 1.03		200.00	185.70		
526 > 219	59	4.477	4.482		11124	17		0.96 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.900	4.906	0	856900	19	>100:1			1000.00	1017.16	105	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.900	4.906	0/0	145436	19	18:1	Target = 12.11		200.00	195.88		
713 > 169	42	4.900	4.906		12705	28	>100:1	11.44 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.276	5.282	0	936899	19	>100:1			1000.00	1033.92	100	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.284	5.282	1/1	125911	19	41:1	Target = 11.48		200.00	205.68		
813 > 269	40	5.276	5.282		11771	20	>100:1	10.69 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.620	5.625	0/0	163908	25	19:1	Target = 13.88		200.00	197.63		
913 > 319	40	5.620	5.625		11612	24	>100:1	14.11 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.868	3.873	0	706927	19	>100:1					96.5	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	741977	20	>100:1					101	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	598960	24	>100:1					99.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	621036	24	>100:1					102	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.513	3.520	0	162428	28	>100:1					99.6	
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### Compound Type Legend

D - Isotopic Dilution Std.  
 \* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

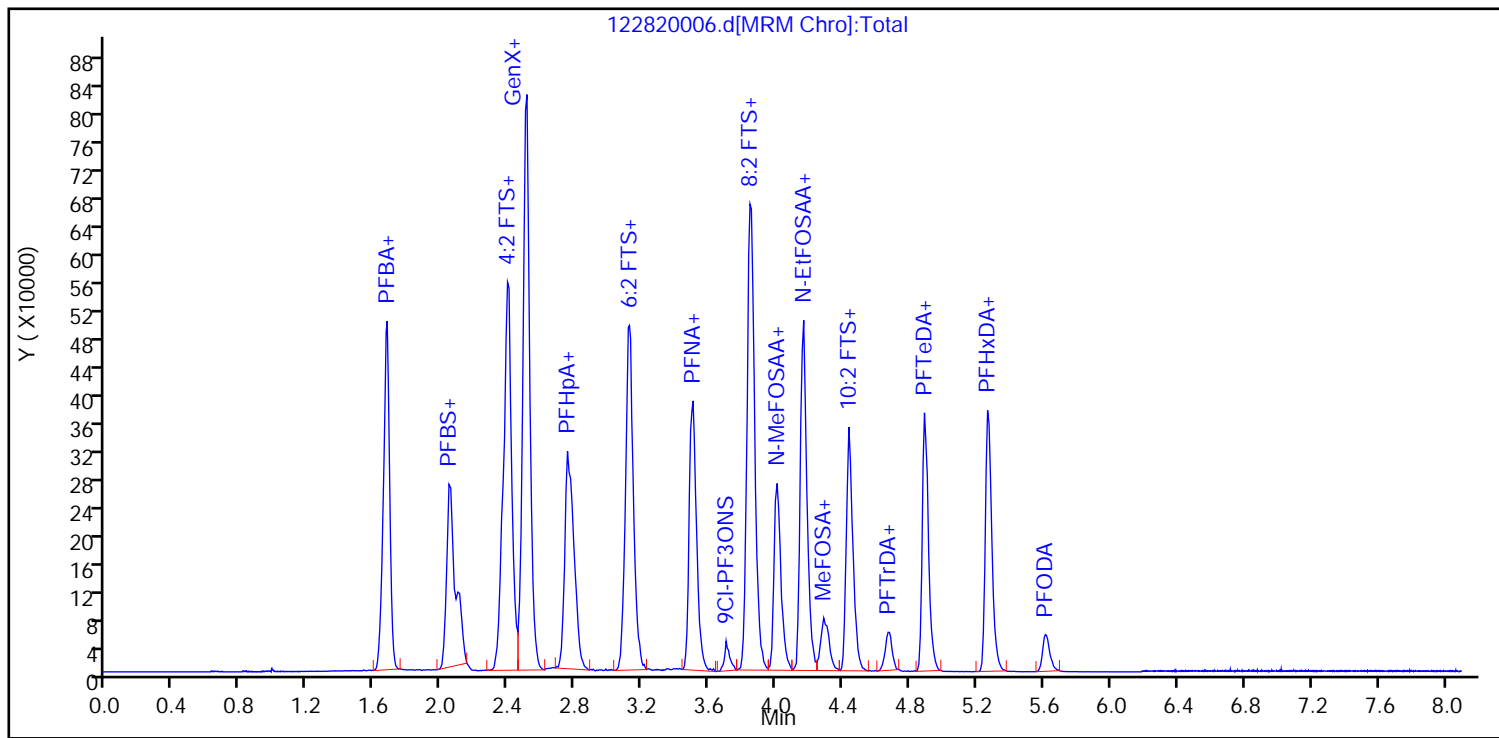
Client ID:

Lab ID: ID CCV 200\_SVLC-1221

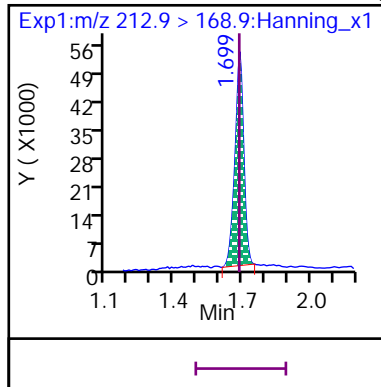
Sample Info: ID CCV 200\_SVLC-1221

Dil. Factor: 1

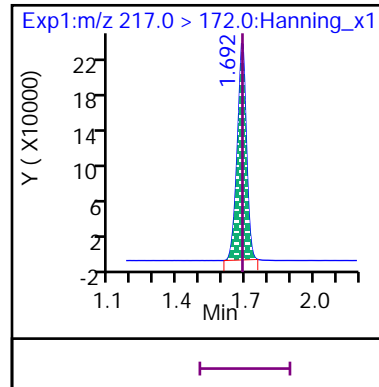
Operator: Matthew M. Miller



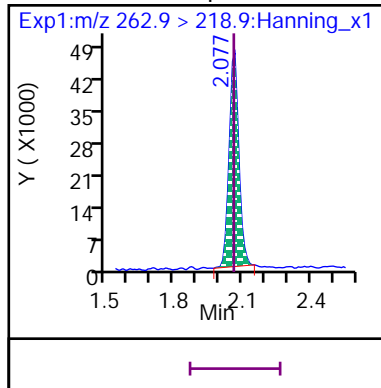
8 Perfluoro-n-butanoic acid (PFBA)



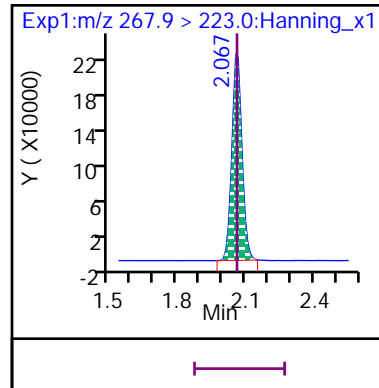
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

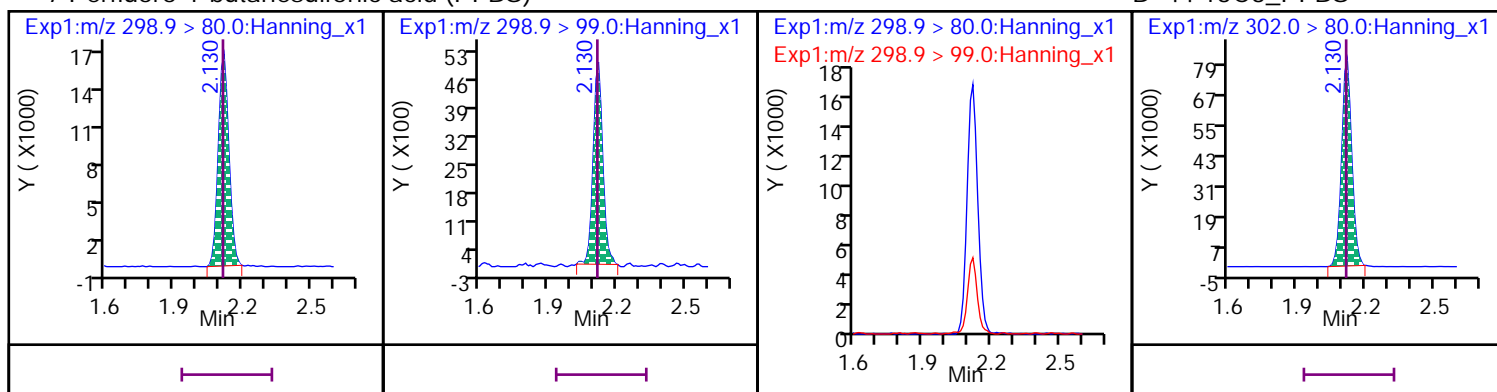


D 50 13C5\_PFPeA



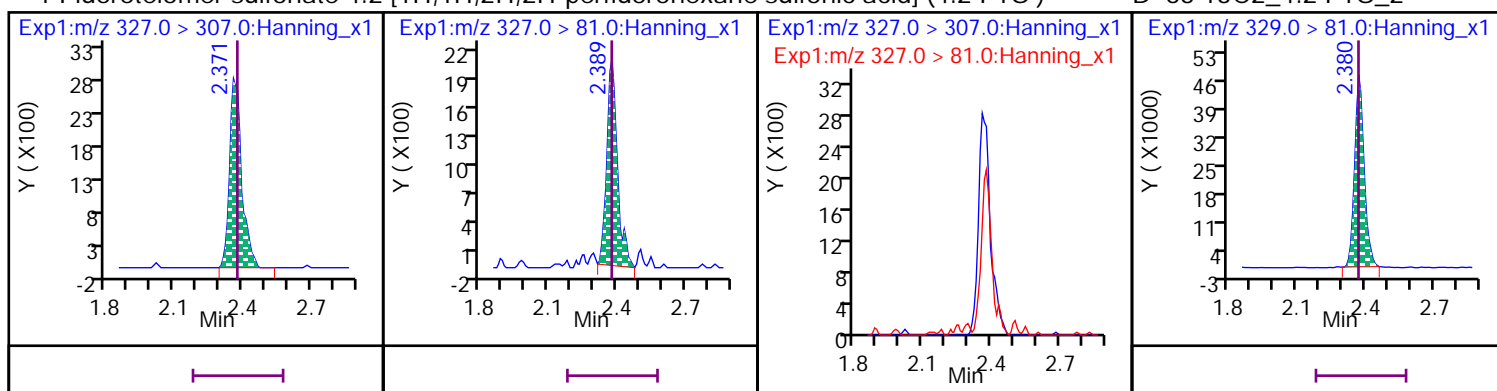
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



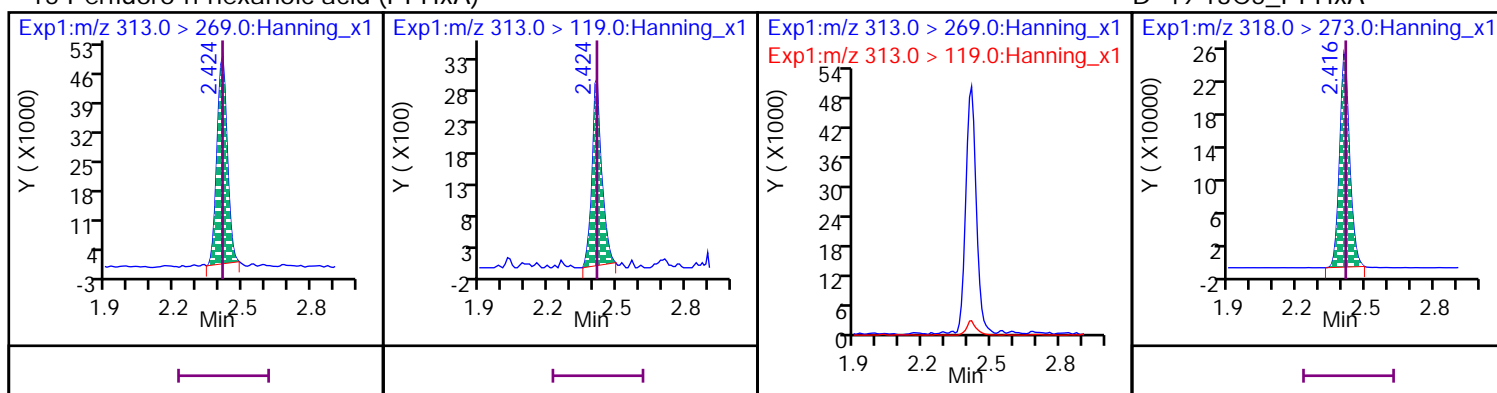
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



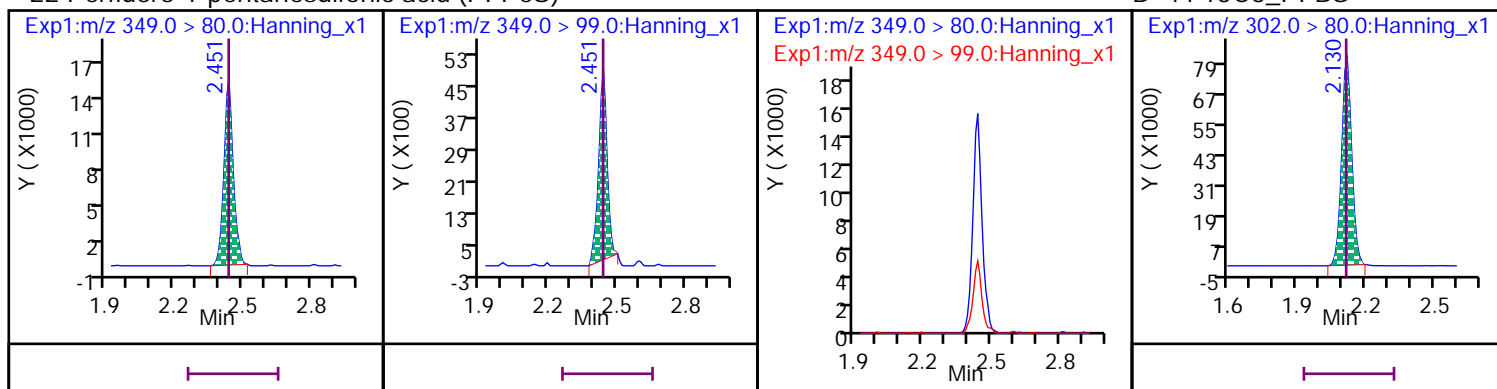
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



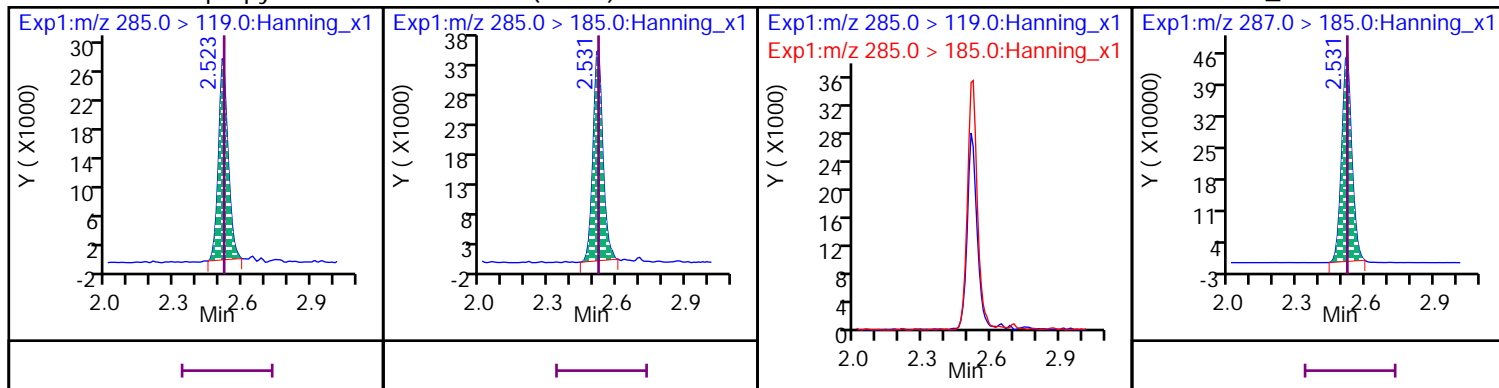
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



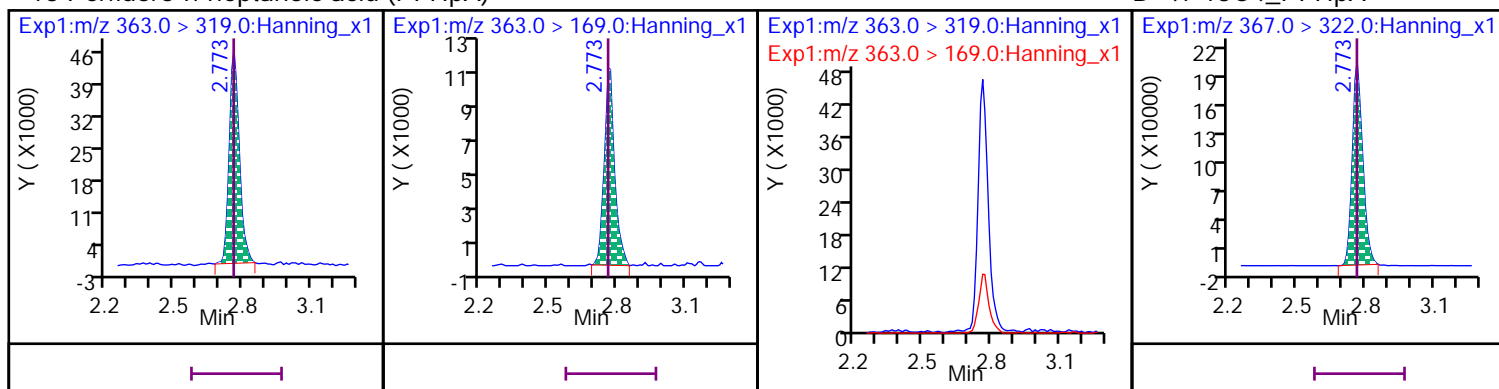
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



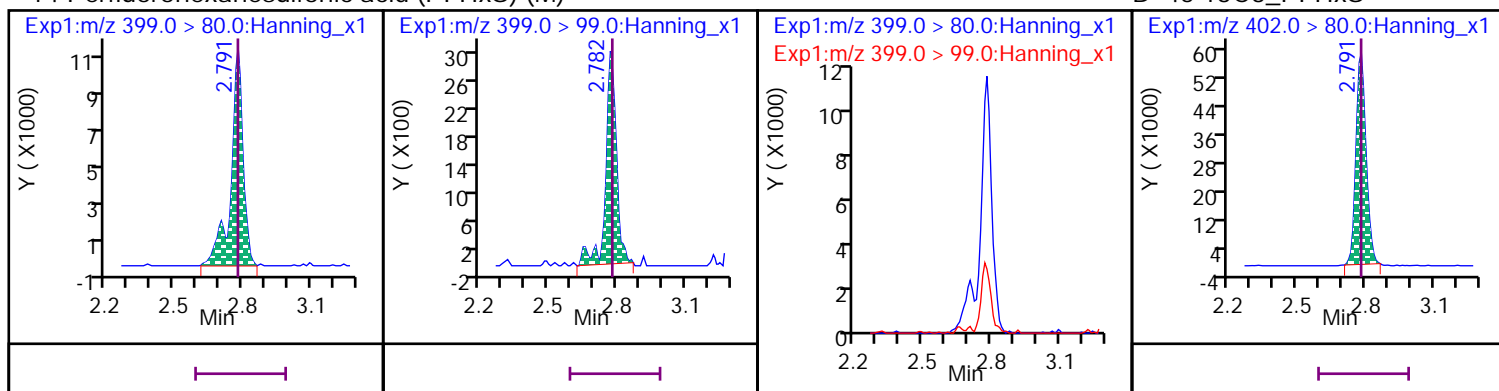
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



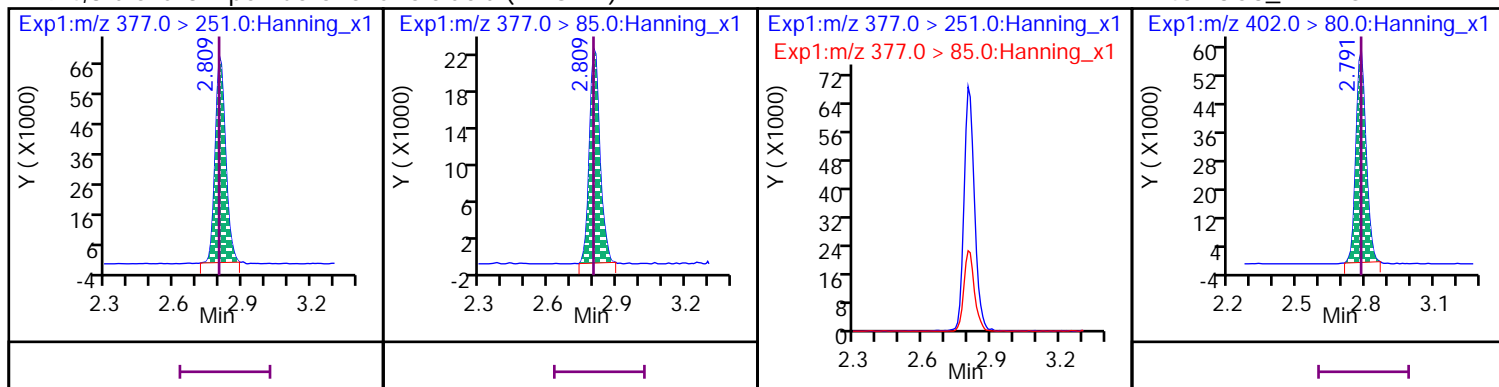
## 14 Perfluorohexanesulfonic acid (PFHxS) (M)

D 45 13C3\_PFHxS



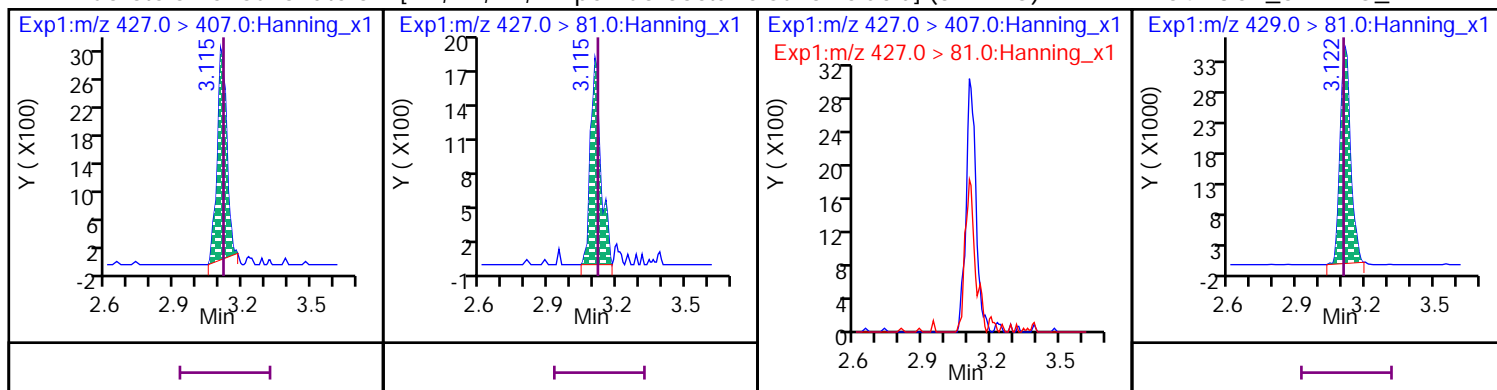
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



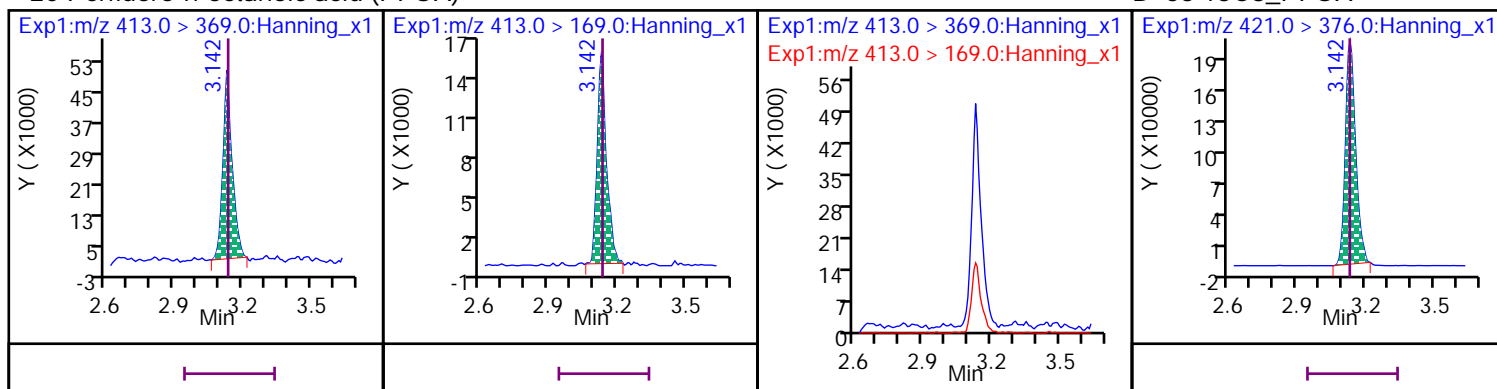
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



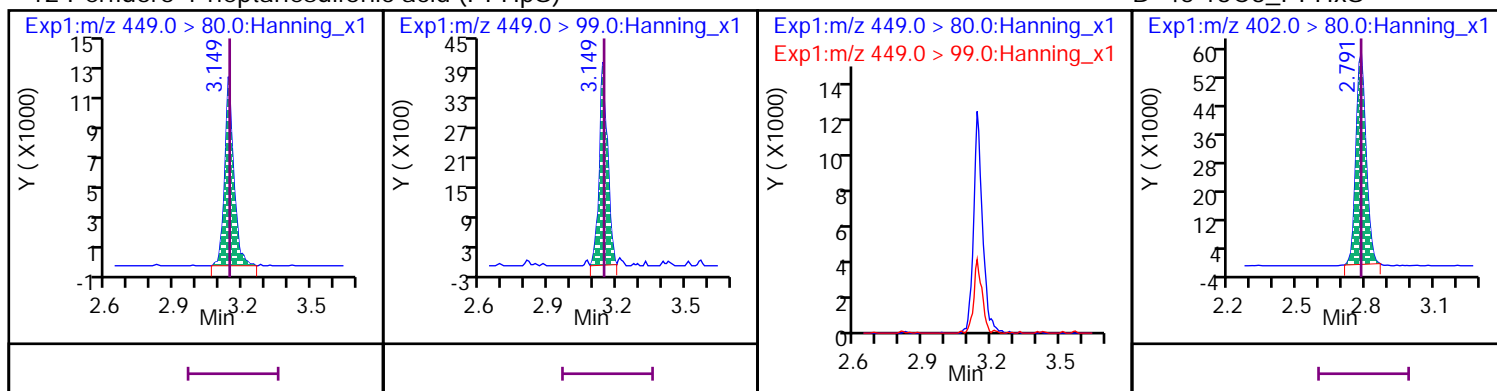
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



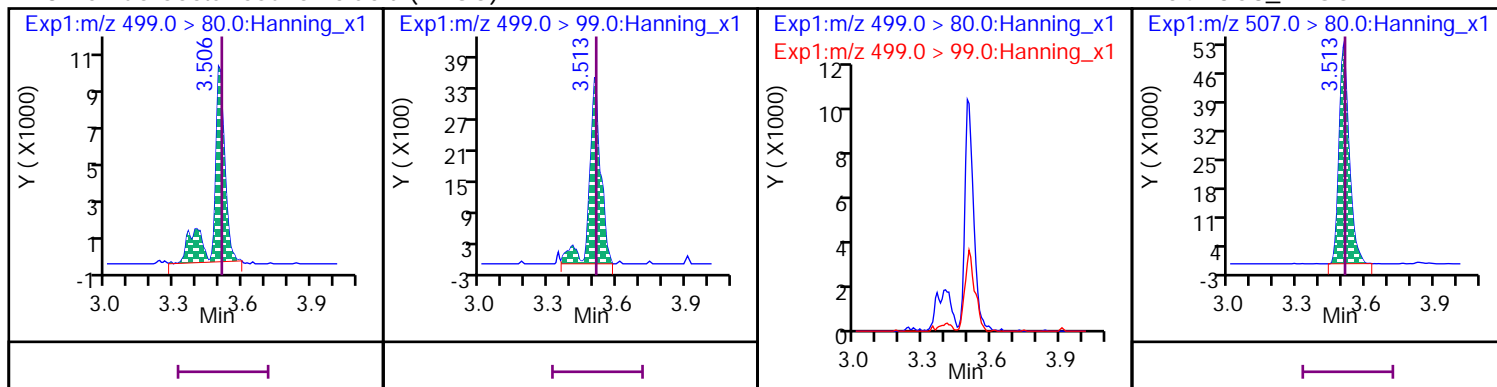
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



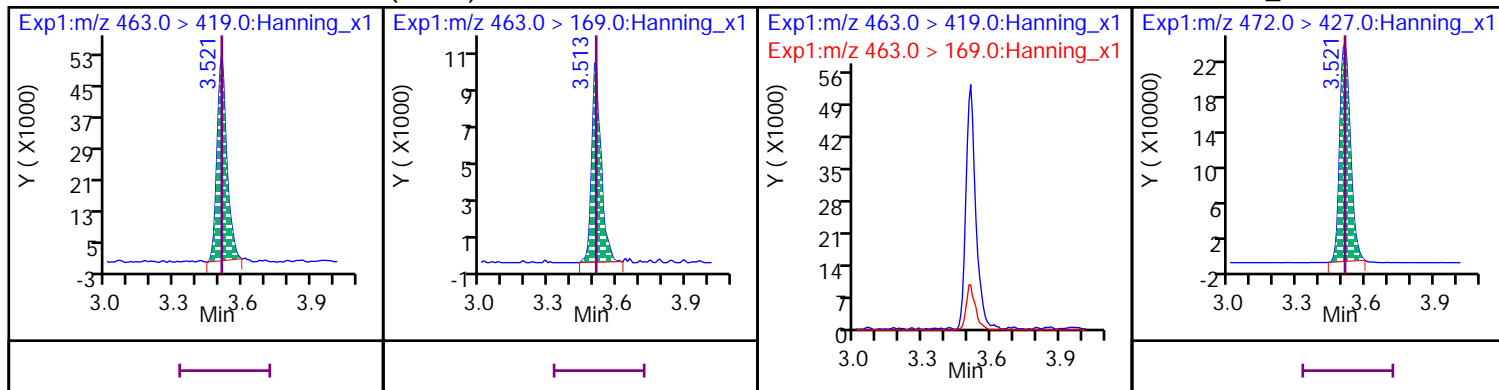
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



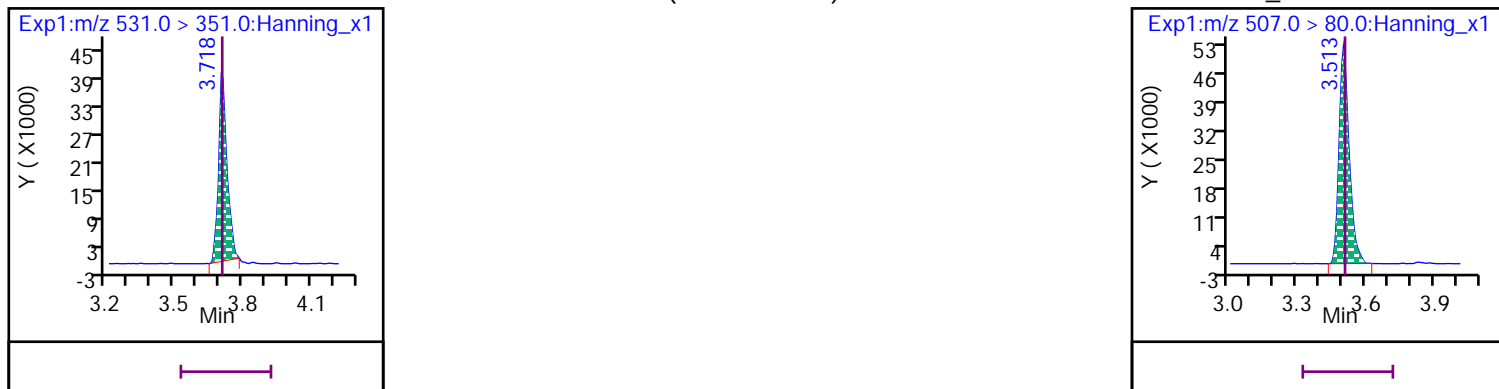
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



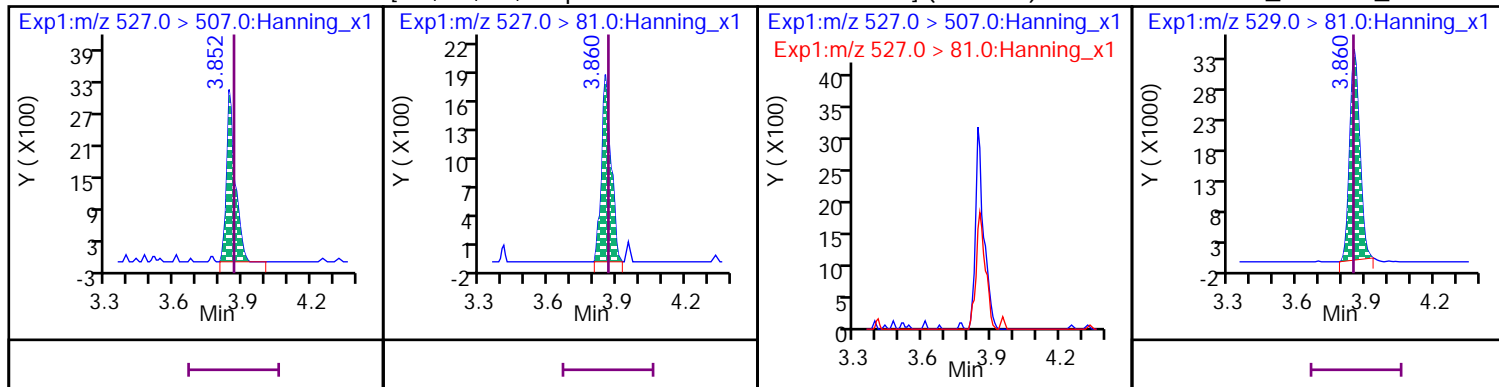
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



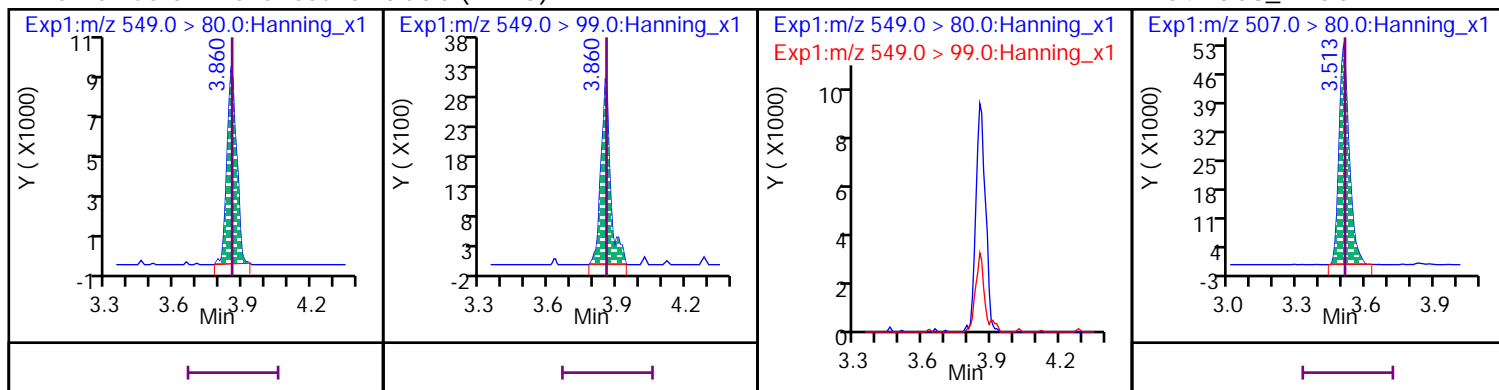
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



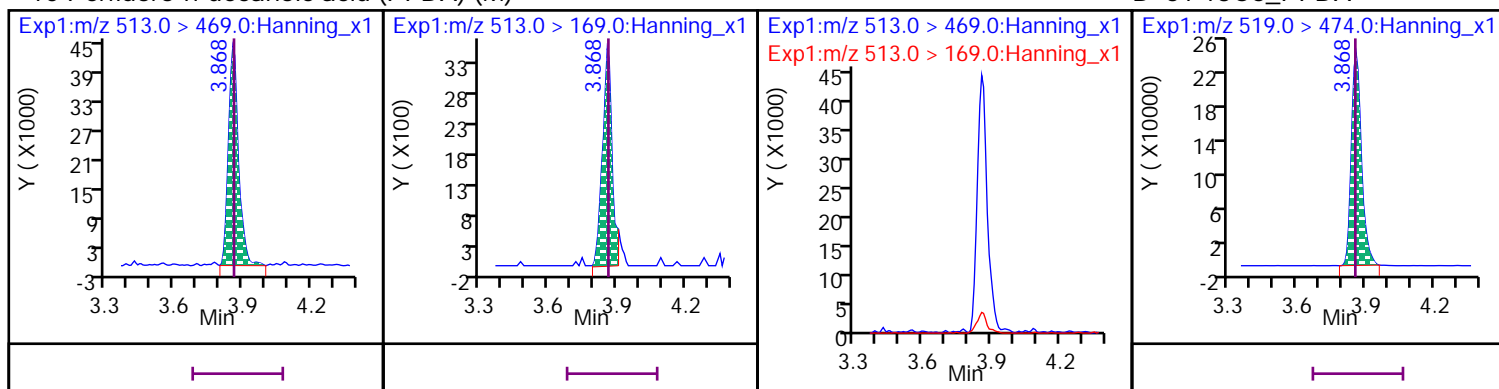
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



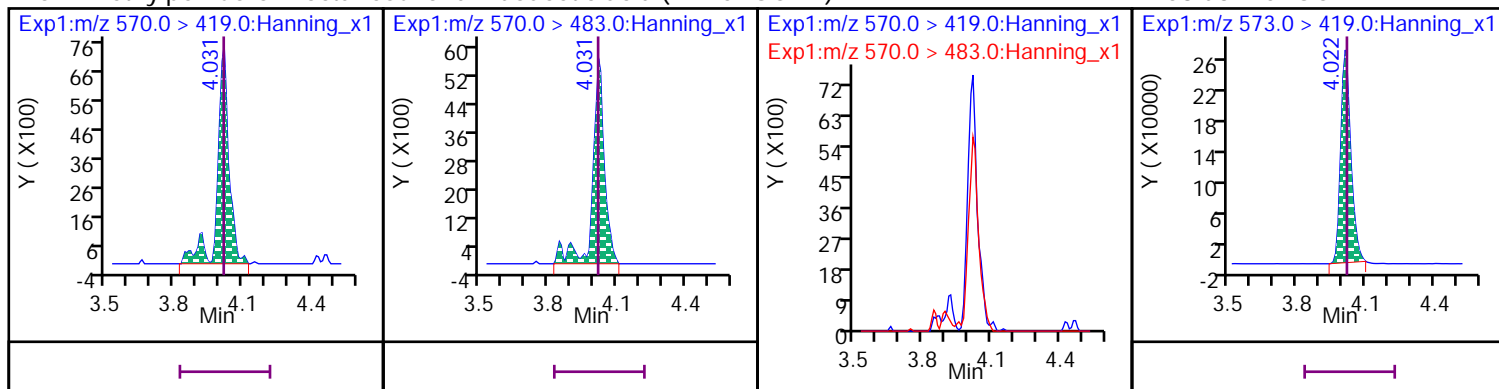
## 10 Perfluoro-n-decanoic acid (PFDA) (M)

D 51 13C6\_PFDA



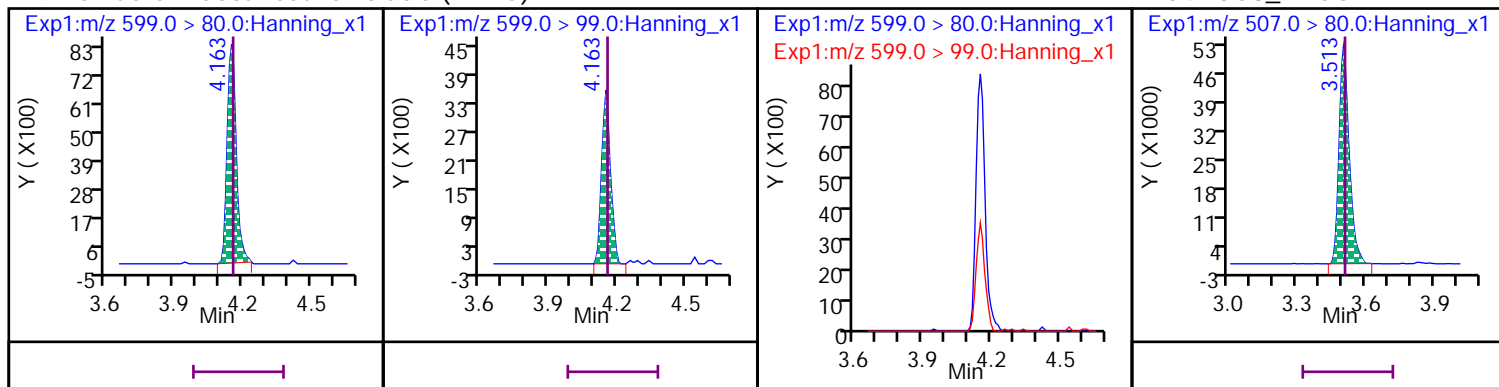
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



## 9 Perfluoro-1-decanesulfonic acid (PFDS)

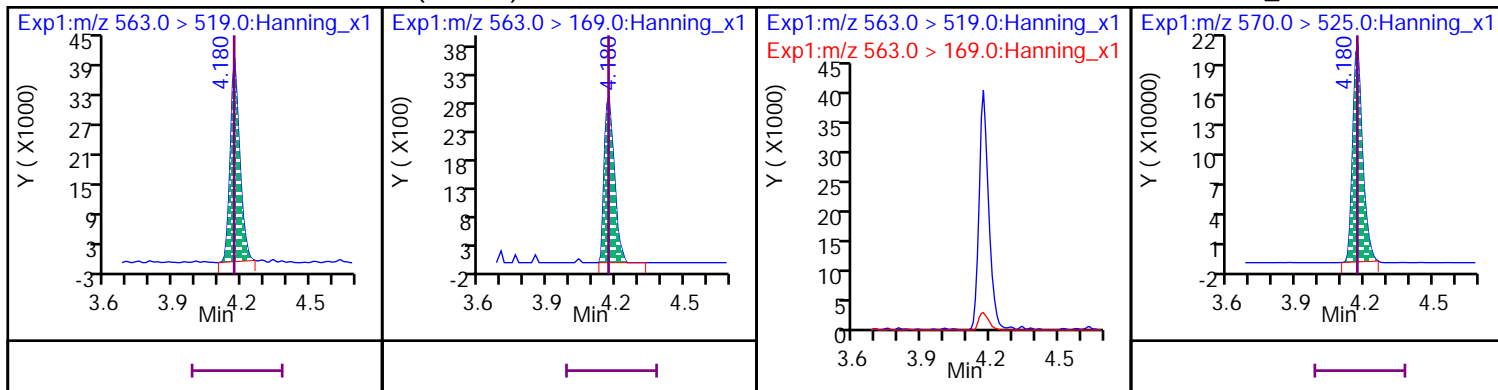
D 54 13C8\_PFOS





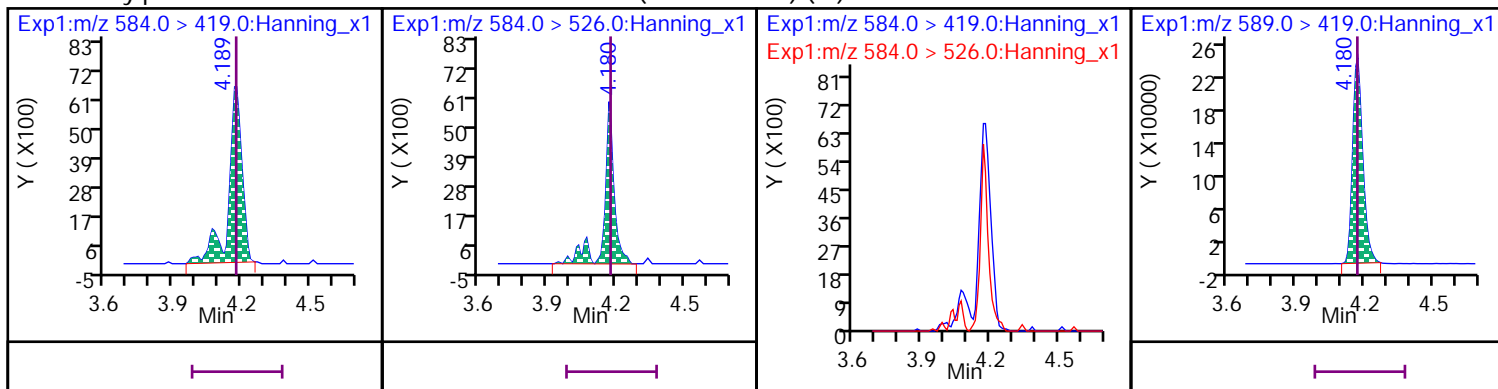
25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



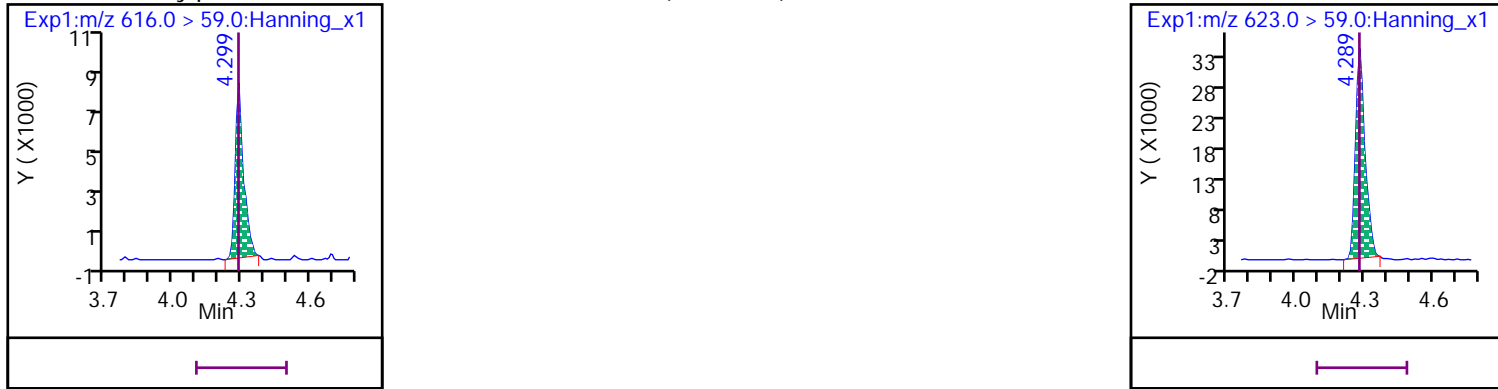
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



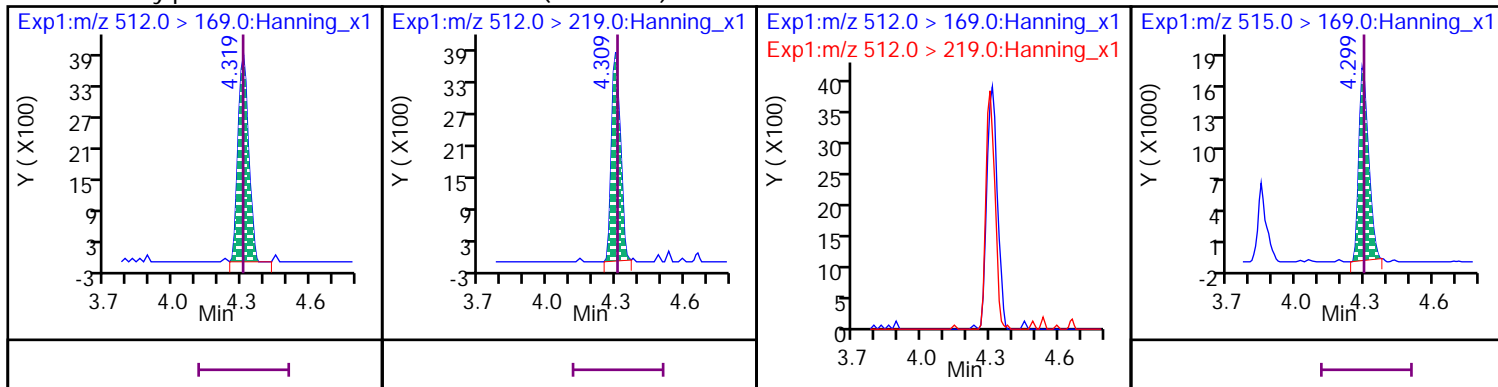
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

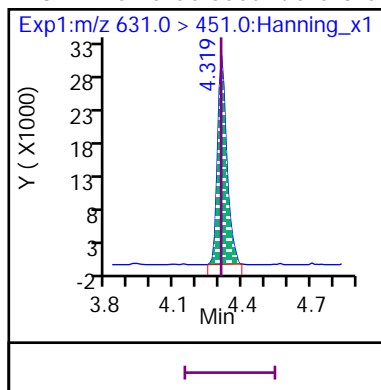


26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

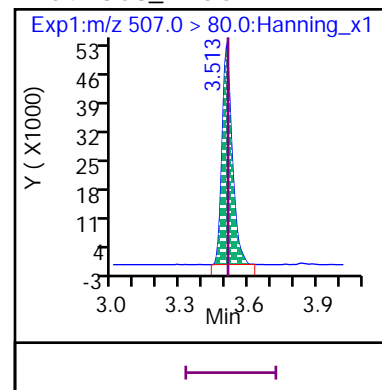
D 57 d3-MeFOSA



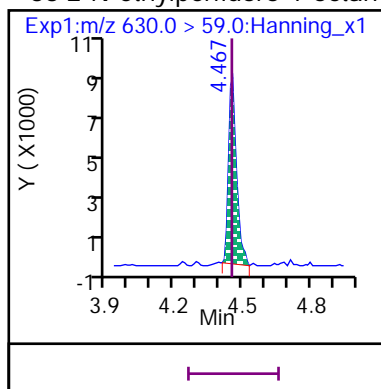
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



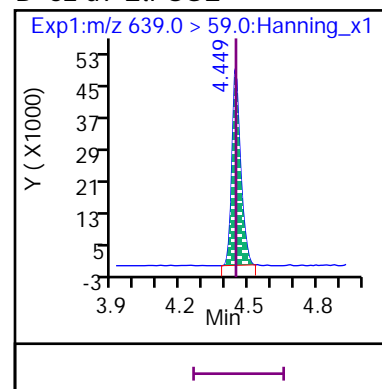
D 54 13C8\_PFOS



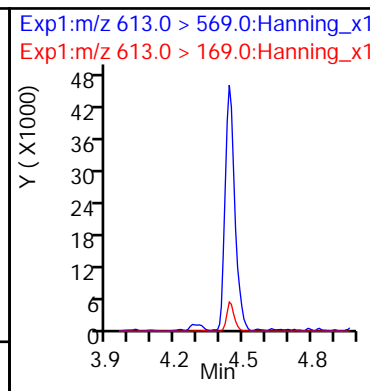
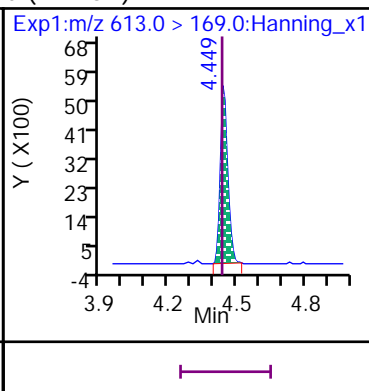
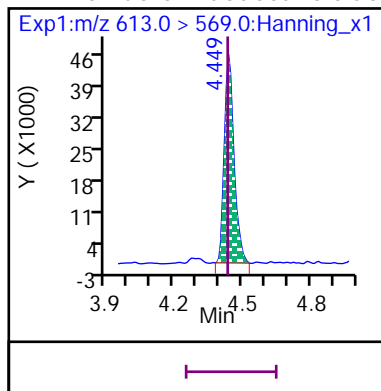
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



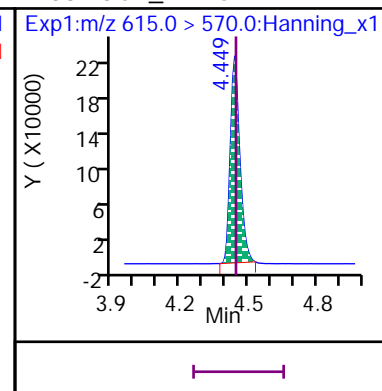
D 62 d9-EtFOSE



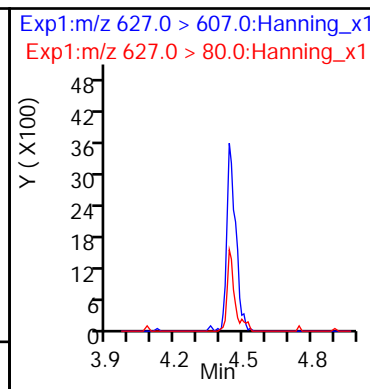
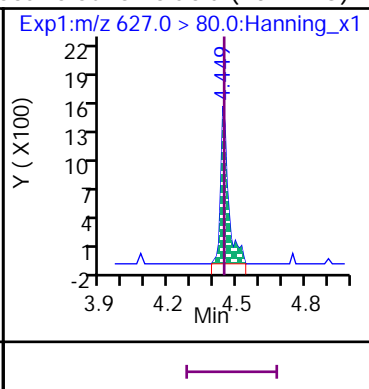
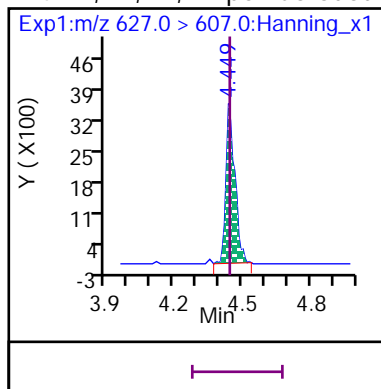
11 Perfluoro-n-dodecanoic acid (PFDoA)



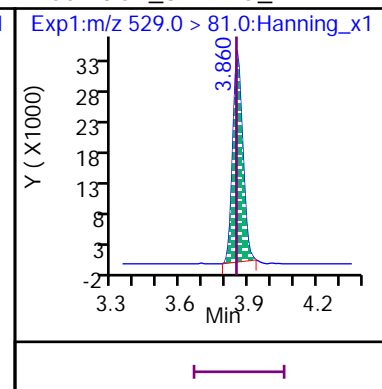
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

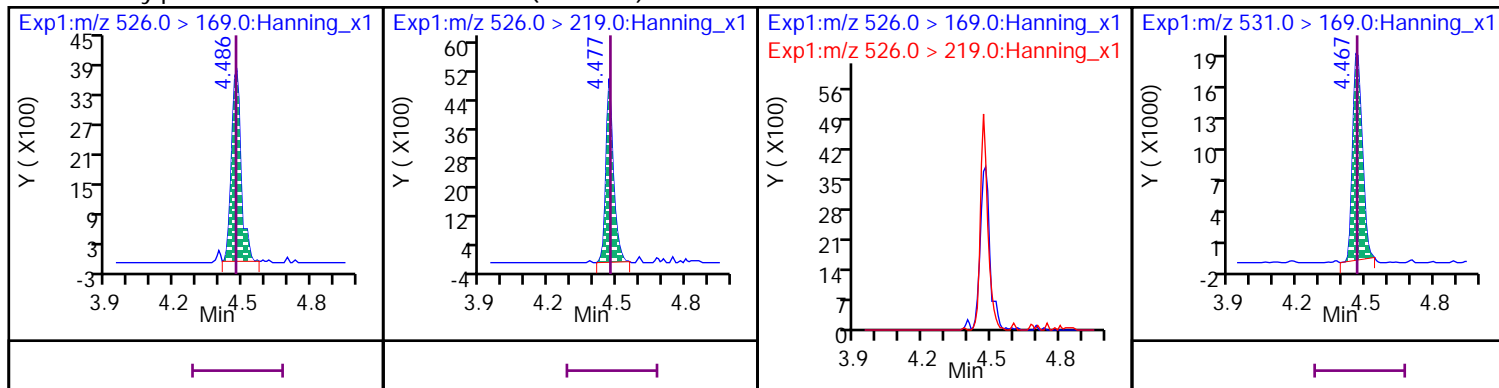


D 65 13C2\_8:2 FTS\_2



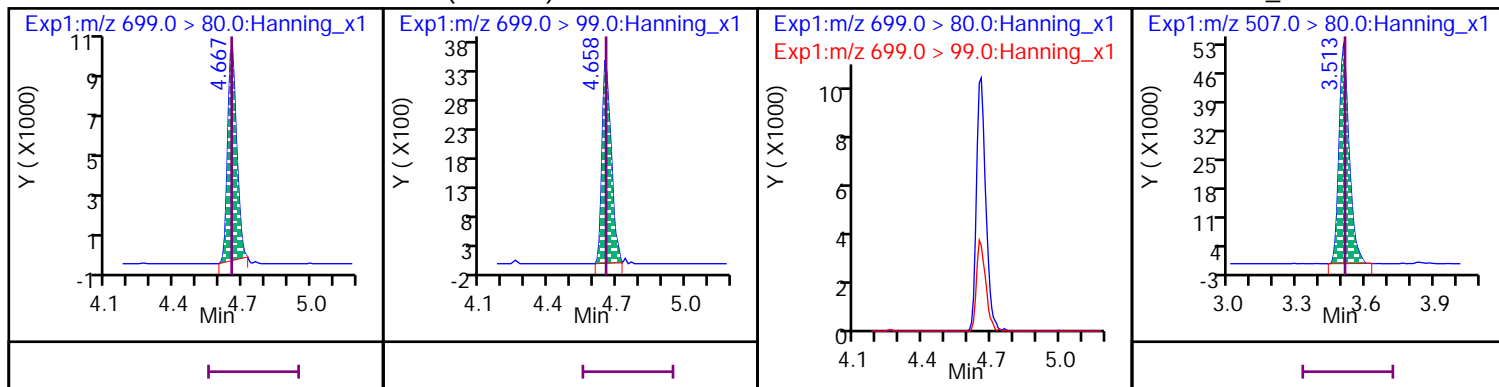
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



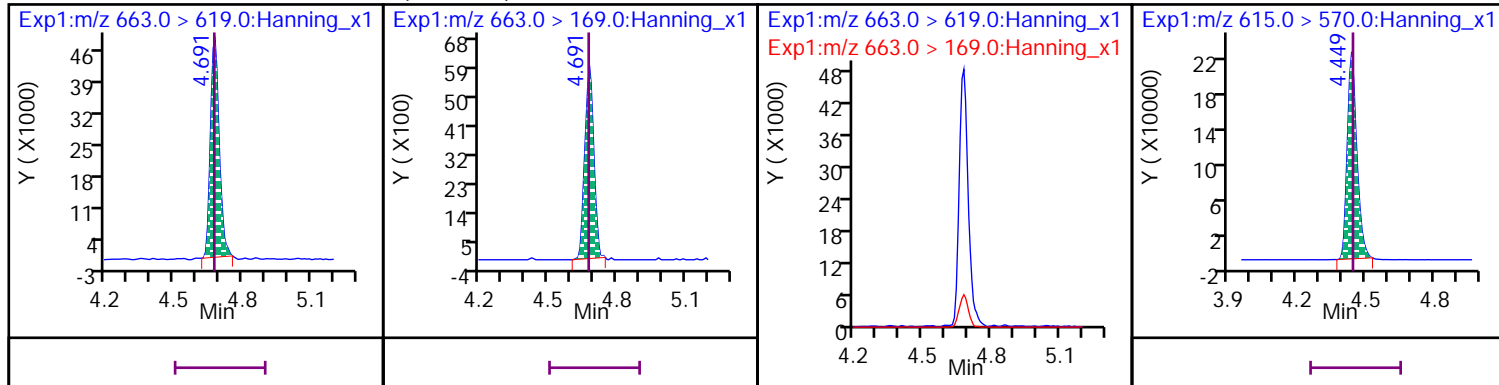
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



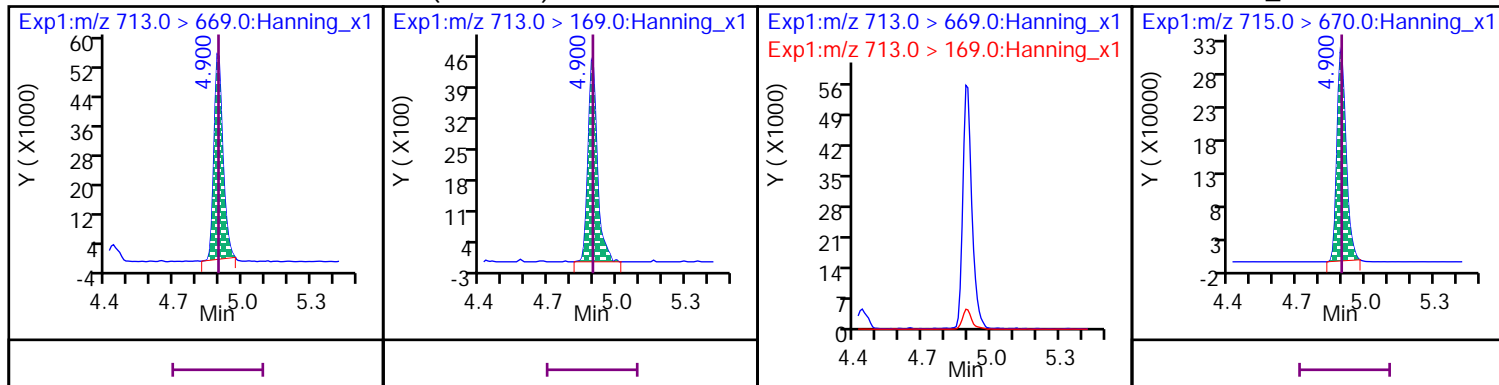
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



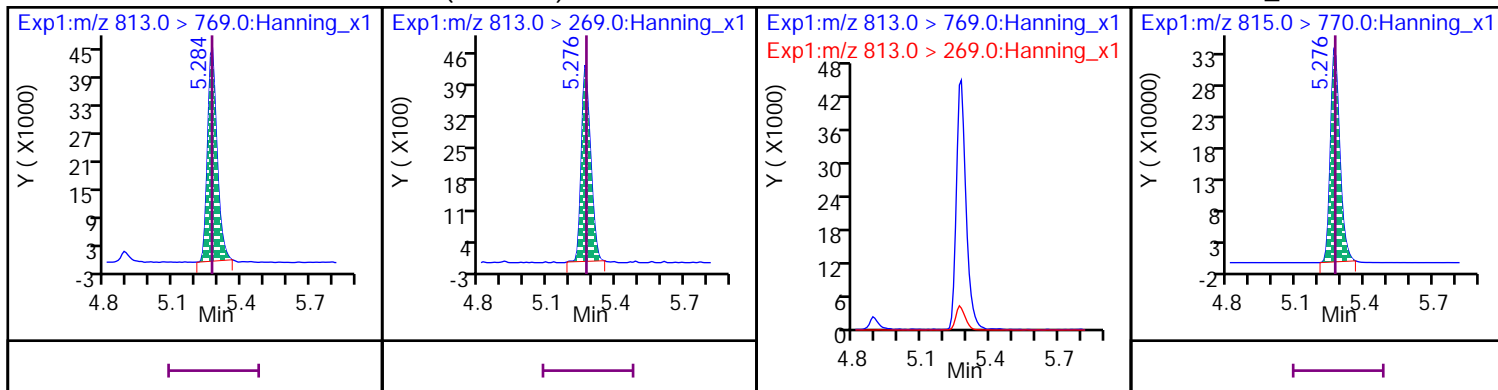
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



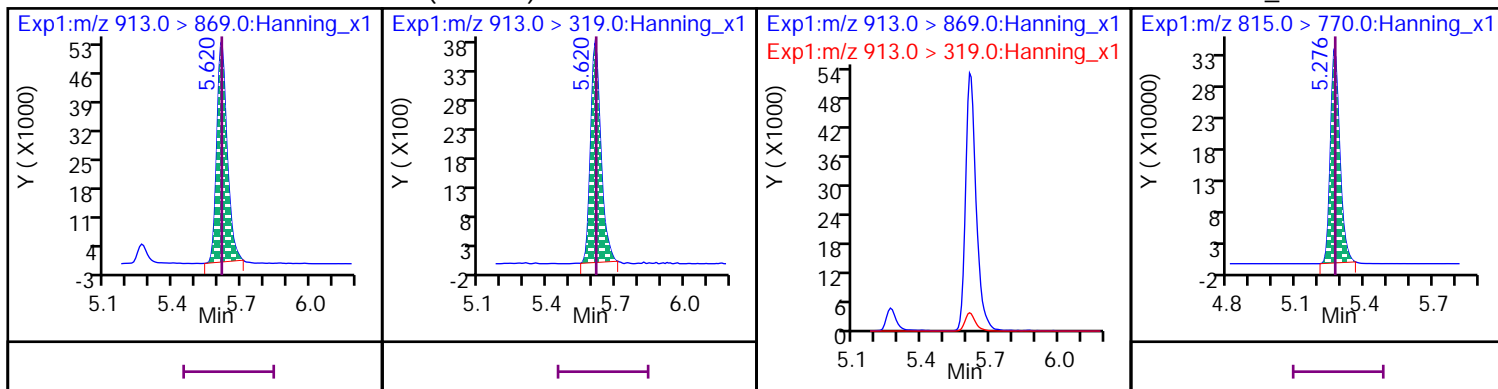
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

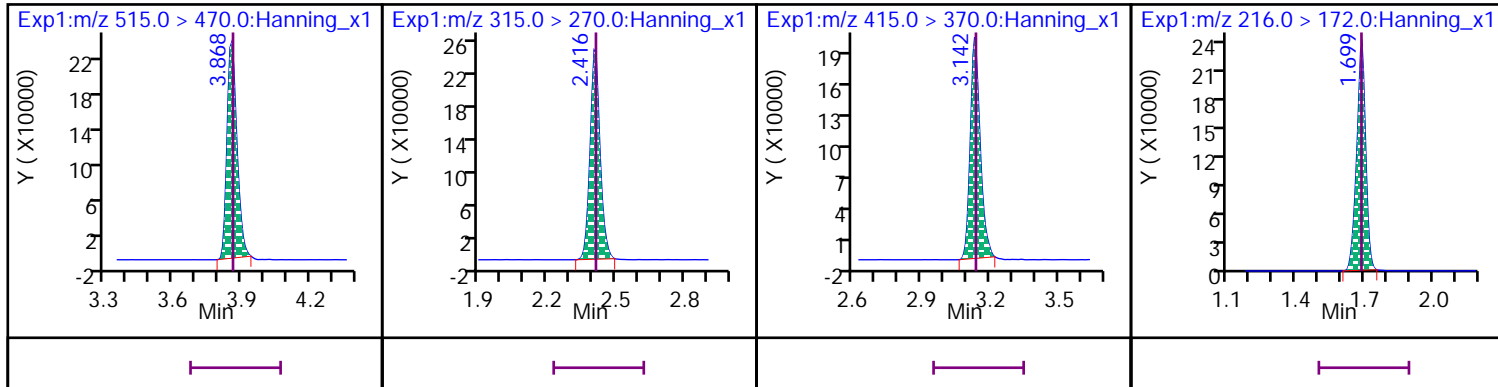


\* 37 13C2\_PFDA

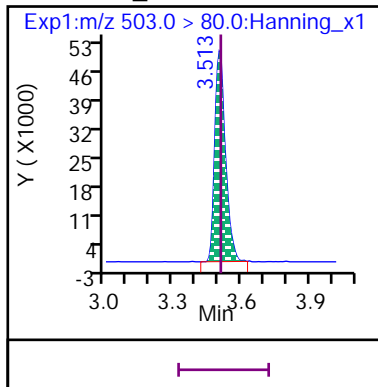
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

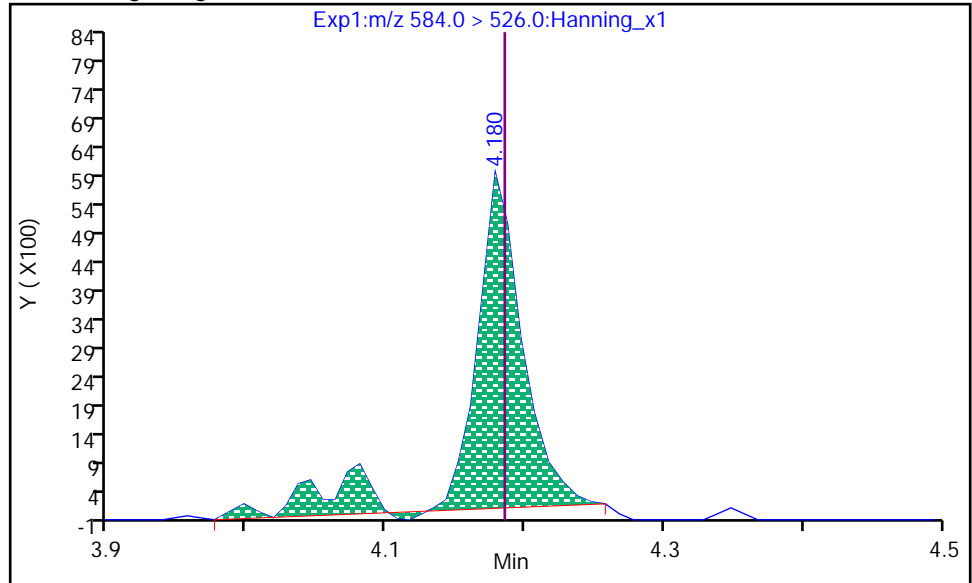
Dil. Factor: 1

Operator: Matthew M. Miller

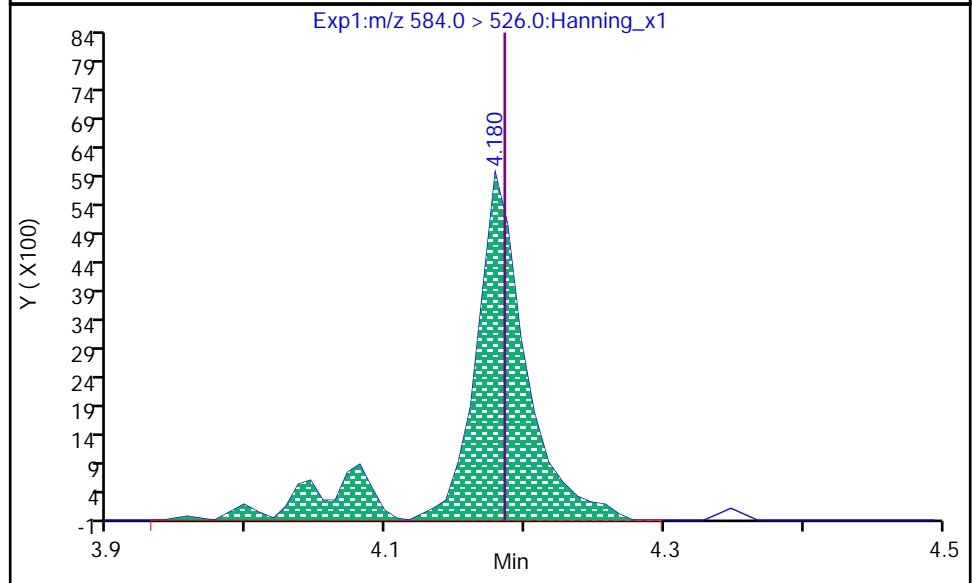
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.180  
Area: 14878  
Amount: 184.90  
Amount Units: ng/L



RT: 4.180  
Area: 17521  
Amount: 184.90  
Amount Units: ng/L



Data Editor: matthew.miller, 28-Dec-2020 10:18:46

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

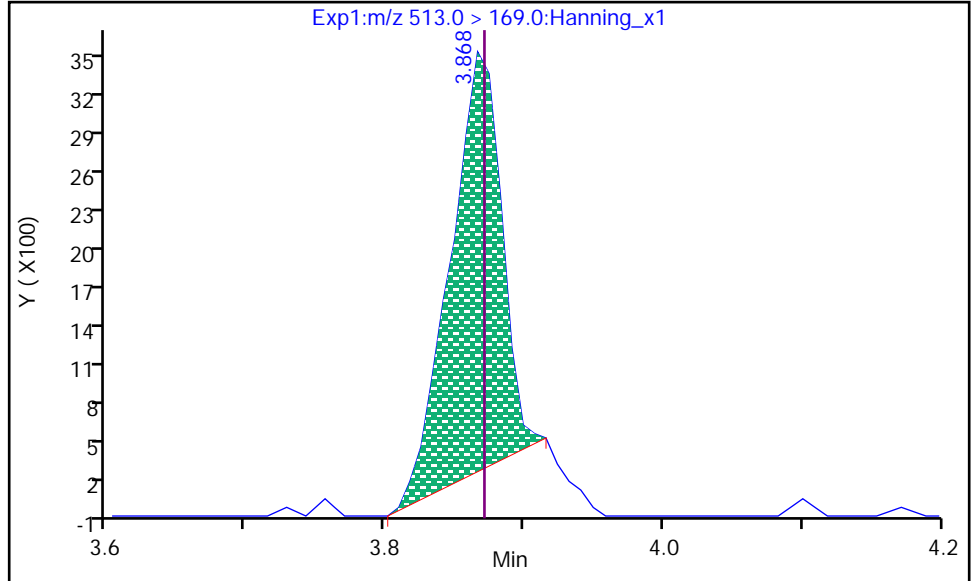
Dil. Factor: 1

Operator: Matthew M. Miller

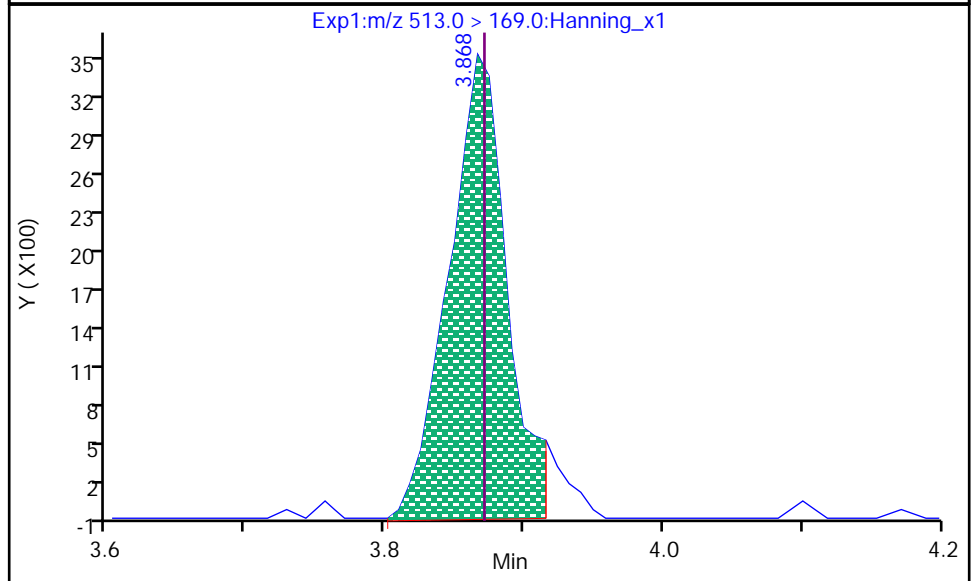
10 PFDA, CAS: 335-76-2

RT: 3.868  
Area: 8127  
Amount: 189.92  
Amount Units: ng/L

Processing Integration Results



RT: 3.868  
Area: 10209  
Amount: 189.92  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:47

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820006.d

Injection Date: 28-Dec-2020 10:06:27

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

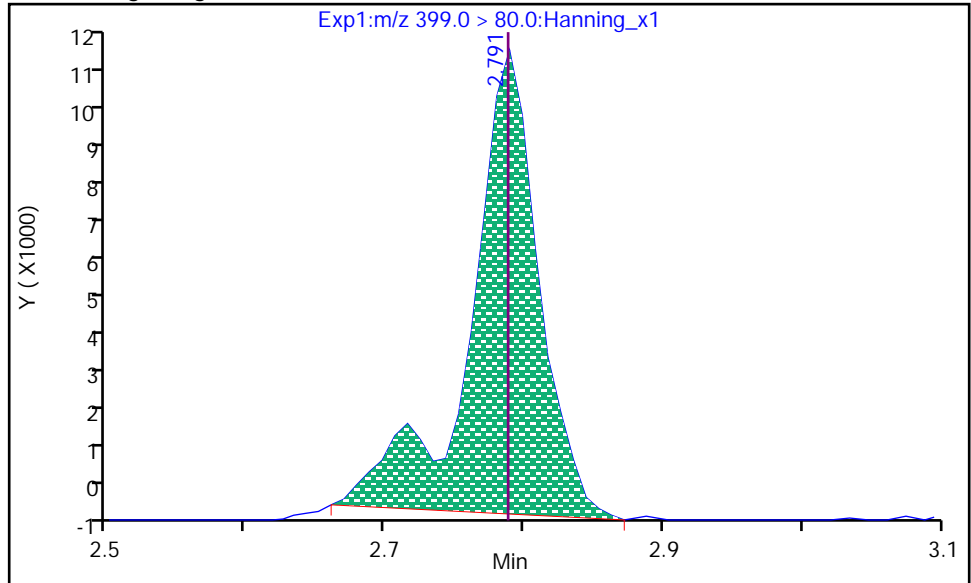
Dil. Factor: 1

Operator: Matthew M. Miller

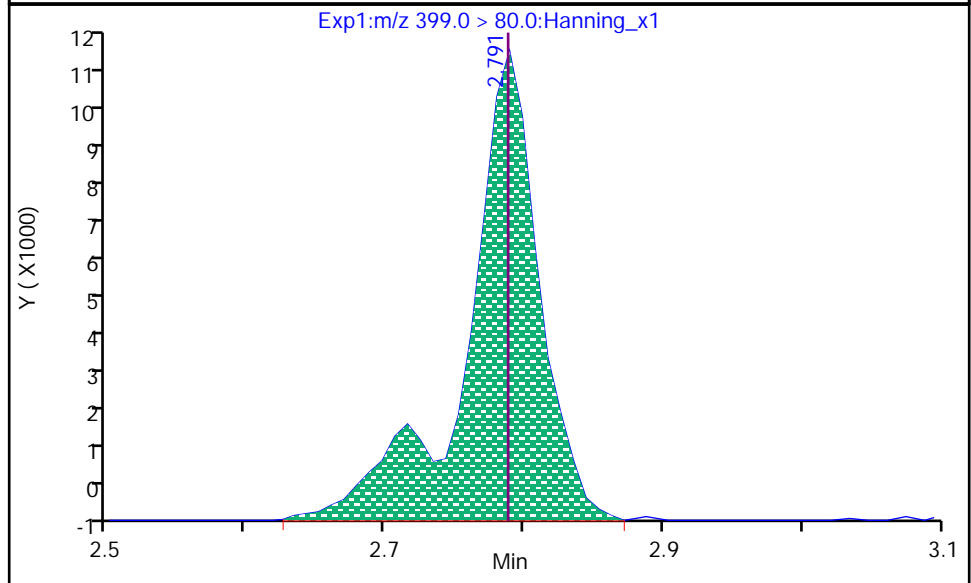
14 PFHxS, CAS: 355-46-4

Processing Integration Results

RT: 2.791  
Area: 37015  
Amount: 196.38  
Amount Units: ng/L



RT: 2.791  
Area: 39735  
Amount: 210.81  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:25:37

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d  
Injection Date: 28-Dec-2020 13:06:43 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 15  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	942.51	94.3	70 - 130
D 46 13C4_PFBA	649747	645073			99.3	50 - 150
D 50 13C5_PFPeA	665996	674000			101	50 - 150
21 PFPeA			1000.00	930.74	93.1	70 - 130
7 PFBS			884.00	816.96	92.4	70 - 130
D 44 13C3_PFBS	238207	230670			96.8	50 - 150
1 4:2 FTS			934.00	917.81	98.3	70 - 130
D 63 13C2_4:2 FTS_2	144067	122646			85.1	50 - 150
D 49 13C5_PFHxA	743582	708128			95.2	50 - 150
15 PFHxA			1000.00	917.27	91.7	70 - 130
22 PFPeS			938.00	891.42	95	70 - 130
28 GenX			2000.00	1878.79	93.9	70 - 130
D 66 13C3_GenX	1401050	1337982			95.5	50 - 150
D 47 13C4_PFHpA	633684	595025			93.9	50 - 150
13 PFHpA			1000.00	960.22	96	70 - 130
D 45 13C3_PFHxS	174146	177911			102	50 - 150
14 PFHxS			910.00	842.13	92.5	70 - 130
29 ADONA			942.00	857.41	91	70 - 130
D 64 13C2_6:2 FTS_2	104346	100427			96.2	50 - 150
2 6:2 FTS			948.00	1056.45	111	70 - 130
20 PFOA			1000.00	989.08	98.9	70 - 130
D 53 13C8_PFOA	628007	576963			91.9	50 - 150
12 PFHpS			952.00	885.48	93	70 - 130
18 PFOS			928.00	845.53	91.1	70 - 130
17 PFNA			1000.00	914.90	91.5	70 - 130
D 56 13C9_PFNA	767623	744395			97	50 - 150
D 54 13C8_PFOS	152445	154691			101	50 - 150
30 9Cl-PF3ONS			932.00	849.93	91.2	70 - 130
D 55 13C8_PFOSA	308857	301021			97.5	50 - 150
19 PFOSA			1000.00	942.49	94.2	70 - 130
16 PFNS			960.00	862.83	89.9	70 - 130
D 65 13C2_8:2 FTS_2	100453	86782			86.4	50 - 150
3 8:2 FTS			958.00	992.09	104	70 - 130
10 PFDA			1000.00	950.43	95	70 - 130
D 51 13C6_PFDA	672868	672515			99.9	50 - 150
D 58 d3-MeFOSAA	791564	701823			88.7	50 - 150



Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1005.53	101	70 - 130
9 PFDS			964.00	827.68	85.9	70 - 130
5 N-EtFOSAA			1000.00	917.42	91.7	70 - 130
25 PFUdA			1000.00	937.12	93.7	70 - 130
D 60 d5-EtFOSAA	731651	692713			94.7	50 - 150
D 52 13C7_PFUdA	643525	626438			97.3	50 - 150
D 61 d7-MeFOSE	105402	106017			101	50 - 150
32 MeFOSE			1000.00	863.40	86.3	70 - 130
26 MeFOSA			1000.00	857.26	85.7	70 - 130
D 57 d3-MeFOSA	51840	54552			105	50 - 150
31 11Cl-PF3OUDS			942.00	832.74	88.4	70 - 130
D 62 d9-EtFOSE	137116	114256			83.3	50 - 150
33 EtFOSE			1000.00	1068.52	107	70 - 130
D 59 d5-EtFOSA	50284	52541			104	50 - 150
D 38 13C2_PFD0A	611364	601549			98.4	50 - 150
4 10:2 FTS			964.00	956.65	99.2	70 - 130
27 EtFOSA			1000.00	821.00	82.1	70 - 130
11 PFD0A			1000.00	965.50	96.6	70 - 130
34 PFDOS			968.00	903.38	93.3	70 - 130
24 PFTrDA			1000.00	939.31	93.9	70 - 130
23 PFTeDA			1000.00	955.79	95.6	70 - 130
D 42 13C2_PFTeDA	813074	802621			98.7	50 - 150
35 PFHxDA			1000.00	988.25	98.8	70 - 130
D 40 13C2_PFHxDA	935525	873641			93.4	50 - 150
36 PFODA			1000.00	967.04	96.7	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d  
 Injection Date: 28-Dec-2020 13:06:43 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 15  
 Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	645073	24	>100:1			1000.00	930.10	99.3	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.699	1.696	1/0	605555	25	>100:1			1000.00	942.51		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.067	2.072	0	674000	17	>100:1			1000.00	979.81	101	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.067	2.072	0/0	630718	18	>100:1			1000.00	930.74		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	230670	18	>100:1			1000.00	1001.91	96.8	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.125	1/0	222188	17	>100:1	Target = 3.50		884.00	816.96		
298.9 > 99	44	2.130	2.125		64156	19	>100:1	3.46 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.450	1/0	178369	19	>100:1	Target = 3.10		938.00	891.42		
349 > 99	44	2.442	2.450		57492	19	>100:1	3.10 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.379	1	122646	20	>100:1			5000.00	5066.27	85.1	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.380	2.388	0/-1	44930	17	>100:1	Target = 1.80		934.00	917.81		
327 > 81	63	2.380	2.388		26006	23	>100:1	1.72 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.423	0	708128	20	>100:1			1000.00	960.73	95.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.415	2.423	0/0	641283	21	>100:1	Target = 18.34		1000.00	917.27		
313 > 119	49	2.415	2.423		33320	19	>100:1	19.24 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.522	2.530	0	1337982	20	>100:1			5000.00	5023.32	95.5	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.522	2.530	0/0	361211	22	>100:1	Target = 0.81		2000.00	1878.79		
285 > 185	66	2.522	2.530		444057	19	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	595025	20	>100:1			1000.00	980.84	93.9	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	592644	21	>100:1	Target = 3.70		1000.00	960.22		
363 > 169	47	2.773	2.772		157979	20	>100:1	3.75 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.782	2.790	0	177911	20	>100:1			1000.00	1039.03	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/1	158857	28	>100:1	Target = 3.21	0.14	910.00	842.13		
399 > 99	45	2.782	2.790		52957	28	>100:1	2.99 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.808	1/1	968468	20	>100:1	Target = 2.97		942.00	857.41		
377 > 85	45	2.809	2.808		316019	20	>100:1	3.06 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.154	1/1	143111	22	>100:1	Target = 3.08		952.00	885.48		
449 > 99	45	3.149	3.154		44962	22	>100:1	3.18 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	100427	30	>100:1			5000.00	5214.71	96.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	43846	44	>100:1	Target = 1.80		948.00	1056.45		
427 > 81	64	3.115	3.128		18099	23	>100:1	2.42 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	576963	25	>100:1			1000.00	974.82	91.9	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	581761	26	>100:1	Target = 2.87		1000.00	989.08		
413 > 169	53	3.142	3.148		188690	24	>100:1	3.08 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	154691	21	>100:1			1000.00	1031.76	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/1	154992	45	>100:1	Target = 3.84	0.25	928.00	845.53		
499 > 99	54	3.514	3.520		40744	39	>100:1	3.80 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/1	442611	24	>100:1			932.00	849.93		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/0	102142	22	>100:1	Target = 3.07		960.00	862.83		
549 > 99	54	3.858	3.865		42460	26	>100:1	2.40 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.169	0/0	92919	20	>100:1	Target = 3.03		964.00	827.68		
599 > 99	54	4.171	4.169		36996	17	>100:1	2.51 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.329	4.317	1/1	365835	15	>100:1			942.00	832.74		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.663	1/1	112191	19	>100:1	Target = 3.33		968.00	903.38		
699 > 99	54	4.665	4.663		35773	21	>100:1	3.13 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	744395	23	>100:1			1000.00	991.25	97	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	681065	22	>100:1	Target = 6.16		1000.00	914.90		
463 > 169	56	3.522	3.520		105758	19	>100:1	6.43 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	301021	22	>100:1			1000.00	972.40	97.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	279582	21	>100:1			1000.00	942.49		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	86782	17				5000.00	4678.24	86.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-1	34611	17	>100:1	Target = 1.95		958.00	992.09		
527 > 81	65	3.866	3.873		16524	16	>100:1	2.09 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.455	1/0	38370	21		Target = 3.14		964.00	956.65		
627 > 80	65	4.456	4.455		10744	16		3.57 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	672515	20	>100:1			1000.00	1013.84	99.9	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.873	0/-1	628056	21	>100:1	Target = 15.94		1000.00	950.43		
513 > 169	51	3.866	3.873		41933	17		14.97 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	701823	20	>100:1			5000.00	4889.41	88.7	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.029	1/0	108417	34	>100:1	Target = 1.33	0.10	1000.00	1005.53		
570 > 483	58	4.030	4.029		80179	34	>100:1	1.35 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	692713	20	>100:1			5000.00	5215.64	94.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.180	4.187	0/-1	126541	36	>100:1	Target = 1.58	0.06	1000.00	917.42		M
584 > 526	60	4.189	4.187		79940	35	>100:1	1.58 (0.79-2.37)	0.22				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	626438	17	>100:1			1000.00	991.08	97.3	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.180	4.178	1/0	551750	18	>100:1	Target = 15.50		1000.00	937.12		
563 > 169	52	4.180	4.178		34284	16	>100:1	16.09 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	106017	18				1000.00	979.75	101	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.299	4.297	1/0	86006	15	>100:1			1000.00	863.40		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.309	4.307	1	54552	15	87:1			1000.00	1030.90	105	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.309	4.317	0/-1	52761	16	>100:1	Target = 1.12		1000.00	857.26		
512 > 219	57	4.309	4.317		51356	22	>100:1	1.02 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	114256	17	>100:1			1000.00	911.17	83.3	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.464	1/0	108616	17	>100:1			1000.00	1068.52		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	601549	20	>100:1			1000.00	993.78	98.4	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	588154	18	>100:1	Target = 10.85		1000.00	965.50		
613 > 169	38	4.456	4.446		55192	26	>100:1	10.65 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	556533	22	>100:1	Target = 8.37		1000.00	939.31		
663 > 169	38	4.689	4.688		64196	18	>100:1	8.66 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	52541	16	>100:1			1000.00	1070.20	104	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	47127	15	>100:1	Target = 1.03		1000.00	821.00		
526 > 219	59	4.483	4.482		43640	14	>100:1	1.07 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	802621	18	>100:1			1000.00	952.73	98.7	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	664684	19	99:1	Target = 12.11		1000.00	955.79		
713 > 169	42	4.907	4.906		54893	19	>100:1	12.10 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	873641	20	>100:1			1000.00	964.11	93.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	564123	20	>100:1	Target = 11.48		1000.00	988.25		
813 > 269	40	5.283	5.282		50423	20	>100:1	11.18 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.626	5.625	1/0	747876	25	94:1	Target = 13.88		1000.00	967.04		
913 > 319	40	5.626	5.625		51346	24	>100:1	14.56 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	668270	20	>100:1					91.3	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.415	2.423	0	697097	20	>100:1					95.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	571452	25	>100:1					95.3	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	596920	24	>100:1					97.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.522	3.520	1	160032	23	>100:1					98.2	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d

Injection Date: 28-Dec-2020 13:06:43

Inst. ID: LCMSMS02

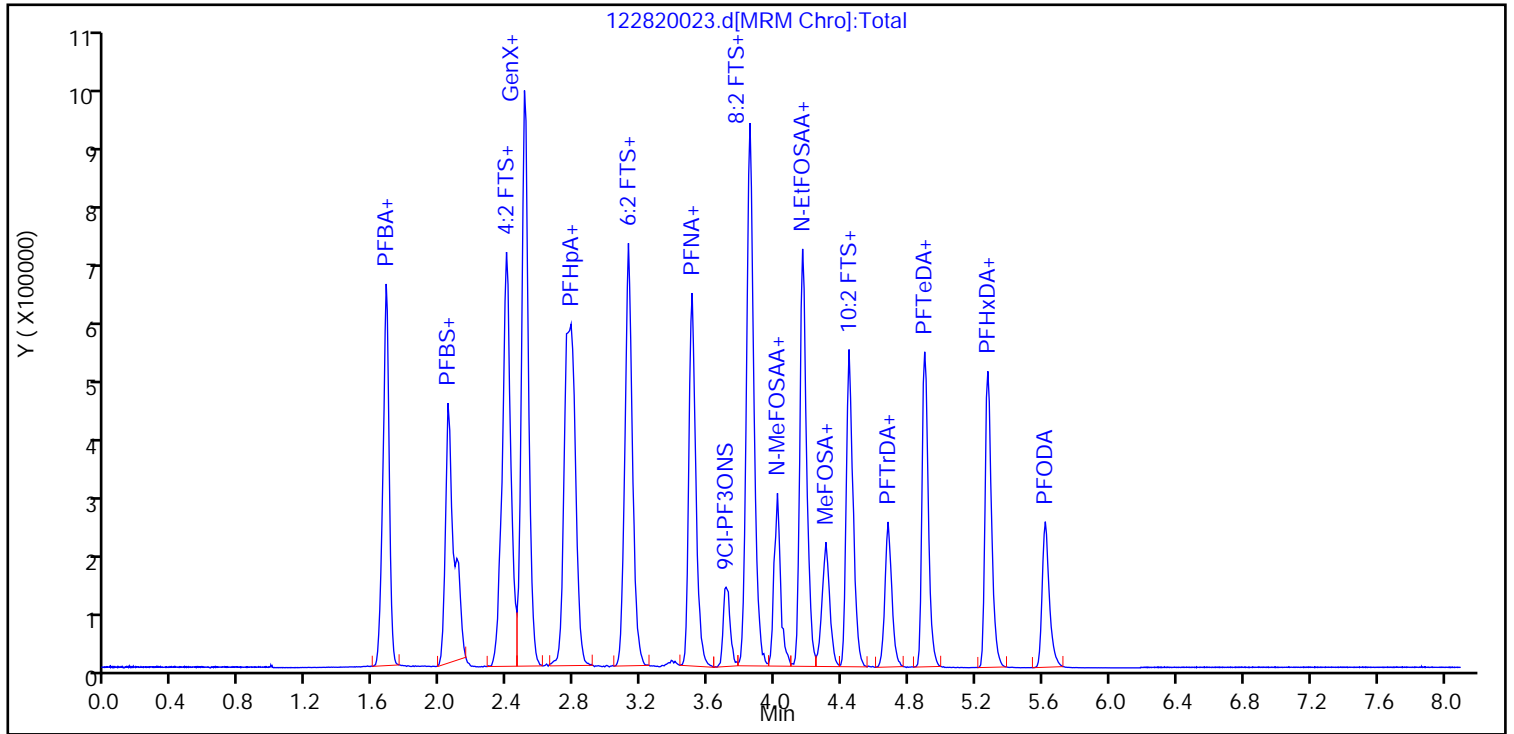
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

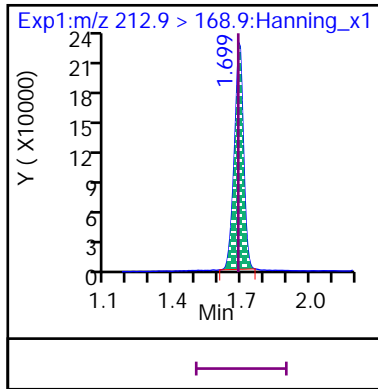
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

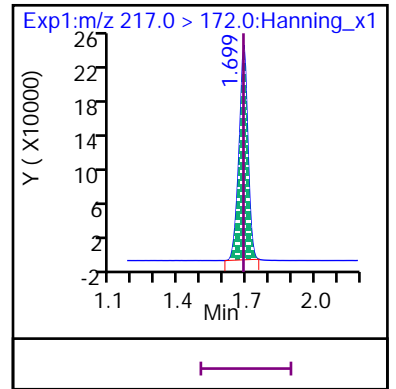
Operator: Matthew M. Miller



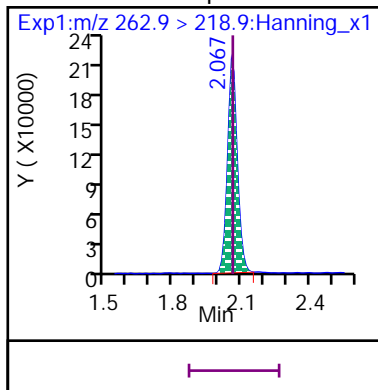
8 Perfluoro-n-butanoic acid (PFBA)



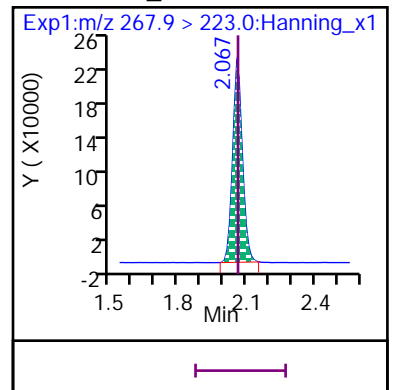
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

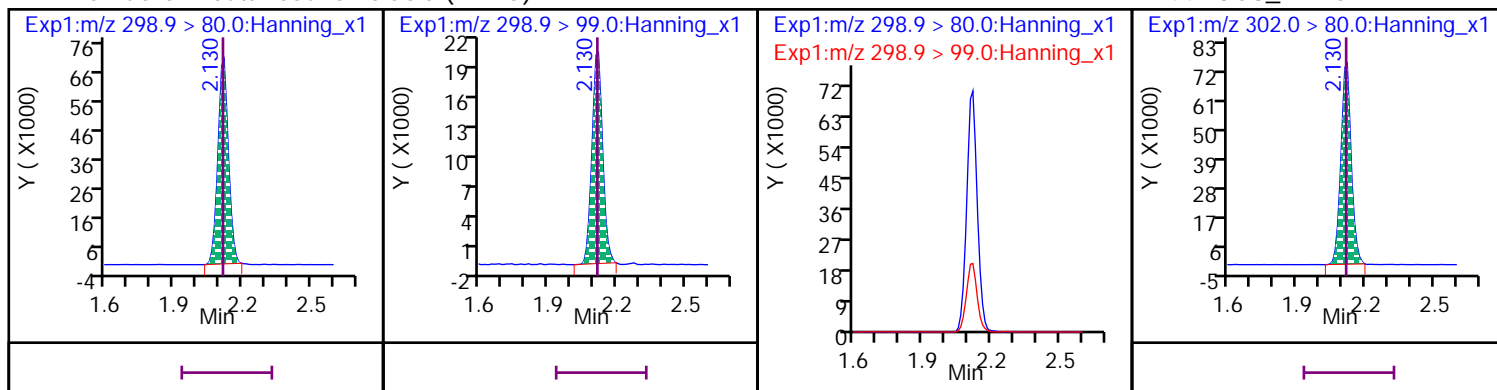


D 50 13C5\_PFPeA



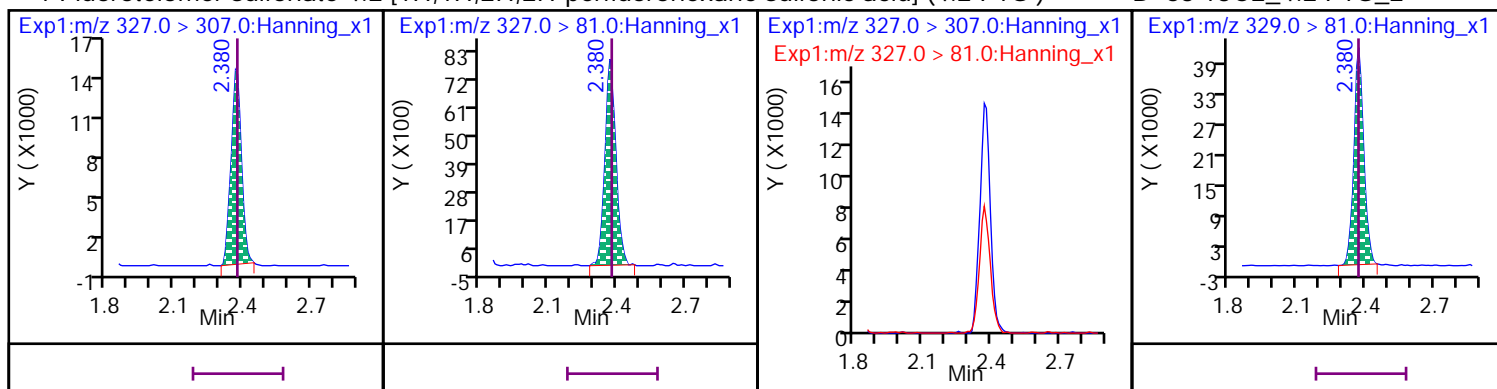
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



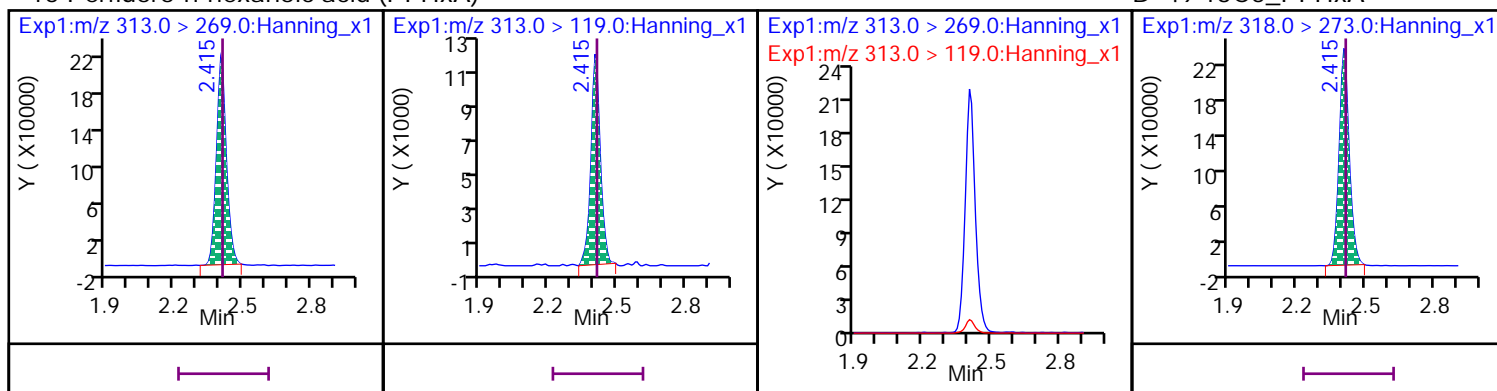
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



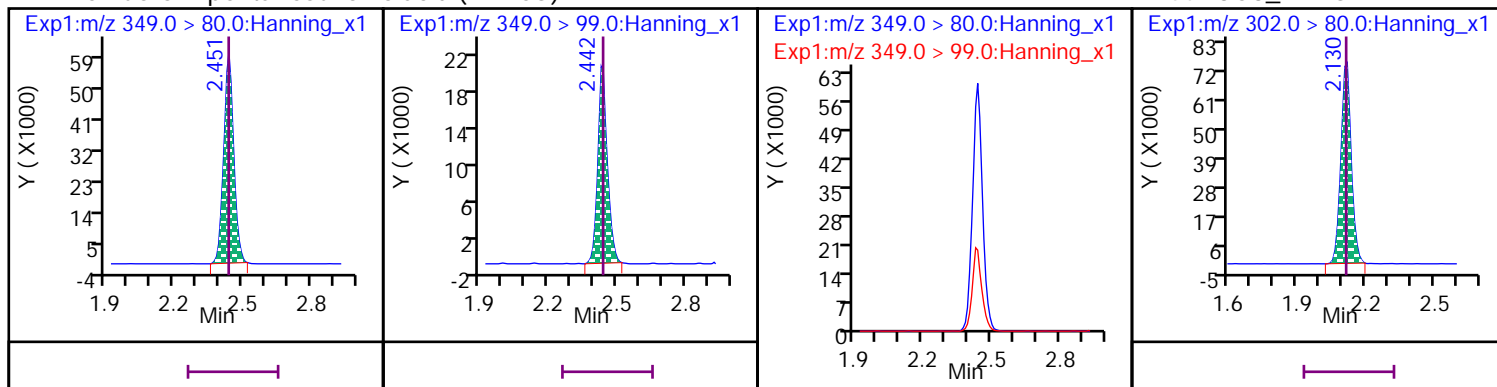
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



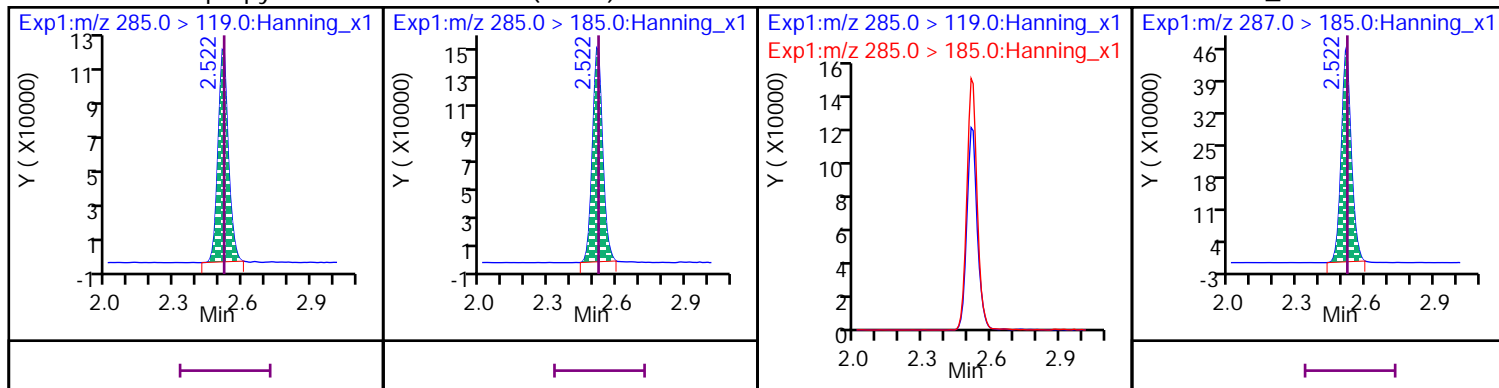
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



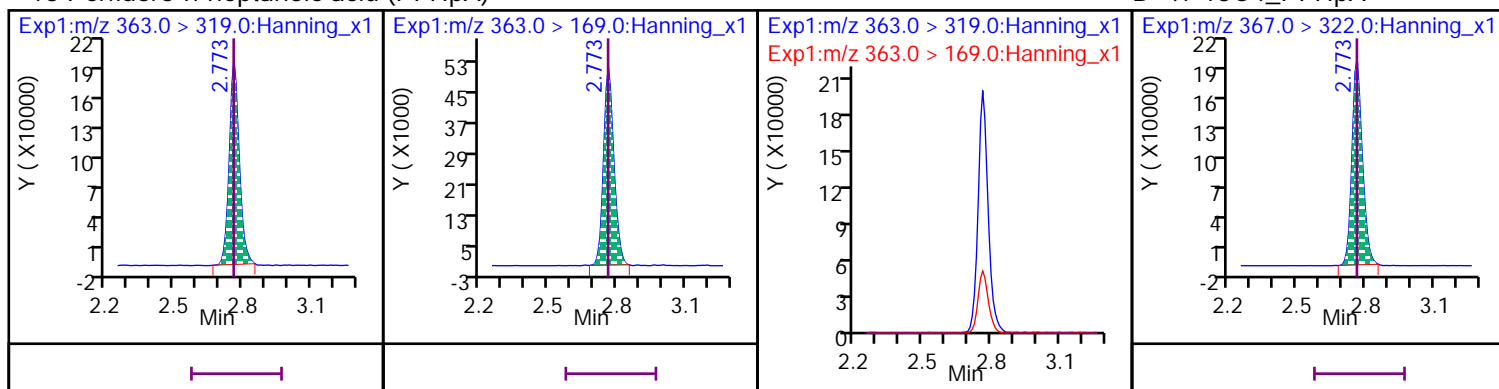
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



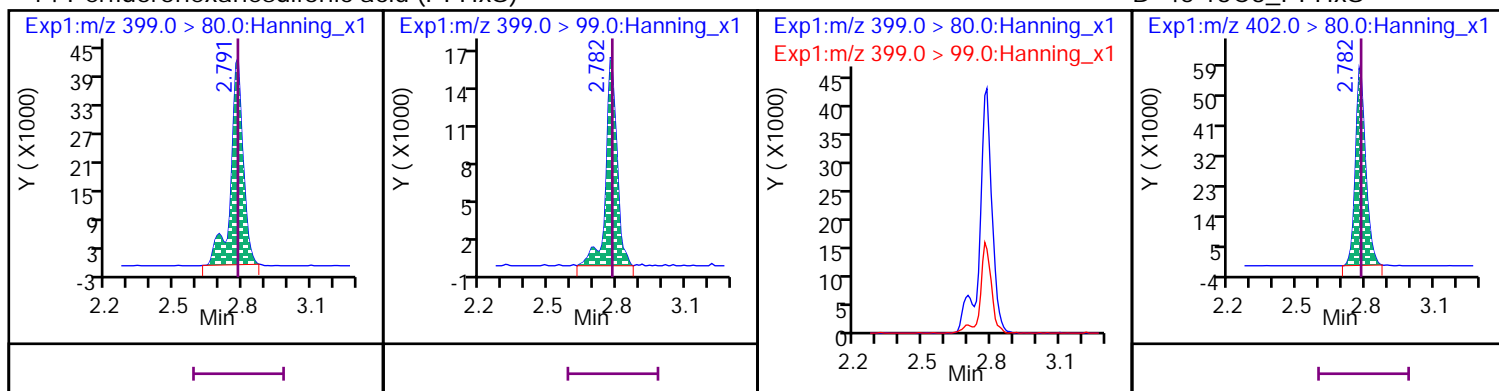
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



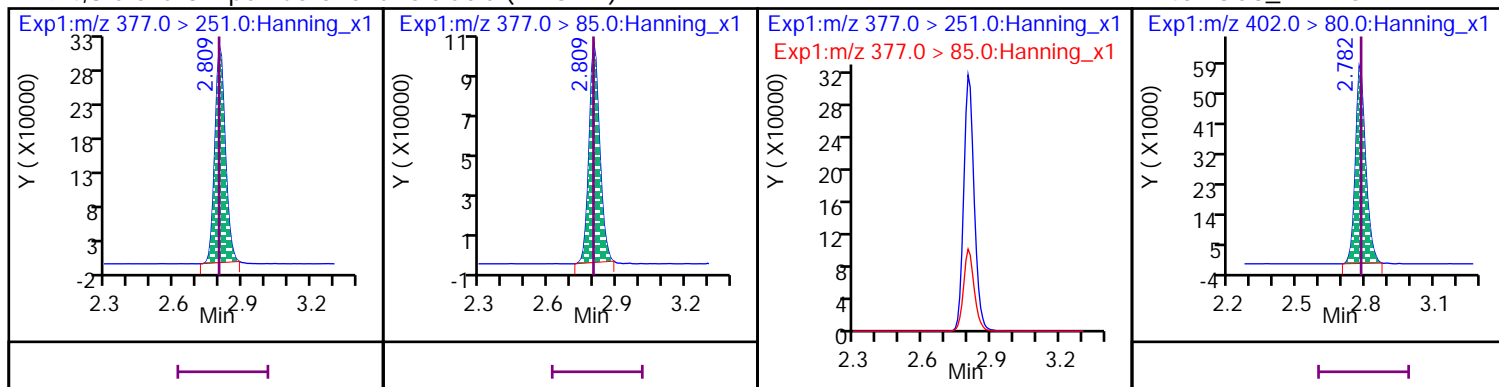
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

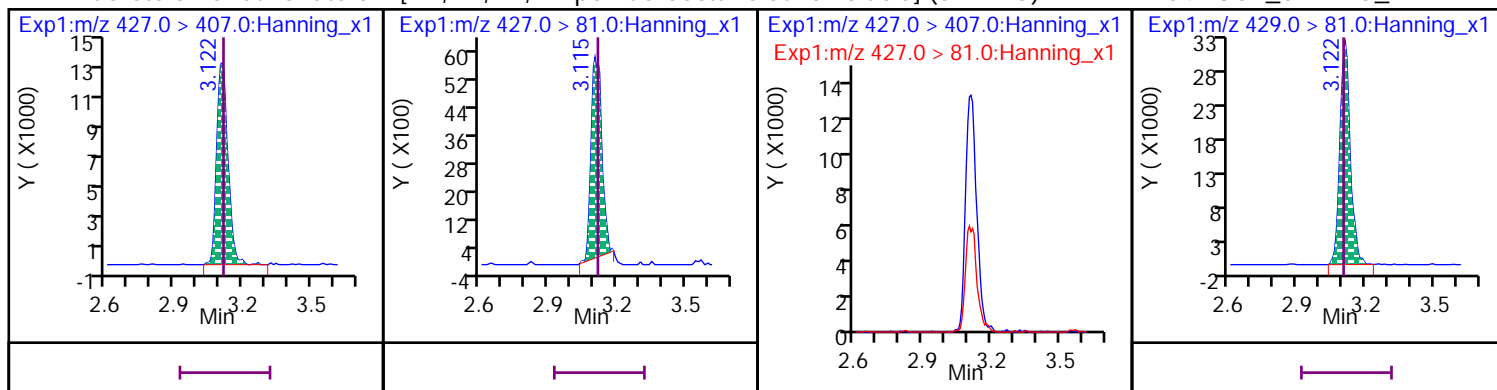
D 45 13C3\_PFHxS





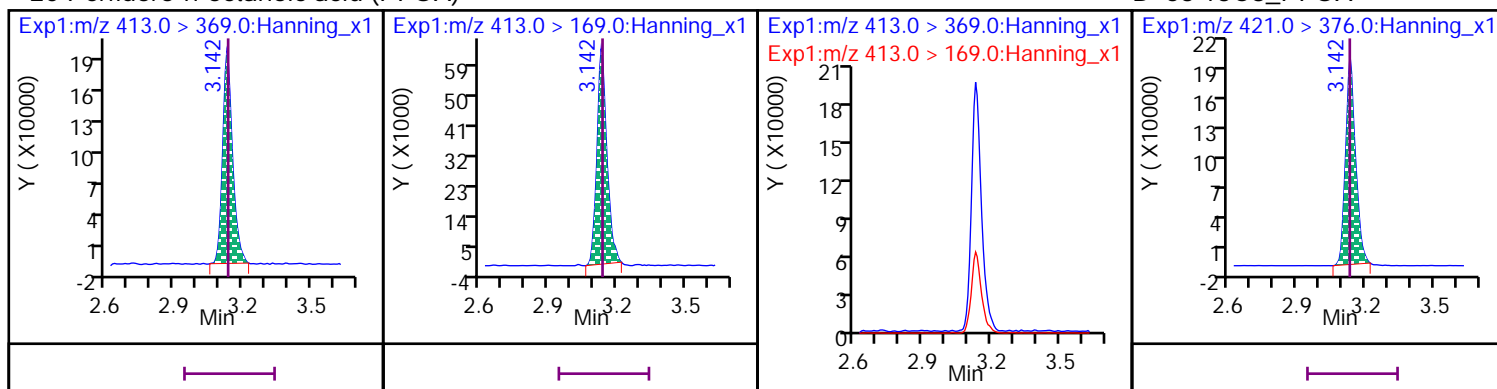
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



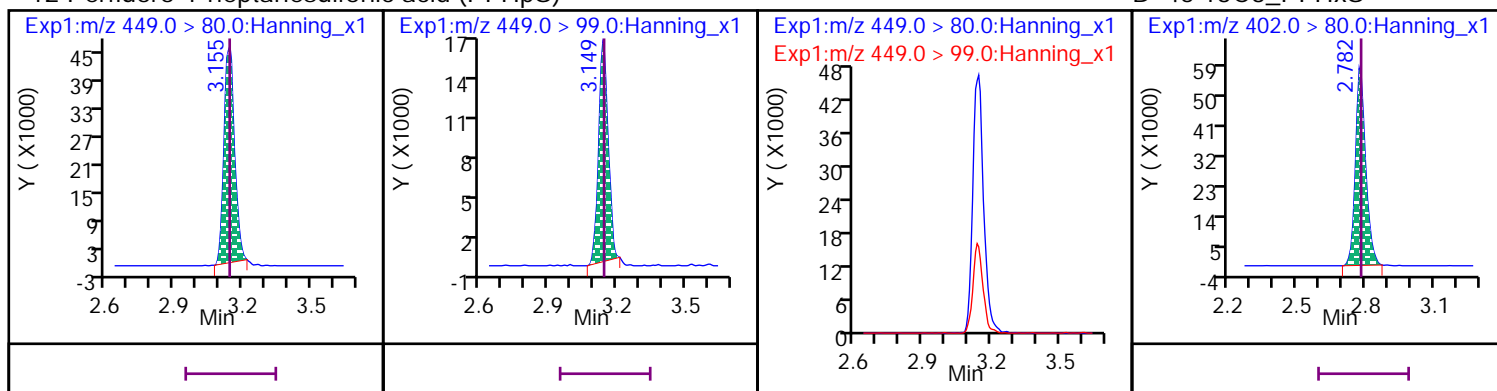
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



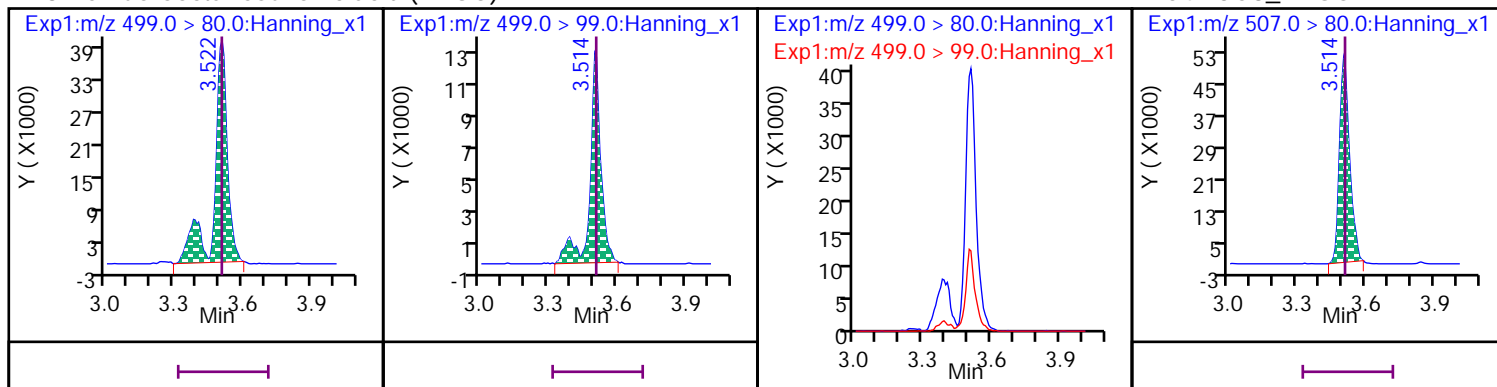
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



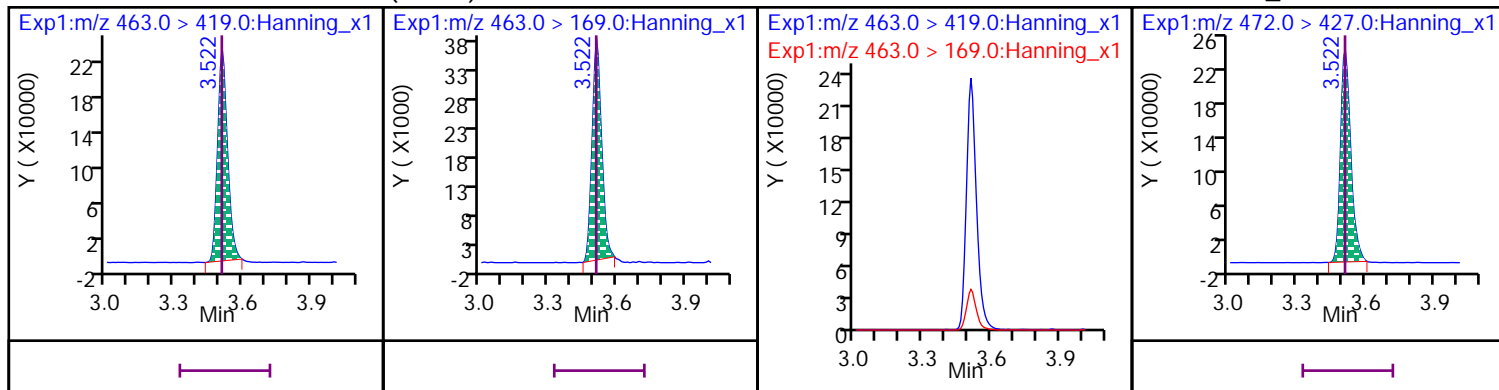
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



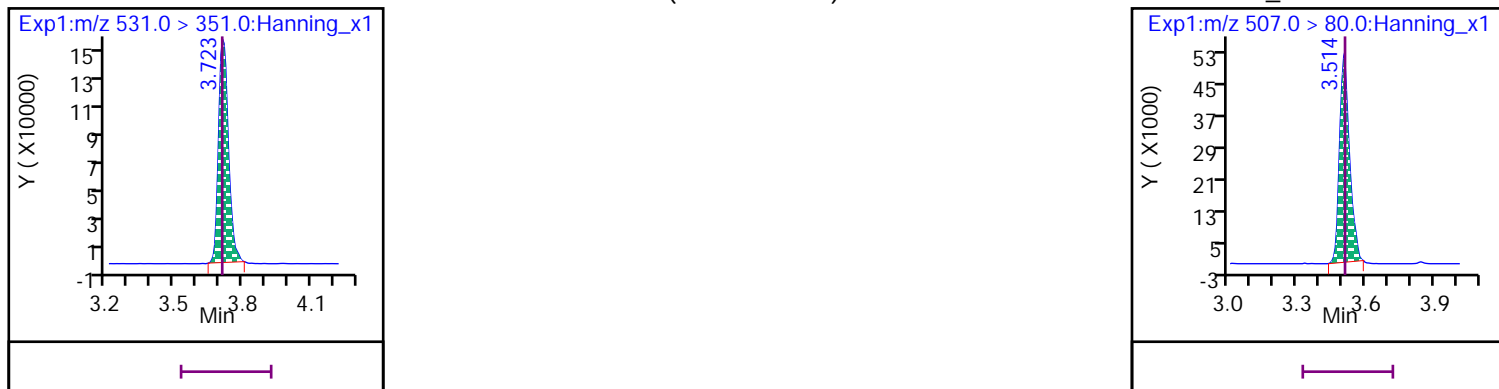
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



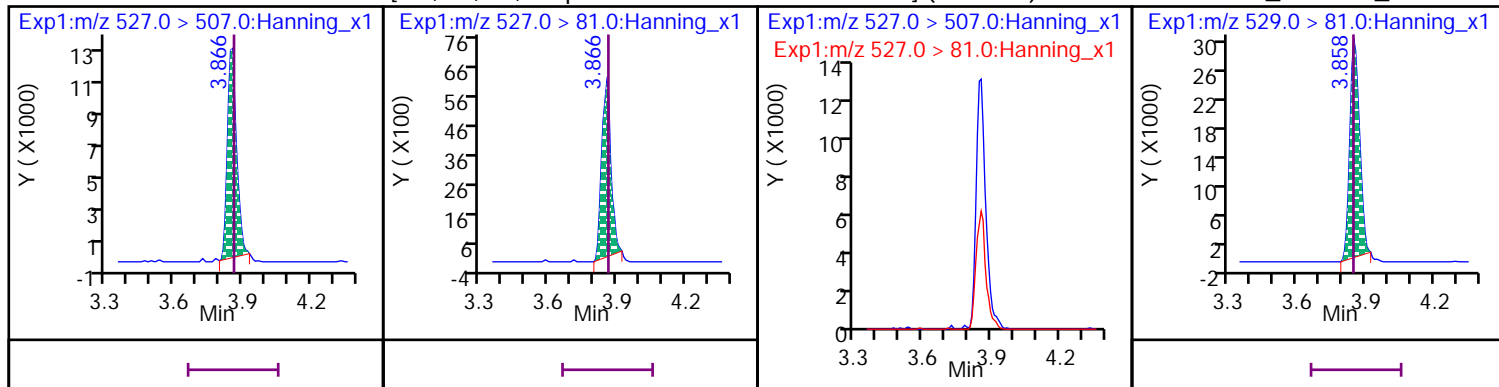
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



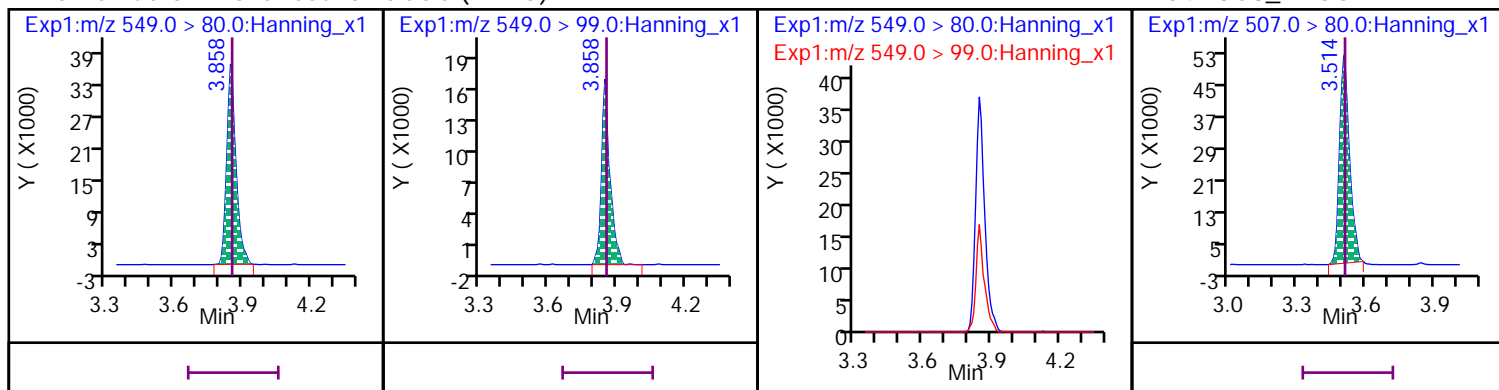
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



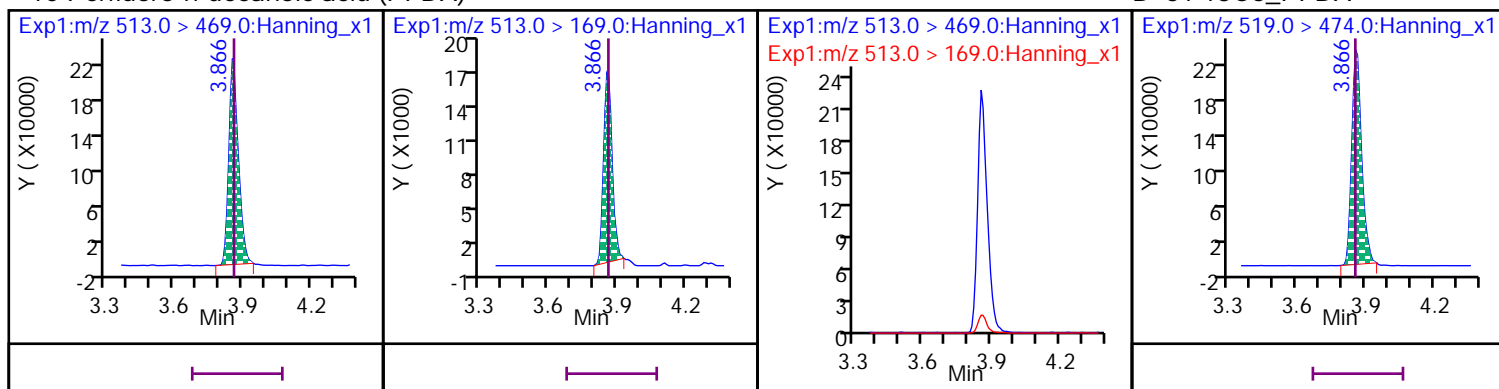
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



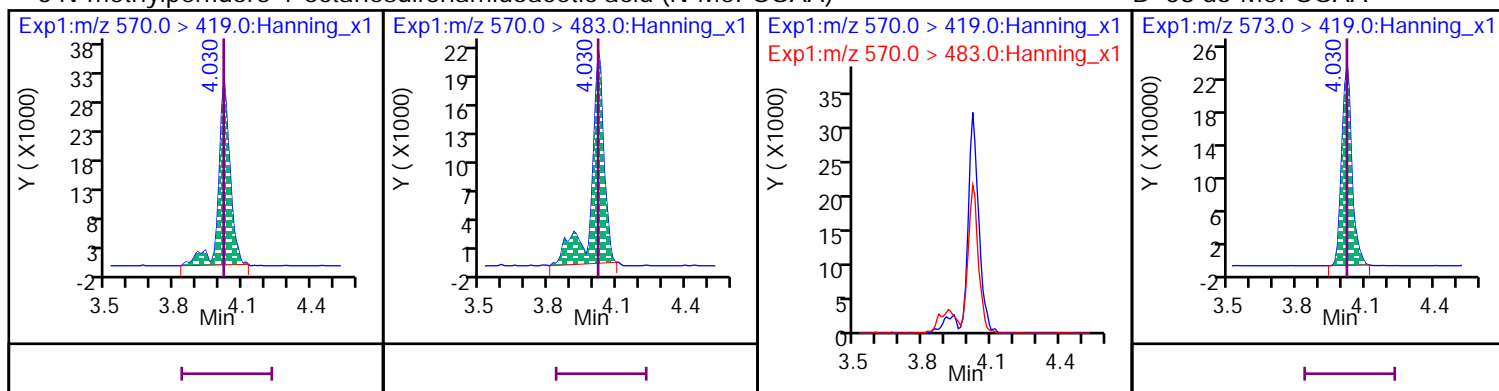
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



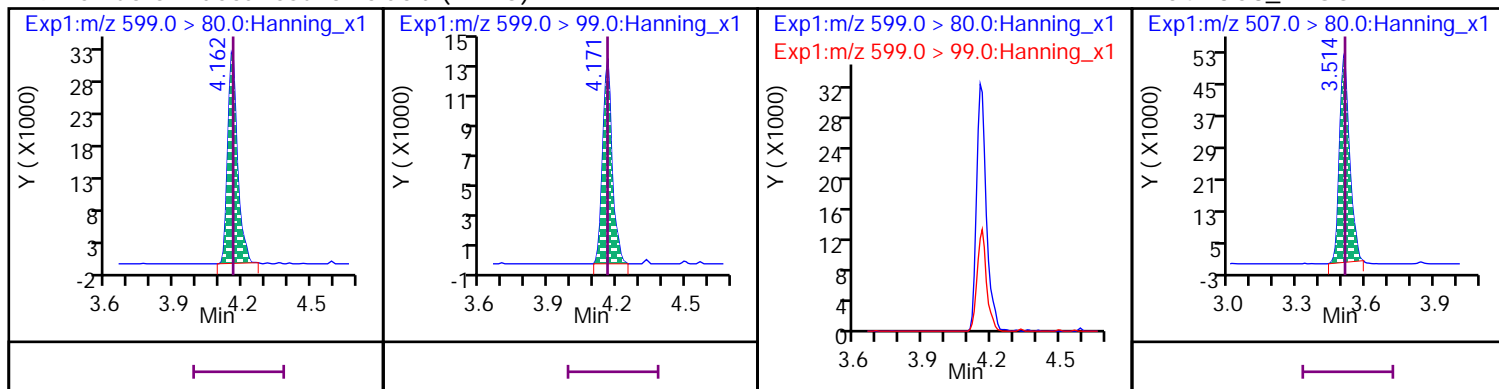
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



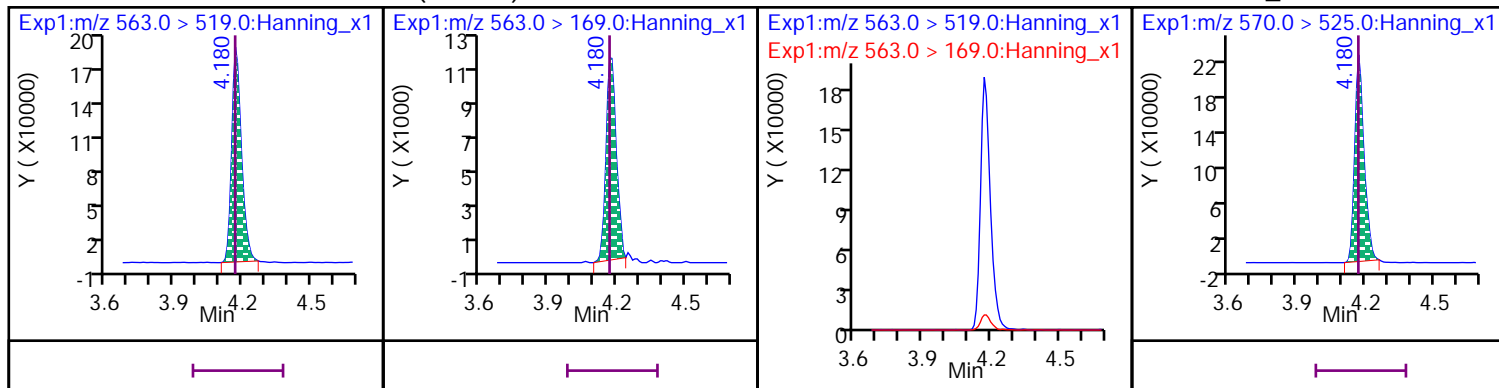
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



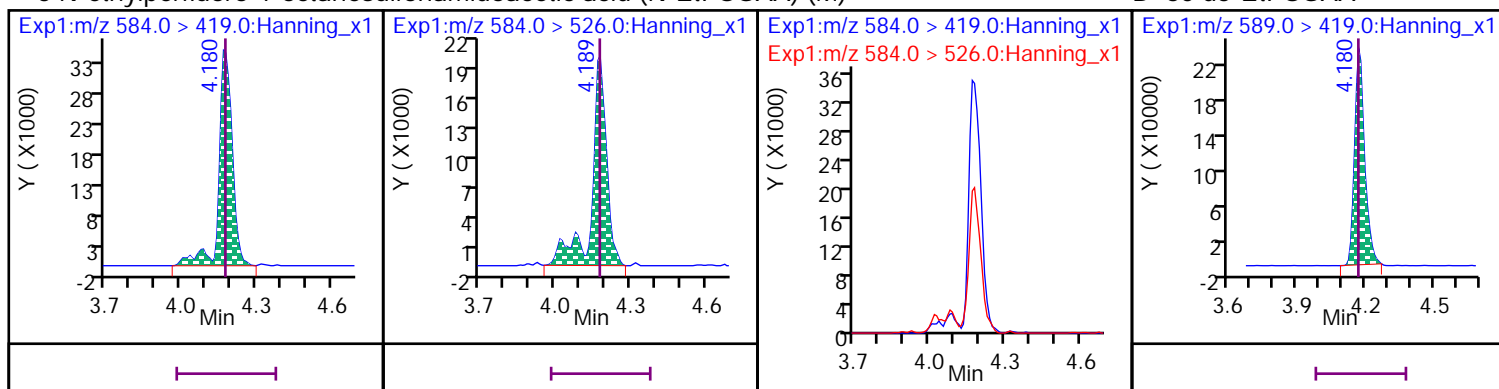
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



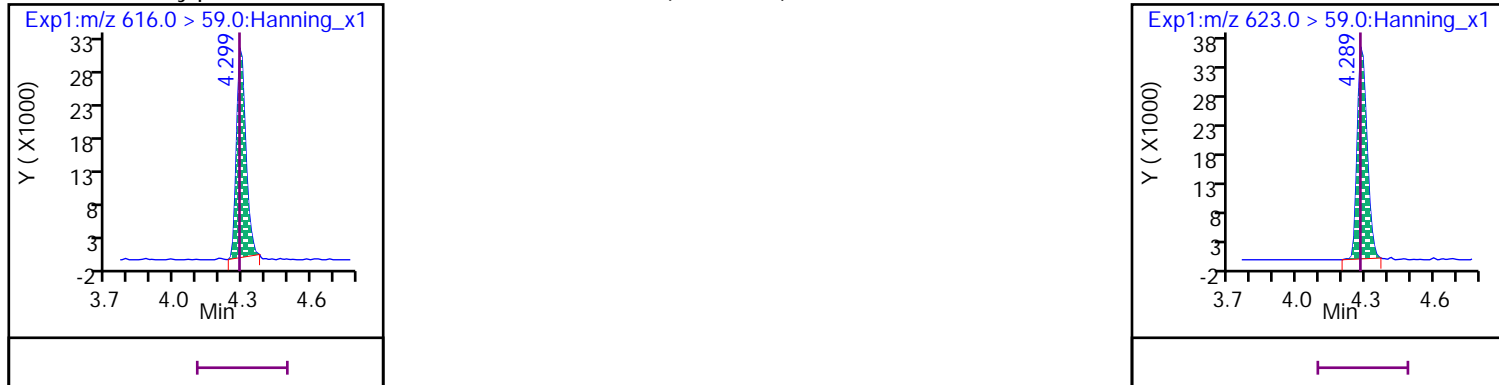
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



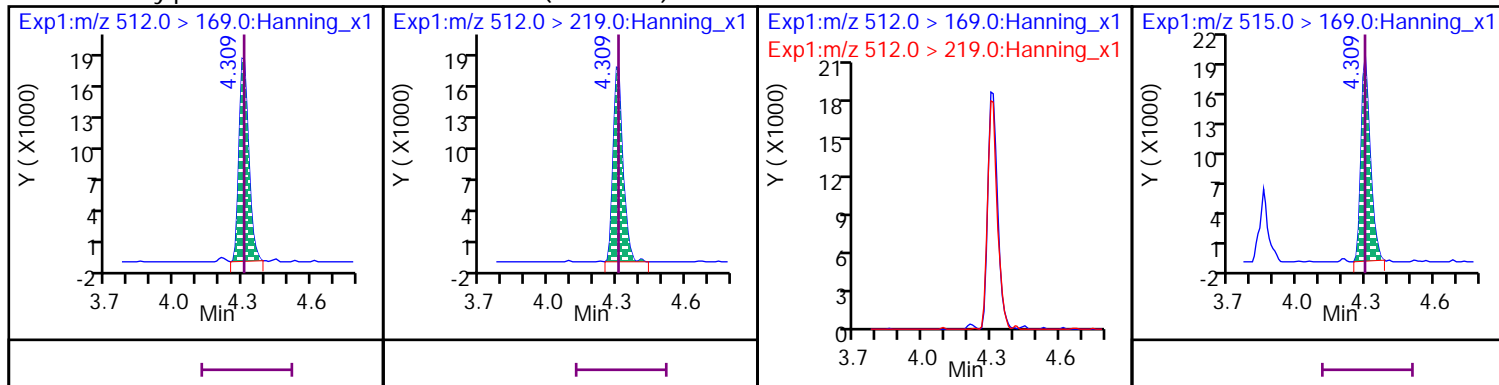
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

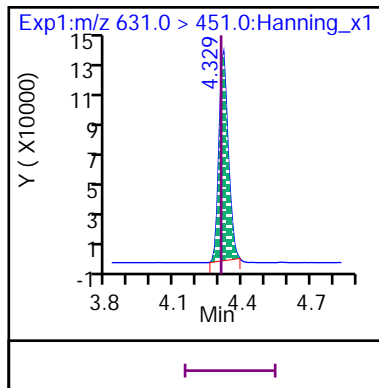


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

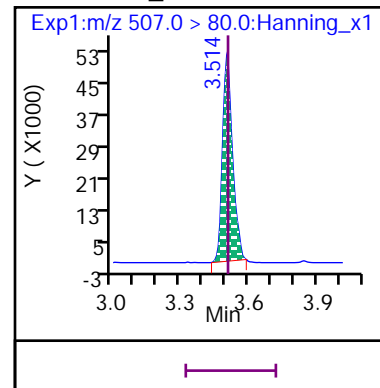
D 57 d3-MeFOSA



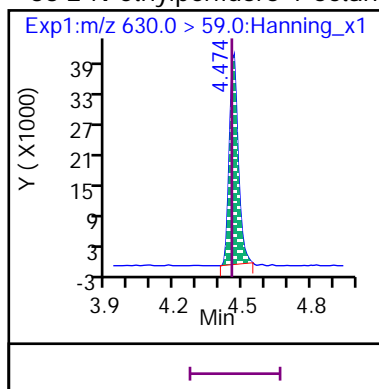
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



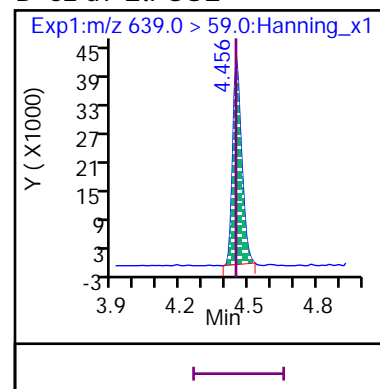
## D 54 13C8\_PFOS



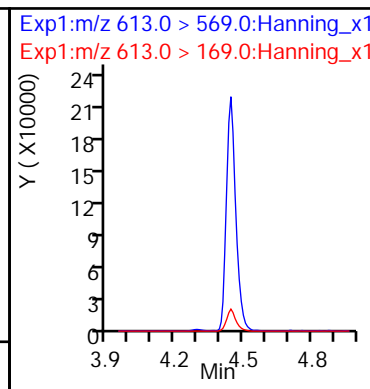
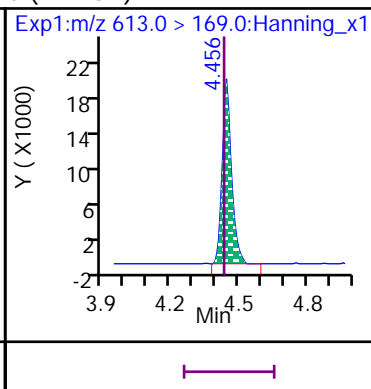
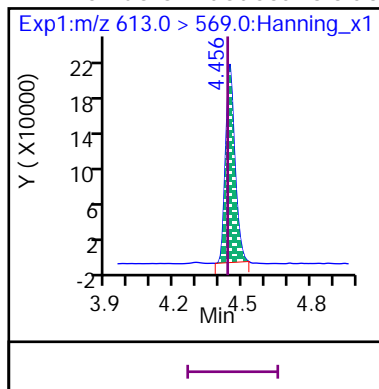
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



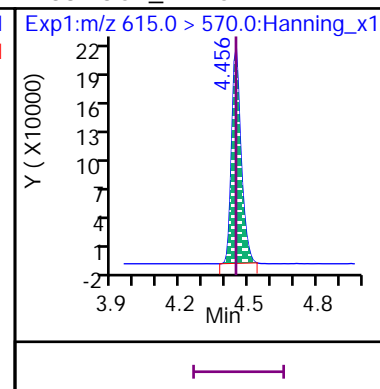
## D 62 d9-EtFOSE



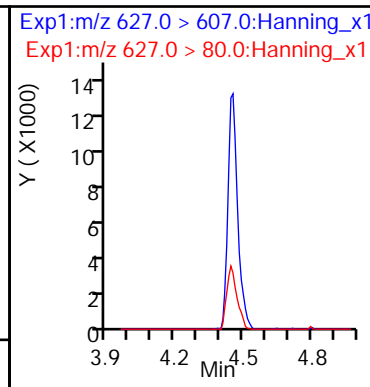
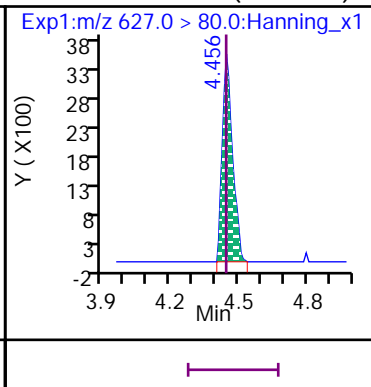
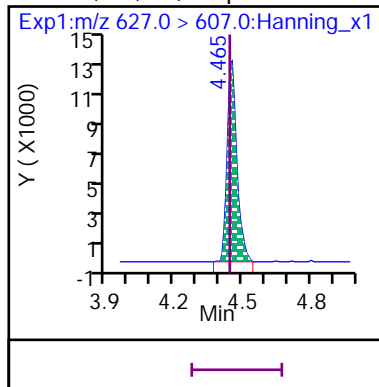
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



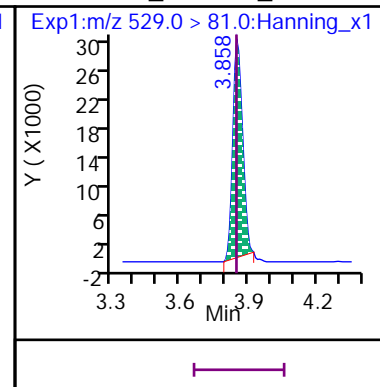
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

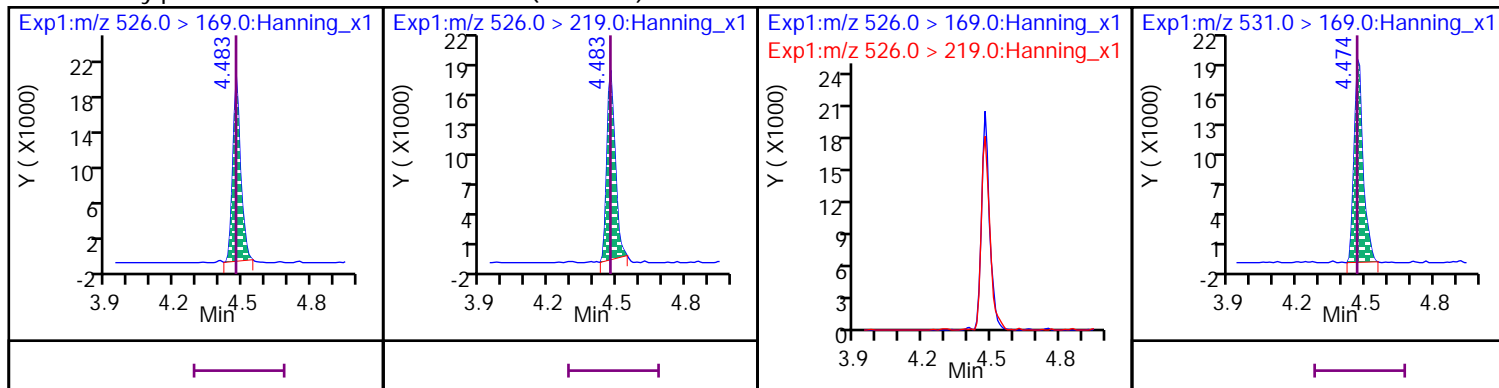


## D 65 13C2\_8:2 FTS\_2



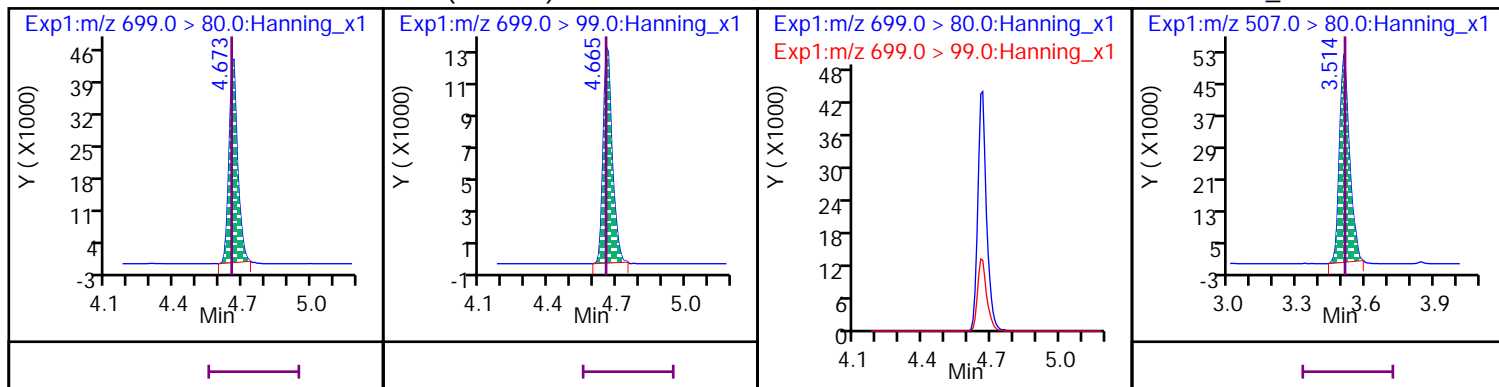
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



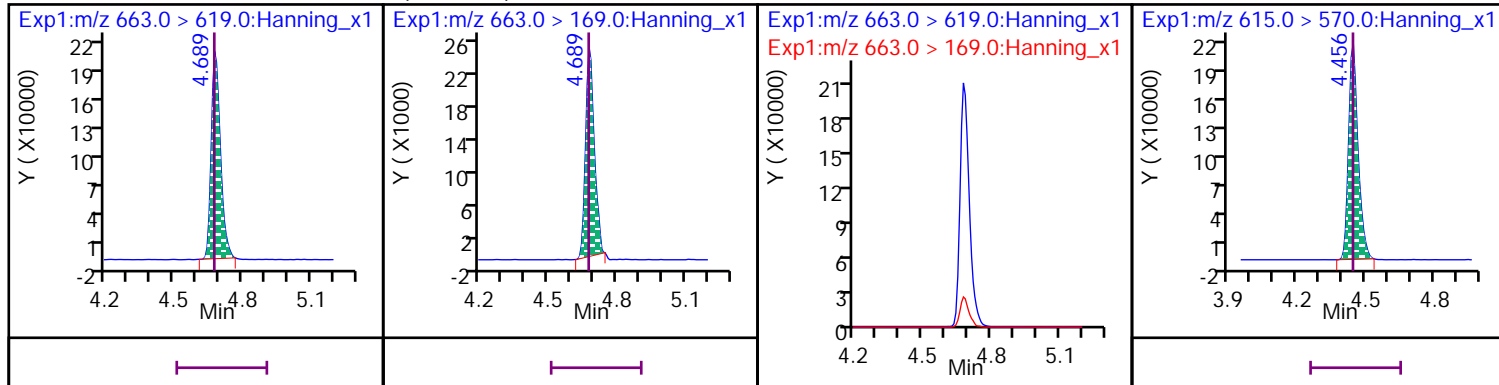
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



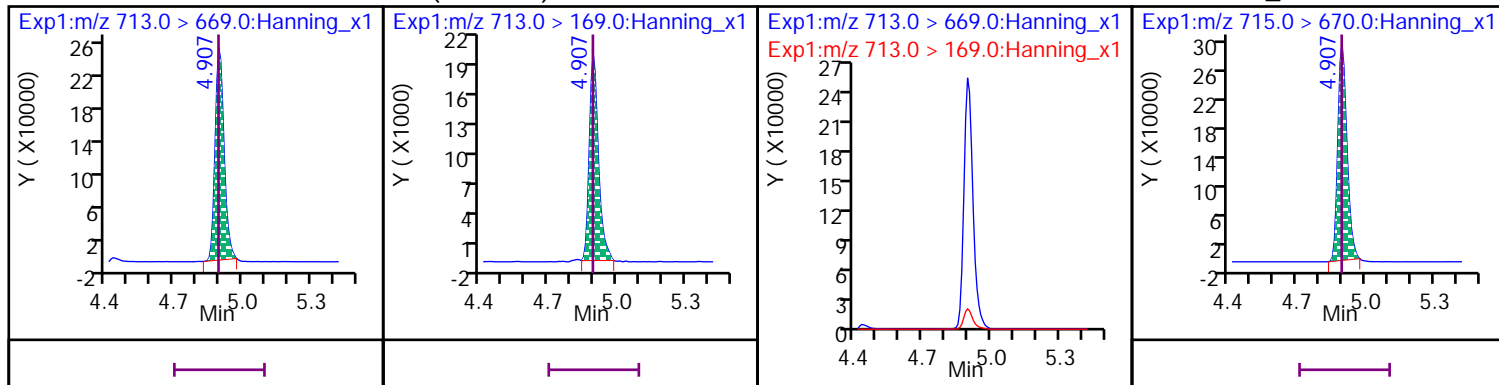
## 24 Perfluoro-n-tridecanoic acid (PFTTrDA)

## D 38 13C2\_PFDaA



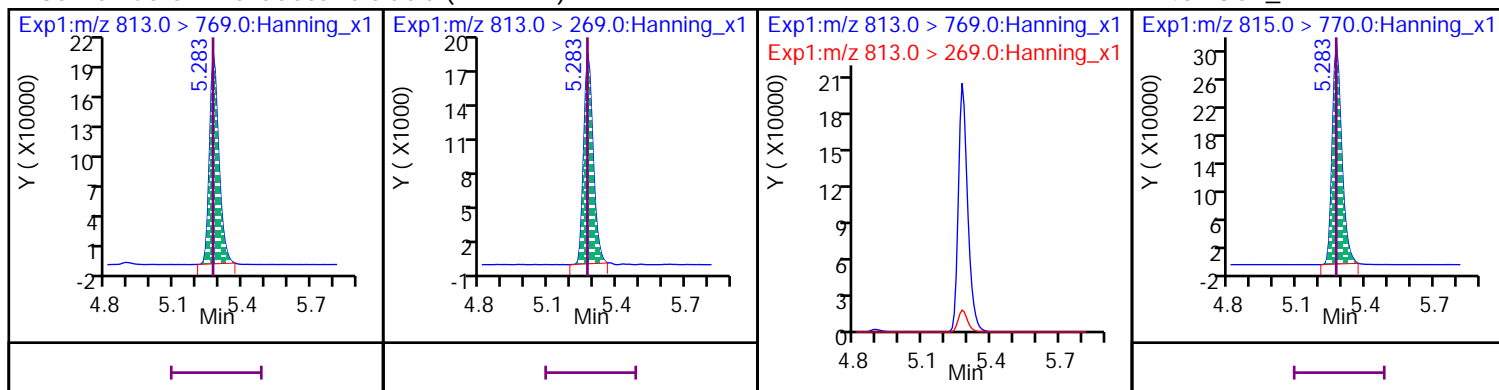
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



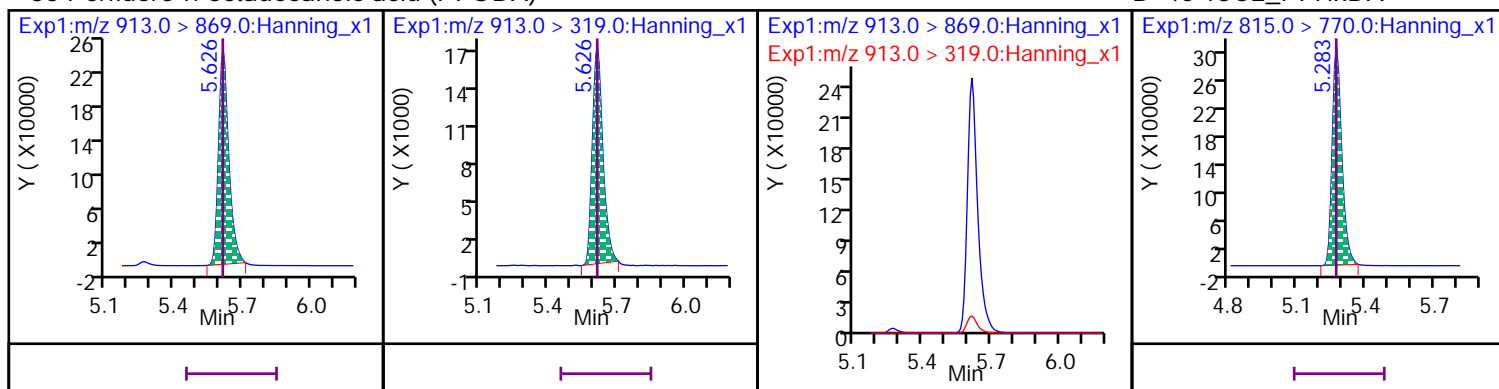
## 35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



## 36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

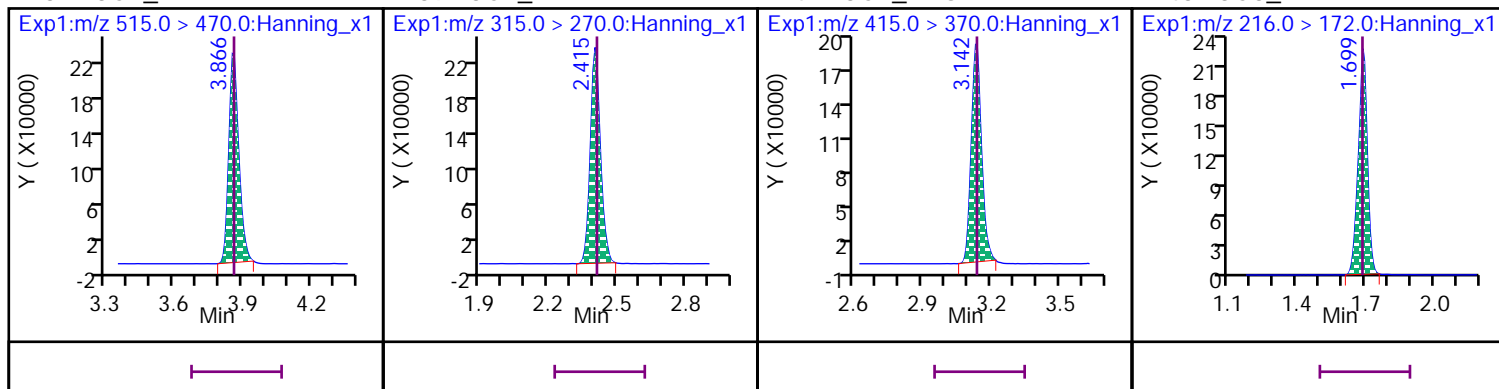


## \* 37 13C2\_PFDA

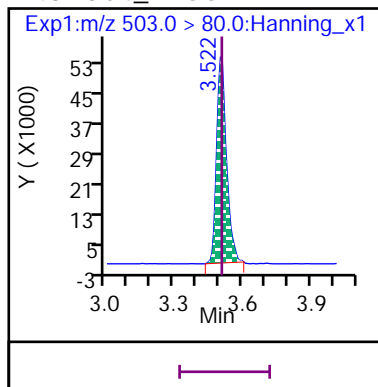
## \* 39 13C2\_PFHxA

## \* 41 13C2\_PFOA

## \* 43 13C3\_PFBA



## \* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820023.d

Injection Date: 28-Dec-2020 13:06:43

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

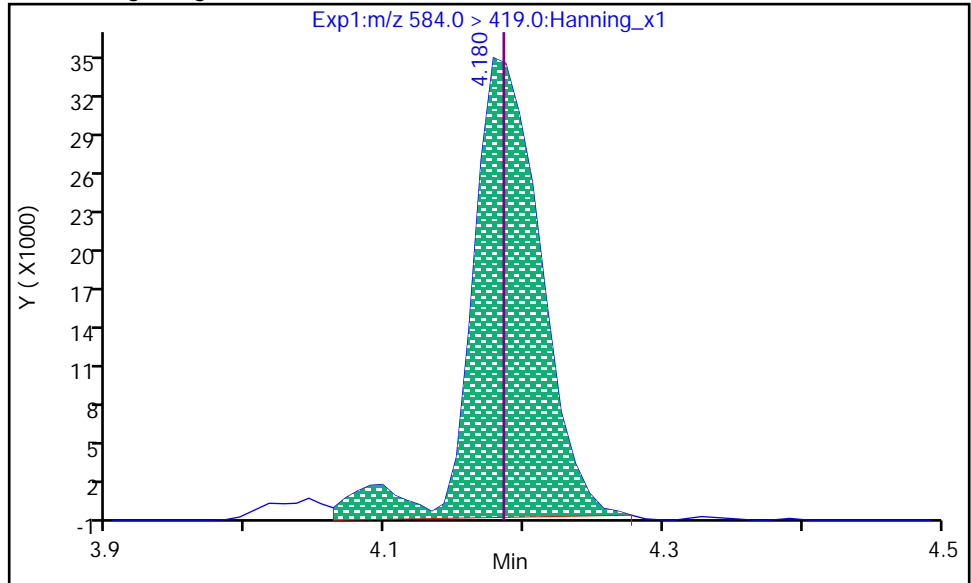
Dil. Factor: 1

Operator: Matthew M. Miller

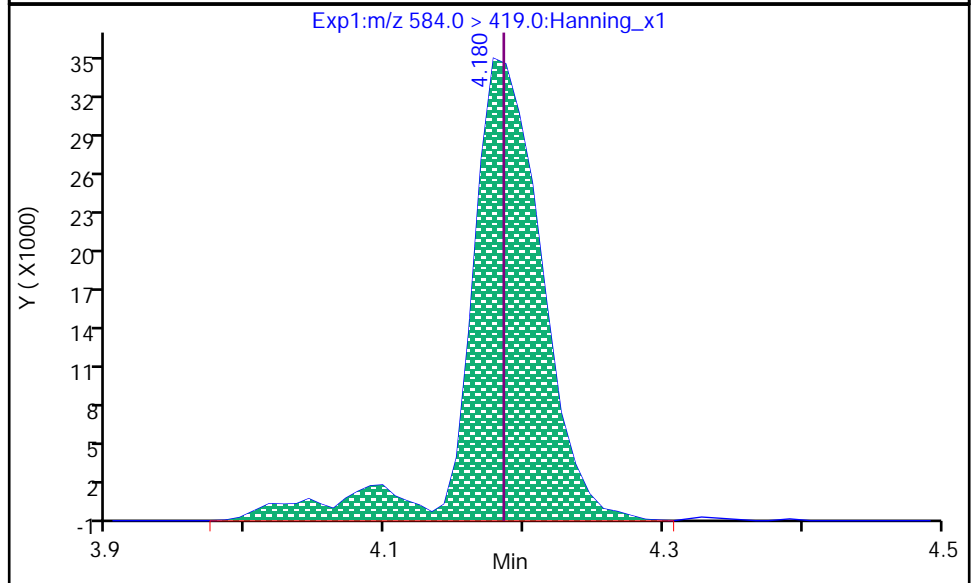
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.180  
Area: 119088  
Amount: 863.39  
Amount Units: ng/L



RT: 4.180  
Area: 126541  
Amount: 917.42  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:35:43

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d  
Injection Date: 28-Dec-2020 15:03:32 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 26  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	918.40	91.8	70 - 130
D 46 13C4_PFBA	649747	546517			84.1	50 - 150
D 50 13C5_PFPeA	665996	560355			84.1	50 - 150
21 PFPeA			1000.00	895.50	89.6	70 - 130
7 PFBS			884.00	836.55	94.6	70 - 130
D 44 13C3_PFBS	238207	196892			82.7	50 - 150
1 4:2 FTS			934.00	879.42	94.2	70 - 130
D 63 13C2_4:2 FTS_2	144067	110884			77	50 - 150
D 49 13C5_PFHxA	743582	610591			82.1	50 - 150
15 PFHxA			1000.00	908.51	90.9	70 - 130
22 PFPeS			938.00	857.12	91.4	70 - 130
28 GenX			2000.00	1828.18	91.4	70 - 130
D 66 13C3_GenX	1401050	1106350			79	50 - 150
D 47 13C4_PFHpA	633684	503010			79.4	50 - 150
13 PFHpA			1000.00	956.12	95.6	70 - 130
D 45 13C3_PFHxS	174146	147717			84.8	50 - 150
14 PFHxS			910.00	823.97	90.5	70 - 130
29 ADONA			942.00	834.94	88.6	70 - 130
D 64 13C2_6:2 FTS_2	104346	82093			78.7	50 - 150
2 6:2 FTS			948.00	973.36	103	70 - 130
20 PFOA			1000.00	958.79	95.9	70 - 130
D 53 13C8_PFOA	628007	497783			79.3	50 - 150
12 PFHpS			952.00	923.43	97	70 - 130
18 PFOS			928.00	875.36	94.3	70 - 130
17 PFNA			1000.00	942.08	94.2	70 - 130
D 56 13C9_PFNA	767623	628147			81.8	50 - 150
D 54 13C8_PFOS	152445	126487			83	50 - 150
30 9Cl-PF3ONS			932.00	901.34	96.7	70 - 130
D 55 13C8_PFOSA	308857	258029			83.5	50 - 150
19 PFOSA			1000.00	977.53	97.8	70 - 130
16 PFNS			960.00	845.74	88.1	70 - 130
D 65 13C2_8:2 FTS_2	100453	79595			79.2	50 - 150
3 8:2 FTS			958.00	1012.22	106	70 - 130
10 PFDA			1000.00	938.15	93.8	70 - 130
D 51 13C6_PFDA	672868	526913			78.3	50 - 150
D 58 d3-MeFOSAA	791564	607684			76.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	983.95	98.4	70 - 130
9 PFDS			964.00	926.00	96.1	70 - 130
5 N-EtFOSAA			1000.00	946.00	94.6	70 - 130
25 PFUdA			1000.00	967.47	96.7	70 - 130
D 60 d5-EtFOSAA	731651	579528			79.2	50 - 150
D 52 13C7_PFUdA	643525	517782			80.5	50 - 150
D 61 d7-MeFOSE	105402	96355			91.4	50 - 150
32 MeFOSE			1000.00	892.57	89.3	70 - 130
26 MeFOSA			1000.00	870.28	87	70 - 130
D 57 d3-MeFOSA	51840	41931			80.9	50 - 150
31 11Cl-PF3OUDS			942.00	876.46	93	70 - 130
D 62 d9-EtFOSE	137116	99273			72.4	50 - 150
33 EtFOSE			1000.00	1030.54	103	70 - 130
D 59 d5-EtFOSA	50284	42245			84	50 - 150
D 38 13C2_PFDoA	611364	537255			87.9	50 - 150
4 10:2 FTS			964.00	920.76	95.5	70 - 130
27 EtFOSA			1000.00	864.06	86.4	70 - 130
11 PFDoA			1000.00	897.91	89.8	70 - 130
34 PFDOS			968.00	880.94	91	70 - 130
24 PFTrDA			1000.00	873.17	87.3	70 - 130
23 PFTeDA			1000.00	938.88	93.9	70 - 130
D 42 13C2_PFTeDA	813074	674645			83	50 - 150
35 PFHxDA			1000.00	966.69	96.7	70 - 130
D 40 13C2_PFHxDA	935525	778067			83.2	50 - 150
36 PFODA			1000.00	923.48	92.3	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d  
Injection Date: 28-Dec-2020 15:03:32 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 26  
Sample Info: ID CCV 1000A\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.698	1.696	1	546517	23	>100:1			1000.00	788.00	84.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.696	1/0	499910	24	>100:1			1000.00	918.40		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.072	1	560355	19	>100:1			1000.00	814.60	84.1	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.072	1/0	504518	17	>100:1			1000.00	895.50		
<b>D 44 13C3_PFBs CAS: SESI-0116</b>													
302 > 80		2.129	2.125	1	196892	17	>100:1			1000.00	855.19	82.7	
<b>7 Perfluoro-1-butanefulfonic acid (PFBs) CAS: 375-73-5</b>													
298.9 > 80	44	2.129	2.125	1/0	194200	17	>100:1	Target = 3.50		884.00	836.55		
298.9 > 99	44	2.129	2.125		53923	17	>100:1	3.60 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	146391	19	>100:1	Target = 3.10		938.00	857.12		
349 > 99	44	2.450	2.450		48252	18	>100:1	3.03 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.379	2.379	0	110884	19	>100:1			5000.00	4580.41	77	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/0	38922	19	>100:1	Target = 1.80		934.00	879.42		
327 > 81	63	2.388	2.388		21956	18	>100:1	1.77 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.414	2.423	0	610591	20	>100:1			1000.00	828.40	82.1	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	547671	19	>100:1	Target = 18.34		1000.00	908.51		
313 > 119	49	2.423	2.423		30056	16	>100:1	18.22 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1106350	20	>100:1			5000.00	4153.68	79	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	290632	21	>100:1	Target = 0.81		2000.00	1828.18		
285 > 185	66	2.530	2.530		367404	19	>100:1	0.79 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	0	503010	19	>100:1			1000.00	829.16	79.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.772	1/1	498860	19	>100:1	Target = 3.70		1000.00	956.12		
363 > 169	47	2.772	2.772		118919	20	>100:1	4.19 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	147717	20	>100:1			1000.00	862.69	84.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	129052	28	>100:1	Target = 3.21	0.12	910.00	823.97		
399 > 99	45	2.790	2.790		44978	29	>100:1	2.86 (1.60-4.81)	0.05				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.817	2.808	1/1	783034	19	>100:1	Target = 2.97		942.00	834.94		
377 > 85	45	2.817	2.808		266321	21	>100:1	2.94 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	123916	24	>100:1	Target = 3.08		952.00	923.43		
449 > 99	45	3.154	3.154		37071	22	>100:1	3.34 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.114	1	82093	22	>100:1			5000.00	4262.71	78.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.121	3.128	0/-1	33098	25	>100:1	Target = 1.80		948.00	973.36		
427 > 81	64	3.128	3.128		19835	25	>100:1	1.66 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.141	1	497783	25	>100:1			1000.00	841.04	79.3	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	0/-1	486552	25	>100:1	Target = 2.87		1000.00	958.79		
413 > 169	53	3.148	3.148		159104	25	>100:1	3.05 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.520	3.520	0	126487	22	>100:1			1000.00	843.65	83	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.520	3.520	0/0	131203	44	>100:1	Target = 3.84	0.28	928.00	875.36		
499 > 99	54	3.520	3.520		37259	36	55:1	3.52 (1.92-5.76)	0.10				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.729	3.722	1/1	383803	22	>100:1			932.00	901.34		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	0/0	81865	19	>100:1	Target = 3.07		960.00	845.74		
549 > 99	54	3.865	3.865		34053	24		2.40 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.169	4.169	0/0	85003	16	>100:1	Target = 3.03		964.00	926.00		
599 > 99	54	4.169	4.169		28679	19	>100:1	2.96 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.327	4.317	1/1	314838	16	>100:1			942.00	876.46		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.663	1/1	89457	20	>100:1	Target = 3.33		968.00	880.94		
699 > 99	54	4.672	4.663		29313	21		3.05 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.520	3.520	0	628147	20	>100:1			1000.00	836.46	81.8	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.520	1/1	591783	24	>100:1	Target = 6.16		1000.00	942.08		
463 > 169	56	3.528	3.520		90687	21	>100:1	6.52 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.849	3.849	0	258029	21	>100:1			1000.00	833.52	83.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.849	3.841	1/1	248561	21	>100:1			1000.00	977.53		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.857	1	79595	27	>100:1			5000.00	4290.80	79.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.865	3.873	0/-1	32378	25	>100:1	Target = 1.95		958.00	1012.22		
527 > 81	65	3.857	3.873		14559	28	>100:1	2.22 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.464	4.455	1/0	33872	24		Target = 3.14		964.00	920.76		
627 > 80	65	4.473	4.455		9645	24	90:1	3.51 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.873	3.865	1	526913	21	>100:1			1000.00	794.34	78.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	0/-1	485722	20	>100:1	Target = 15.94		1000.00	938.15		
513 > 169	51	3.873	3.873		32268	16	>100:1	15.05 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.028	4.029	0	607684	18	>100:1			5000.00	4233.57	76.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.037	4.029	1/1	91860	37	>100:1	Target = 1.33	0.11	1000.00	983.95		
570 > 483	58	4.028	4.029		61200	33	>100:1	1.50 (0.66-1.99)	0.21				

Data File: \\ORGANIS\ILL\LCMSMS02.1\122820-DOD.b\122820034.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.178	4.178	0	579528	19	>100:1			5000.00	4363.43	79.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.187	4.187	0/0	109162	35	>100:1	Target = 1.58		1000.00	946.00		M
584 > 526	60	4.197	4.187		70163	34	>100:1	1.55 (0.79-2.37)	0.20				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.178	1	517782	17	>100:1			1000.00	819.18	80.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.178	1/0	470818	19	>100:1	Target = 15.50		1000.00	967.47		
563 > 169	52	4.178	4.178		32104	23		14.66 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.287	4.287	0	96355	16	>100:1			1000.00	890.46	91.4	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.297	4.297	0/0	80809	20	>100:1			1000.00	892.57		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.307	4.307	0	41931	15	66:1			1000.00	792.39	80.9	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	0/0	41170	18		Target = 1.12		1000.00	870.28		
512 > 219	57	4.317	4.317		43038	16	>100:1	0.95 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.455	0	99273	18	>100:1			1000.00	791.68	72.4	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.464	1/1	91018	18	>100:1			1000.00	1030.54		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	0	537255	19	>100:1			1000.00	887.56	87.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.455	4.446	1/1	488519	18	>100:1	Target = 10.85		1000.00	897.91		
613 > 169	38	4.455	4.446		44552	23	>100:1	10.96 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.688	1/1	462047	20	>100:1	Target = 8.37		1000.00	873.17		
663 > 169	38	4.696	4.688		57427	20	>100:1	8.04 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.473	4.473	0	42245	19	>100:1			1000.00	860.48	84	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	0/0	39879	18	>100:1	Target = 1.03		1000.00	864.06		
526 > 219	59	4.482	4.482		39558	18		1.00 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.914	4.906	1	674645	19	>100:1			1000.00	800.82	83	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.914	4.906	1/0	548817	21	90:1	Target = 12.11		1000.00	938.88		
713 > 169	42	4.906	4.906		45482	18	>100:1	12.06 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.282	1	778067	19	>100:1			1000.00	858.64	83.2	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.282	1/0	491449	20	>100:1	Target = 11.48		1000.00	966.69		
813 > 269	40	5.291	5.282		42888	19	>100:1	11.45 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.625	1/0	636053	25	>100:1	Target = 13.88		1000.00	923.48		
913 > 319	40	5.632	5.625		44698	24	>100:1	14.23 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.873	3.873	0	568302	21	>100:1					77.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	585757	20	>100:1					80.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	0	490743	25	>100:1					81.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.698	1.696	1	506767	24	>100:1					83.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	0	131581	21	>100:1					80.7	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d

Injection Date: 28-Dec-2020 15:03:32

Inst. ID: LCMSMS02

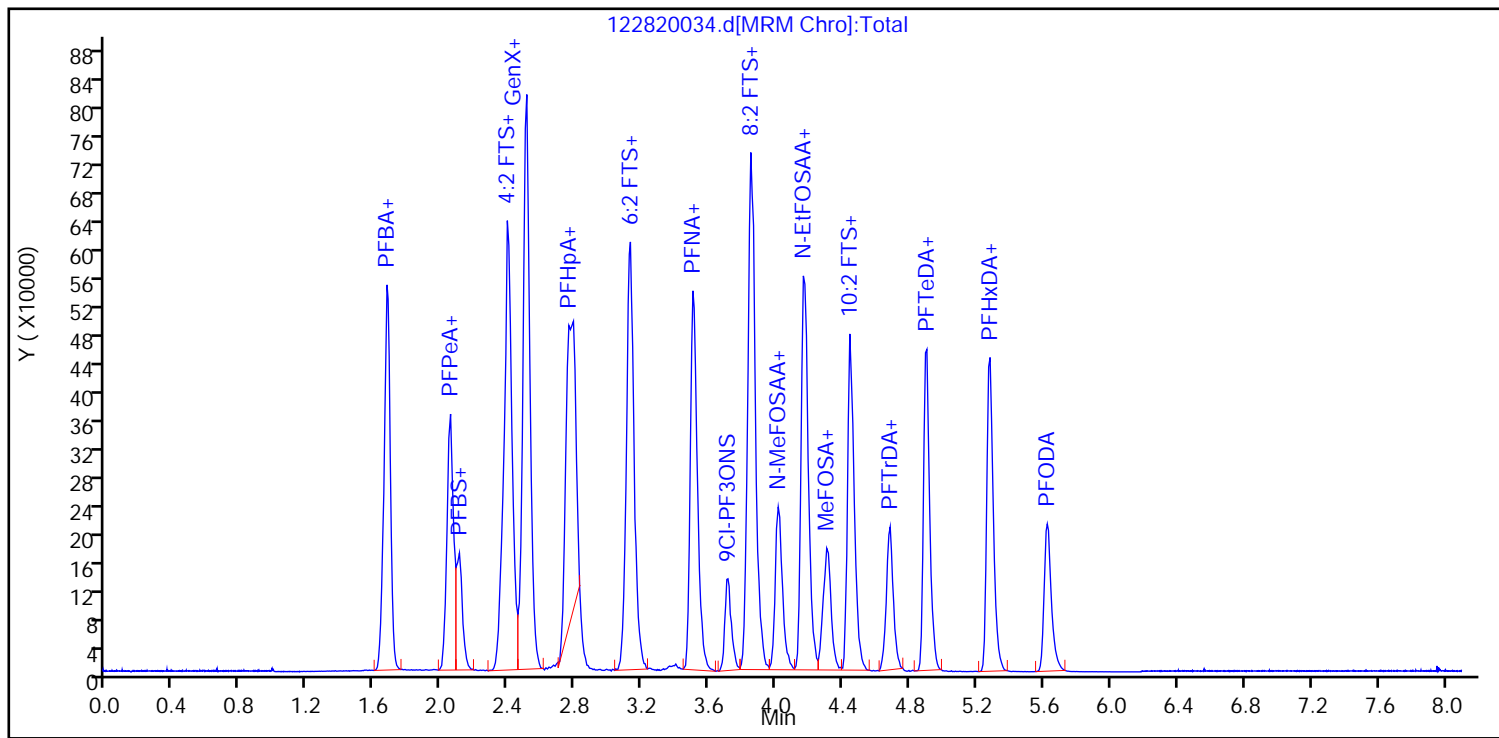
Client ID:

Lab ID: ID CCV 1000A\_SVLC-1248

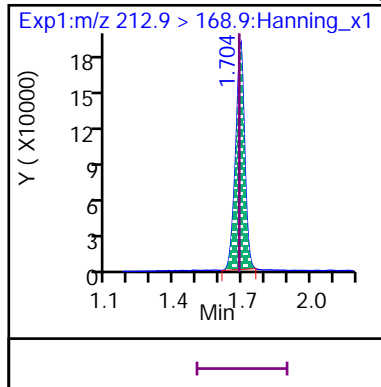
Sample Info: ID CCV 1000A\_SVLC-1248

Dil. Factor: 1

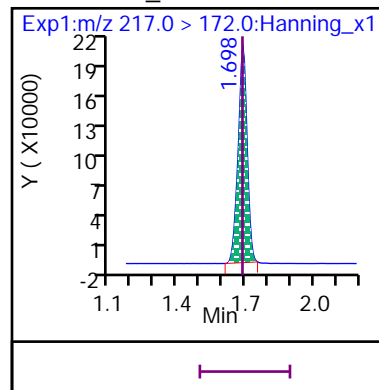
Operator: Matthew M. Miller



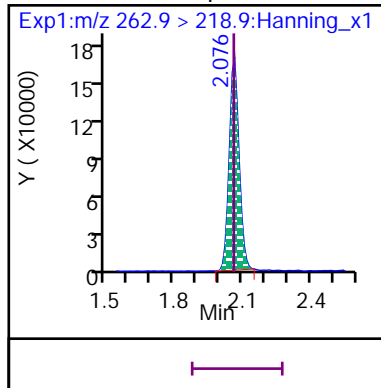
8 Perfluoro-n-butanoic acid (PFBA)



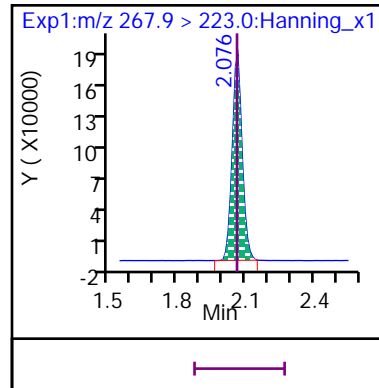
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

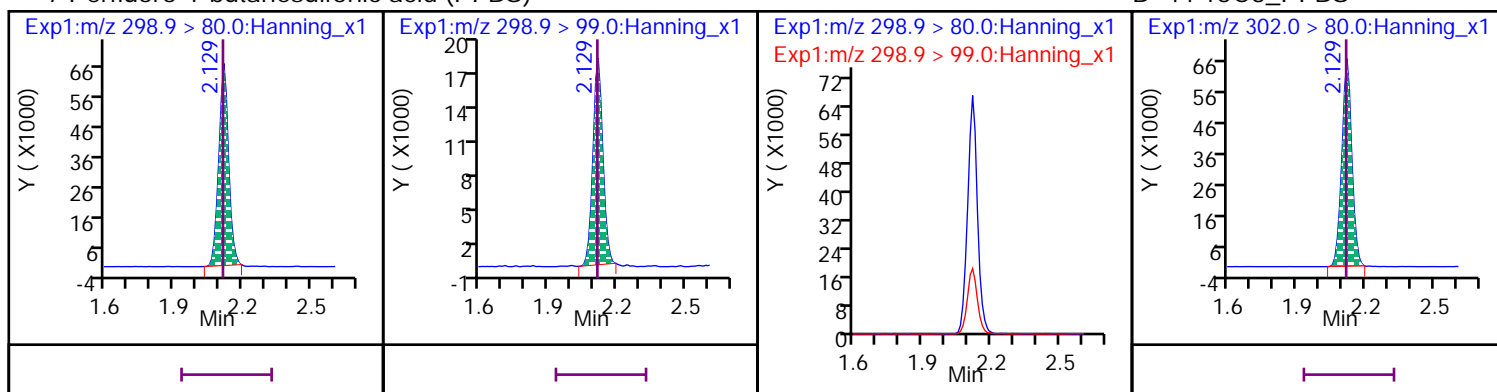


D 50 13C5\_PFPeA



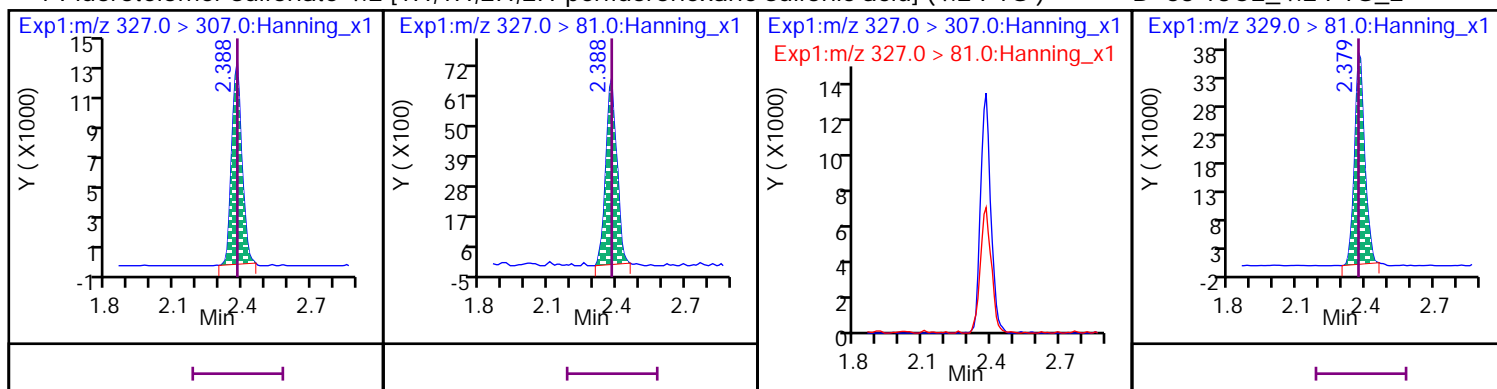
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



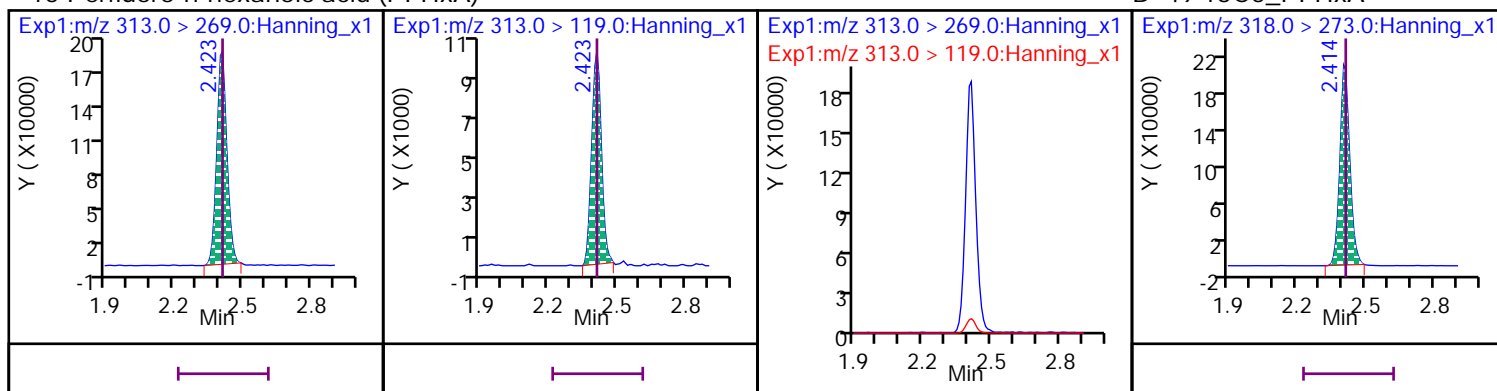
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



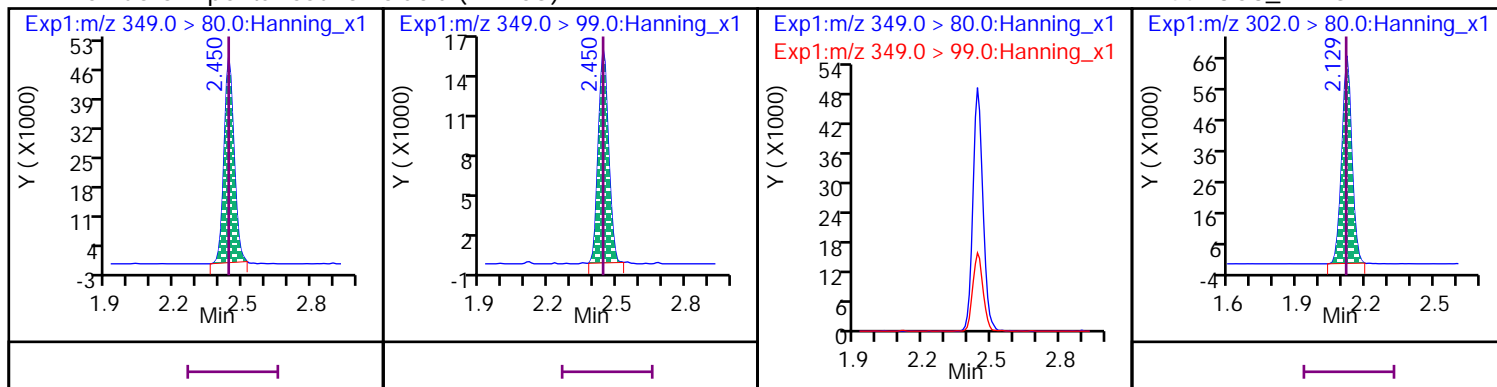
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

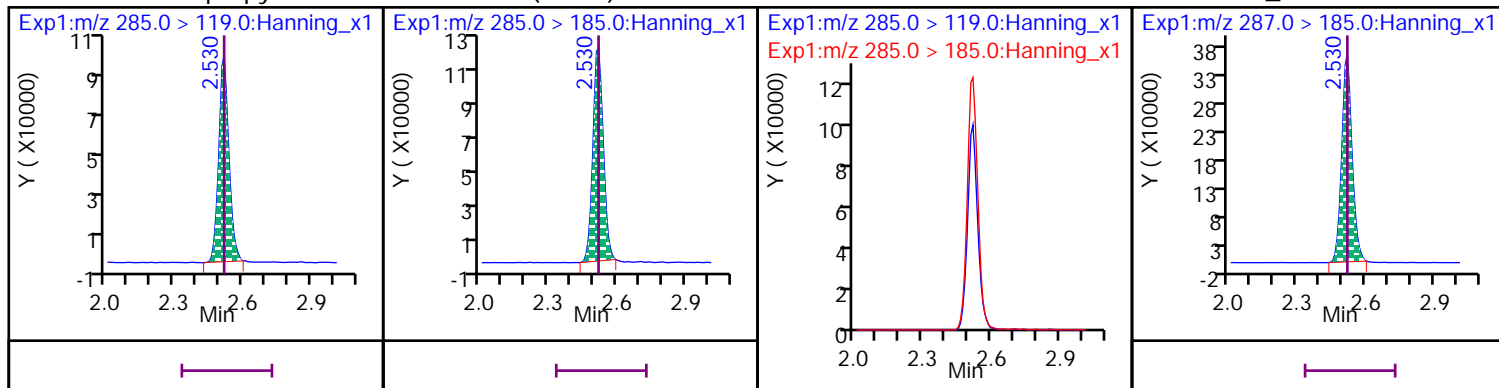
D 44 13C3\_PFBS





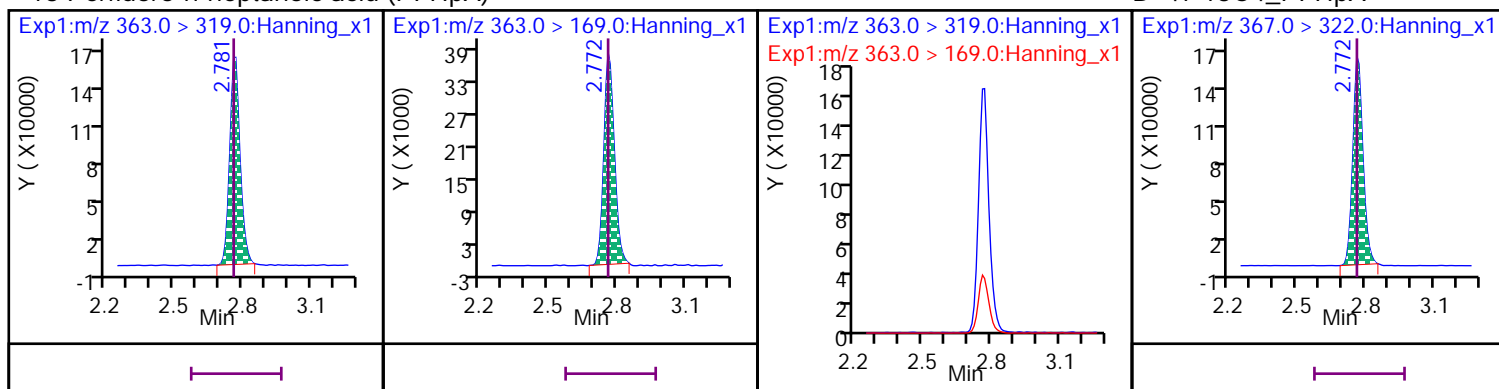
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



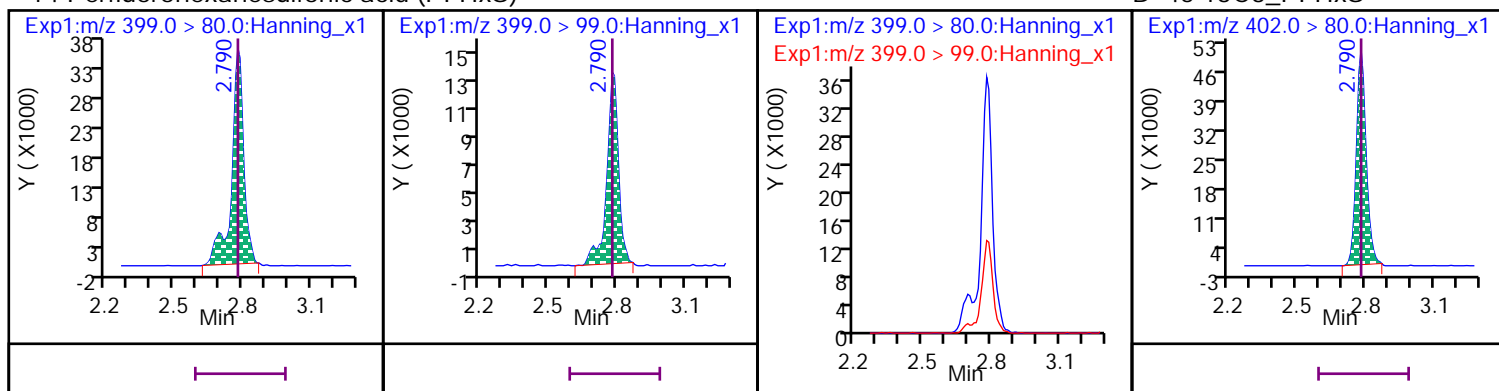
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



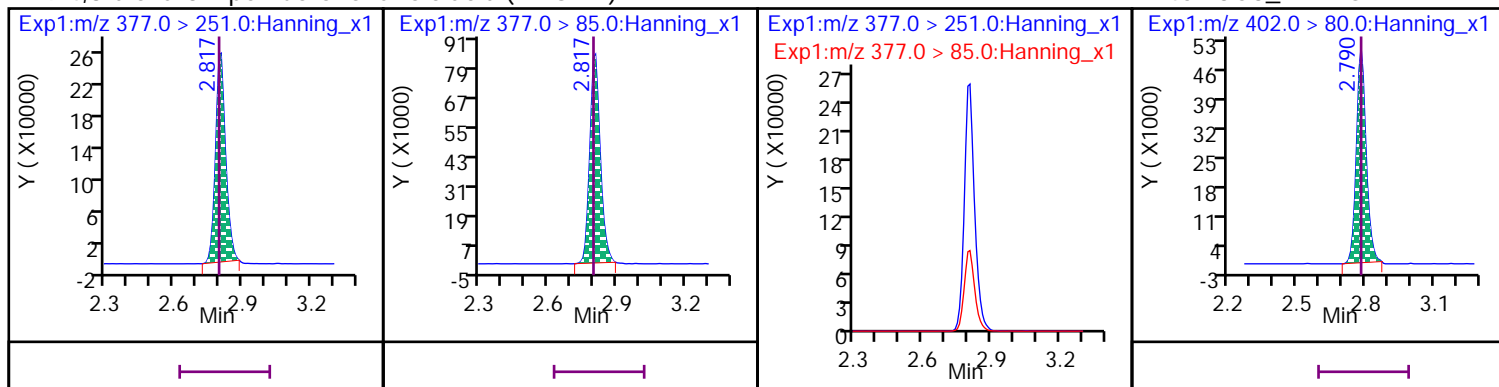
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



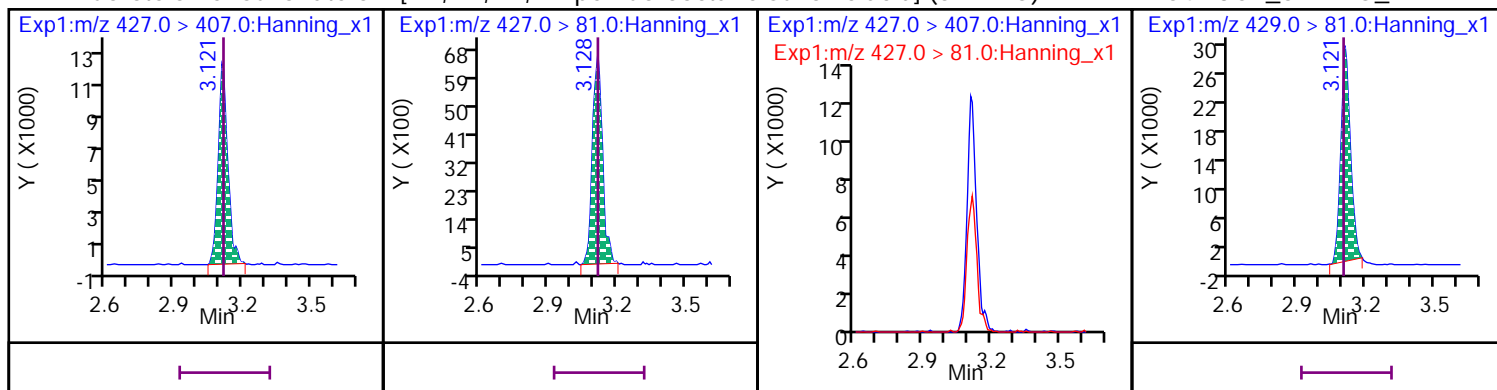
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



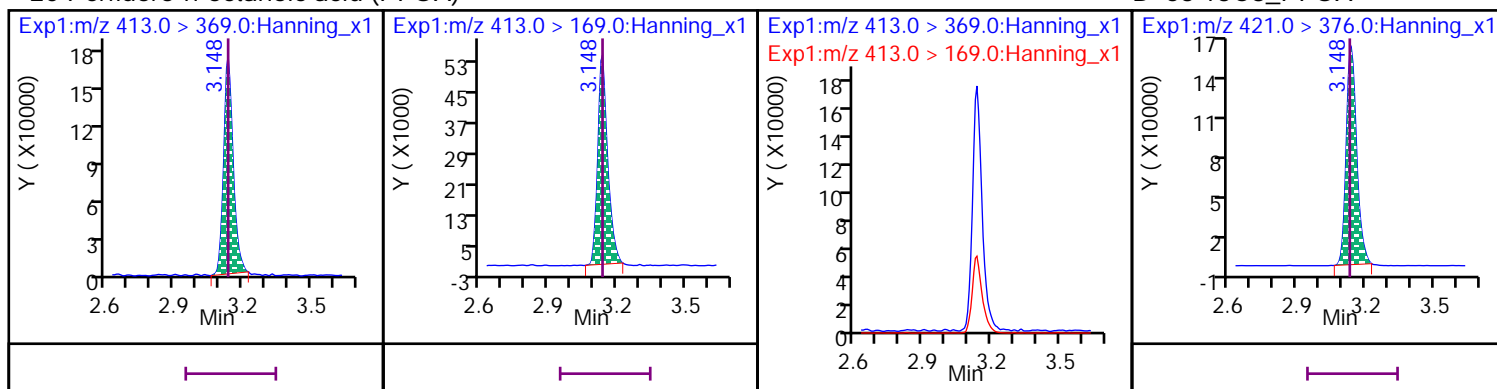
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



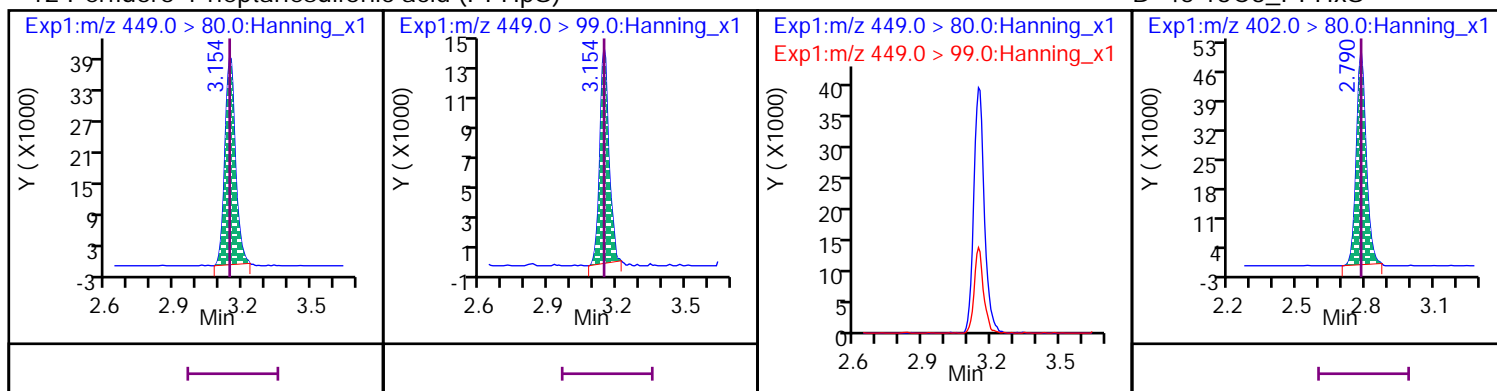
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



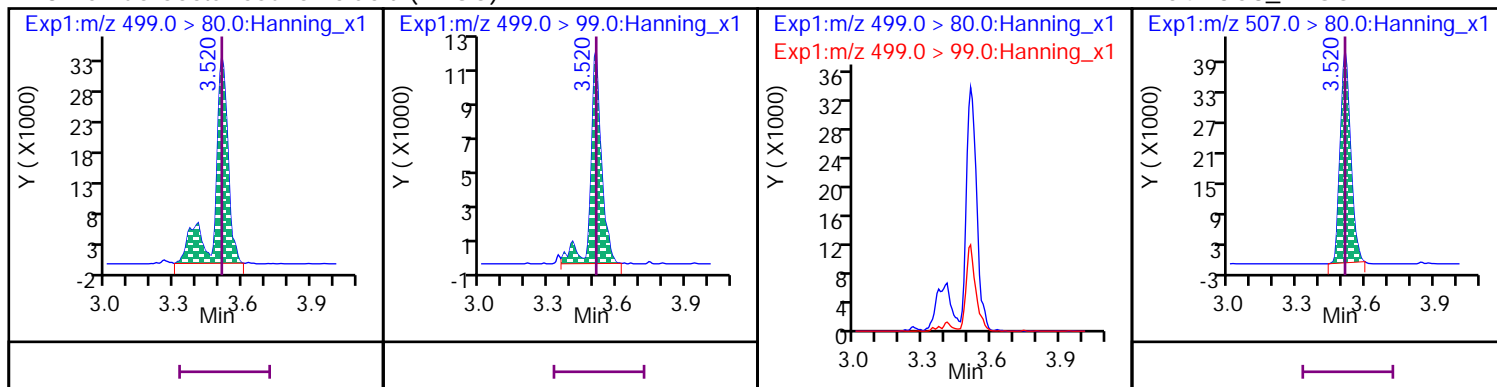
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



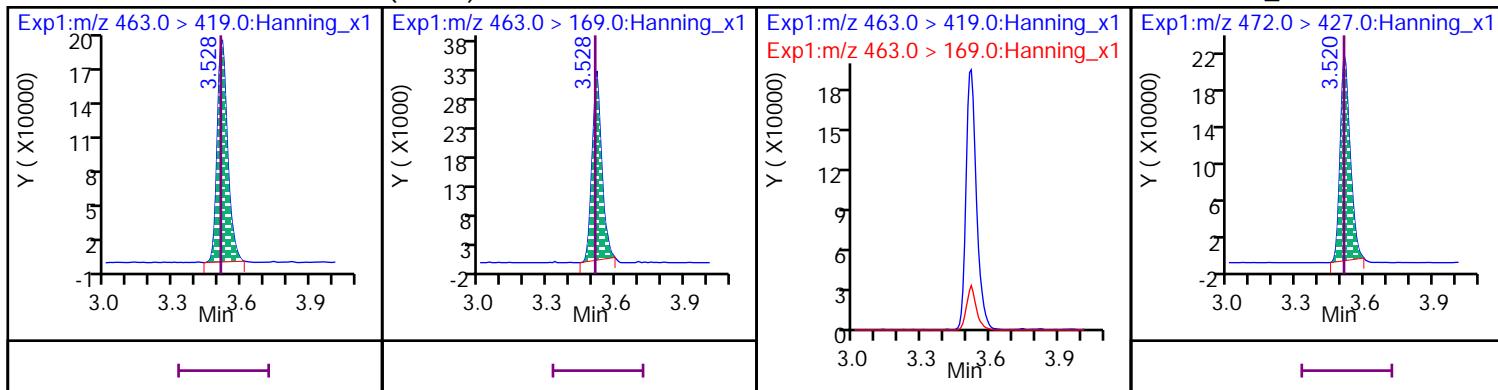
## 18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



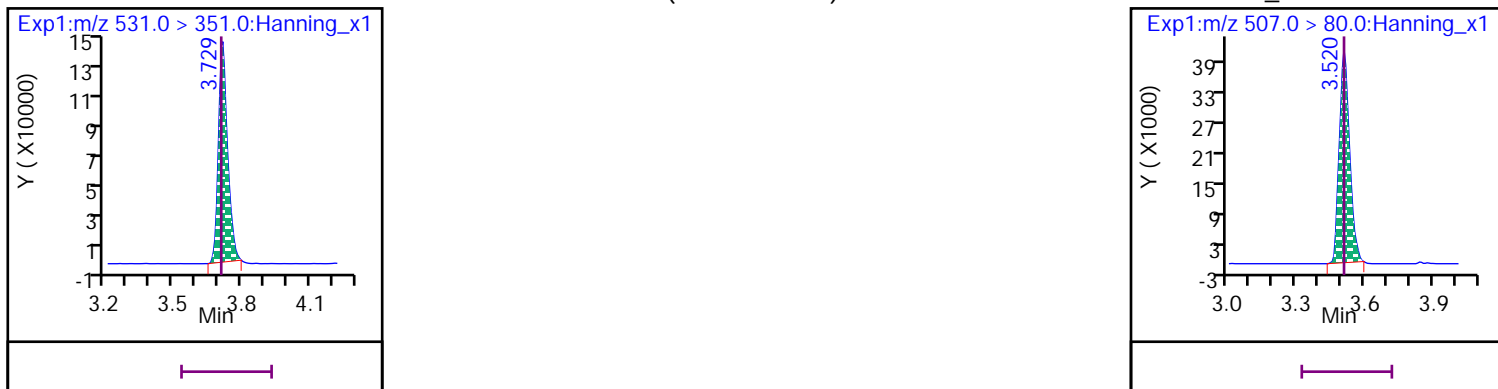
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



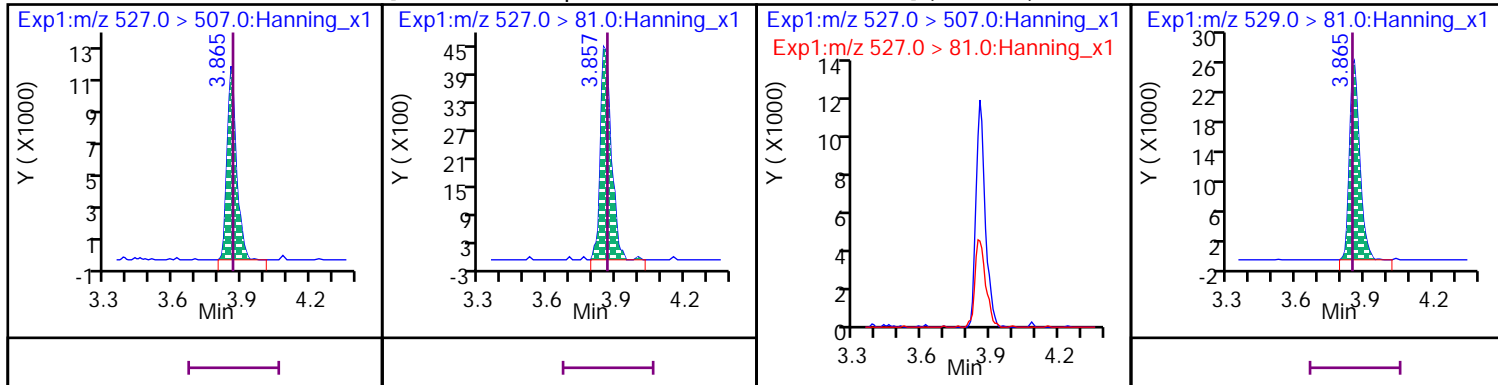
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



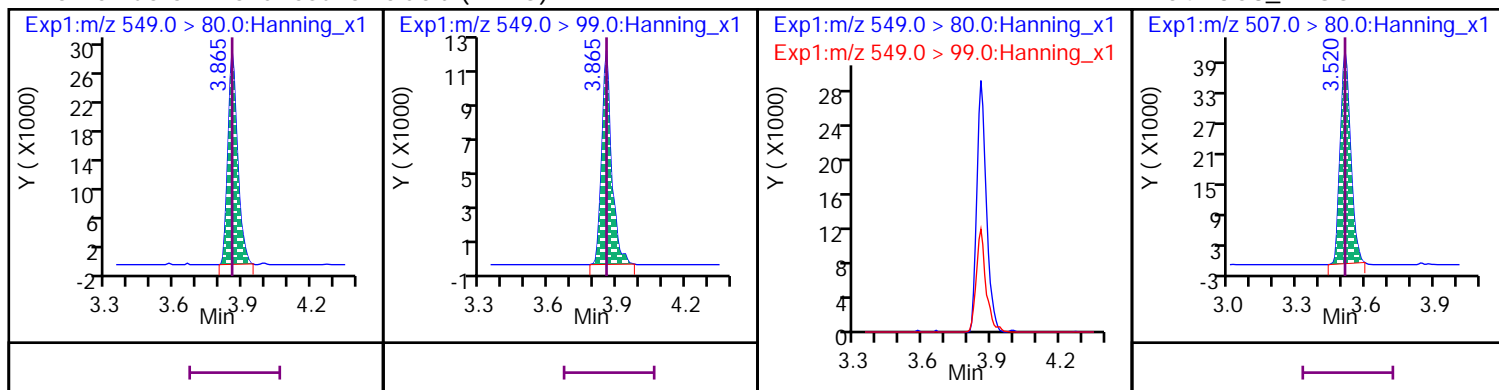
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



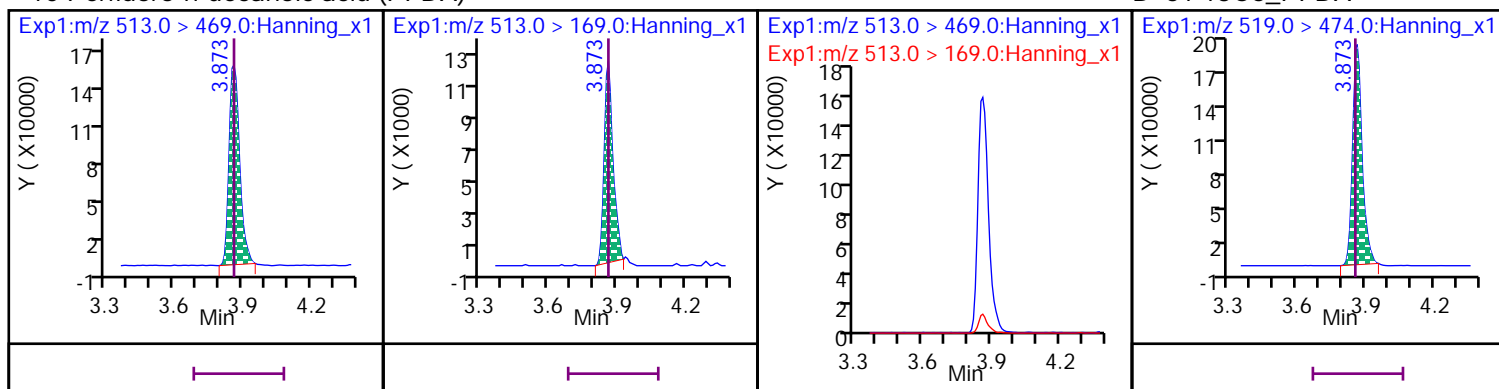
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



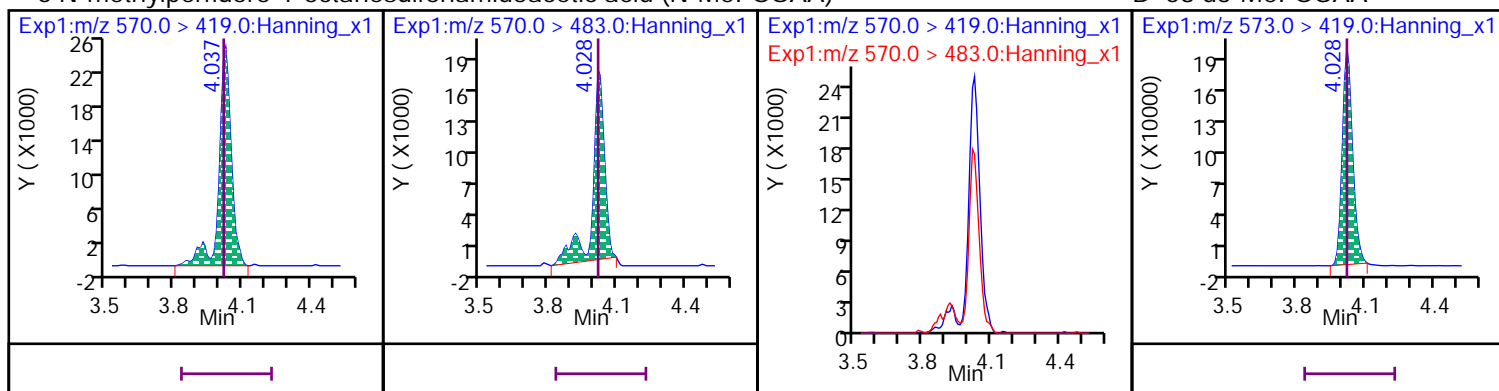
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



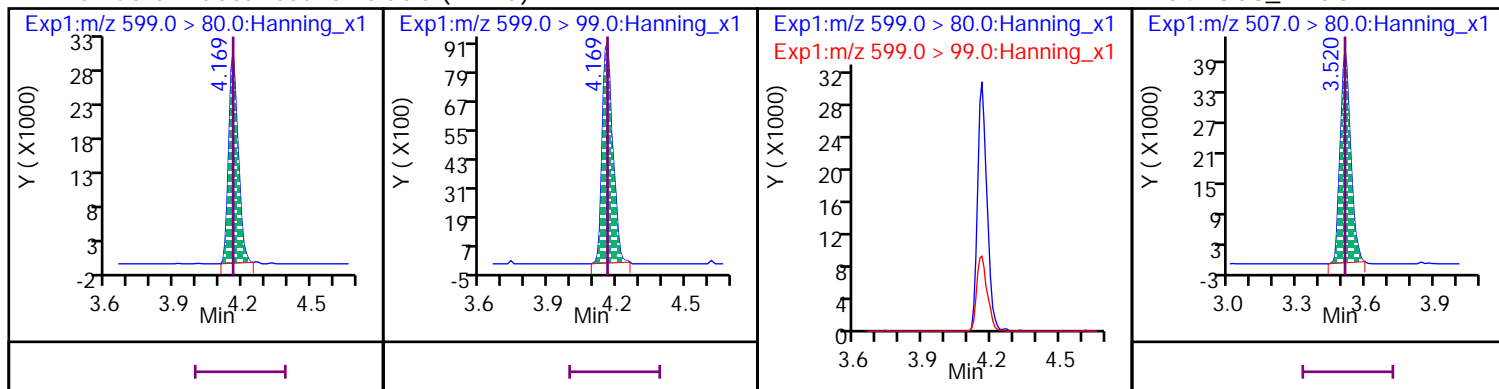
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



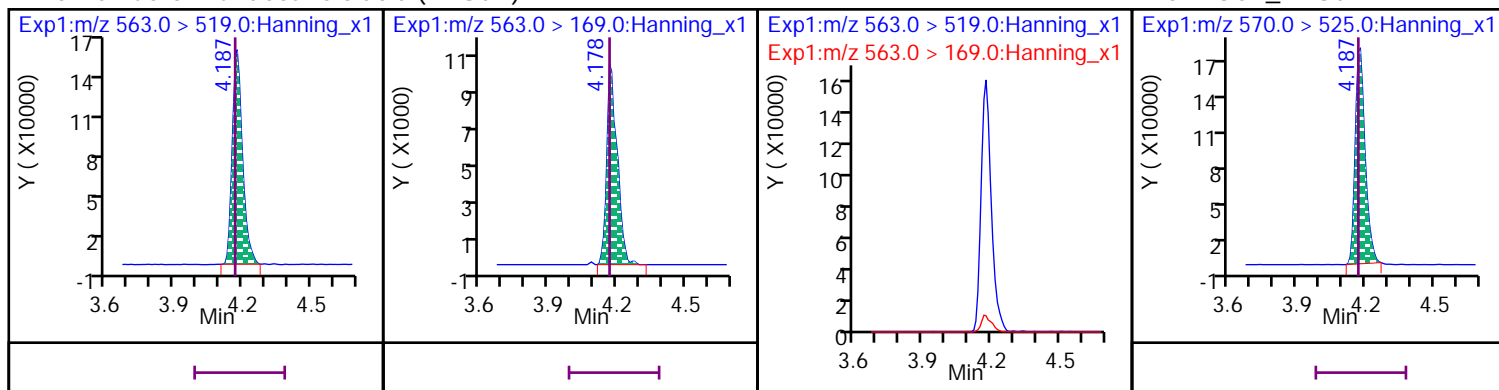
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



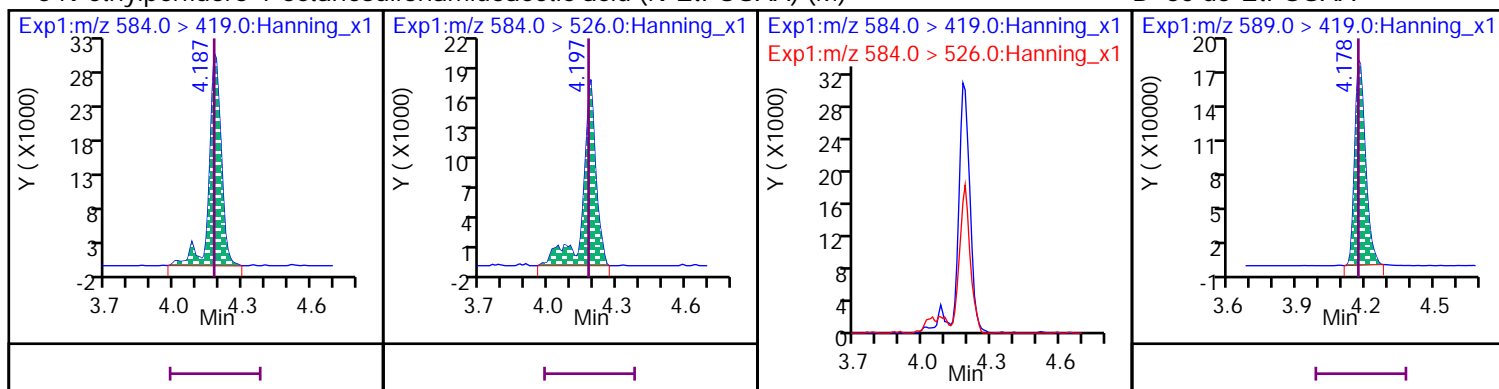
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



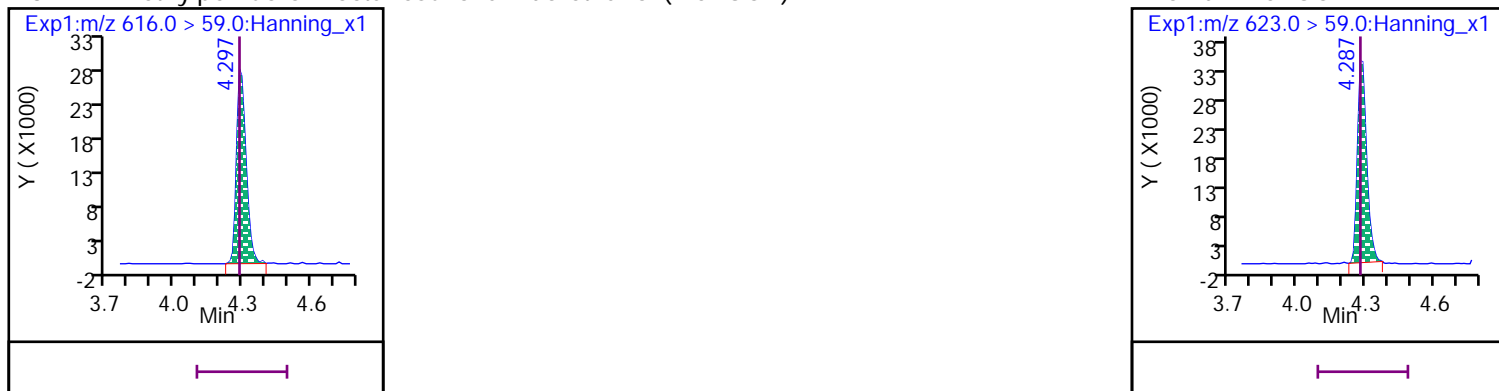
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



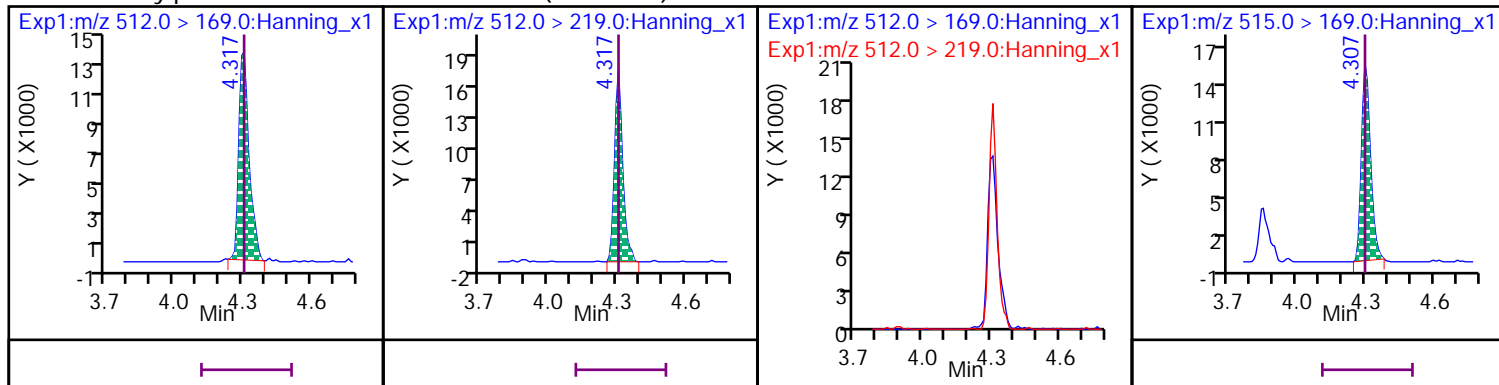
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

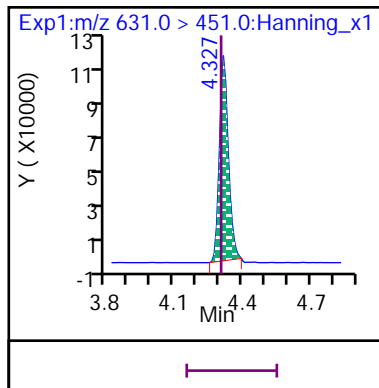


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

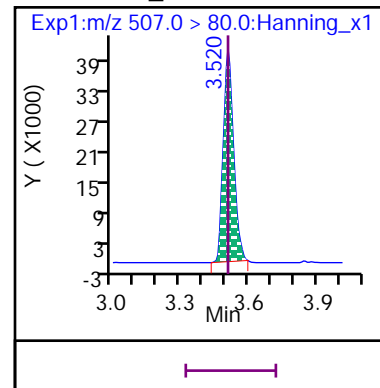
D 57 d3-MeFOSA



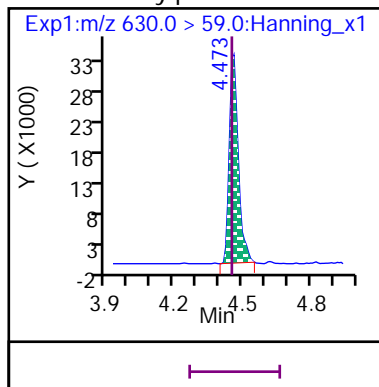
## 31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



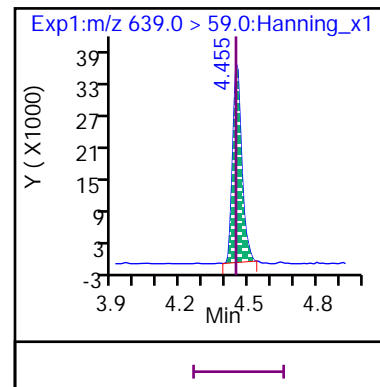
## D 54 13C8\_PFOS



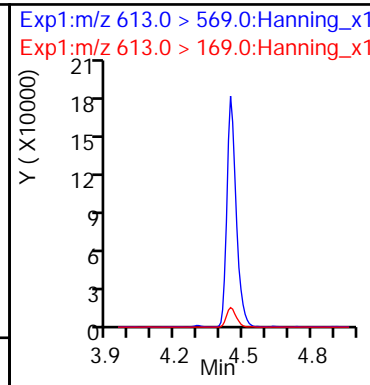
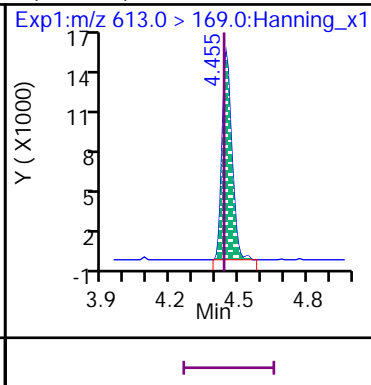
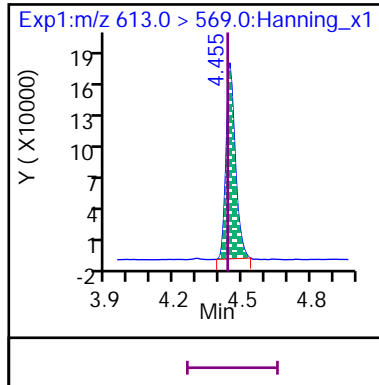
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



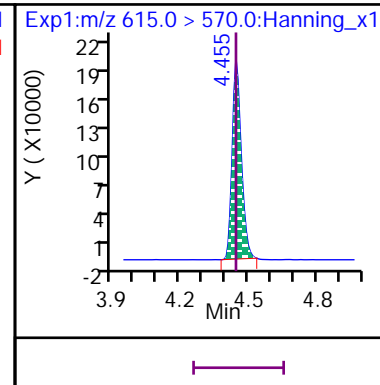
## D 62 d9-EtFOSE



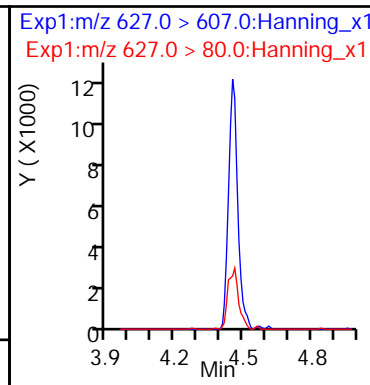
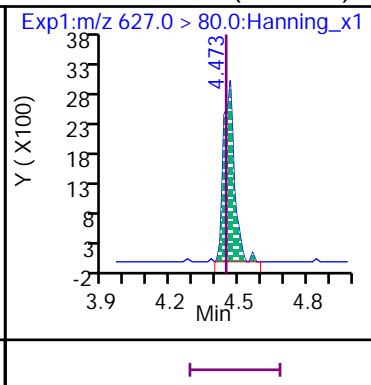
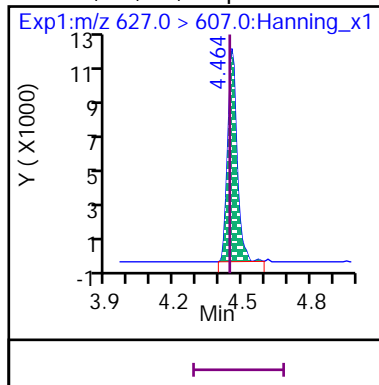
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



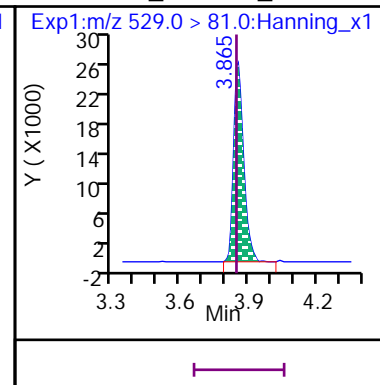
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

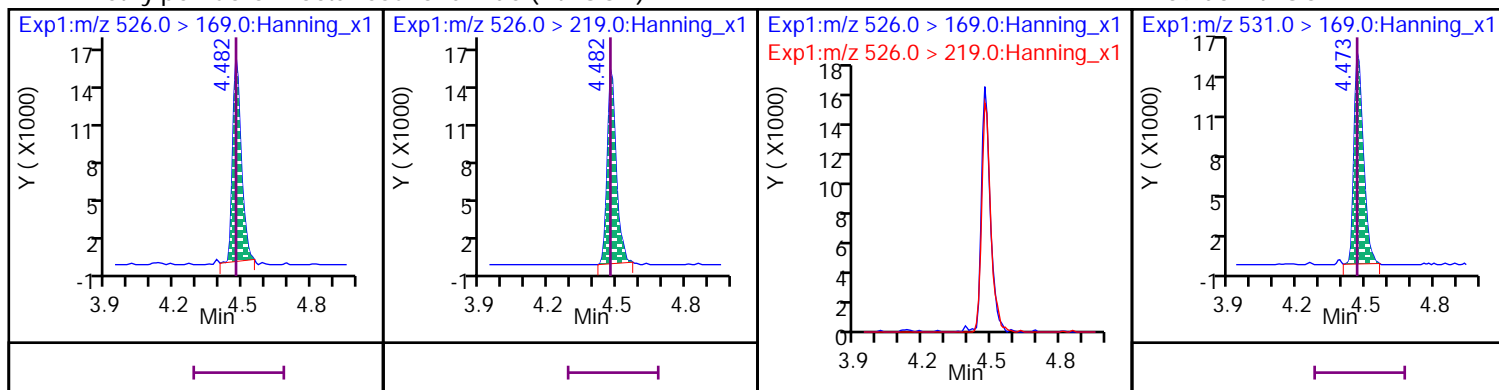


## D 65 13C2\_8:2 FTS\_2



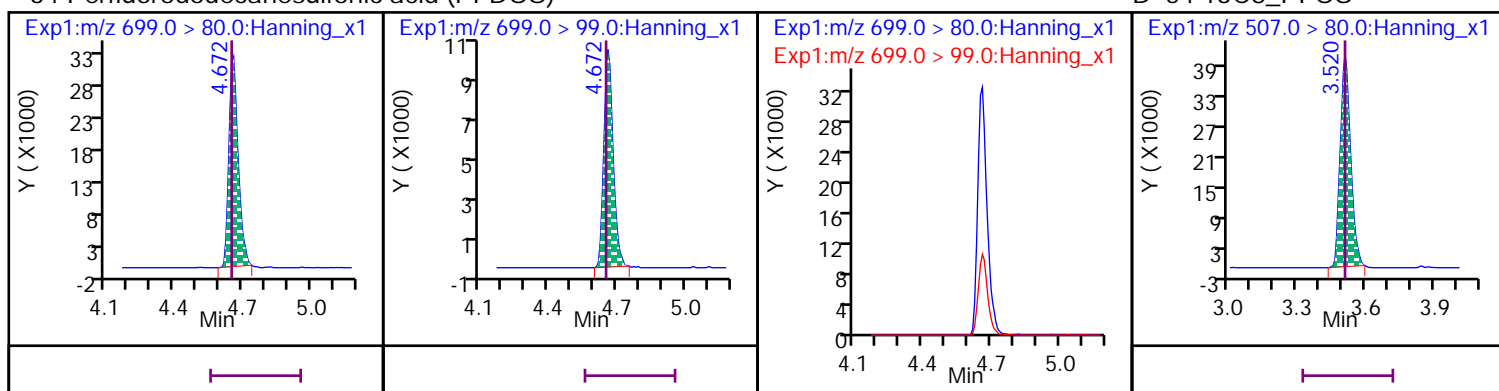
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



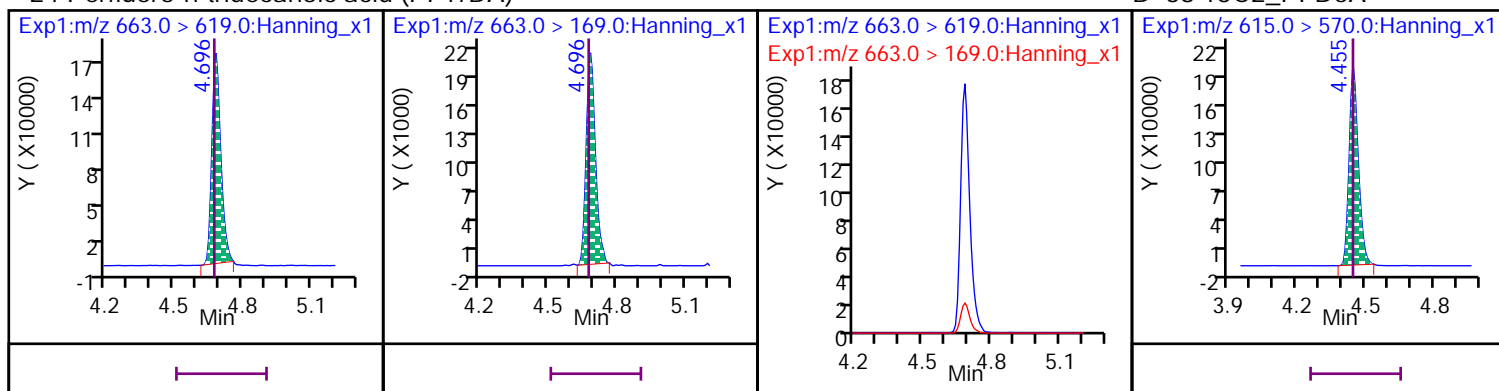
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



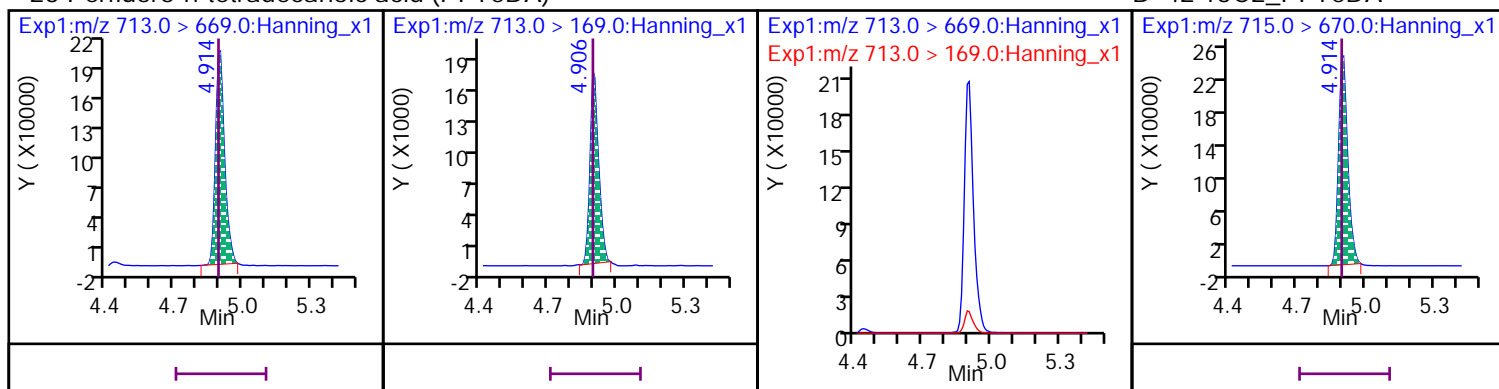
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



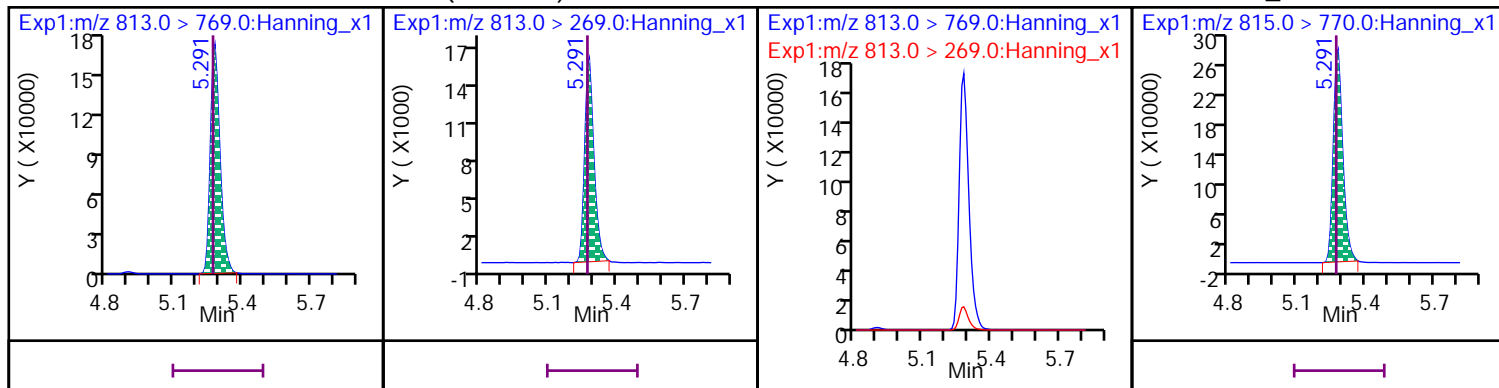
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



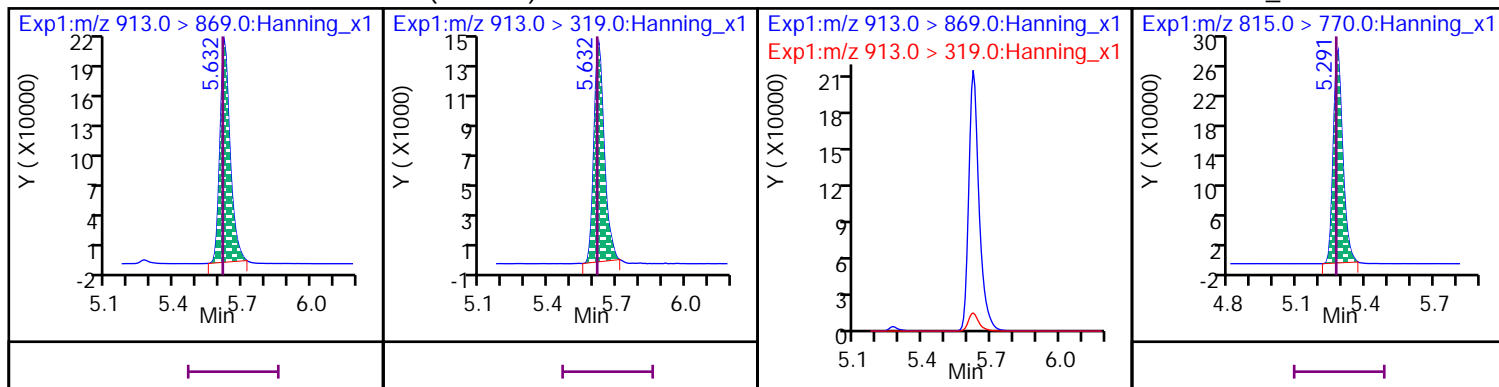
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

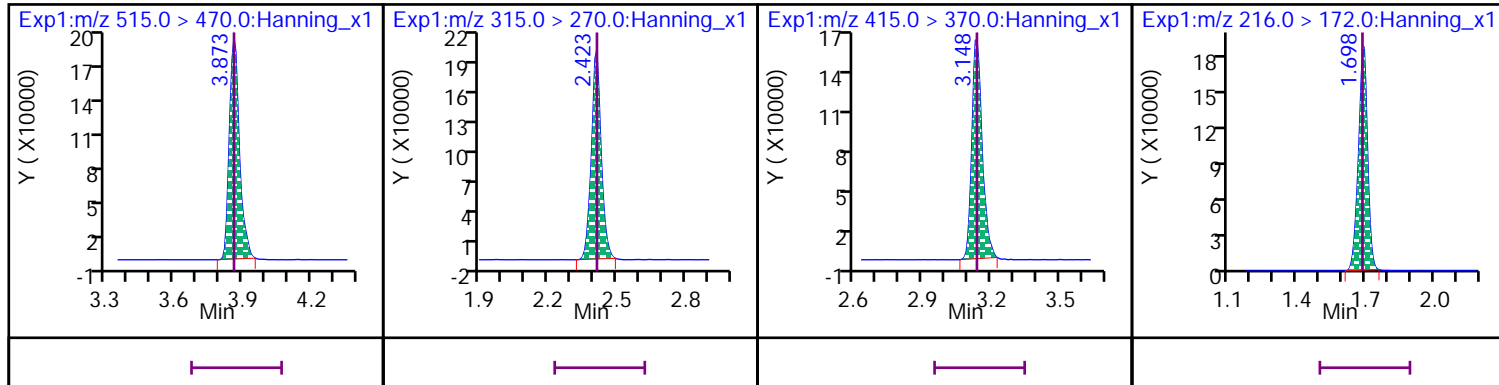


\* 37 13C2\_PFDA

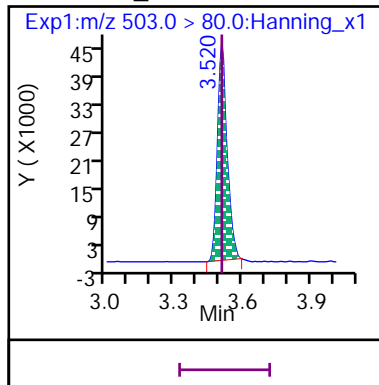
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS





Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820034.d

Injection Date: 28-Dec-2020 15:03:32

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000A\_SVLC-1248

Sample Info: ID CCV 1000A\_SVLC-1248

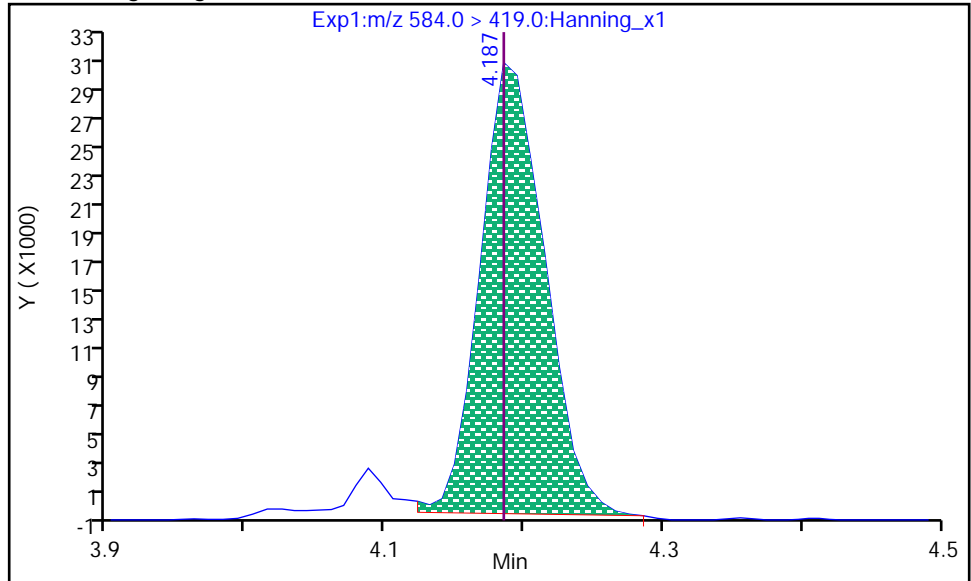
Dil. Factor: 1

Operator: Matthew M. Miller

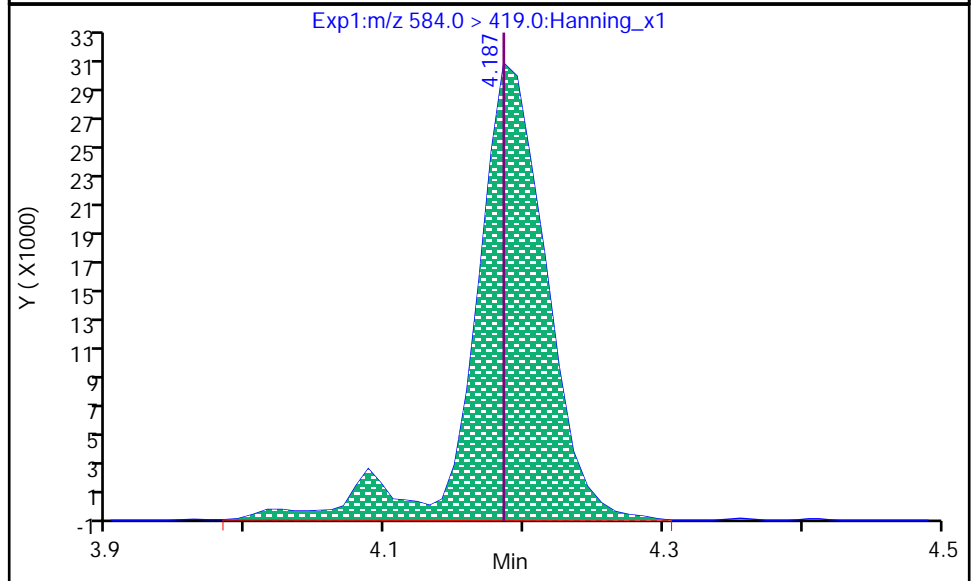
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.187  
Area: 95876  
Amount: 830.86  
Amount Units: ng/L



RT: 4.187  
Area: 109162  
Amount: 946.00  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:41:29

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d  
Injection Date: 28-Dec-2020 15:46:06 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 30  
Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	924.61	92.5	70 - 130
D 46 13C4_PFBA	649747	561534			86.4	50 - 150
D 50 13C5_PFPeA	665996	574349			86.2	50 - 150
21 PFPeA			1000.00	917.88	91.8	70 - 130
7 PFBS			884.00	817.38	92.5	70 - 130
D 44 13C3_PFBS	238207	203714			85.5	50 - 150
1 4:2 FTS			934.00	898.33	96.2	70 - 130
D 63 13C2_4:2 FTS_2	144067	109018			75.7	50 - 150
D 49 13C5_PFHxA	743582	597519			80.4	50 - 150
15 PFHxA			1000.00	979.97	98	70 - 130
22 PFPeS			938.00	876.23	93.4	70 - 130
28 GenX			2000.00	1883.51	94.2	70 - 130
D 66 13C3_GenX	1401050	1148511			82	50 - 150
D 47 13C4_PFHpA	633684	522228			82.4	50 - 150
13 PFHpA			1000.00	915.10	91.5	70 - 130
D 45 13C3_PFHxS	174146	151253			86.9	50 - 150
14 PFHxS			910.00	844.55	92.8	70 - 130
29 ADONA			942.00	884.16	93.9	70 - 130
D 64 13C2_6:2 FTS_2	104346	82866			79.4	50 - 150
2 6:2 FTS			948.00	1049.37	111	70 - 130
20 PFOA			1000.00	953.80	95.4	70 - 130
D 53 13C8_PFOA	628007	502895			80.1	50 - 150
12 PFHpS			952.00	901.63	94.7	70 - 130
18 PFOS			928.00	827.55	89.2	70 - 130
17 PFNA			1000.00	903.46	90.3	70 - 130
D 56 13C9_PFNA	767623	645363			84.1	50 - 150
D 54 13C8_PFOS	152445	130974			85.9	50 - 150
30 9CI-PF3ONS			932.00	859.55	92.2	70 - 130
D 55 13C8_PFOA	308857	260099			84.2	50 - 150
19 PFOSA			1000.00	946.62	94.7	70 - 130
16 PFNS			960.00	893.48	93.1	70 - 130
D 65 13C2_8:2 FTS_2	100453	77414			77.1	50 - 150
3 8:2 FTS			958.00	835.34	87.2	70 - 130
10 PFDA			1000.00	978.26	97.8	70 - 130
D 51 13C6_PFDA	672868	556533			82.7	50 - 150
D 58 d3-MeFOSAA	791564	632923			80	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	937.29	93.7	70 - 130
9 PFDS			964.00	867.22	90	70 - 130
5 N-EtFOSAA			1000.00	979.08	97.9	70 - 130
25 PFUdA			1000.00	992.73	99.3	70 - 130
D 60 d5-EtFOSAA	731651	592679			81	50 - 150
D 52 13C7_PFUdA	643525	521905			81.1	50 - 150
D 61 d7-MeFOSE	105402	95892			91	50 - 150
32 MeFOSE			1000.00	986.50	98.7	70 - 130
26 MeFOSA			1000.00	1076.28	108	70 - 130
D 57 d3-MeFOSA	51840	41275			79.6	50 - 150
31 11Cl-PF3OUDS			942.00	890.35	94.5	70 - 130
D 62 d9-EtFOSE	137116	101203			73.8	50 - 150
33 EtFOSE			1000.00	998.07	99.8	70 - 130
D 59 d5-EtFOSA	50284	41850			83.2	50 - 150
D 38 13C2_PFDoA	611364	536079			87.7	50 - 150
4 10:2 FTS			964.00	876.10	90.9	70 - 130
27 EtFOSA			1000.00	935.86	93.6	70 - 130
11 PFDoA			1000.00	859.50	85.9	70 - 130
34 PFDOS			968.00	865.33	89.4	70 - 130
24 PFTrDA			1000.00	892.67	89.3	70 - 130
23 PFTeDA			1000.00	961.87	96.2	70 - 130
D 42 13C2_PFTeDA	813074	678956			83.5	50 - 150
35 PFHxDA			1000.00	980.62	98.1	70 - 130
D 40 13C2_PFHxDA	935525	779161			83.3	50 - 150
36 PFODA			1000.00	972.65	97.3	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d  
Injection Date: 28-Dec-2020 15:46:06 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 30  
Sample Info: ID CCV 1000B\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.703	1.696	1	561534	24	>100:1			1000.00	809.65	86.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.703	1.696	1/0	517119	24	>100:1			1000.00	924.61		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.072	2.072	0	574349	16	>100:1			1000.00	834.95	86.2	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.072	2.072	0/0	530038	17	>100:1			1000.00	917.88		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.125	2.125	1	203714	16	>100:1			1000.00	884.83	85.5	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.136	2.125	1/0	196324	18	>100:1	Target = 3.50		884.00	817.38		
298.9 > 99	44	2.125	2.125		54346	16	>100:1	3.61 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.450	0/-1	154840	19		Target = 3.10		938.00	876.23		
349 > 99	44	2.450	2.450		47336	18	>100:1	3.27 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.379	1	109018	19	>100:1			5000.00	4503.33	75.7	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	0/-1	39090	21	>100:1	Target = 1.80		934.00	898.33		
327 > 81	63	2.379	2.388		19898	19	>100:1	1.96 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	0	597519	19	>100:1			1000.00	810.67	80.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	0/0	578101	20	>100:1	Target = 18.34		1000.00	979.97		
313 > 119	49	2.423	2.423		29691	18	>100:1	19.47 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	0	1148511	21	>100:1			5000.00	4311.97	82	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	0/0	310839	21	>100:1	Target = 0.81		2000.00	1883.51		
285 > 185	66	2.530	2.530		372814	21	>100:1	0.83 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.772	0	522228	21	>100:1			1000.00	860.84	82.4	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.772	0/0	495698	20	>100:1	Target = 3.70		1000.00	915.10		
363 > 169	47	2.772	2.772		132751	20	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.790	0	151253	21				1000.00	883.34	86.9	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.790	0/0	135442	27	>100:1	Target = 3.21	0.15	910.00	844.55		
399 > 99	45	2.790	2.790		42050	27	>100:1	3.22 (1.60-4.81)	0.12				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.808	1/1	849041	21	>100:1	Target = 2.97		942.00	884.16		
377 > 85	45	2.818	2.808		277173	19	>100:1	3.06 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.154	3.154	0/0	123886	25	>100:1	Target = 3.08		952.00	901.63		
449 > 99	45	3.154	3.154		40523	30	>100:1	3.05 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.128	3.114	1	82866	21	>100:1			5000.00	4302.85	79.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.128	0/-1	35943	23	>100:1	Target = 1.80		948.00	1049.37		
427 > 81	64	3.128	3.128		17597	22	>100:1	2.04 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.141	1	502895	23	>100:1			1000.00	849.68	80.1	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.148	3.148	0/-1	488989	24	>100:1	Target = 2.87		1000.00	953.80		
413 > 169	53	3.148	3.148		163764	24	>100:1	2.98 (1.43-4.31)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.528	3.520	1	130974	23	>100:1			1000.00	873.57	85.9	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.528	3.520	1/0	128437	42	>100:1	Target = 3.84	0.27	928.00	827.55		
499 > 99	54	3.520	3.520		38583	32	>100:1	3.32 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.729	3.722	1/0	378994	24	>100:1			932.00	859.55		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.865	1/0	89554	21	>100:1	Target = 3.07		960.00	893.48		
549 > 99	54	3.865	3.865		27721	19		3.23 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	82431	16	>100:1	Target = 3.03		964.00	867.22		
599 > 99	54	4.178	4.169		34166	24		2.41 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.327	4.317	1/0	331174	19	>100:1			942.00	890.35		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.663	1/0	90989	18	>100:1	Target = 3.33		968.00	865.33		
699 > 99	54	4.680	4.663		28202	18	>100:1	3.22 (1.66-5.00)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.528	3.520	1	645363	22	>100:1			1000.00	859.38	84.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.520	1/0	583075	21	>100:1	Target = 6.16		1000.00	903.46		
463 > 169	56	3.520	3.520		95008	26	>100:1	6.13 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.849	1	260099	21	>100:1			1000.00	840.21	84.2	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.857	3.841	1/0	242633	23	>100:1			1000.00	946.62		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.865	3.857	1	77414	20	>100:1			5000.00	4173.23	77.1	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.873	1/0	26078	19	86:1	Target = 1.95		958.00	835.34		
527 > 81	65	3.873	3.873		15291	18	87:1	1.70 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.473	4.455	2/1	31346	23	>100:1	Target = 3.14		964.00	876.10		
627 > 80	65	4.464	4.455		11417	24	>100:1	2.74 (1.57-4.72)					
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.873	3.865	1	556533	20	>100:1			1000.00	839.00	82.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.873	3.873	1/0	534957	21	>100:1	Target = 15.94		1000.00	978.26		
513 > 169	51	3.873	3.873		33559	20	>100:1	15.94 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.029	1	632923	18	>100:1			5000.00	4409.40	80	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.046	4.029	2/1	91138	38	>100:1	Target = 1.33	0.12	1000.00	937.29		
570 > 483	58	4.038	4.029		72079	34	>100:1	1.26 (0.66-1.99)	0.26				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.178	1	592679	18	>100:1			5000.00	4462.45	81	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.197	4.187	1/0	115543	38	>100:1	Target = 1.58	0.07	1000.00	979.08		M
584 > 526	60	4.197	4.187		69484	31		1.66 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.178	1	521905	18				1000.00	825.70	81.1	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.178	1/0	486960	17	>100:1	Target = 15.50		1000.00	992.73		
563 > 169	52	4.187	4.178		30574	18	>100:1	15.92 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.287	1	95892	18	>100:1			1000.00	886.18	91	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.297	1/0	88884	16	>100:1			1000.00	986.50		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.307	1	41275	16	>100:1			1000.00	780.00	79.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	1/0	50119	16	>100:1	Target = 1.12		1000.00	1076.28		
512 > 219	57	4.317	4.317		44292	15	>100:1	1.13 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.455	1	101203	17	>100:1			1000.00	807.07	73.8	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.464	1/0	89864	17	>100:1			1000.00	998.07		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.455	4.455	1	536079	20	>100:1			1000.00	885.62	87.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.446	2/1	466596	20	>100:1	Target = 10.85		1000.00	859.50		
613 > 169	38	4.464	4.446		46299	22		10.07 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.688	1/0	471336	21	>100:1	Target = 8.37		1000.00	892.67		
663 > 169	38	4.696	4.688		59156	29	>100:1	7.96 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.473	1	41850	19	>100:1			1000.00	852.44	83.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.482	1/0	42789	19	>100:1	Target = 1.03		1000.00	935.86		
526 > 219	59	4.482	4.482		44070	17	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.914	4.906	1	678956	18	>100:1			1000.00	805.94	83.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.914	4.906	1/0	565848	21	92:1	Target = 12.11		1000.00	961.87		
713 > 169	42	4.914	4.906		50734	18	>100:1	11.15 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.282	1	779161	19	>100:1			1000.00	859.84	83.3	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.282	1/0	499229	19	>100:1	Target = 11.48		1000.00	980.62		
813 > 269	40	5.291	5.282		44078	20	>100:1	11.32 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.625	1/0	670861	26	>100:1	Target = 13.88		1000.00	972.65		
913 > 319	40	5.632	5.625		45590	26	>100:1	14.71 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.873	1	561006	21	>100:1					76.6	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	0	584973	21	>100:1					80	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.148	0	517960	25	>100:1					86.4	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.703	1.696	1	516639	24	>100:1					84.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.520	3.520	1	143138	22	>100:1					87.8	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d

Injection Date: 28-Dec-2020 15:46:06

Inst. ID: LCMSMS02

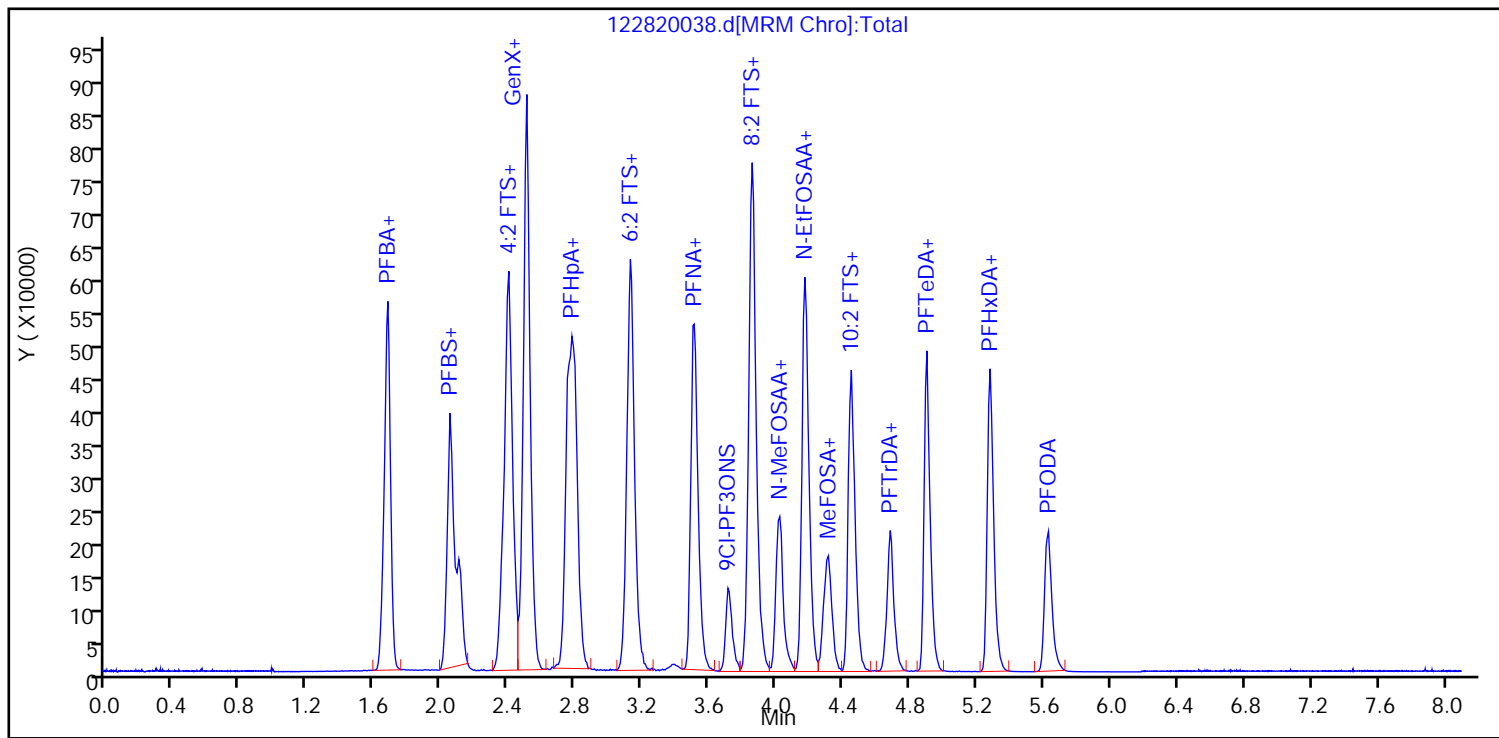
Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

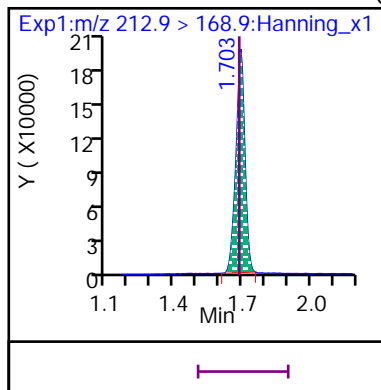
Sample Info: ID CCV 1000B\_SVLC-1248

Dil. Factor: 1

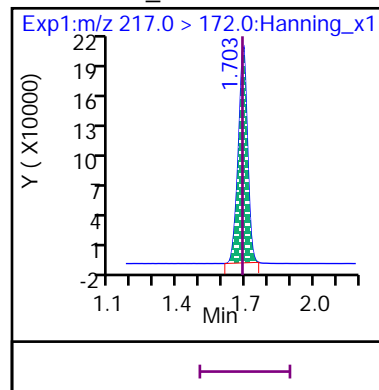
Operator: Matthew M. Miller



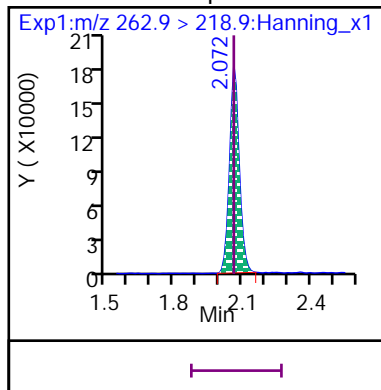
8 Perfluoro-n-butanoic acid (PFBA)



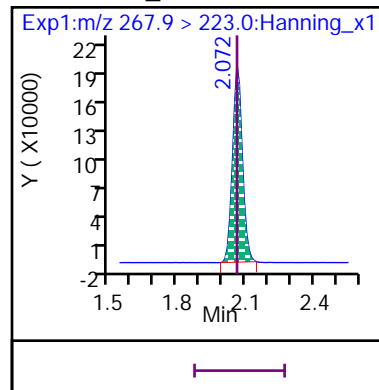
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



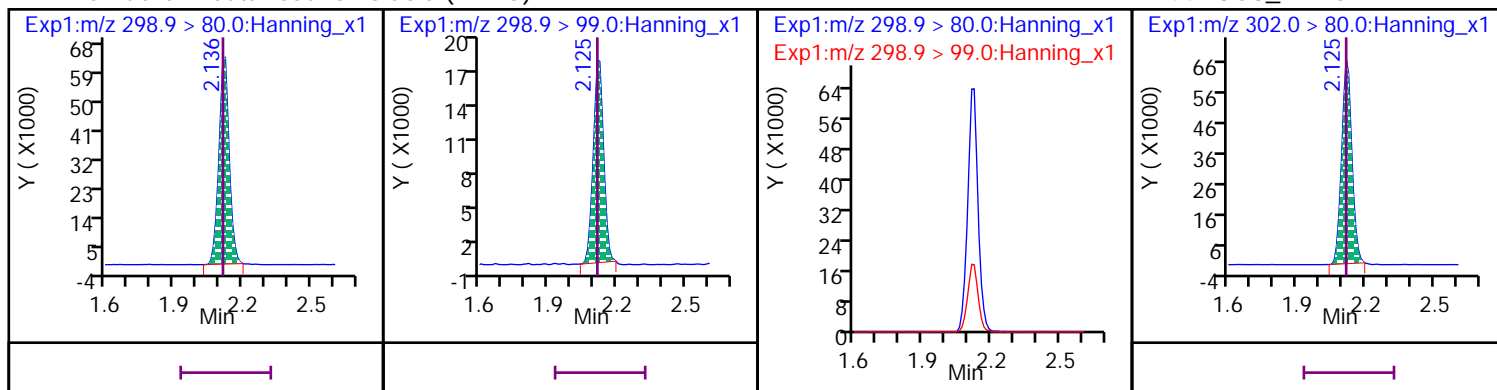
D 50 13C5\_PFPeA





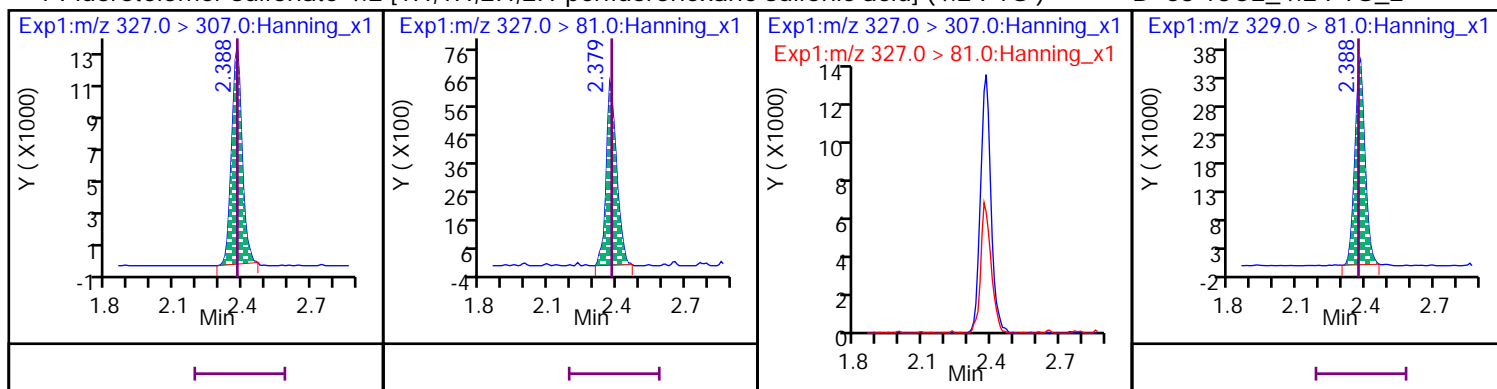
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



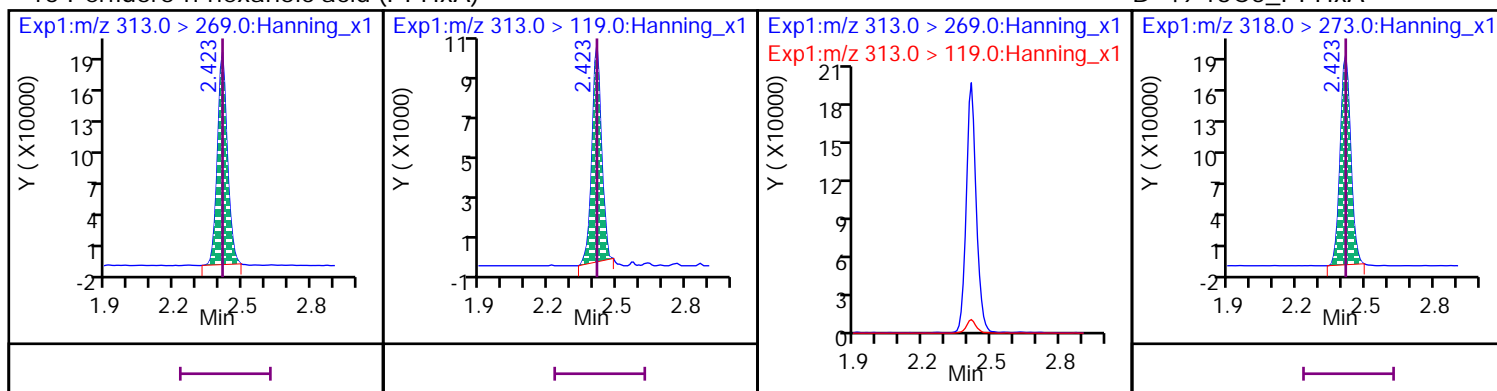
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



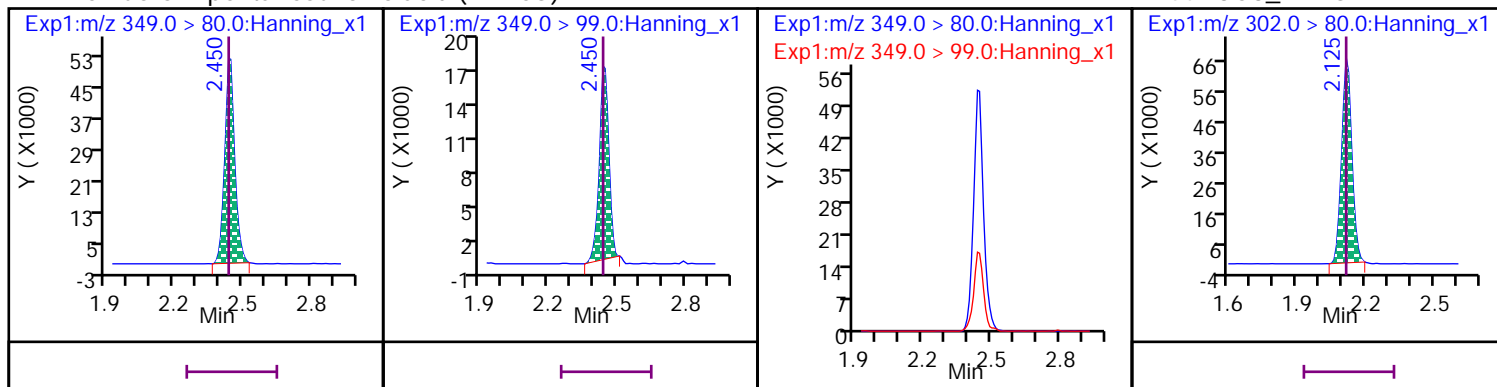
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



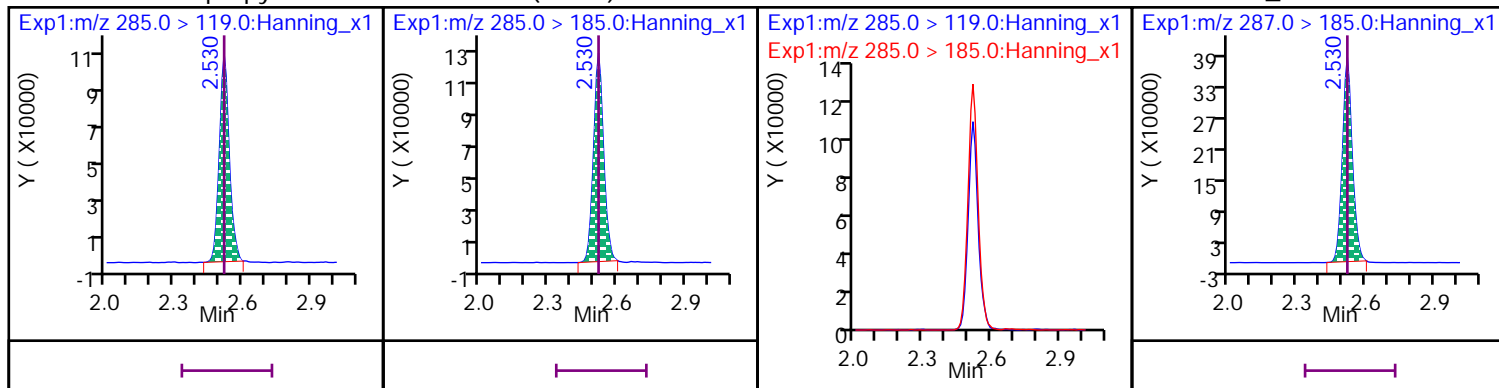
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



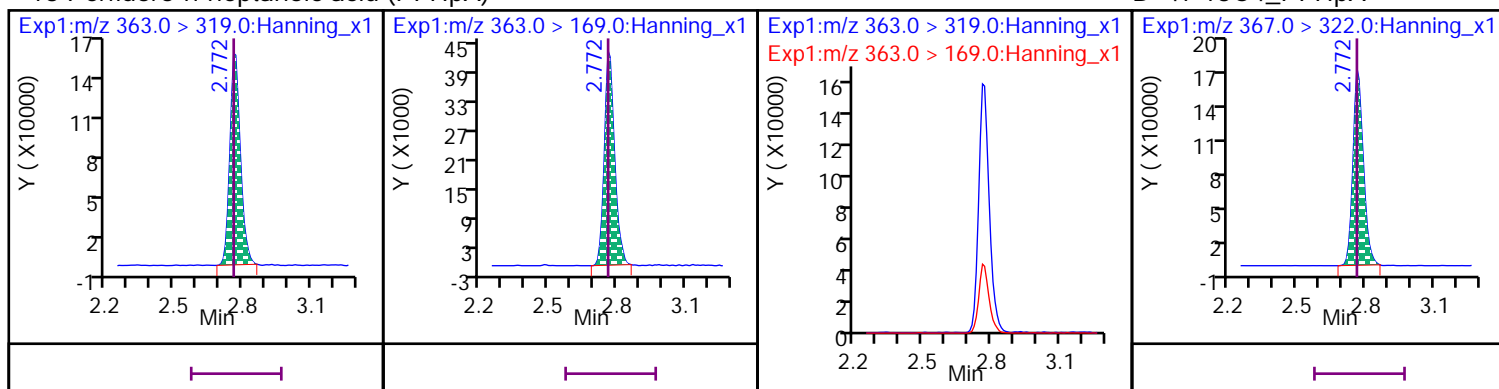
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



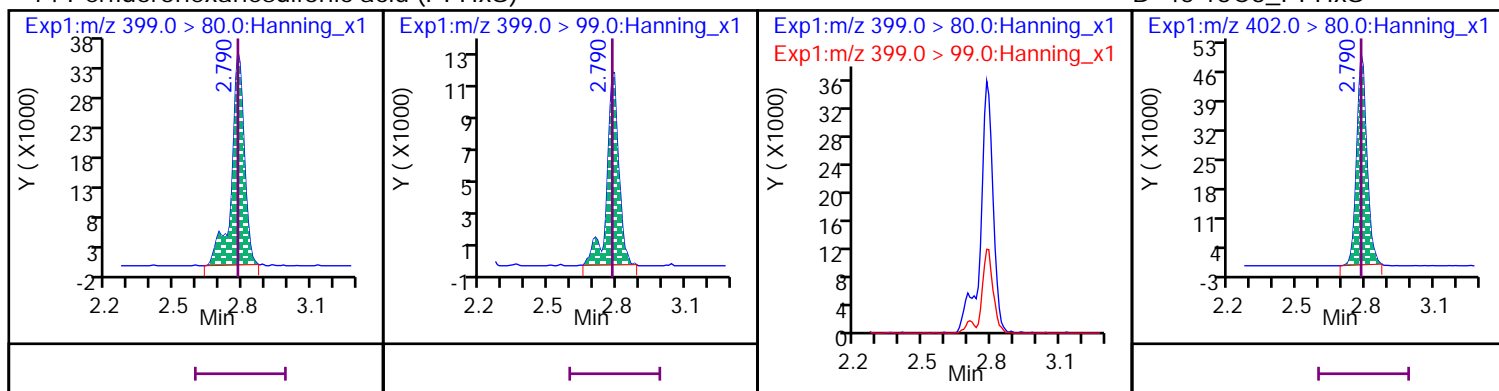
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



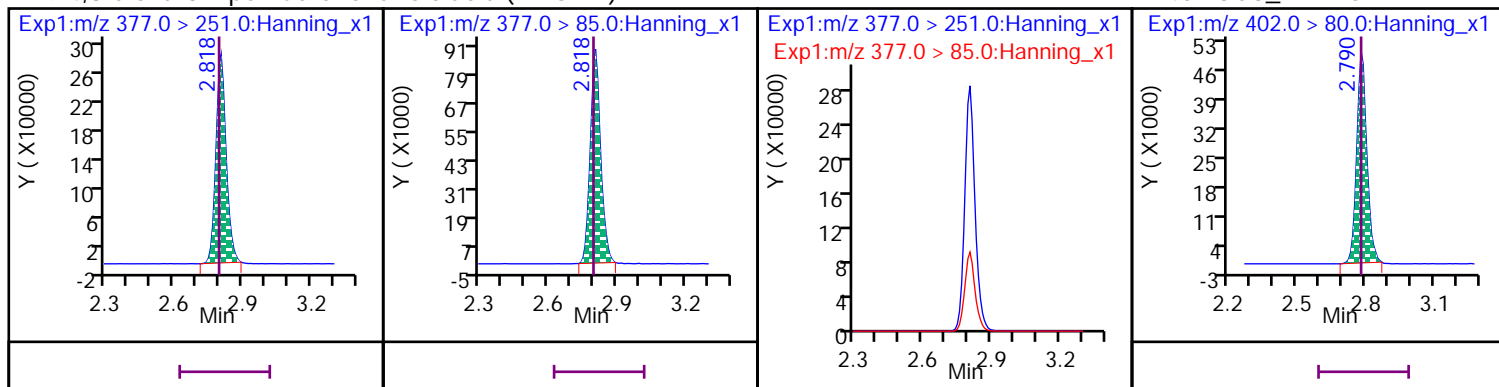
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



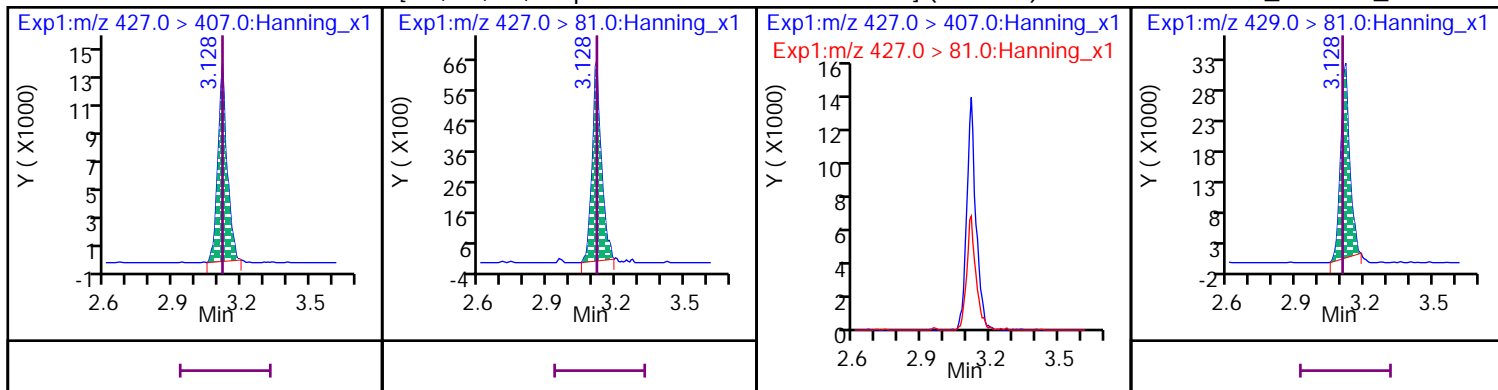
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



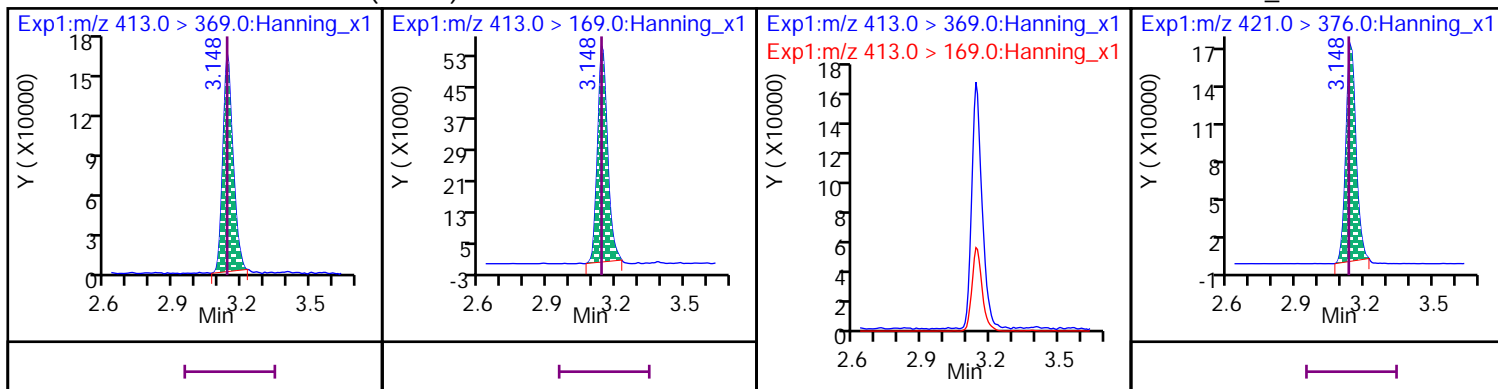
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



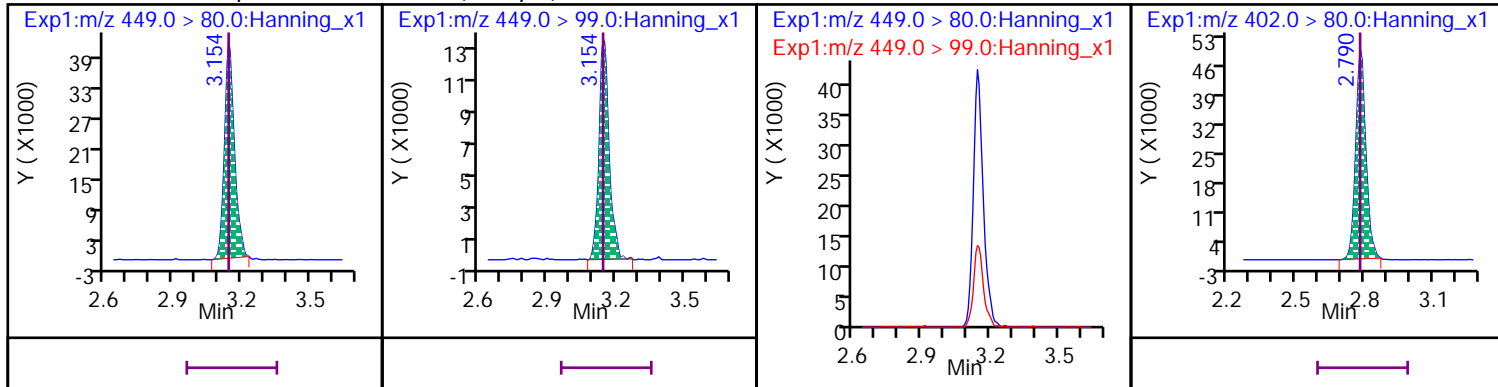
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



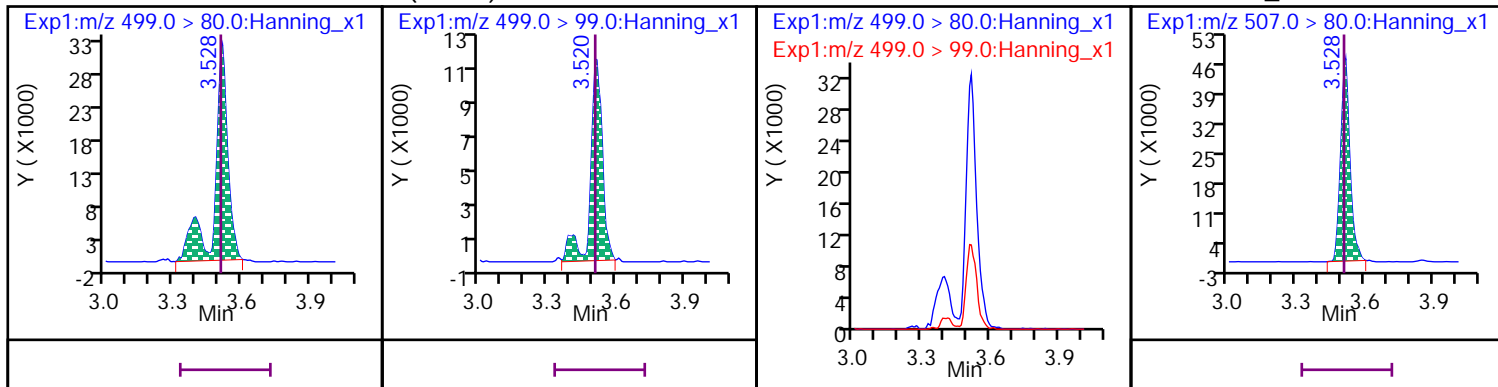
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



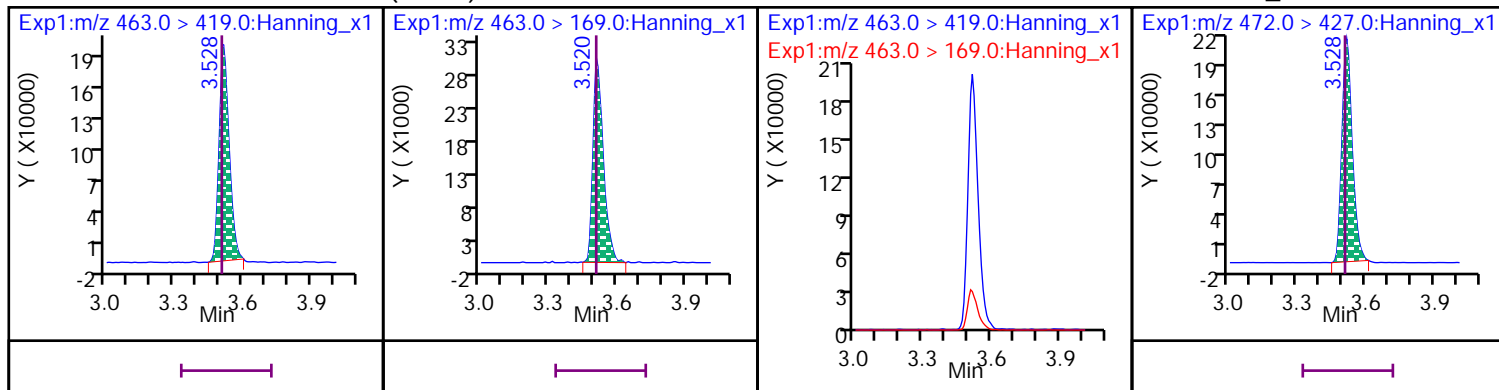
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



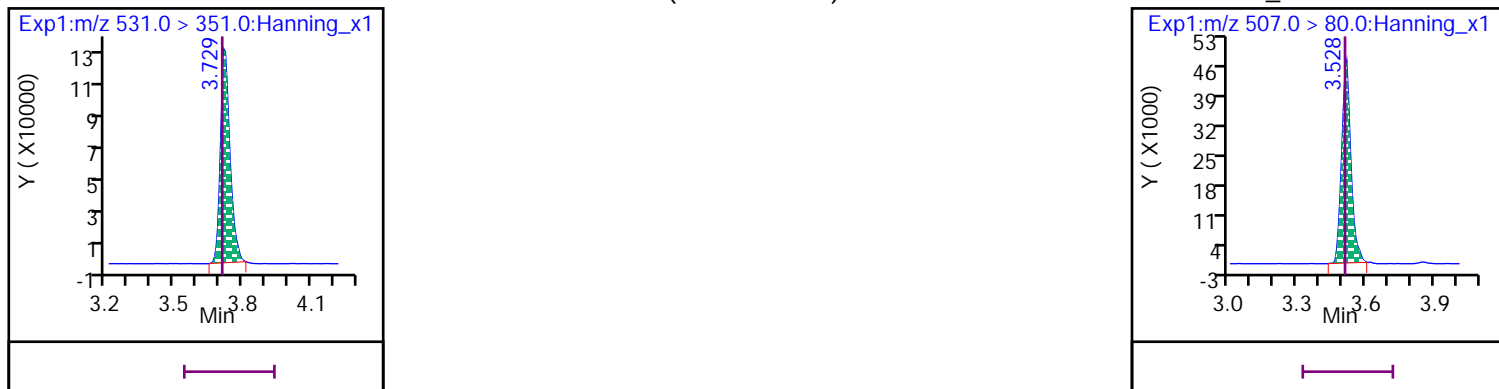
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



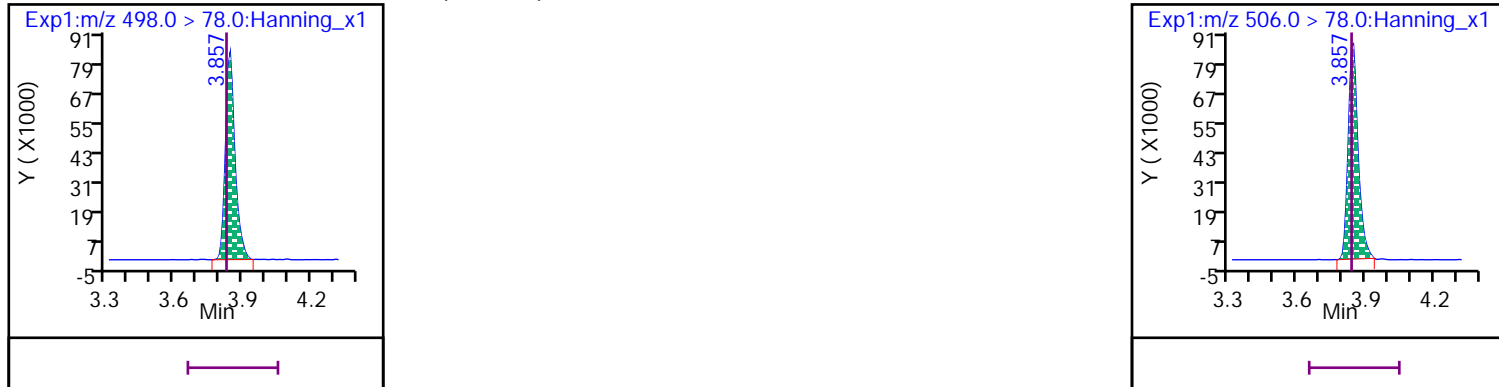
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



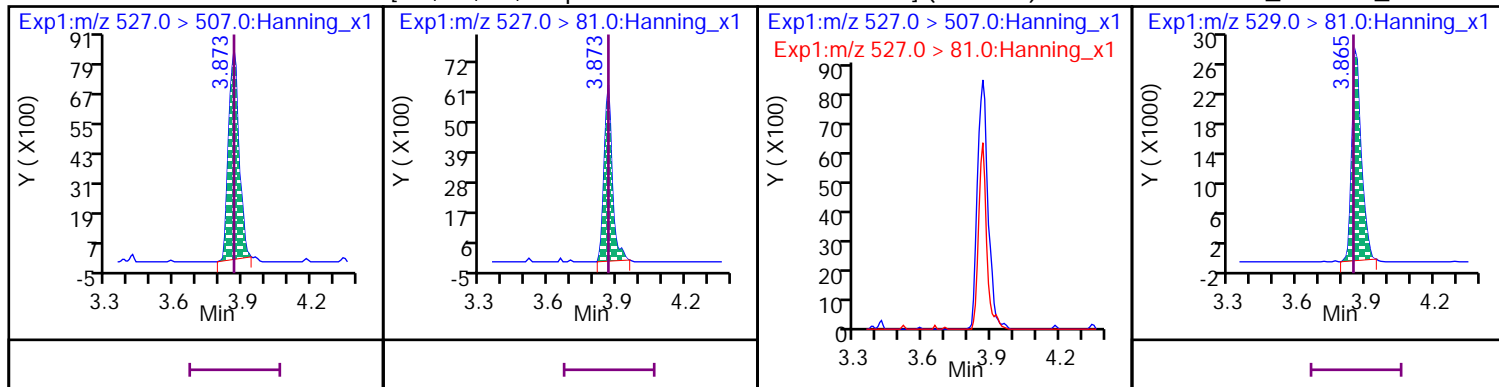
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



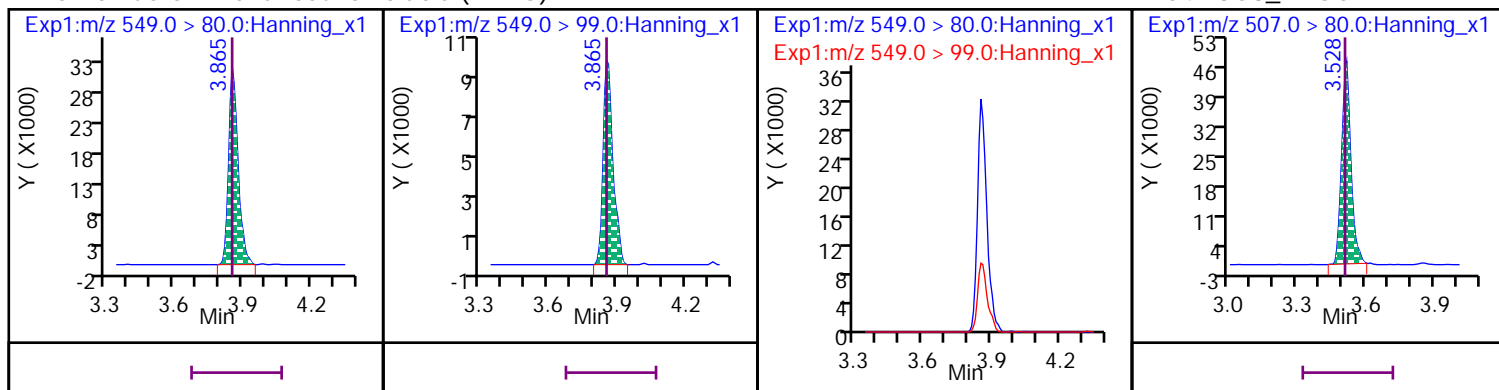
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



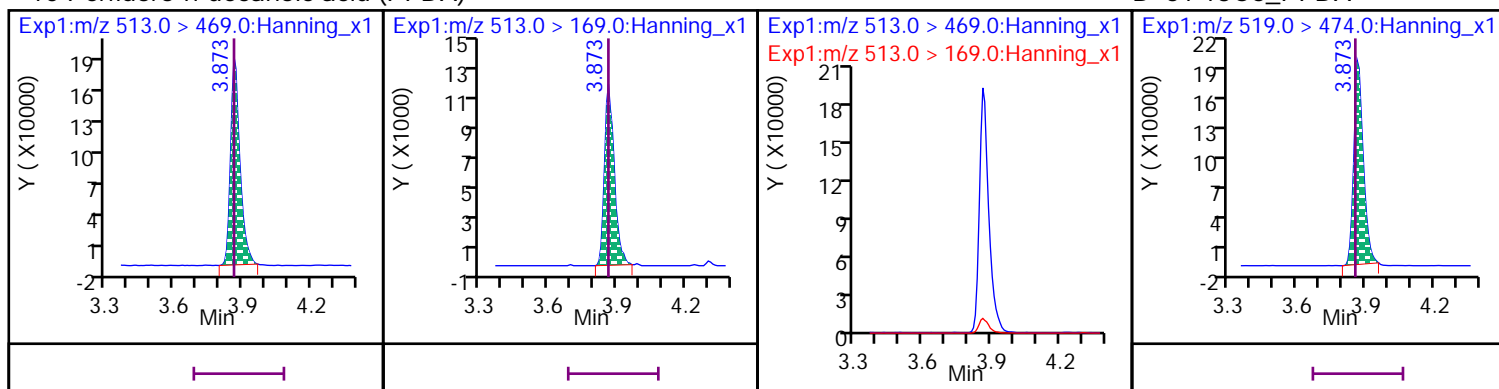
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



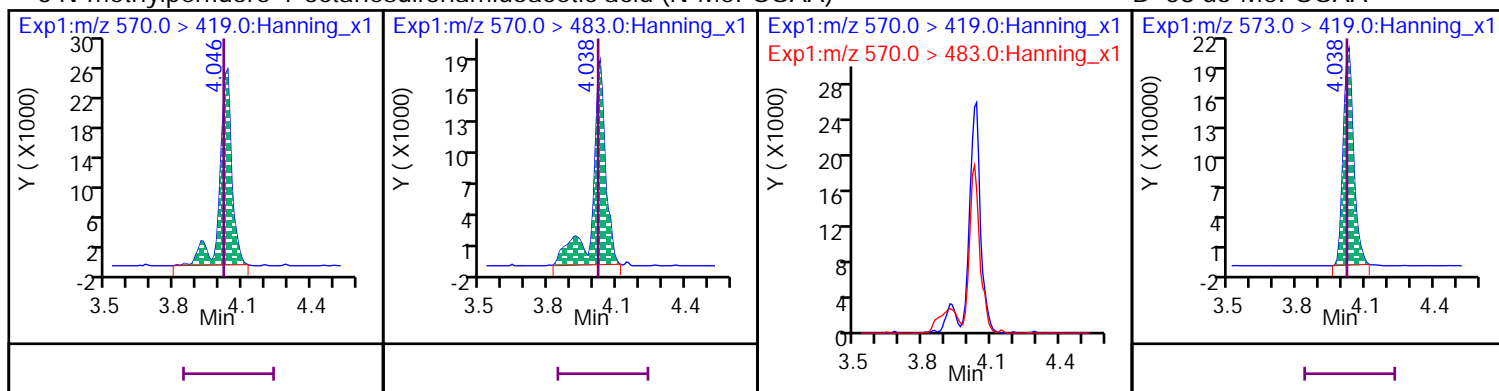
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



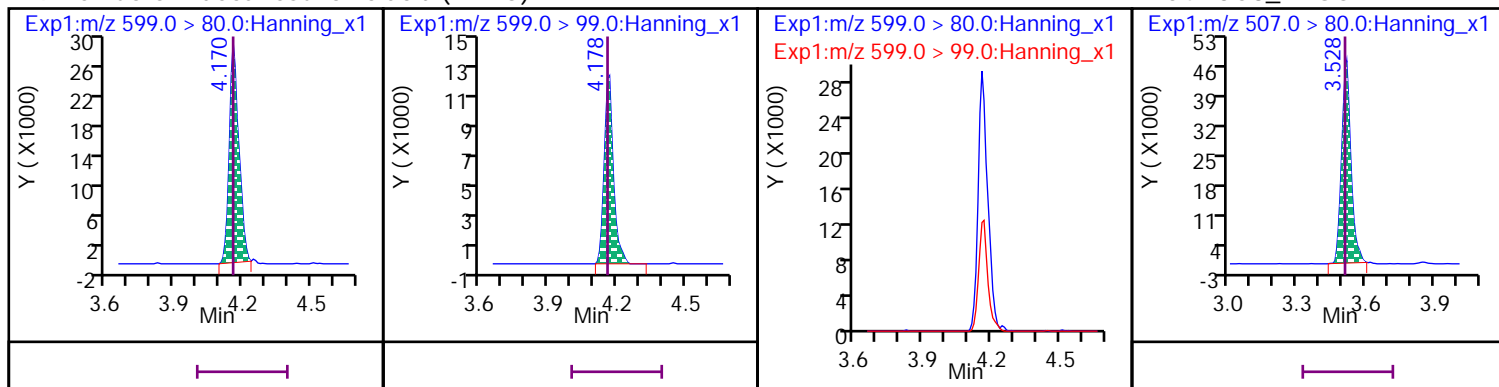
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



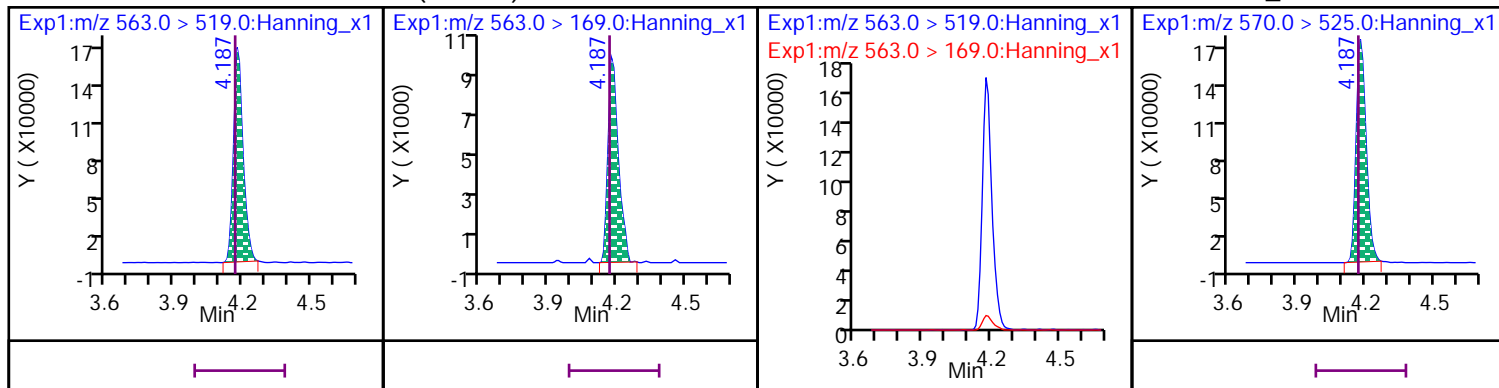
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



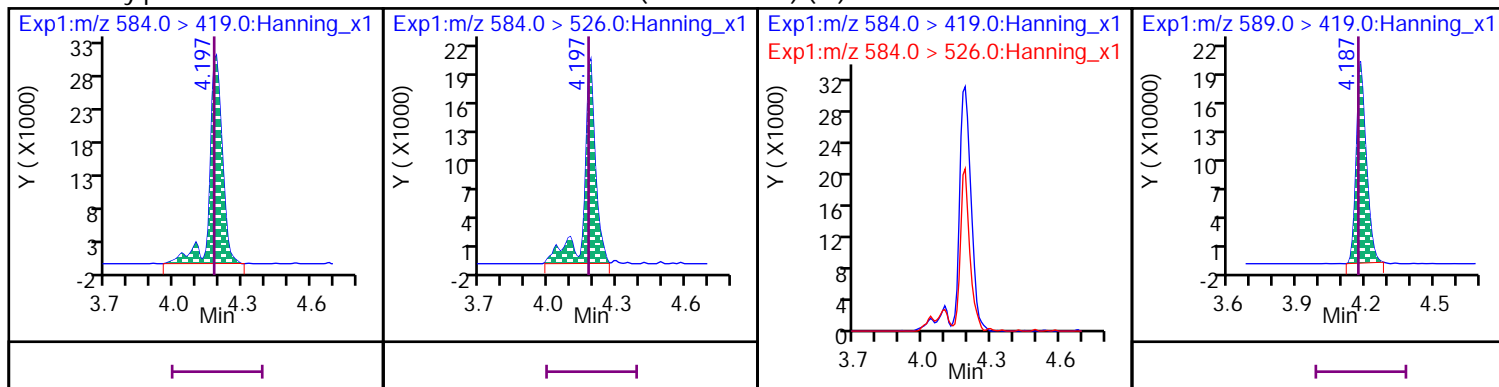
## 25 Perfluoro-n-undecanoic acid (PFUDa)

## D 52 13C7\_PFUdA



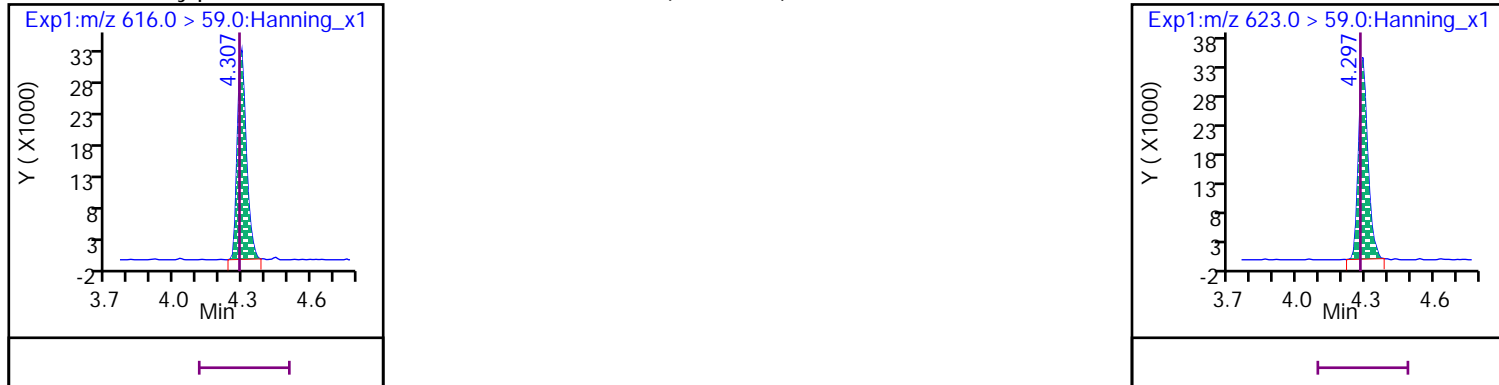
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

## D 60 d5-EtFOSAA



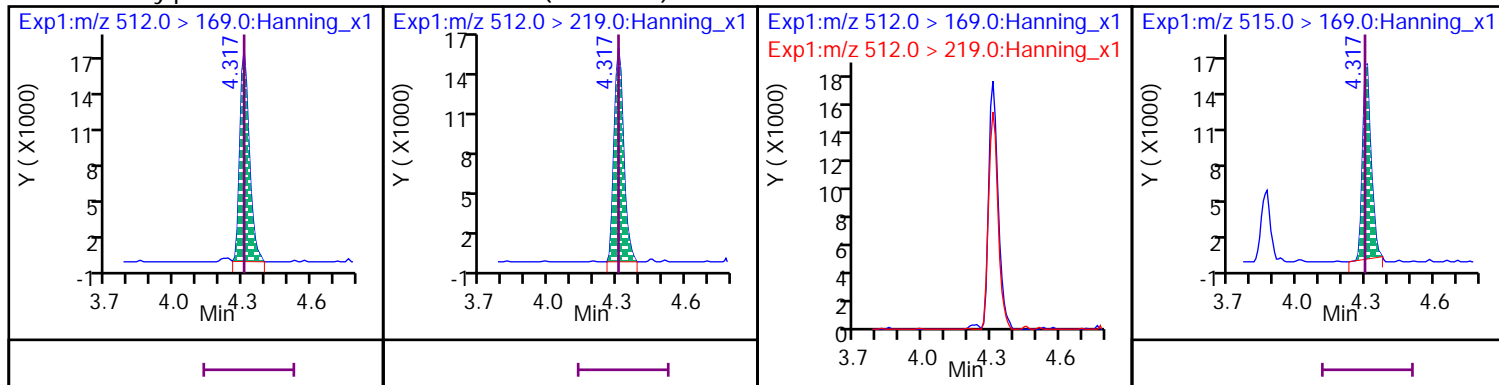
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

## D 61 d7-MeFOSE

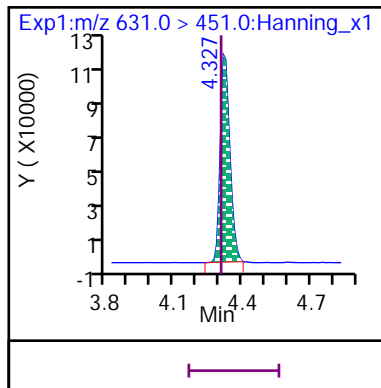


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

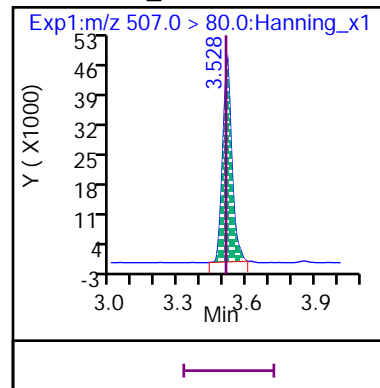
## D 57 d3-MeFOSA



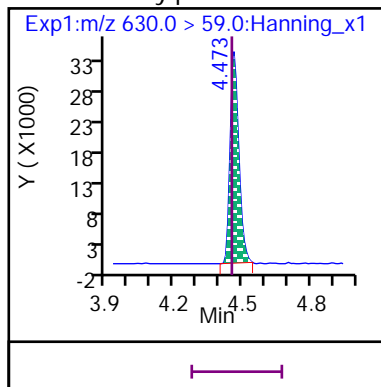
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



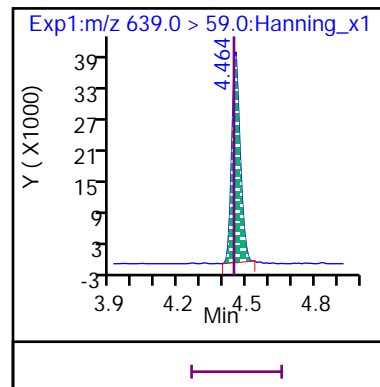
D 54 13C8\_PFOS



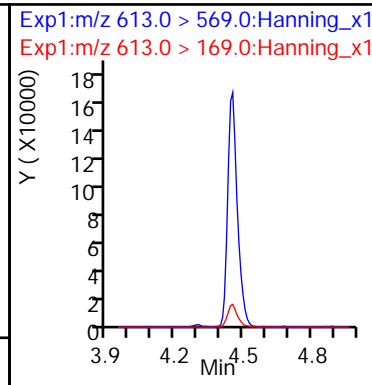
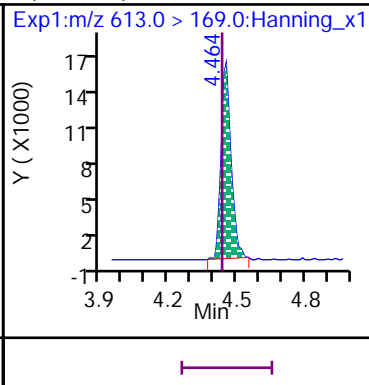
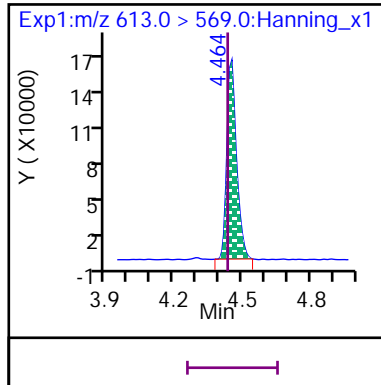
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



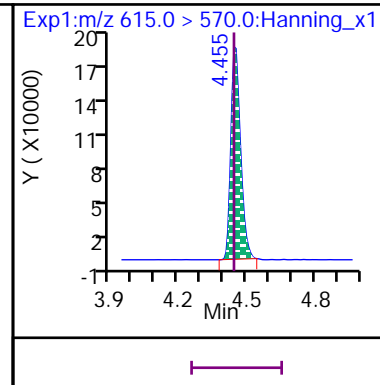
D 62 d9-EtFOSE



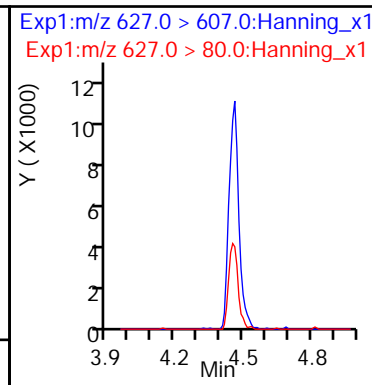
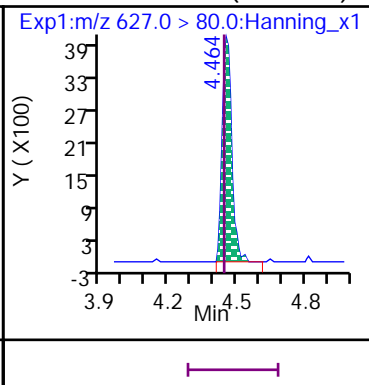
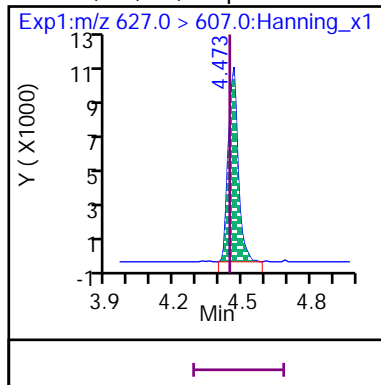
11 Perfluoro-n-dodecanoic acid (PFDaA)



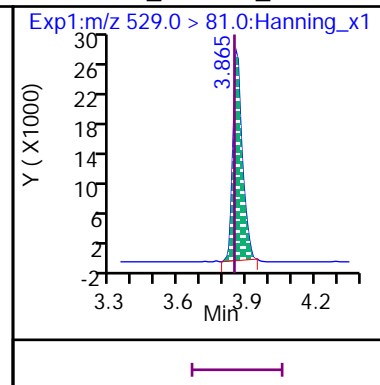
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

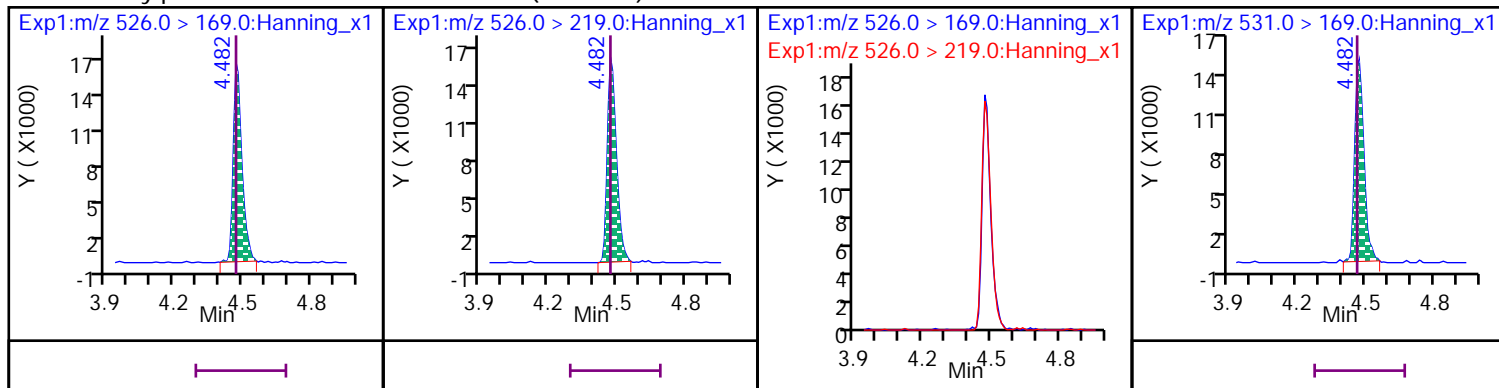


D 65 13C2\_8:2 FTS\_2



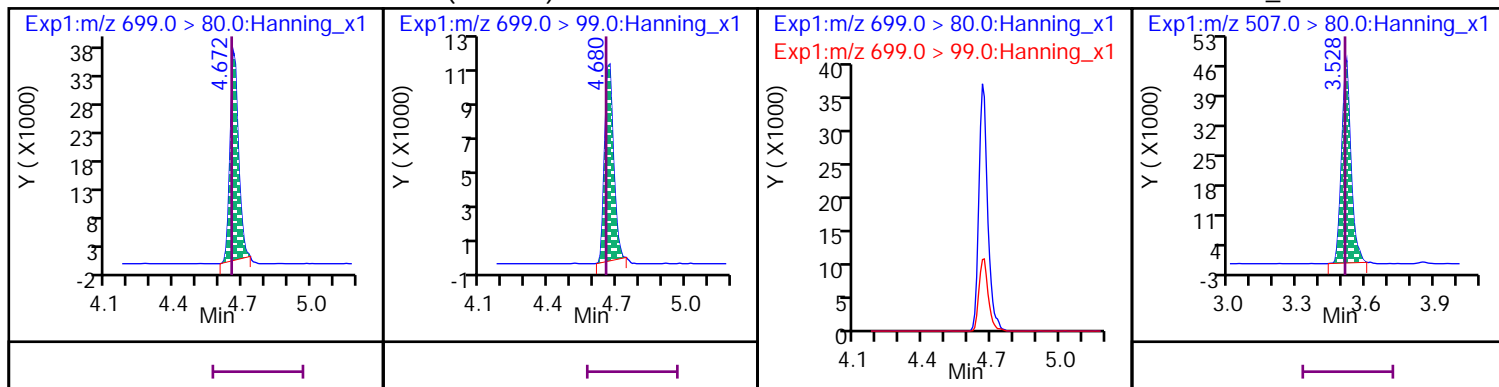
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



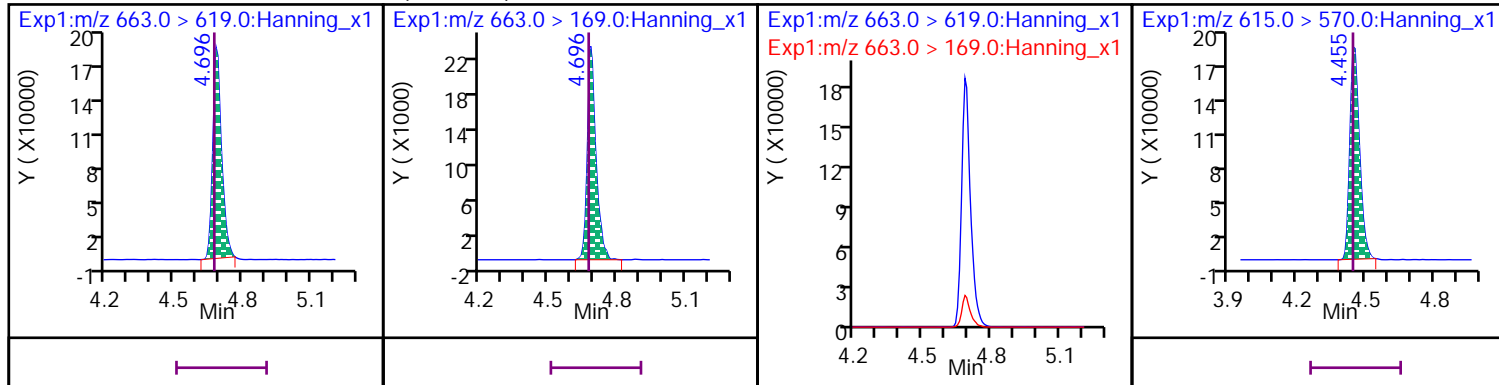
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



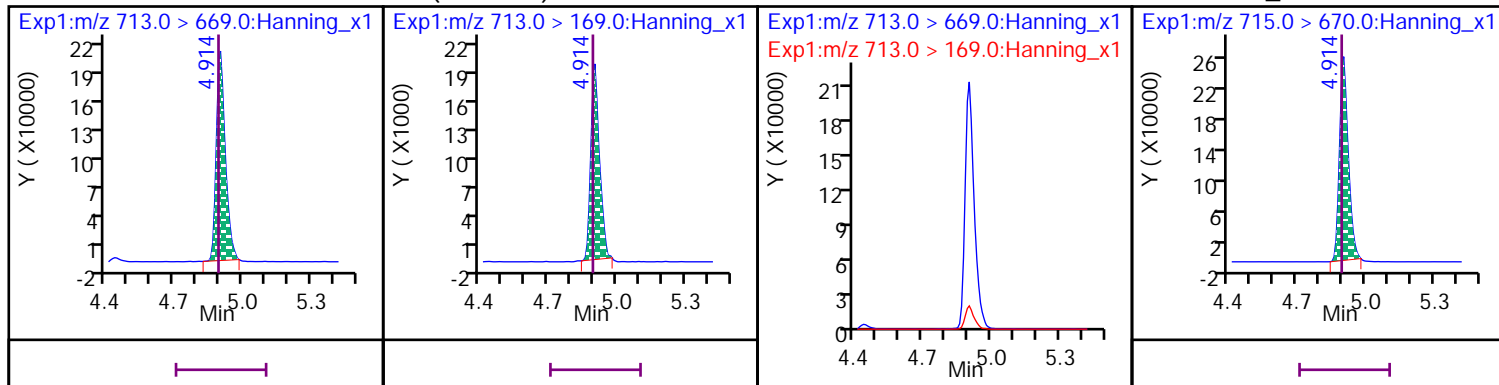
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

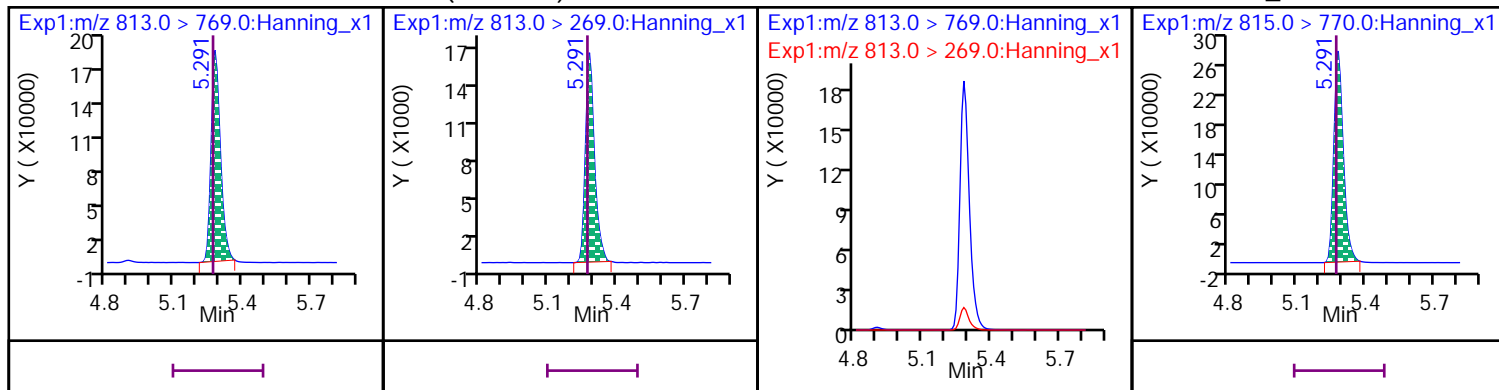
## D 42 13C2\_PFTeDA





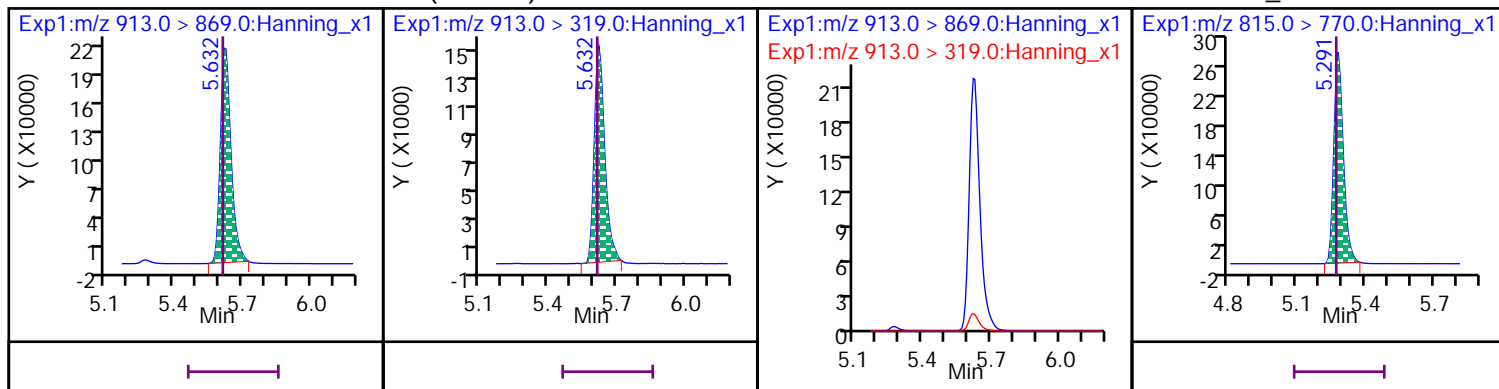
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

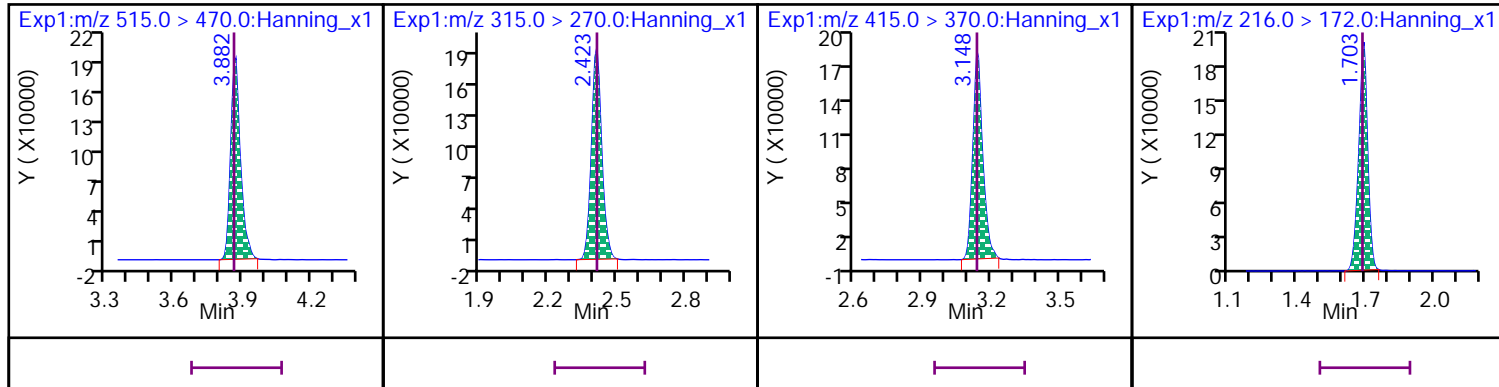


\* 37 13C2\_PFDA

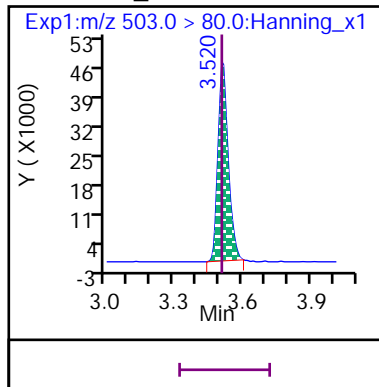
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820038.d

Injection Date: 28-Dec-2020 15:46:06

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000B\_SVLC-1248

Sample Info: ID CCV 1000B\_SVLC-1248

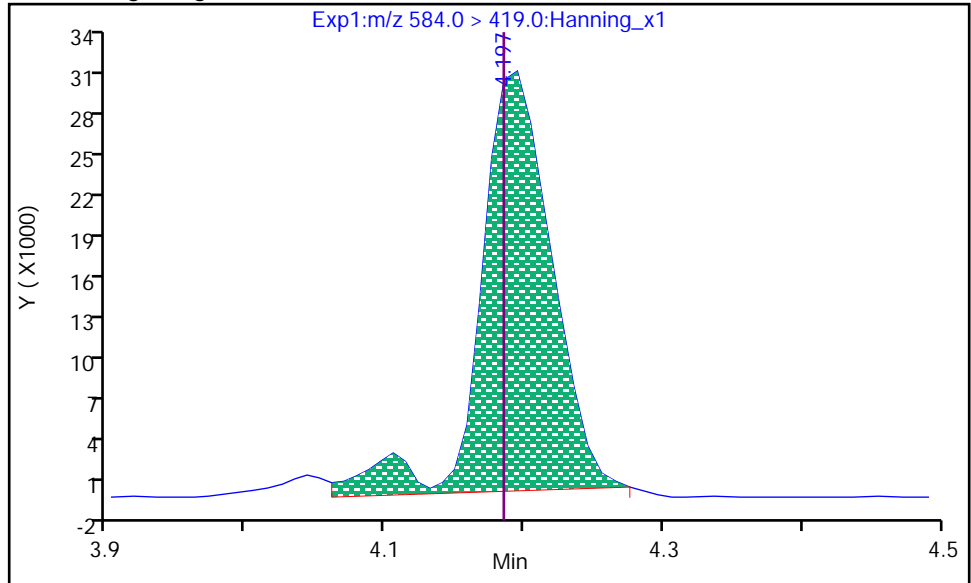
Dil. Factor: 1

Operator: Matthew M. Miller

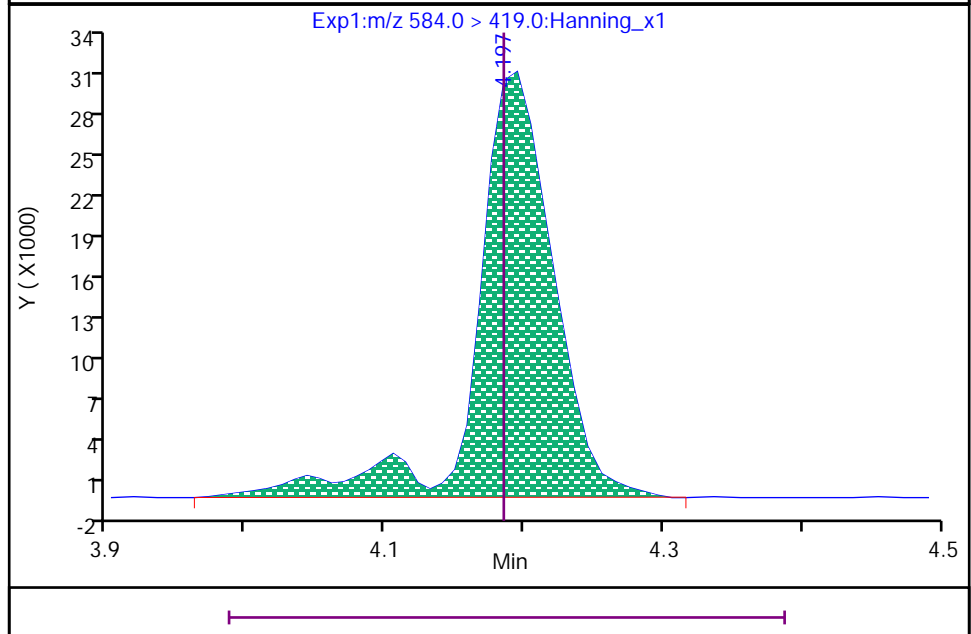
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.197  
Area: 106655  
Amount: 903.76  
Amount Units: ng/L



RT: 4.197  
Area: 115543  
Amount: 979.08  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:43:07

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d  
Injection Date: 28-Dec-2020 17:32:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 40  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	921.62	92.2	70 - 130
D 46 13C4_PFBA	649747	552912			85.1	50 - 150
D 50 13C5_PFPeA	665996	554850			83.3	50 - 150
21 PFPeA			1000.00	952.51	95.3	70 - 130
7 PFBS			884.00	823.24	93.1	70 - 130
D 44 13C3_PFBS	238207	200702			84.3	50 - 150
1 4:2 FTS			934.00	932.10	99.8	70 - 130
D 63 13C2_4:2 FTS_2	144067	112871			78.3	50 - 150
D 49 13C5_PFHxA	743582	622455			83.7	50 - 150
15 PFHxA			1000.00	900.45	90	70 - 130
22 PFPeS			938.00	920.55	98.1	70 - 130
28 GenX			2000.00	1750.22	87.5	70 - 130
D 66 13C3_GenX	1401050	1137718			81.2	50 - 150
D 47 13C4_PFHpA	633684	502311			79.3	50 - 150
13 PFHpA			1000.00	960.48	96	70 - 130
D 45 13C3_PFHxS	174146	156468			89.8	50 - 150
14 PFHxS			910.00	836.22	91.9	70 - 130
29 ADONA			942.00	811.74	86.2	70 - 130
D 64 13C2_6:2 FTS_2	104346	86545			82.9	50 - 150
2 6:2 FTS			948.00	933.00	98.4	70 - 130
20 PFOA			1000.00	901.38	90.1	70 - 130
D 53 13C8_PFOA	628007	501087			79.8	50 - 150
12 PFHpS			952.00	853.66	89.7	70 - 130
18 PFOS			928.00	812.39	87.5	70 - 130
17 PFNA			1000.00	966.88	96.7	70 - 130
D 56 13C9_PFNA	767623	625420			81.5	50 - 150
D 54 13C8_PFOS	152445	134387			88.2	50 - 150
30 9CI-PF3ONS			932.00	832.59	89.3	70 - 130
D 55 13C8_PFOSA	308857	272963			88.4	50 - 150
19 PFOSA			1000.00	923.66	92.4	70 - 130
16 PFNS			960.00	834.24	86.9	70 - 130
D 65 13C2_8:2 FTS_2	100453	81731			81.4	50 - 150
3 8:2 FTS			958.00	973.47	102	70 - 130
10 PFDA			1000.00	911.08	91.1	70 - 130
D 51 13C6_PFDA	672868	579163			86.1	50 - 150
D 58 d3-MeFOSAA	791564	646987			81.7	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	910.11	91	70 - 130
9 PFDS			964.00	900.92	93.5	70 - 130
5 N-EtFOSAA			1000.00	860.91	86.1	70 - 130
25 PFUdA			1000.00	904.25	90.4	70 - 130
D 60 d5-EtFOSAA	731651	655305			89.6	50 - 150
D 52 13C7_PFUdA	643525	540202			83.9	50 - 150
D 61 d7-MeFOSE	105402	87996			83.5	50 - 150
32 MeFOSE			1000.00	882.51	88.3	70 - 130
26 MeFOSA			1000.00	922.80	92.3	70 - 130
D 57 d3-MeFOSA	51840	42811			82.6	50 - 150
31 11Cl-PF3OUDS			942.00	838.68	89	70 - 130
D 62 d9-EtFOSE	137116	107736			78.6	50 - 150
33 EtFOSE			1000.00	965.39	96.5	70 - 130
D 59 d5-EtFOSA	50284	40643			80.8	50 - 150
D 38 13C2_PFDoA	611364	499154			81.6	50 - 150
4 10:2 FTS			964.00	793.16	82.3	70 - 130
27 EtFOSA			1000.00	1022.29	102	70 - 130
11 PFDoA			1000.00	931.55	93.2	70 - 130
34 PFDOS			968.00	865.34	89.4	70 - 130
24 PFTrDA			1000.00	937.03	93.7	70 - 130
23 PFTeDA			1000.00	962.31	96.2	70 - 130
D 42 13C2_PFTeDA	813074	661479			81.4	50 - 150
35 PFHxDA			1000.00	979.68	98	70 - 130
D 40 13C2_PFHxDA	935525	794037			84.9	50 - 150
36 PFODA			1000.00	950.93	95.1	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d  
Injection Date: 28-Dec-2020 17:32:21 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 40  
Sample Info: ID CCV 1000C\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.696	1	552912	23	>100:1			1000.00	797.22	85.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.696	1/0	507533	24	>100:1			1000.00	921.62		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	554850	19	>100:1			1000.00	806.60	83.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.072	1/0	531364	17	>100:1			1000.00	952.51		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	200702	18	>100:1			1000.00	871.74	84.3	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.141	2.125	1/0	194808	17	>100:1	Target = 3.50		884.00	823.24		
298.9 > 99	44	2.141	2.125		52632	17	>100:1	3.70 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.460	2.450	1/0	160266	19	>100:1	Target = 3.10		938.00	920.55		
349 > 99	44	2.460	2.450		47872	17	>100:1	3.34 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.379	1	112871	19	>100:1			5000.00	4662.49	78.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.388	1/0	41993	20	>100:1	Target = 1.80		934.00	932.10		
327 > 81	63	2.389	2.388		22585	20	>100:1	1.85 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.423	1	622455	20	>100:1			1000.00	844.50	83.7	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.423	1/0	553362	20	>100:1	Target = 18.34		1000.00	900.45		
313 > 119	49	2.433	2.423		29073	20	>100:1	19.03 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.530	1	1137718	21	>100:1			5000.00	4271.45	81.2	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.540	2.530	1/0	286128	19	>100:1	Target = 0.81		2000.00	1750.22		
285 > 185	66	2.531	2.530		379734	21	>100:1	0.75 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.772	1	502311	20	>100:1			1000.00	828.01	79.3	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.772	1/0	500437	22	>100:1	Target = 3.70		1000.00	960.48		
363 > 169	47	2.782	2.772		129685	20	>100:1	3.85 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.800	2.790	1	156468	19	>100:1			1000.00	913.80	89.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.800	2.790	1/0	138729	28		Target = 3.21	0.11	910.00	836.22		
399 > 99	45	2.800	2.790		39041	20	47:1	3.55 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.808	1/0	806377	20	>100:1	Target = 2.97		942.00	811.74		
377 > 85	45	2.819	2.808		269773	21	>100:1	2.98 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.162	3.154	1/0	121340	23	>100:1	Target = 3.08		952.00	853.66		
449 > 99	45	3.169	3.154		42938	33	>100:1	2.82 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.114	1	86545	24	>100:1			5000.00	4493.88	82.9	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.135	3.128	1/0	33488	24		Target = 1.80		948.00	933.00		
427 > 81	64	3.129	3.128		16807	22	>100:1	1.99 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.155	3.141	1	501087	23	>100:1			1000.00	846.62	79.8	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.148	1/0	460456	24	>100:1	Target = 2.87		1000.00	901.38		
413 > 169	53	3.162	3.148		163312	26	>100:1	2.81 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.529	3.520	1	134387	24	>100:1			1000.00	896.34	88.2	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.520	1/0	129371	41	>100:1	Target = 3.84	0.24	928.00	812.39		
499 > 99	54	3.529	3.520		39986	42	>100:1	3.23 (1.92-5.76)	0.12				M
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.722	1/0	376671	24	>100:1			932.00	832.59		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.865	1/0	85795	21		Target = 3.07		960.00	834.24		
549 > 99	54	3.874	3.865		34961	18	>100:1	2.45 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	87866	18	>100:1	Target = 3.03		964.00	900.92		
599 > 99	54	4.179	4.169		30993	18	>100:1	2.83 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.338	4.317	2/1	320085	18	>100:1			942.00	838.68		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.681	4.663	2/1	93362	18		Target = 3.33		968.00	865.34		
699 > 99	54	4.681	4.663		28688	21	>100:1	3.25 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.537	3.520	1	625420	24	>100:1			1000.00	832.82	81.5	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.537	3.520	1/0	604726	24	>100:1	Target = 6.16		1000.00	966.88		
463 > 169	56	3.529	3.520		94264	22	>100:1	6.41 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.849	1	272963	21	>100:1			1000.00	881.77	88.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.841	2/1	248457	21	>100:1			1000.00	923.66		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.857	2	81731	19				5000.00	4405.95	81.4	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-2	31995	18	>100:1	Target = 1.95		958.00	973.47		M
527 > 81	65	3.874	3.873		17042	18		1.87 (0.97-2.93)					M
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.455	2/0	29961	25	>100:1	Target = 3.14		964.00	793.16		
627 > 80	65	4.474	4.455		9937	18		3.01 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.882	3.865	2	579163	21	>100:1			1000.00	873.11	86.1	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.873	1/-1	518478	21	>100:1	Target = 15.94		1000.00	911.08		
513 > 169	51	3.882	3.873		36349	25	>100:1	14.26 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.029	1	646987	18	>100:1			5000.00	4507.38	81.7	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.029	1/0	90462	33	>100:1	Target = 1.33	0.11	1000.00	910.11		
570 > 483	58	4.038	4.029		77993	35	>100:1	1.15 (0.66-1.99)	0.16				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.178	1	655305	19	>100:1			5000.00	4933.98	89.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.187	1/0	112333	33		Target = 1.58	0.11	1000.00	860.91		
584 > 526	60	4.198	4.187		65606	35	>100:1	1.71 (0.79-2.37)	0.17				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.198	4.178	2	540202	18	>100:1			1000.00	854.65	83.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.178	2/0	459110	19	>100:1	Target = 15.50		1000.00	904.25		
563 > 169	52	4.188	4.178		32850	16	>100:1	13.97 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.287	1	87996	18	>100:1			1000.00	813.21	83.5	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.297	1/0	72967	16	>100:1			1000.00	882.51		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.307	1	42811	18	6.0:1			1000.00	809.02	82.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.317	1/0	44571	15	>100:1	Target = 1.12		1000.00	922.80		
512 > 219	57	4.318	4.317		45683	17	>100:1	0.97 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.455	1	107736	19	>100:1			1000.00	859.17	78.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.464	1/0	92533	19	>100:1			1000.00	965.39		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.455	1	499154	19	>100:1			1000.00	824.62	81.6	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.446	2/1	470876	18	>100:1	Target = 10.85		1000.00	931.55		
613 > 169	38	4.465	4.446		49231	19	>100:1	9.56 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.704	4.688	1/0	460680	20	>100:1	Target = 8.37		1000.00	937.03		
663 > 169	38	4.704	4.688		58937	23	>100:1	7.81 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.473	1	40643	16	>100:1			1000.00	827.85	80.8	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.482	1/0	45393	21	>100:1	Target = 1.03		1000.00	1022.29		
526 > 219	59	4.492	4.482		41994	17	>100:1	1.08 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.906	1	661479	19	>100:1			1000.00	785.19	81.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.906	1/0	551534	21	97:1	Target = 12.11		1000.00	962.31		
713 > 169	42	4.915	4.906		46372	18	>100:1	11.89 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.300	5.282	2	794037	19	>100:1			1000.00	876.26	84.9	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.300	5.282	2/0	508274	21	>100:1	Target = 11.48		1000.00	979.68		
813 > 269	40	5.300	5.282		43114	21	>100:1	11.78 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.640	5.625	1/-1	668407	26	98:1	Target = 13.88		1000.00	950.93		
913 > 319	40	5.640	5.625		45956	26	>100:1	14.54 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.873	1	575171	21	>100:1					78.5	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	588236	20	>100:1					80.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.162	3.148	1	485412	26	>100:1					81	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.696	1	510985	23	>100:1					83.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.537	3.520	1	137966	22	>100:1					84.6	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated



Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

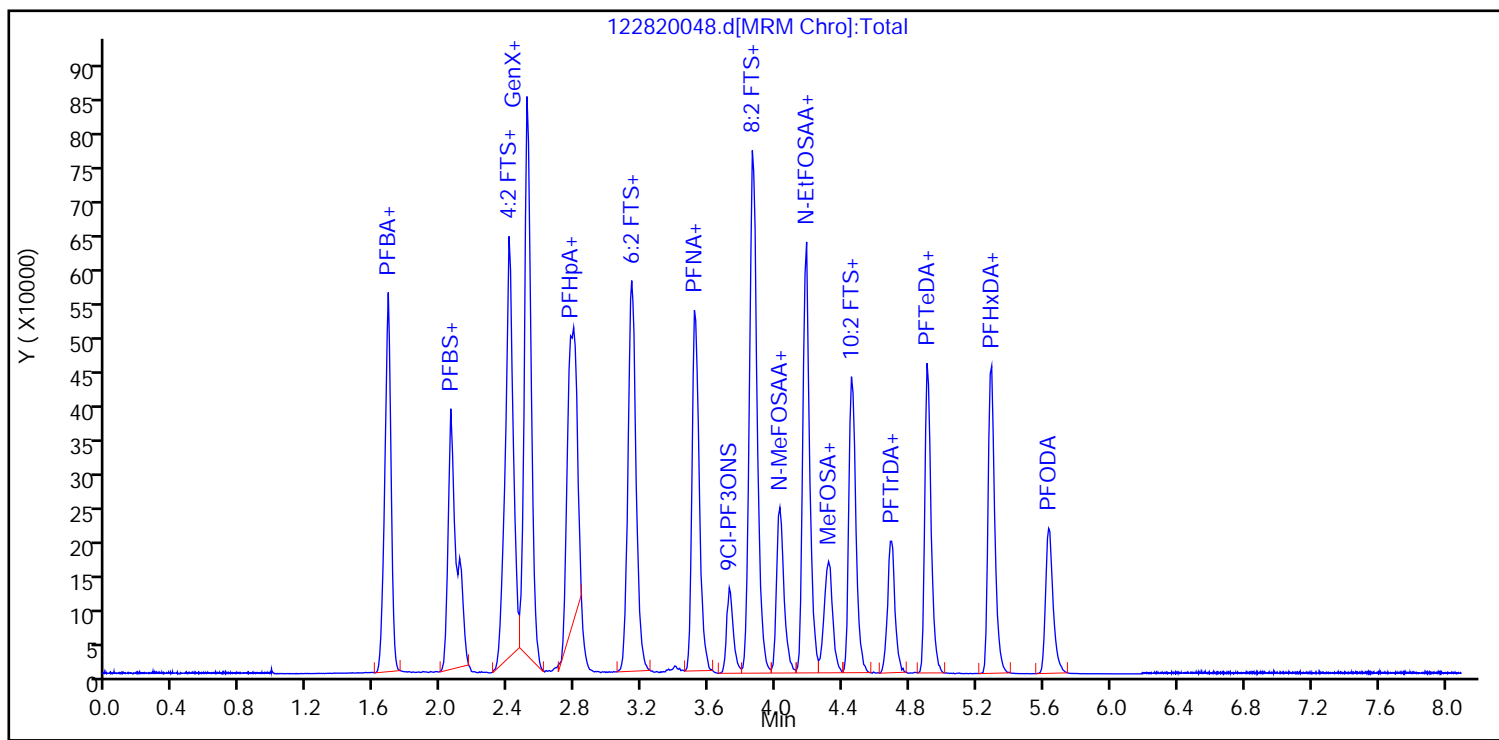
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Lab ID: ID CCV 1000C\_SVLC-1248

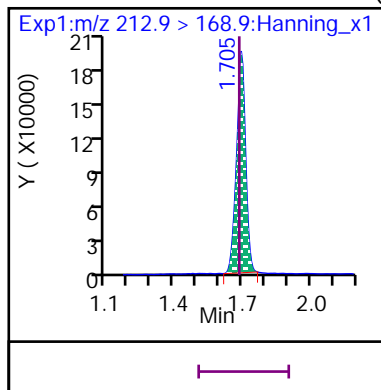
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Dil. Factor: 1

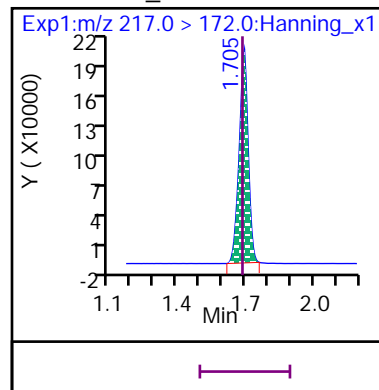
Operator: Matthew M. Miller



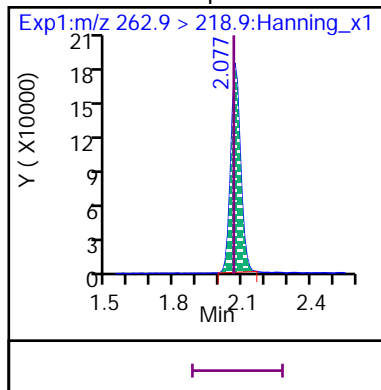
8 Perfluoro-n-butanoic acid (PFBA)



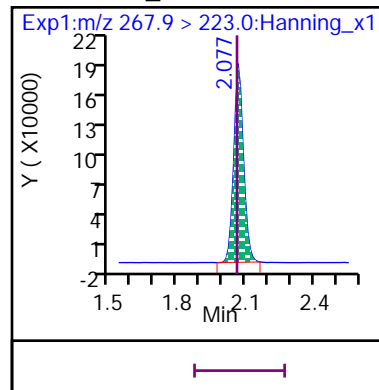
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

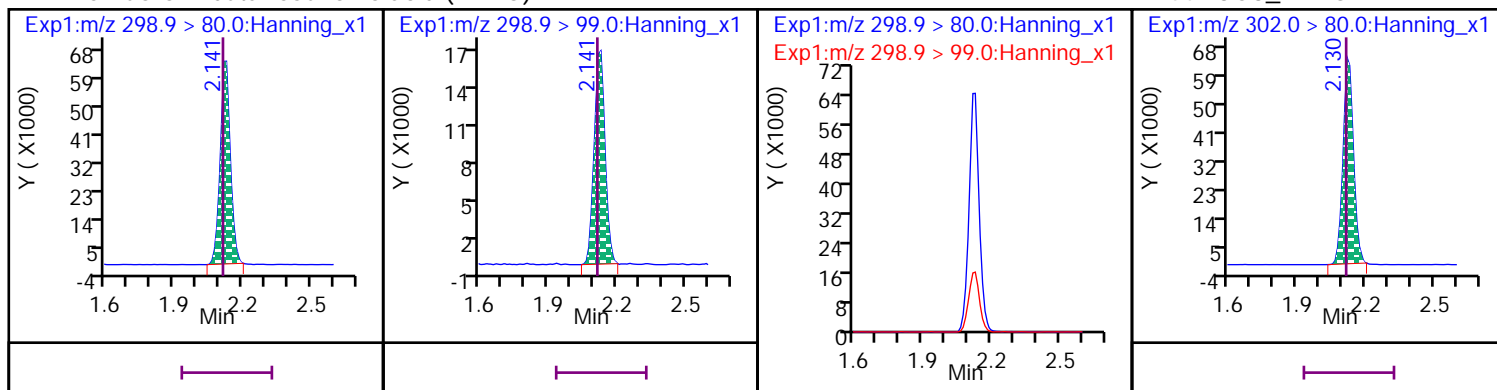


D 50 13C5\_PFPeA



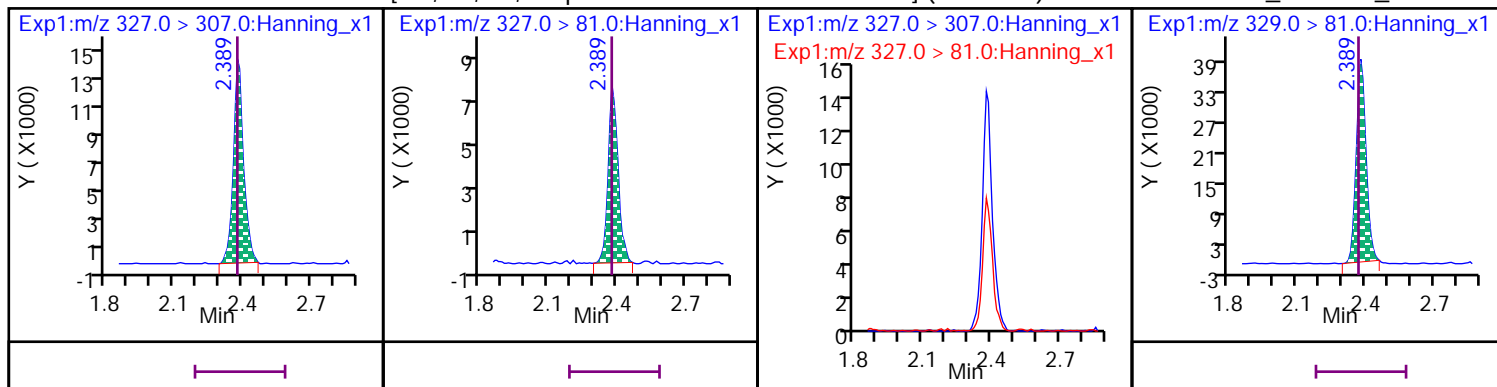
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



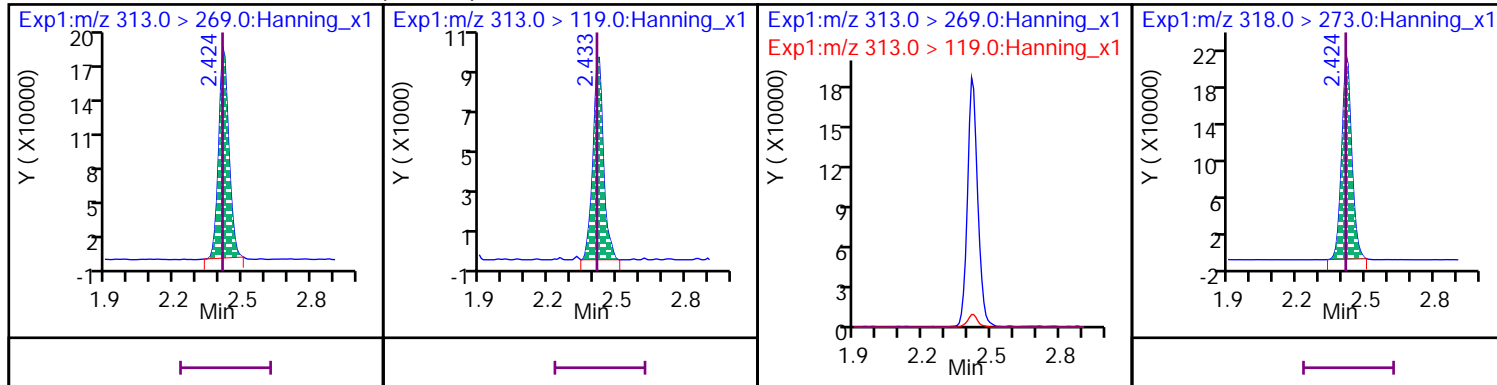
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



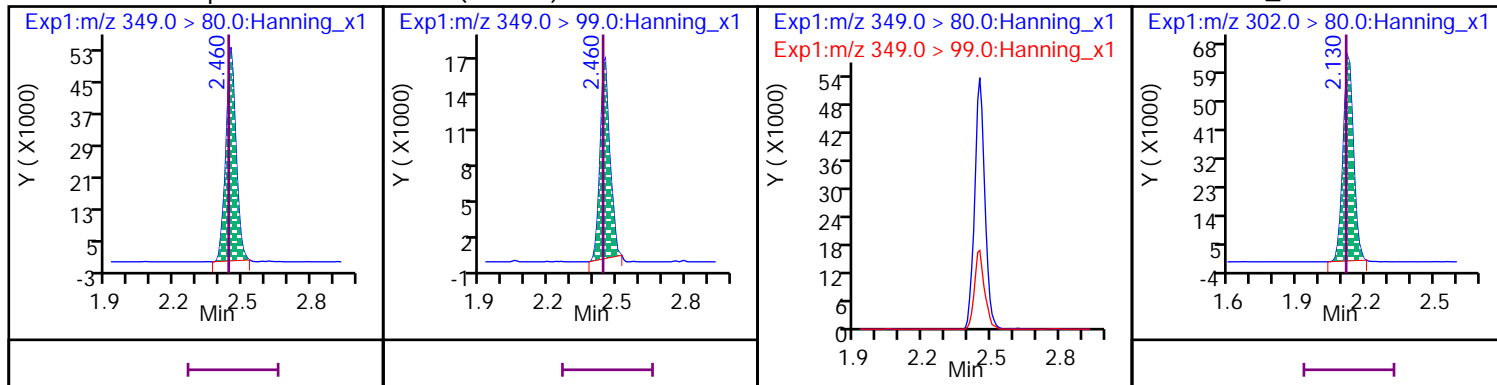
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



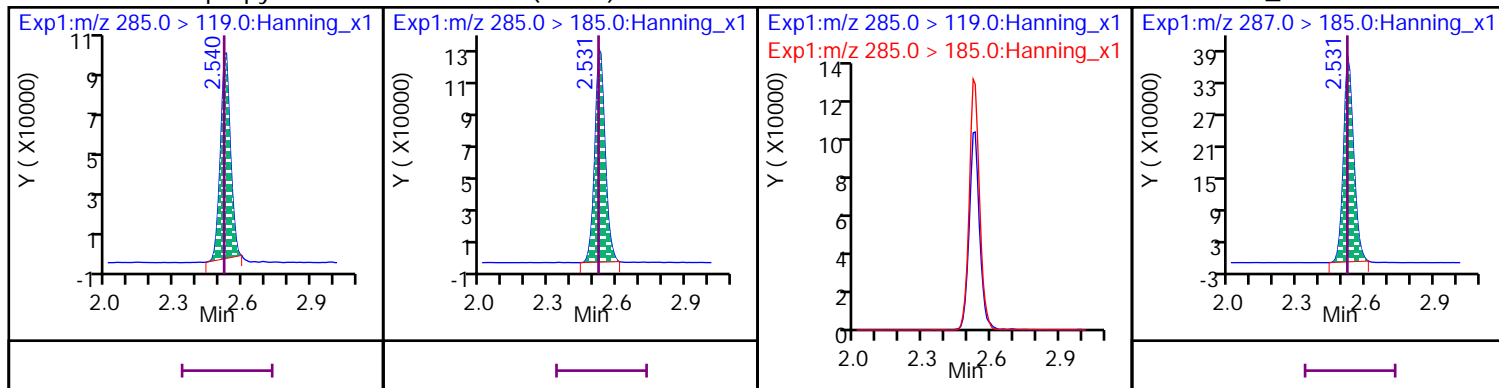
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



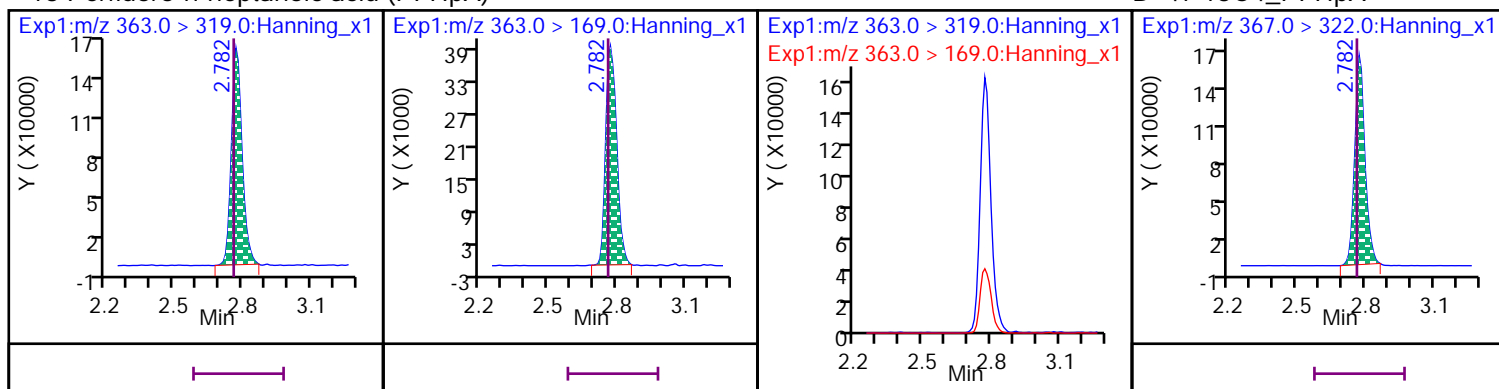
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



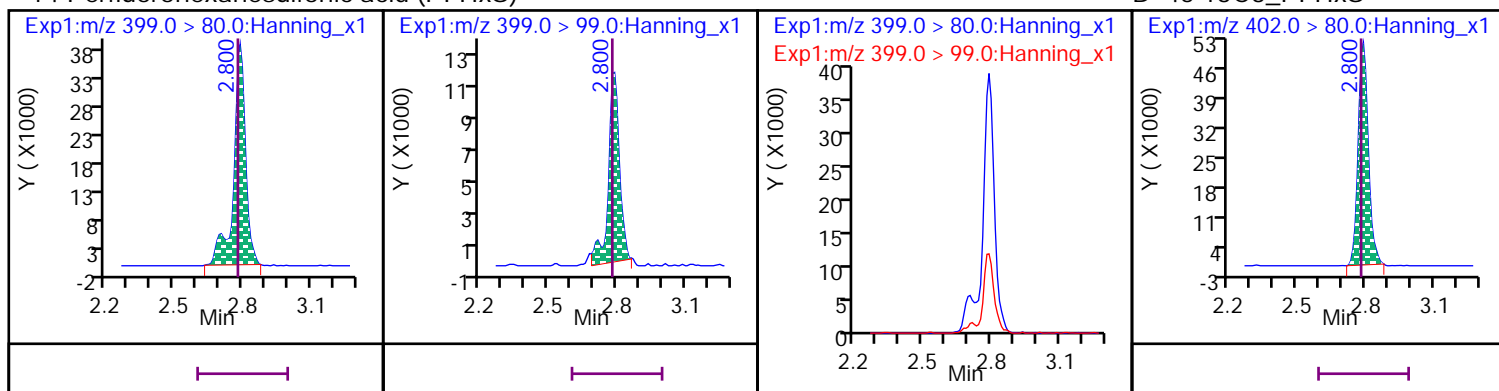
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



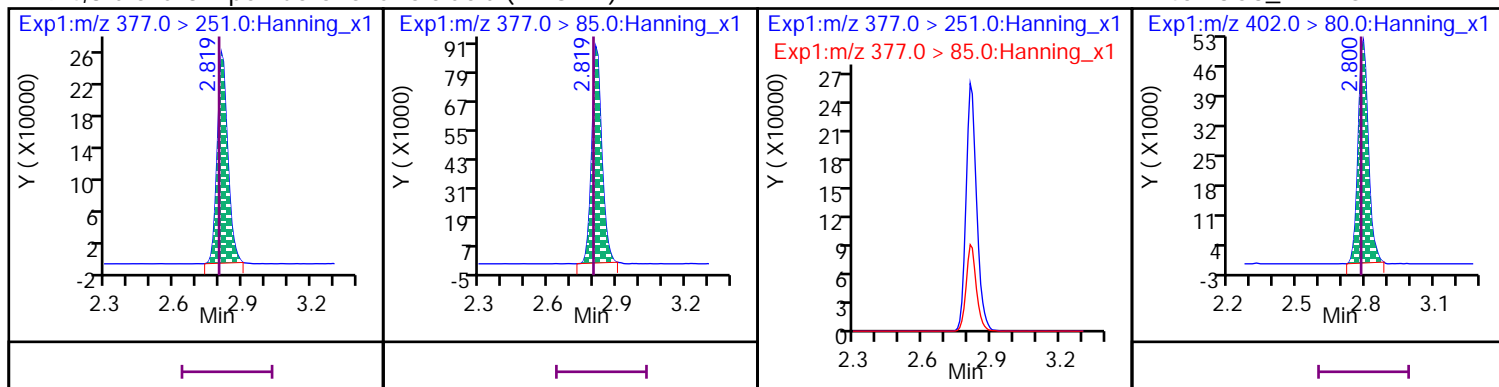
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



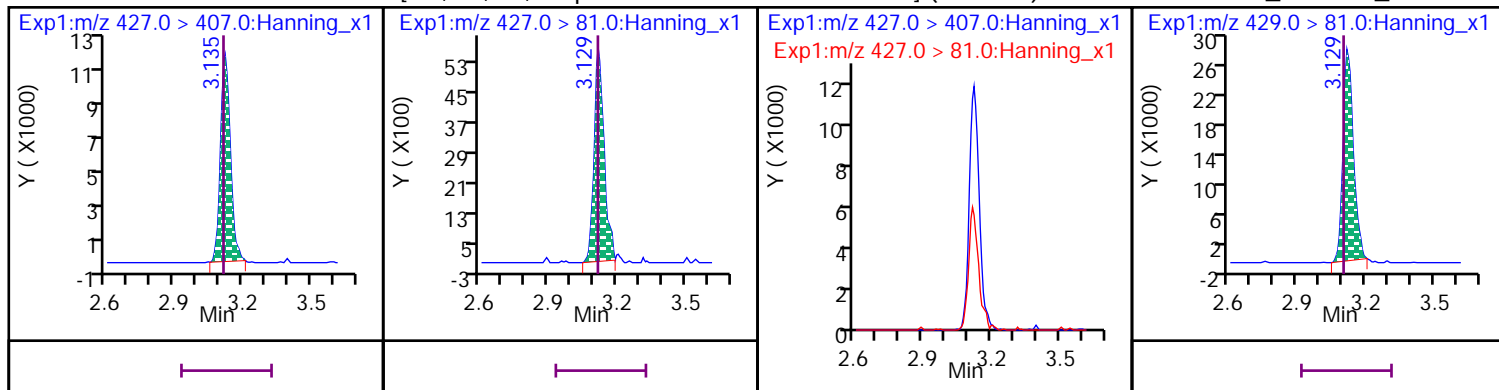
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



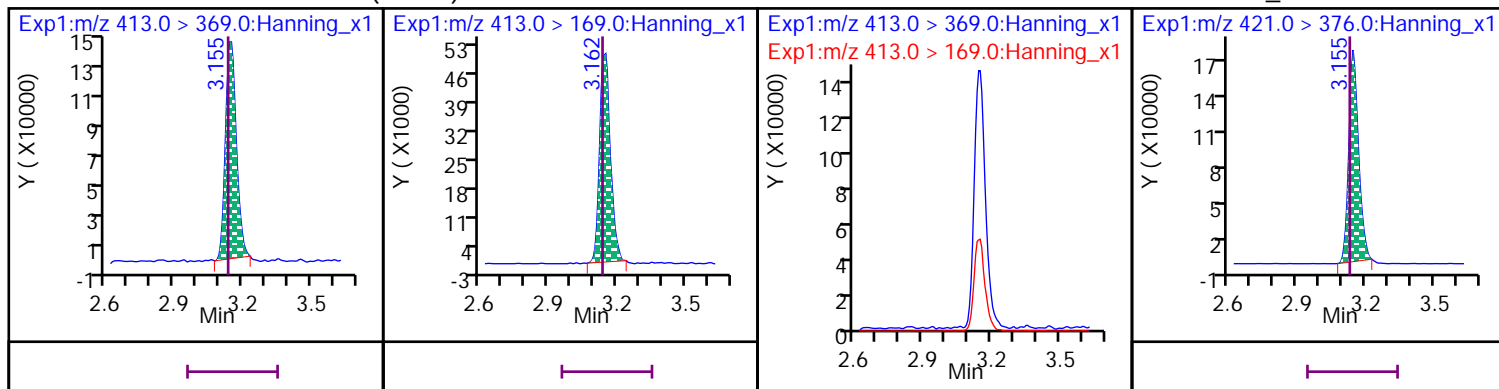
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



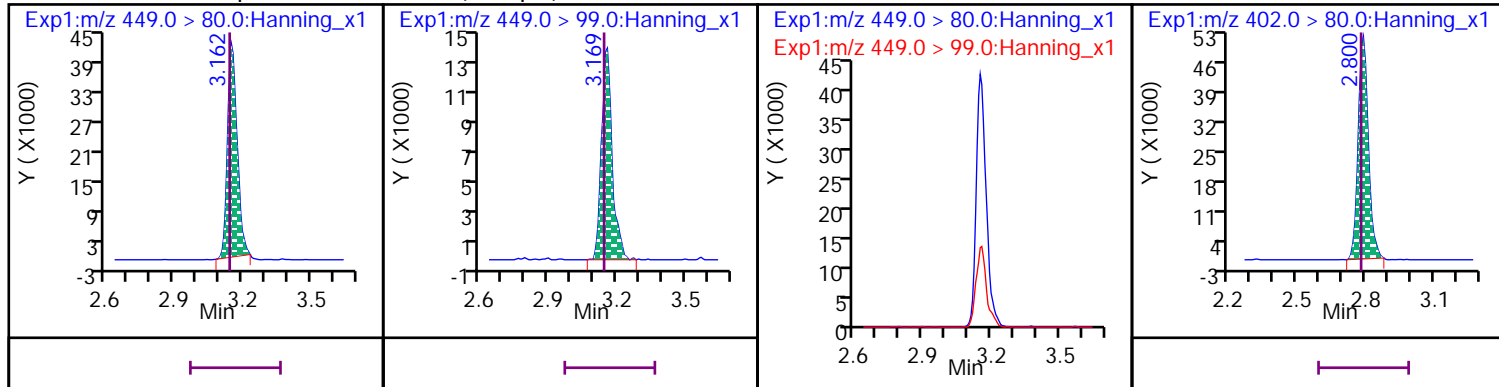
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



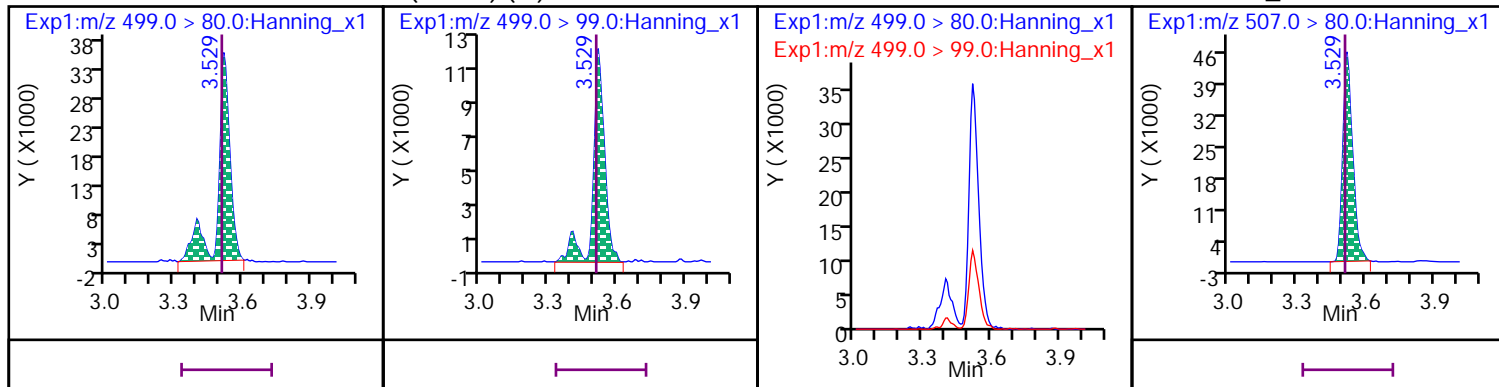
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



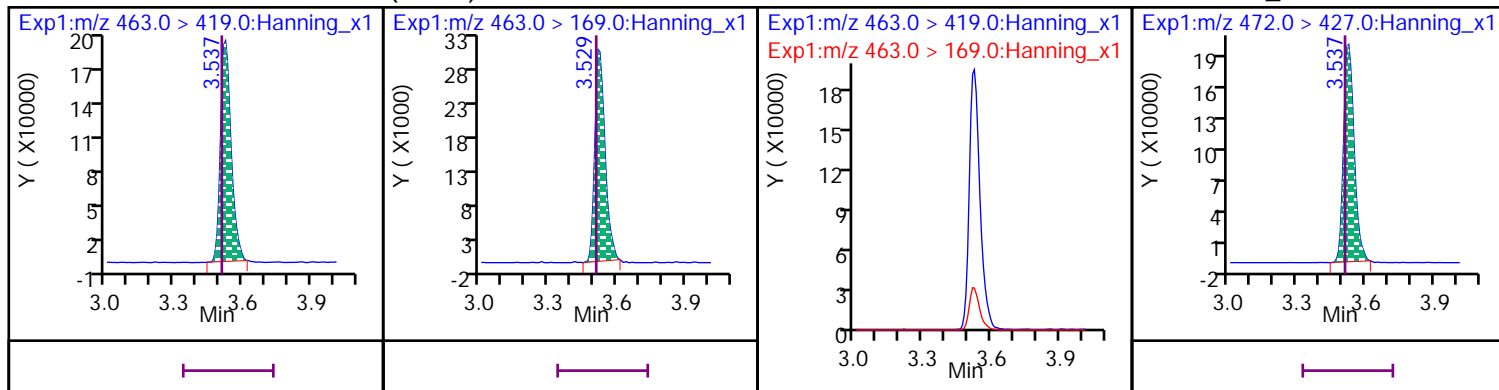
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



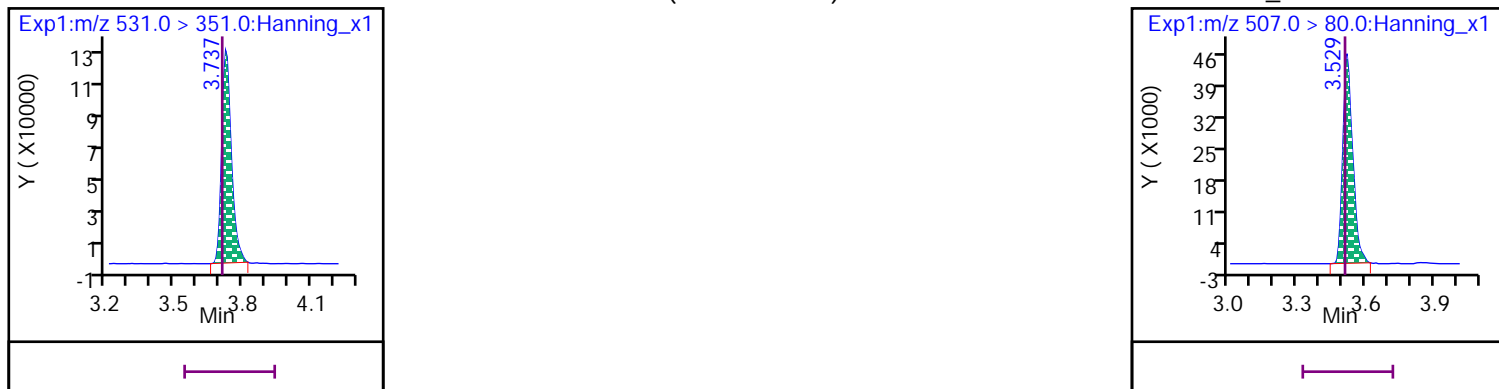
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



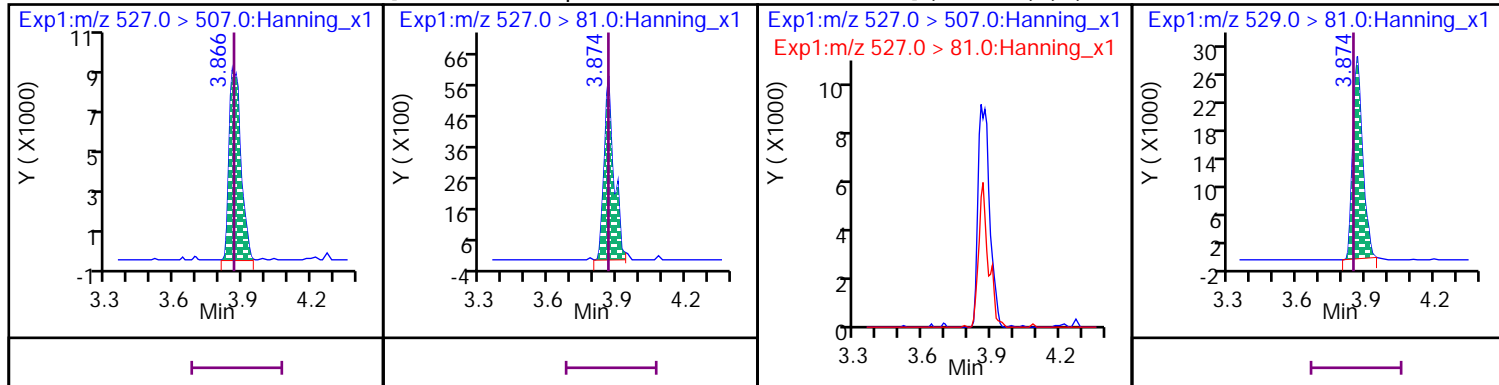
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



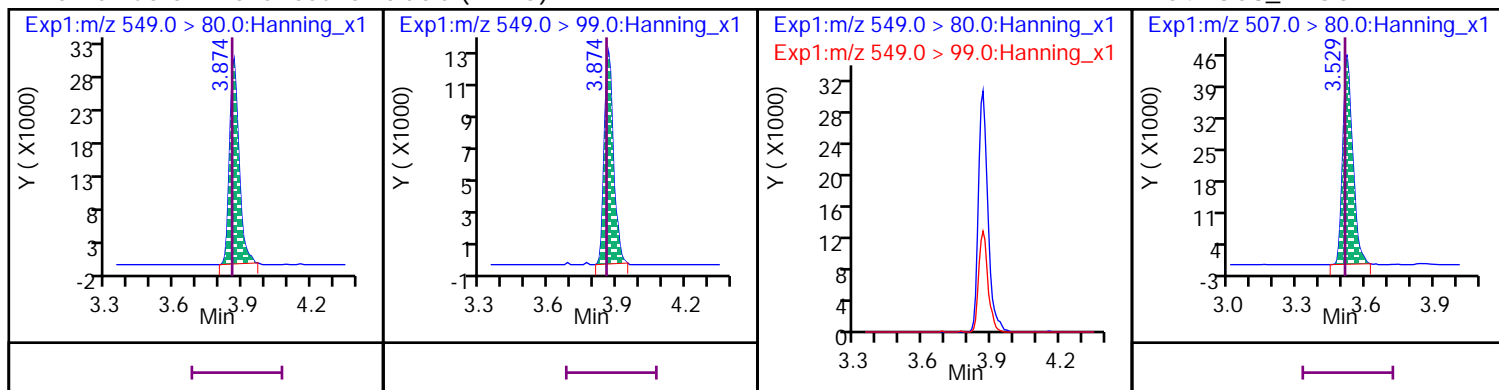
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



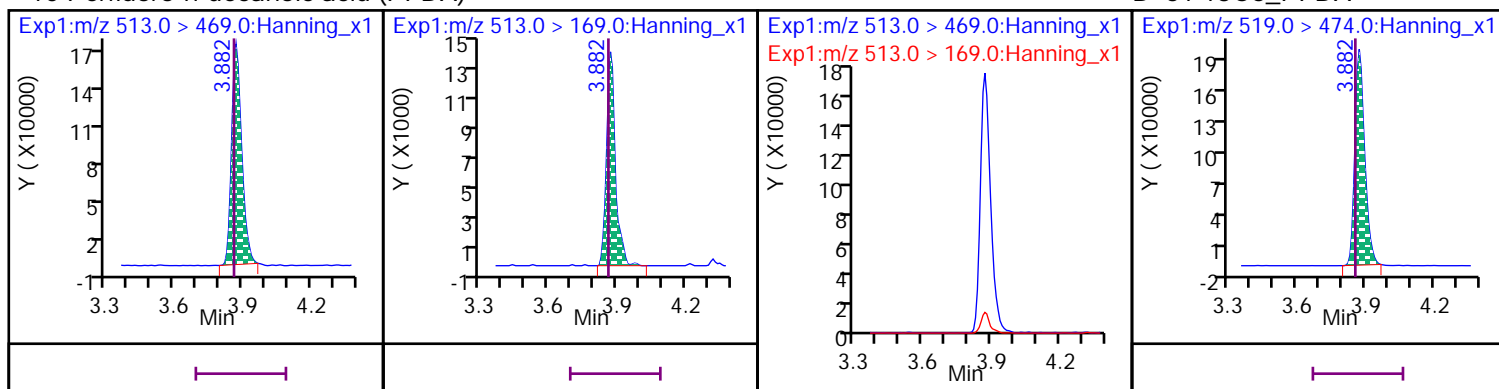
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



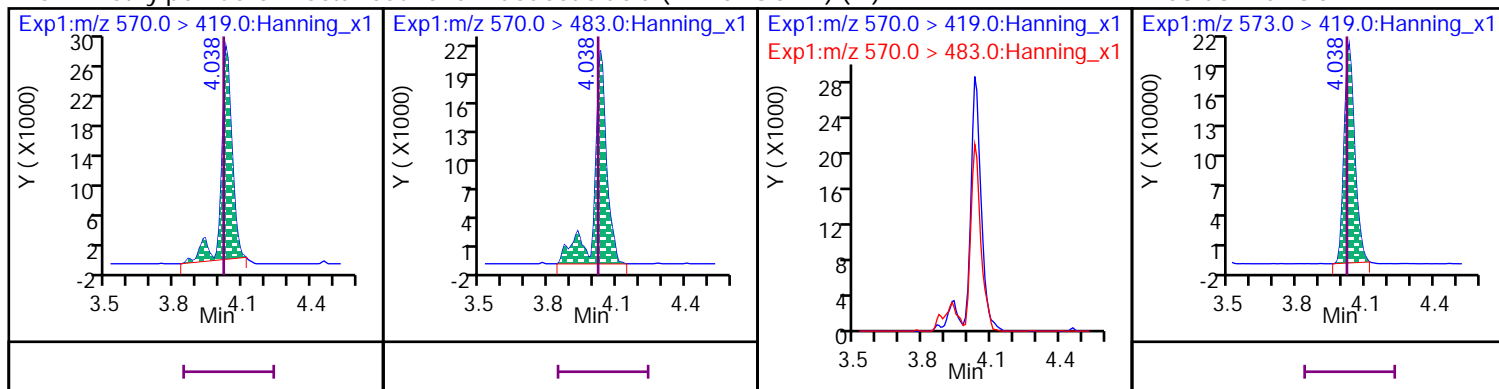
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



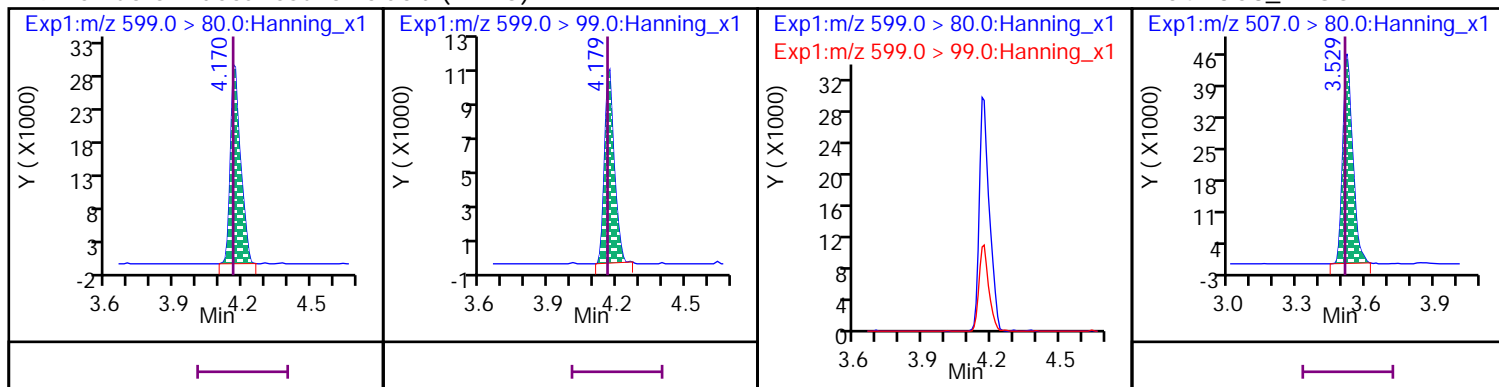
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



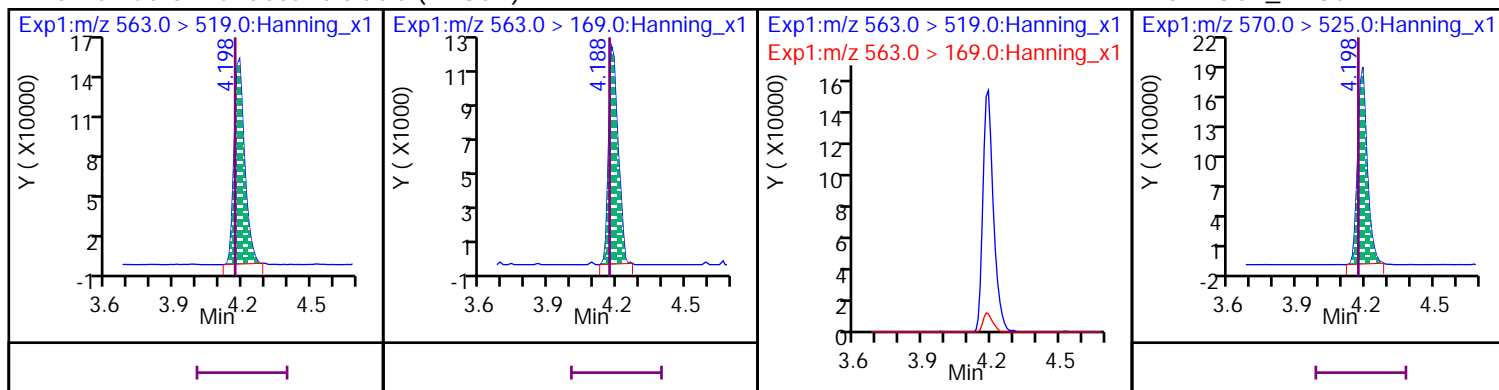
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



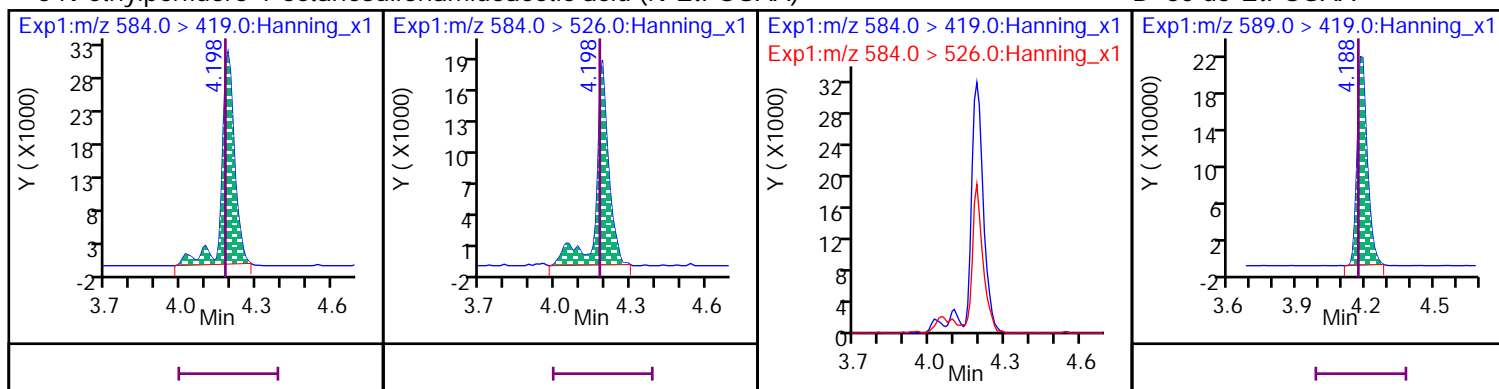
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



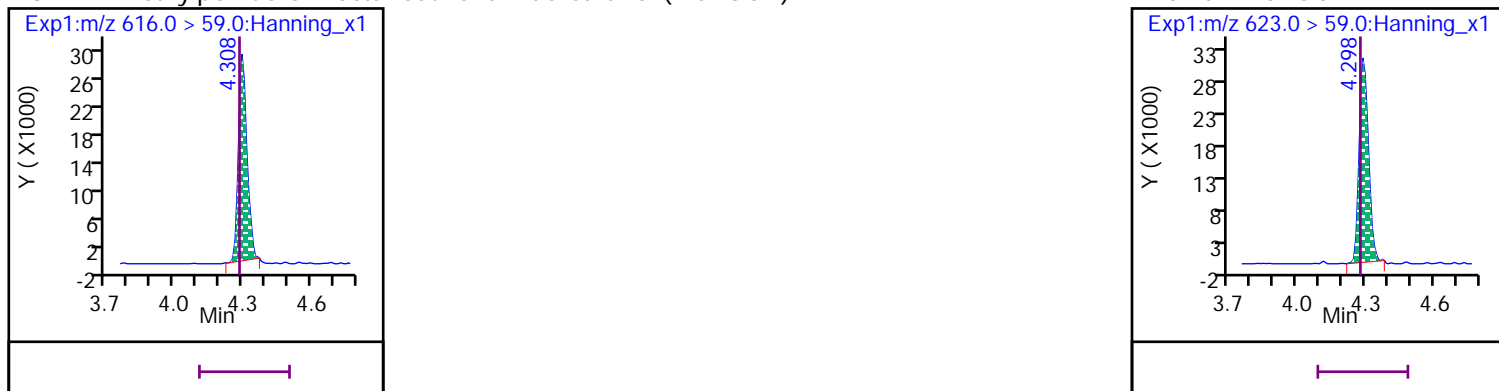
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



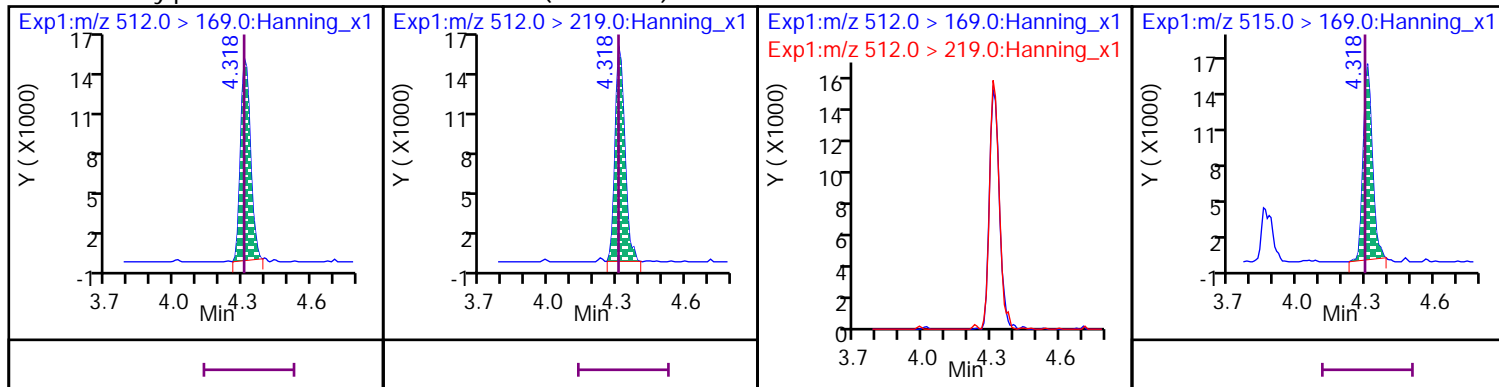
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

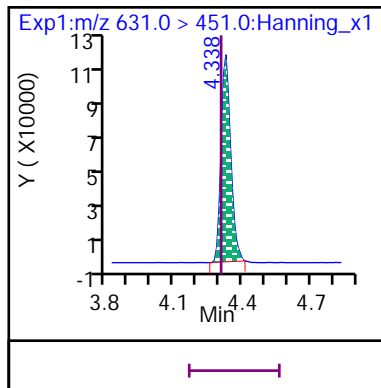


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

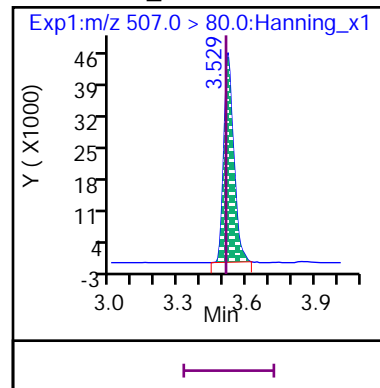
D 57 d3-MeFOSA



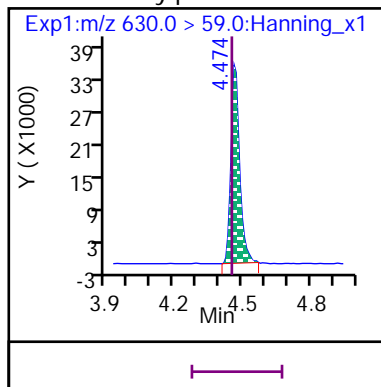
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



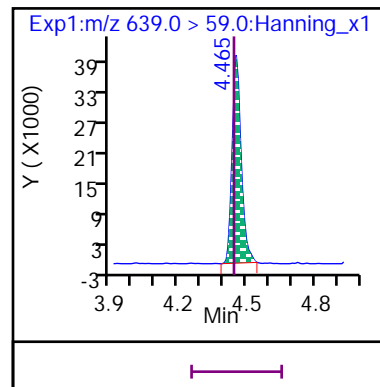
D 54 13C8\_PFOS



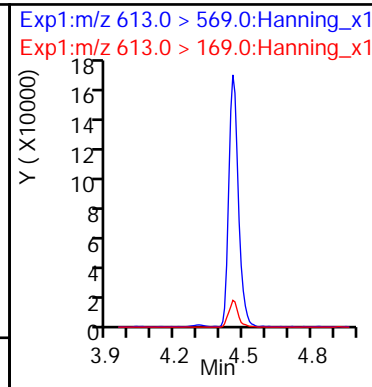
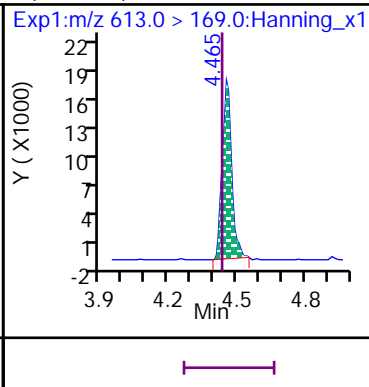
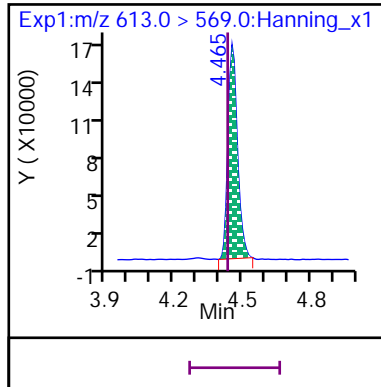
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



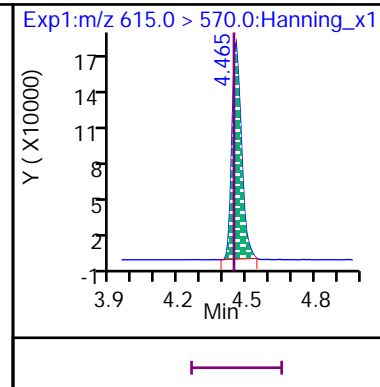
D 62 d9-EtFOSE



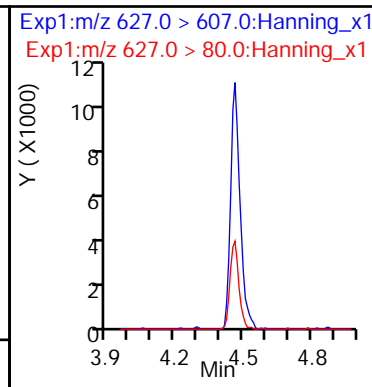
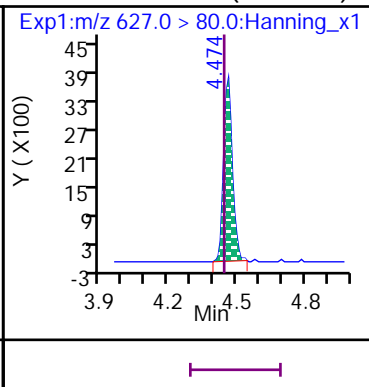
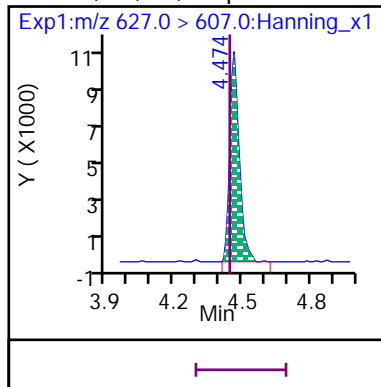
11 Perfluoro-n-dodecanoic acid (PFDaA)



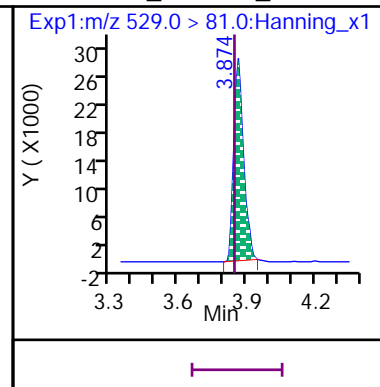
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)



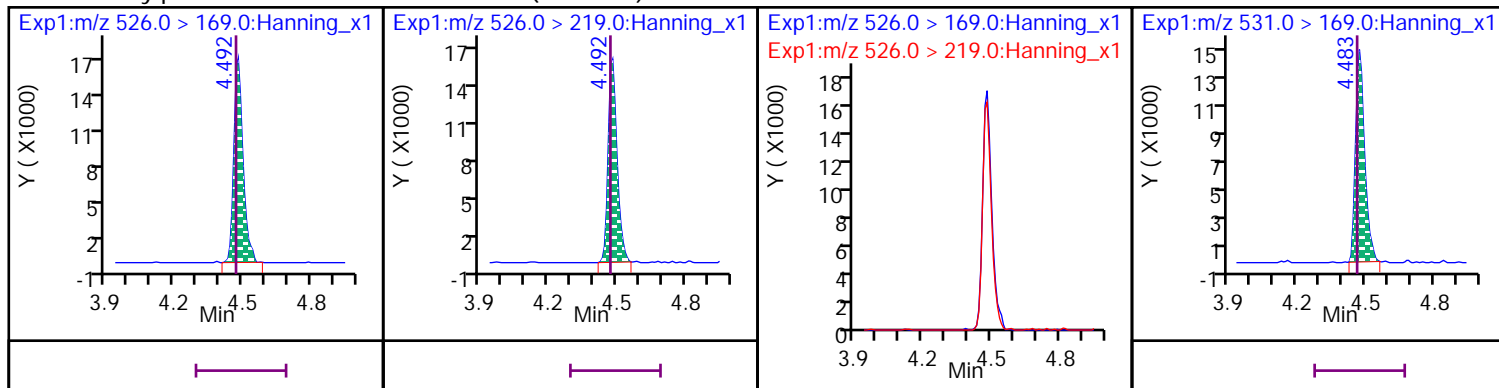
D 65 13C2\_8:2 FTS\_2





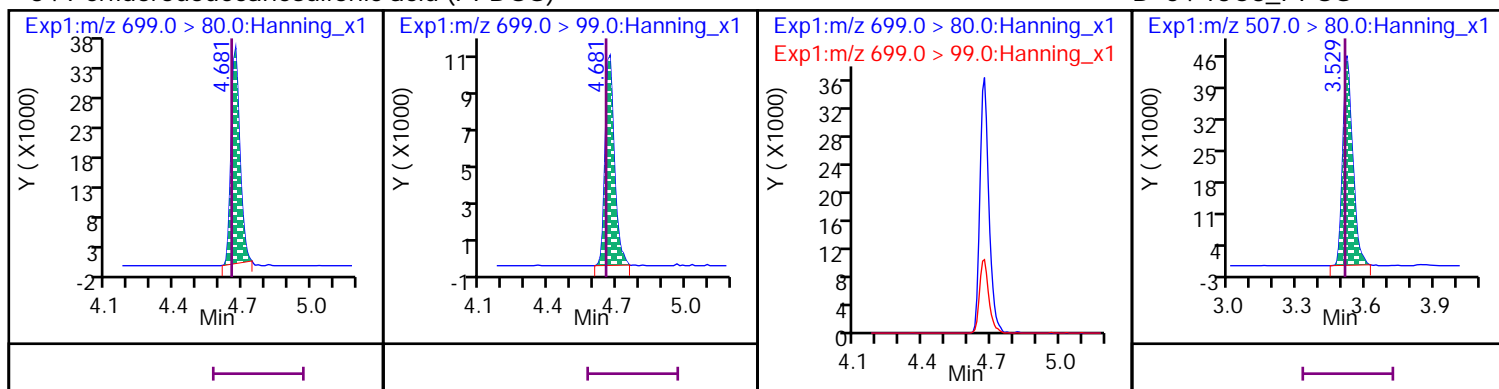
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



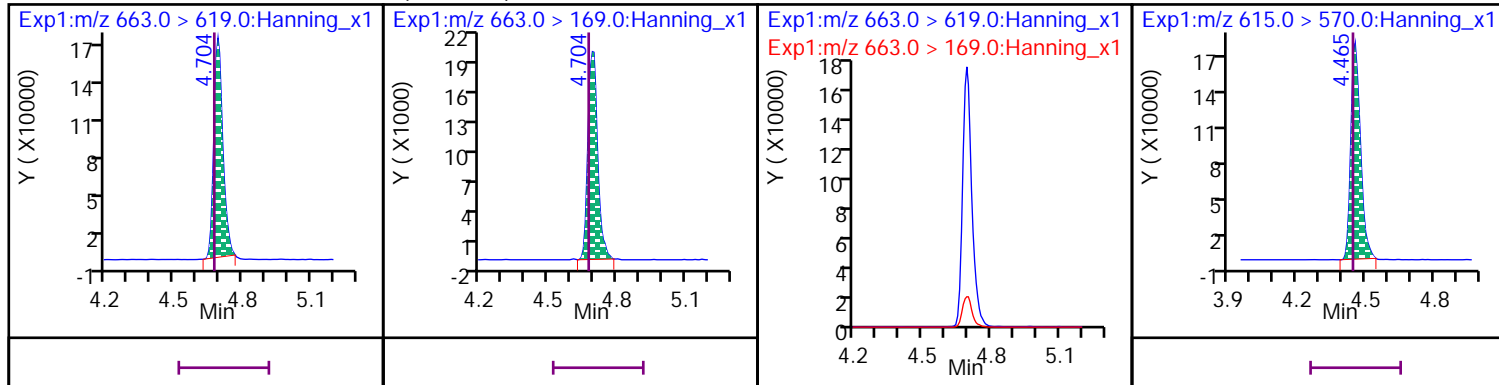
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



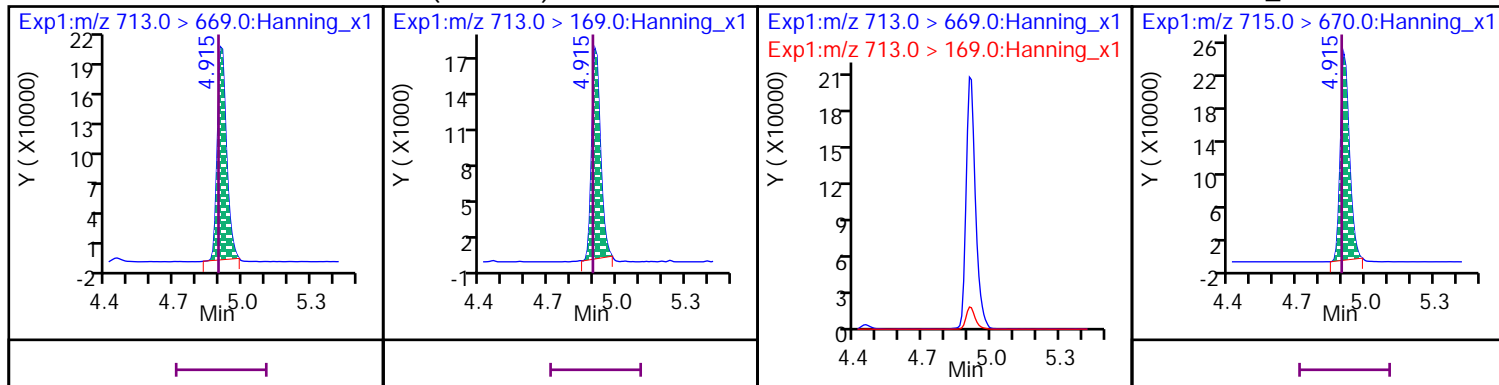
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



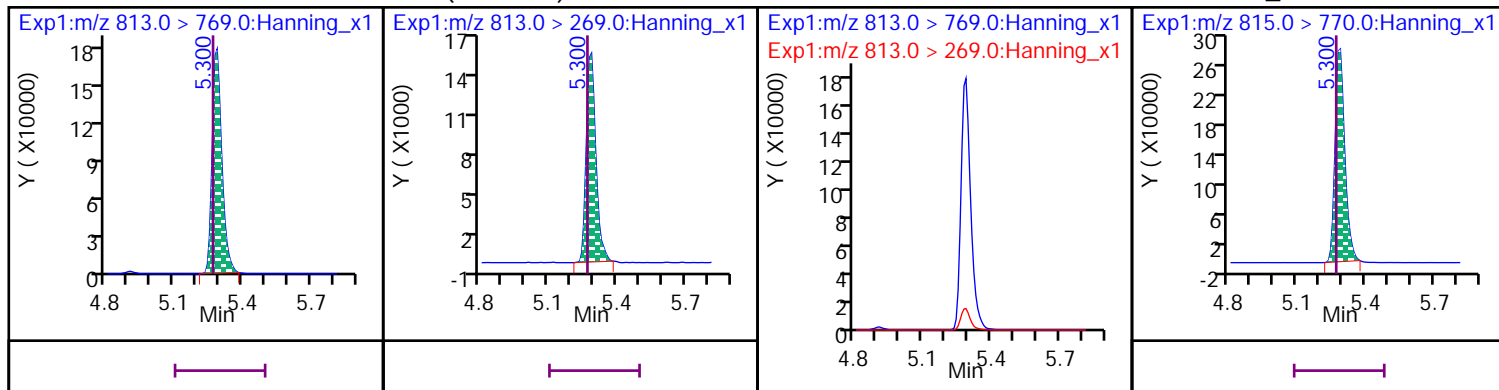
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



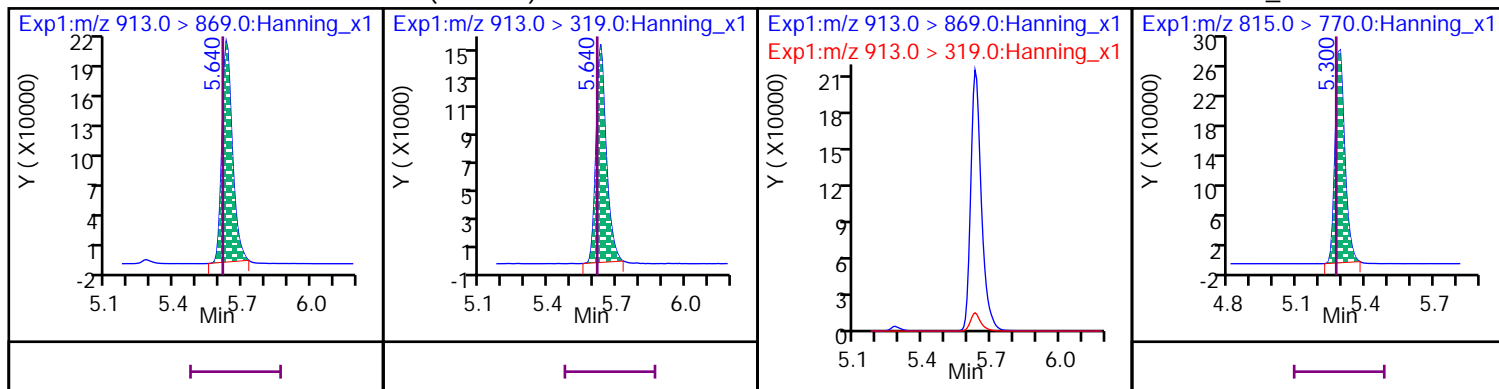
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

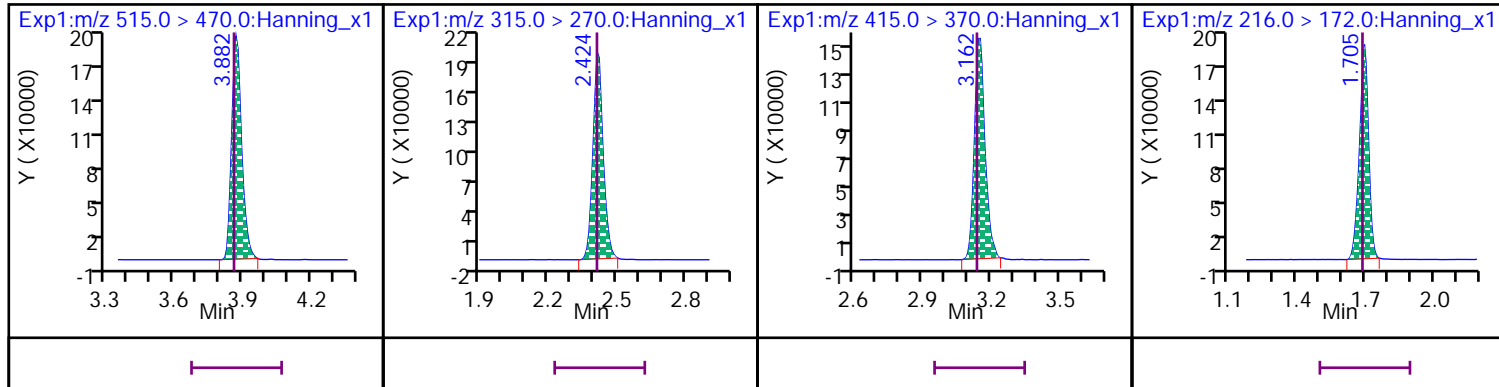


\* 37 13C2\_PFDA

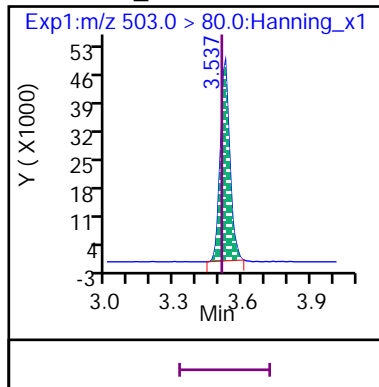
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

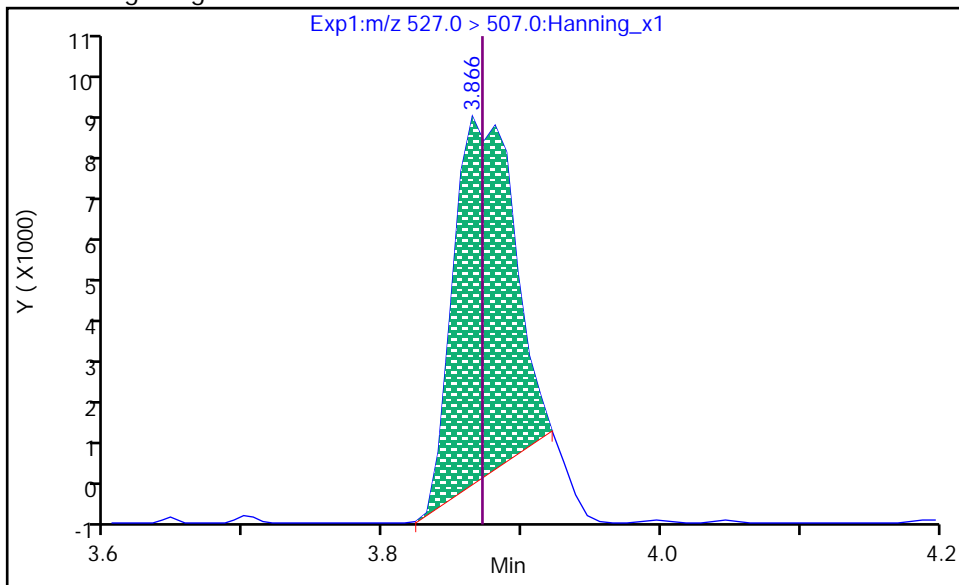
Dil. Factor: 1

Operator: Matthew M. Miller

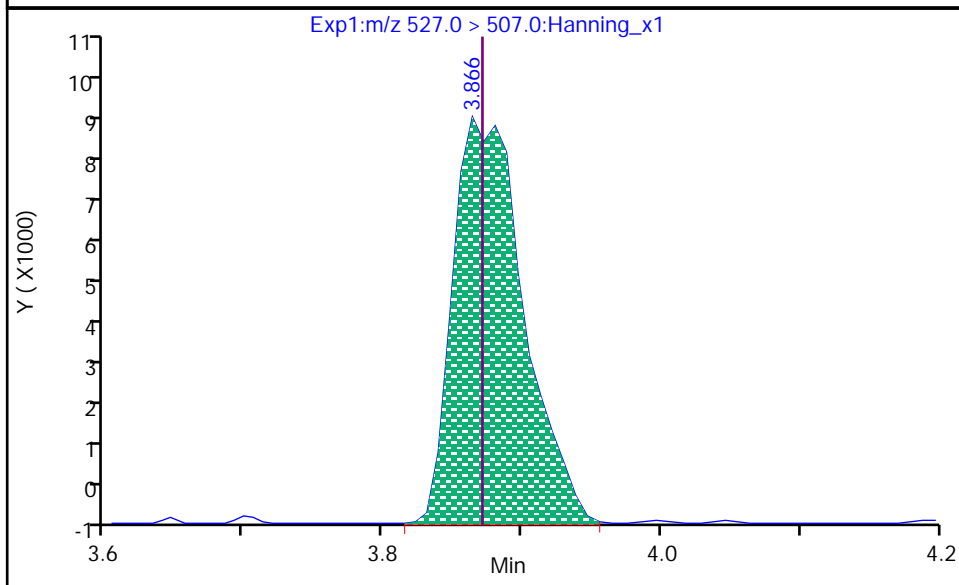
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.866  
Area: 24155  
Amount: 730.81  
Amount Units: ng/L



RT: 3.866  
Area: 31995  
Amount: 973.47  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:53

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

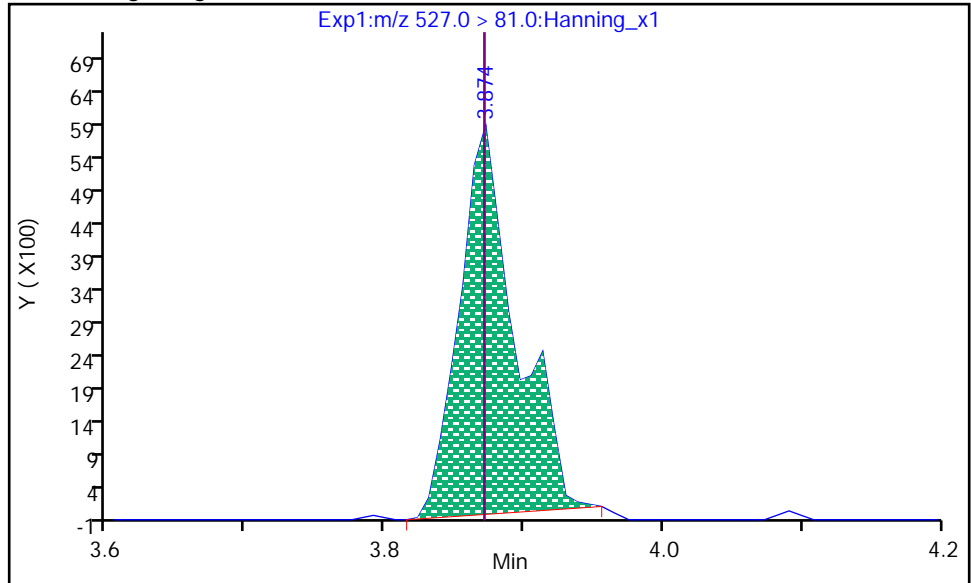
Dil. Factor: 1

Operator: Matthew M. Miller

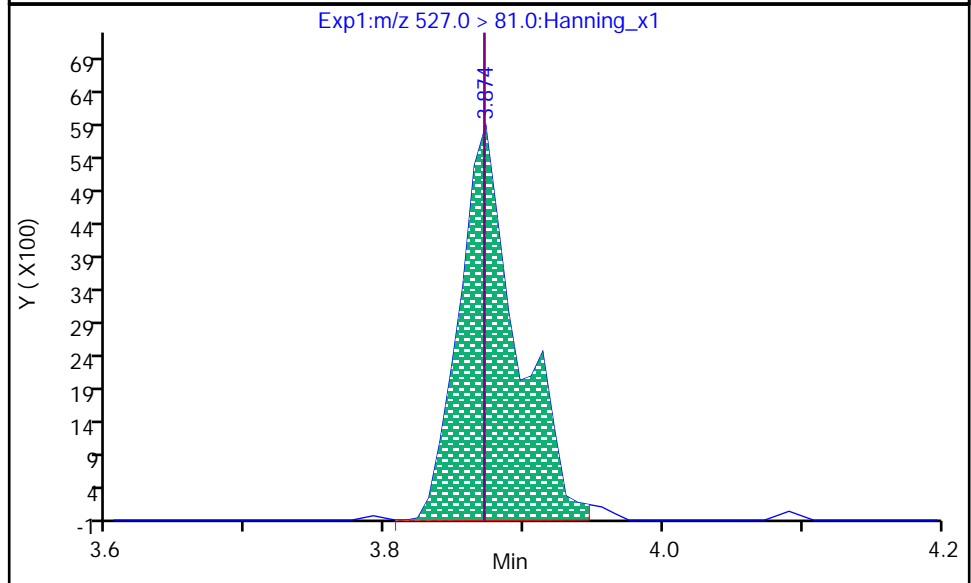
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.874  
Area: 16288  
Amount: 973.47  
Amount Units: ng/L



RT: 3.874  
Area: 17042  
Amount: 973.47  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:58

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

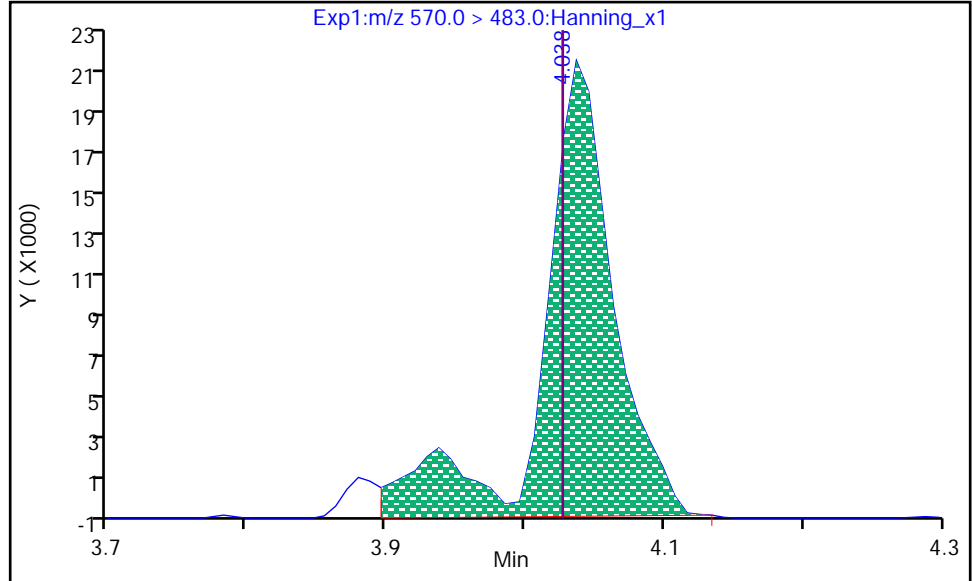
Dil. Factor: 1

Operator: Matthew M. Miller

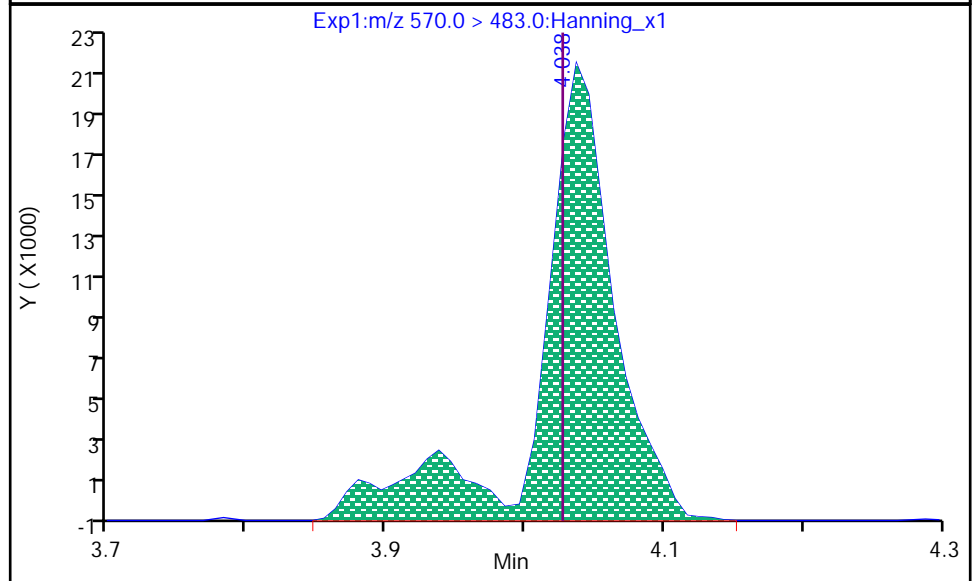
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.038  
Area: 73636  
Amount: 910.11  
Amount Units: ng/L

Processing Integration Results



RT: 4.038  
Area: 77993  
Amount: 910.11  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:50:05

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820048.d

Injection Date: 28-Dec-2020 17:32:21

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000C\_SVLC-1248

Sample Info: ID CCV 1000C\_SVLC-1248

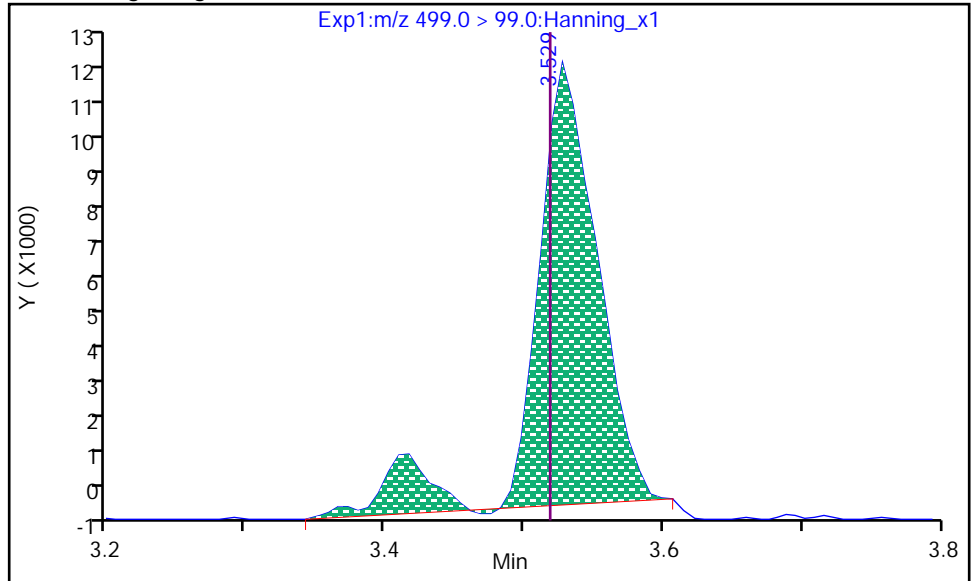
Dil. Factor: 1

Operator: Matthew M. Miller

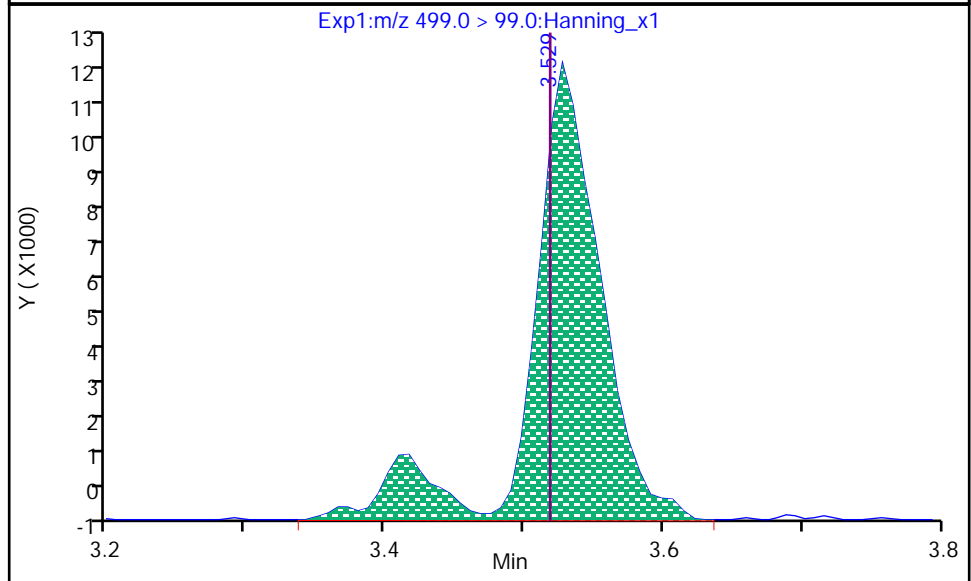
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.529  
Area: 35227  
Amount: 812.39  
Amount Units: ng/L



RT: 3.529  
Area: 39986  
Amount: 812.39  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:49:45

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d  
Injection Date: 28-Dec-2020 19:50:36 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 52  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	916.63	91.7	70 - 130
D 46 13C4_PFBA	649747	605166			93.1	50 - 150
D 50 13C5_PFPeA	665996	617611			92.7	50 - 150
21 PFPeA			1000.00	924.32	92.4	70 - 130
7 PFBS			884.00	792.35	89.6	70 - 130
D 44 13C3_PFBS	238207	221732			93.1	50 - 150
1 4:2 FTS			934.00	877.41	93.9	70 - 130
D 63 13C2_4:2 FTS_2	144067	123865			86	50 - 150
D 49 13C5_PFHxA	743582	670789			90.2	50 - 150
15 PFHxA			1000.00	929.09	92.9	70 - 130
22 PFPeS			938.00	900.38	96	70 - 130
28 GenX			2000.00	1738.13	86.9	70 - 130
D 66 13C3_GenX	1401050	1245450			88.9	50 - 150
D 47 13C4_PFHpA	633684	532901			84.1	50 - 150
13 PFHpA			1000.00	953.84	95.4	70 - 130
D 45 13C3_PFHxS	174146	171902			98.7	50 - 150
14 PFHxS			910.00	752.55	82.7	70 - 130
29 ADONA			942.00	797.11	84.6	70 - 130
D 64 13C2_6:2 FTS_2	104346	96090			92.1	50 - 150
2 6:2 FTS			948.00	929.97	98.1	70 - 130
20 PFOA			1000.00	907.82	90.8	70 - 130
D 53 13C8_PFOA	628007	559219			89	50 - 150
12 PFHpS			952.00	876.91	92.1	70 - 130
18 PFOS			928.00	894.88	96.4	70 - 130
17 PFNA			1000.00	922.79	92.3	70 - 130
D 56 13C9_PFNA	767623	707970			92.2	50 - 150
D 54 13C8_PFOS	152445	142321			93.4	50 - 150
30 9CI-PF3ONS			932.00	838.87	90	70 - 130
D 55 13C8_PFOSA	308857	285015			92.3	50 - 150
19 PFOSA			1000.00	965.59	96.6	70 - 130
16 PFNS			960.00	944.54	98.4	70 - 130
D 65 13C2_8:2 FTS_2	100453	83585			83.2	50 - 150
3 8:2 FTS			958.00	987.61	103	70 - 130
10 PFDA			1000.00	905.25	90.5	70 - 130
D 51 13C6_PFDA	672868	626358			93.1	50 - 150
D 58 d3-MeFOSAA	791564	692035			87.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1076.48	108	70 - 130
9 PFDS			964.00	912.75	94.7	70 - 130
5 N-EtFOSAA			1000.00	862.69	86.3	70 - 130
25 PFUdA			1000.00	891.31	89.1	70 - 130
D 60 d5-EtFOSAA	731651	699325			95.6	50 - 150
D 52 13C7_PFUdA	643525	578713			89.9	50 - 150
D 61 d7-MeFOSE	105402	99287			94.2	50 - 150
32 MeFOSE			1000.00	878.36	87.8	70 - 130
26 MeFOSA			1000.00	916.27	91.6	70 - 130
D 57 d3-MeFOSA	51840	50971			98.3	50 - 150
31 11Cl-PF3OUDS			942.00	843.76	89.6	70 - 130
D 62 d9-EtFOSE	137116	109140			79.6	50 - 150
33 EtFOSE			1000.00	960.99	96.1	70 - 130
D 59 d5-EtFOSA	50284	43259			86	50 - 150
D 38 13C2_PFDoA	611364	556160			91	50 - 150
4 10:2 FTS			964.00	876.96	91	70 - 130
27 EtFOSA			1000.00	935.08	93.5	70 - 130
11 PFDoA			1000.00	921.03	92.1	70 - 130
34 PFDOS			968.00	859.59	88.8	70 - 130
24 PFTrDA			1000.00	955.42	95.5	70 - 130
23 PFTeDA			1000.00	965.36	96.5	70 - 130
D 42 13C2_PFTeDA	813074	703343			86.5	50 - 150
35 PFHxDA			1000.00	1005.23	101	70 - 130
D 40 13C2_PFHxDA	935525	836498			89.4	50 - 150
36 PFODA			1000.00	966.37	96.6	70 - 130



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d  
Injection Date: 28-Dec-2020 19:50:36 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 52  
Sample Info: ID CCV 1000D\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.704	1.696	1	605166	23	>100:1			1000.00	872.56	93.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.696	1/0	552493	22	>100:1			1000.00	916.63		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.072	1	617611	17	>100:1			1000.00	897.84	92.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.072	1/0	573961	17	>100:1			1000.00	924.32		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.125	1	221732	16	>100:1			1000.00	963.09	93.1	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.140	2.125	1/0	207145	17	>100:1	Target = 3.50		884.00	792.35		
298.9 > 99	44	2.140	2.125		58013	17	>100:1	3.57 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.459	2.450	1/0	173181	20	>100:1	Target = 3.10		938.00	900.38		
349 > 99	44	2.459	2.450		56027	19	>100:1	3.09 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.379	1	123865	20	>100:1			5000.00	5116.63	86	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.388	2.388	1/0	43379	38		Target = 1.80		934.00	877.41		
327 > 81	63	2.388	2.388		19972	19	90:1	2.17 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.423	1	670789	19	>100:1			1000.00	910.07	90.2	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.423	1/0	615294	19	>100:1	Target = 18.34		1000.00	929.09		
313 > 119	49	2.423	2.423		30997	18	>100:1	19.85 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.530	1	1245450	21	>100:1			5000.00	4675.92	88.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.530	1/0	311058	20	>100:1	Target = 0.81		2000.00	1738.13		
285 > 185	66	2.530	2.530		408753	19	>100:1	0.76 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.781	2.772	1	532901	19	>100:1			1000.00	878.44	84.1	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.781	2.772	1/0	527241	20	>100:1	Target = 3.70		1000.00	953.84		
363 > 169	47	2.781	2.772		141032	21	>100:1	3.73 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.799	2.790	1	171902	25	>100:1			1000.00	1003.93	98.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.799	2.790	1/0	137163	29	>100:1	Target = 3.21	0.15	910.00	752.55		
399 > 99	45	2.808	2.790		46659	29	>100:1	2.93 (1.60-4.81)	0.09				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.808	1/0	869946	19	>100:1	Target = 2.97		942.00	797.11		
377 > 85	45	2.818	2.808		300675	20	>100:1	2.89 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.168	3.154	1/0	136939	25	>100:1	Target = 3.08		952.00	876.91		
449 > 99	45	3.161	3.154		44126	25	>100:1	3.10 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.128	3.114	1	96090	25	>100:1			5000.00	4989.51	92.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.141	3.128	1/0	37064	30		Target = 1.80		948.00	929.97		
427 > 81	64	3.141	3.128		20020	28	>100:1	1.85 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.154	3.141	1	559219	25	>100:1			1000.00	944.84	89	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.161	3.148	1/0	517546	25	>100:1	Target = 2.87		1000.00	907.82		
413 > 169	53	3.161	3.148		182564	23	>100:1	2.83 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.535	3.520	1	142321	22	>100:1			1000.00	949.26	93.4	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.535	3.520	1/0	150920	41	>100:1	Target = 3.84	0.26	928.00	894.88		
499 > 99	54	3.535	3.520		39618	34	>100:1	3.80 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.743	3.722	2/1	401921	23	>100:1			932.00	838.87		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.881	3.865	1/0	102873	21	>100:1	Target = 3.07		960.00	944.54		
549 > 99	54	3.881	3.865		36740	21	>100:1	2.80 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.178	4.169	1/0	94275	18	>100:1	Target = 3.03		964.00	912.75		
599 > 99	54	4.178	4.169		34663	18	>100:1	2.71 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.337	4.317	2/1	341034	16	>100:1			942.00	843.76		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.680	4.663	1/0	98216	18		Target = 3.33		968.00	859.59		
699 > 99	54	4.680	4.663		30730	21	>100:1	3.19 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.535	3.520	1	707970	22	>100:1			1000.00	942.75	92.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.543	3.520	2/1	653325	20	>100:1	Target = 6.16		1000.00	922.79		
463 > 169	56	3.535	3.520		98941	22	>100:1	6.60 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.849	1	285015	20	>100:1			1000.00	920.70	92.3	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.865	3.841	2/1	271203	21	>100:1			1000.00	965.59		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.881	3.857	2	83585	19				5000.00	4505.90	83.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.881	3.873	1/-1	33188	23	>100:1	Target = 1.95		958.00	987.61		
527 > 81	65	3.873	3.873		15710	19	>100:1	2.11 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.473	4.455	2/0	33878	21	>100:1	Target = 3.14		964.00	876.96		
627 > 80	65	4.473	4.455		10825	21	59:1	3.12 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.890	3.865	2	626358	21	>100:1			1000.00	944.26	93.1	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.890	3.873	1/-1	557141	19	>100:1	Target = 15.94		1000.00	905.25		
513 > 169	51	3.890	3.873		42581	27		13.08 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.037	4.029	1	692035	18	>100:1			5000.00	4821.22	87.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.046	4.029	2/1	114449	35	>100:1	Target = 1.33	0.12	1000.00	1076.48		
570 > 483	58	4.046	4.029		76338	35	>100:1	1.49 (0.66-1.99)	0.25				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.197	4.178	2	699325	18	>100:1			5000.00	5265.42	95.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.206	4.187	2/0	120127	34	>100:1	Target = 1.58	0.08	1000.00	862.69		M
584 > 526	60	4.206	4.187		71724	34	82:1	1.67 (0.79-2.37)					M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.197	4.178	2	578713	18	>100:1			1000.00	915.58	89.9	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.197	4.178	2/0	484800	18	>100:1	Target = 15.50		1000.00	891.31		
563 > 169	52	4.197	4.178		38789	18	>100:1	12.49 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.297	4.287	1	99287	16	>100:1			1000.00	917.56	94.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.307	4.297	1/0	81942	15	>100:1			1000.00	878.36		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.317	4.307	1	50971	15	93:1			1000.00	963.23	98.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.317	4.317	1/0	52691	17	>100:1	Target = 1.12		1000.00	916.27		
512 > 219	57	4.317	4.317		48269	15	>100:1	1.09 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.464	4.455	1	109140	17	>100:1			1000.00	870.37	79.6	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.482	4.464	2/1	93312	16	>100:1			1000.00	960.99		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.464	4.455	1	556160	18	>100:1			1000.00	918.79	91	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.446	2/1	518729	18	>100:1	Target = 10.85		1000.00	921.03		
613 > 169	38	4.473	4.446		53017	20	>100:1	9.78 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.703	4.688	1/0	523361	21	>100:1	Target = 8.37		1000.00	955.42		
663 > 169	38	4.703	4.688		60162	18	>100:1	8.69 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.473	1	43259	15	>100:1			1000.00	881.14	86	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.491	4.482	1/0	44193	15		Target = 1.03		1000.00	935.08		
526 > 219	59	4.491	4.482		45514	15	>100:1	0.97 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.923	4.906	2	703343	18	>100:1			1000.00	834.89	86.5	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.923	4.906	2/0	588299	18	>100:1	Target = 12.11		1000.00	965.36		
713 > 169	42	4.923	4.906		50525	19	>100:1	11.64 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.299	5.282	2	836498	18	>100:1			1000.00	923.12	89.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.299	5.282	2/0	549418	20	>100:1	Target = 11.48		1000.00	1005.23		
813 > 269	40	5.299	5.282		47501	20	>100:1	11.56 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.646	5.625	2/0	715584	24	99:1	Target = 13.88		1000.00	966.37		
913 > 319	40	5.646	5.625		51219	24	>100:1	13.97 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.890	3.873	1	625153	20	>100:1					85.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.423	1	623552	19	>100:1					85.3	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.154	3.148	1	550811	25	>100:1					91.9	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.704	1.696	1	543582	24	>100:1					89.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.535	3.520	1	150191	21	>100:1					92.1	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

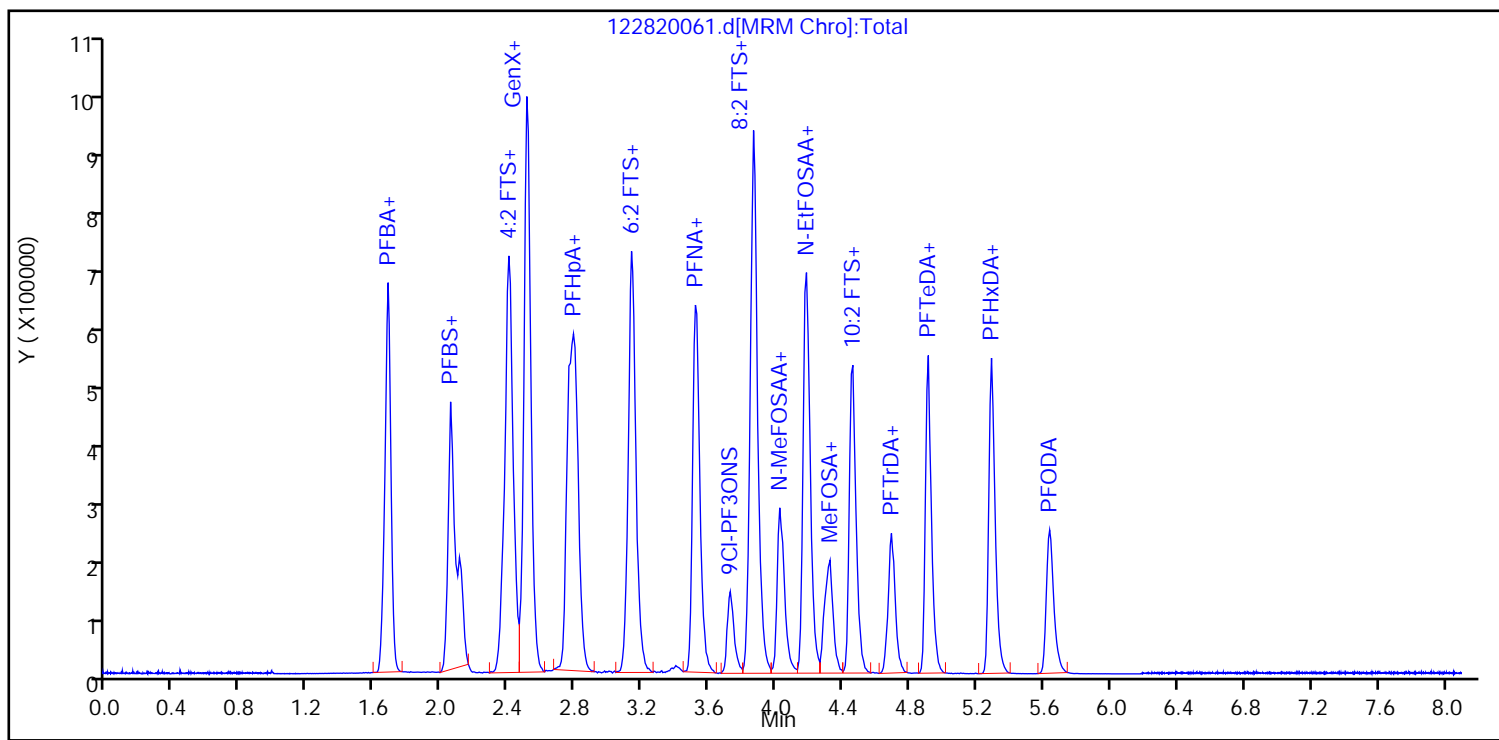
Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

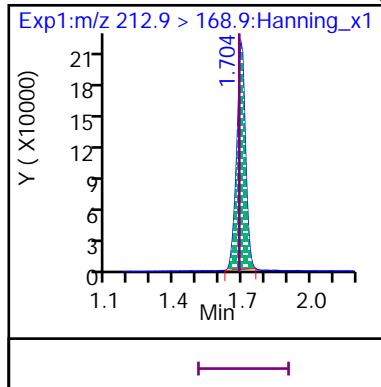
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Dil. Factor: 1

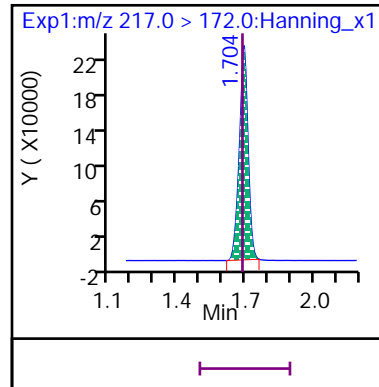
Operator: Matthew M. Miller



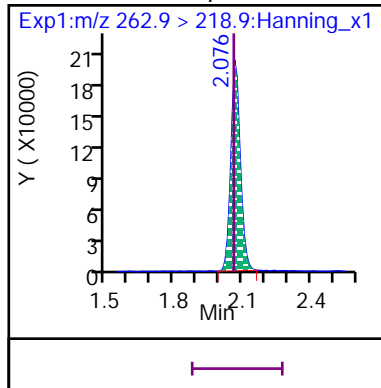
8 Perfluoro-n-butanoic acid (PFBA)



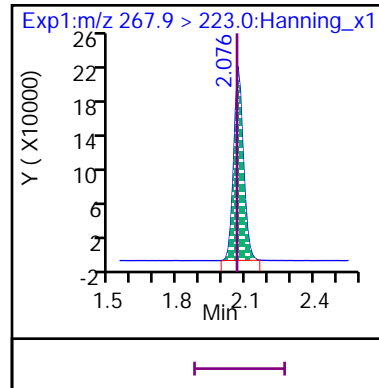
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

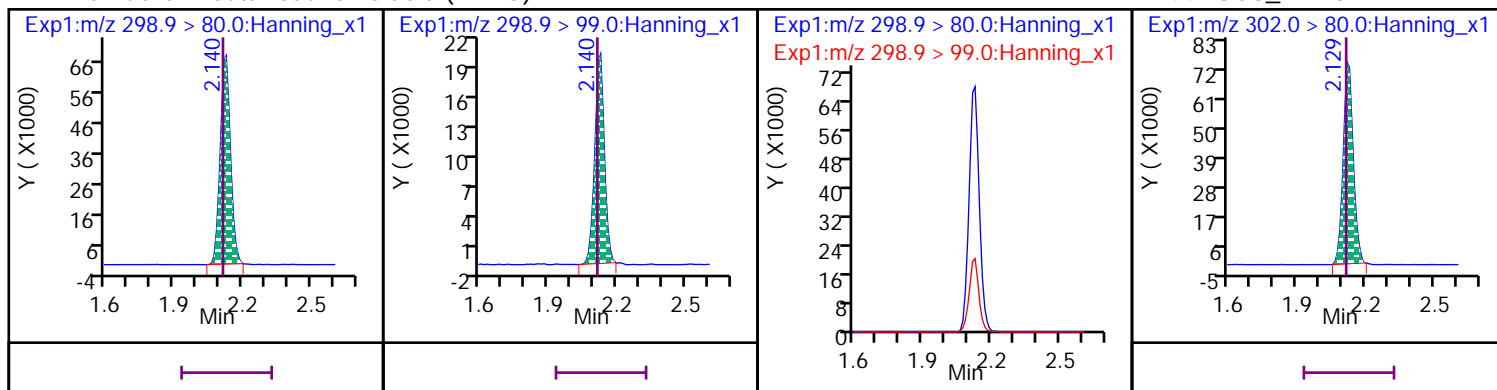


D 50 13C5\_PFPeA



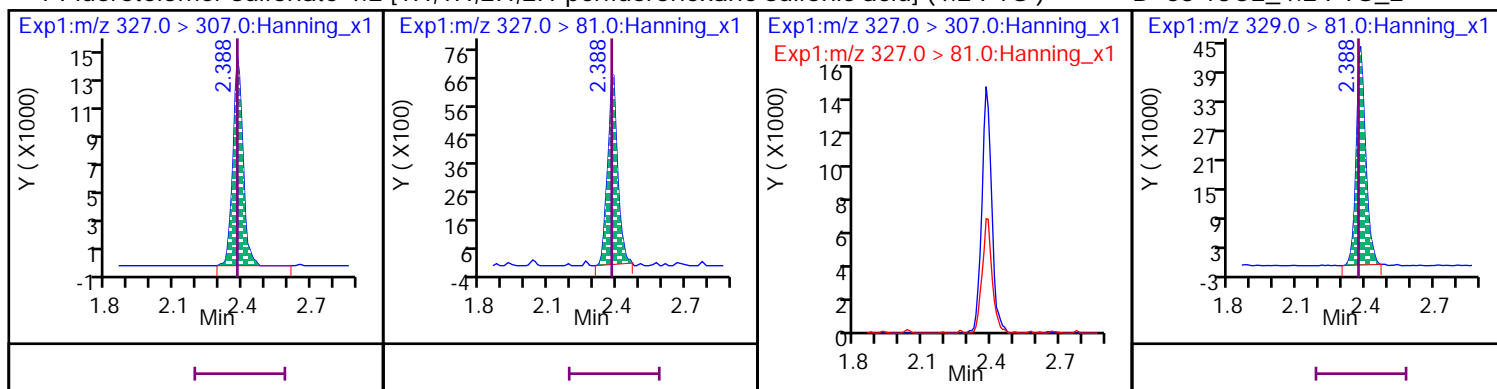
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



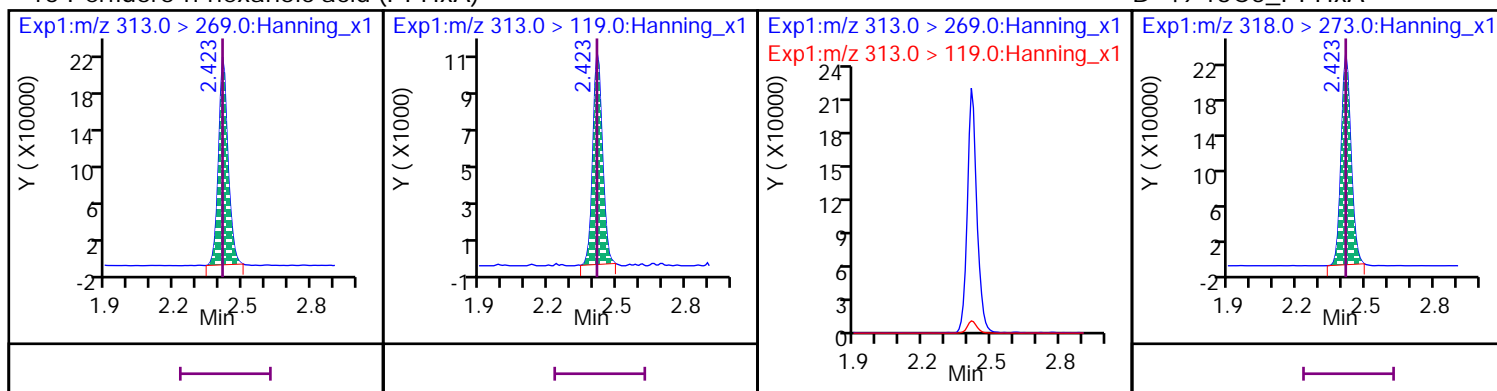
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



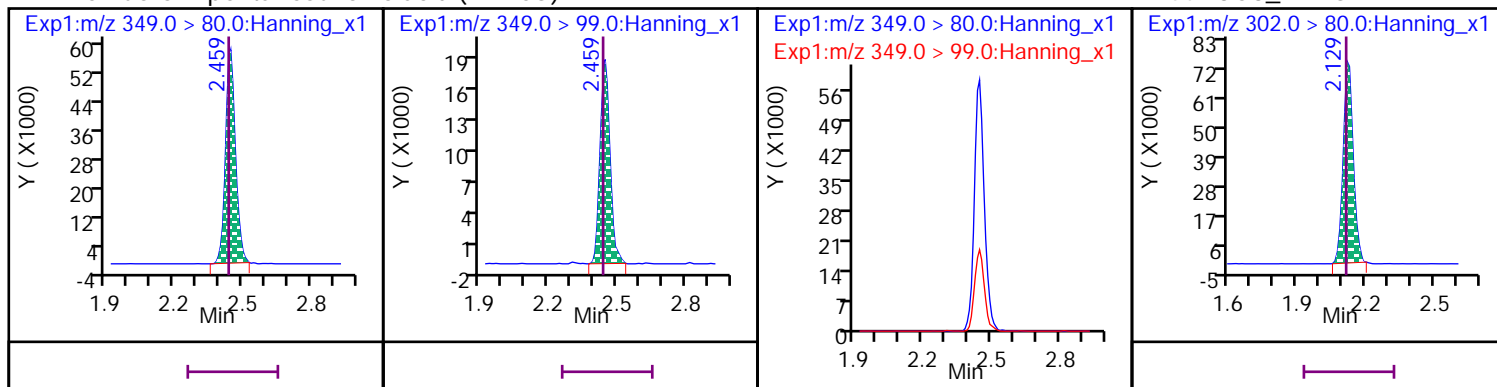
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



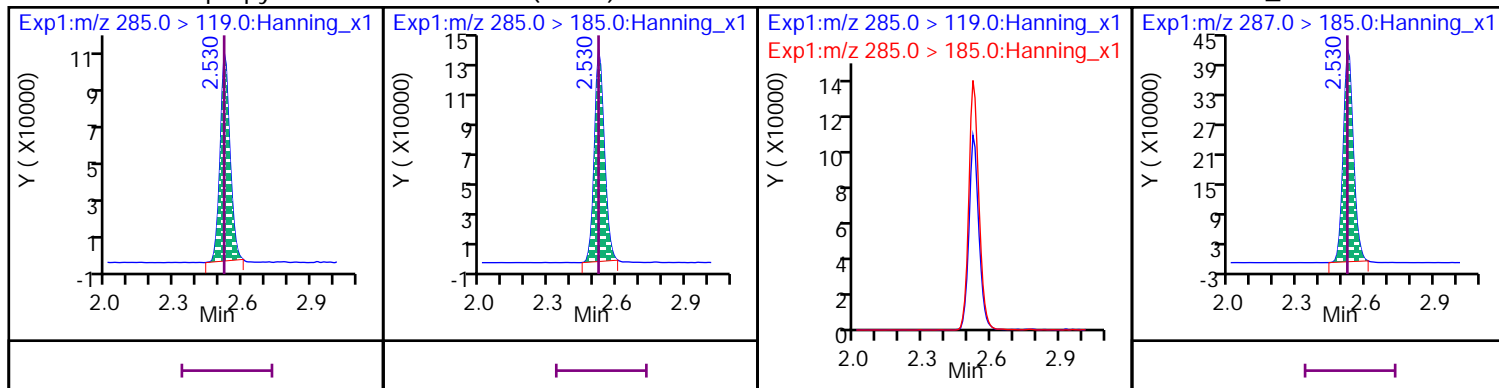
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



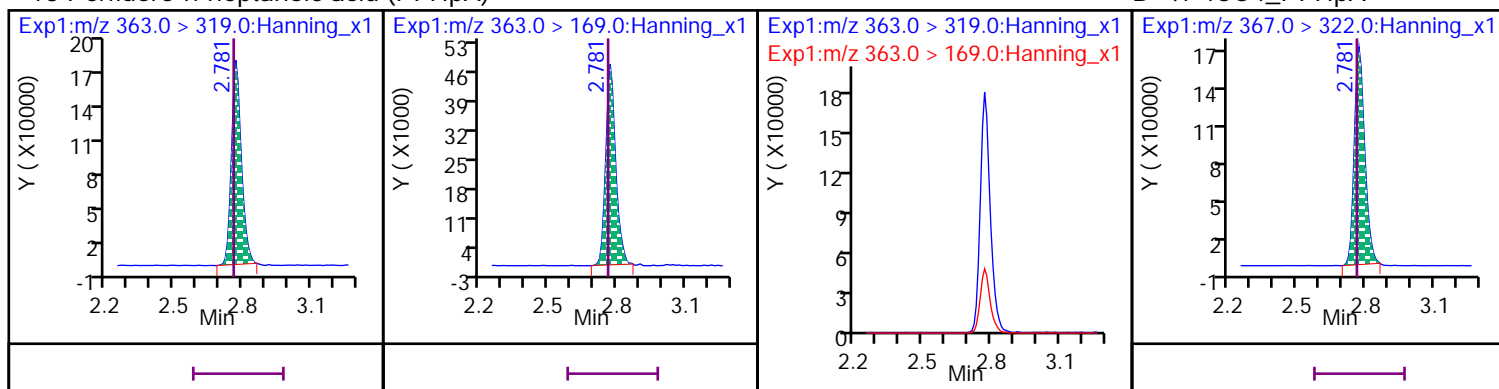
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



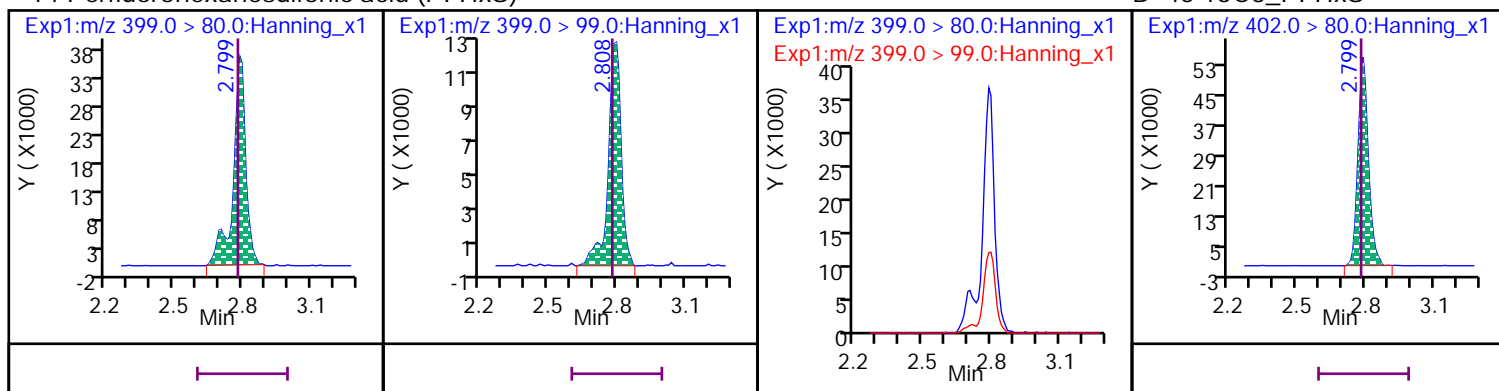
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



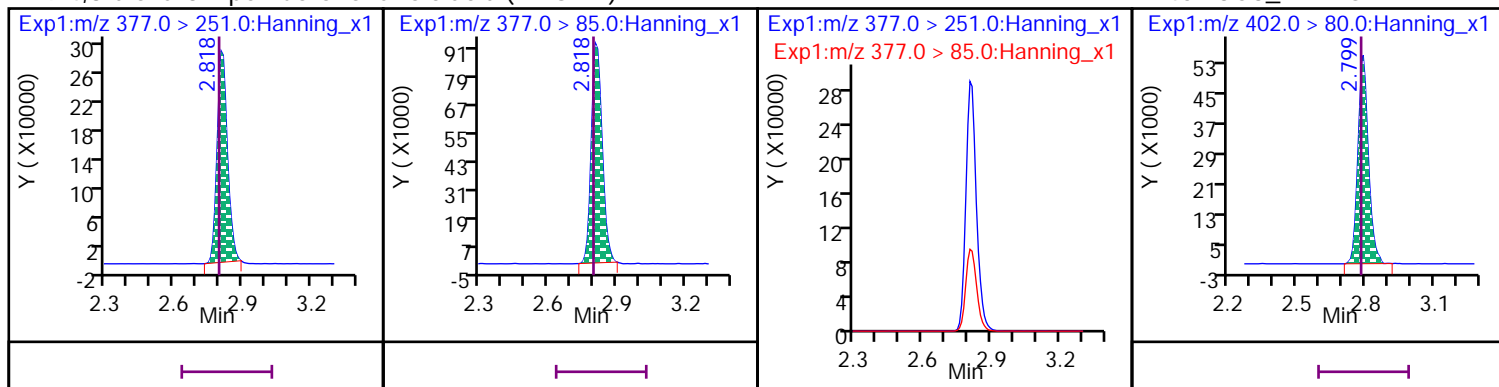
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



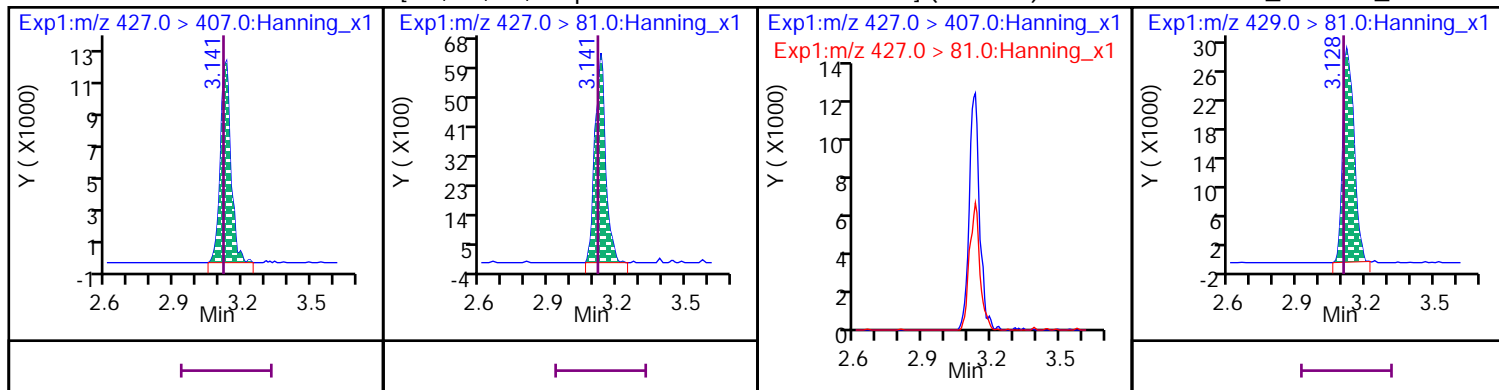
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



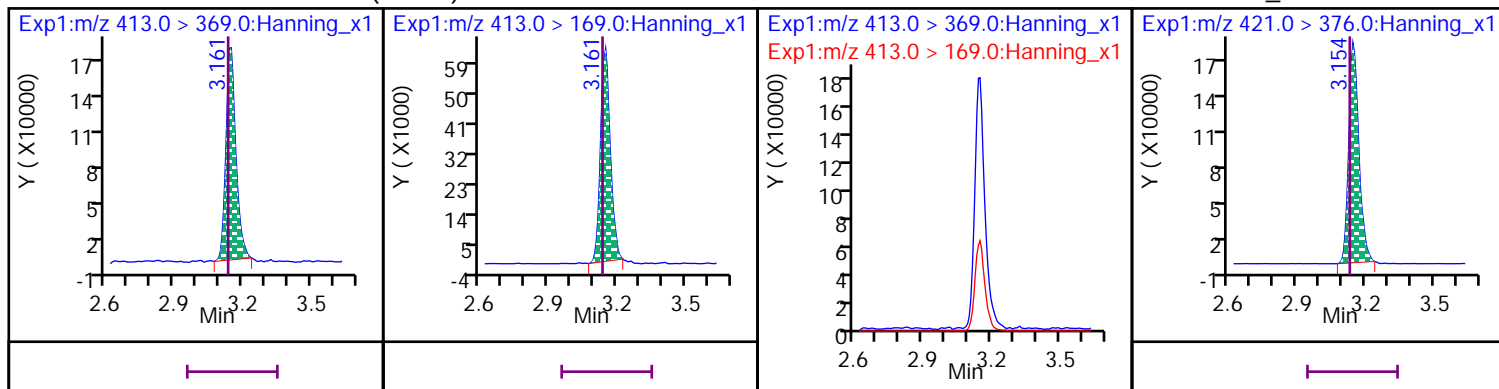
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



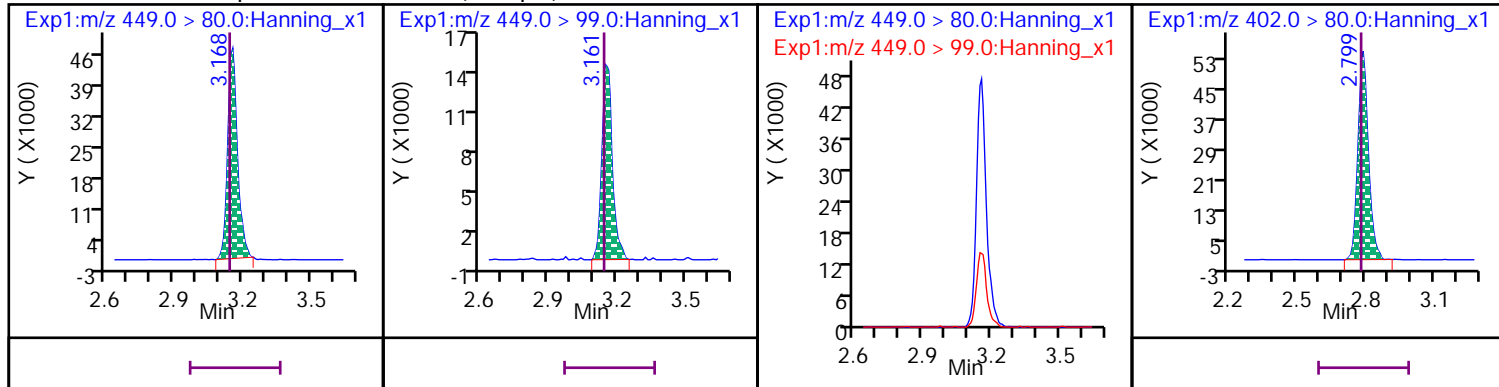
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



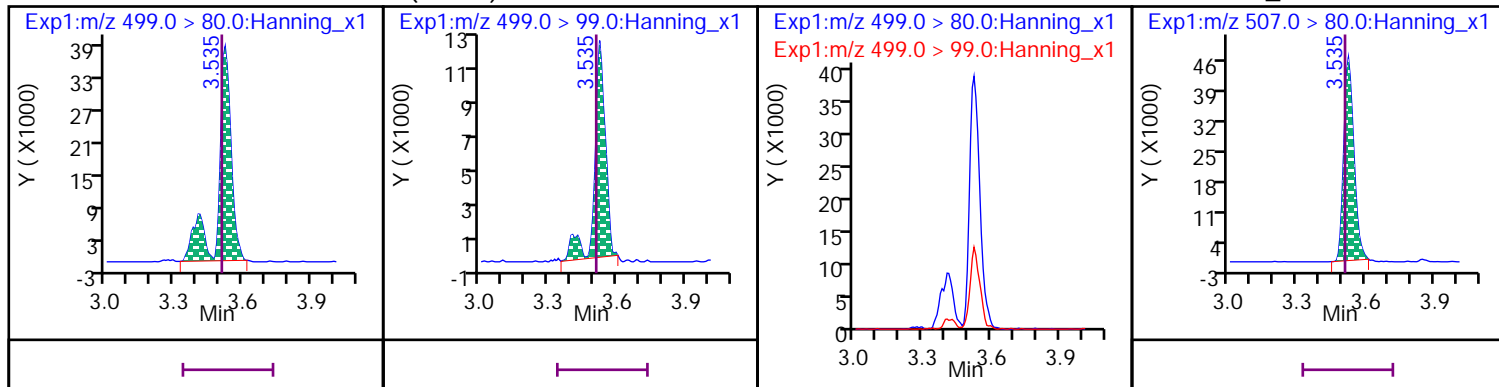
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

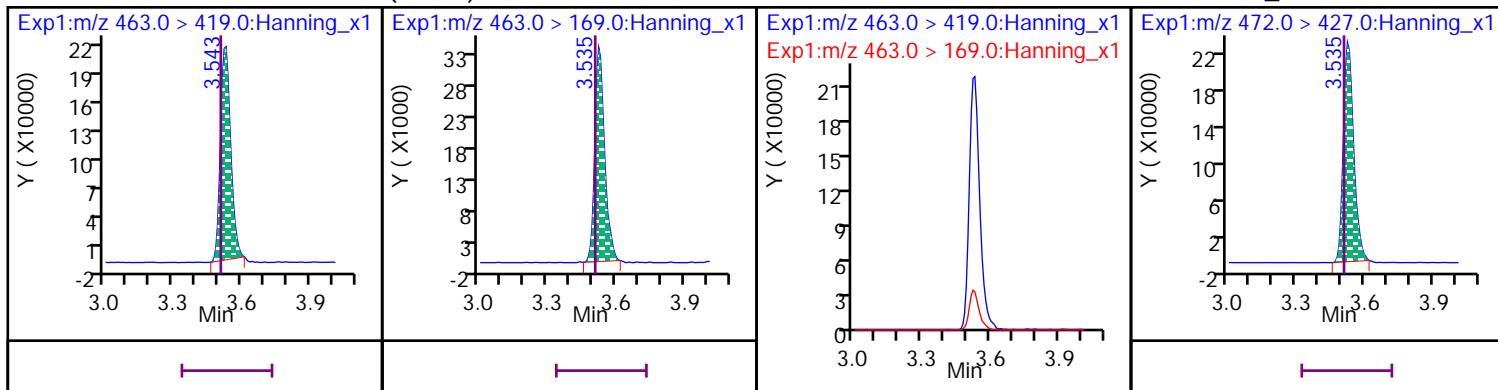
D 54 13C8\_PFOS





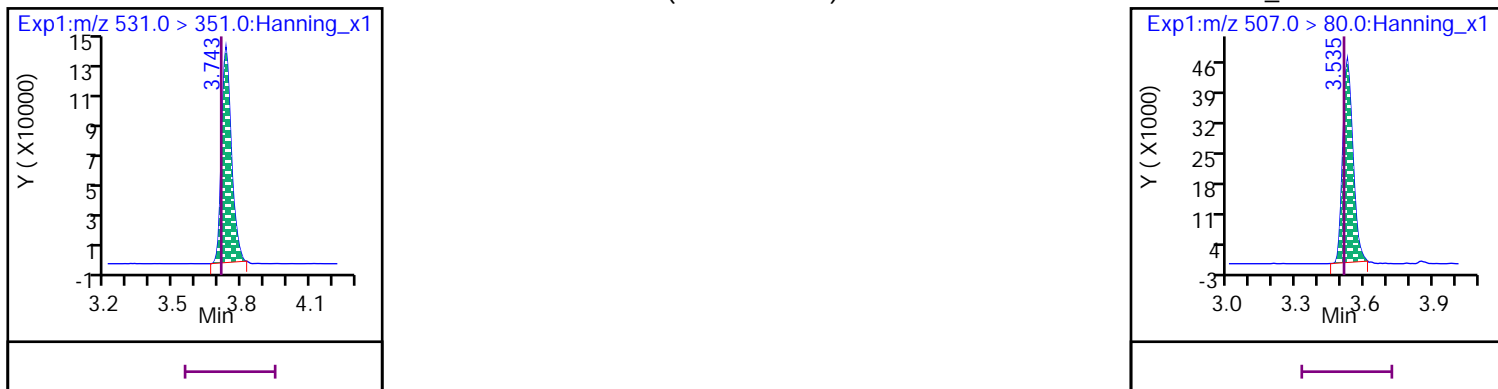
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



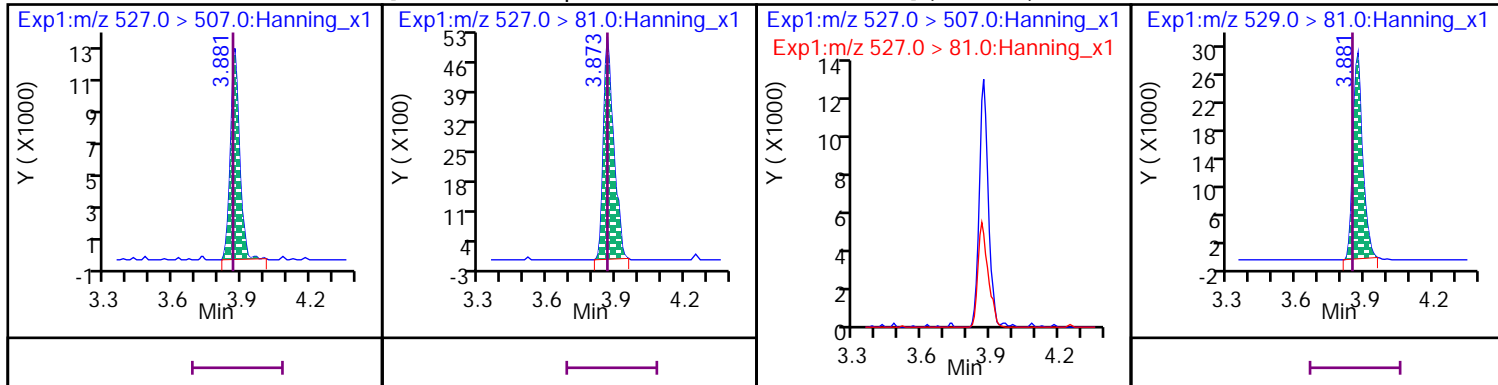
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



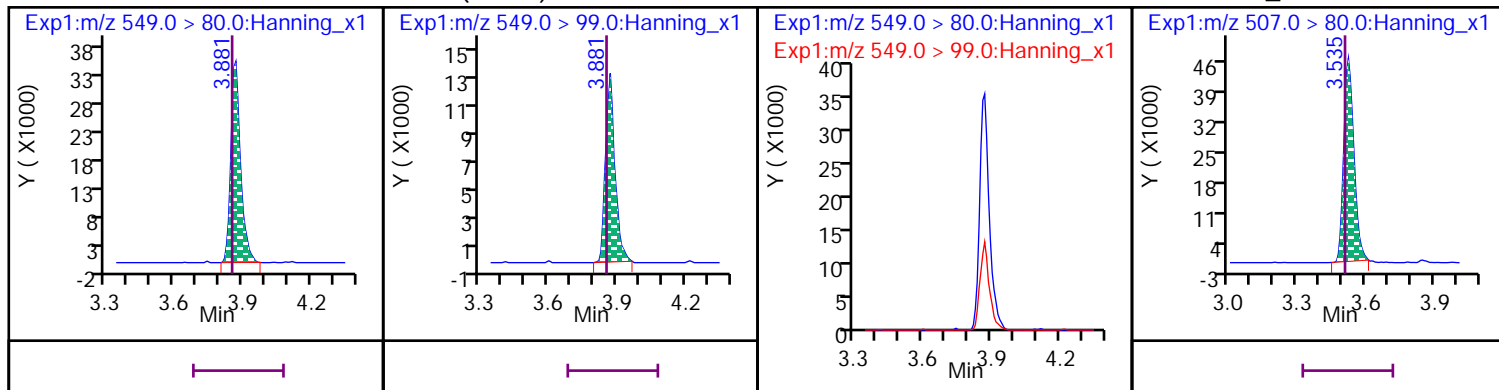
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



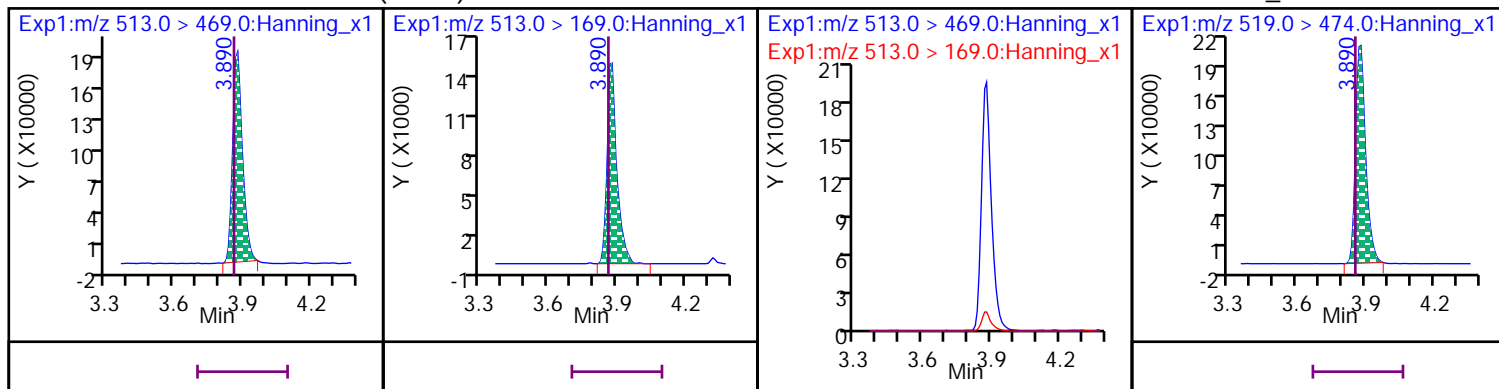
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



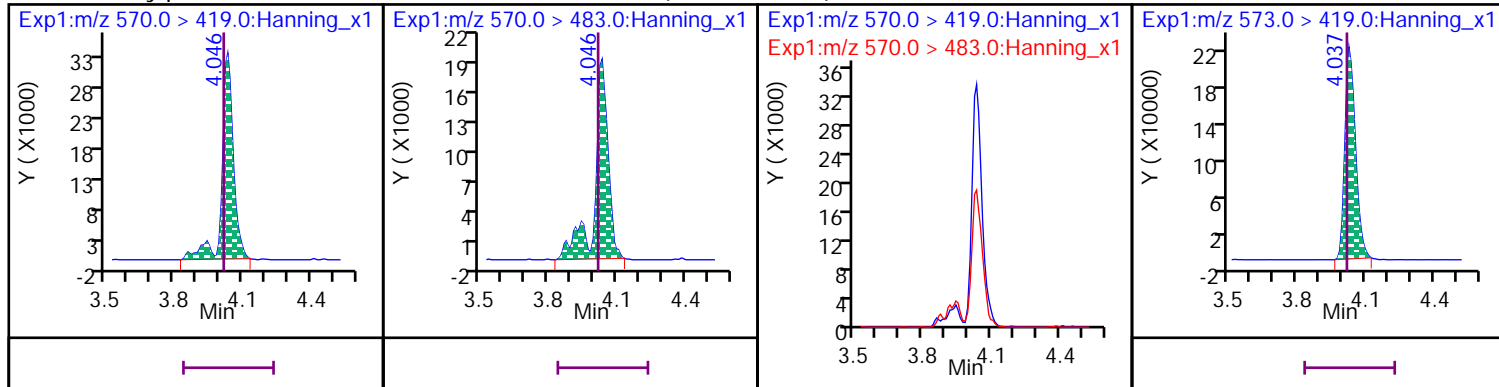
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



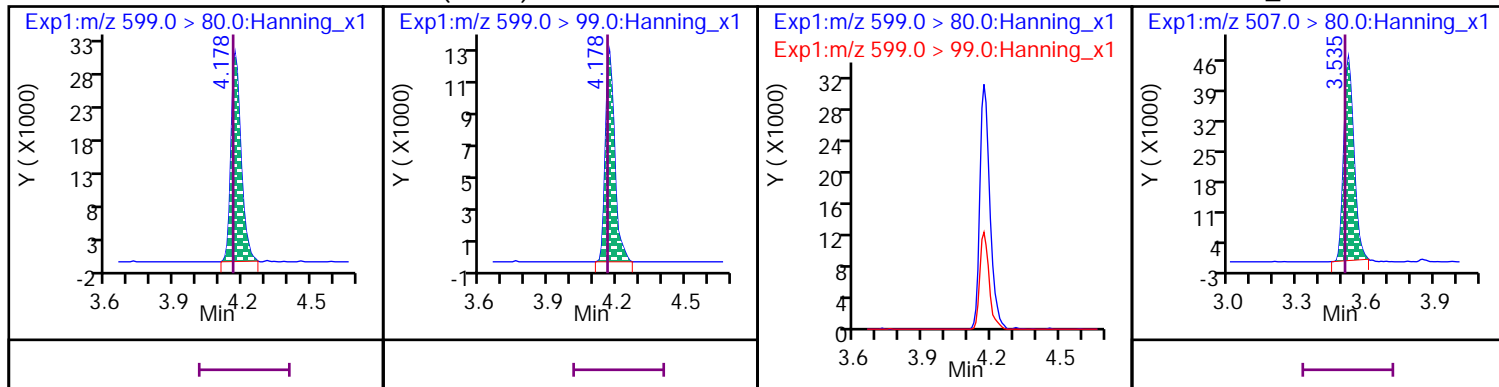
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



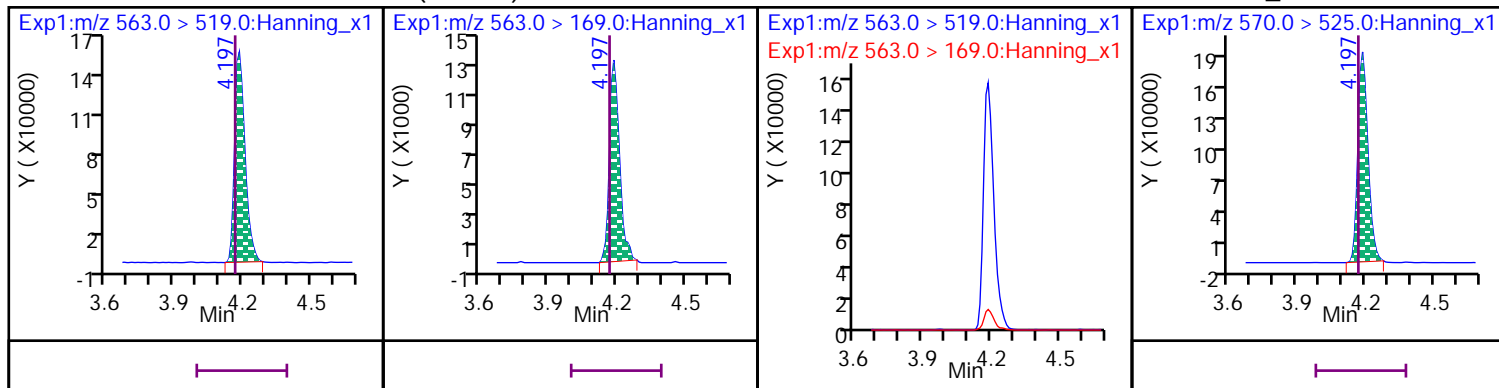
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



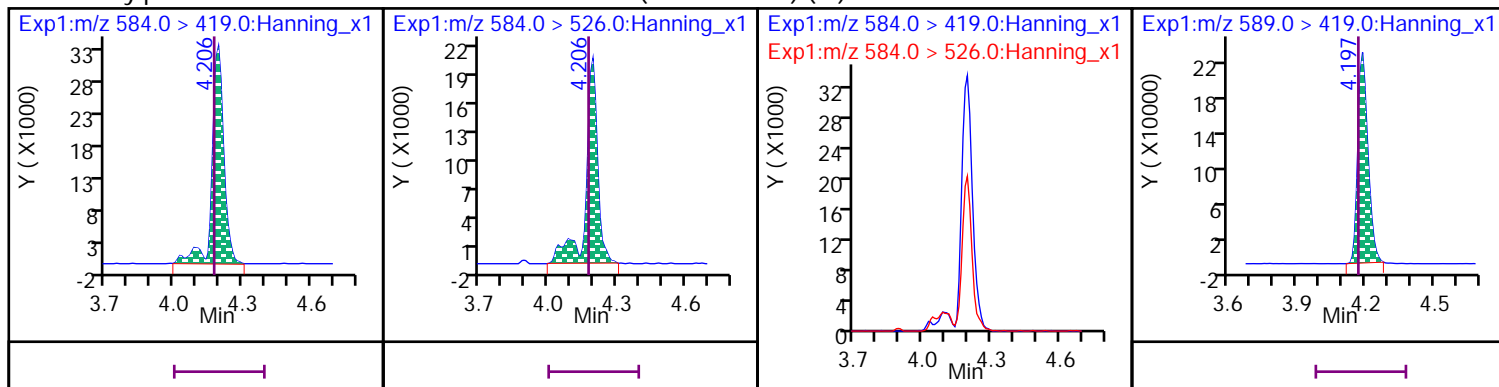
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



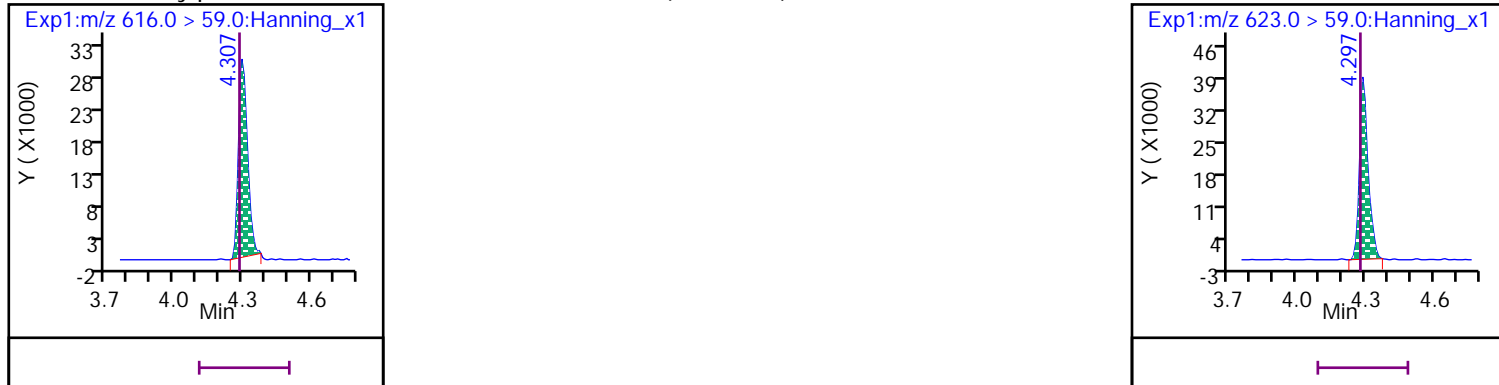
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



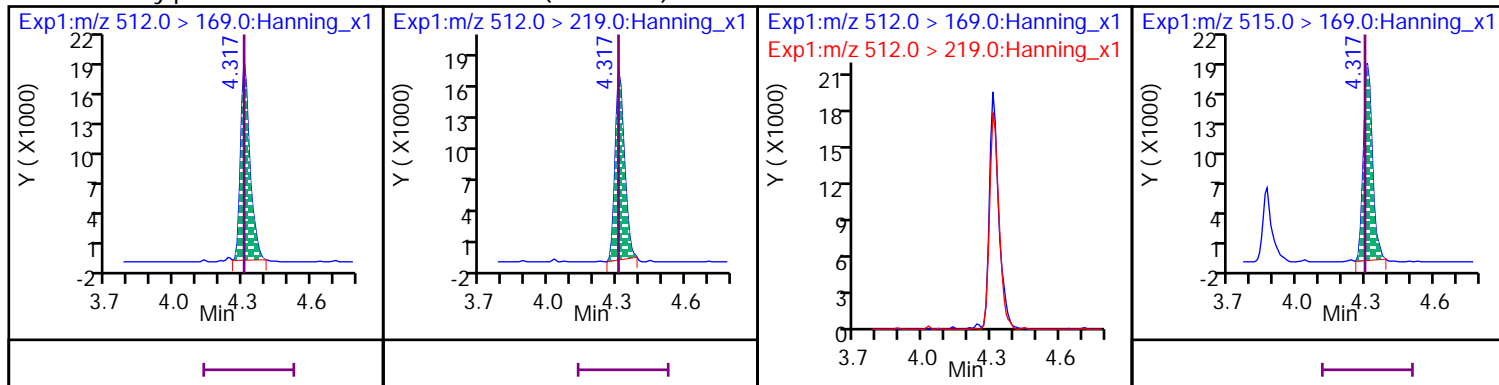
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

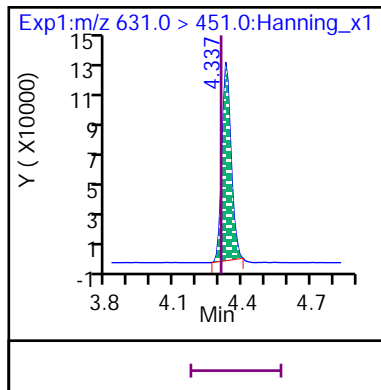


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

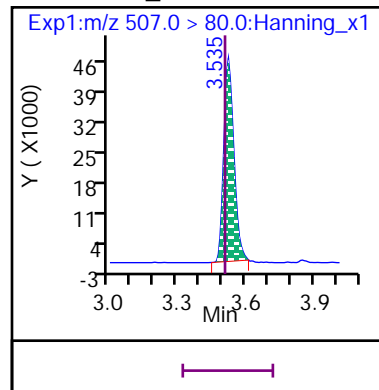
D 57 d3-MeFOSA



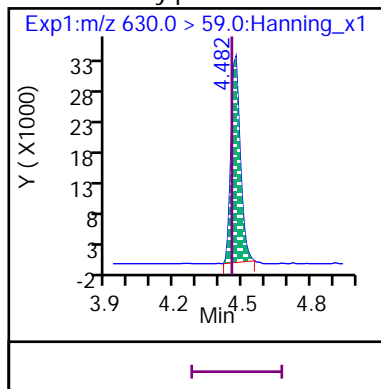
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



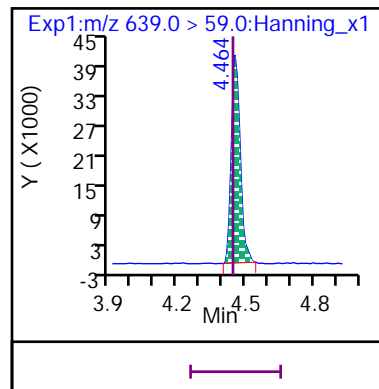
D 54 13C8\_PFOS



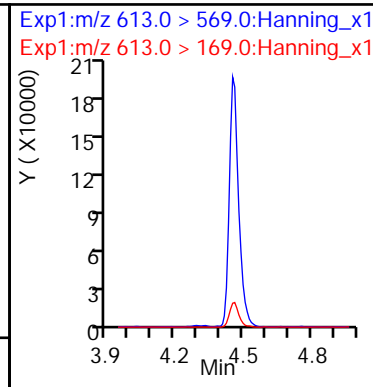
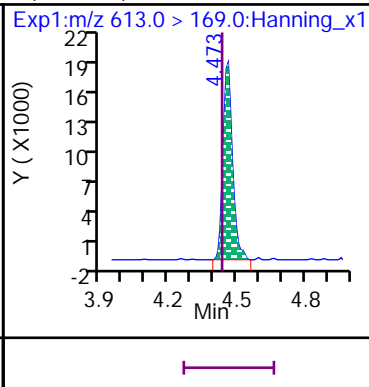
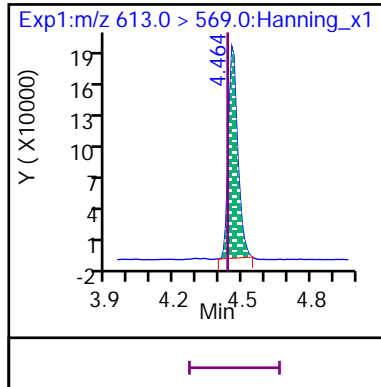
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



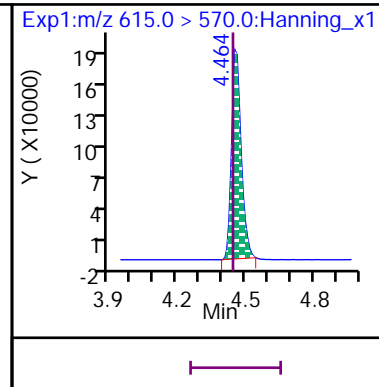
D 62 d9-EtFOSE



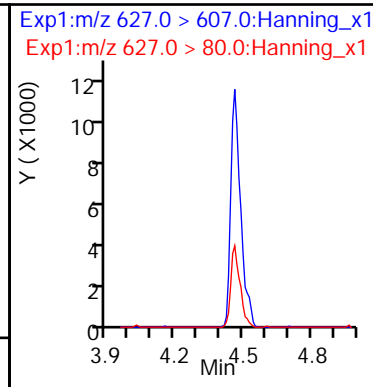
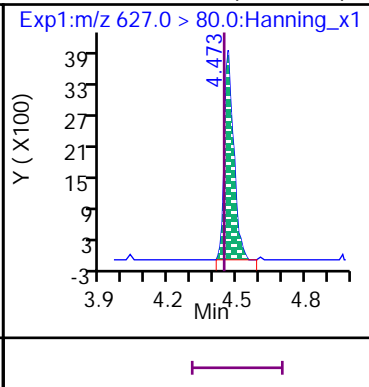
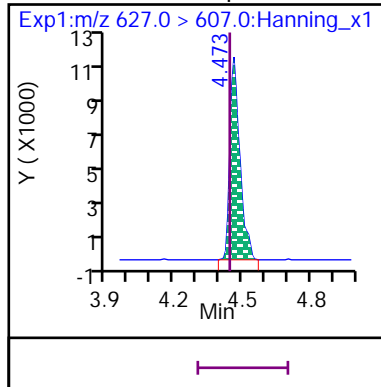
11 Perfluoro-n-dodecanoic acid (PFDoA)



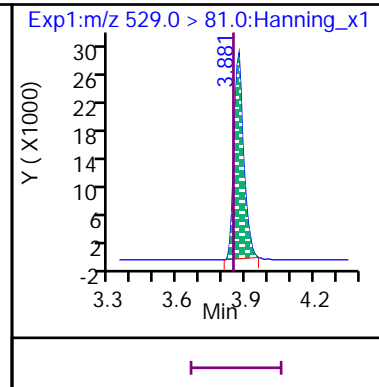
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

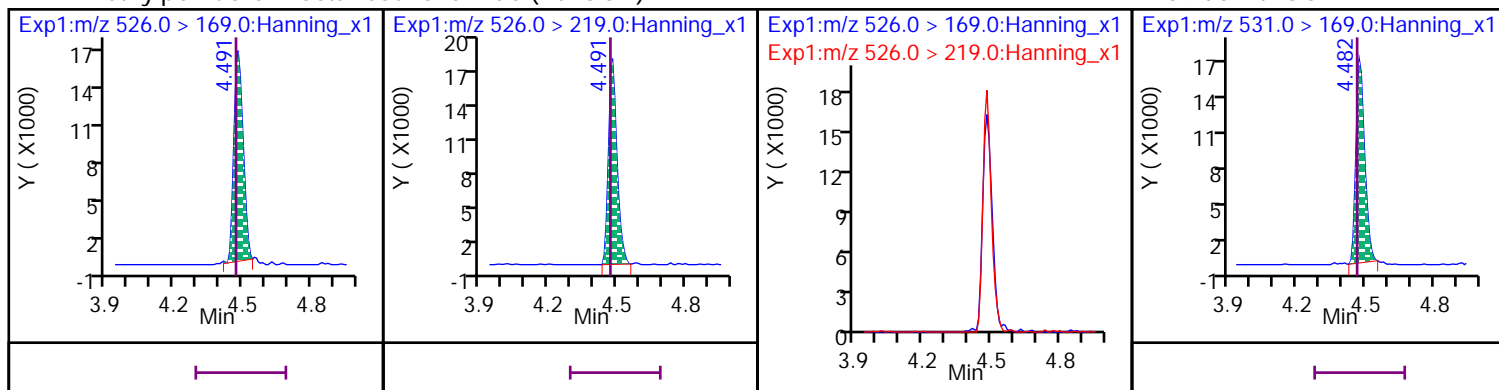


D 65 13C2\_8:2 FTS\_2



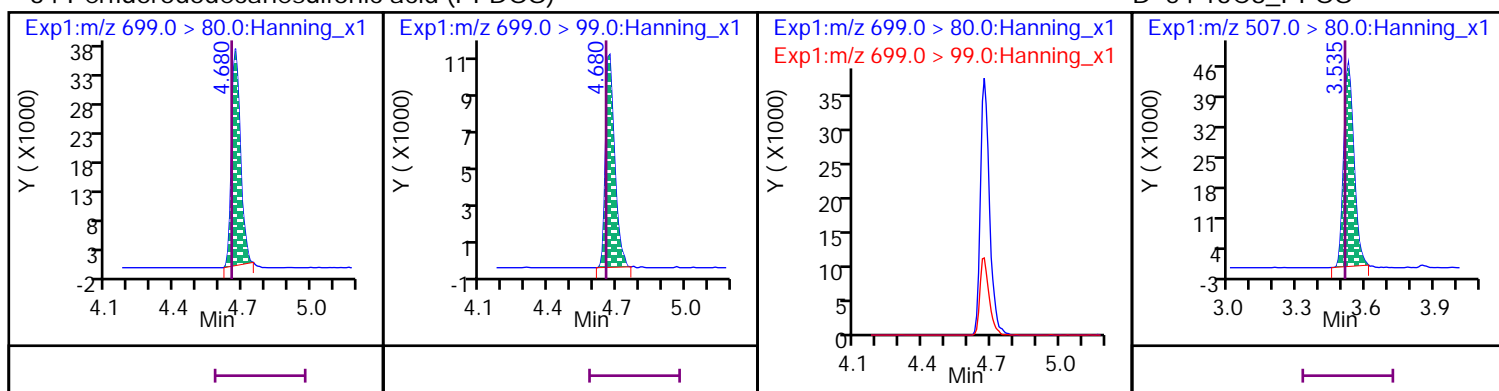
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



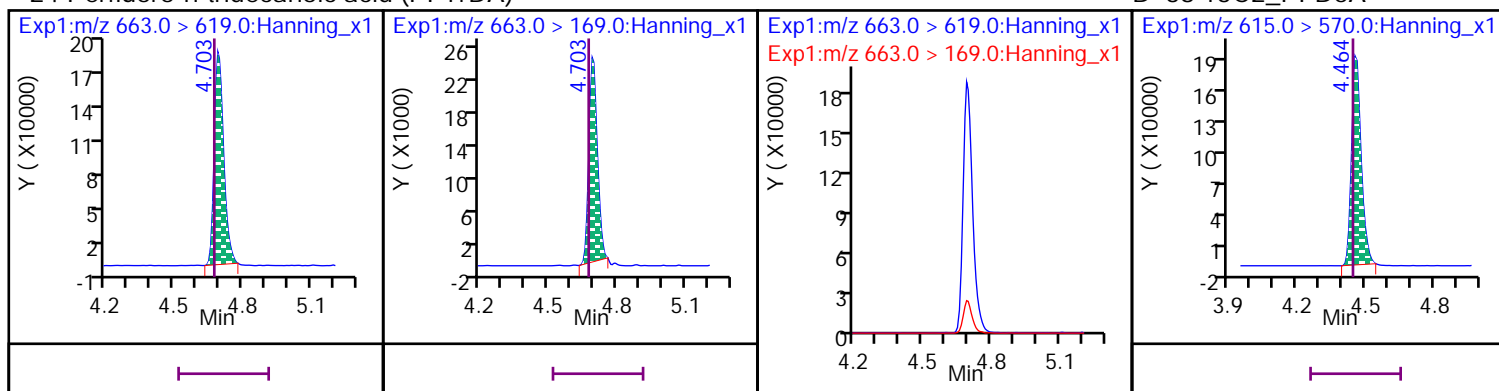
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



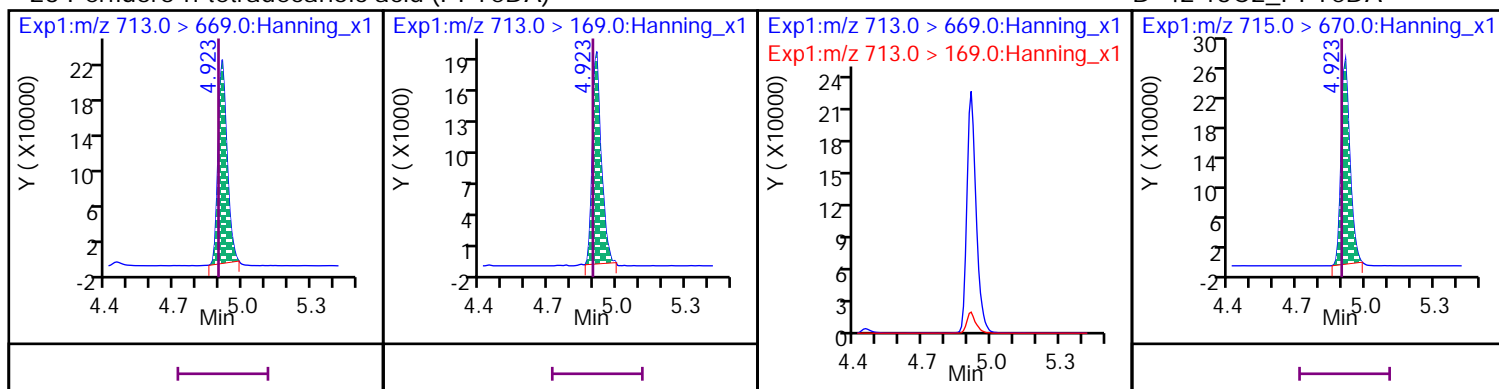
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



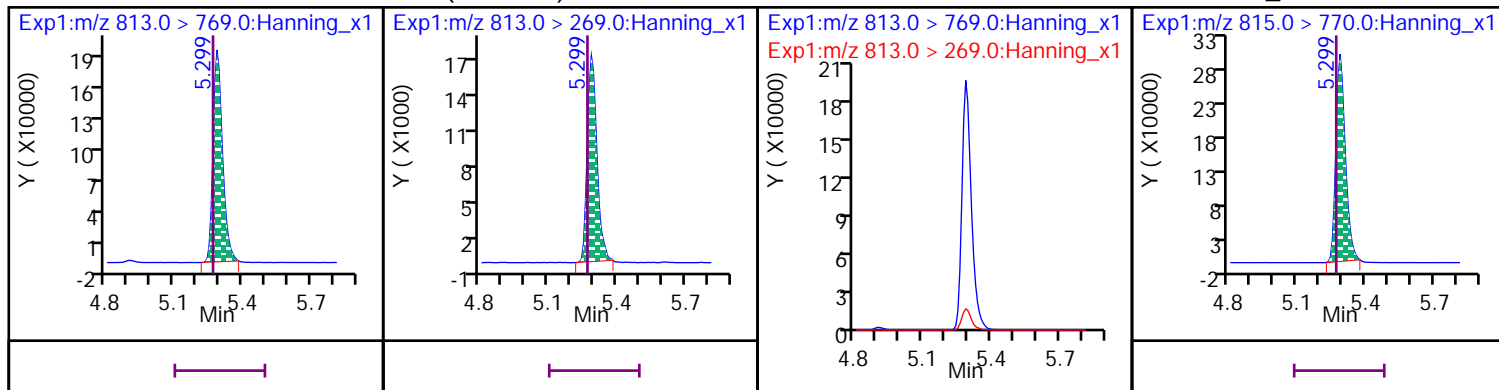
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



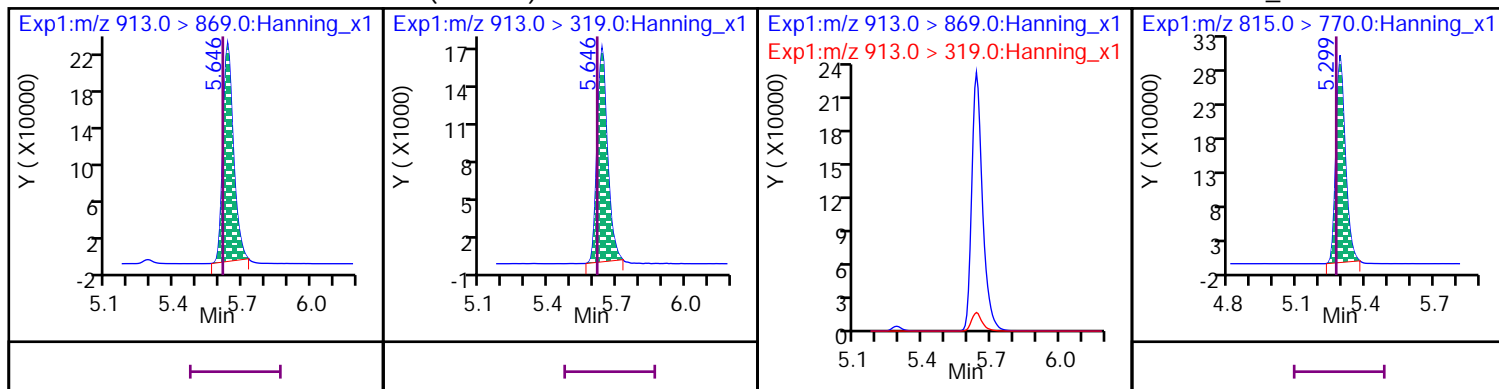
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

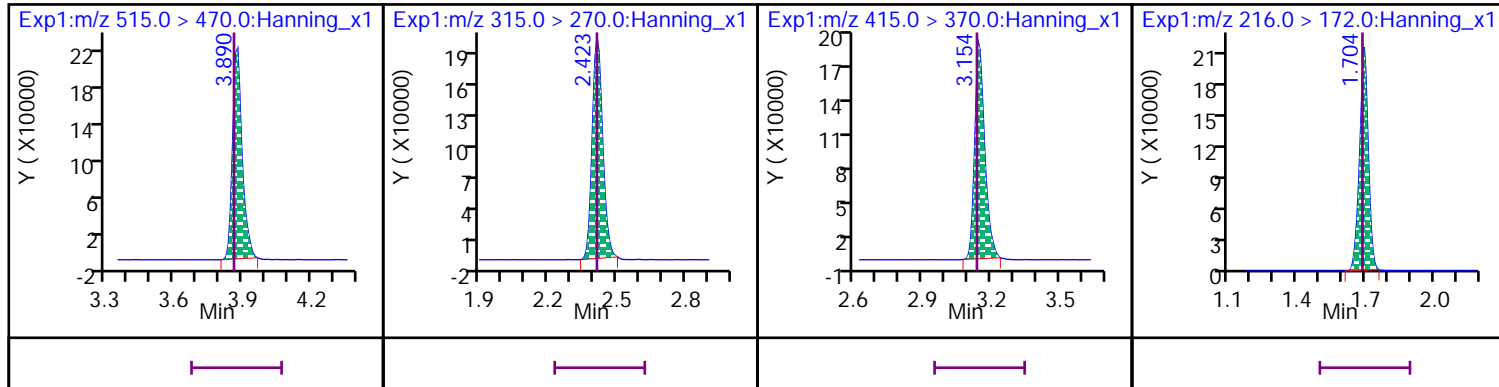


\* 37 13C2\_PFDA

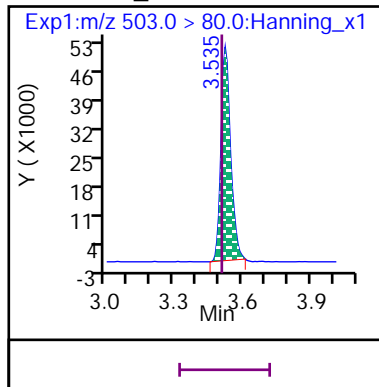
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

Sample Info: ID CCV 1000D\_SVLC-1248

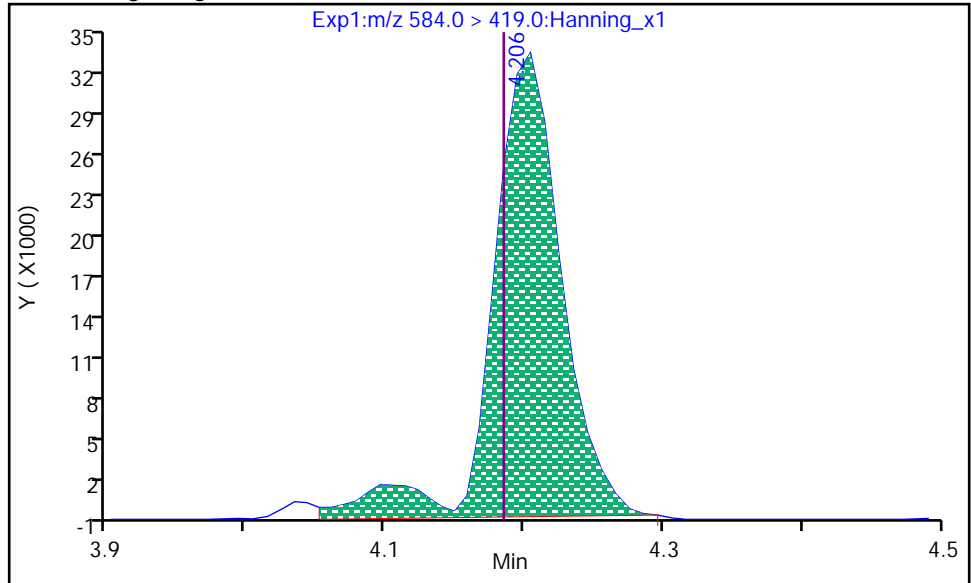
Dil. Factor: 1

Operator: Matthew M. Miller

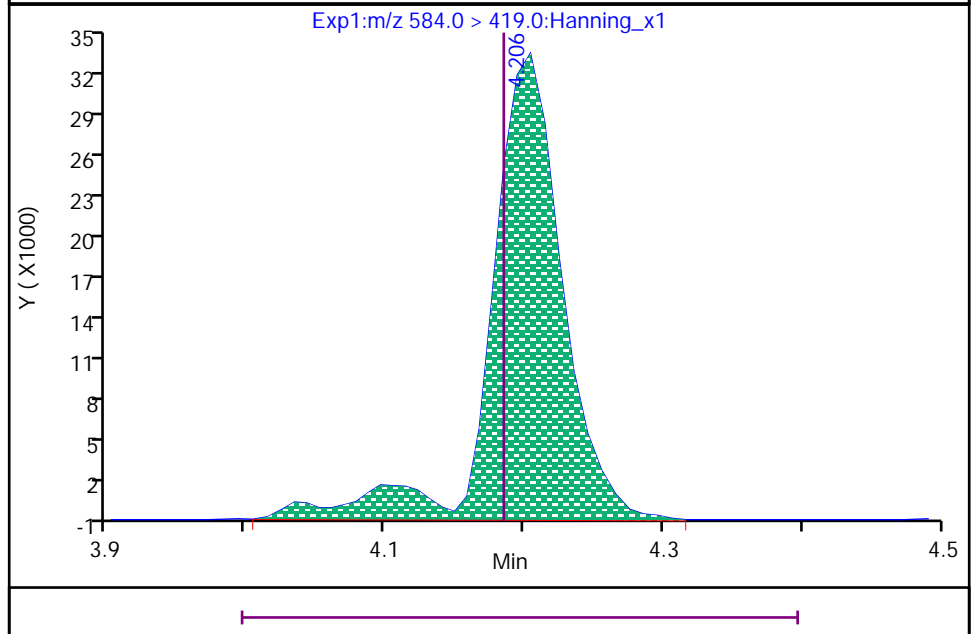
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.206  
Area: 114962  
Amount: 825.60  
Amount Units: ng/L



RT: 4.206  
Area: 120127  
Amount: 862.69  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:52:58

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820061.d

Injection Date: 28-Dec-2020 19:50:36

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000D\_SVLC-1248

Sample Info: ID CCV 1000D\_SVLC-1248

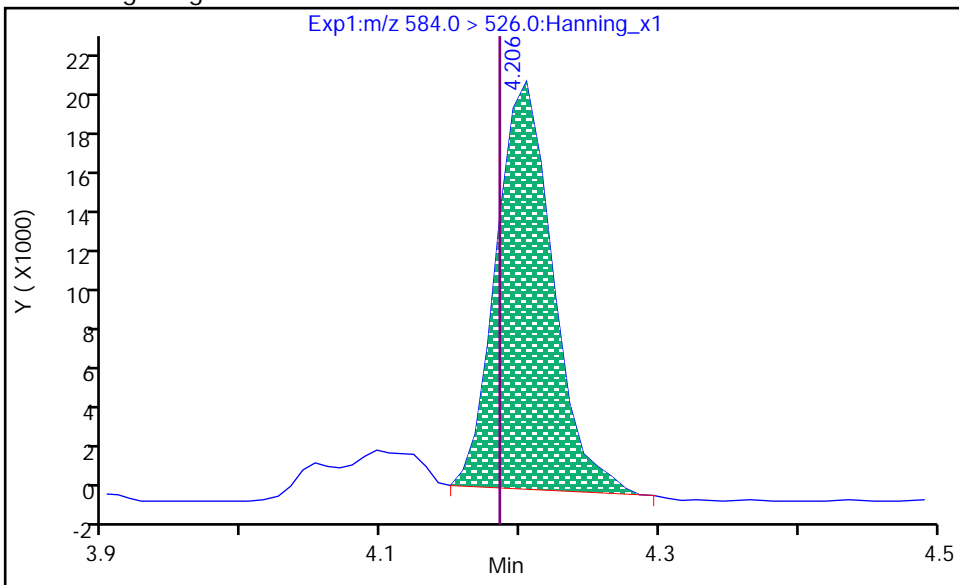
Dil. Factor: 1

Operator: Matthew M. Miller

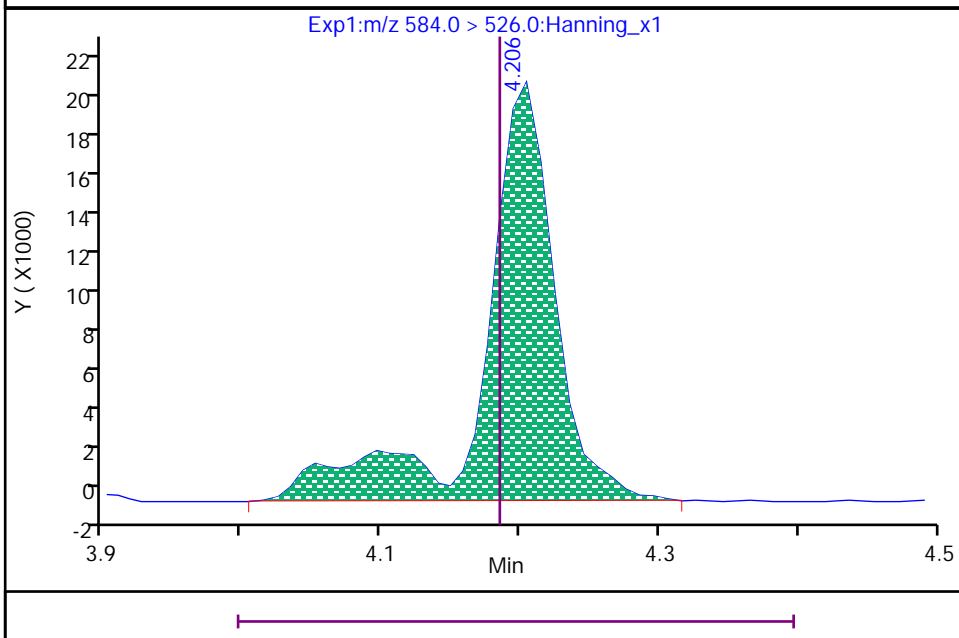
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.206  
Area: 55401  
Amount: 862.69  
Amount Units: ng/L



RT: 4.206  
Area: 71724  
Amount: 862.69  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:53:02

Audit Action: Mint

Audit Reason: Invalid Integration



Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d  
Injection Date: 29-Dec-2020 10:13:38 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 95  
Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	105.54	106	70 - 130
D 46 13C4_PFBA	735341	669792			91.1	50 - 150
D 50 13C5_PFPeA	728206	688361			94.5	50 - 150
21 PFPeA			100.00	107.43	107	70 - 130
7 PFBS			88.400	85.769	97	70 - 130
D 44 13C3_PFBS	247575	241196			97.4	50 - 150
1 4:2 FTS			93.400	107.91	116	70 - 130
D 63 13C2_4:2 FTS_2	126464	136264			108	50 - 150
D 49 13C5_PFHxA	774364	755876			97.6	50 - 150
15 PFHxA			100.00	104.20	104	70 - 130
22 PFPeS			93.800	91.523	97.6	70 - 130
28 GenX			200.00	201.70	101	70 - 130
D 66 13C3_GenX	1412202	1415766			100	50 - 150
D 47 13C4_PFHpA	616003	613536			99.6	50 - 150
13 PFHpA			100.00	107.11	107	70 - 130
D 45 13C3_PFHxS	179294	185779			104	50 - 150
14 PFHxS			91.000	96.579	106	70 - 130
29 ADONA			94.200	93.123	98.9	70 - 130
D 64 13C2_6:2 FTS_2	104623	105371			101	50 - 150
2 6:2 FTS			94.800	97.263	103	70 - 130
20 PFOA			100.00	107.57	108	70 - 130
D 53 13C8_PFOA	654941	607240			92.7	50 - 150
12 PFHpS			95.200	104.37	110	70 - 130
18 PFOS			92.800	100.19	108	70 - 130
17 PFNA			100.00	103.89	104	70 - 130
D 56 13C9_PFNA	792377	787757			99.4	50 - 150
D 54 13C8_PFOS	154357	153541			99.5	50 - 150
30 9CI-PF3ONS			93.200	102.93	110	70 - 130
D 55 13C8_PFOA	330552	318847			96.5	50 - 150
19 PFOSA			100.00	114.29	114	70 - 130
16 PFNS			96.000	116.88	122	70 - 130
D 65 13C2_8:2 FTS_2	93314	104593			112	50 - 150
3 8:2 FTS			95.800	110.01	115	70 - 130
10 PFDA			100.00	102.56	103	70 - 130
D 51 13C6_PFDA	698114	701677			101	50 - 150
D 58 d3-MeFOSAA	762102	727199			95.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	117.72	118	70 - 130
9 PFDS			96.400	115.41	120	70 - 130
5 N-EtFOSAA			100.00	98.350	98.3	70 - 130
25 PFUdA			100.00	103.40	103	70 - 130
D 60 d5-EtFOSAA	738335	710460			96.2	50 - 150
D 52 13C7_PFUdA	678701	641343			94.5	50 - 150
D 61 d7-MeFOSE	117292	96951			82.7	50 - 150
32 MeFOSE			100.00	97.568	97.6	70 - 130
26 MeFOSA			100.00	130.24	130	70 - 130
D 57 d3-MeFOSA	54969	52459			95.4	50 - 150
31 11Cl-PF3OUDS			94.200	94.419	100	70 - 130
D 62 d9-EtFOSE	121851	123442			101	50 - 150
33 EtFOSE			100.00	100.94	101	70 - 130
D 59 d5-EtFOSA	51517	48002			93.2	50 - 150
D 38 13C2_PFDoA	649290	609821			93.9	50 - 150
4 10:2 FTS			96.400	80.905	83.9	70 - 130
27 EtFOSA			100.00	79.992	80	70 - 130
11 PFDoA			100.00	101.36	101	70 - 130
34 PFDOS			96.800	108.56	112	70 - 130
24 PFTrDA			100.00	100.28	100	70 - 130
23 PFTeDA			100.00	114.52	115	70 - 130
D 42 13C2_PFTeDA	887372	786208			88.6	50 - 150
35 PFHxDA			100.00	112.42	112	70 - 130
D 40 13C2_PFHxDA	913664	908883			99.5	50 - 150
36 PFODA			100.00	102.31	102	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d  
 Injection Date: 29-Dec-2020 10:13:38 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 95  
 Sample Info: ID CCV 100\_SVLC-1220 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.702	1.702	1	669792	23	>100:1			1000.00	965.74	91.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.709	1.709	1/0	70406	23	38:1			100.00	105.54		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.080	2.080	1	688361	17	>100:1			1000.00	1000.69	94.5	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.080	2.080	1/0	74348	16	>100:1			100.00	107.43		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.133	2.133	1	241196	17	>100:1			1000.00	1047.63	97.4	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.133	2.133	1/0	24391	16	>100:1	Target = 3.50		88.400	85.769		
298.9 > 99	44	2.133	2.133		7050	18	69:1	3.45 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.446	2.446	0/-1	19149	15	>100:1	Target = 3.10		93.800	91.523		
349 > 99	44	2.455	2.446		6737	24	66:1	2.84 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.393	2.393	1	136264	21	>100:1			5000.00	5628.81	108	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.393	2.393	1/0	5869	22	90:1	Target = 1.80		93.400	107.91		
327 > 81	63	2.402	2.393		4067	25	23:1	1.44 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.429	2.429	1	755876	20	>100:1			1000.00	1025.51	97.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.420	2.420	0/-1	77758	19	>100:1	Target = 18.34		100.00	104.20		
313 > 119	49	2.429	2.420		3614	15	29:1	21.51 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.536	2.536	0	1415766	20	>100:1			5000.00	5315.36	100	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.536	2.536	0/0	41032	20	>100:1	Target = 0.81		200.00	201.70		
285 > 185	66	2.536	2.536		50585	18	>100:1	0.81 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.777	2.777	0	613536	22	>100:1			1000.00	1011.36	99.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.786	2.786	0/0	68164	20	94:1	Target = 3.70		100.00	107.11		
363 > 169	47	2.777	2.786		16876	19	55:1	4.03 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.795	2.795	0	185779	19	>100:1			1000.00	1084.98	104	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.795	2.795	0/0	19024	26	>100:1	Target = 3.21	0.16	91.000	96.579		
399 > 99	45	2.804	2.795		6319	24	29:1	3.01 (1.60-4.81)	0.09				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.823	2.823	0/0	109837	19	>100:1	Target = 2.97		94.200	93.123		
377 > 85	45	2.814	2.823		36417	27	>100:1	3.01 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.166	3.166	0/0	17614	23	>100:1	Target = 3.08		95.200	104.37		
449 > 99	45	3.172	3.166		6016	21	58:1	2.92 (1.54-4.63)					M
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.132	3.132	0	105371	29	>100:1			5000.00	5471.43	101	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.139	3.139	1/1	5353	26	67:1	Target = 1.80		94.800	97.263		
427 > 81	64	3.145	3.139		2873	17		1.86 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.159	3.159	0	607240	25	>100:1			1000.00	1025.98	92.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.159	3.159	0/0	66590	22	44:1	Target = 2.87		100.00	107.57		
413 > 169	53	3.152	3.159		25388	23	>100:1	2.62 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.533	3.533	0	153541	20	>100:1			1000.00	1024.09	99.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.533	3.533	0/0	18229	37		Target = 3.84	0.53	92.800	100.19		M
499 > 99	54	3.526	3.533		5412	42	37:1	3.36 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.740	3.740	0/0	53204	21	>100:1			93.200	102.93		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.879	3.879	0/0	13733	17	>100:1	Target = 3.07		96.000	116.88		
549 > 99	54	3.870	3.879		4009	23		3.42 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.175	4.175	-1/-1	12860	20	>100:1	Target = 3.03		96.400	115.41		
599 > 99	54	4.184	4.175		4036	22	17:1	3.18 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.334	4.334	-1/-1	41171	17	>100:1			94.200	94.419		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.677	4.677	-1/-1	13382	16	>100:1	Target = 3.33		96.800	108.56		
699 > 99	54	4.669	4.677		4146	16	38:1	3.22 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.533	3.533	0	787757	22	>100:1			1000.00	1049.00	99.4	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.533	3.533	0/0	81843	20	>100:1	Target = 6.16		100.00	103.89		
463 > 169	56	3.533	3.533		14635	17	>100:1	5.59 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.854	3.854	0	318847	20	>100:1			1000.00	1029.99	96.5	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.854	3.854	0/0	35912	27	>100:1			100.00	114.29		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.879	3.879	0	104593	21				5000.00	5638.39	112	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.911	3.911	3/3	5245	20	15:1	Target = 1.95		95.800	110.01		M
527 > 81	65	3.879	3.911		3013	23		1.74 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.479	4.479	0/0	3911	20	46:1	Target = 3.14		96.400	80.905		
627 > 80	65	4.470	4.479		1794	16		2.18 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.887	3.887	0	701677	20	>100:1			1000.00	1057.81	101	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.887	3.887	0/0	70709	20	92:1	Target = 15.94		100.00	102.56		
513 > 169	51	3.879	3.887		4938	20	9.4:1	14.31 (7.97-23.91)					M
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.034	4.034	-1	727199	17	>100:1			5000.00	5066.20	95.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.043	4.043	-1/0	13152	25	53:1	Target = 1.33	0.08	100.00	117.72		
570 > 483	58	4.043	4.043		8685	31	37:1	1.51 (0.66-1.99)	0.35				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.193	4.193	-1	710460	18	>100:1			5000.00	5349.26	96.2	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.203	4.203	0/1	13913	30	77:1	Target = 1.58	0.22	100.00	98.350		
584 > 526	60	4.193	4.203		7957	32	37:1	1.74 (0.79-2.37)	0.31				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.193	4.193	-1	641343	18	>100:1			1000.00	1014.66	94.5	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.193	4.193	-1/0	62330	19	>100:1	Target = 15.50		100.00	103.40		
563 > 169	52	4.203	4.193		5865	24		10.62 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.294	4.294	0	96951	17	>100:1			1000.00	895.97	82.7	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.304	4.304	0/0	8888	19	26:1			100.00	97.568		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.314	4.314	0	52459	16	80:1			1000.00	991.35	95.4	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.334	4.334	0/0	7708	24		Target = 1.12		100.00	130.24		
512 > 219	57	4.314	4.334		5478	18	47:1	1.40 (0.56-1.68)					M
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.461	4.461	0	123442	17	>100:1			1000.00	984.42	101	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.470	4.470	0/0	11086	17	43:1			100.00	100.94		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.461	4.461	-1	609821	19	>100:1			1000.00	1007.44	93.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.461	4.461	-1/0	62592	19	16:1	Target = 10.85		100.00	101.36		
613 > 169	38	4.470	4.461		5218	21	52:1	11.99 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.701	4.701	-1/0	60233	18	>100:1	Target = 8.37		100.00	100.28		
663 > 169	38	4.701	4.701		7924	21	82:1	7.60 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.479	4.479	0	48002	19	>100:1			1000.00	977.75	93.2	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.479	4.479	0/0	4195	14	36:1	Target = 1.03		100.00	79.992		
526 > 219	59	4.479	4.479		6209	23	32:1	0.67 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.918	4.918	-1	786208	18	>100:1			1000.00	933.25	88.6	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.918	4.918	-1/0	78009	19	11:1	Target = 12.11		100.00	114.52		
713 > 169	42	4.918	4.918		6944	23	41:1	11.23 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.296	5.296	-2	908883	19	>100:1			1000.00	1003.00	99.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.296	5.296	-2/0	66761	20	18:1	Target = 11.48		100.00	112.42		
813 > 269	40	5.296	5.296		5494	25	>100:1	12.15 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.643	5.643	-2/0	82316	24	10:1	Target = 13.88		100.00	102.31		
913 > 319	40	5.636	5.643		5602	24	>100:1	14.69 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.887	3.887	0	688059	22	>100:1					94.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.429	2.429	1	731130	19	>100:1					97.1	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.152	3.152	0	616634	25	>100:1					95.7	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.702	1.702	1	640092	24	>100:1					96.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.533	3.533	0	172175	23	>100:1					106	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID:

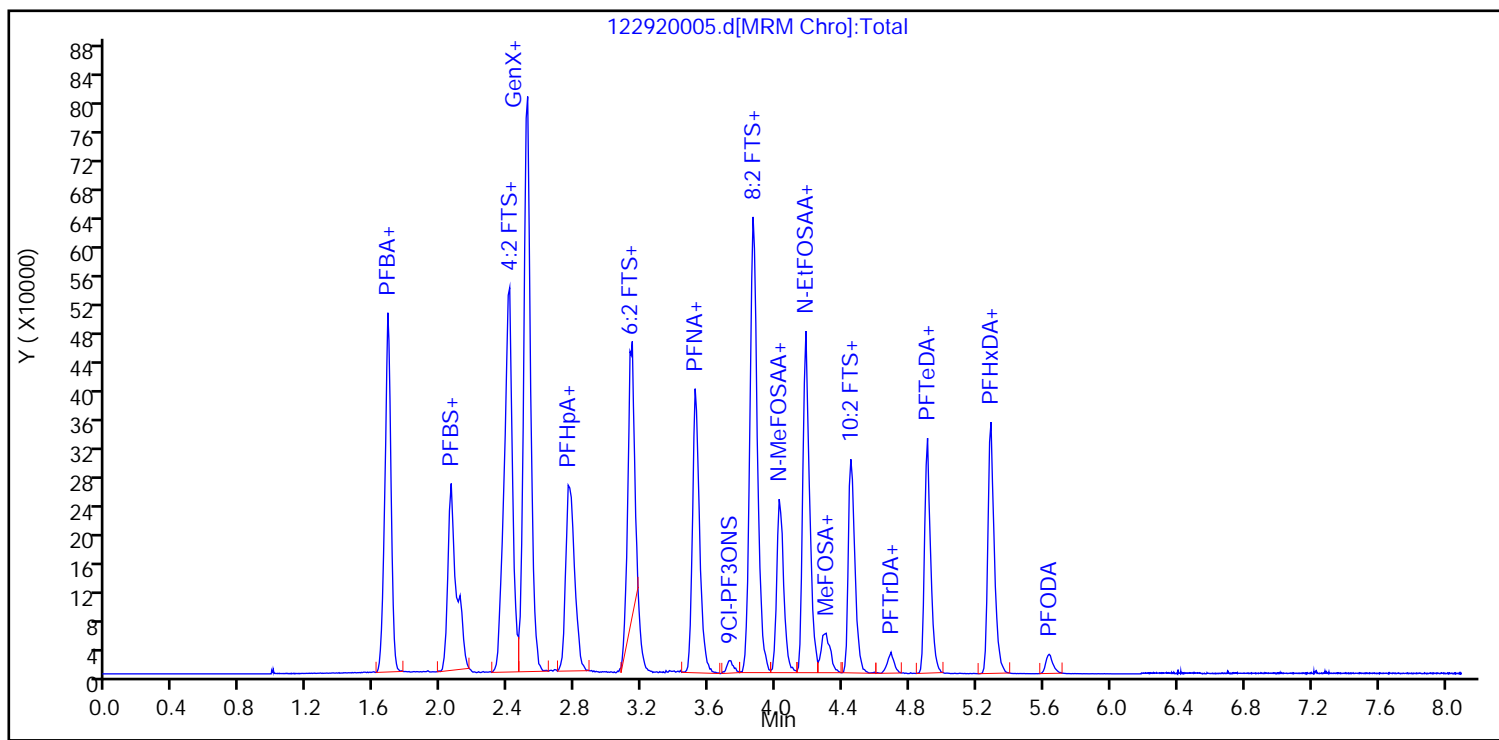
ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

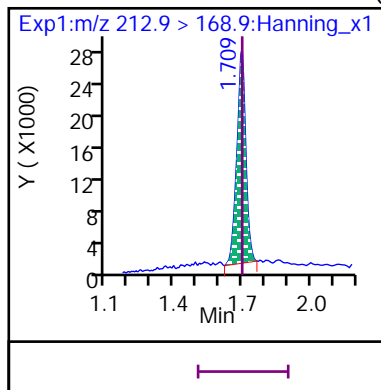
Dil. Factor: 1

Operator:

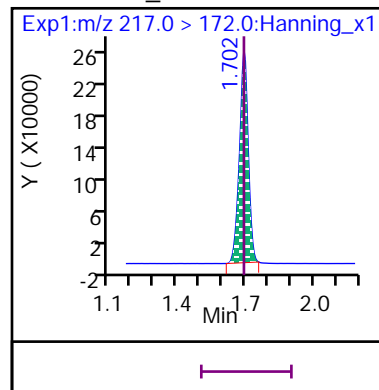
Matthew M. Miller



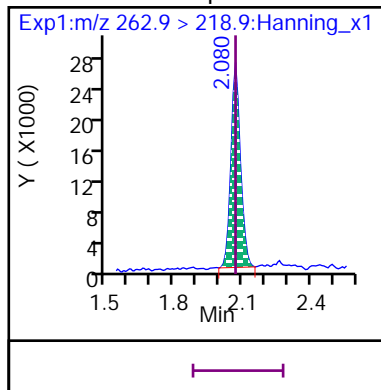
8 Perfluoro-n-butanoic acid (PFBA)



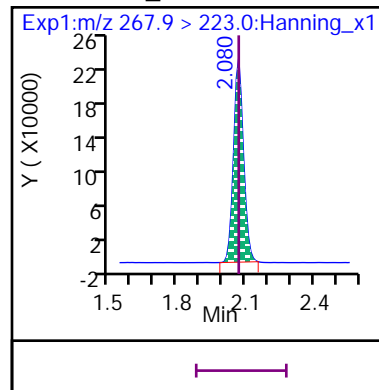
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

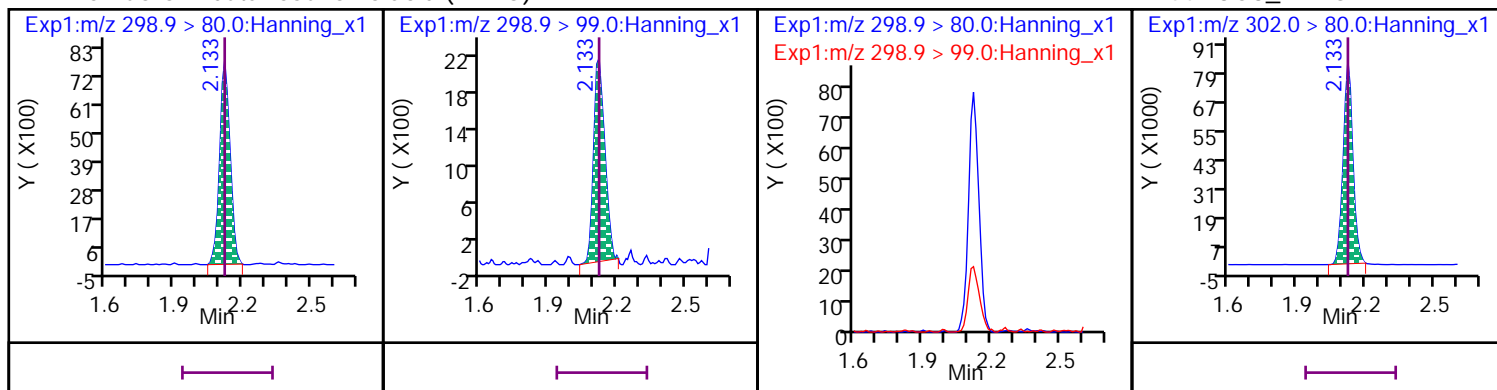


D 50 13C5\_PFPeA



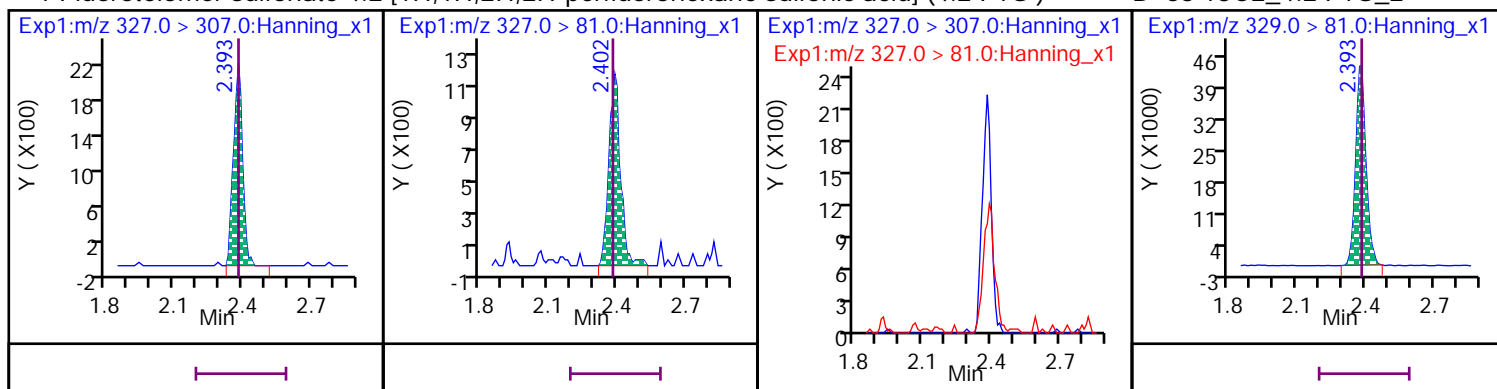
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



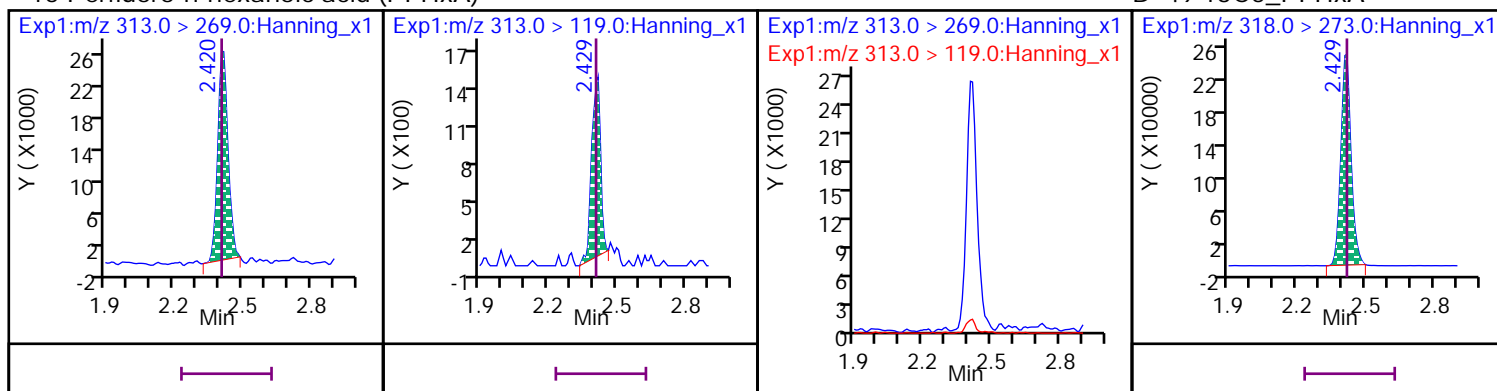
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



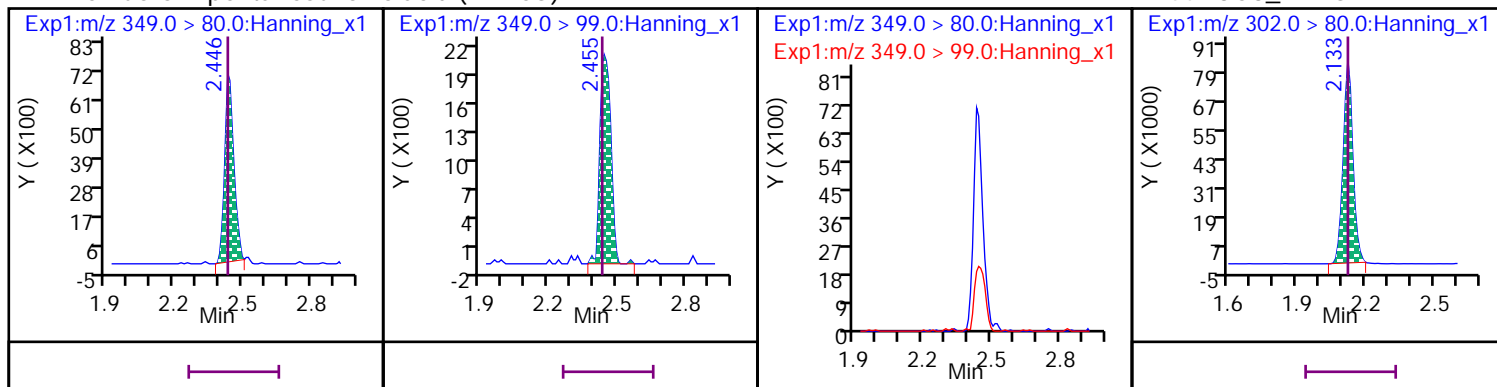
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

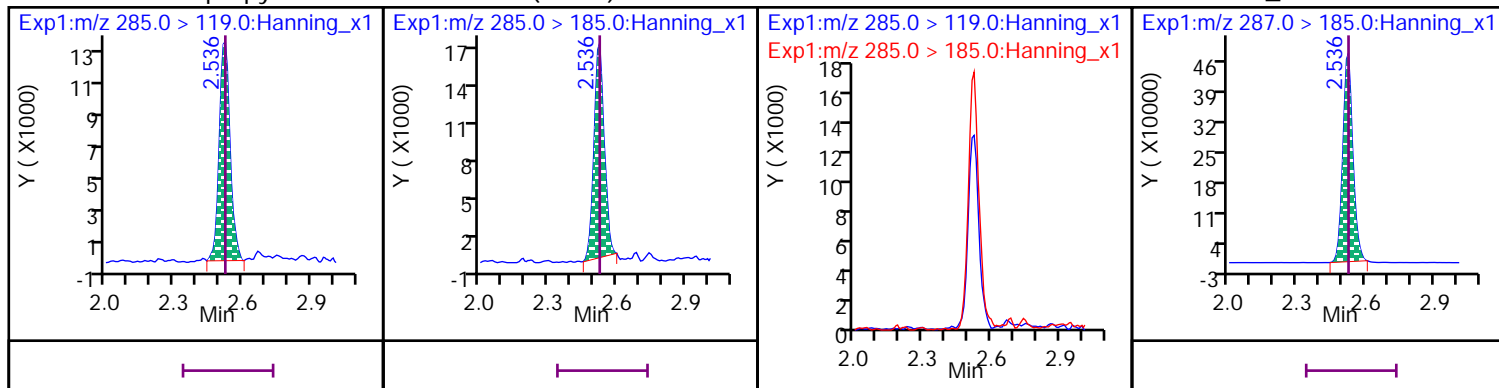
D 44 13C3\_PFBS





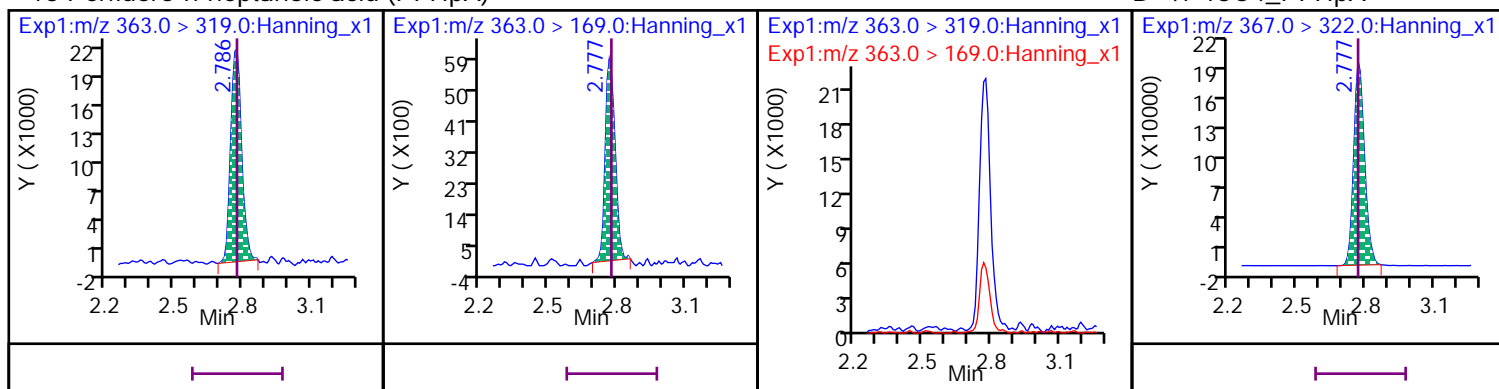
28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



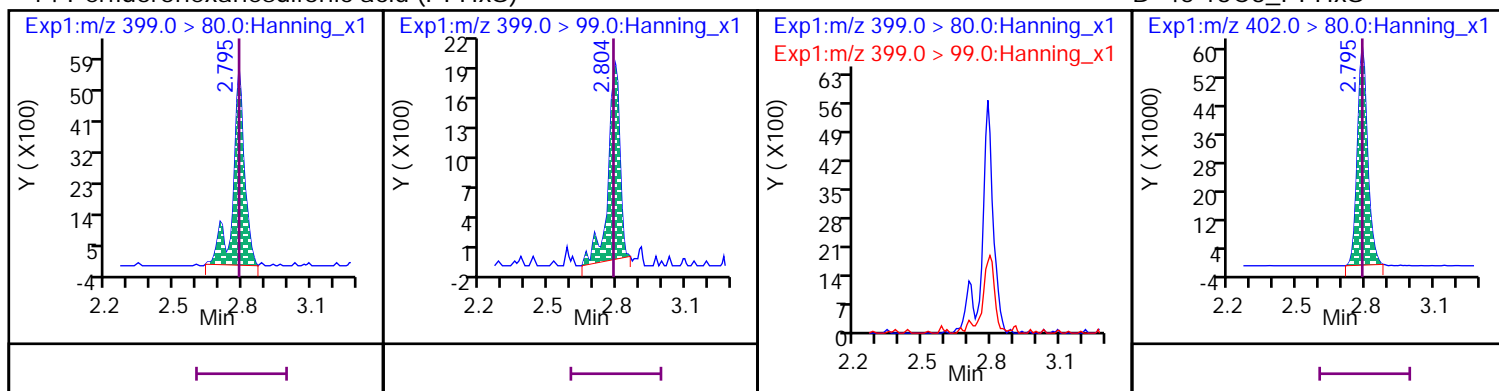
13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



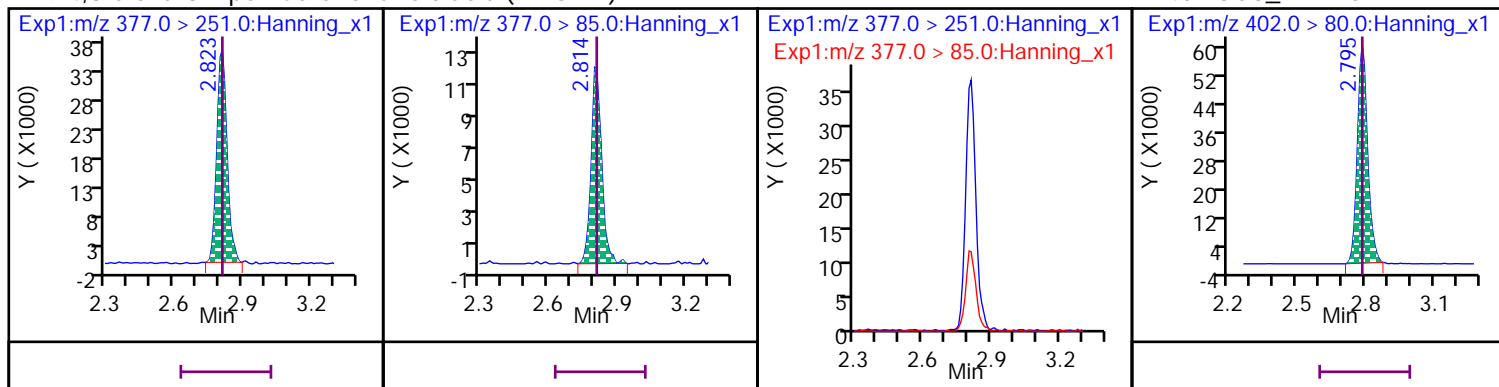
14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



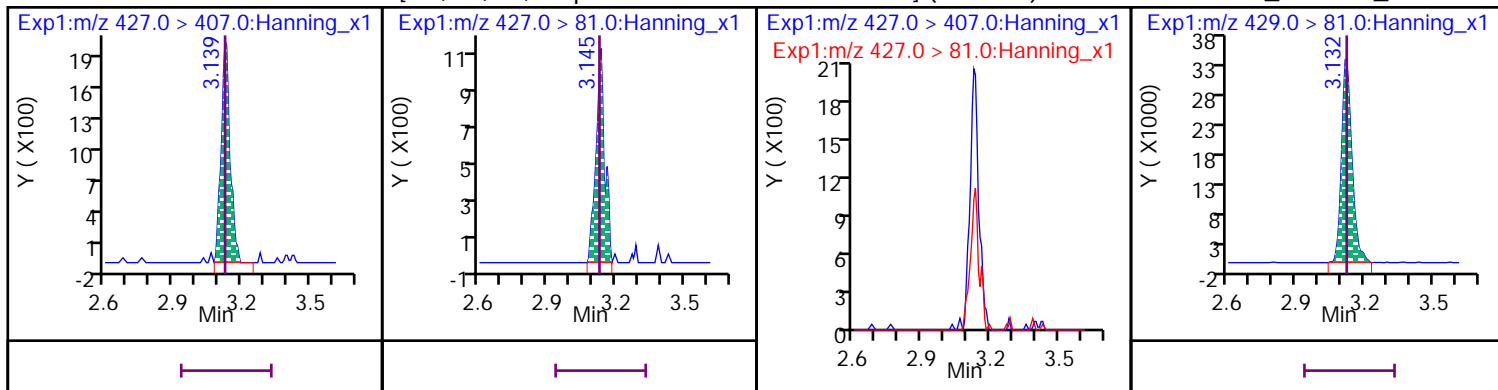
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



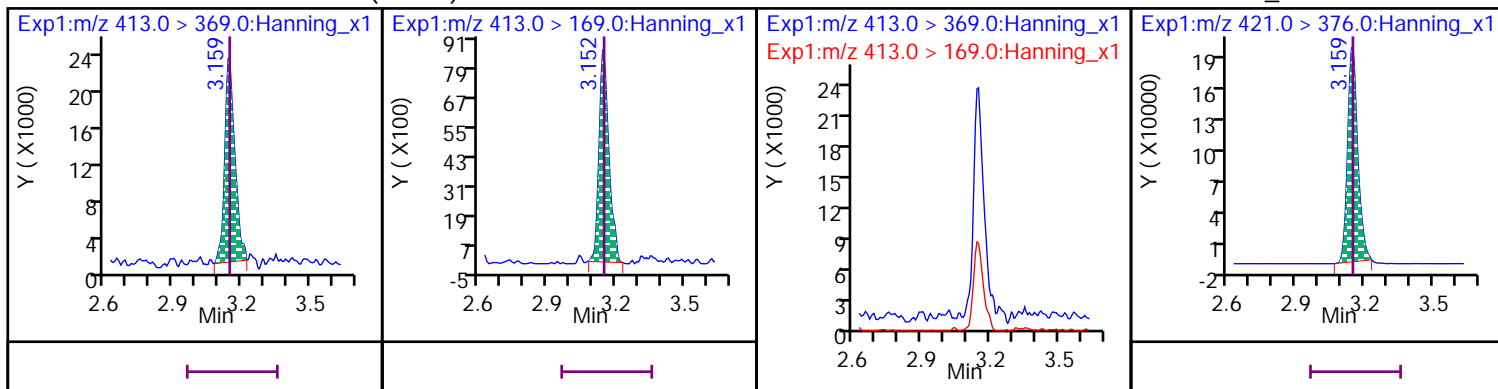
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



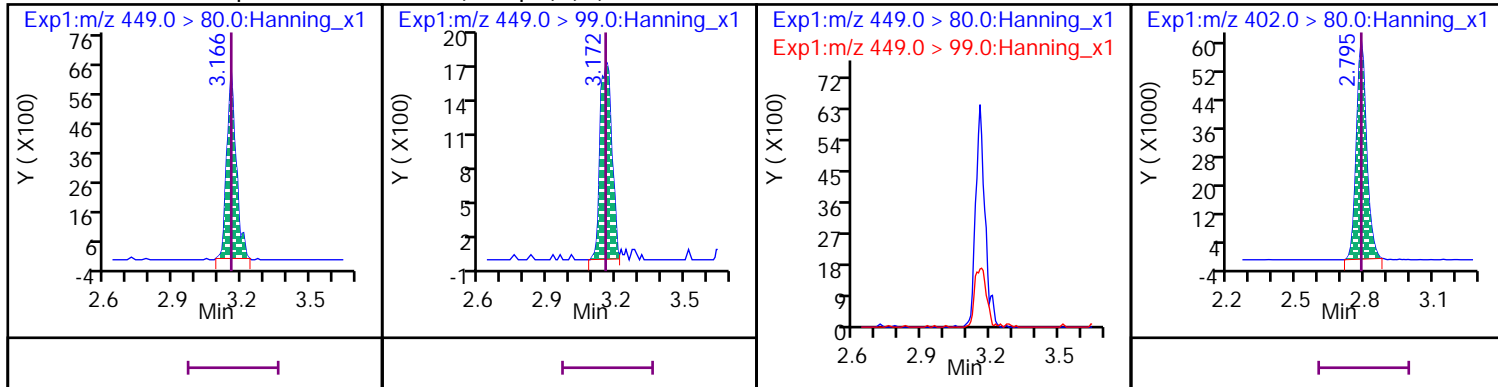
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



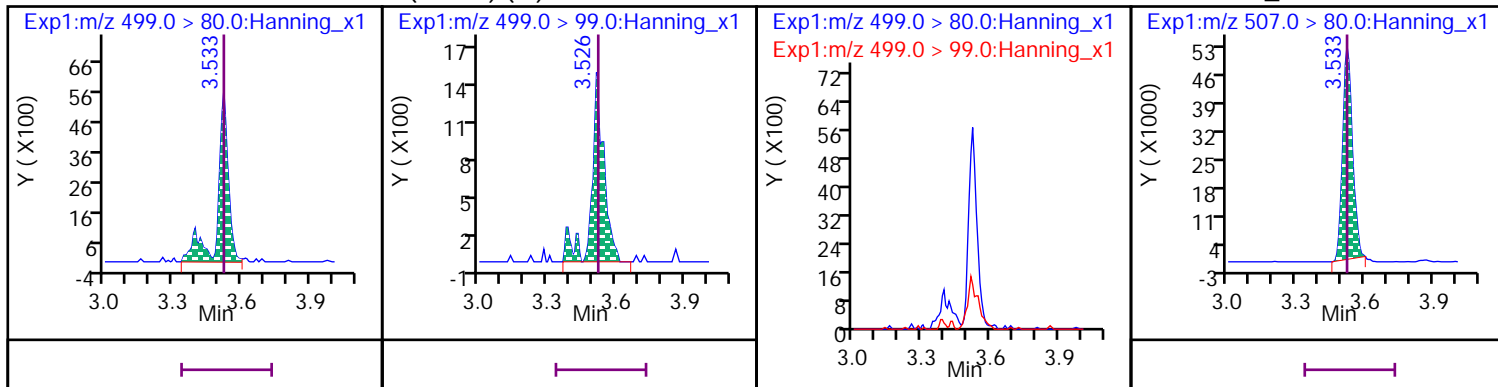
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (M)

D 45 13C3\_PFHxS



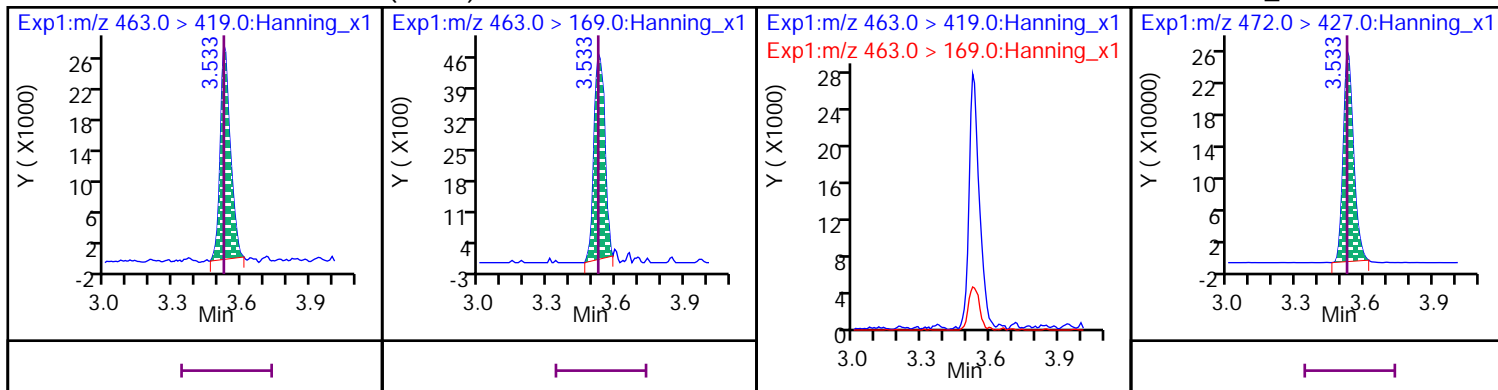
18 Perfluorooctanesulfonic acid (PFOS) (M)

D 54 13C8\_PFOS



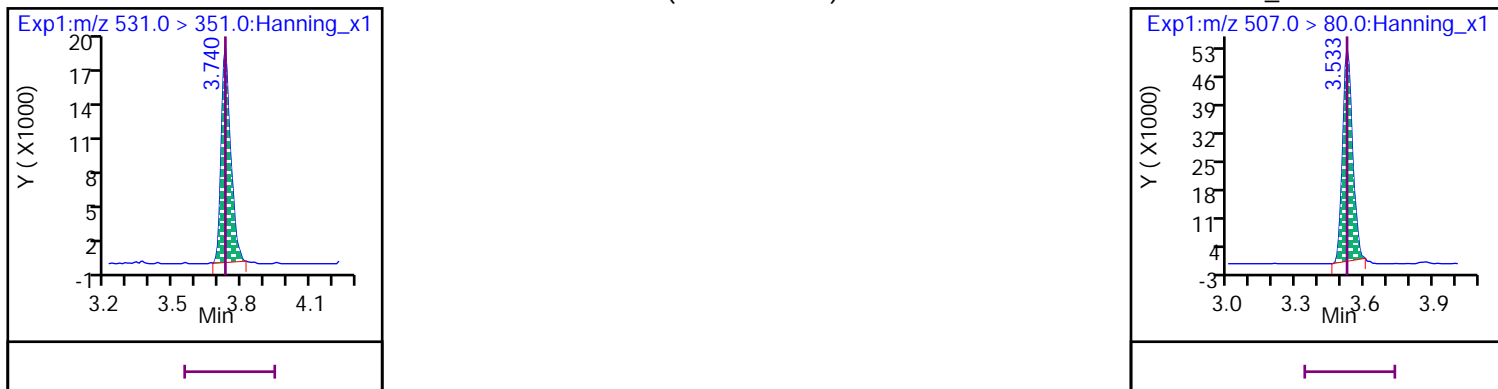
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



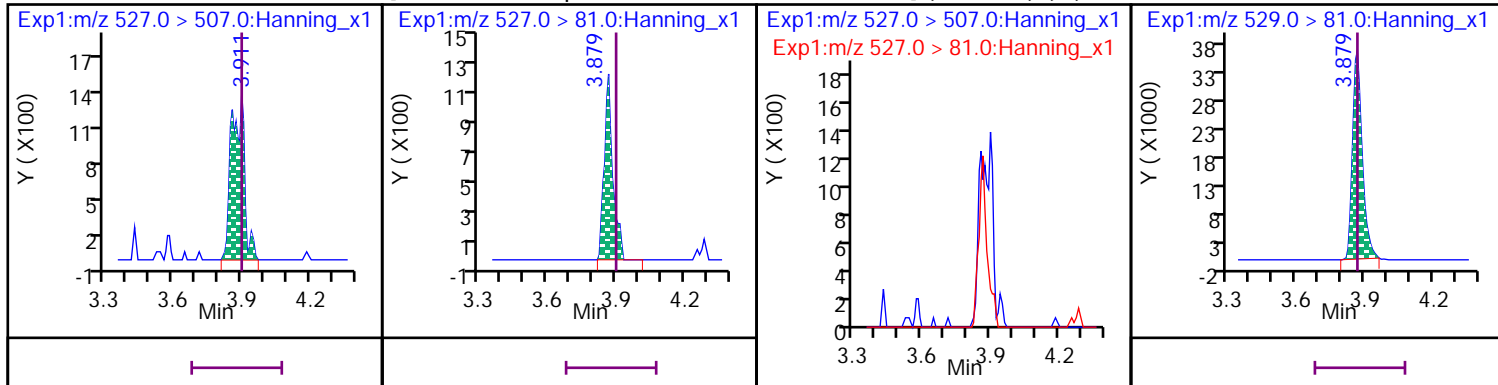
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



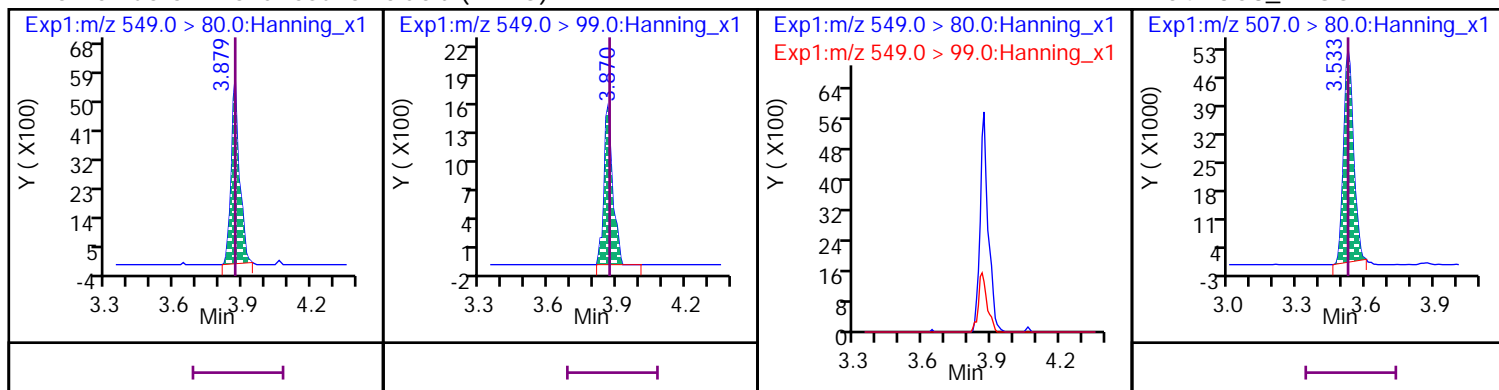
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (M)

D 65 13C2\_8:2 FTS\_2



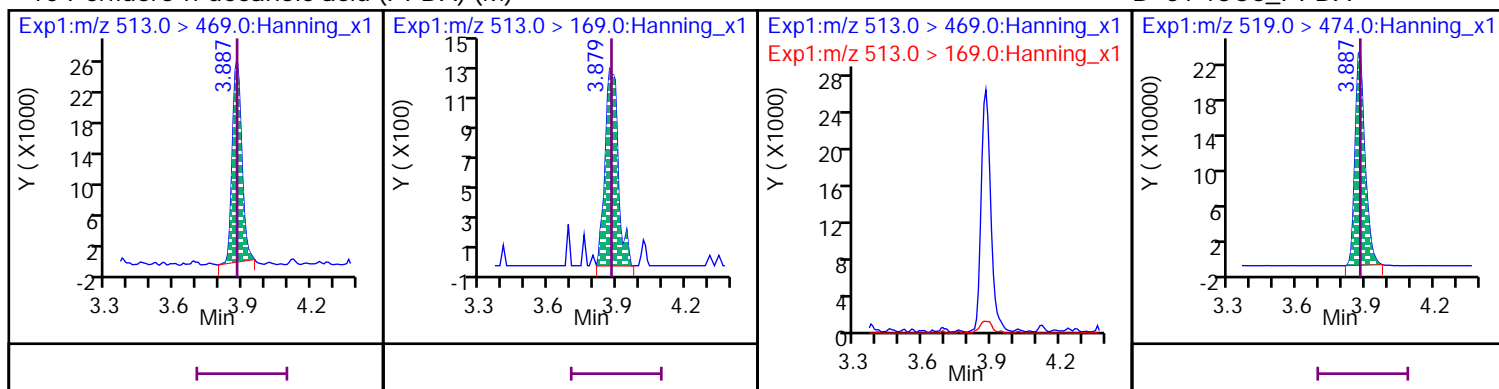
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



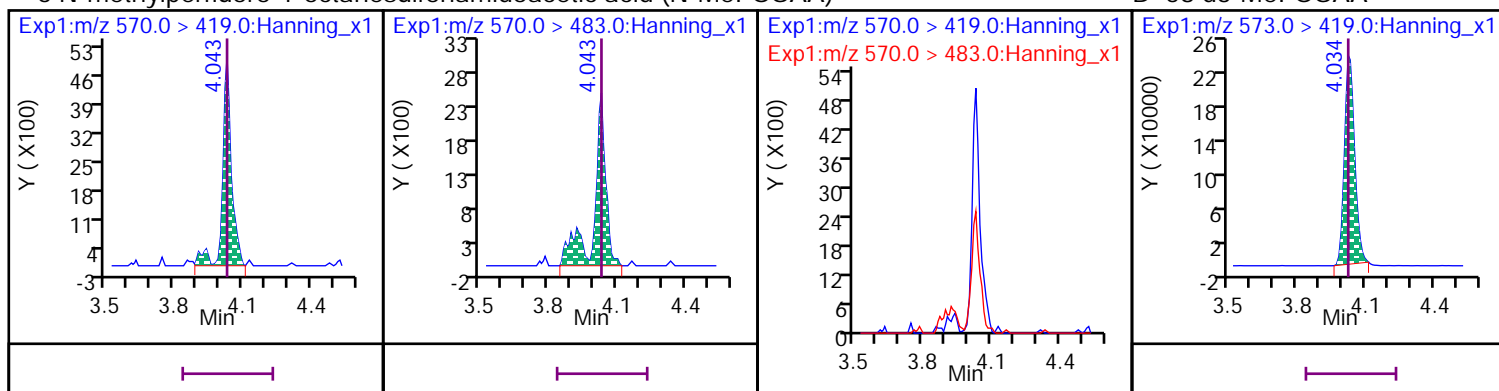
10 Perfluoro-n-decanoic acid (PFDA) (M)

D 51 13C6\_PFDA



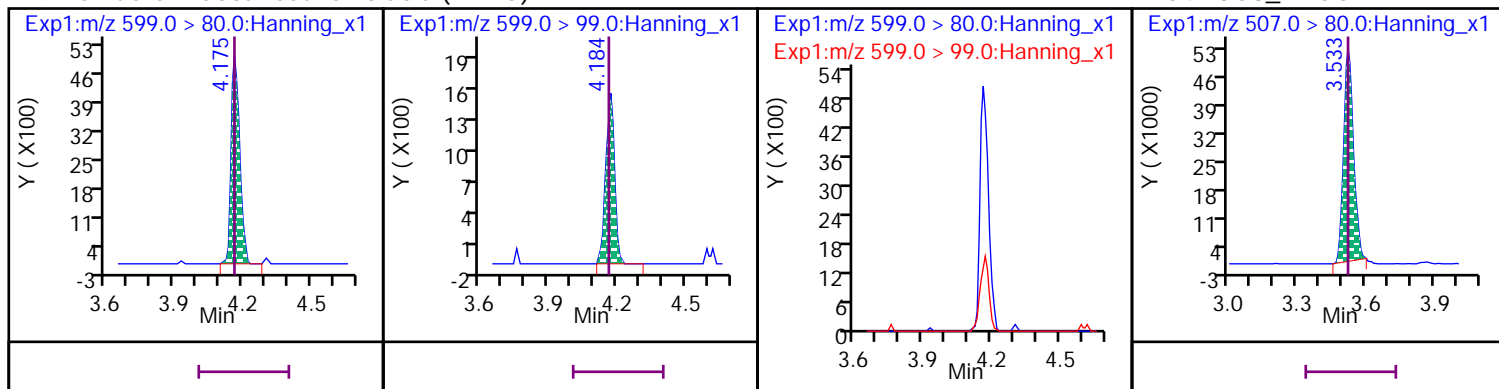
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



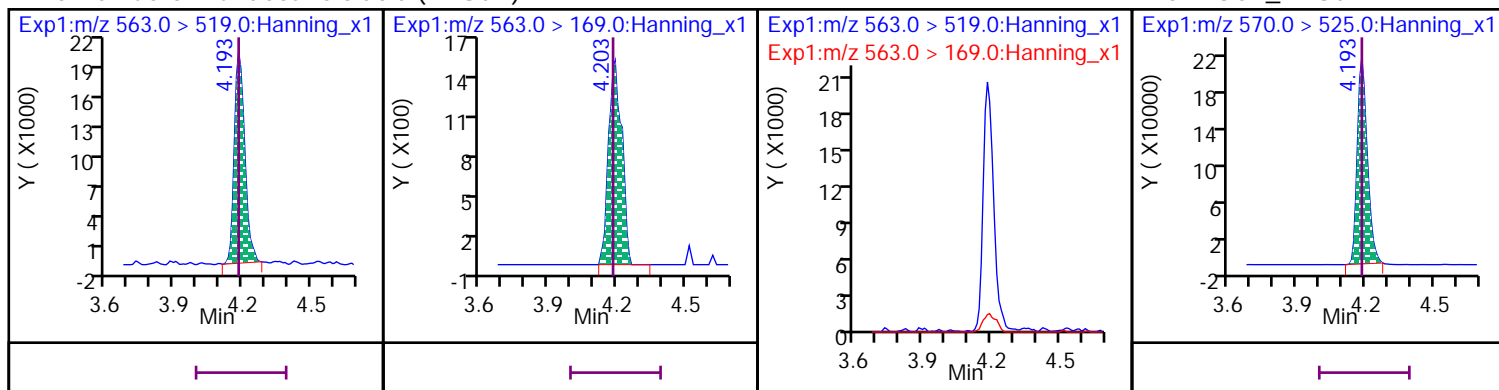
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



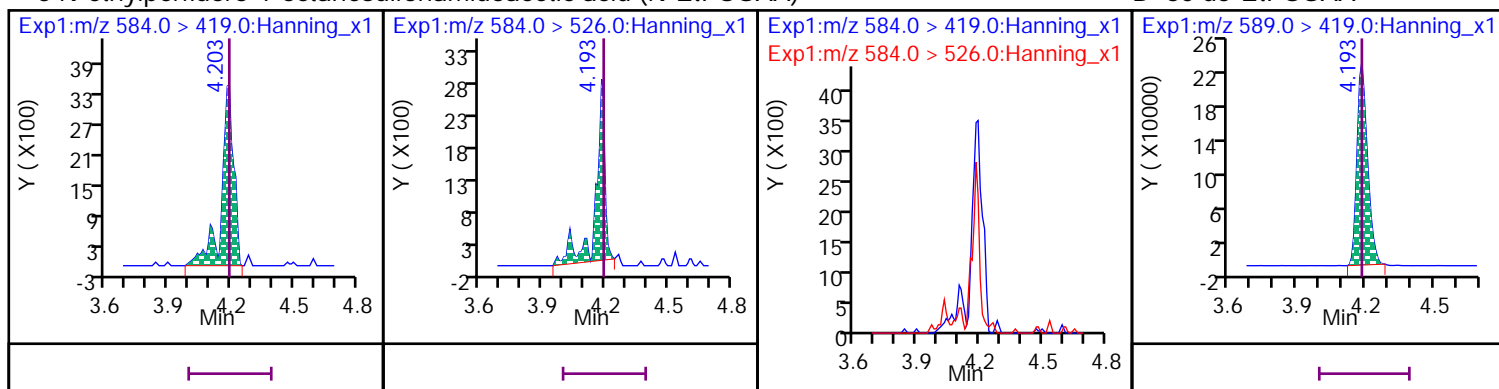
## 25 Perfluoro-n-undecanoic acid (PFUdA)

## D 52 13C7\_PFUdA



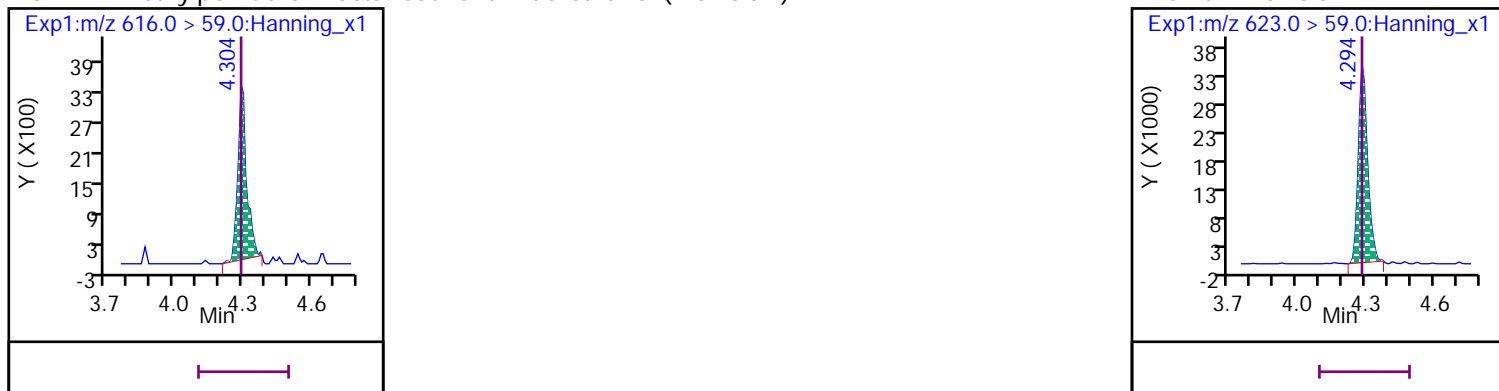
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

## D 60 d5-EtFOSAA



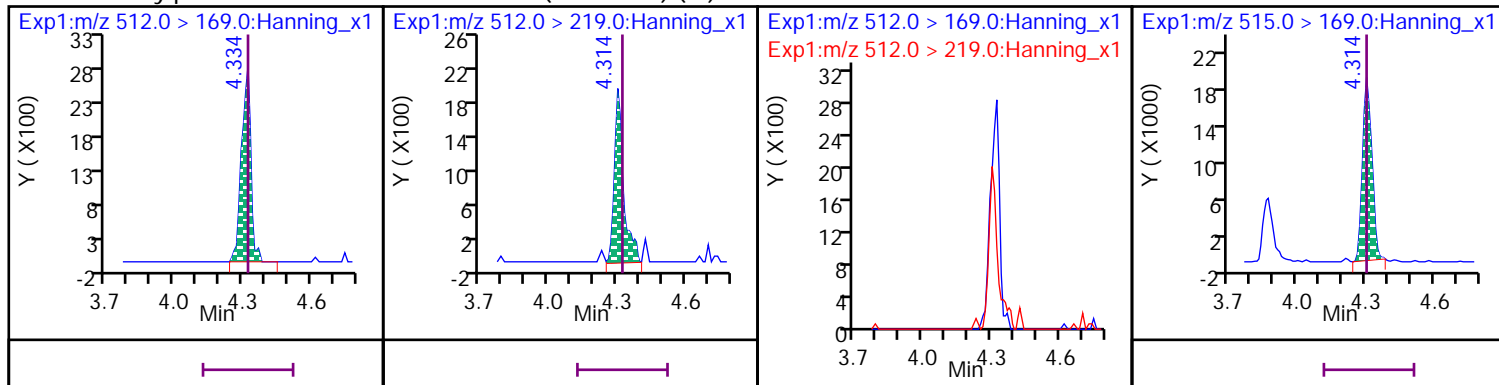
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

## D 61 d7-MeFOSE

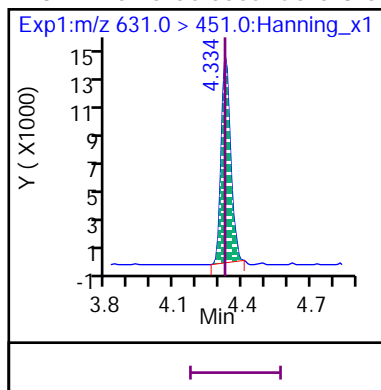


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (M)

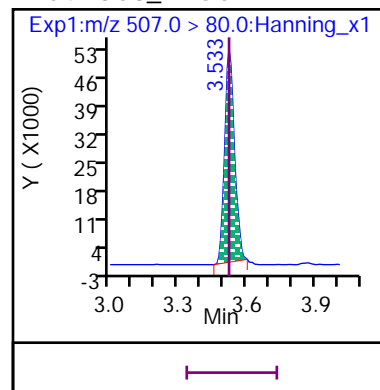
## D 57 d3-MeFOSA



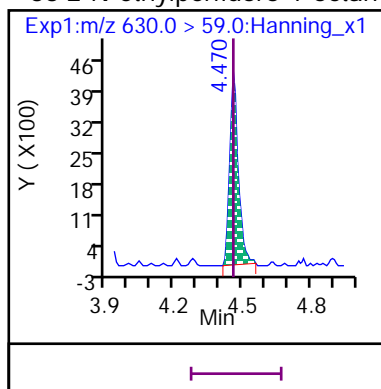
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



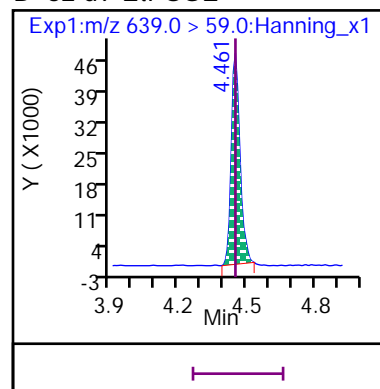
D 54 13C8\_PFOS



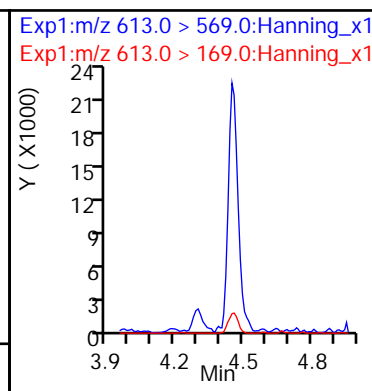
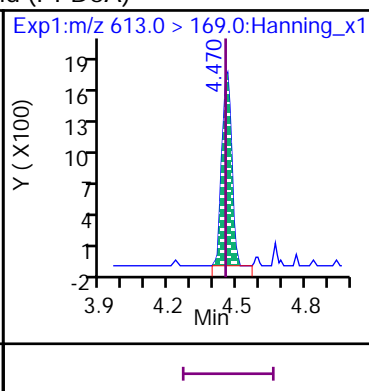
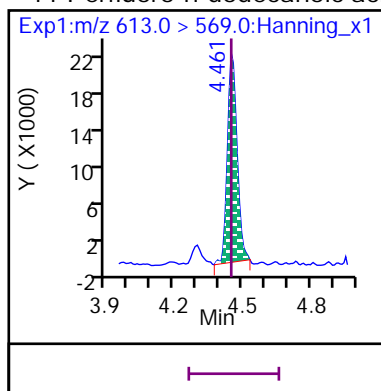
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



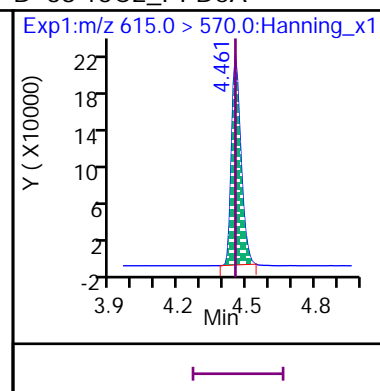
D 62 d9-EtFOSE



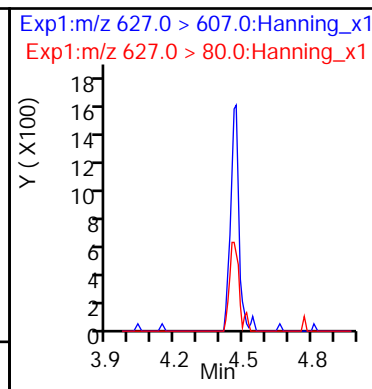
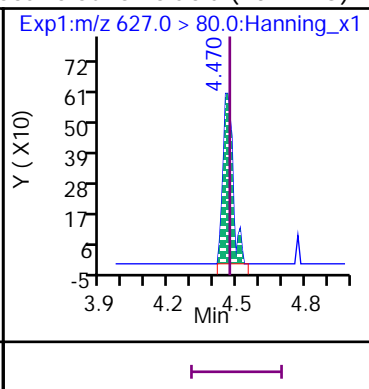
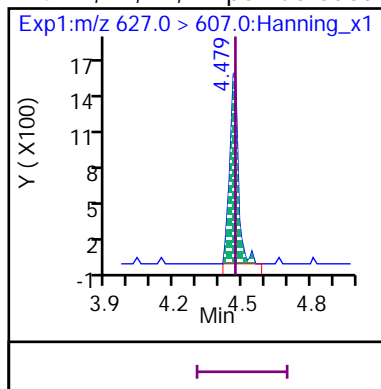
11 Perfluoro-n-dodecanoic acid (PFDaA)



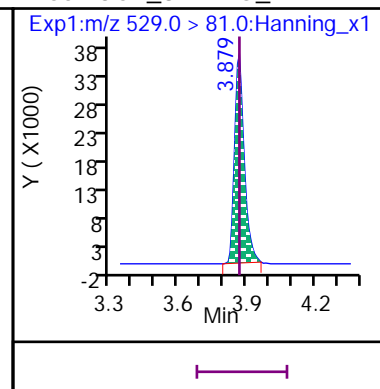
D 38 13C2\_PFDaA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

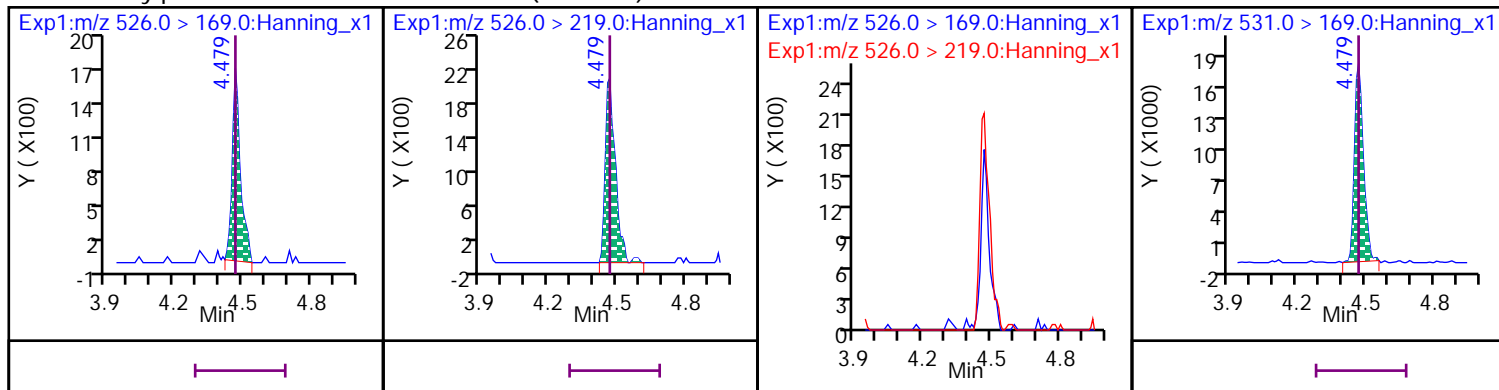


D 65 13C2\_8:2 FTS\_2



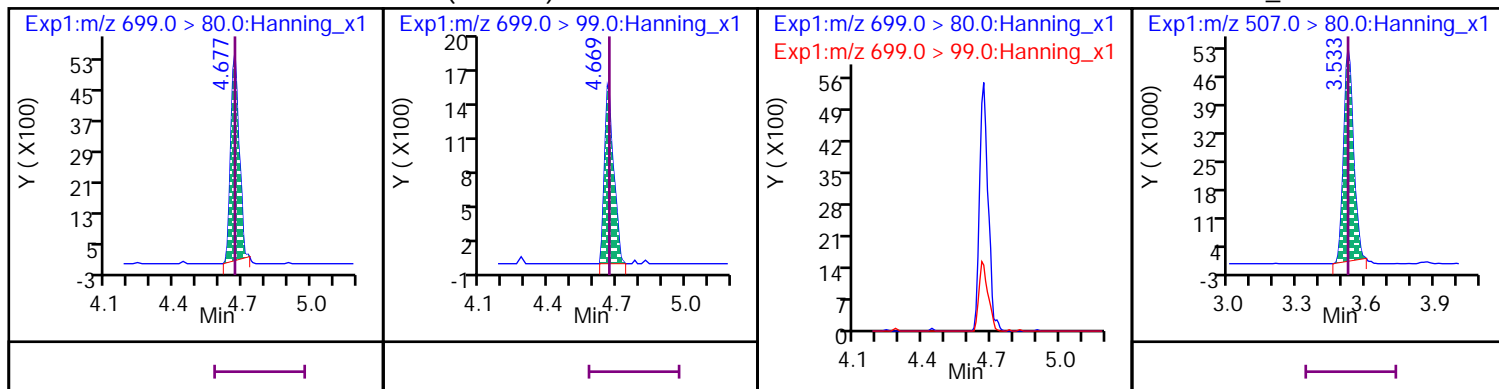
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

D 59 d5-EtFOSA



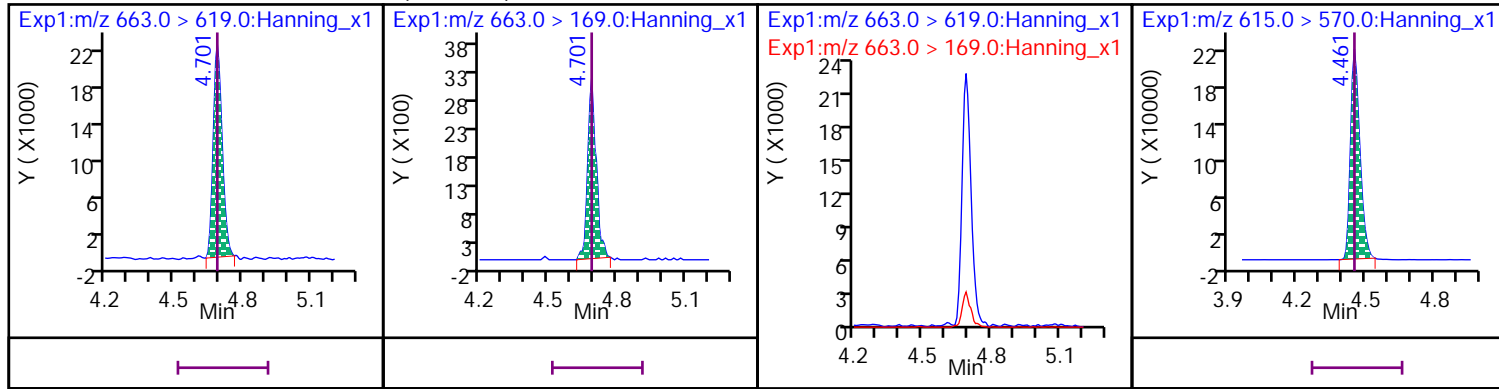
34 Perfluorododecanesulfonic acid (PFDOS)

D 54 13C8\_PFOS



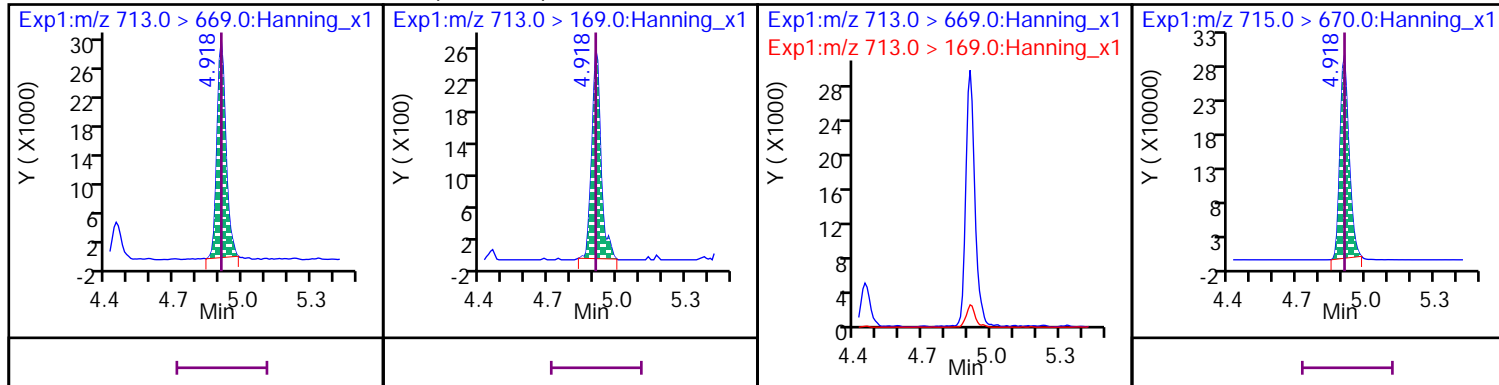
24 Perfluoro-n-tridecanoic acid (PFTrDA)

D 38 13C2\_PFDaA



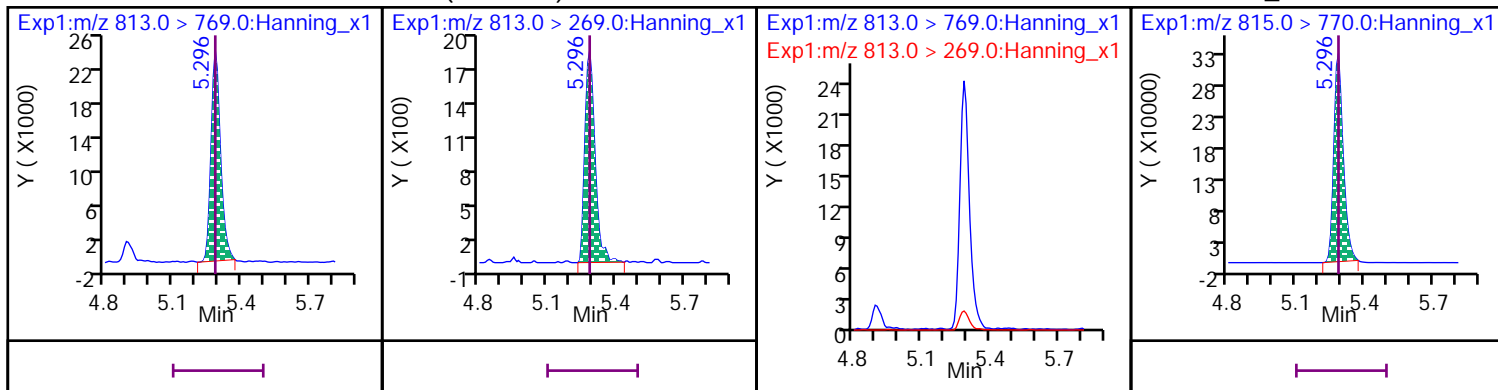
23 Perfluoro-n-tetradecanoic acid (PFTeDA)

D 42 13C2\_PFTeDA



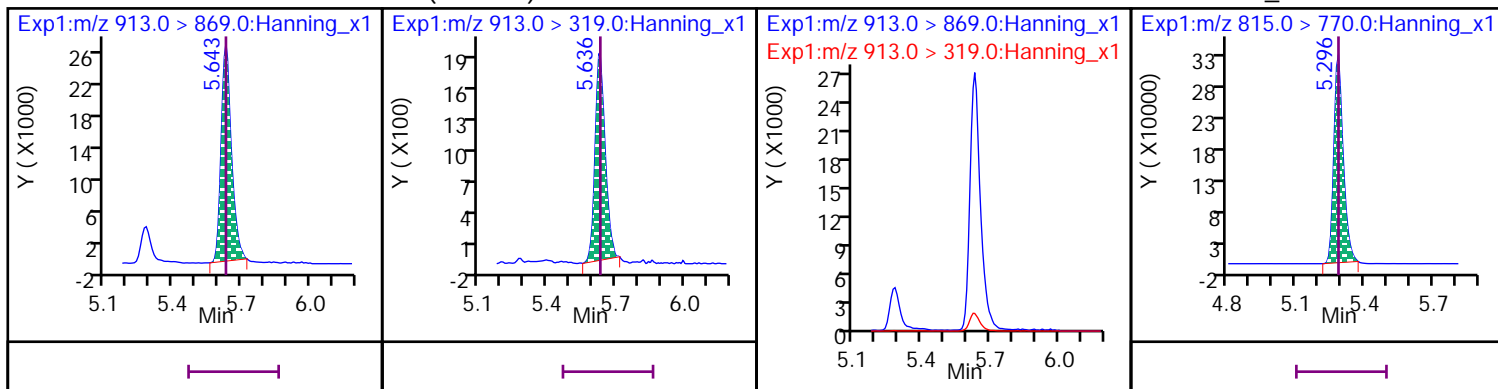
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

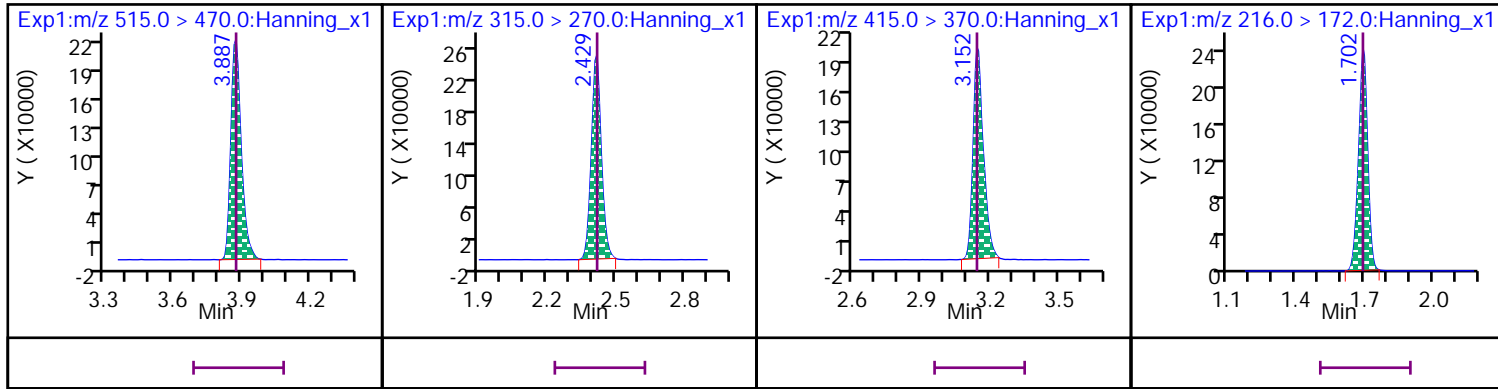


\* 37 13C2\_PFDA

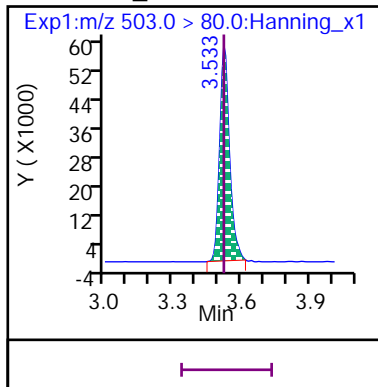
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBFA



\* 48 13C4\_PFOF





Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

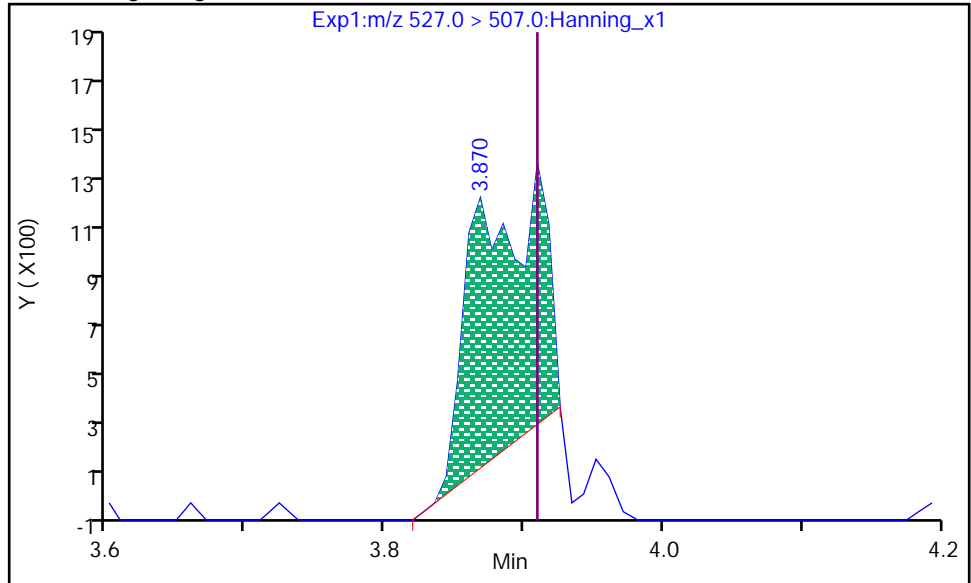
Dil. Factor: 1

Operator: Matthew M. Miller

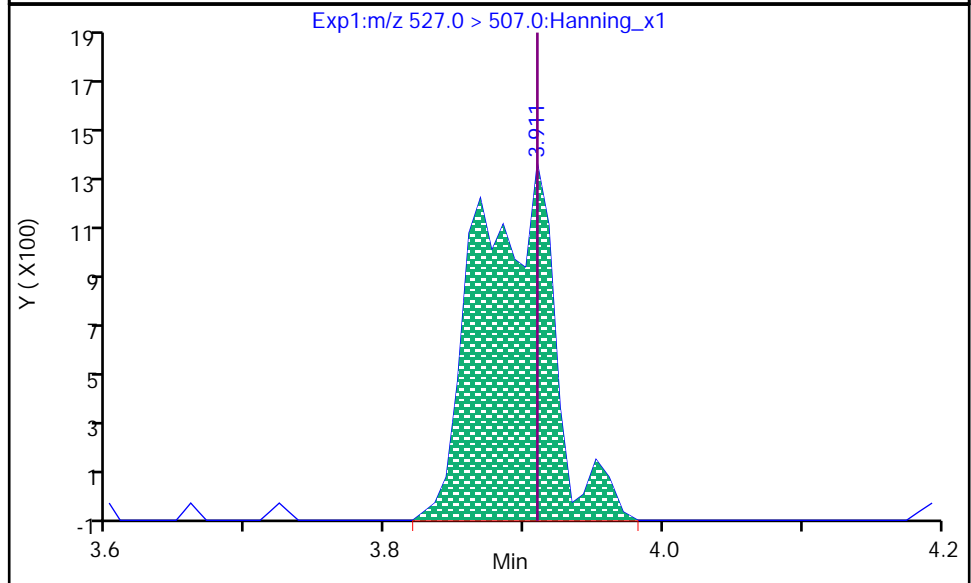
3 8:2 FTS, CAS: 39108-34-4

Processing Integration Results

RT: 3.870  
Area: 3446  
Amount: 66.502  
Amount Units: ng/L



RT: 3.911  
Area: 5245  
Amount: 110.01  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 10:27:45

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID:

ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

Dil. Factor: 1

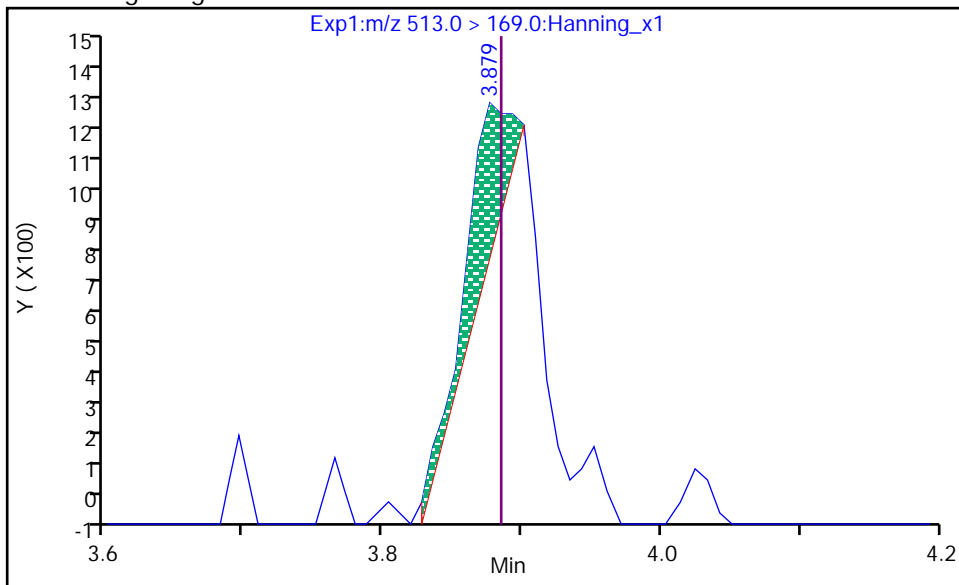
Operator:

Matthew M. Miller

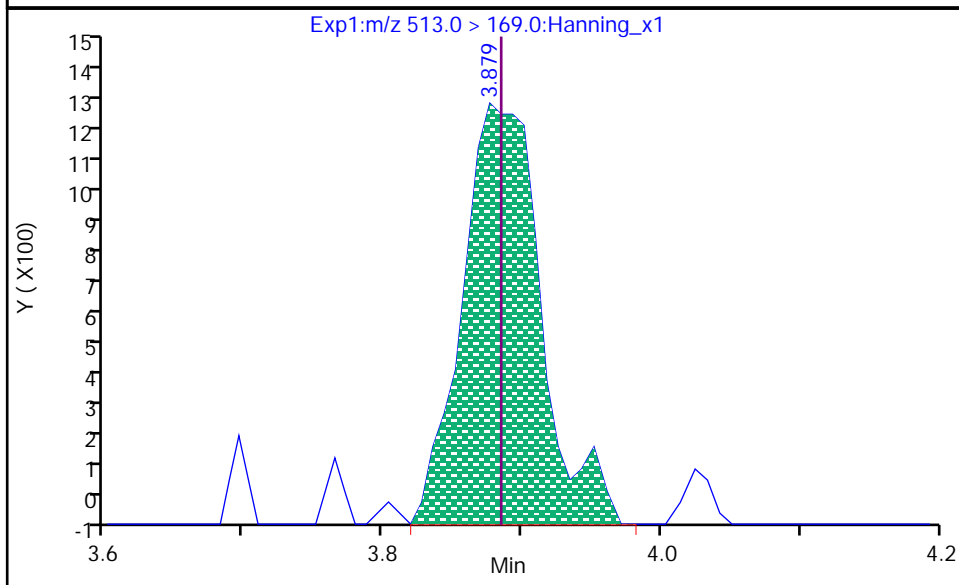
10 PFDA, CAS: 335-76-2

Processing Integration Results

RT: 3.879  
Area: 938  
Amount: 102.56  
Amount Units: ng/L



RT: 3.879  
Area: 4938  
Amount: 102.56  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:35:26

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

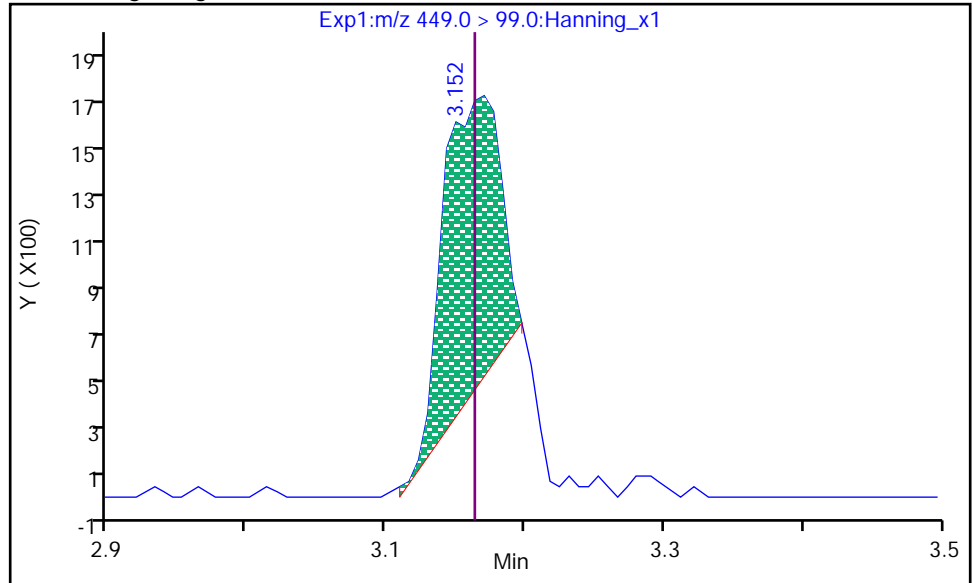
Dil. Factor: 1

Operator: Matthew M. Miller

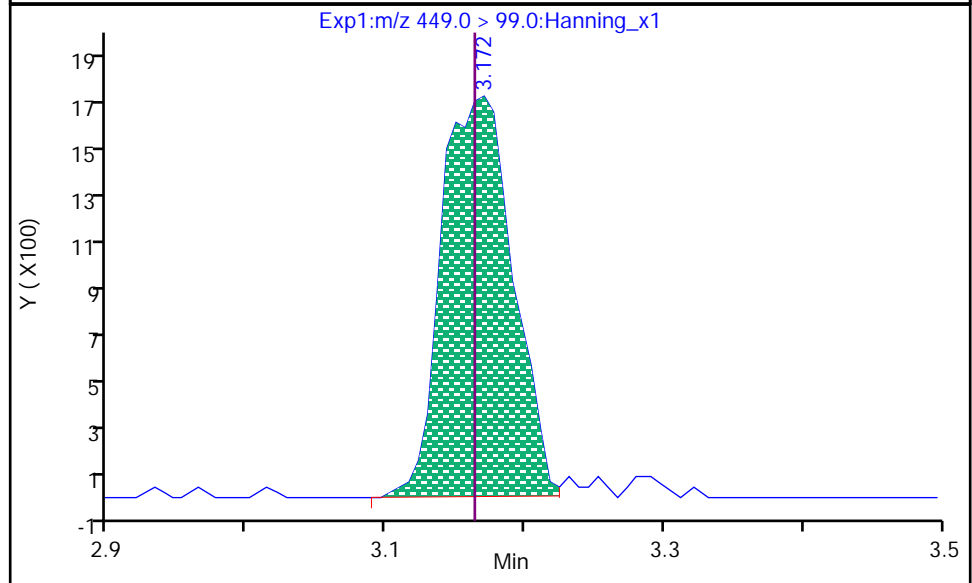
12 PFHpS, CAS: 375-92-8

Processing Integration Results

RT: 3.152  
Area: 3578  
Amount: 104.37  
Amount Units: ng/L



RT: 3.172  
Area: 6016  
Amount: 104.37  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:34:14

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

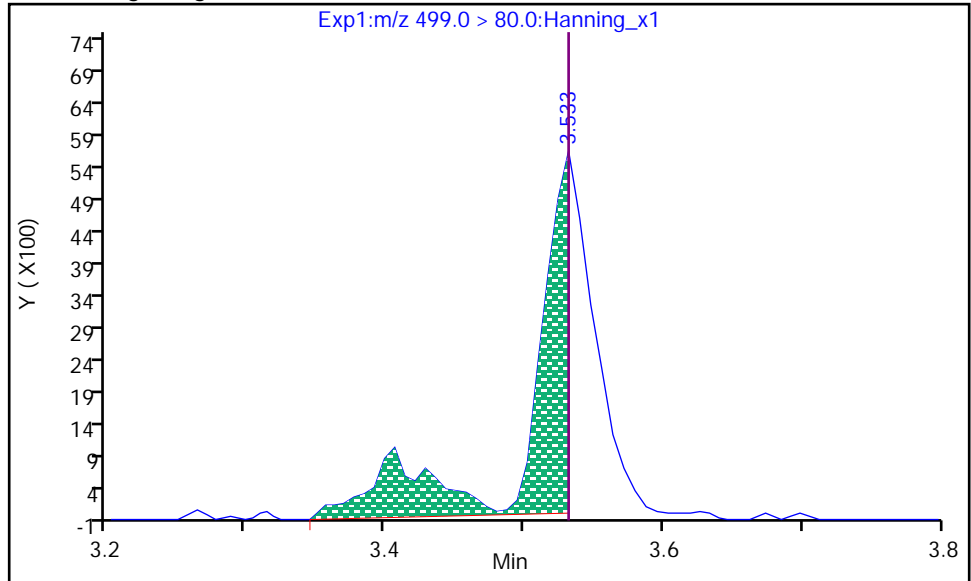
Dil. Factor: 1

Operator: Matthew M. Miller

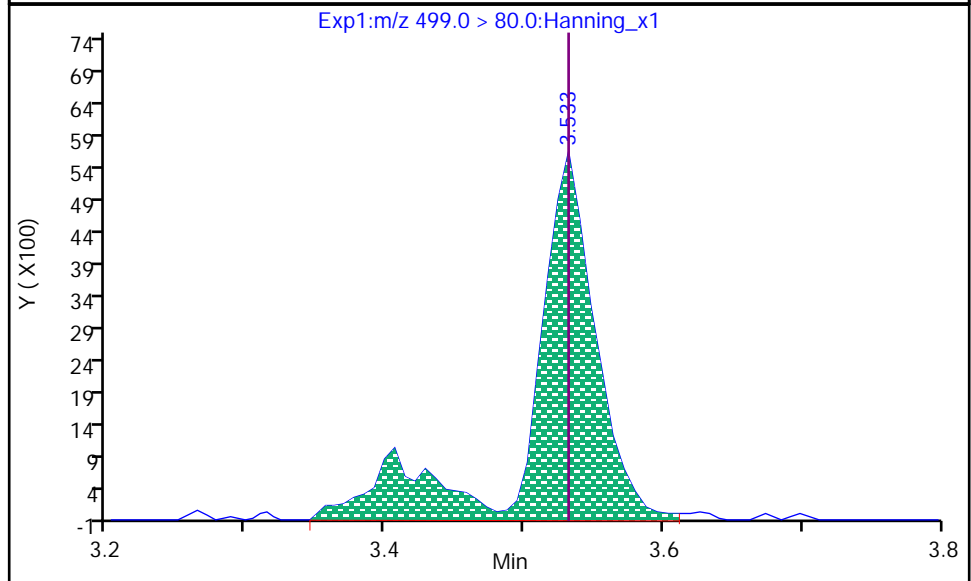
18 PFOS, CAS: 1763-23-1

Processing Integration Results

RT: 3.533  
Area: 9949  
Amount: 54.682  
Amount Units: ng/L



RT: 3.533  
Area: 18229  
Amount: 100.19  
Amount Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 10:27:39

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920005.d

Injection Date: 29-Dec-2020 10:13:38

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 100\_SVLC-1220

Sample Info: ID CCV 100\_SVLC-1220

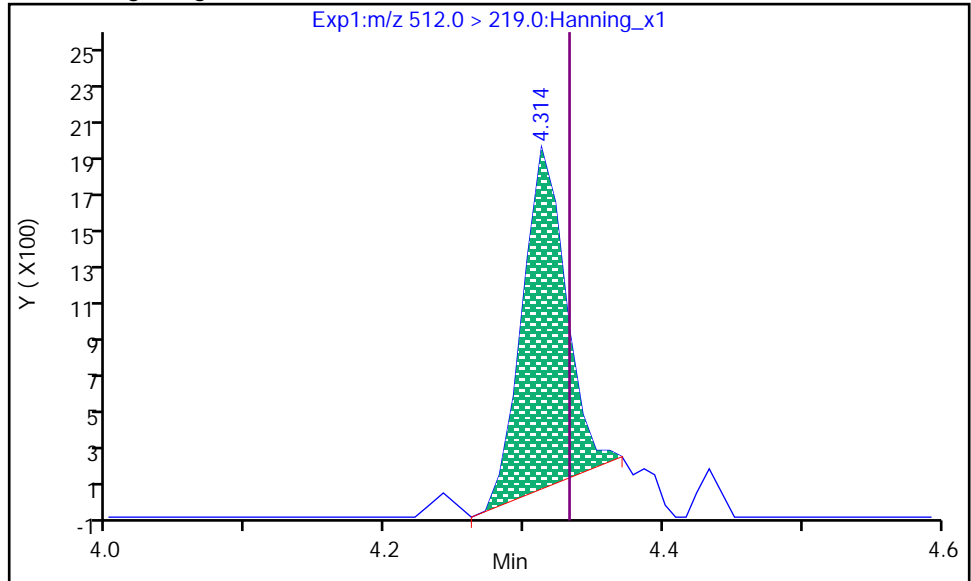
Dil. Factor: 1

Operator: Matthew M. Miller

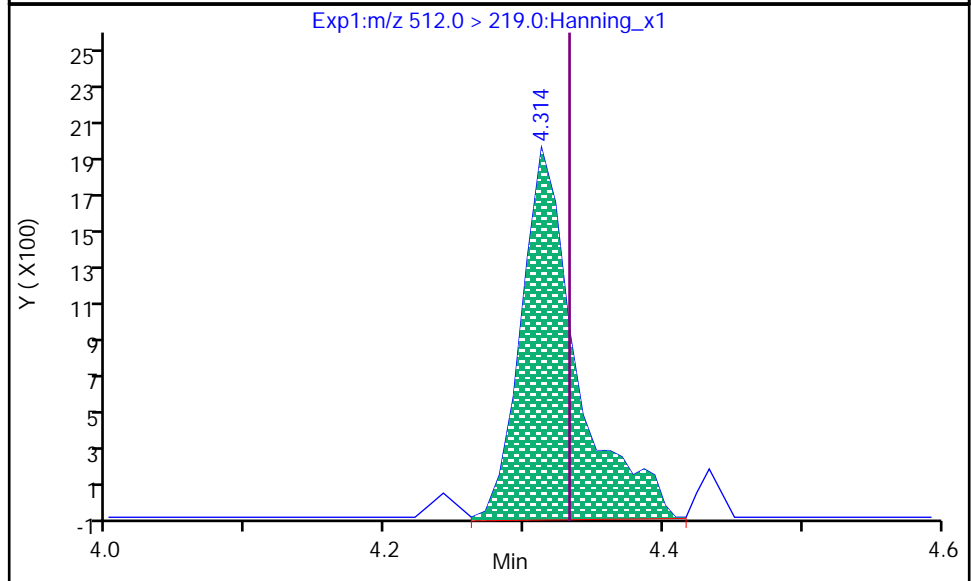
26 MeFOSA, CAS: 31506-32-8

Processing Integration Results

RT: 4.314  
Area: 3897  
Amount: 130.24  
Amount Units: ng/L



RT: 4.314  
Area: 5478  
Amount: 130.24  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:35:42

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d  
Injection Date: 29-Dec-2020 10:24:12 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 96  
Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.49	102	70 - 130
D 46 13C4_PFBA	669792	688588			103	50 - 150
D 50 13C5_PFPeA	688361	708040			103	50 - 150
21 PFPeA			200.00	199.24	99.6	70 - 130
7 PFBS			176.80	185.86	105	70 - 130
D 44 13C3_PFBS	241196	245383			102	50 - 150
1 4:2 FTS			186.80	183.02	98	70 - 130
D 63 13C2_4:2 FTS_2	136264	140370			103	50 - 150
D 49 13C5_PFHxA	755876	770487			102	50 - 150
15 PFHxA			200.00	203.73	102	70 - 130
22 PFPeS			187.60	195.58	104	70 - 130
28 GenX			400.00	386.83	96.7	70 - 130
D 66 13C3_GenX	1415766	1424329			101	50 - 150
D 47 13C4_PFHpA	613536	615197			100	50 - 150
13 PFHpA			200.00	214.41	107	70 - 130
D 45 13C3_PFHxS	185779	190236			102	50 - 150
14 PFHxS			182.00	171.05	94	70 - 130
29 ADONA			188.40	184.27	97.8	70 - 130
D 64 13C2_6:2 FTS_2	105371	109300			104	50 - 150
2 6:2 FTS			189.60	194.61	103	70 - 130
20 PFOA			200.00	191.52	95.8	70 - 130
D 53 13C8_PFOA	607240	617201			102	50 - 150
12 PFHpS			190.40	199.79	105	70 - 130
18 PFOS			185.60	186.33	100	70 - 130
17 PFNA			200.00	198.39	99.2	70 - 130
D 56 13C9_PFNA	787757	814662			103	50 - 150
D 54 13C8_PFOS	153541	164823			107	50 - 150
30 9CI-PF3ONS			186.40	181.71	97.5	70 - 130
D 55 13C8_PFOA	318847	310617			97.4	50 - 150
19 PFOSA			200.00	206.63	103	70 - 130
16 PFNS			192.00	181.55	94.6	70 - 130
D 65 13C2_8:2 FTS_2	104593	93821			89.7	50 - 150
3 8:2 FTS			191.60	190.51	99.4	70 - 130
10 PFDA			200.00	188.95	94.5	70 - 130
D 51 13C6_PFDA	701677	702571			100	50 - 150
D 58 d3-MeFOSAA	727199	783818			108	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	221.56	111	70 - 130
9 PFDS			192.80	203.99	106	70 - 130
5 N-EtFOSAA			200.00	214.43	107	70 - 130
25 PFUdA			200.00	208.81	104	70 - 130
D 60 d5-EtFOSAA	710460	714919			101	50 - 150
D 52 13C7_PFUdA	641343	676868			106	50 - 150
D 61 d7-MeFOSE	96951	111121			115	50 - 150
32 MeFOSE			200.00	179.20	89.6	70 - 130
26 MeFOSA			200.00	223.35	112	70 - 130
D 57 d3-MeFOSA	52459	54336			104	50 - 150
31 11Cl-PF3OUDS			188.40	186.91	99.2	70 - 130
D 62 d9-EtFOSE	123442	119635			96.9	50 - 150
33 EtFOSE			200.00	183.43	91.7	70 - 130
D 59 d5-EtFOSA	48002	51915			108	50 - 150
D 38 13C2_PFDoA	609821	626300			103	50 - 150
4 10:2 FTS			192.80	228.33	118	70 - 130
27 EtFOSA			200.00	210.48	105	70 - 130
11 PFDoA			200.00	190.54	95.3	70 - 130
34 PFDOS			193.60	179.09	92.5	70 - 130
24 PFTrDA			200.00	197.62	98.8	70 - 130
23 PFTeDA			200.00	211.05	106	70 - 130
D 42 13C2_PFTeDA	786208	804927			102	50 - 150
35 PFHxDA			200.00	211.85	106	70 - 130
D 40 13C2_PFHxDA	908883	937823			103	50 - 150
36 PFODA			200.00	194.50	97.2	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d  
 Injection Date: 29-Dec-2020 10:24:12 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 96  
 Sample Info: ID CCV 200\_SVLC-1221 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	688588	23	>100:1			1000.00	992.84	103	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.709	0/-1	140247	29	75:1			200.00	204.49		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.080	0	708040	17	>100:1			1000.00	1029.30	103	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.077	2.080	0/0	141831	15	>100:1			200.00	199.24		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	245383	16	>100:1			1000.00	1065.81	102	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.133	0/0	53771	18	>100:1	Target = 3.50		176.80	185.86		
298.9 > 99	44	2.130	2.133		13438	15	100:1	4.00 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.446	1/1	41631	19	>100:1	Target = 3.10		187.60	195.58		
349 > 99	44	2.451	2.446		13199	26	>100:1	3.15 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.393	0	140370	19	>100:1			5000.00	5798.42	103	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.397	2.393	1/1	10254	23	44:1	Target = 1.80		186.80	183.02		
327 > 81	63	2.388	2.393		4977	15	15:1	2.06 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.424	2.429	0	770487	21	>100:1			1000.00	1045.34	102	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.424	2.420	1/1	154978	20	>100:1	Target = 18.34		200.00	203.73		
313 > 119	49	2.424	2.420		7987	22	57:1	19.40 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.536	0	1424329	20	>100:1			5000.00	5347.50	101	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.531	2.536	0/0	79170	19	>100:1	Target = 0.81		400.00	386.83		
285 > 185	66	2.531	2.536		98762	24	>100:1	0.80 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.782	2.777	1	615197	19	>100:1			1000.00	1014.09	100	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.786	0/-1	136818	20	>100:1	Target = 3.70		200.00	214.41		
363 > 169	47	2.782	2.786		38702	20	>100:1	3.53 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	190236	20	>100:1			1000.00	1111.01	102	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.795	0/0	34501	26	>100:1	Target = 3.21	0.16	182.00	171.05		
399 > 99	45	2.800	2.795		11863	28	59:1	2.90 (1.60-4.81)	0.13				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.823	0/0	222554	19	>100:1	Target = 2.97		188.40	184.27		
377 > 85	45	2.818	2.823		68725	21	>100:1	3.23 (1.48-4.46)					



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.162	3.166	0/0	34527	31		Target = 3.08		190.40	199.79		
449 > 99	45	3.155	3.166		12298	27	>100:1	2.80 (1.54-4.63)					M
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.132	0	109300	25	>100:1			5000.00	5675.45	104	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.139	0/0	9832	22	>100:1	Target = 1.80		189.60	194.61		
427 > 81	64	3.121	3.139		6505	37	54:1	1.51 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.148	3.159	0	617201	28	>100:1			1000.00	1042.81	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.159	0/0	120506	21	77:1	Target = 2.87		200.00	191.52		
413 > 169	53	3.155	3.159		43450	22	>100:1	2.77 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.529	3.533	0	164823	21	>100:1			1000.00	1099.34	107	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.533	0/0	36393	38	>100:1	Target = 3.84	0.26	185.60	186.33		
499 > 99	54	3.529	3.533		10850	43		3.35 (1.92-5.76)	0.14				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.737	3.740	0/0	100826	28	>100:1			186.40	181.71		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.879	0/0	22900	21	>100:1	Target = 3.07		192.00	181.55		
549 > 99	54	3.874	3.879		10201	24	48:1	2.24 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.171	4.175	0/0	24401	15		Target = 3.03		192.80	203.99		
599 > 99	54	4.171	4.175		8776	21	52:1	2.78 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	87490	19	>100:1			188.40	186.91		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.677	0/0	23698	18	>100:1	Target = 3.33		193.60	179.09		
699 > 99	54	4.673	4.677		7584	18	>100:1	3.12 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	814662	24	>100:1			1000.00	1084.82	103	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.533	0/0	161628	20	>100:1	Target = 6.16		200.00	198.39		
463 > 169	56	3.529	3.533		25973	20	>100:1	6.22 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.858	3.854	1	310617	19				1000.00	1003.40	97.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.858	3.854	1/0	63250	18	>100:1			200.00	206.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.879	0	93821	21				5000.00	5057.70	89.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.911	-2/-2	7690	16	44:1	Target = 1.95		191.60	190.51		
527 > 81	65	3.866	3.911		4872	27	44:1	1.57 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.465	4.479	0/0	9901	22		Target = 3.14		192.80	228.33		
627 > 80	65	4.474	4.479		2982	24		3.32 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.883	3.887	0	702571	21	>100:1			1000.00	1059.15	100	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.883	3.887	0/0	130441	18	>100:1	Target = 15.94		200.00	188.95		
513 > 169	51	3.874	3.887		10384	18	46:1	12.56 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.039	4.034	1	783818	19	>100:1			5000.00	5460.65	108	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.039	4.043	0/-1	26680	34		Target = 1.33	0.07	200.00	221.56		M
570 > 483	58	4.039	4.043		17672	38	>100:1	1.50 (0.66-1.99)	0.21				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	714919	18	>100:1			5000.00	5382.83	101	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.203	0/0	30524	33	89:1	Target = 1.58	0.03	200.00	214.43		
584 > 526	60	4.207	4.203		18289	31	78:1	1.66 (0.79-2.37)	0.19				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	676868	18	>100:1			1000.00	1070.87	106	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.198	4.193	1/1	132838	17	>100:1	Target = 15.50		200.00	208.81		
563 > 169	52	4.188	4.193		8645	26	38:1	15.36 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	111121	15	>100:1			1000.00	1026.92	115	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	18710	17	>100:1			200.00	179.20		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.314	1	54336	14	91:1			1000.00	1026.82	104	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.334	0/-1	13692	21	89:1	Target = 1.12		200.00	223.35		
512 > 219	57	4.318	4.334		9689	15	56:1	1.41 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.461	0	119635	17	>100:1			1000.00	954.06	96.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.474	4.470	1/1	19524	21	>100:1			200.00	183.43		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.465	4.461	1	626300	17	>100:1			1000.00	1034.66	103	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.465	4.461	1/0	120845	17	55:1	Target = 10.85		200.00	190.54		
613 > 169	38	4.465	4.461		12130	16	65:1	9.96 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.697	4.701	0/-1	121905	19	>100:1	Target = 8.37		200.00	197.62		
663 > 169	38	4.697	4.701		14921	37	>100:1	8.17 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	51915	17	>100:1			1000.00	1057.45	108	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.492	4.479	1/0	11938	15	62:1	Target = 1.03		200.00	210.48		
526 > 219	59	4.483	4.479		11740	23		1.01 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.916	4.918	0	804927	18	>100:1			1000.00	955.47	102	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.916	4.918	0/0	147189	21	20:1	Target = 12.11		200.00	211.05		
713 > 169	42	4.916	4.918		11798	18	78:1	12.47 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	937823	20	>100:1			1000.00	1034.94	103	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	129815	17	37:1	Target = 11.48		200.00	211.85		
813 > 269	40	5.292	5.296		12108	40	>100:1	10.72 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.640	5.643	0/0	161466	25	19:1	Target = 13.88		200.00	194.50		
913 > 319	40	5.633	5.643		11986	25	>100:1	13.47 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.883	3.887	0	680248	19	>100:1					98.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.429	0	750108	21	>100:1					103	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.155	3.152	1	620593	25	>100:1					101	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	635780	25	>100:1					99.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80	3.529	3.533	0	177266	21	>100:1						103	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

Client ID:

Lab ID:

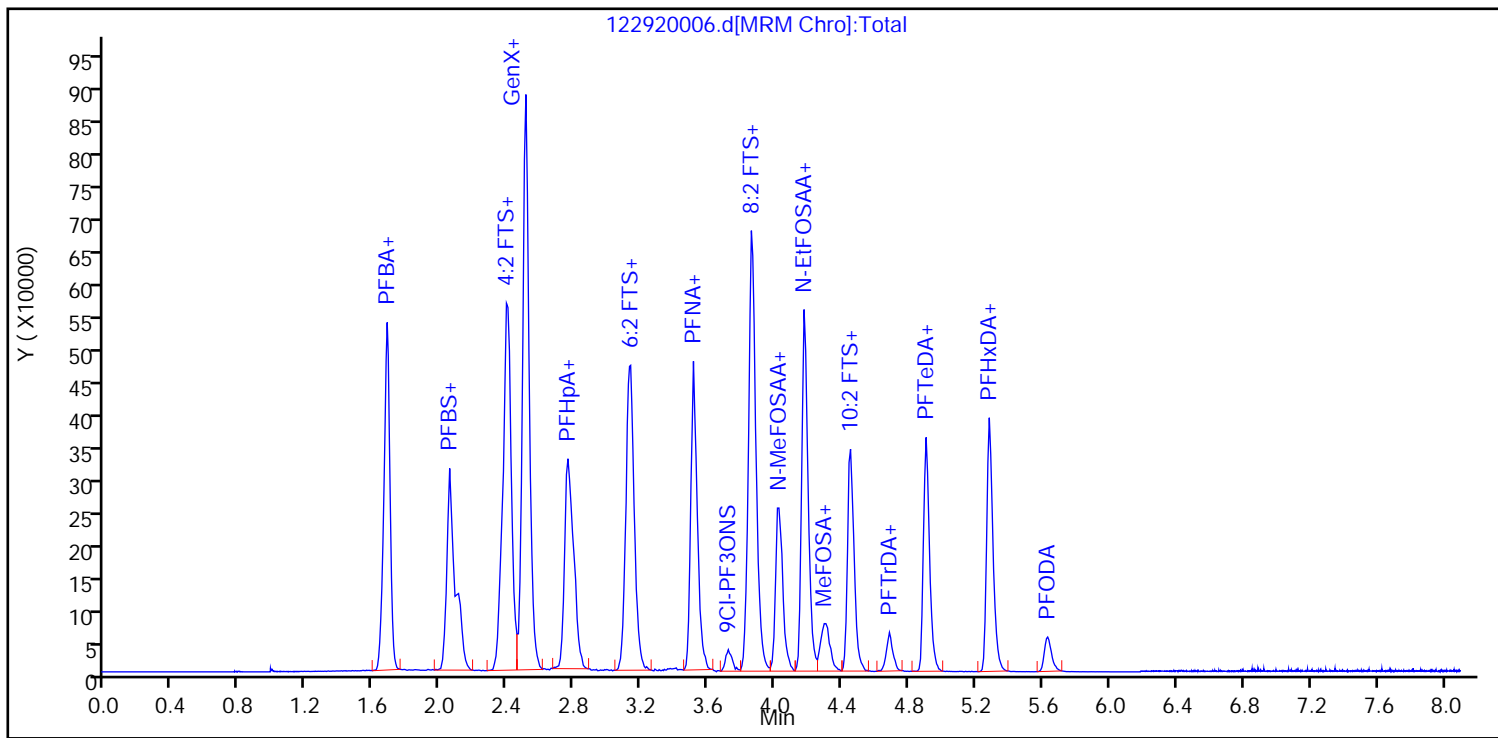
ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

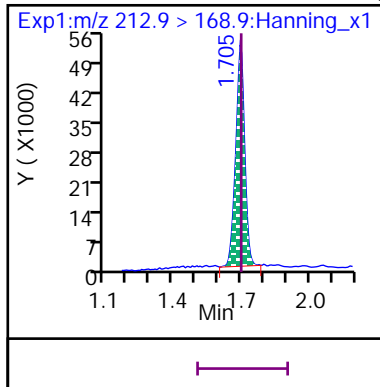
Dil. Factor: 1

Operator:

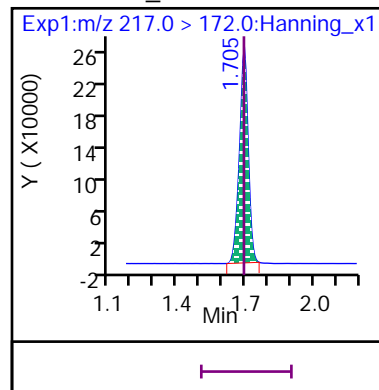
Matthew M. Miller



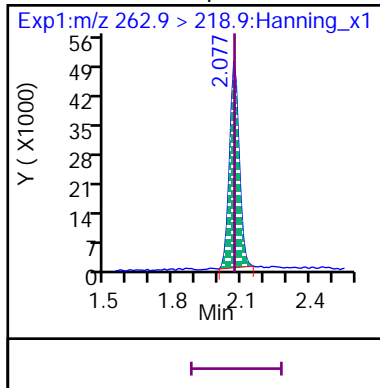
8 Perfluoro-n-butanoic acid (PFBA)



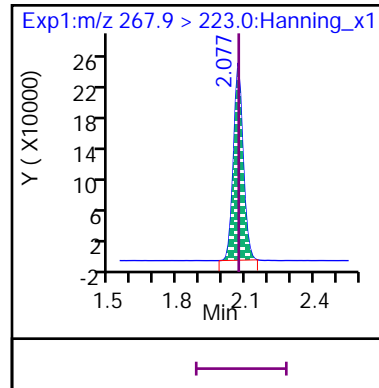
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

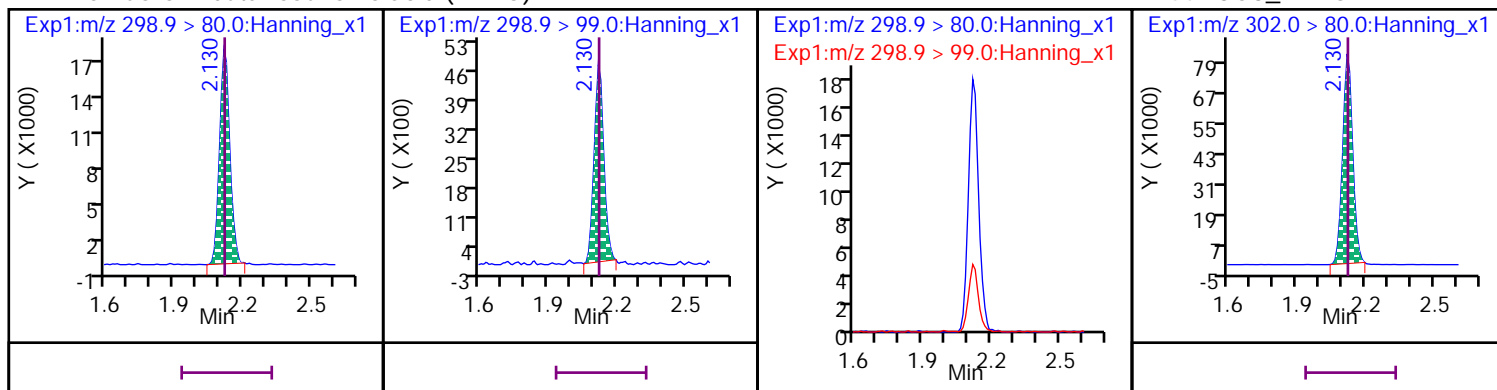


D 50 13C5\_PFPeA



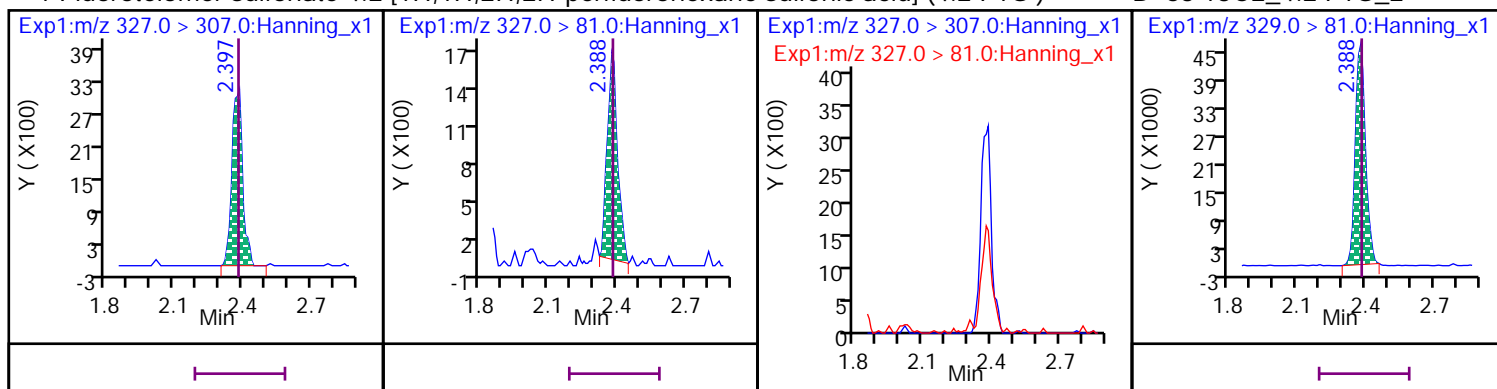
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



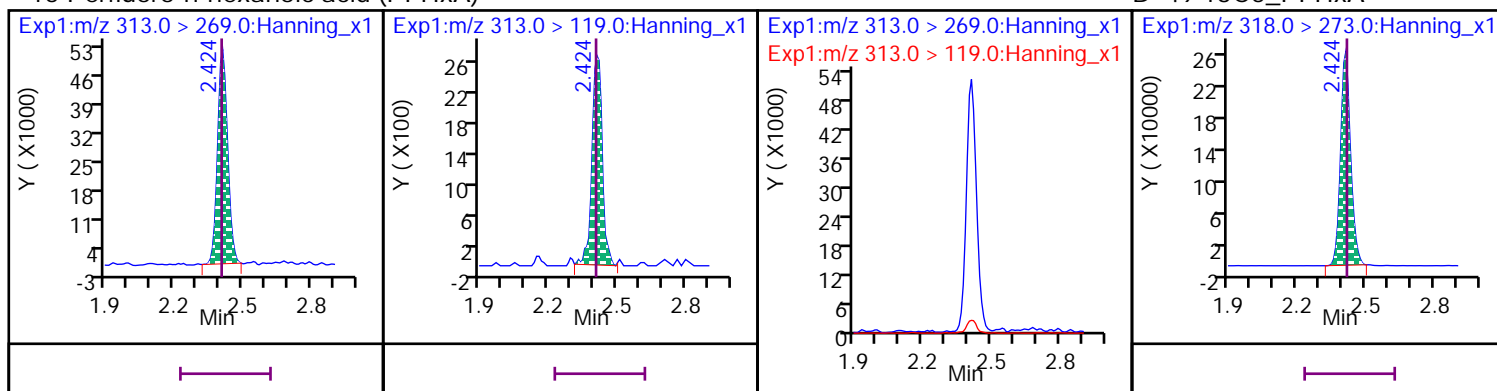
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



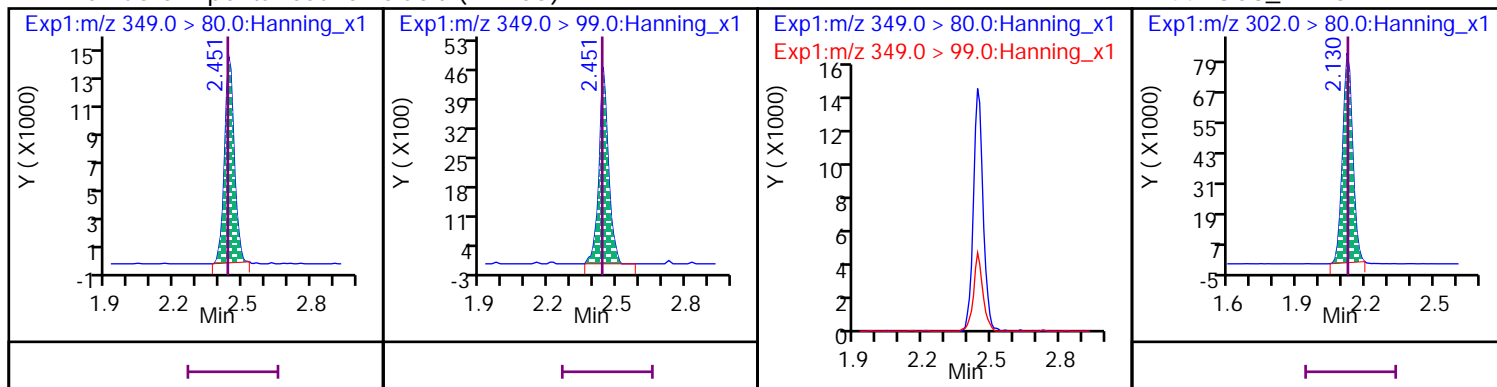
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



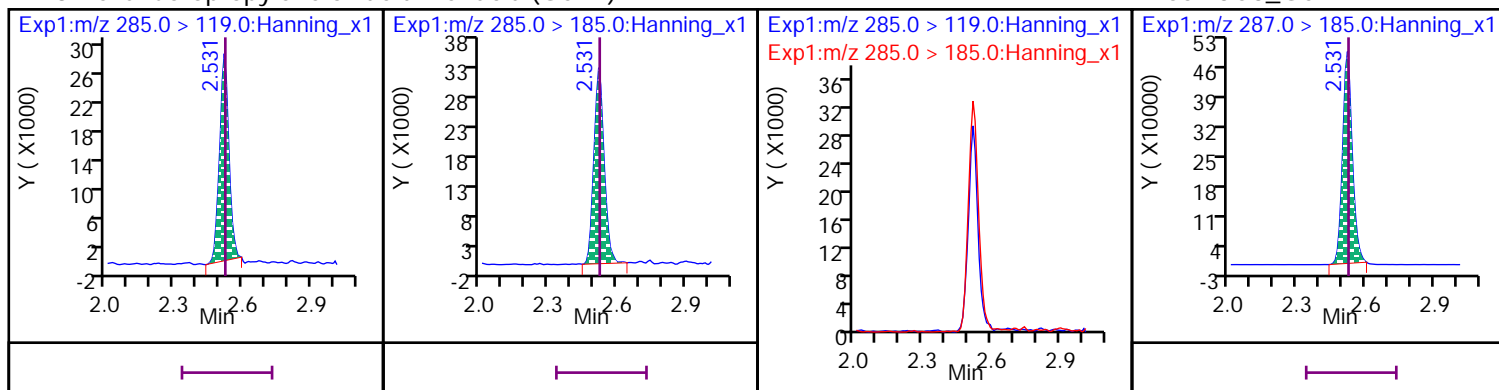
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



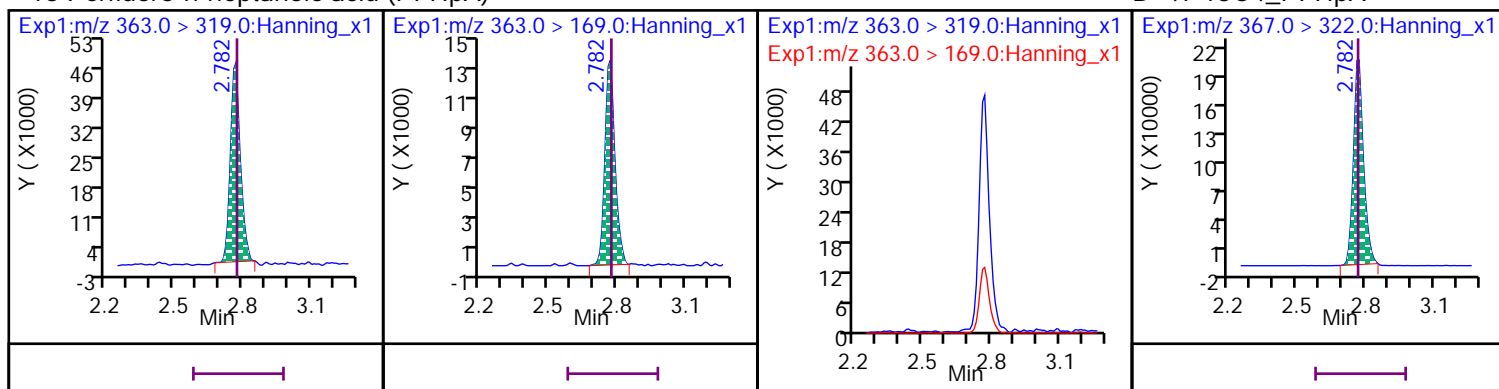
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



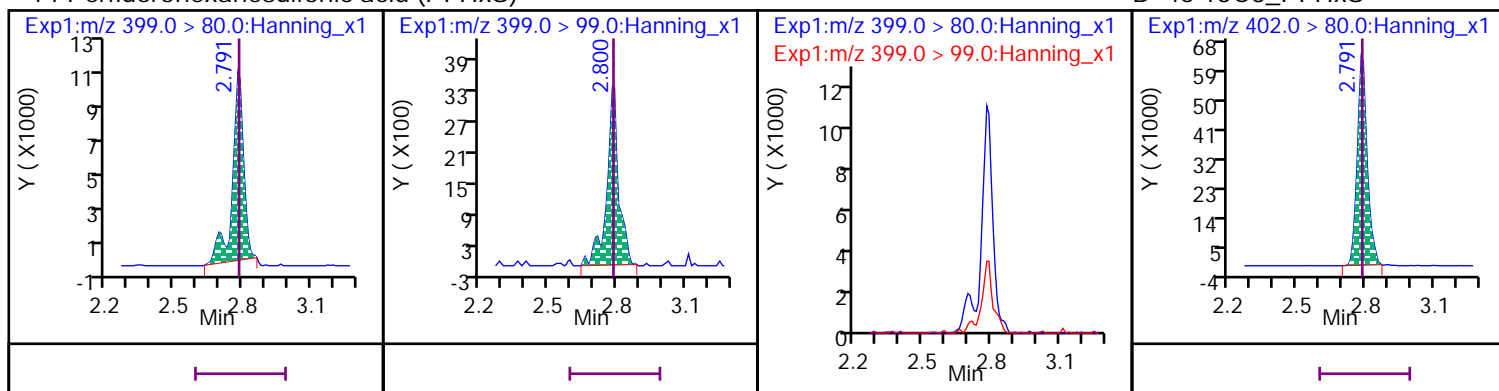
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



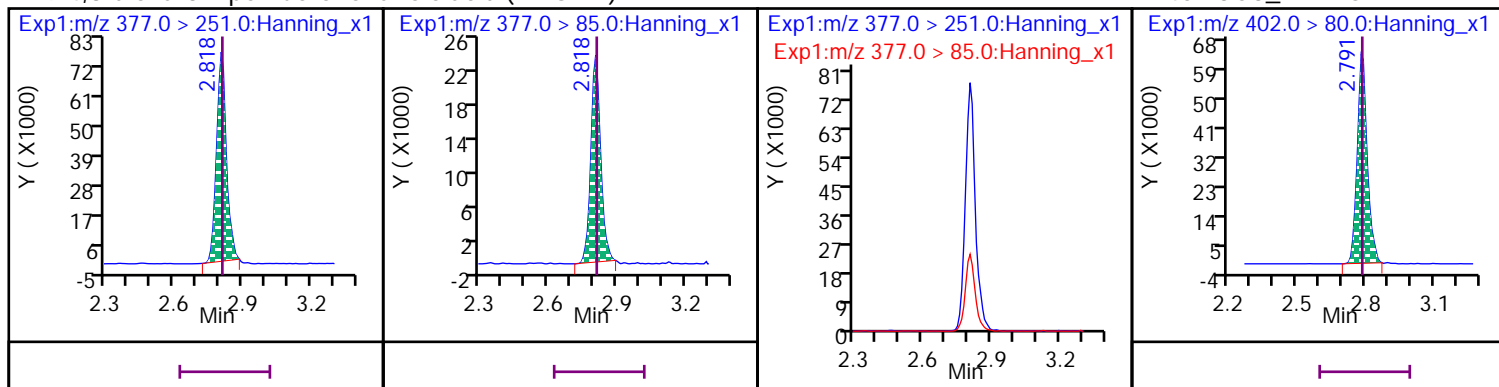
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



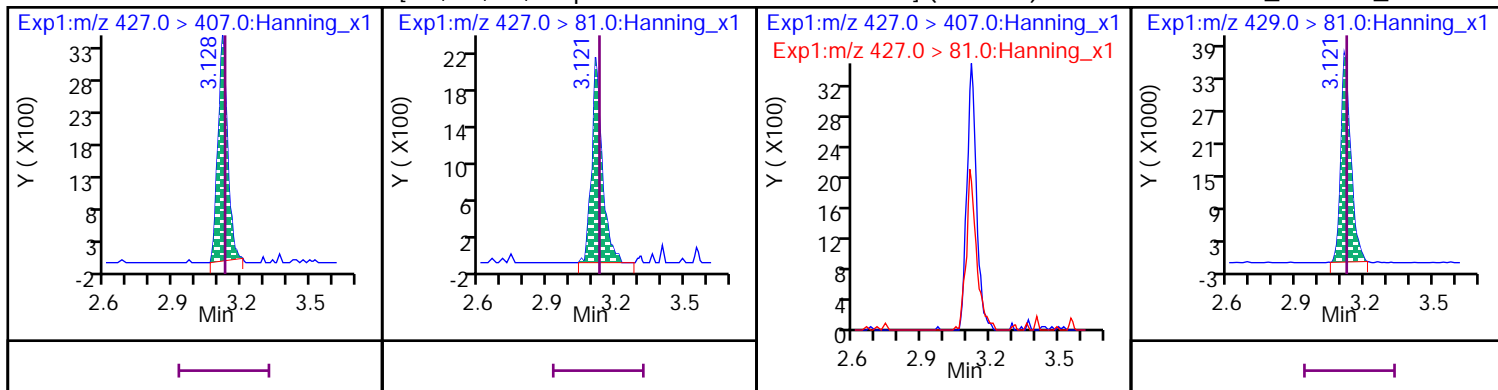
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



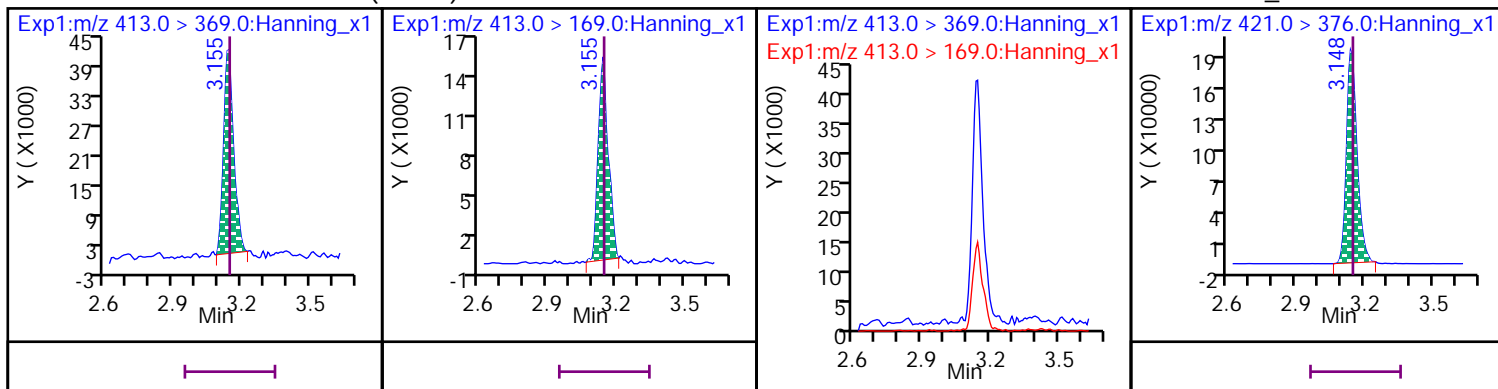
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



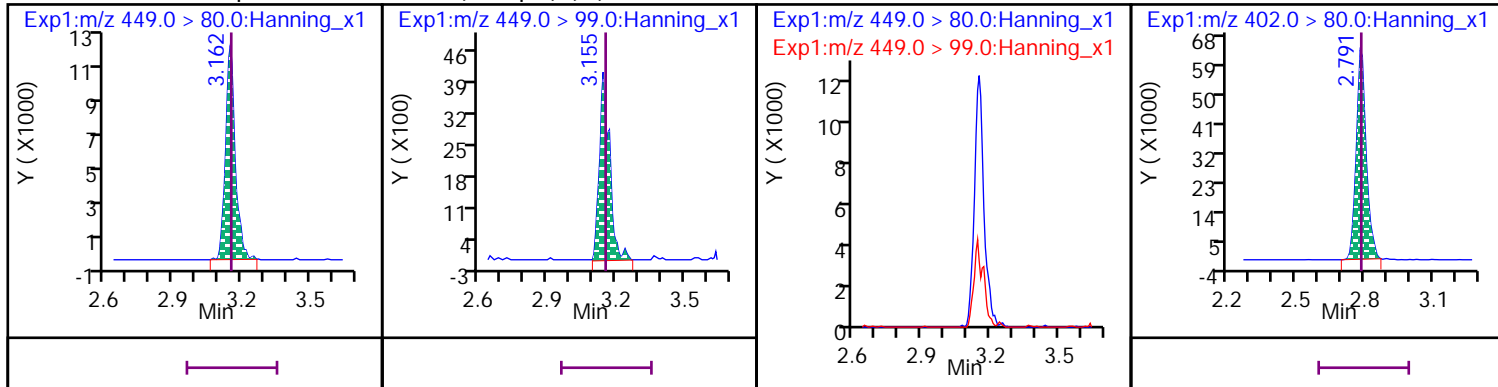
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



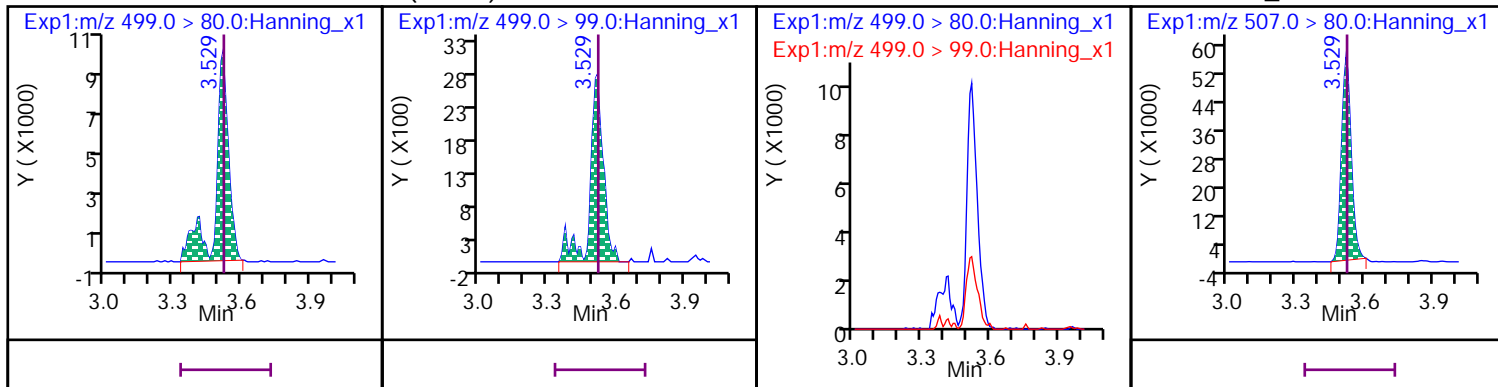
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (M)

D 45 13C3\_PFHxS



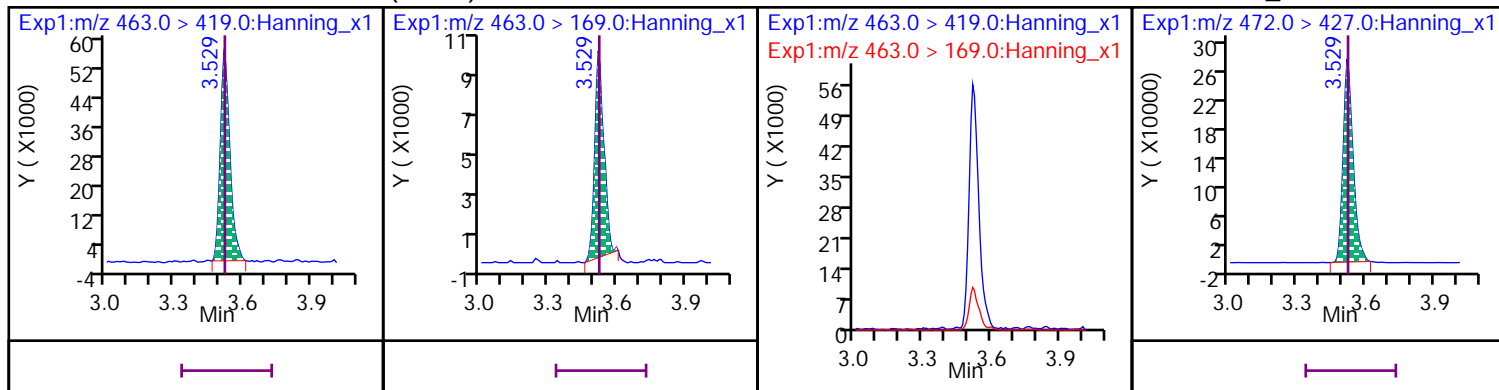
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



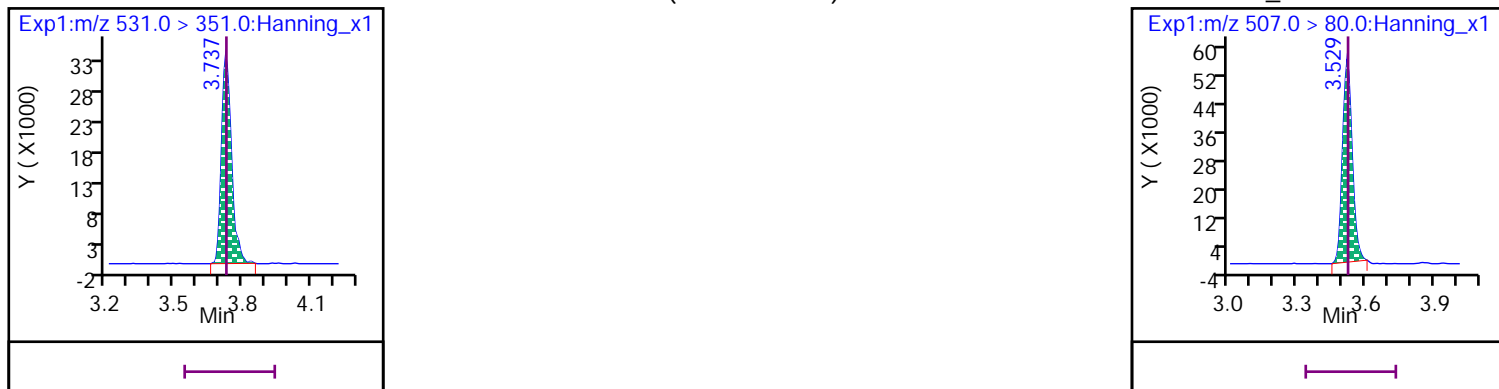
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



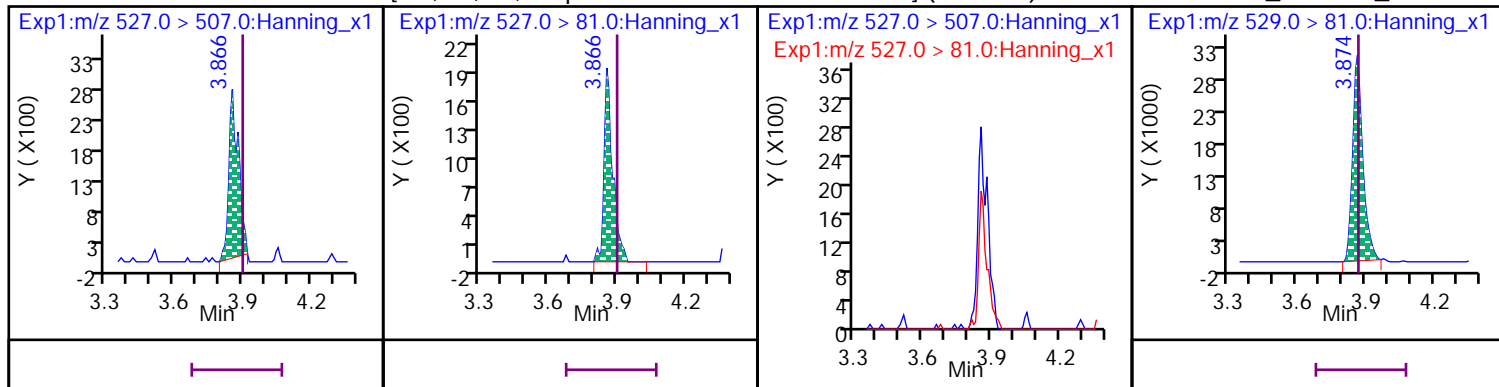
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

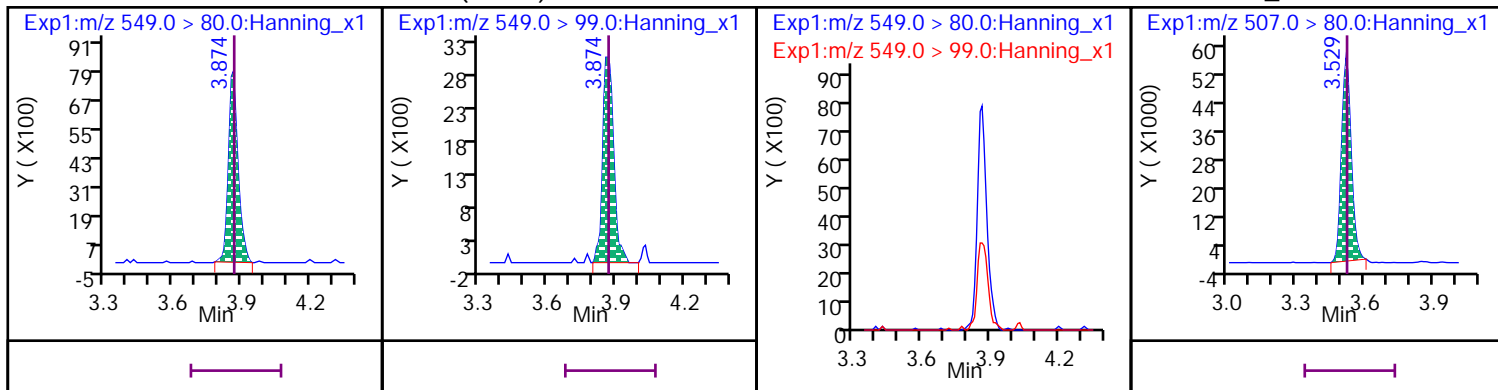
D 65 13C2\_8:2 FTS\_2





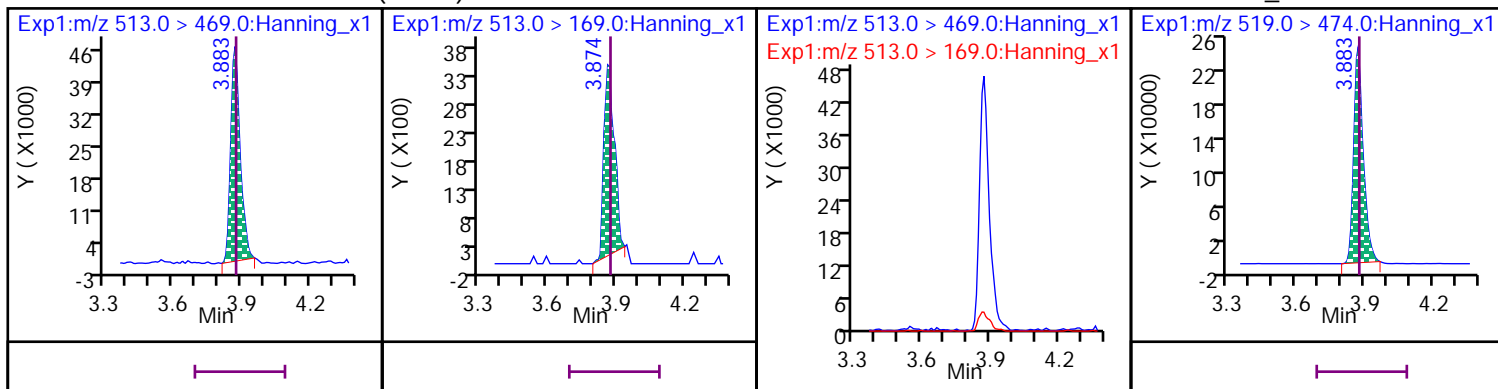
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



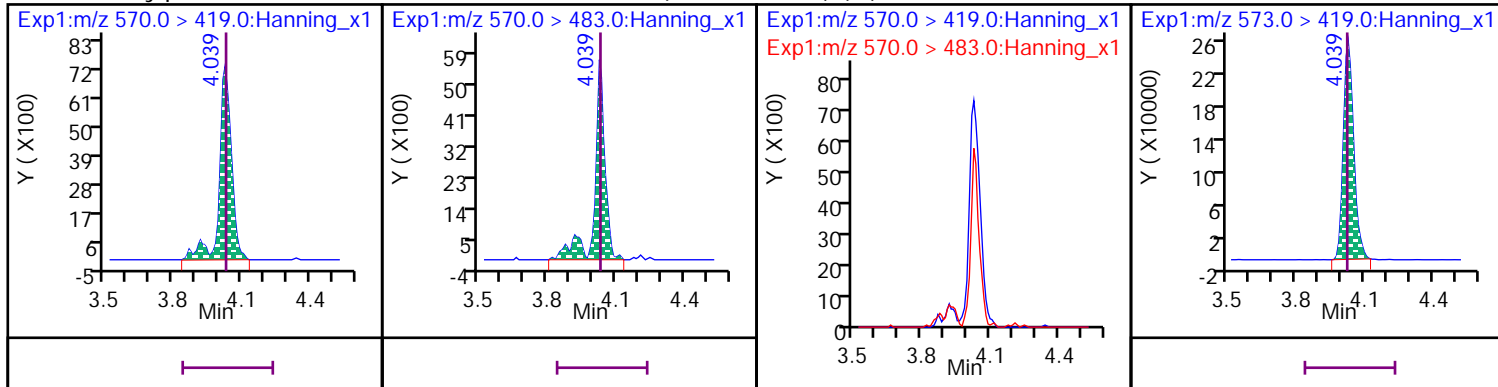
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



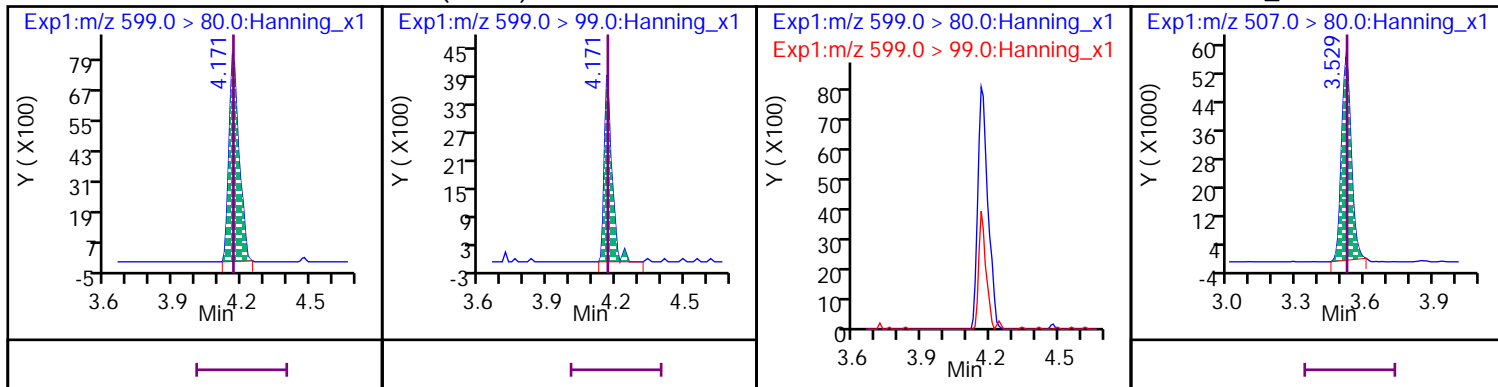
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



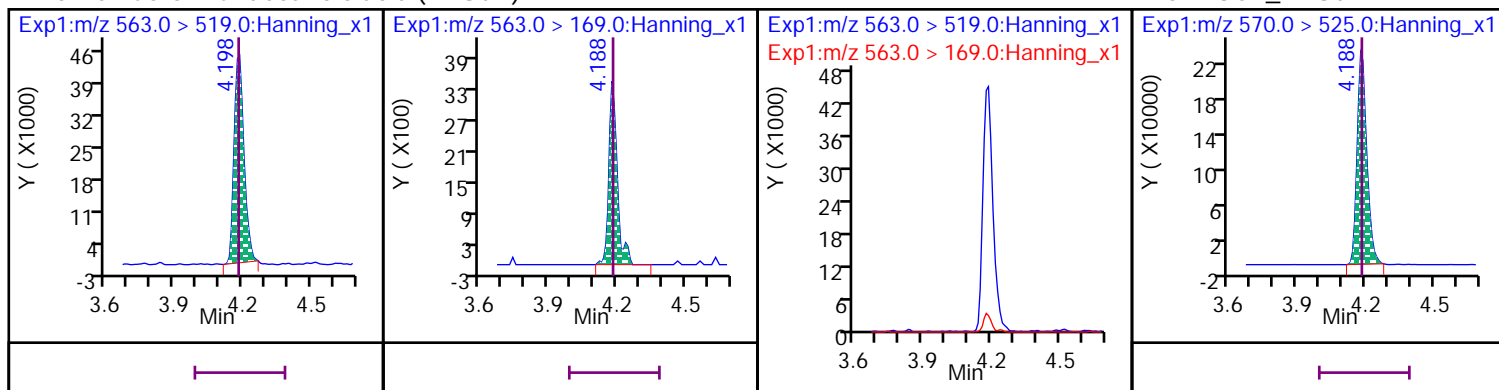
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



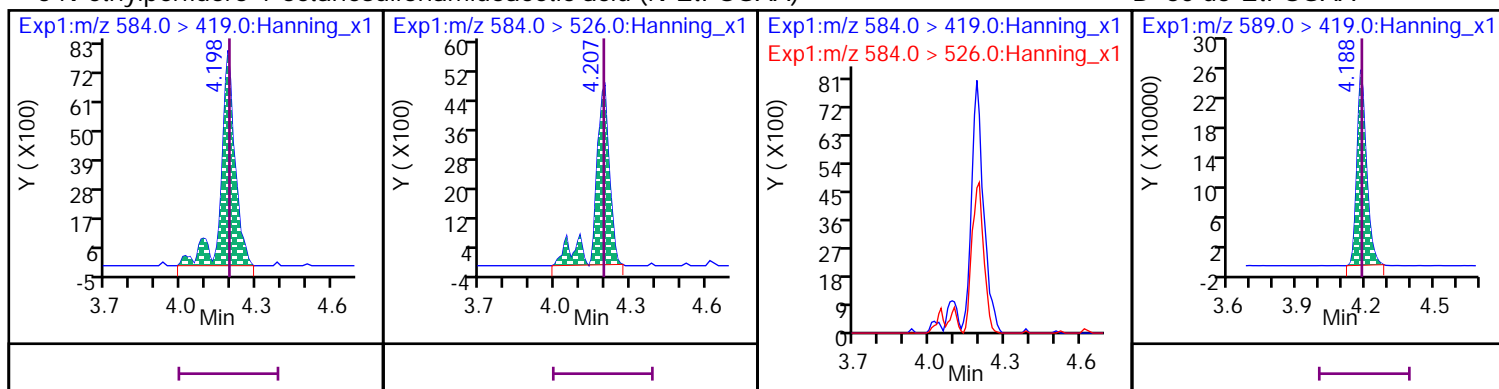
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



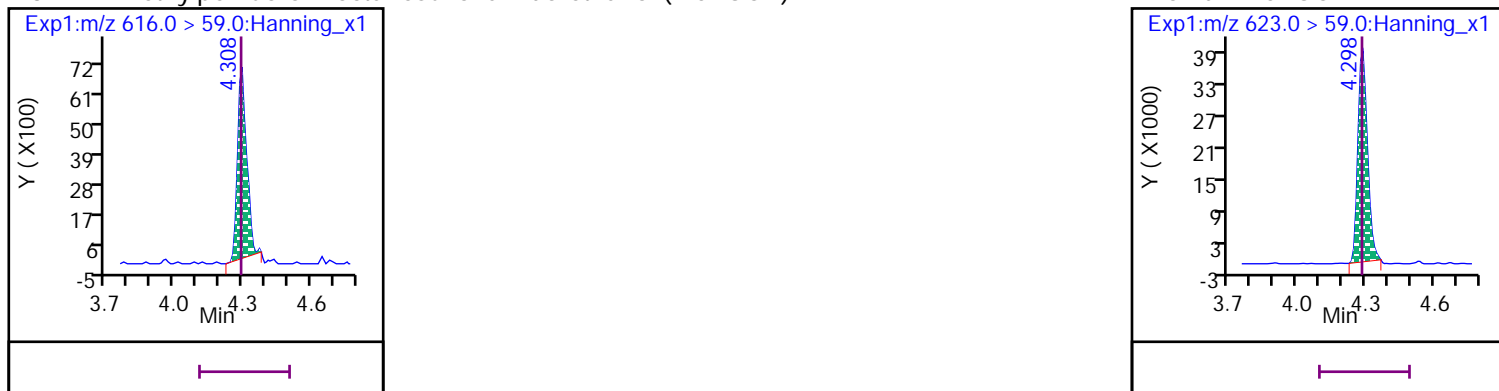
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



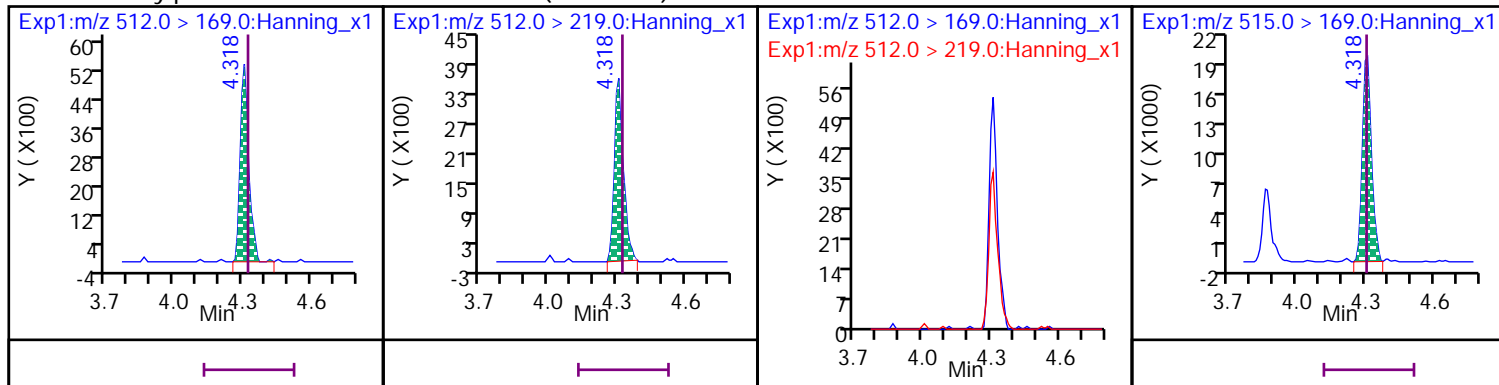
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

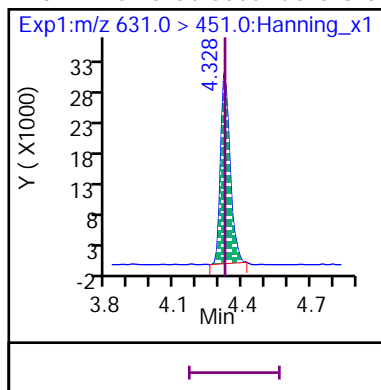


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

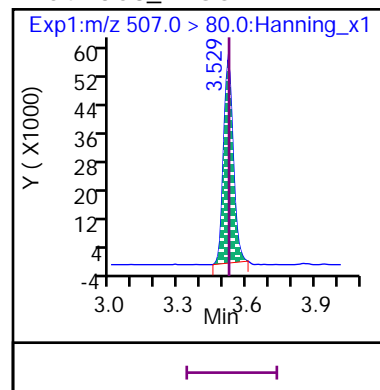
D 57 d3-MeFOSA



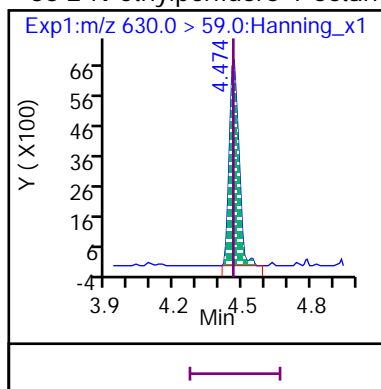
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



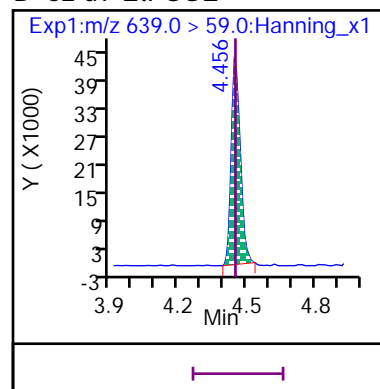
D 54 13C8\_PFOS



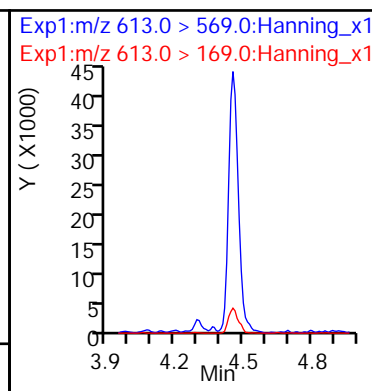
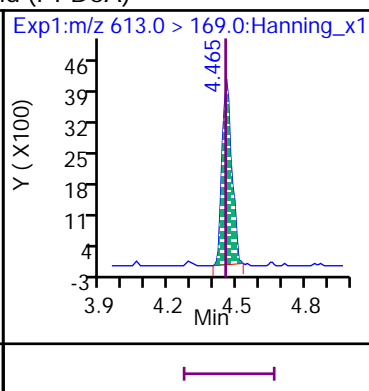
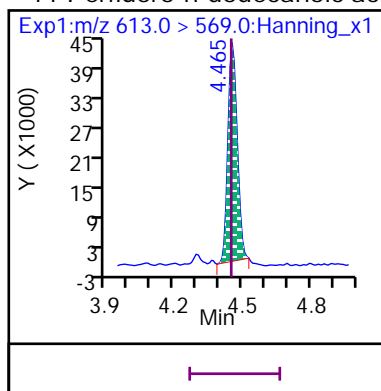
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



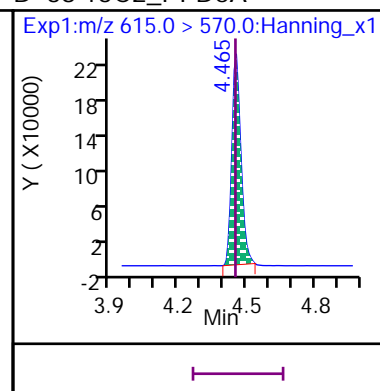
D 62 d9-EtFOSE



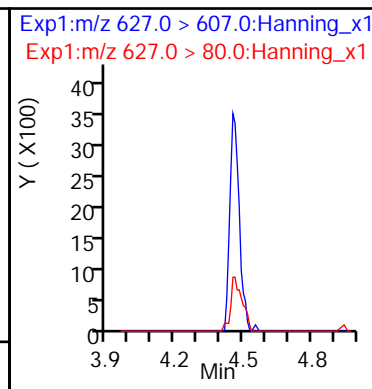
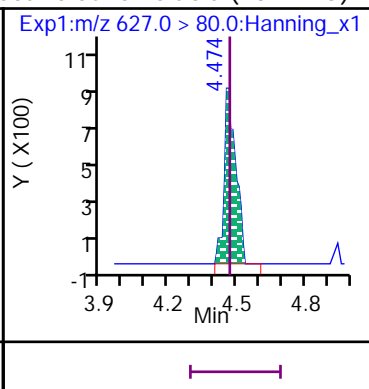
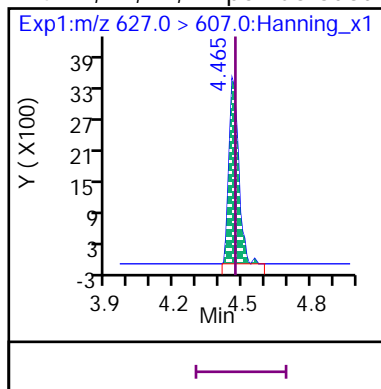
11 Perfluoro-n-dodecanoic acid (PFDoA)



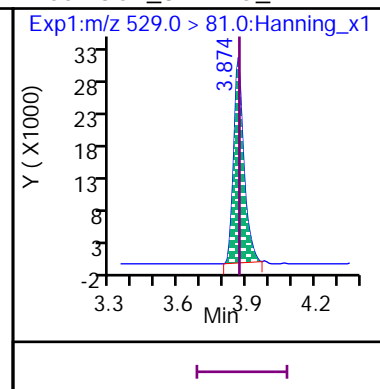
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

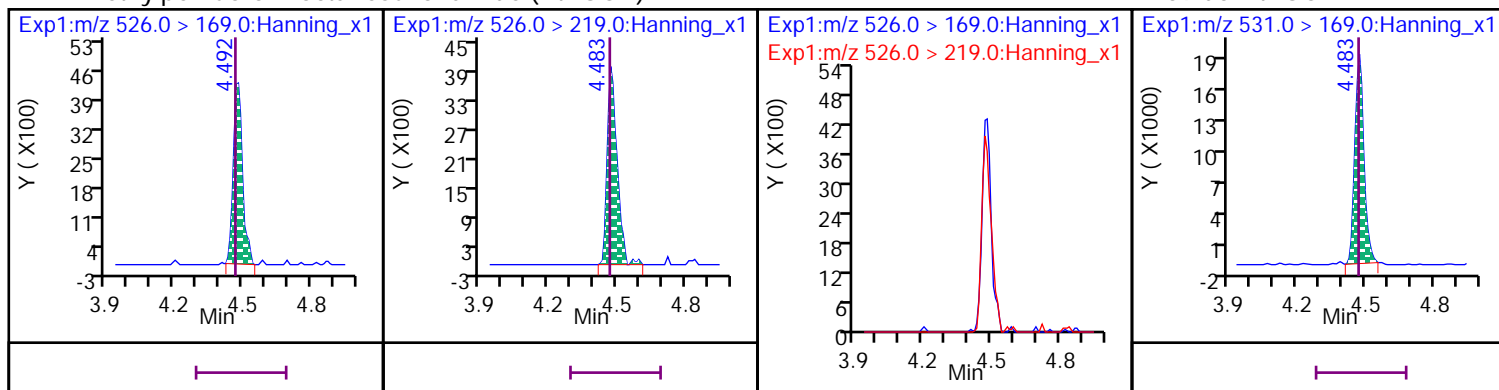


D 65 13C2\_8:2 FTS\_2



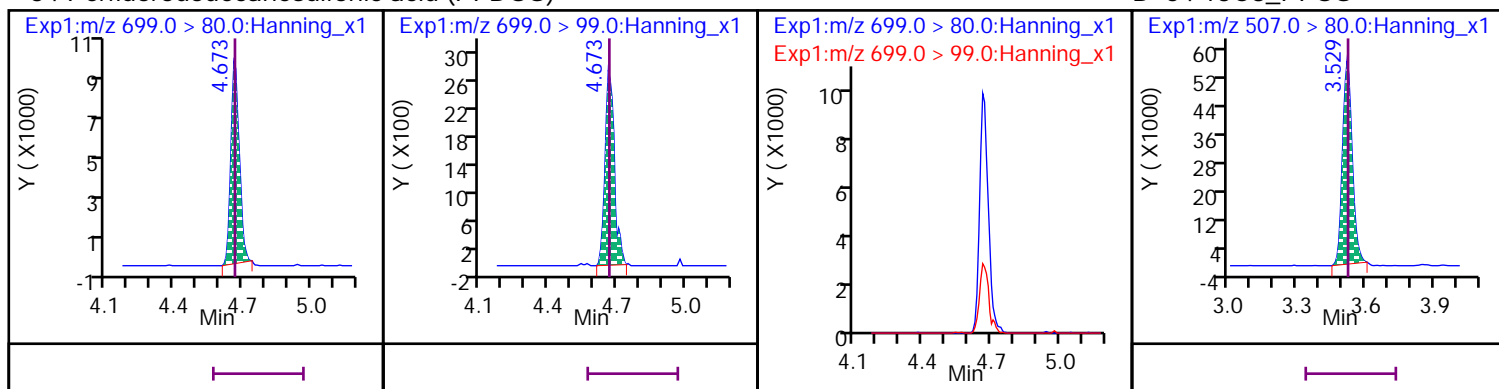
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



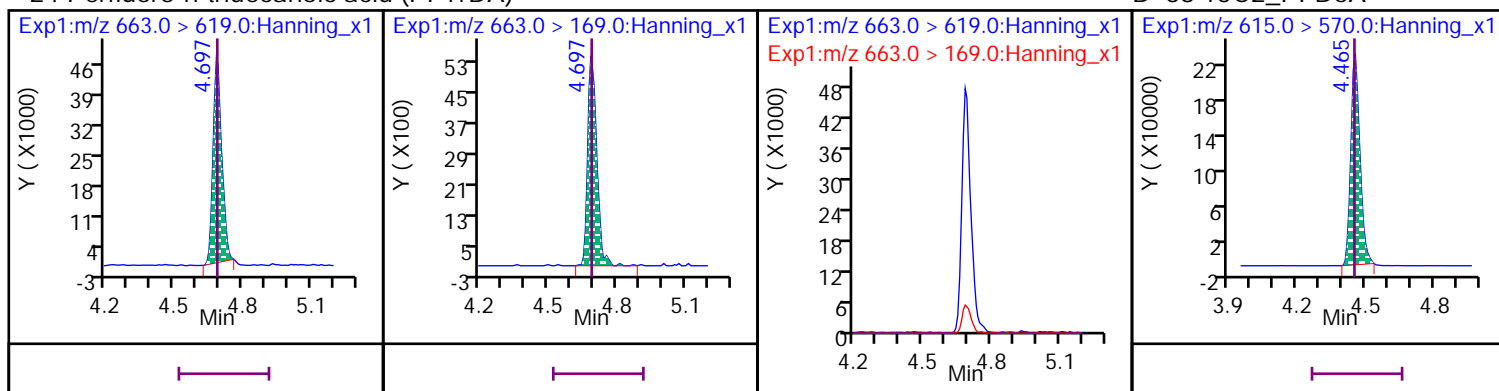
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



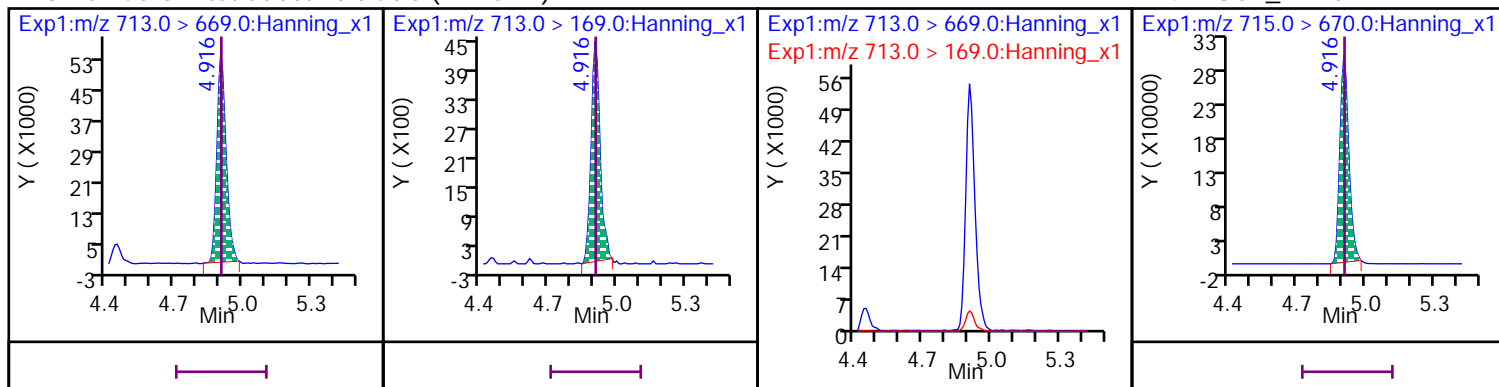
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



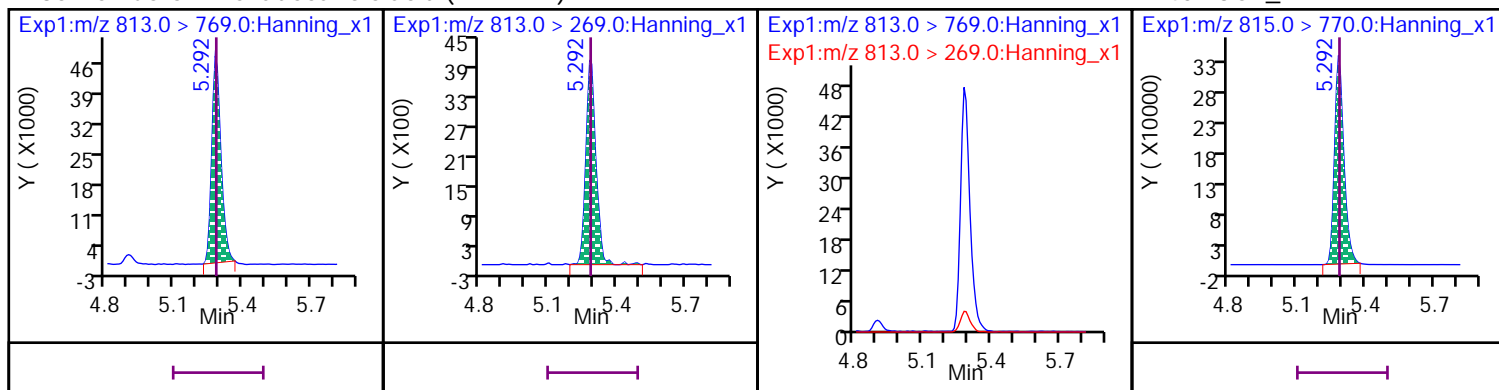
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



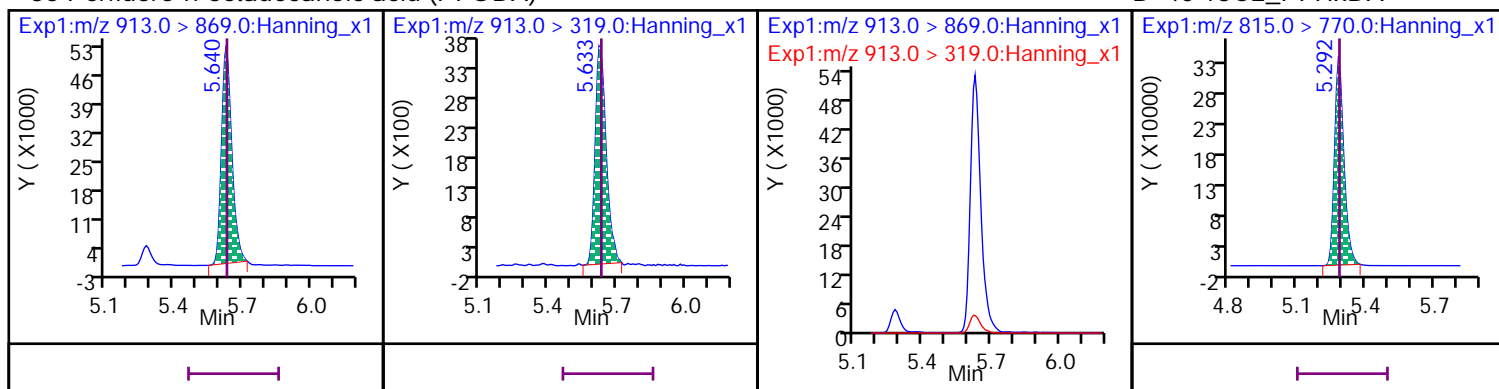
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

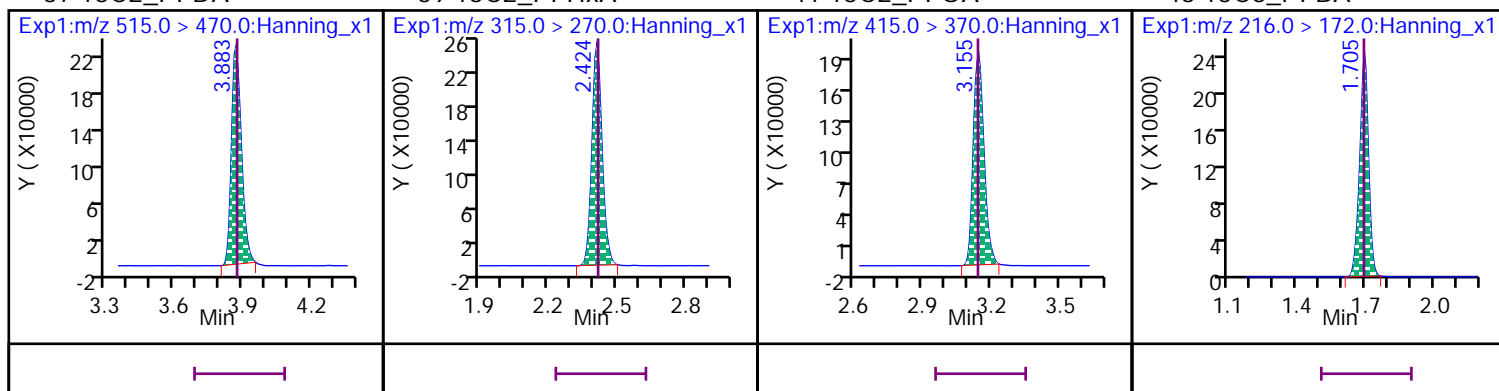


\* 37 13C2\_PFDA

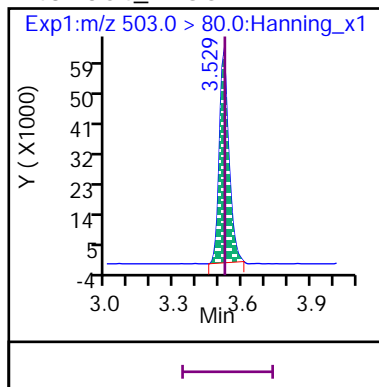
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

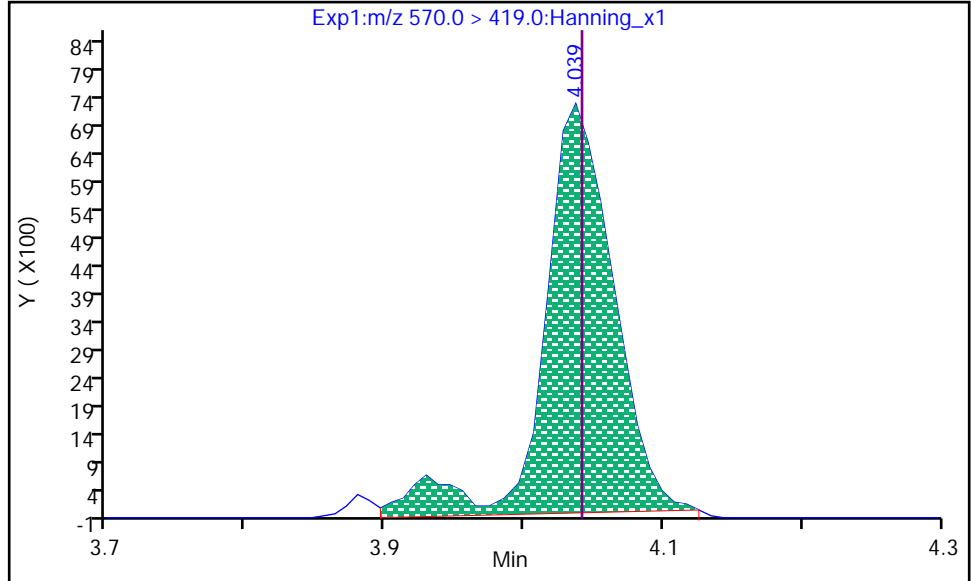
Dil. Factor: 1

Operator: Matthew M. Miller

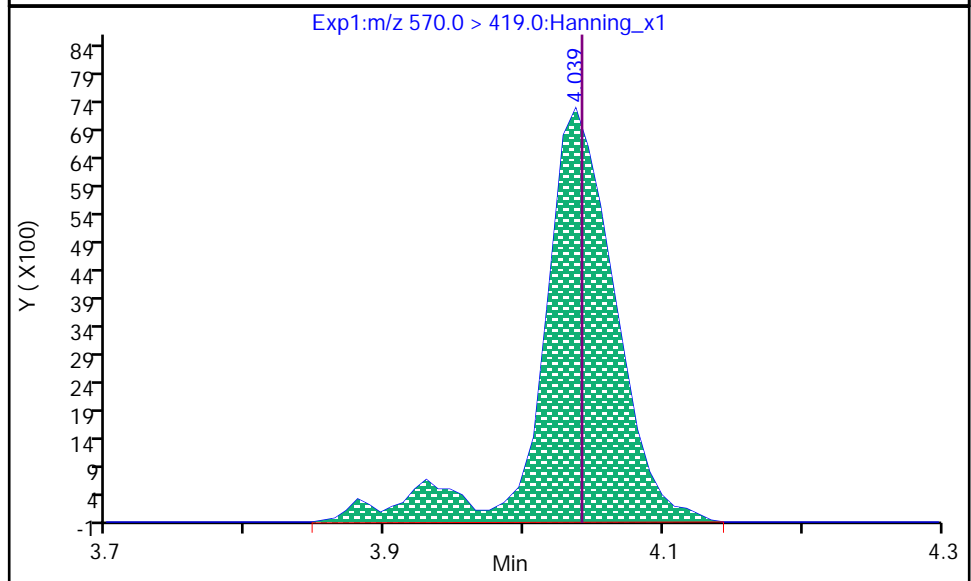
6 N-MeFOSAA, CAS: 2355-31-9

RT: 4.039  
Area: 25062  
Amount: 208.12  
Amount Units: ng/L

Processing Integration Results



RT: 4.039  
Area: 26680  
Amount: 221.56  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:36:34

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920006.d

Injection Date: 29-Dec-2020 10:24:12

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 200\_SVLC-1221

Sample Info: ID CCV 200\_SVLC-1221

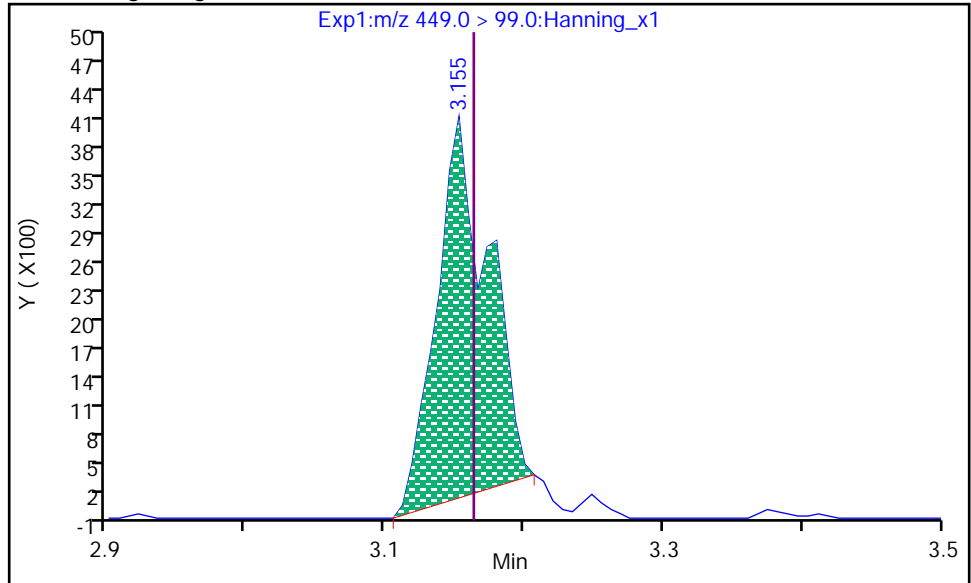
Dil. Factor: 1

Operator: Matthew M. Miller

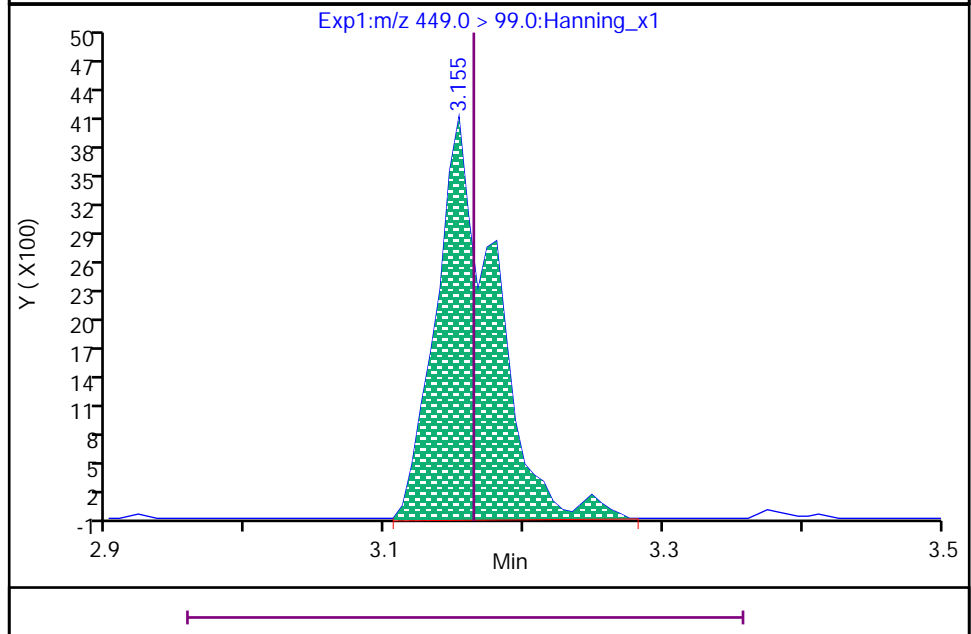
12 PFHpS, CAS: 375-92-8

Processing Integration Results

RT: 3.155  
Area: 10113  
Amount: 199.79  
Amount Units: ng/L



RT: 3.155  
Area: 12298  
Amount: 199.79  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:36:22

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d  
Injection Date: 29-Dec-2020 12:10:17 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 9  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	939.55	94	70 - 130
D 46 13C4_PFBA	669792	652461			97.4	50 - 150
D 50 13C5_PFPeA	688361	676602			98.3	50 - 150
21 PFPeA			1000.00	908.11	90.8	70 - 130
7 PFBS			884.00	804.09	91	70 - 130
D 44 13C3_PFBS	241196	241420			100	50 - 150
1 4:2 FTS			934.00	971.41	104	70 - 130
D 63 13C2_4:2 FTS_2	136264	123944			91	50 - 150
D 49 13C5_PFHxA	755876	714129			94.5	50 - 150
15 PFHxA			1000.00	921.86	92.2	70 - 130
22 PFPeS			938.00	848.90	90.5	70 - 130
28 GenX			2000.00	1829.51	91.5	70 - 130
D 66 13C3_GenX	1415766	1314549			92.9	50 - 150
D 47 13C4_PFHpA	613536	601085			98	50 - 150
13 PFHpA			1000.00	960.95	96.1	70 - 130
D 45 13C3_PFHxS	185779	173240			93.3	50 - 150
14 PFHxS			910.00	888.21	97.6	70 - 130
29 ADONA			942.00	859.16	91.2	70 - 130
D 64 13C2_6:2 FTS_2	105371	103475			98.2	50 - 150
2 6:2 FTS			948.00	893.43	94.2	70 - 130
20 PFOA			1000.00	917.82	91.8	70 - 130
D 53 13C8_PFOA	607240	593449			97.7	50 - 150
12 PFHpS			952.00	958.42	101	70 - 130
18 PFOS			928.00	820.66	88.4	70 - 130
17 PFNA			1000.00	954.95	95.5	70 - 130
D 56 13C9_PFNA	787757	731519			92.9	50 - 150
D 54 13C8_PFOS	153541	154039			100	50 - 150
30 9CI-PF3ONS			932.00	845.82	90.8	70 - 130
D 55 13C8_PFOA	318847	306147			96	50 - 150
19 PFOSA			1000.00	958.74	95.9	70 - 130
16 PFNS			960.00	852.15	88.8	70 - 130
D 65 13C2_8:2 FTS_2	104593	92237			88.2	50 - 150
3 8:2 FTS			958.00	990.57	103	70 - 130
10 PFDA			1000.00	926.83	92.7	70 - 130
D 51 13C6_PFDA	701677	661287			94.2	50 - 150
D 58 d3-MeFOSAA	727199	694521			95.5	50 - 150



Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	991.90	99.2	70 - 130
9 PFDS			964.00	859.74	89.2	70 - 130
5 N-EtFOSAA			1000.00	950.44	95	70 - 130
25 PFUdA			1000.00	949.06	94.9	70 - 130
D 60 d5-EtFOSAA	710460	671897			94.6	50 - 150
D 52 13C7_PFUdA	641343	605349			94.4	50 - 150
D 61 d7-MeFOSE	96951	107158			111	50 - 150
32 MeFOSE			1000.00	869.77	87	70 - 130
26 MeFOSA			1000.00	902.93	90.3	70 - 130
D 57 d3-MeFOSA	52459	54407			104	50 - 150
31 11Cl-PF3OUDS			942.00	830.51	88.2	70 - 130
D 62 d9-EtFOSE	123442	116044			94	50 - 150
33 EtFOSE			1000.00	1030.51	103	70 - 130
D 59 d5-EtFOSA	48002	47564			99.1	50 - 150
D 38 13C2_PFDoA	609821	576213			94.5	50 - 150
4 10:2 FTS			964.00	789.19	81.9	70 - 130
27 EtFOSA			1000.00	829.59	83	70 - 130
11 PFDoA			1000.00	930.58	93.1	70 - 130
34 PFDOS			968.00	853.11	88.1	70 - 130
24 PFTrDA			1000.00	918.51	91.9	70 - 130
23 PFTeDA			1000.00	969.70	97	70 - 130
D 42 13C2_PFTeDA	786208	742034			94.4	50 - 150
35 PFHxDA			1000.00	999.69	100	70 - 130
D 40 13C2_PFHxDA	908883	859077			94.5	50 - 150
36 PFODA			1000.00	966.10	96.6	70 - 130

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d  
Injection Date: 29-Dec-2020 12:10:17 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 9  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	652461	24	>100:1			1000.00	940.75	97.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.705	1.709	0/-1	610566	23	>100:1			1000.00	939.55		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.078	2.080	0	676602	17	>100:1			1000.00	983.60	98.3	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.078	2.080	0/0	617759	16	>100:1			1000.00	908.11		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	241420	18	>100:1			1000.00	1048.60	100	
<b>7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.130	2.133	0/0	228879	18	>100:1	Target = 3.50		884.00	804.09		
298.9 > 99	44	2.130	2.133		65577	17	>100:1	3.49 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.451	2.446	1/1	177776	20	>100:1	Target = 3.10		938.00	848.90		
349 > 99	44	2.451	2.446		53097	20	>100:1	3.34 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.393	0	123944	19	>100:1			5000.00	5119.89	91	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.389	2.393	0/0	48057	17	>100:1	Target = 1.80		934.00	971.41		
327 > 81	63	2.380	2.393		25357	20	>100:1	1.89 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.425	2.429	0	714129	19	>100:1			1000.00	968.87	94.5	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.425	2.420	1/1	649952	20	>100:1	Target = 18.34		1000.00	921.86		
313 > 119	49	2.416	2.420		37926	18	>100:1	17.13 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.532	2.536	0	1314549	20	>100:1			5000.00	4935.35	92.9	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.532	2.536	0/0	345577	20	>100:1	Target = 0.81		2000.00	1829.51		
285 > 185	66	2.532	2.536		443687	20	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.777	0	601085	21	>100:1			1000.00	990.83	98	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.786	0/0	599137	19	>100:1	Target = 3.70		1000.00	960.95		
363 > 169	47	2.773	2.786		158553	21	>100:1	3.77 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	173240	21	>100:1			1000.00	1011.75	93.3	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.795	0/0	163150	27	>100:1	Target = 3.21	0.13	910.00	888.21		
399 > 99	45	2.791	2.795		47870	28	>100:1	3.40 (1.60-4.81)	0.14				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.823	0/0	944966	21	>100:1	Target = 2.97		942.00	859.16		
377 > 85	45	2.819	2.823		319849	20	>100:1	2.95 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.156	3.166	0/0	150832	25	>100:1	Target = 3.08		952.00	958.42		
449 > 99	45	3.156	3.166		45425	21	>100:1	3.32 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.132	0	103475	23	>100:1			5000.00	5372.98	98.2	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.129	3.139	0/0	38392	28	>100:1	Target = 1.80		948.00	893.43		
427 > 81	64	3.122	3.139		22154	24	>100:1	1.73 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.159	0	593449	25	>100:1			1000.00	1002.68	97.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.149	3.159	0/0	555273	25	>100:1	Target = 2.87		1000.00	917.82		
413 > 169	53	3.149	3.159		185964	24	>100:1	2.98 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.522	3.533	0	154039	22	>100:1			1000.00	1027.41	100	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.529	3.533	0/0	149799	42	>100:1	Target = 3.84	0.25	928.00	820.66		
499 > 99	54	3.522	3.533		43097	46	>100:1	3.47 (1.92-5.76)	0.16				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.730	3.740	0/0	438614	23	>100:1			932.00	845.82		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.874	3.879	0/0	100452	21	>100:1	Target = 3.07		960.00	852.15		
549 > 99	54	3.866	3.879		35877	24	>100:1	2.79 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.171	4.175	0/0	96111	17		Target = 3.03		964.00	859.74		
599 > 99	54	4.171	4.175		35828	17		2.68 (1.51-4.55)					
<b>31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	363315	17	>100:1			942.00	830.51		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.673	4.677	0/0	105502	18	>100:1	Target = 3.33		968.00	853.11		
699 > 99	54	4.673	4.677		34432	18		3.06 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	731519	22	>100:1			1000.00	974.11	92.9	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.529	3.533	0/0	698586	23	>100:1	Target = 6.16		1000.00	954.95		
463 > 169	56	3.529	3.533		110157	21	>100:1	6.34 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.854	0	306147	22	>100:1			1000.00	988.96	96	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.854	0/0	289245	21	>100:1			1000.00	958.74		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.866	3.879	0	92237	22				5000.00	4972.31	88.2	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.911	-2/-2	36731	22	>100:1	Target = 1.95		958.00	990.57		
527 > 81	65	3.874	3.911		21425	39		1.71 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.474	4.479	0/0	33643	23	>100:1	Target = 3.14		964.00	789.19		
627 > 80	65	4.465	4.479		10624	17	70:1	3.16 (1.57-4.72)					M
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.874	3.887	0	661287	20	>100:1			1000.00	996.92	94.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.874	3.887	0/0	602232	20	>100:1	Target = 15.94		1000.00	926.83		
513 > 169	51	3.874	3.887		46934	25	>100:1	12.83 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.034	0	694521	18	>100:1			5000.00	4838.54	95.5	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.039	4.043	0/0	105835	35		Target = 1.33	0.12	1000.00	991.90		M
570 > 483	58	4.039	4.043		78462	35	>100:1	1.34 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	671897	19	>100:1			5000.00	5058.91	94.6	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.198	4.203	0/0	127156	36	>100:1	Target = 1.58	0.09	1000.00	950.44		M
584 > 526	60	4.188	4.203		74054	31	>100:1	1.71 (0.79-2.37)	0.16				M
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	605349	18				1000.00	957.72	94.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.188	4.193	0/0	539970	19	>100:1	Target = 15.50		1000.00	949.06		
563 > 169	52	4.198	4.193		37479	21	>100:1	14.40 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	107158	15	>100:1			1000.00	990.30	111	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	87573	15	>100:1			1000.00	869.77		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.314	0	54407	15	67:1			1000.00	1028.16	104	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.334	-1/-1	55424	15	>100:1	Target = 1.12		1000.00	902.93		
512 > 219	57	4.318	4.334		51549	19	>100:1	1.07 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.461	0	116044	16	>100:1			1000.00	925.42	94	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.470	0/0	106392	17	>100:1			1000.00	1030.51		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.461	0	576213	18	>100:1			1000.00	951.92	94.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.461	0/0	543007	20	>100:1	Target = 10.85		1000.00	930.58		
613 > 169	38	4.456	4.461		48410	18	>100:1	11.21 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.697	4.701	0/0	521286	20	>100:1	Target = 8.37		1000.00	918.51		
663 > 169	38	4.697	4.701		61067	21	>100:1	8.53 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	47564	15	>100:1			1000.00	968.83	99.1	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.479	1/0	43109	24	>100:1	Target = 1.03		1000.00	829.59		
526 > 219	59	4.483	4.479		45785	18	>100:1	0.94 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	742034	19	>100:1			1000.00	880.81	94.4	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.918	0/0	623457	20	87:1	Target = 12.11		1000.00	969.70		
713 > 169	42	4.915	4.918		57053	21	>100:1	10.92 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	859077	19	>100:1			1000.00	948.04	94.5	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	561136	20	>100:1	Target = 11.48		1000.00	999.69		
813 > 269	40	5.292	5.296		50163	19	>100:1	11.18 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.633	5.643	0/0	734689	25	92:1	Target = 13.88		1000.00	966.10		
913 > 319	40	5.633	5.643		51921	27	>100:1	14.15 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.883	3.887	0	651606	21	>100:1					94.7	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.425	2.429	0	708508	19	>100:1					96.9	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.152	0	573720	24	>100:1					93	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	604507	25	>100:1					94.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
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\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80		3.522	3.533	0	165064	23	>100:1					95.9	
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### Compound Type Legend

D - Isotopic Dilution Std.  
\* - ISTD

### QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

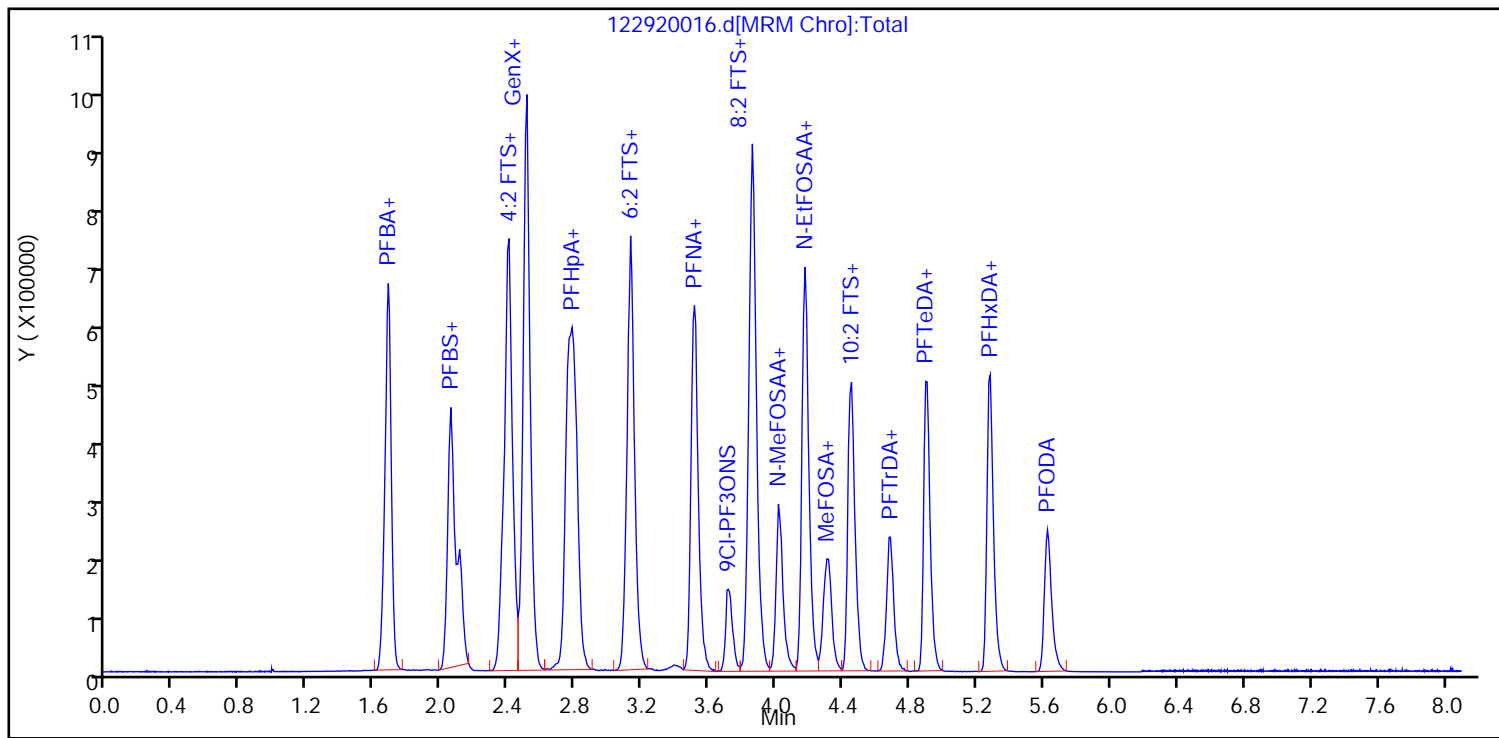
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

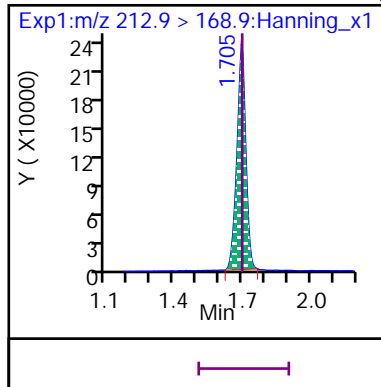
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

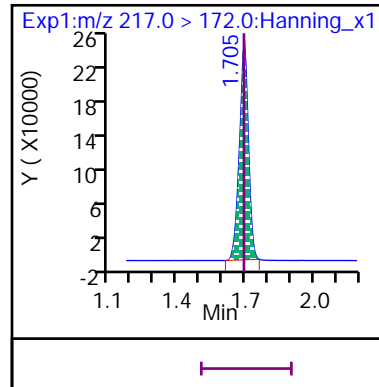
Operator: Matthew M. Miller



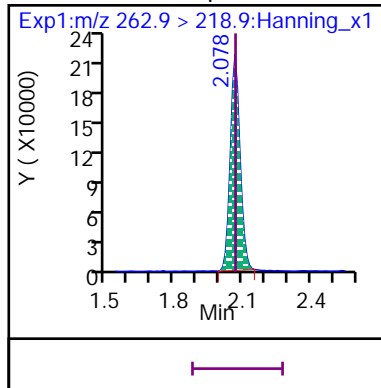
8 Perfluoro-n-butanoic acid (PFBA)



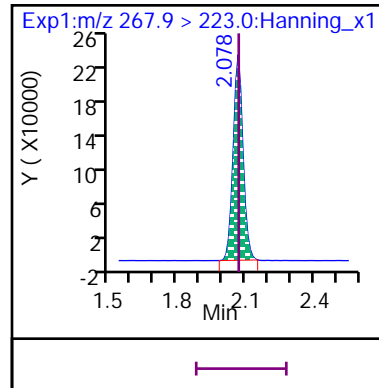
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

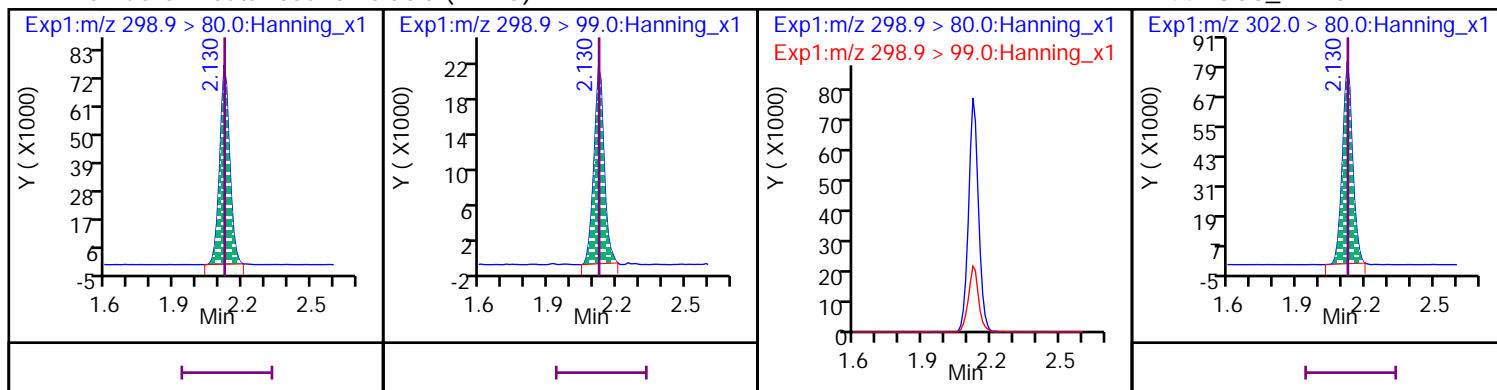


D 50 13C5\_PFPeA



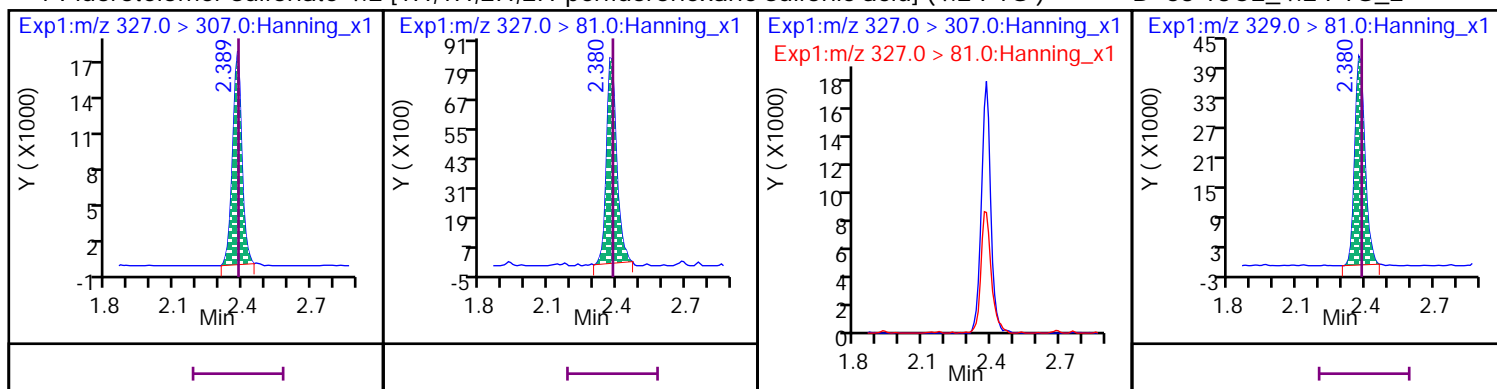
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



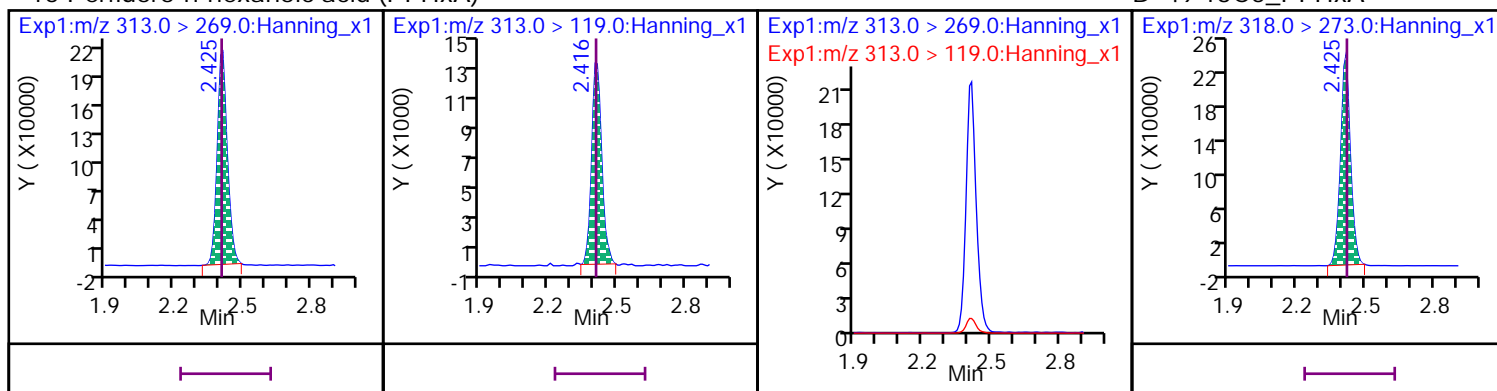
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



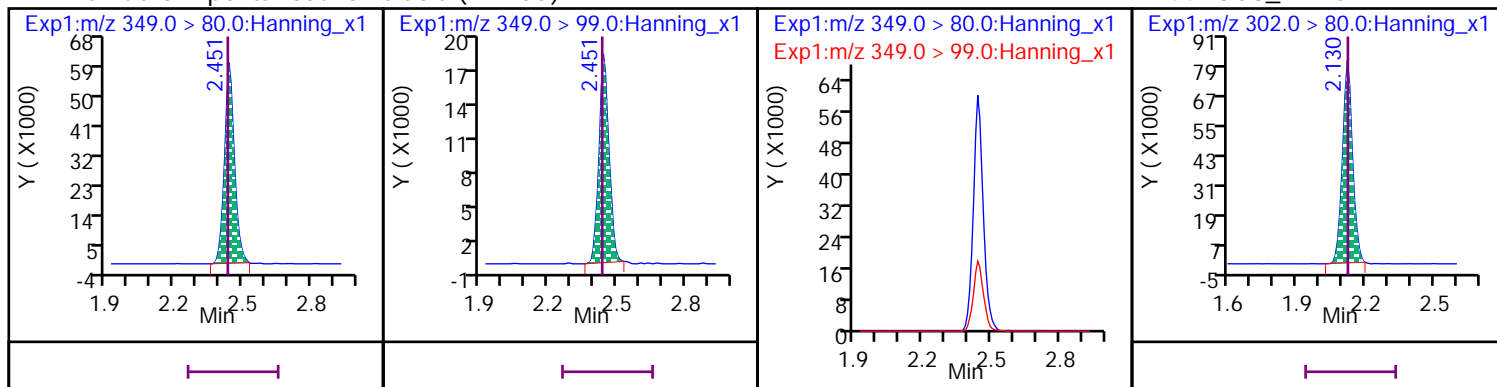
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



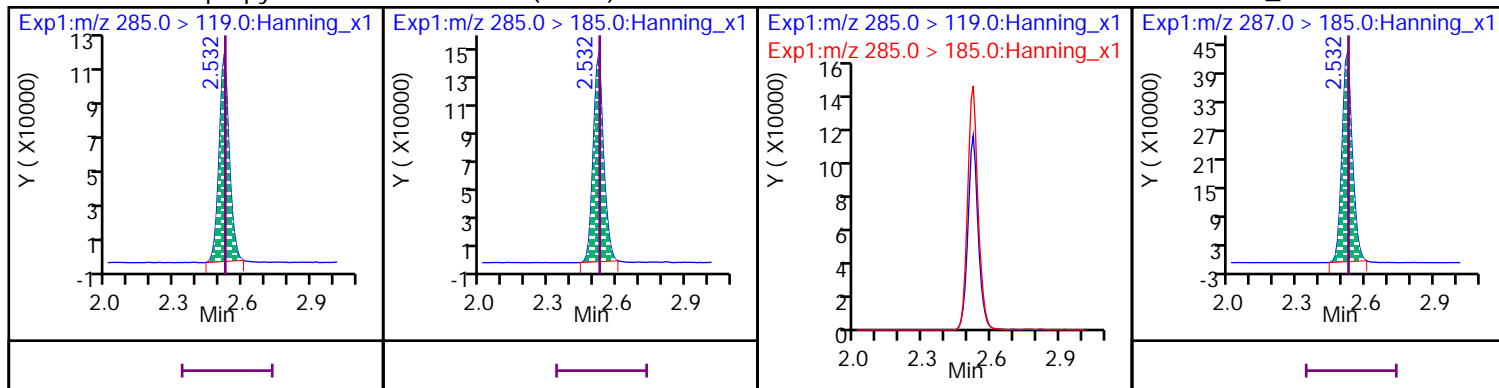
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



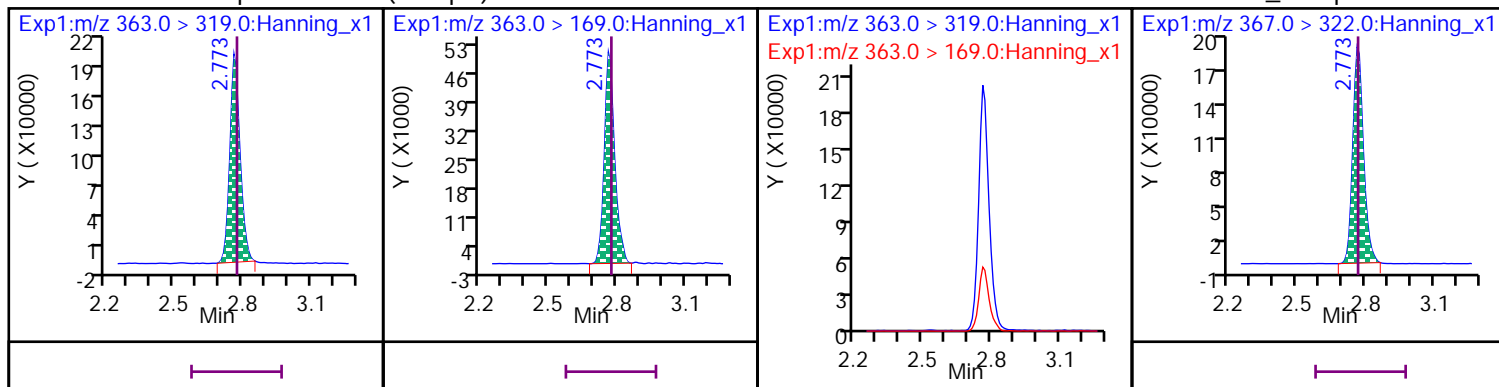
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



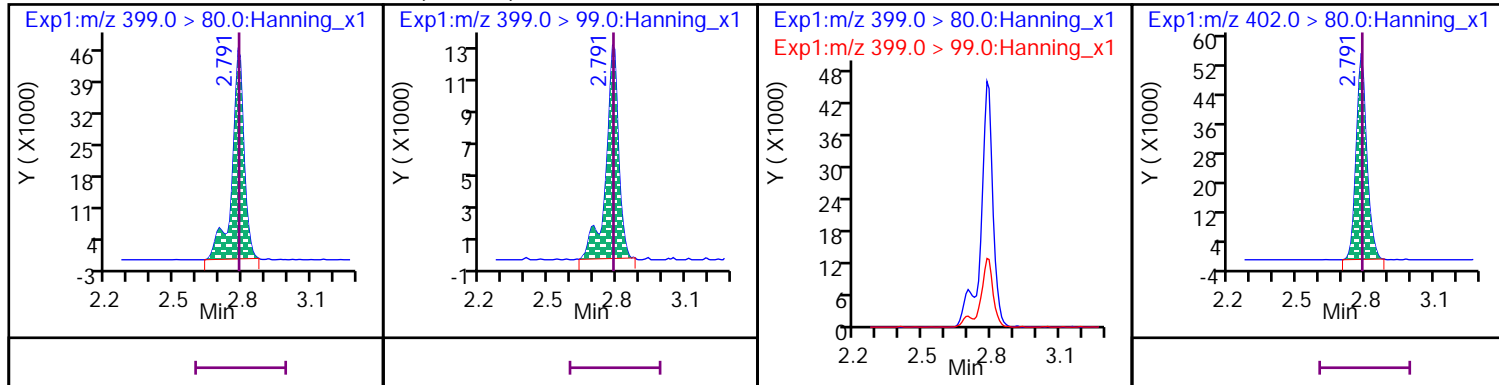
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



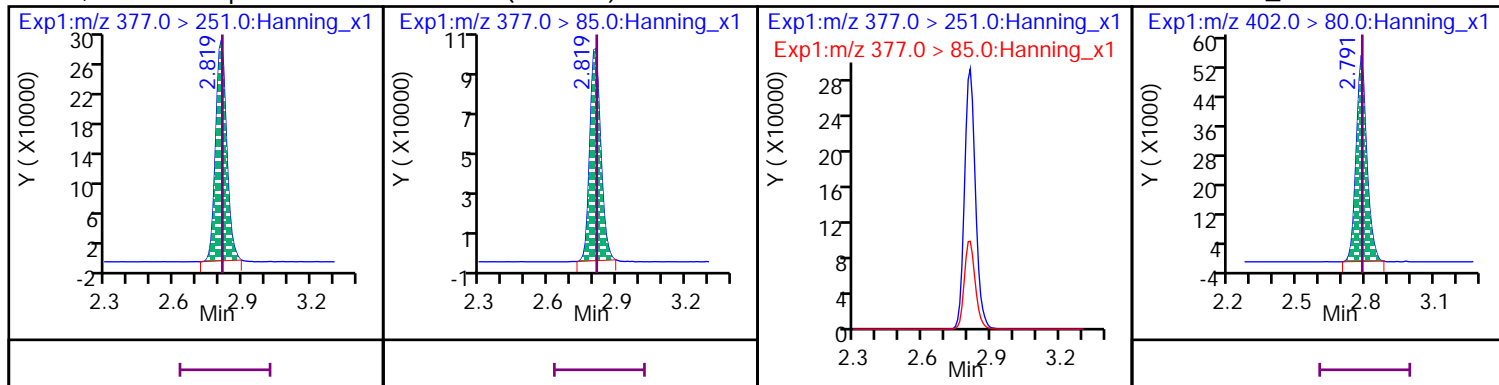
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

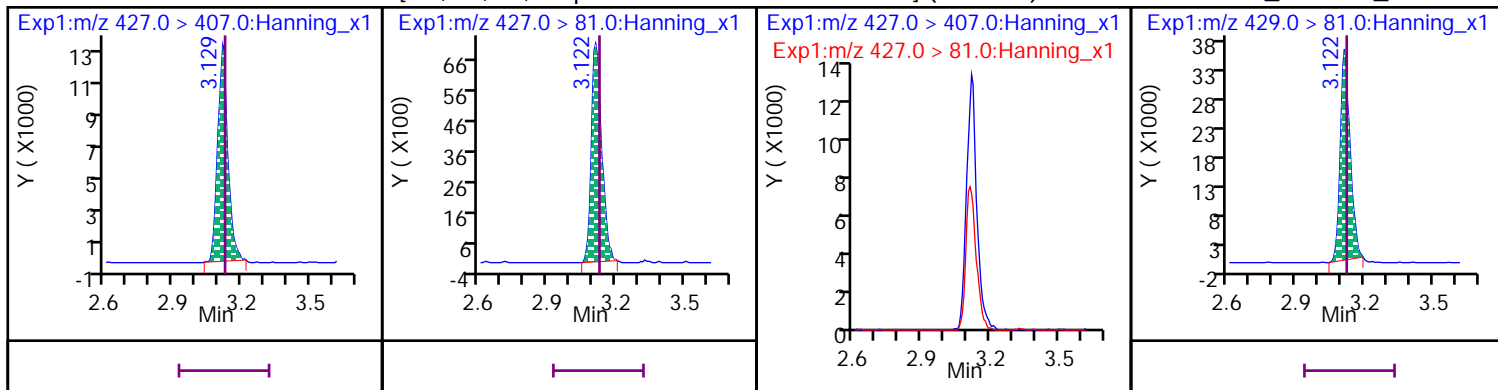
D 45 13C3\_PFHxS





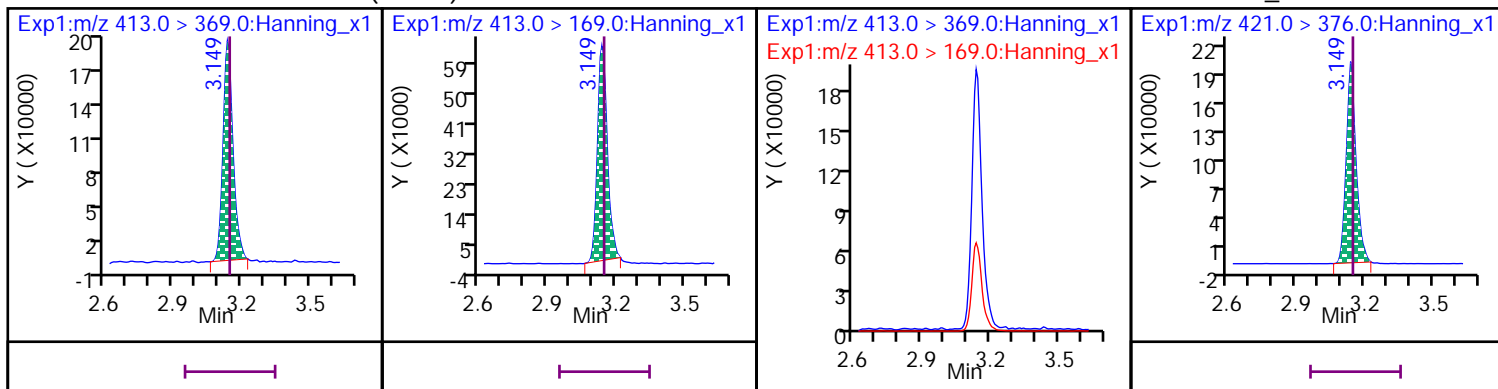
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



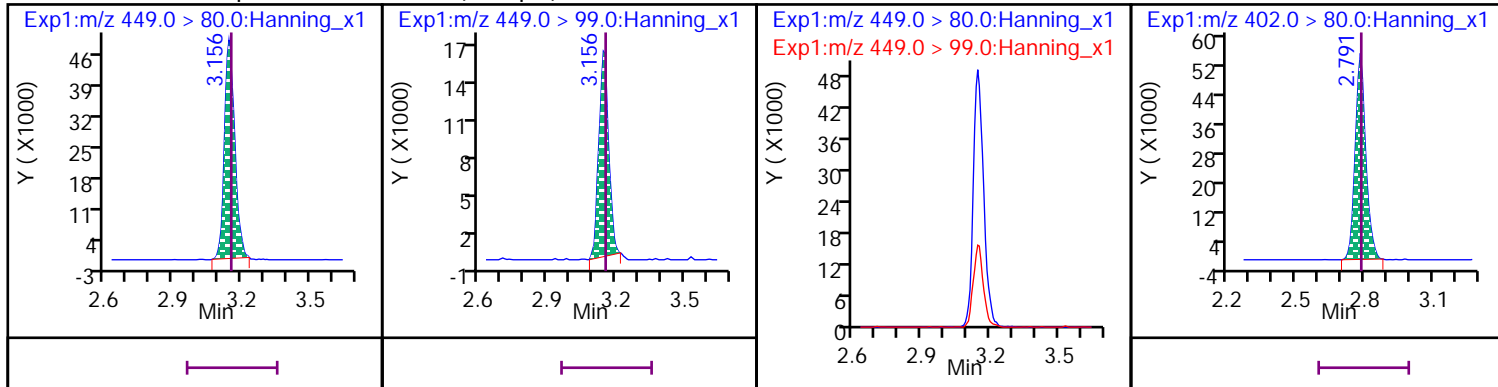
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



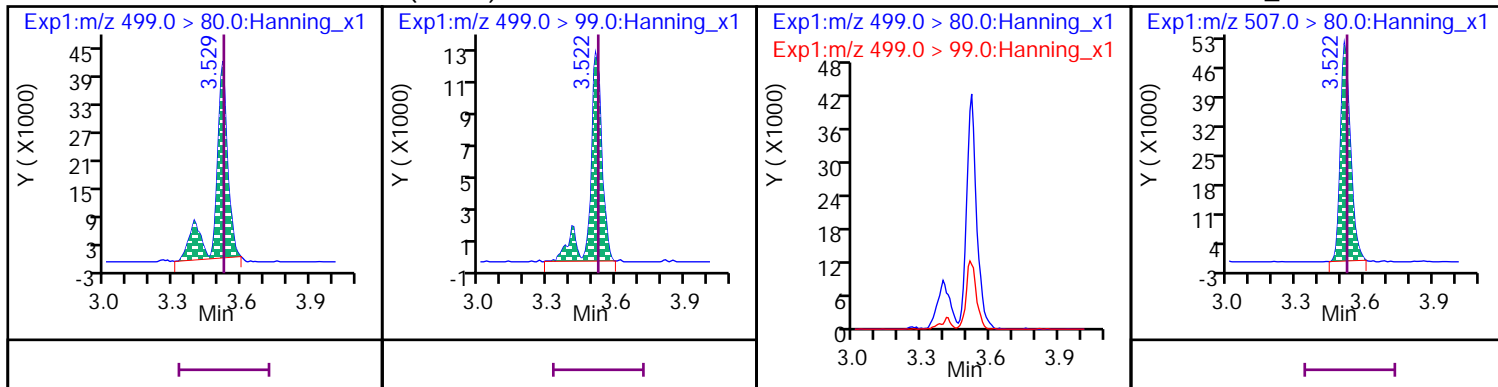
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



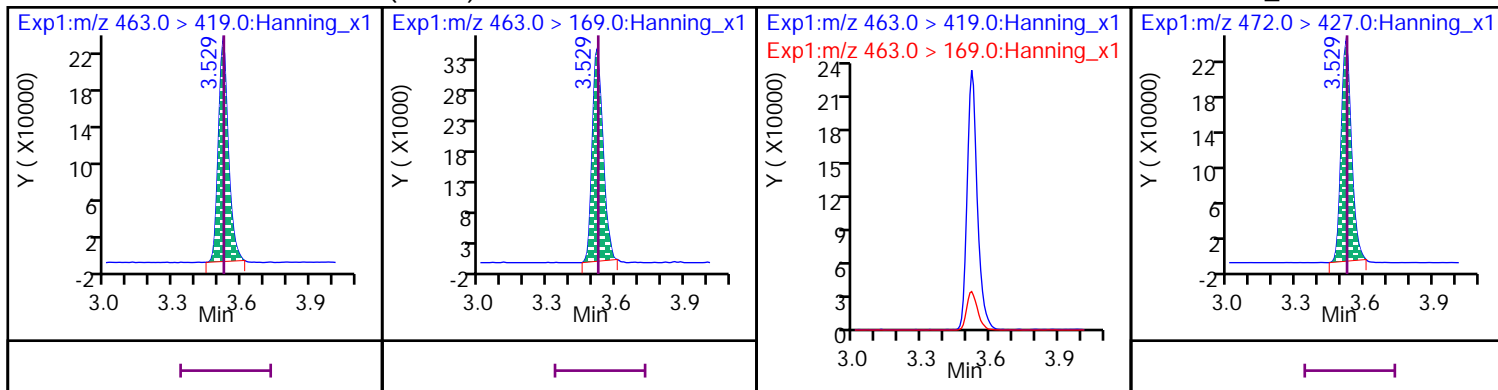
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



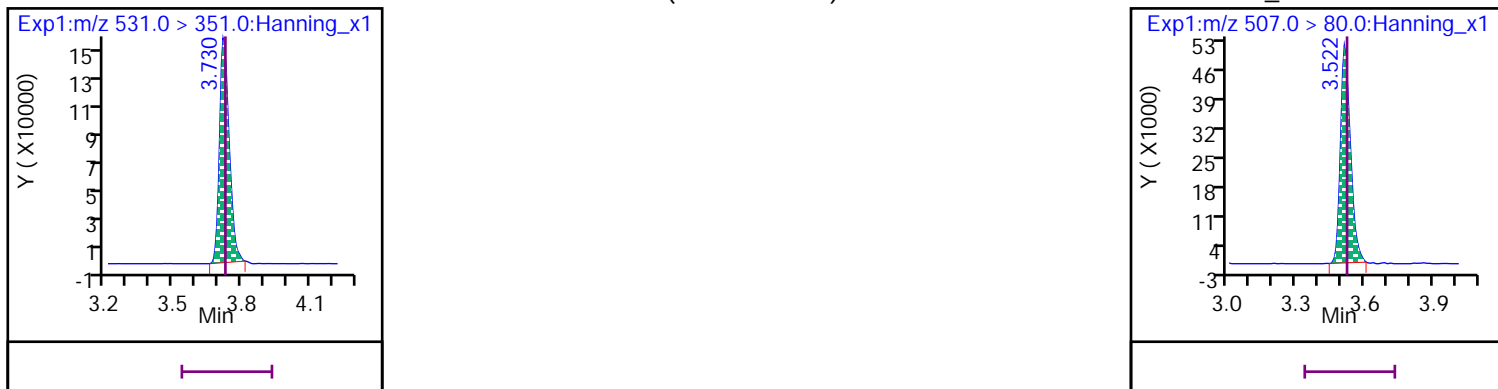
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



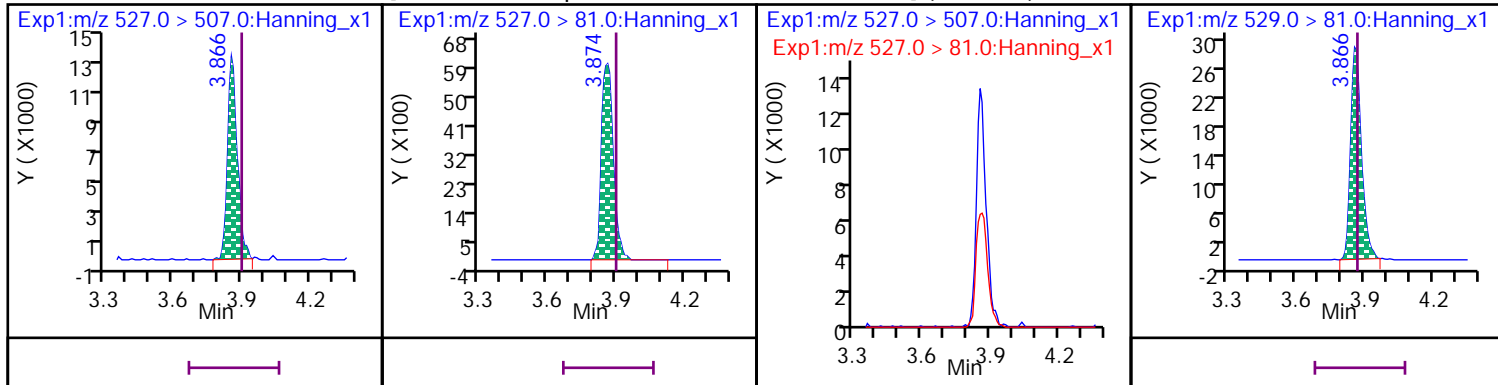
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



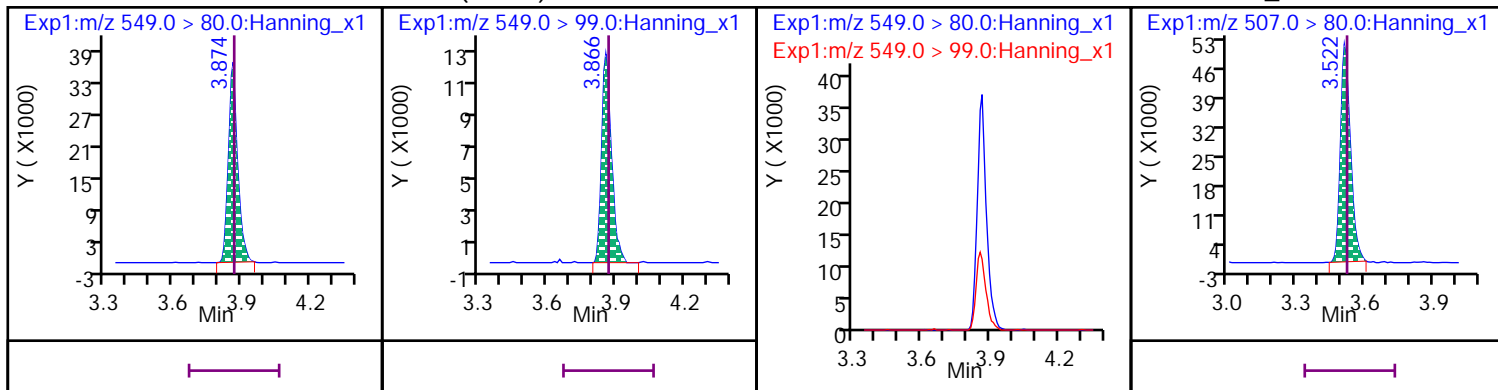
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



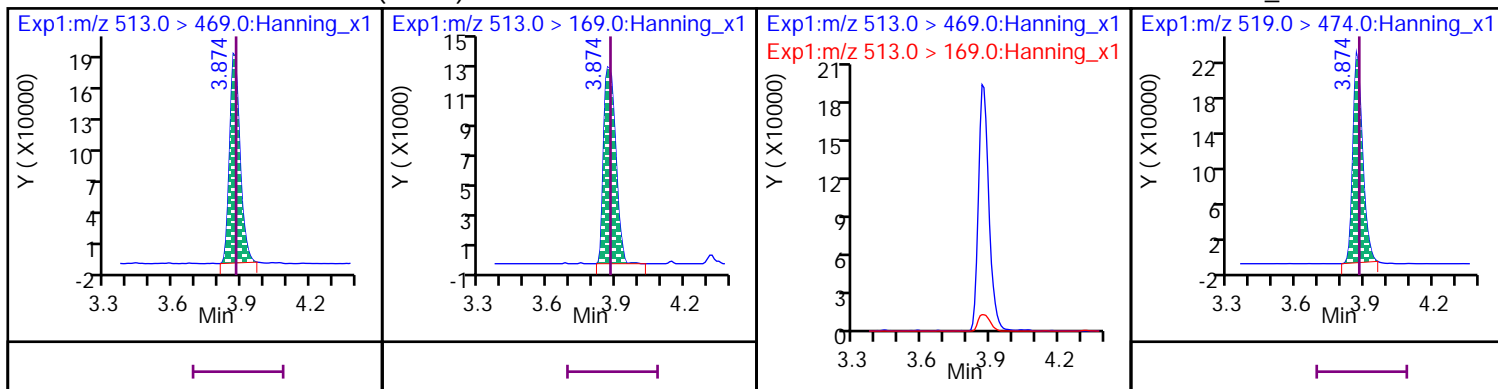
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



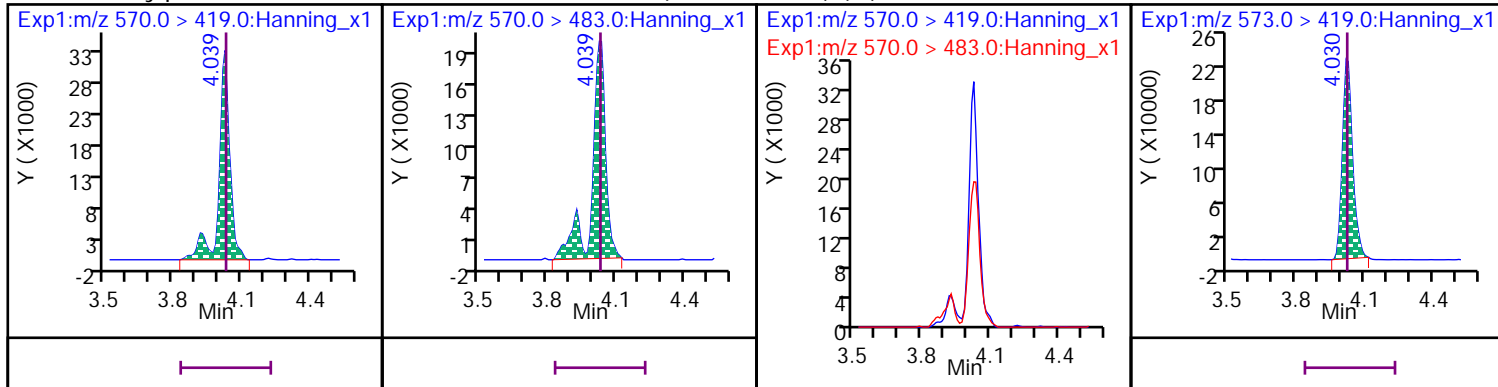
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



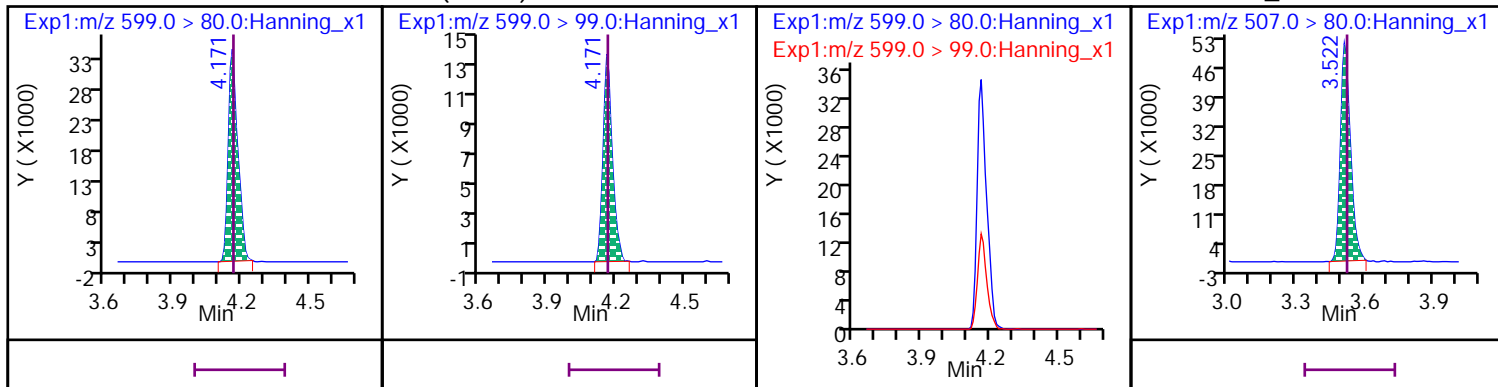
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



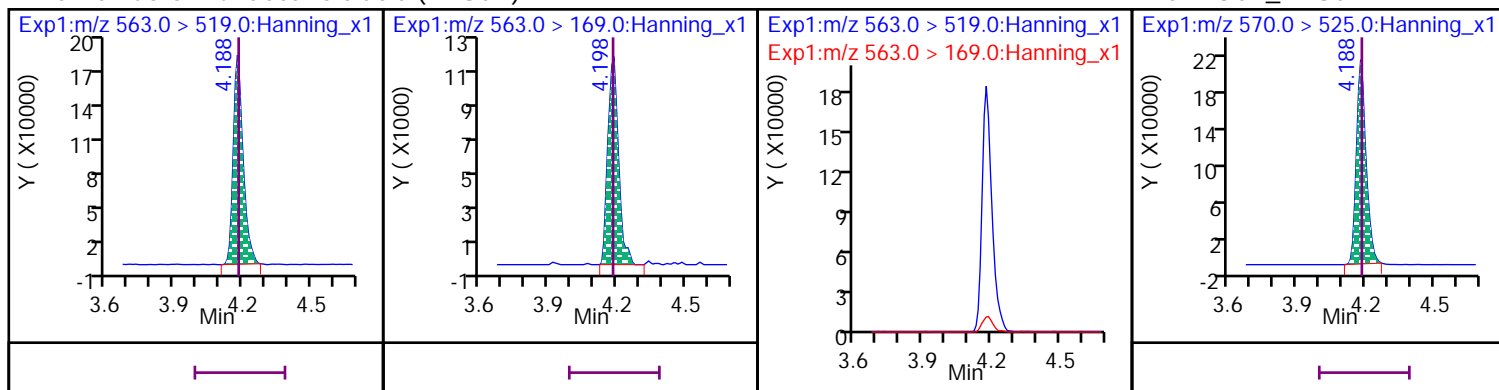
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



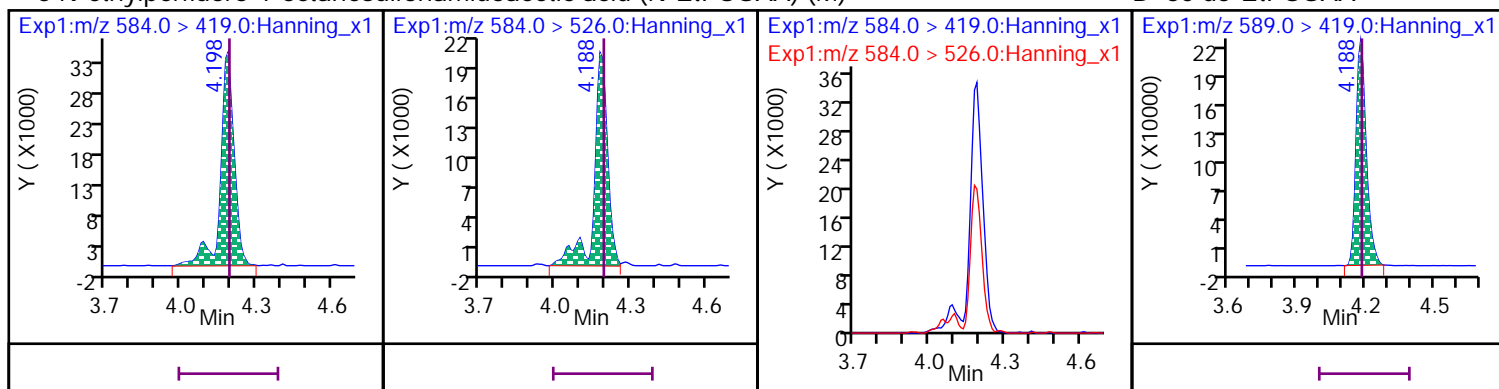
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



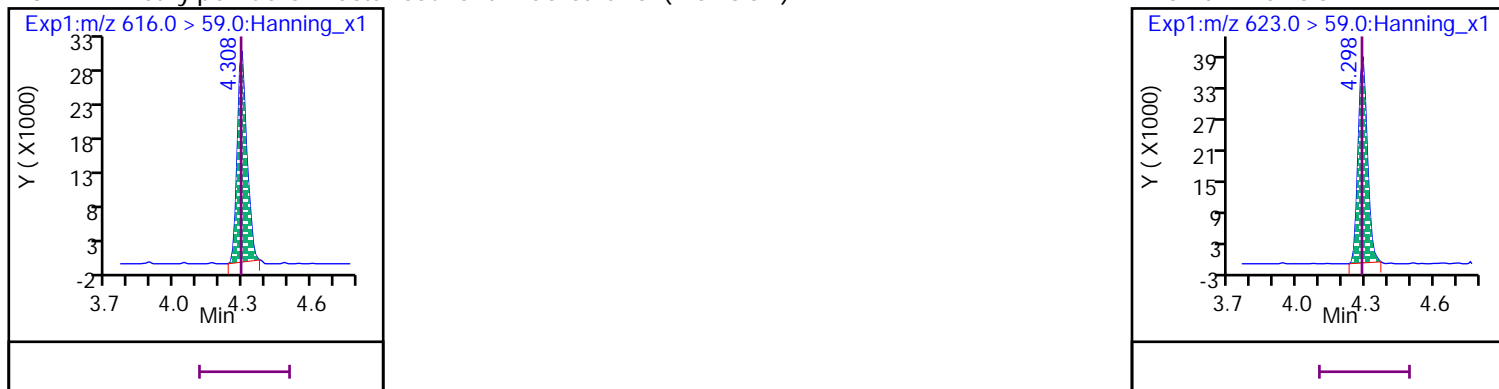
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



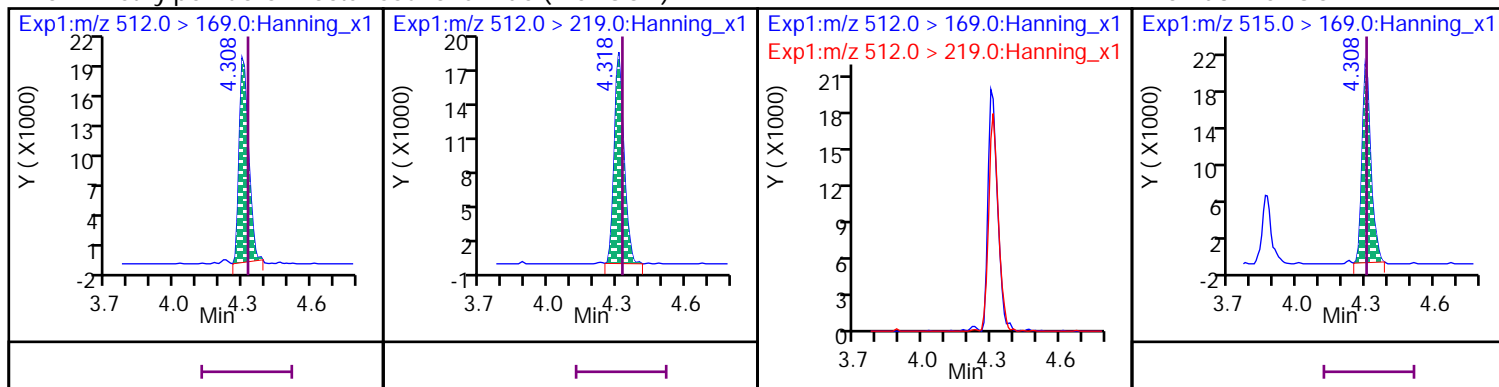
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

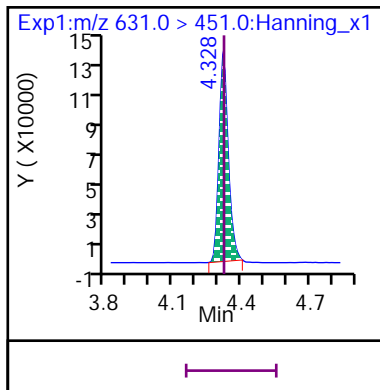


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

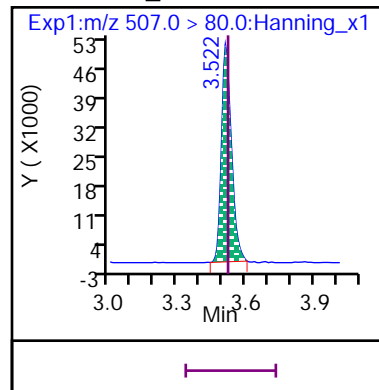
D 57 d3-MeFOSA



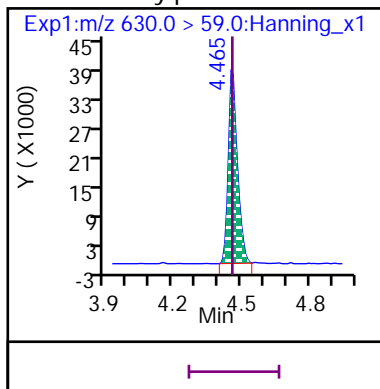
31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



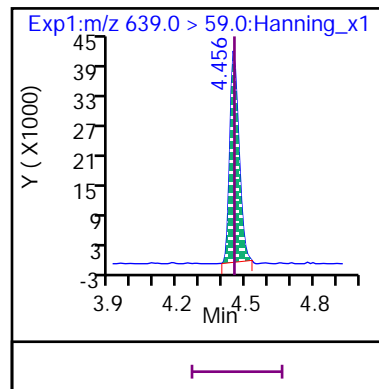
D 54 13C8\_PFOS



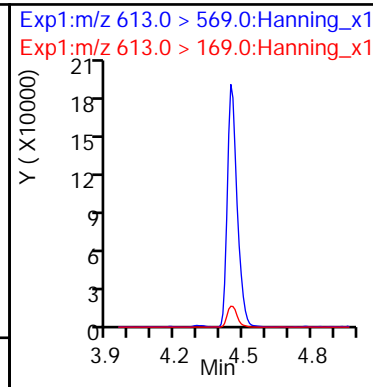
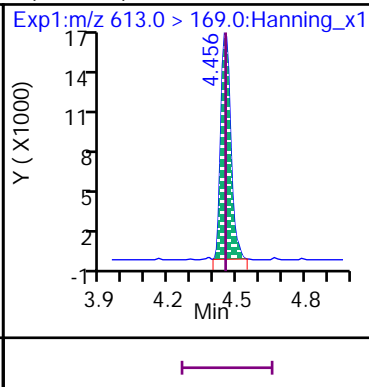
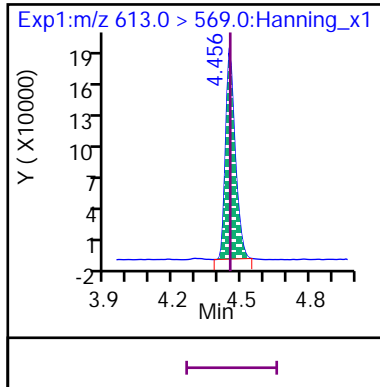
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



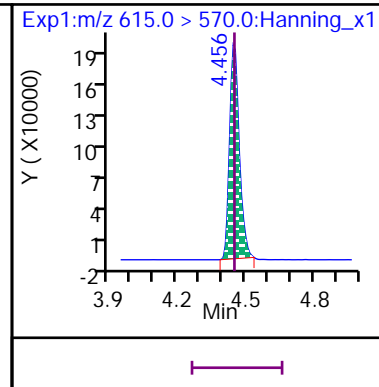
D 62 d9-EtFOSE



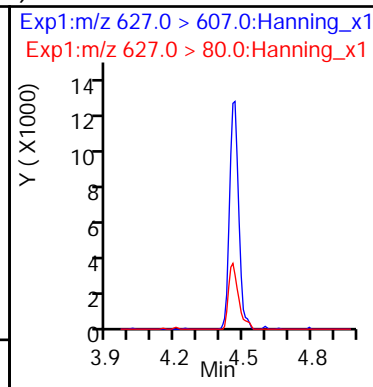
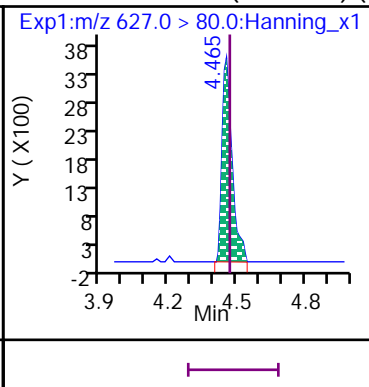
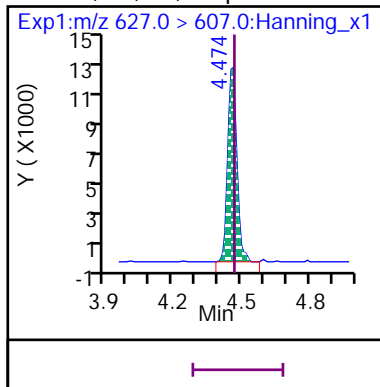
11 Perfluoro-n-dodecanoic acid (PFDoA)



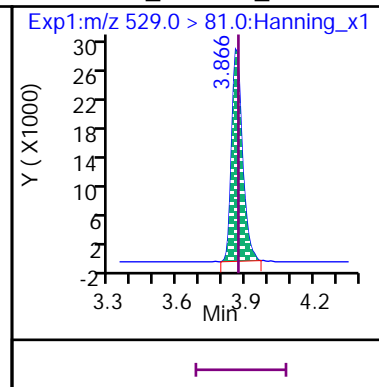
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (M)

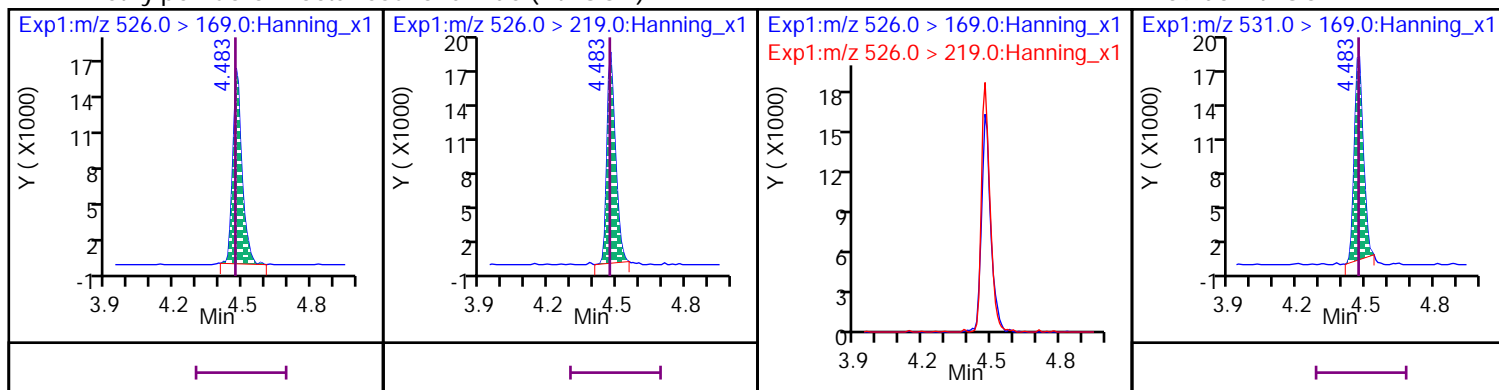


D 65 13C2\_8:2 FTS\_2



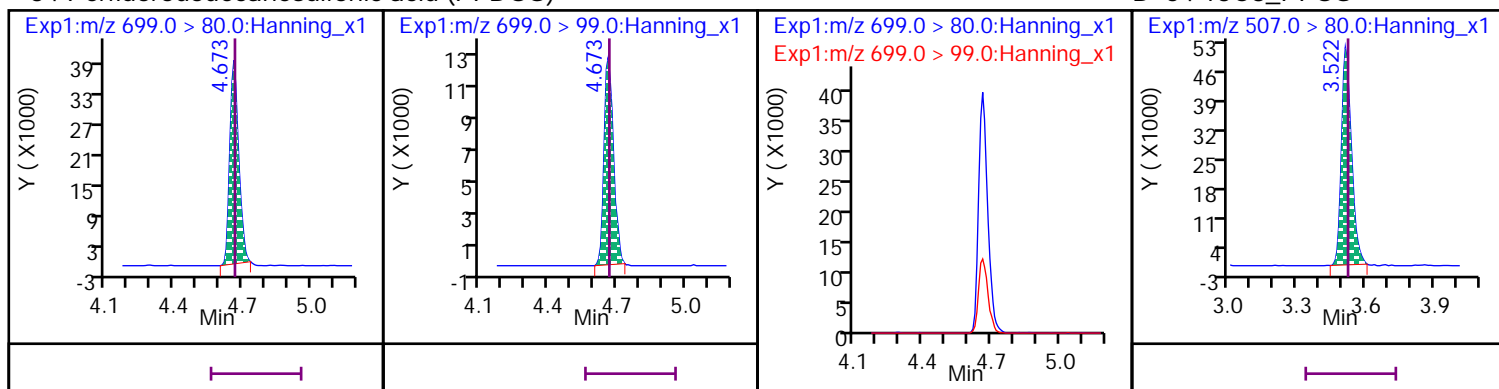
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



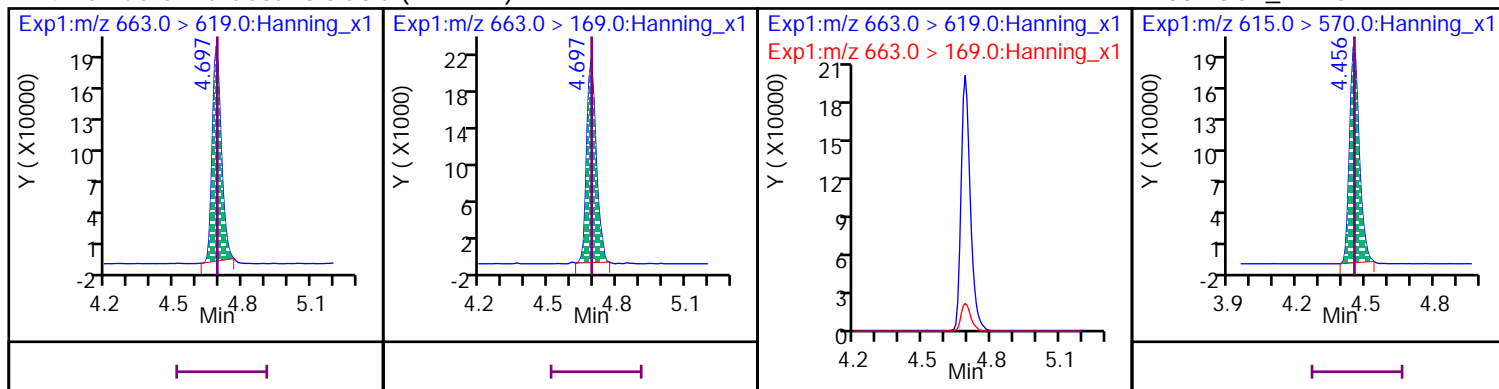
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



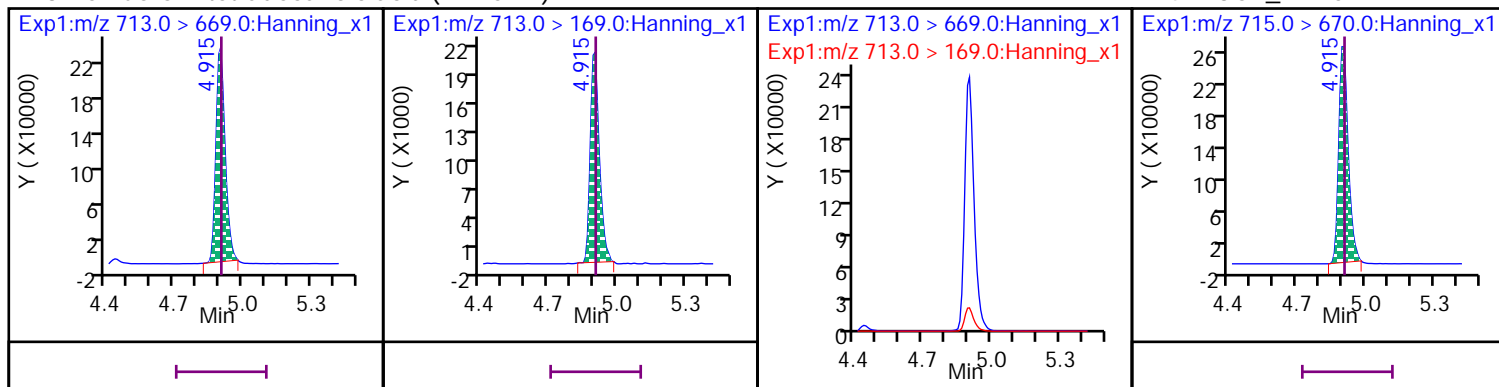
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



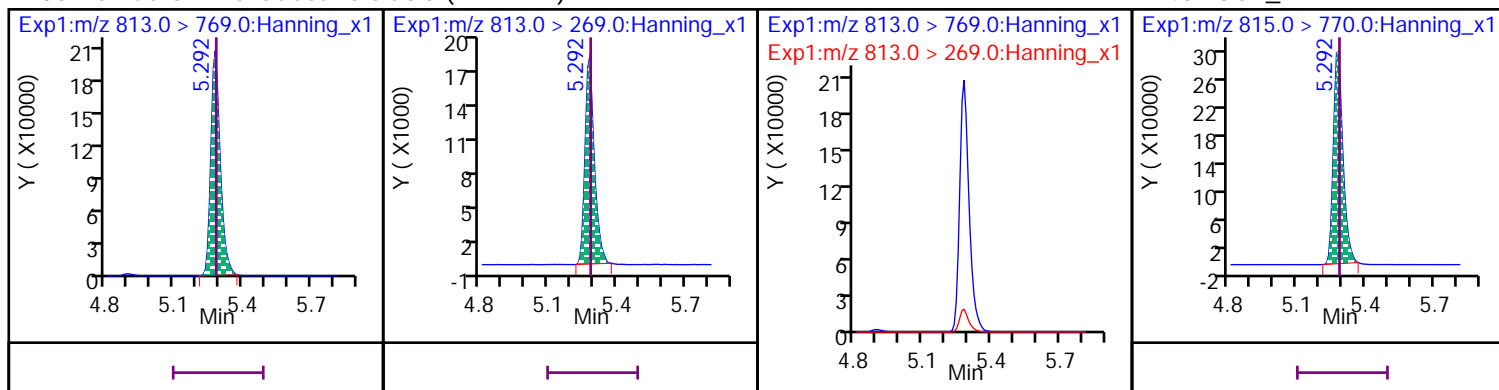
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



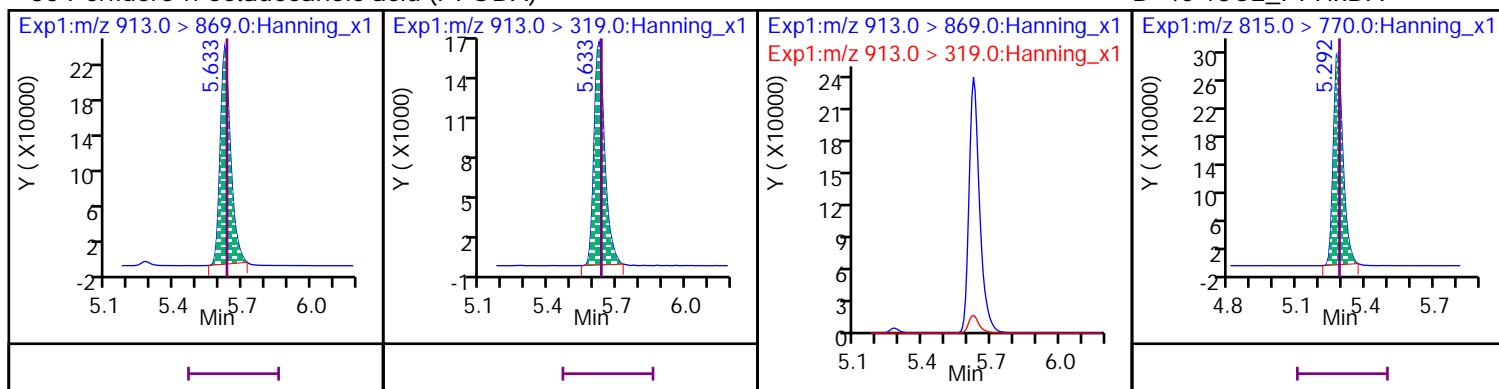
## 35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



## 36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

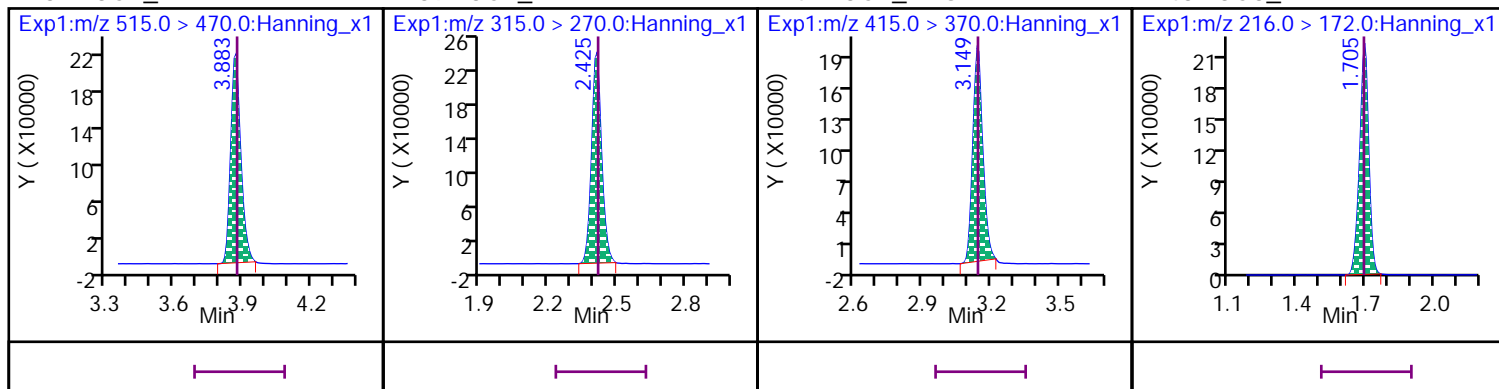


## \* 37 13C2\_PFDA

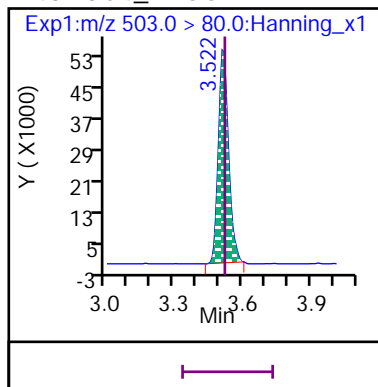
## \* 39 13C2\_PFHxA

## \* 41 13C2\_PFOA

## \* 43 13C3\_PFBFA



## \* 48 13C4\_PFOS



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

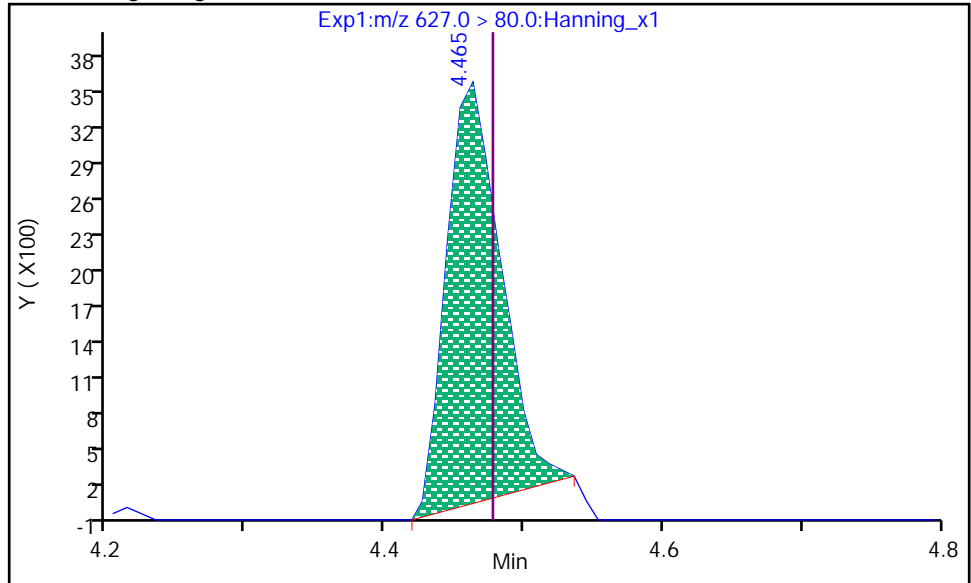
Dil. Factor: 1

Operator: Matthew M. Miller

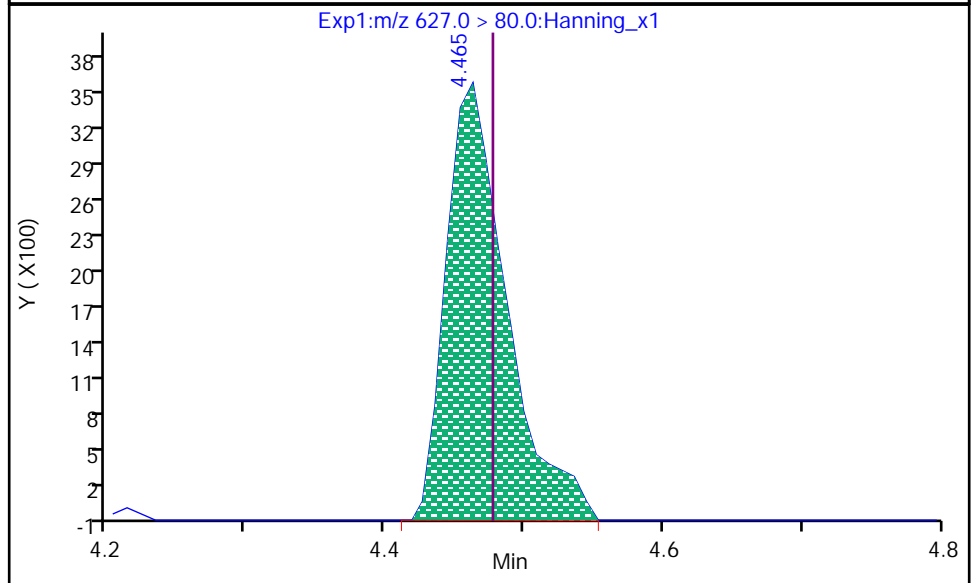
4 10:2 FTS, CAS: 120226-60-0

Processing Integration Results

RT: 4.465  
Area: 9210  
Amount: 789.19  
Amount Units: ng/L



RT: 4.465  
Area: 10624  
Amount: 789.19  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:31

Audit Action: Mint

Audit Reason: Invalid Integration



Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

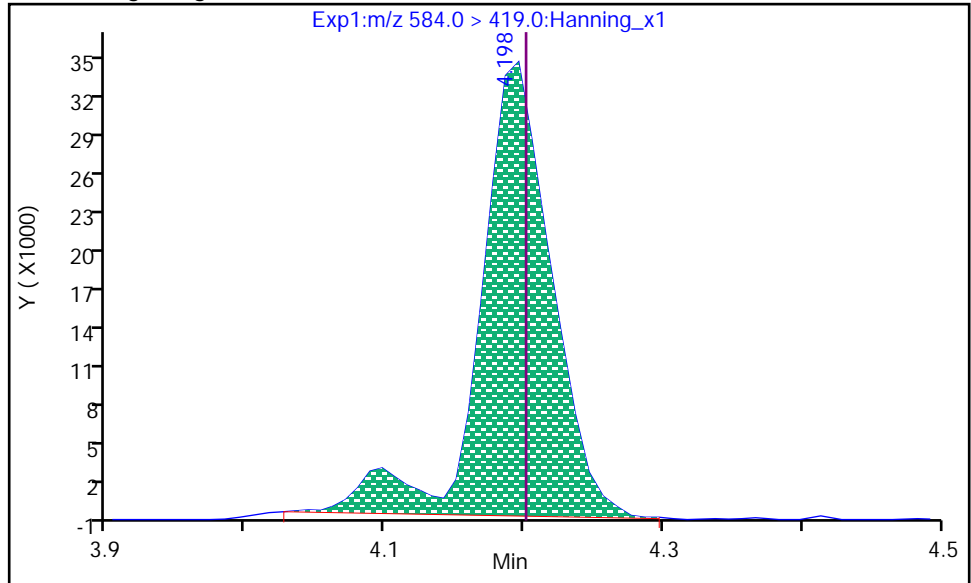
Dil. Factor: 1

Operator: Matthew M. Miller

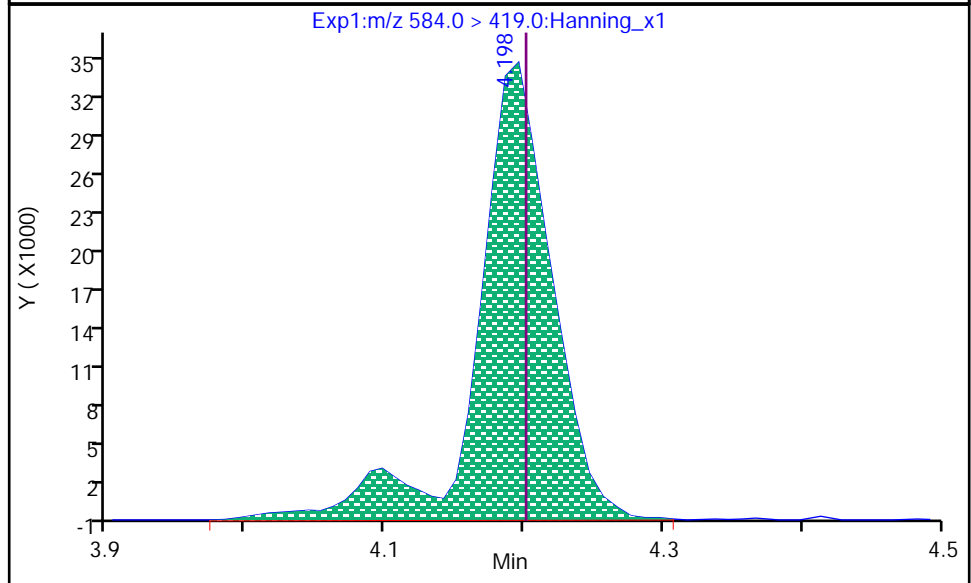
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.198  
Area: 120224  
Amount: 898.63  
Amount Units: ng/L



RT: 4.198  
Area: 127156  
Amount: 950.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:13

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

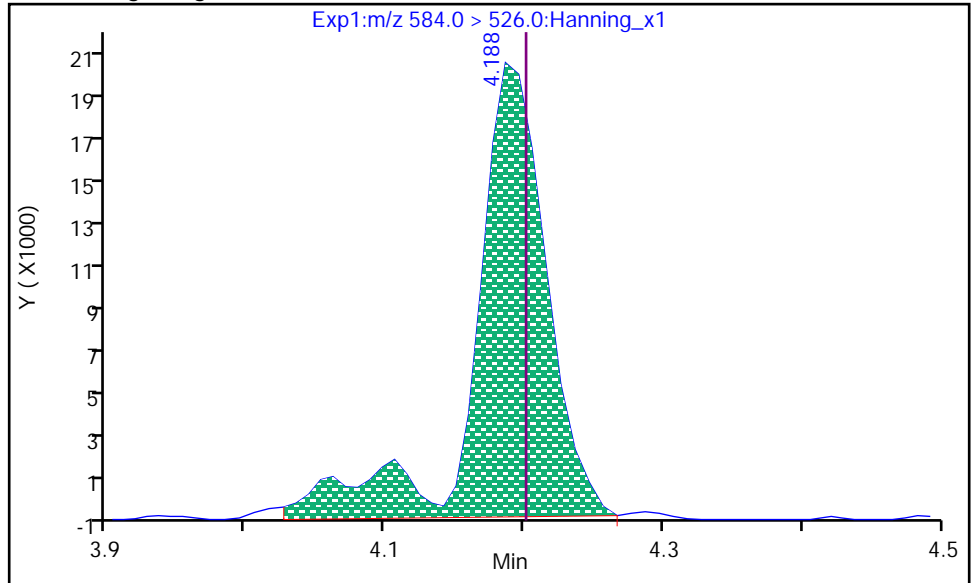
Dil. Factor: 1

Operator: Matthew M. Miller

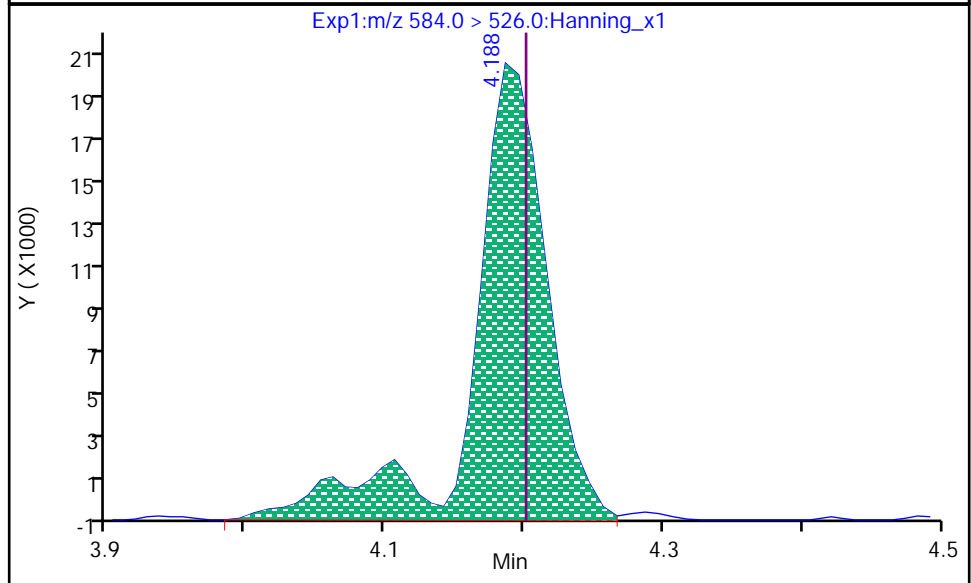
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.188  
Area: 71776  
Amount: 950.44  
Amount Units: ng/L



RT: 4.188  
Area: 74054  
Amount: 950.44  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:19

Audit Action: Mint

Audit Reason: Invalid Integration

Manual Integration Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920016.d

Injection Date: 29-Dec-2020 12:10:17

Inst. ID: LCMSMS02

Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

Sample Info: ID CCV 1000\_SVLC-1248

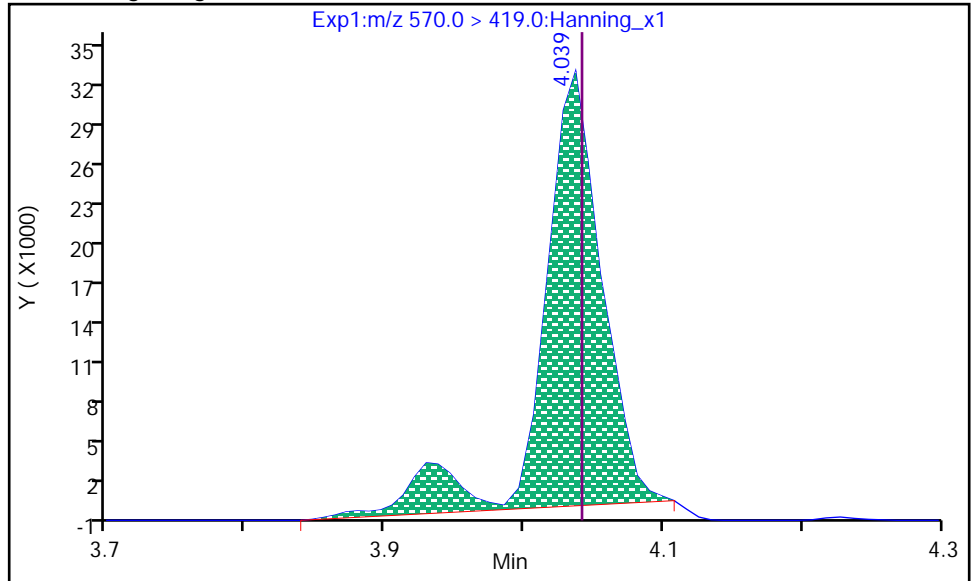
Dil. Factor: 1

Operator: Matthew M. Miller

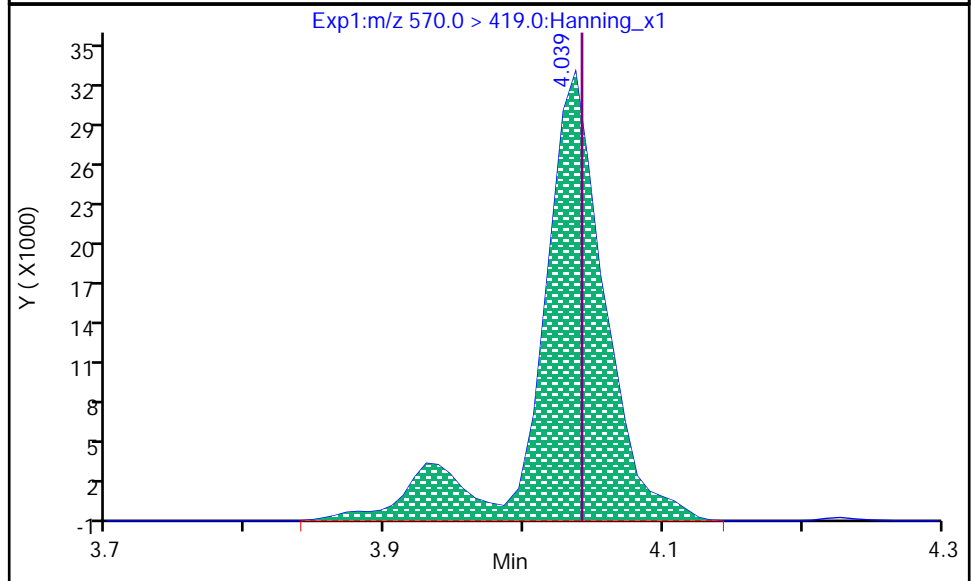
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.039  
Area: 93326  
Amount: 874.66  
Amount Units: ng/L



RT: 4.039  
Area: 105835  
Amount: 991.90  
Amount Units: ng/L



Data Editor: matthew.miller, 30-Dec-2020 09:51:03

Audit Action: Mint

Audit Reason: Invalid Integration

Pace Environmental Services, LLC  
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d  
Injection Date: 29-Dec-2020 14:28:22 Injection Vol: 10.0 uL  
Sample Type: CCV Auto Sampler: 22  
Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	914.74	91.5	70 - 130
D 46 13C4_PFBA	669792	666639			99.5	50 - 150
D 50 13C5_PFPeA	688361	665962			96.7	50 - 150
21 PFPeA			1000.00	929.90	93	70 - 130
7 PFBS			884.00	831.75	94.1	70 - 130
D 44 13C3_PFBS	241196	236632			98.1	50 - 150
1 4:2 FTS			934.00	921.79	98.7	70 - 130
D 63 13C2_4:2 FTS_2	136264	127069			93.3	50 - 150
D 49 13C5_PFHxA	755876	731588			96.8	50 - 150
15 PFHxA			1000.00	950.74	95.1	70 - 130
22 PFPeS			938.00	882.41	94.1	70 - 130
28 GenX			2000.00	1822.33	91.1	70 - 130
D 66 13C3_GenX	1415766	1316227			93	50 - 150
D 47 13C4_PFHpA	613536	586926			95.7	50 - 150
13 PFHpA			1000.00	991.53	99.2	70 - 130
D 45 13C3_PFHxS	185779	170919			92	50 - 150
14 PFHxS			910.00	848.17	93.2	70 - 130
29 ADONA			942.00	898.35	95.4	70 - 130
D 64 13C2_6:2 FTS_2	105371	101240			96.1	50 - 150
2 6:2 FTS			948.00	946.73	99.9	70 - 130
20 PFOA			1000.00	968.47	96.8	70 - 130
D 53 13C8_PFOA	607240	609051			100	50 - 150
12 PFHpS			952.00	942.42	99	70 - 130
18 PFOS			928.00	866.48	93.4	70 - 130
17 PFNA			1000.00	919.26	91.9	70 - 130
D 56 13C9_PFNA	787757	774032			98.3	50 - 150
D 54 13C8_PFOS	153541	154557			101	50 - 150
30 9CI-PF3ONS			932.00	834.68	89.6	70 - 130
D 55 13C8_PFOSA	318847	291566			91.4	50 - 150
19 PFOSA			1000.00	1004.63	100	70 - 130
16 PFNS			960.00	837.23	87.2	70 - 130
D 65 13C2_8:2 FTS_2	104593	92569			88.5	50 - 150
3 8:2 FTS			958.00	998.21	104	70 - 130
10 PFDA			1000.00	971.83	97.2	70 - 130
D 51 13C6_PFDA	701677	654027			93.2	50 - 150
D 58 d3-MeFOSAA	727199	671090			92.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1059.66	106	70 - 130
9 PFDS			964.00	917.62	95.2	70 - 130
5 N-EtFOSAA			1000.00	910.50	91.1	70 - 130
25 PFUdA			1000.00	939.23	93.9	70 - 130
D 60 d5-EtFOSAA	710460	694515			97.8	50 - 150
D 52 13C7_PFUdA	641343	652486			102	50 - 150
D 61 d7-MeFOSE	96951	104083			107	50 - 150
32 MeFOSE			1000.00	926.91	92.7	70 - 130
26 MeFOSA			1000.00	942.55	94.3	70 - 130
D 57 d3-MeFOSA	52459	50004			95.3	50 - 150
31 11Cl-PF3OUDS			942.00	876.83	93.1	70 - 130
D 62 d9-EtFOSE	123442	113477			91.9	50 - 150
33 EtFOSE			1000.00	991.58	99.2	70 - 130
D 59 d5-EtFOSA	48002	46908			97.7	50 - 150
D 38 13C2_PFDoA	609821	569911			93.5	50 - 150
4 10:2 FTS			964.00	877.35	91	70 - 130
27 EtFOSA			1000.00	954.87	95.5	70 - 130
11 PFDoA			1000.00	962.89	96.3	70 - 130
34 PFDOS			968.00	890.43	92	70 - 130
24 PFTrDA			1000.00	978.30	97.8	70 - 130
23 PFTeDA			1000.00	918.58	91.9	70 - 130
D 42 13C2_PFTeDA	786208	802237			102	50 - 150
35 PFHxDA			1000.00	982.36	98.2	70 - 130
D 40 13C2_PFHxDA	908883	905354			99.6	50 - 150
36 PFODA			1000.00	955.46	95.5	70 - 130

Pace Environmental Services, LLC  
 Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d  
 Injection Date: 29-Dec-2020 14:28:22 Injection Vol: 10.0 uL  
 Sample Type: CCV Auto Sampler: 22  
 Sample Info: ID CCV 1000\_SVLC-1248 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.704	1.702	1	666639	23	>100:1			1000.00	961.20	99.5	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46	1.704	1.709	0/-1	607360	24	>100:1			1000.00	914.74		
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.076	2.080	0	665962	18	>100:1			1000.00	968.13	96.7	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50	2.076	2.080	0/0	622633	16	>100:1			1000.00	929.90		
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.129	2.133	0	236632	18	>100:1			1000.00	1027.80	98.1	
<b>7 Perfluoro-1-butananesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44	2.129	2.133	0/0	232056	18	>100:1	Target = 3.50		884.00	831.75		
298.9 > 99	44	2.129	2.133		63783	16	>100:1	3.63 (1.75-5.25)					
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44	2.450	2.446	1/1	181129	19	>100:1	Target = 3.10		938.00	882.41		
349 > 99	44	2.450	2.446		58055	25	>100:1	3.11 (1.55-4.65)					
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.388	2.393	0	127069	19	>100:1			5000.00	5248.98	93.3	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63	2.379	2.393	0/0	46752	18	>100:1	Target = 1.80		934.00	921.79		
327 > 81	63	2.388	2.393		24388	17	>100:1	1.91 (0.90-2.70)					
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.423	2.429	0	731588	20	>100:1			1000.00	992.56	96.8	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49	2.423	2.420	1/1	686699	20	>100:1	Target = 18.34		1000.00	950.74		
313 > 119	49	2.423	2.420		34404	19	>100:1	19.95 (9.17-27.51)					
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.530	2.536	0	1316227	21	>100:1			5000.00	4941.65	93	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66	2.530	2.536	0/0	344660	21	>100:1	Target = 0.81		2000.00	1822.33		
285 > 185	66	2.530	2.536		443226	21	>100:1	0.77 (0.40-1.22)					
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.772	2.777	0	586926	21	>100:1			1000.00	967.49	95.7	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.772	2.786	0/0	603642	21	>100:1	Target = 3.70		1000.00	991.53		
363 > 169	47	2.772	2.786		152183	20	>100:1	3.96 (1.85-5.56)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.790	2.795	0	170919	19	>100:1			1000.00	998.19	92	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.790	2.795	0/0	153708	27	>100:1	Target = 3.21	0.18	910.00	848.17		
399 > 99	45	2.799	2.795		51304	29	>100:1	2.99 (1.60-4.81)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.818	2.823	0/0	974833	20	>100:1	Target = 2.97		942.00	898.35		
377 > 85	45	2.818	2.823		322646	20	>100:1	3.02 (1.48-4.46)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.166	0/0	146327	25	>100:1	Target = 3.08		952.00	942.42		
449 > 99	45	3.155	3.166		47842	26	>100:1	3.05 (1.54-4.63)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.121	3.132	0	101240	26	>100:1			5000.00	5256.93	96.1	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.128	3.139	0/0	39733	25		Target = 1.80		948.00	946.73		
427 > 81	64	3.121	3.139		23297	29	>100:1	1.70 (0.90-2.71)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.155	3.159	0	609051	24	>100:1			1000.00	1029.04	100	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.155	3.159	0/0	601320	33	>100:1	Target = 2.87		1000.00	968.47		
413 > 169	53	3.148	3.159		197129	25	>100:1	3.05 (1.43-4.31)					
<b>D 54 13C8_PFOA CAS: SESI-0098</b>													
507 > 80		3.528	3.533	0	154557	23	>100:1			1000.00	1030.87	101	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.528	3.533	0/0	158693	42	>100:1	Target = 3.84	0.27	928.00	866.48		
499 > 99	54	3.520	3.533		44536	40	>100:1	3.56 (1.92-5.76)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.736	3.740	0/0	434293	24	>100:1			932.00	834.68		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.865	3.879	0/0	99026	20	>100:1	Target = 3.07		960.00	837.23		
549 > 99	54	3.865	3.879		35585	19	>100:1	2.78 (1.53-4.61)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.175	0/0	102926	18		Target = 3.03		964.00	917.62		
599 > 99	54	4.170	4.175		39740	27	>100:1	2.58 (1.51-4.55)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.334	0/0	384870	17	>100:1			942.00	876.83		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.672	4.677	0/0	110487	19	>100:1	Target = 3.33		968.00	890.43		
699 > 99	54	4.672	4.677		30972	18	>100:1	3.56 (1.66-5.00)					
<b>D 56 13C9_PFOA CAS: SESI-0099</b>													
472 > 427		3.528	3.533	0	774032	23	>100:1			1000.00	1030.72	98.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.528	3.533	0/0	711555	22	>100:1	Target = 6.16		1000.00	919.26		
463 > 169	56	3.528	3.533		112822	25	>100:1	6.30 (3.07-9.24)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.857	3.854	1	291566	20	>100:1			1000.00	941.86	91.4	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.849	3.854	0/-1	288655	21	>100:1			1000.00	1004.63		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.873	3.879	0	92569	21				5000.00	4990.20	88.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.873	3.911	-2/-2	37143	27	>100:1	Target = 1.95		958.00	998.21		
527 > 81	65	3.865	3.911		14926	16		2.48 (0.97-2.93)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.464	4.479	0/0	37536	16		Target = 3.14		964.00	877.35		
627 > 80	65	4.464	4.479		10214	24	>100:1	3.67 (1.57-4.72)					
<b>D 51 13C6_PFOA CAS: SESI-0115</b>													
519 > 474		3.882	3.887	0	654027	21	>100:1			1000.00	985.97	93.2	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.882	3.887	0/0	624541	21	>100:1	Target = 15.94		1000.00	971.83		
513 > 169	51	3.882	3.887		42575	20	>100:1	14.66 (7.97-23.91)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.037	4.034	1	671090	17	>100:1			5000.00	4675.30	92.3	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.037	4.043	0/-1	109251	35	>100:1	Target = 1.33	0.13	1000.00	1059.66		
570 > 483	58	4.037	4.043		85382	34	>100:1	1.27 (0.66-1.99)	0.22				

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.187	4.193	0	694515	19	>100:1			5000.00	5229.20	97.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.197	4.203	0/0	125913	36	>100:1	Target = 1.58	0.13	1000.00	910.50		
584 > 526	60	4.187	4.203		81520	32	>100:1	1.54 (0.79-2.37)	0.21				
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.187	4.193	0	652486	20	>100:1			1000.00	1032.29	102	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.187	4.193	0/0	575986	18	>100:1	Target = 15.50		1000.00	939.23		
563 > 169	52	4.187	4.193		36038	17	>100:1	15.98 (7.75-23.26)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	104083	15	>100:1			1000.00	961.88	107	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.304	1/0	90649	15	>100:1			1000.00	926.91		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.314	0	50004	19	>100:1			1000.00	944.95	95.3	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.334	0/0	53174	16	>100:1	Target = 1.12		1000.00	942.55		
512 > 219	57	4.318	4.334		56380	19	>100:1	0.94 (0.56-1.68)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.455	4.461	0	113477	18	>100:1			1000.00	904.95	91.9	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.473	4.470	1/1	100108	18	>100:1			1000.00	991.58		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.464	4.461	1	569911	18	>100:1			1000.00	941.51	93.5	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.464	4.461	1/0	555714	18	>100:1	Target = 10.85		1000.00	962.89		
613 > 169	38	4.464	4.461		53726	17	>100:1	10.34 (5.42-16.29)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.696	4.701	0/-1	549144	21	>100:1	Target = 8.37		1000.00	978.30		
663 > 169	38	4.696	4.701		65760	20	>100:1	8.35 (4.18-12.56)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.482	4.479	1	46908	20	>100:1			1000.00	955.46	97.7	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.482	4.479	1/0	48935	18	>100:1	Target = 1.03		1000.00	954.87		
526 > 219	59	4.482	4.479		47070	14	>100:1	1.03 (0.51-1.55)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	802237	18	>100:1			1000.00	952.27	102	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.915	4.918	0/0	638504	19	80:1	Target = 12.11		1000.00	918.58		
713 > 169	42	4.915	4.918		51560	19	>100:1	12.38 (6.05-18.17)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.291	5.296	0	905354	18	>100:1			1000.00	999.11	99.6	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.291	5.296	0/0	581115	21	>100:1	Target = 11.48		1000.00	982.36		
813 > 269	40	5.291	5.296		53753	20	>100:1	10.81 (5.74-17.23)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.632	5.643	0/0	765739	24	>100:1	Target = 13.88		1000.00	955.46		
913 > 319	40	5.632	5.643		52861	23	>100:1	14.48 (6.94-20.82)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.887	0	646131	21	>100:1					93.9	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.423	2.429	0	705070	21	>100:1					96.4	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.148	3.152	0	601618	23	>100:1					97.6	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.704	1.702	1	609031	24	>100:1					95.1	



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/%Rec	Flags
--------	-----------	-----------	---------------	--------------	----------	----------	-----	-----------	--------------	---------------	-----------------	-------------	-------

\* **48 13C4\_PFOS CAS: 2795-39-3**

503 > 80	3.528	3.533	0	167813	21	>100:1						97.5	
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**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920029.d

Injection Date: 29-Dec-2020 14:28:22

Inst. ID: LCMSMS02

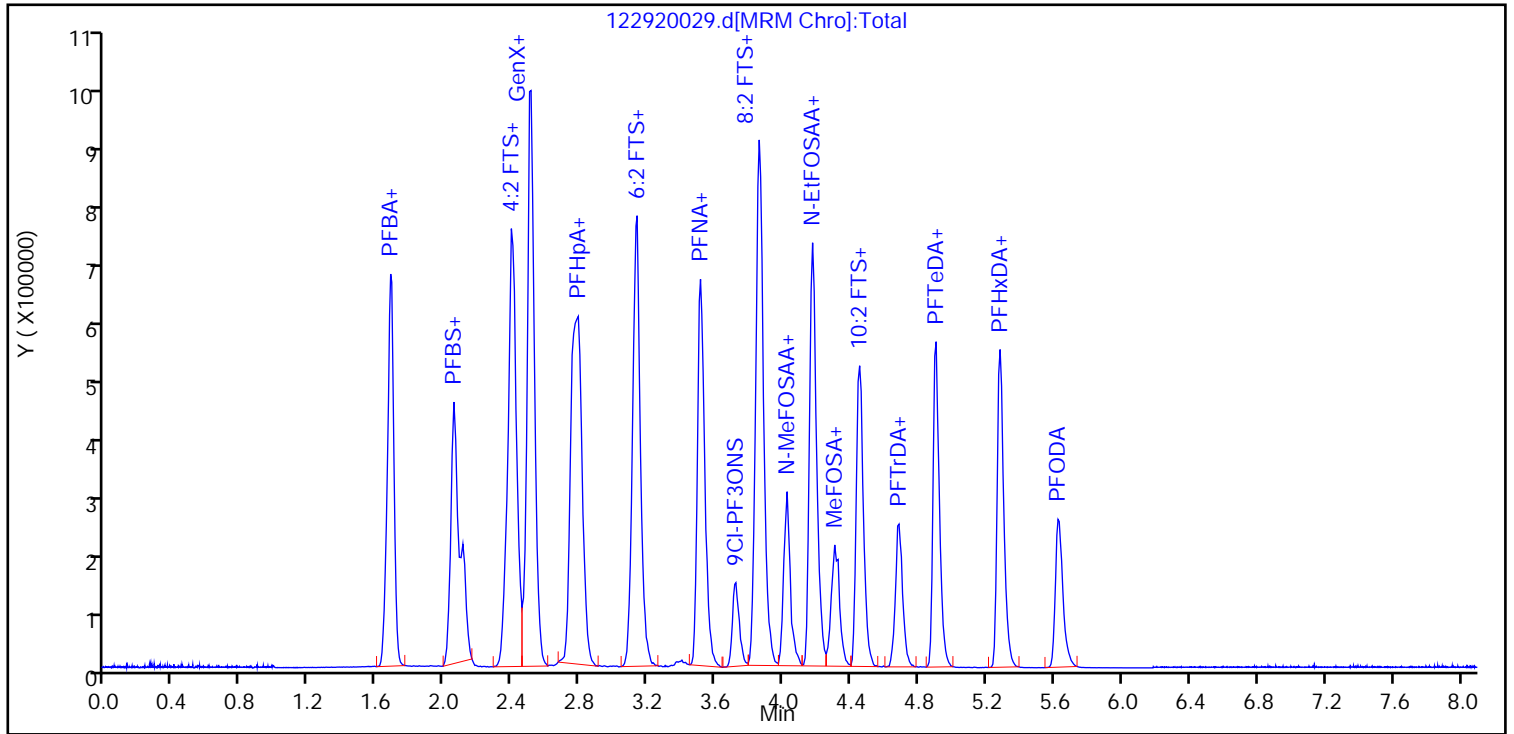
Client ID:

Lab ID: ID CCV 1000\_SVLC-1248

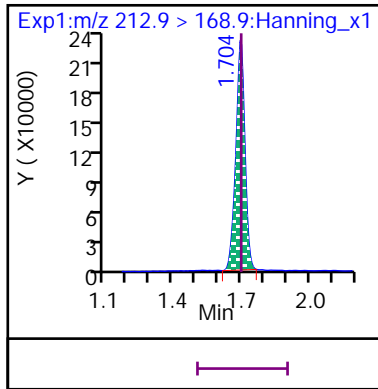
Sample Info: ID CCV 1000\_SVLC-1248

Dil. Factor: 1

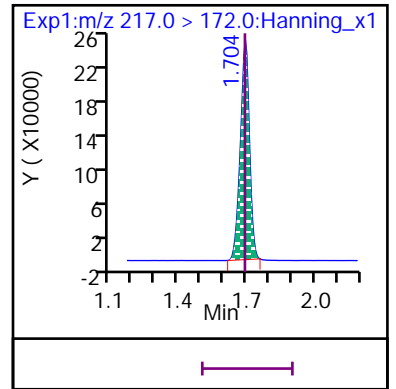
Operator: Matthew M. Miller



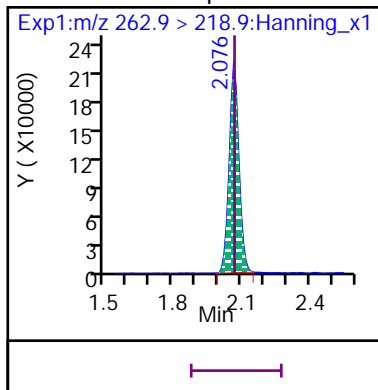
8 Perfluoro-n-butanoic acid (PFBA)



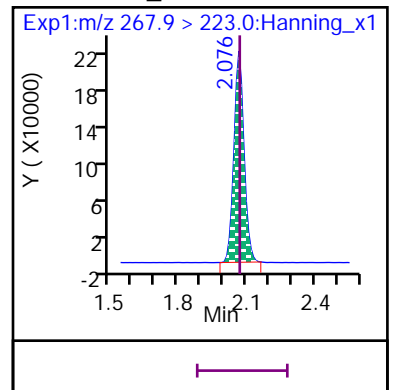
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

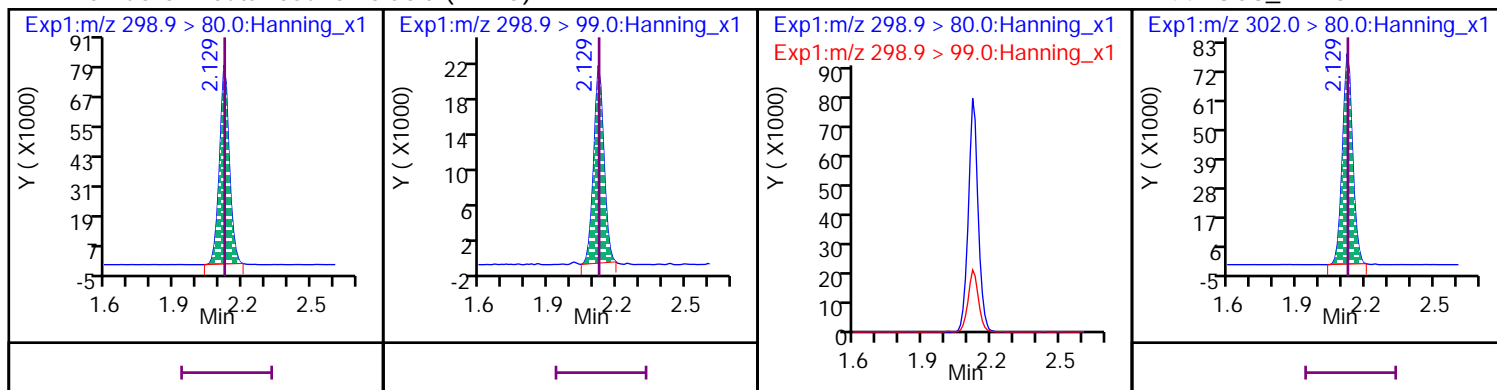


D 50 13C5\_PFPeA



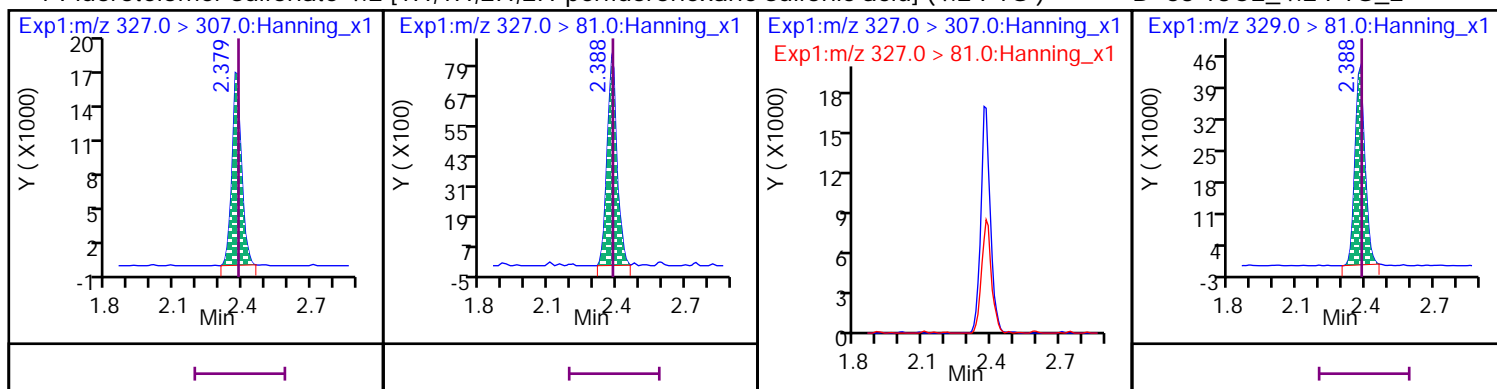
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



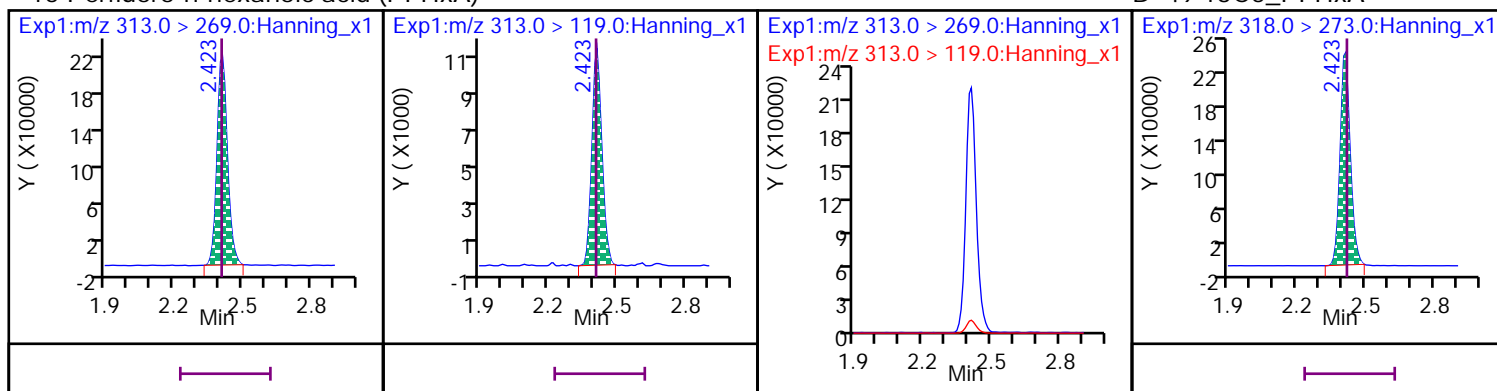
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



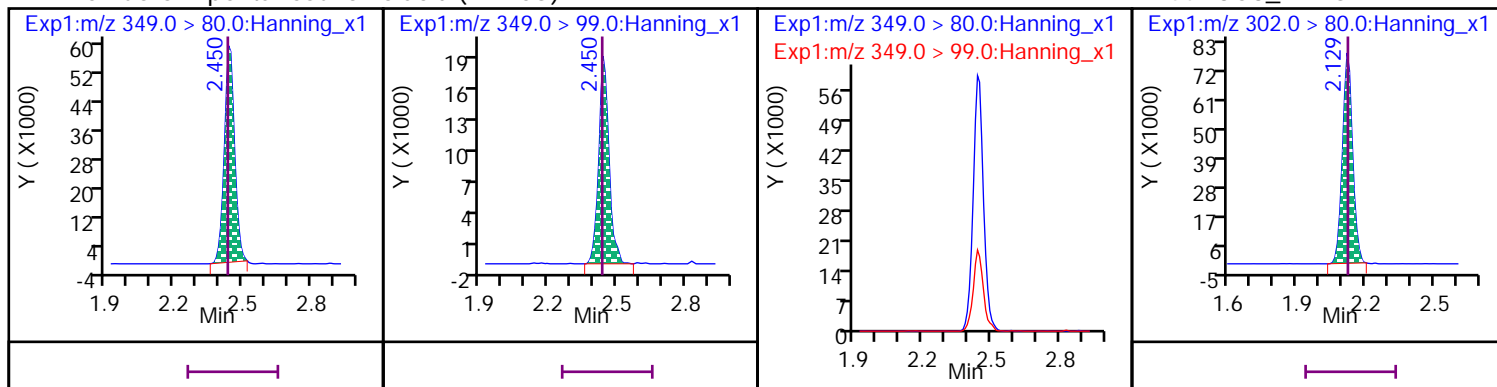
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



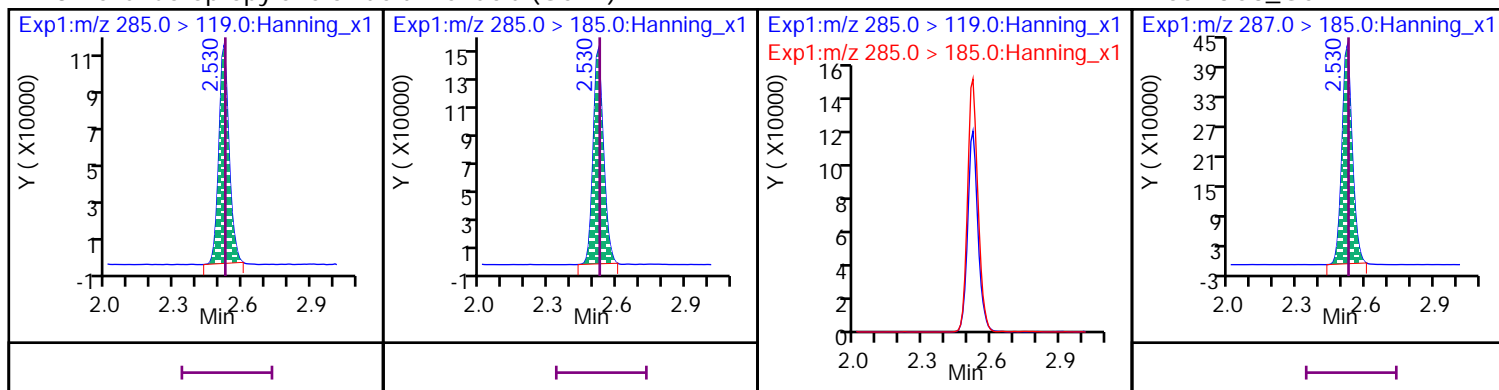
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



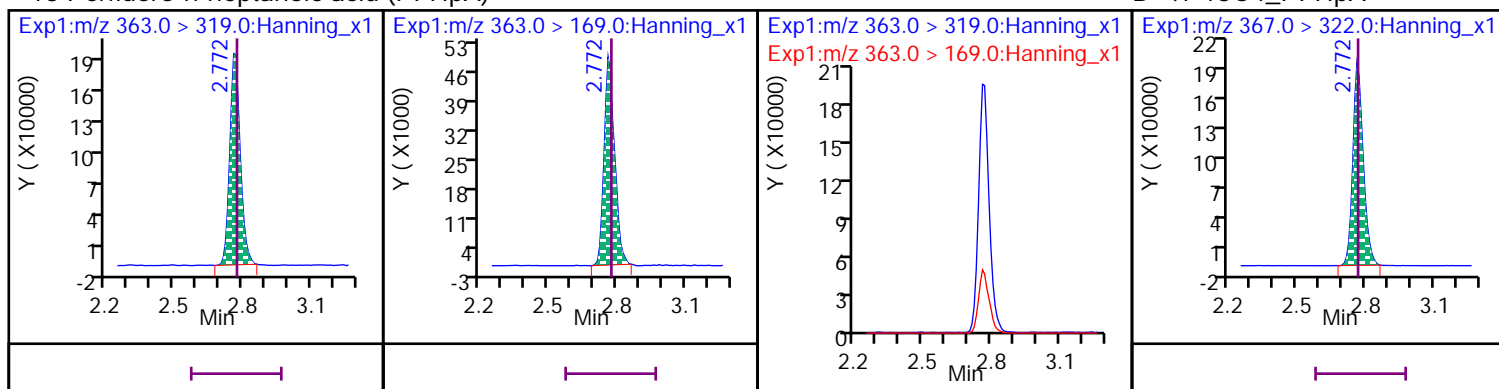
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



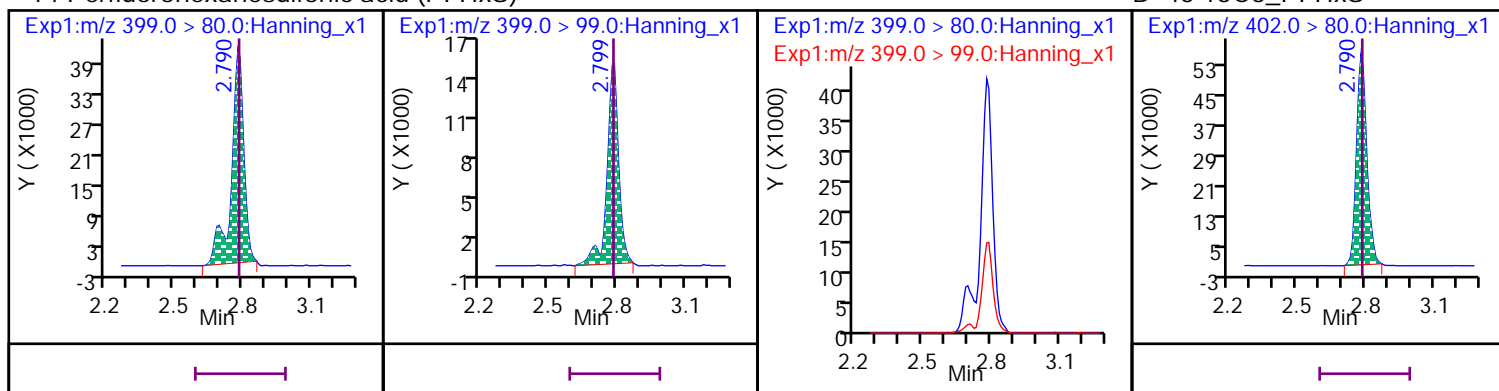
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



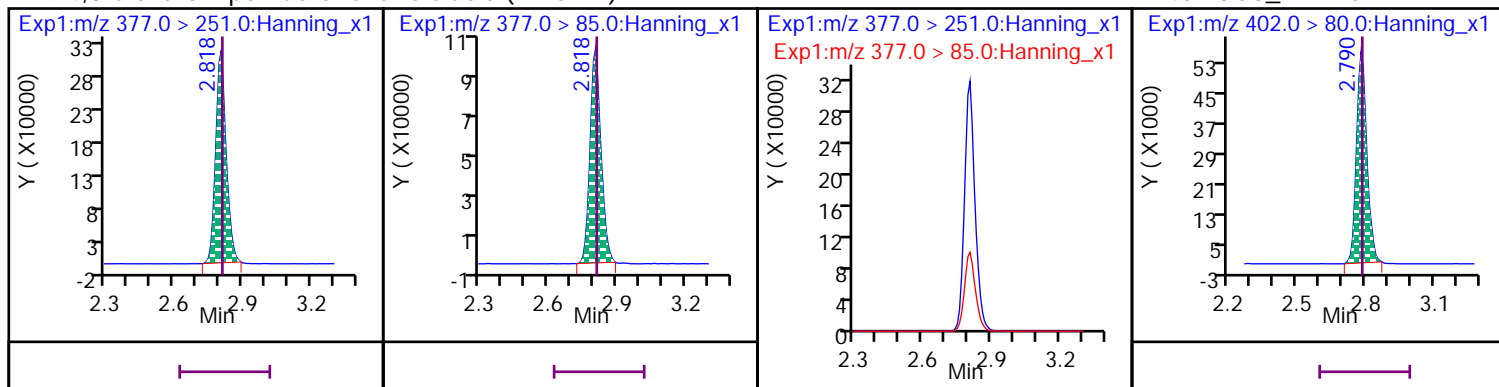
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



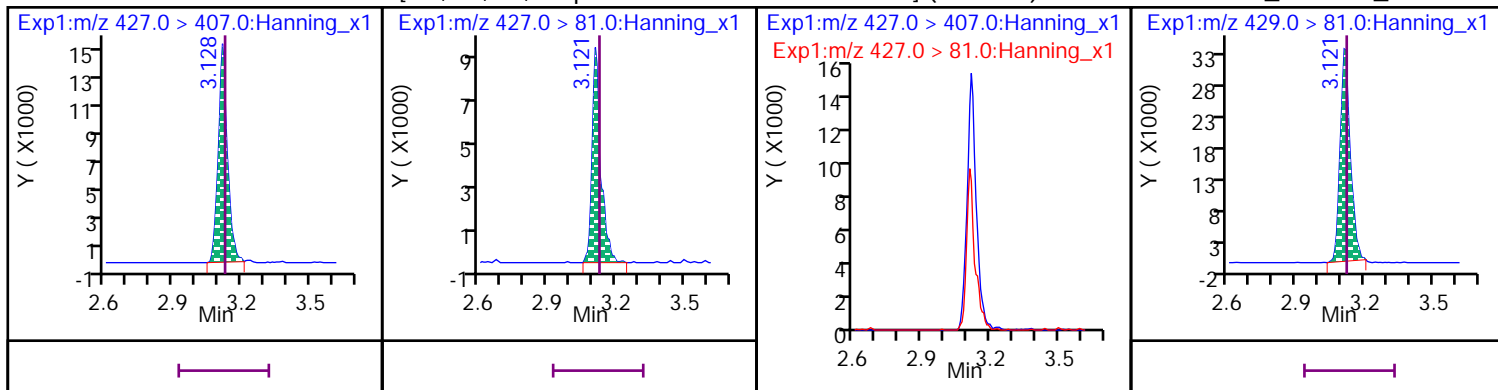
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



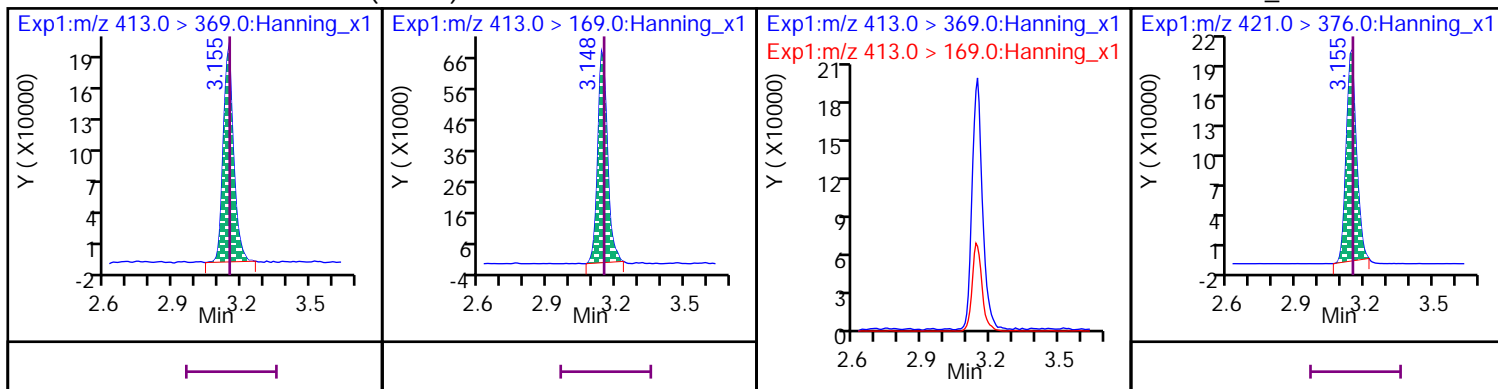
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



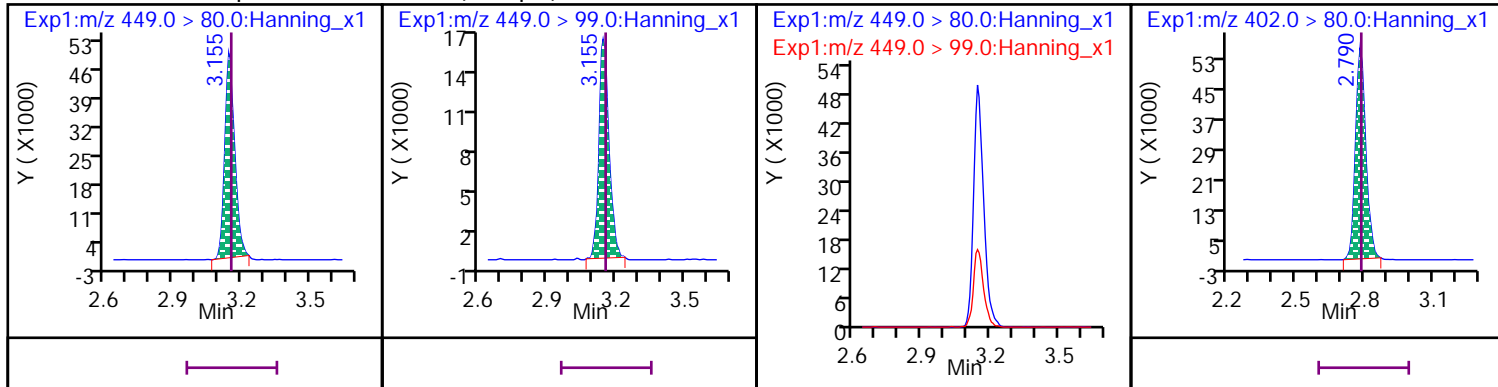
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



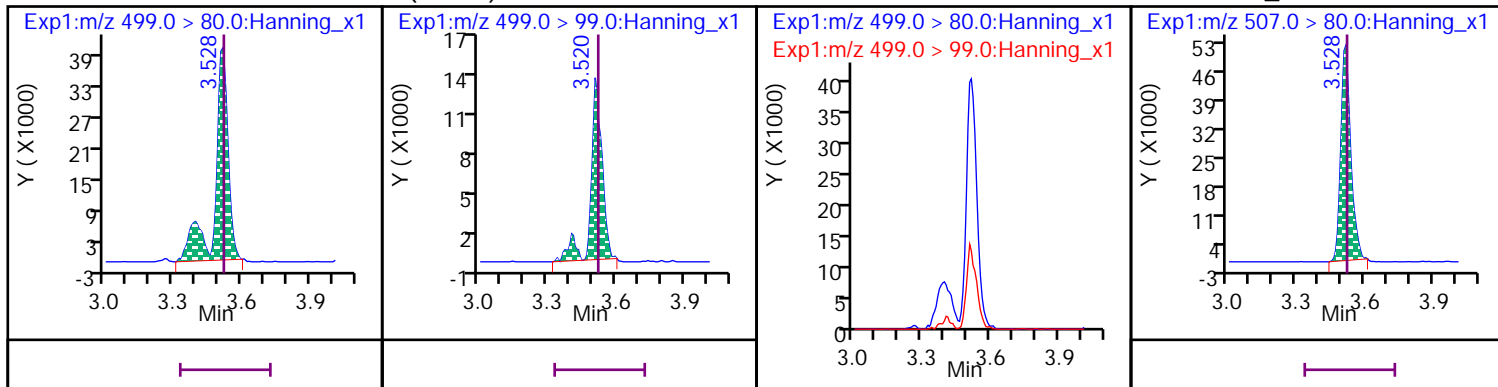
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



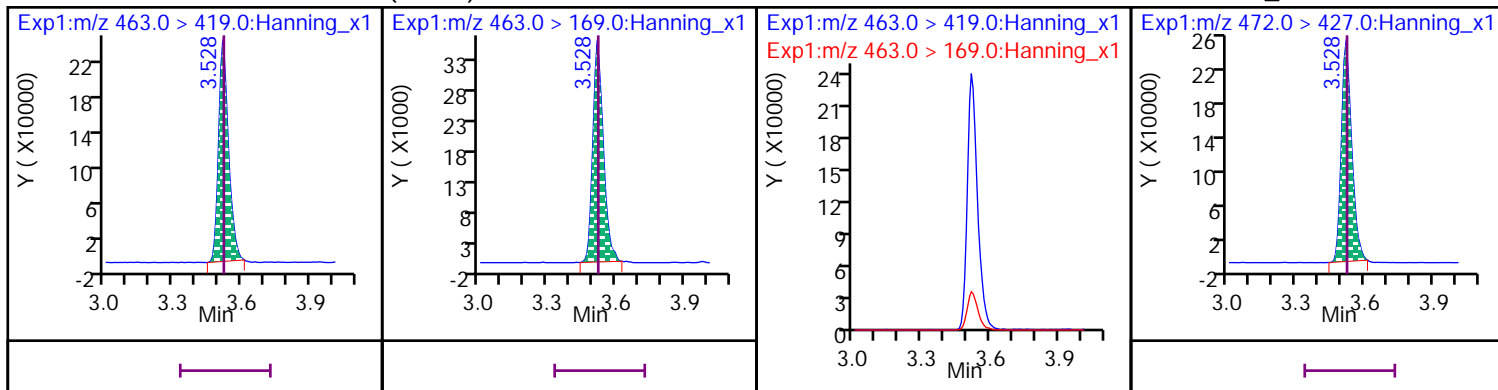
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



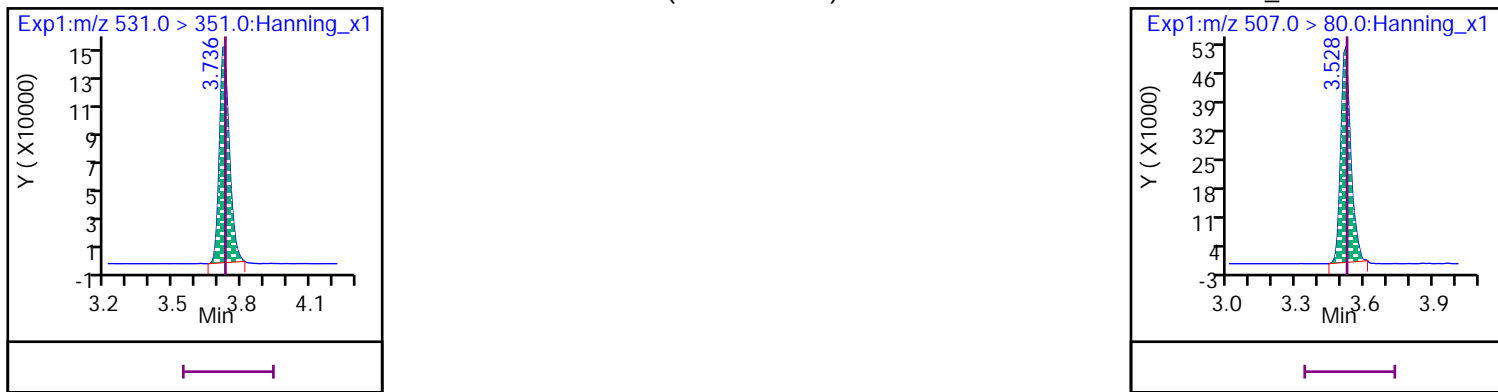
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



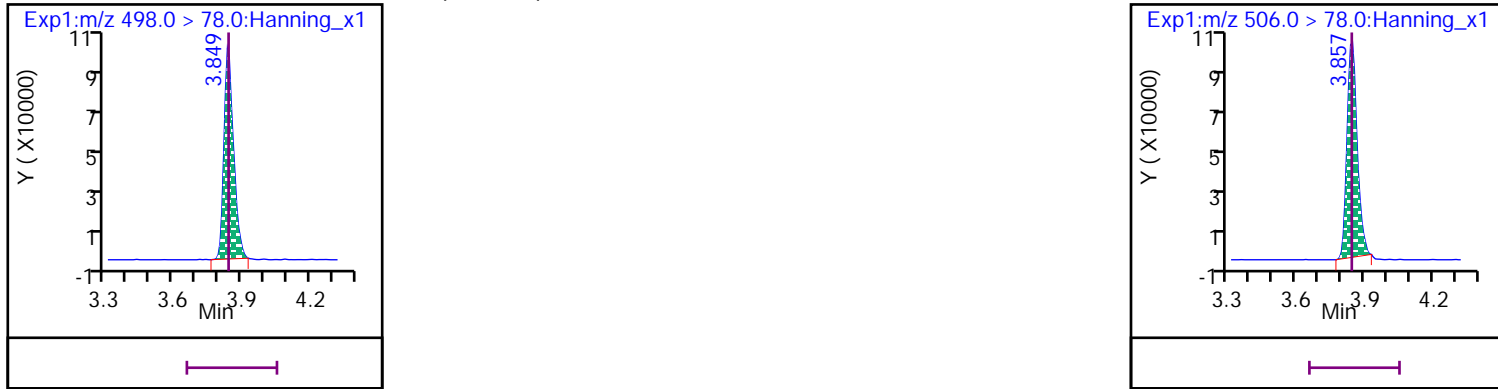
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



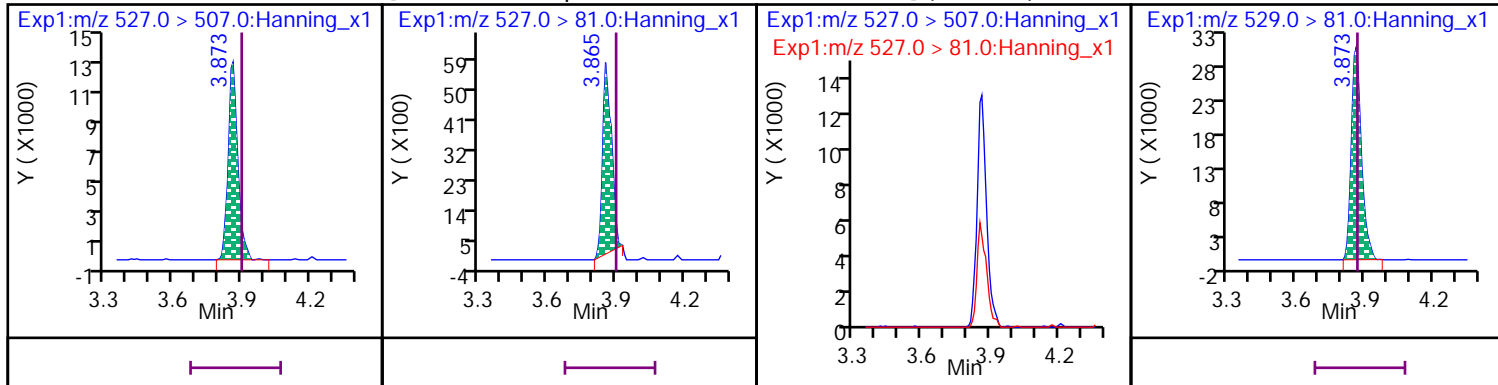
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



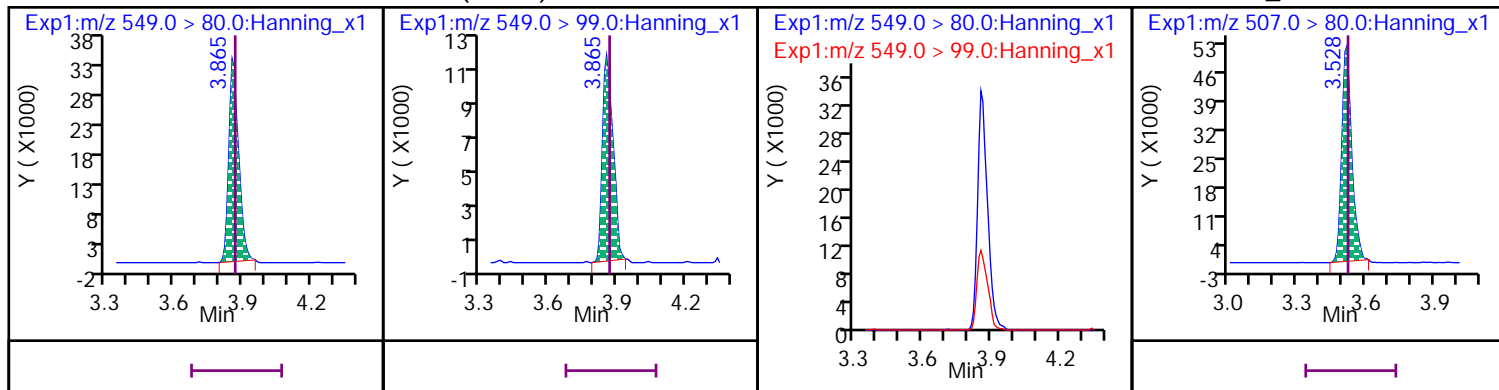
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



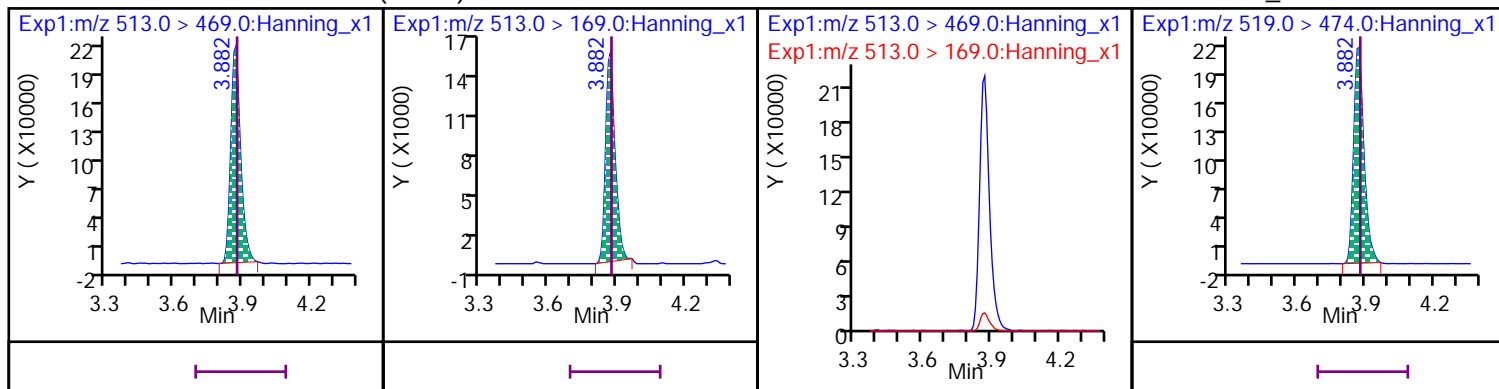
16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



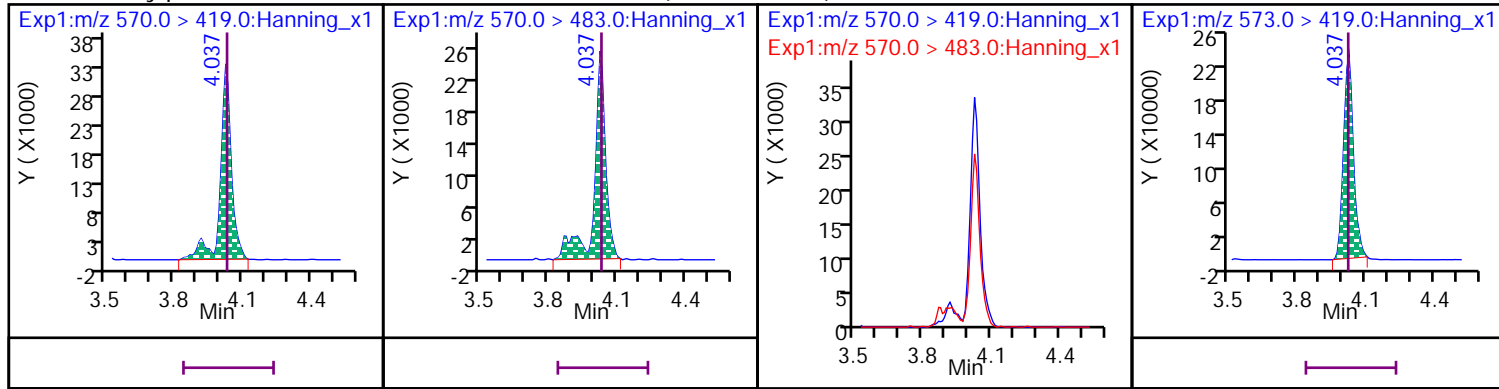
10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



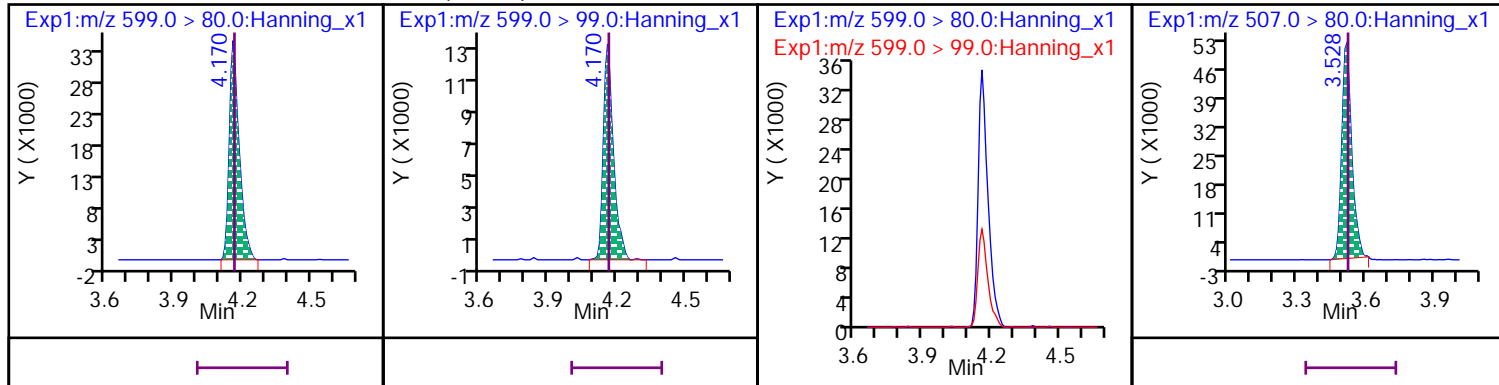
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



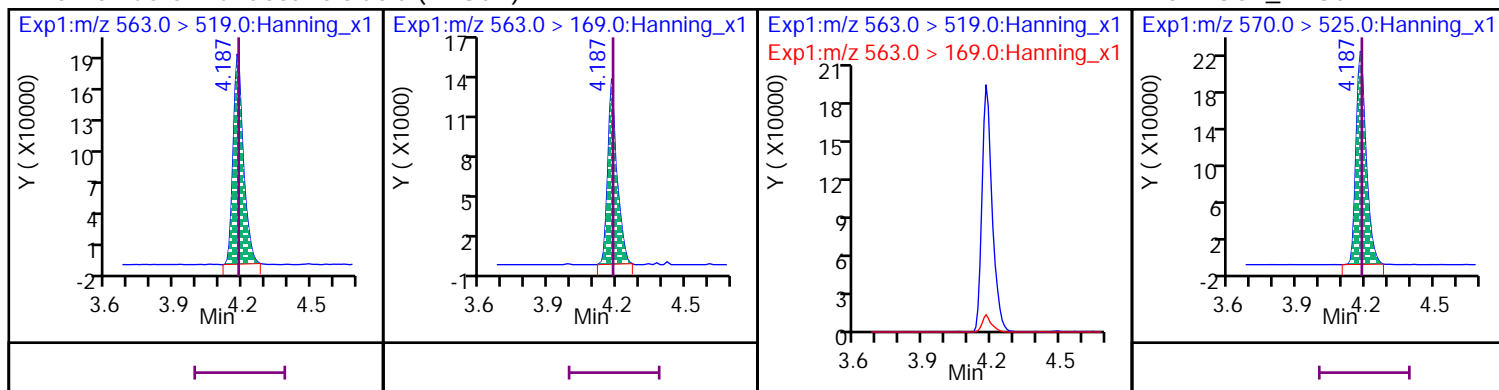
9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



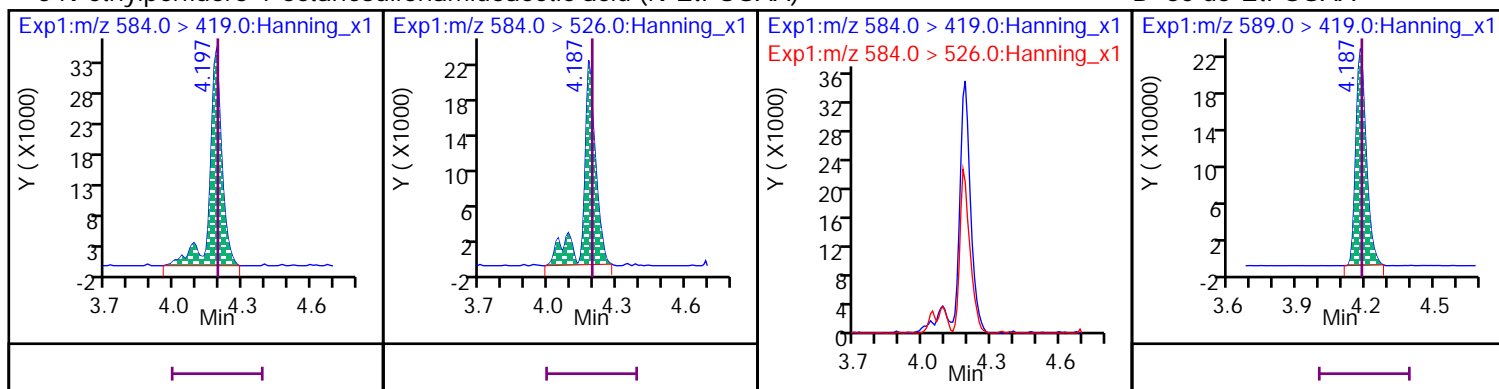
## 25 Perfluoro-n-undecanoic acid (PFUdA)

D 52 13C7\_PFUdA



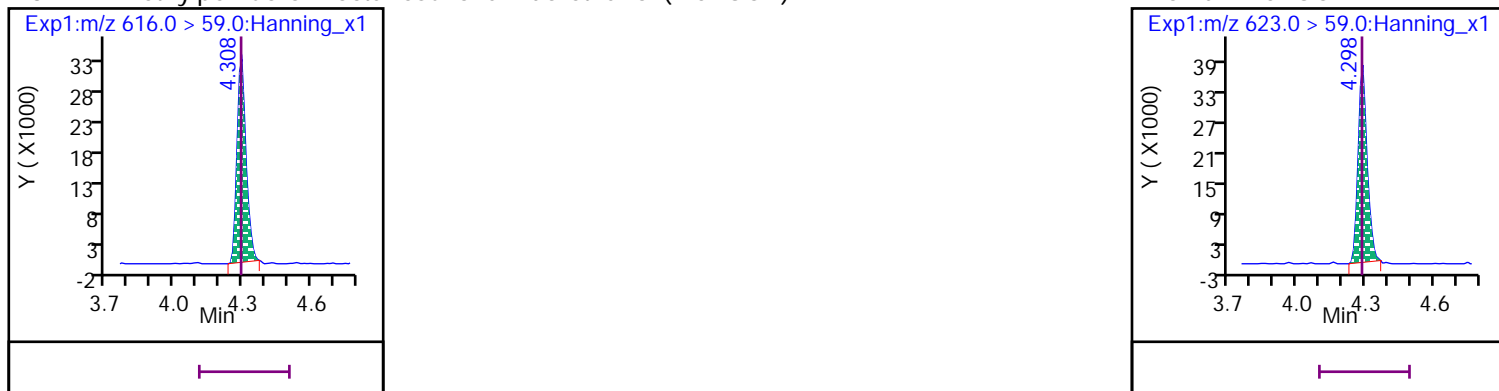
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



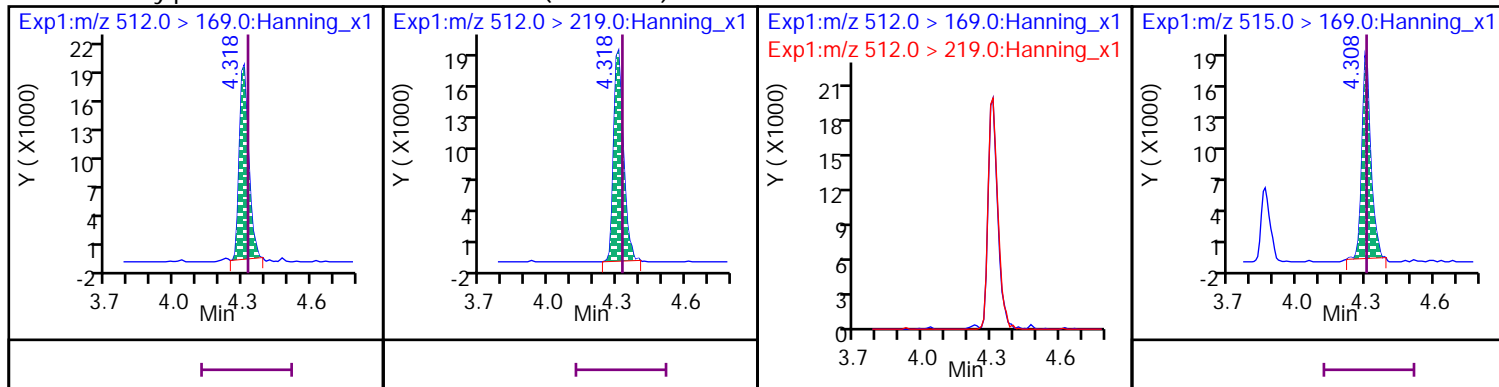
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE



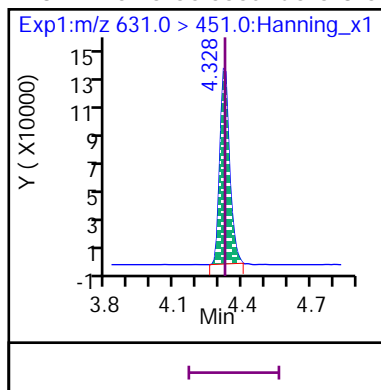
## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

D 57 d3-MeFOSA

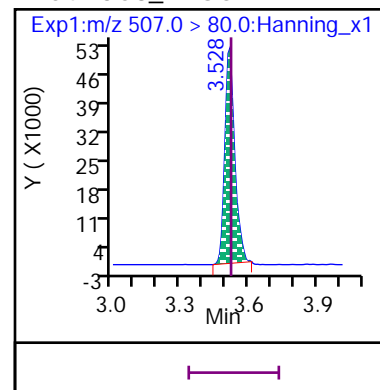




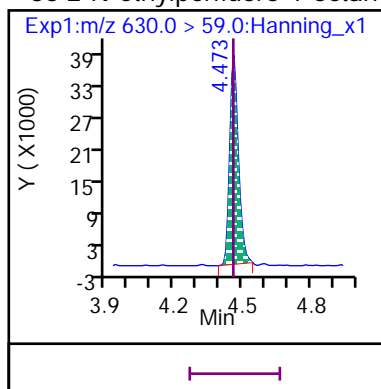
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



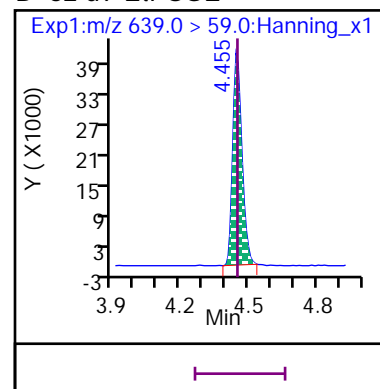
## D 54 13C8\_PFOS



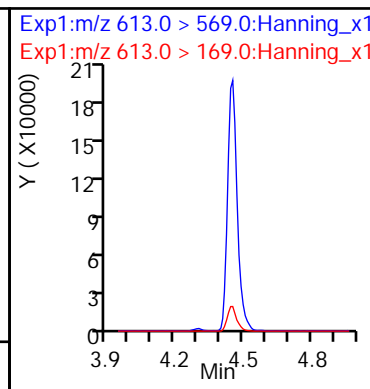
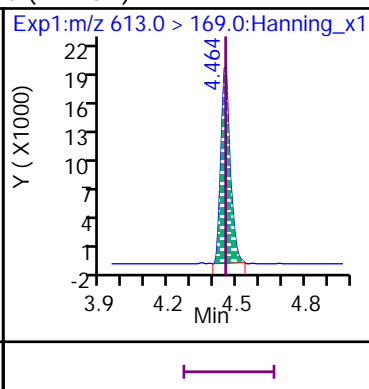
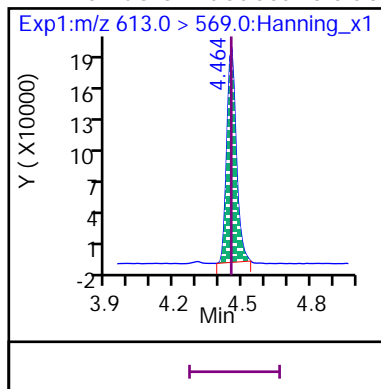
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



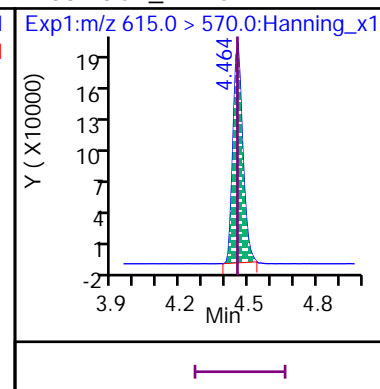
## D 62 d9-EtFOSE



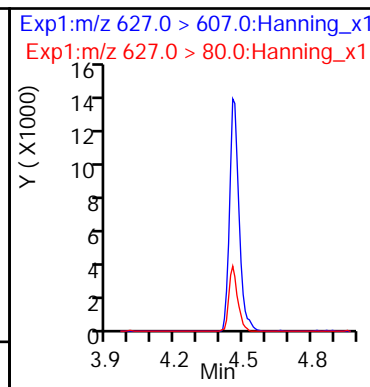
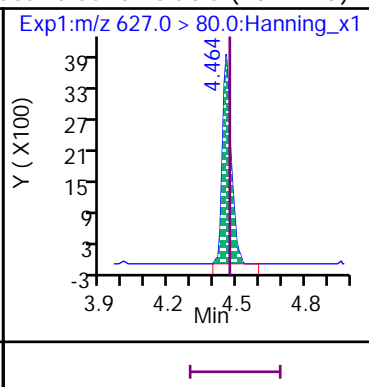
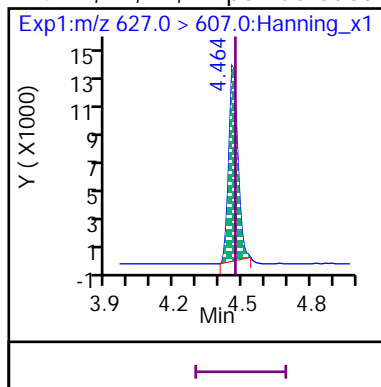
## 11 Perfluoro-n-dodecanoic acid (PFDaA)



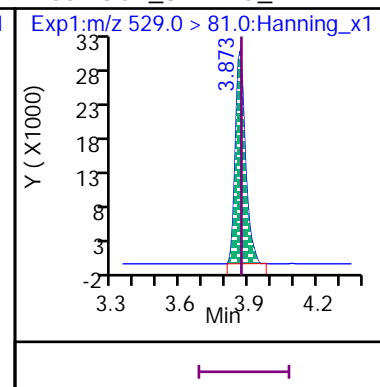
## D 38 13C2\_PFDaA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

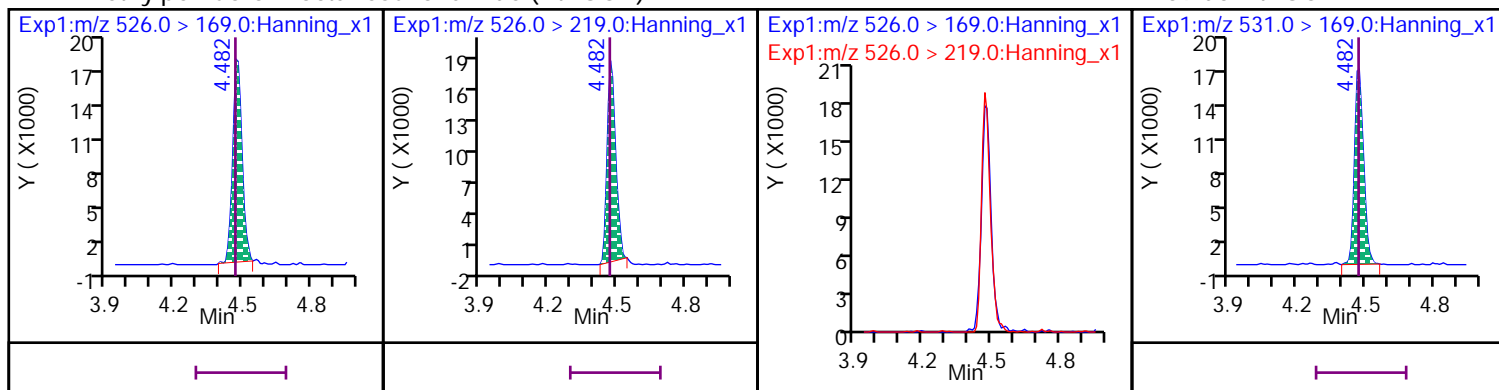


## D 65 13C2\_8:2 FTS\_2



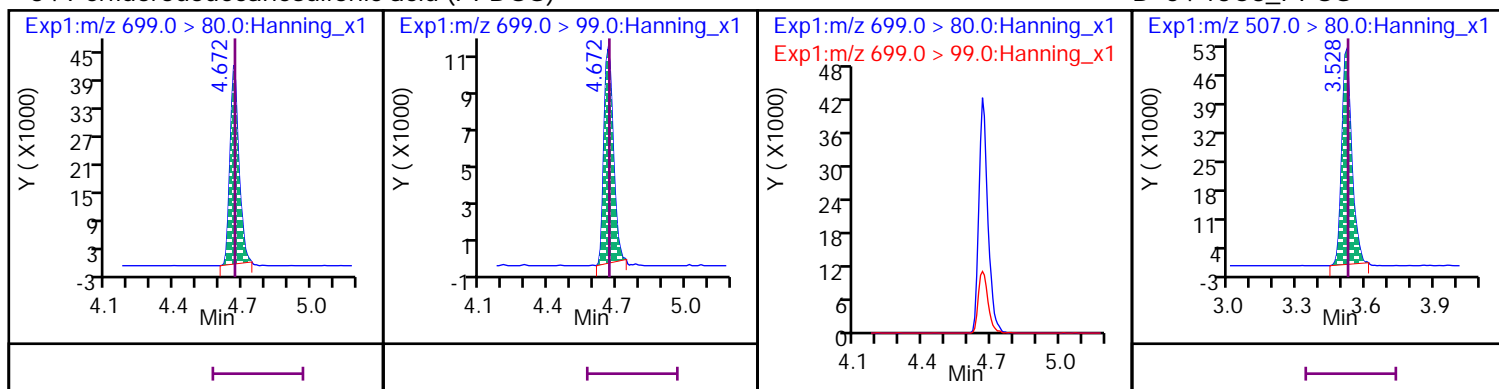
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



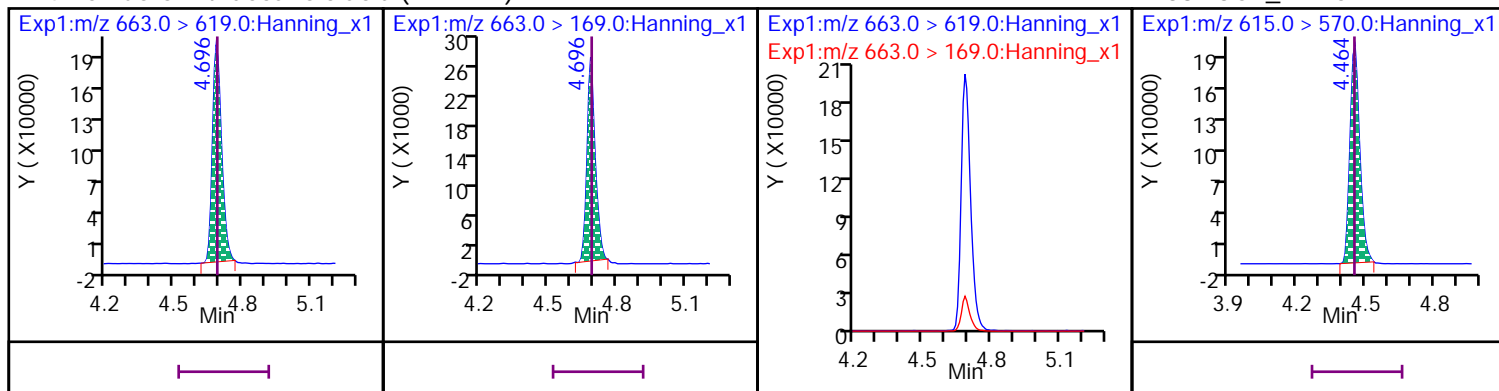
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



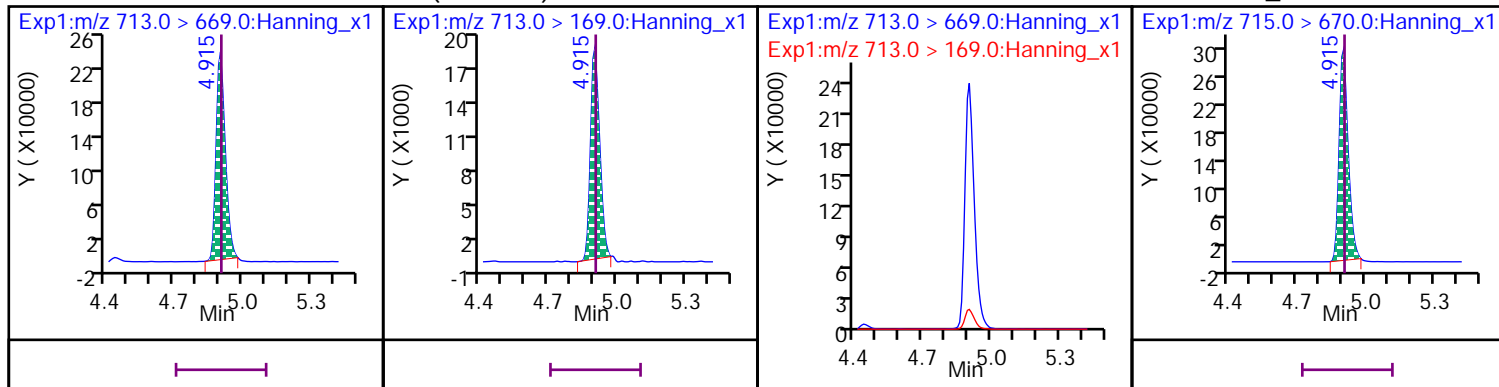
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



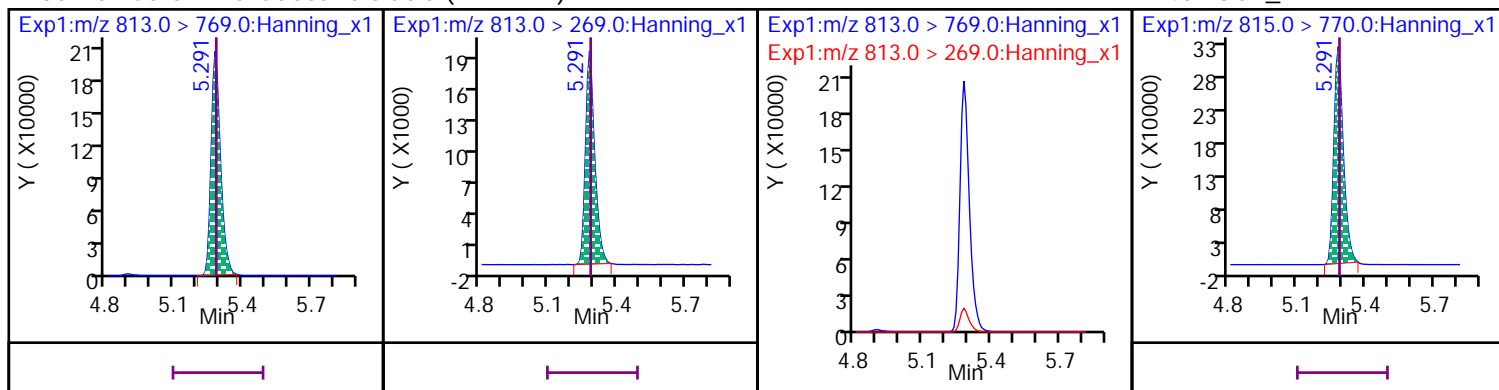
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



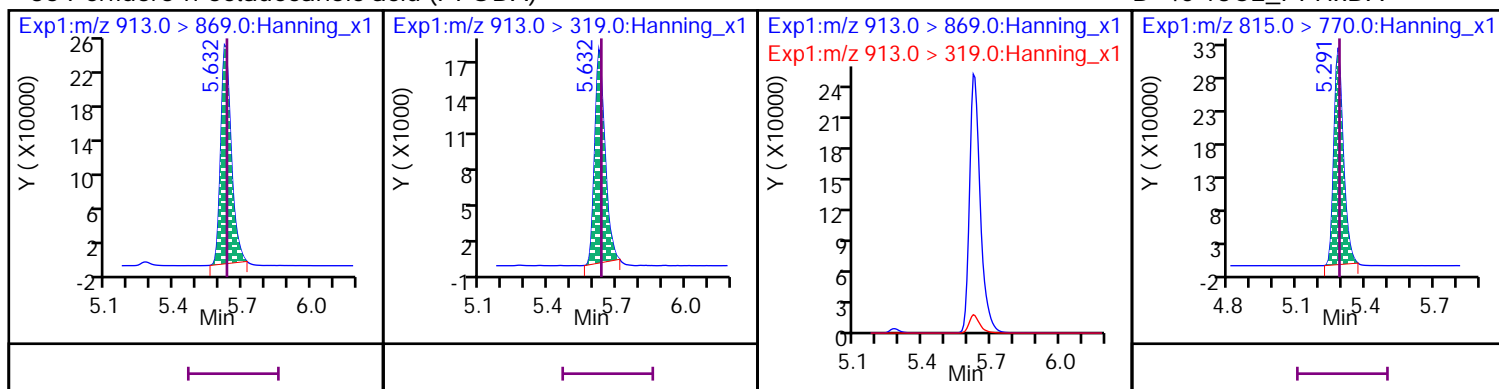
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

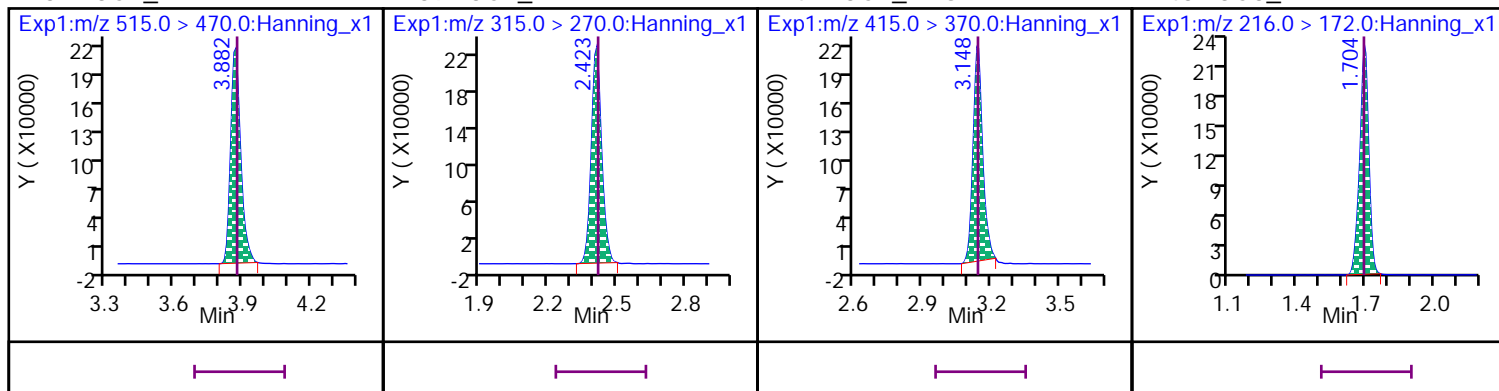


\* 37 13C2\_PFDA

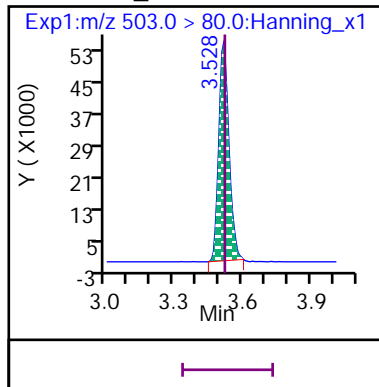
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# RAW QC DATA



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# SCIEX Triple Quad™ 4500/4500MD System

## Planned Maintenance Procedure



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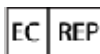
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# Introduction

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# 1

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**Note:** For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

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The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD system with the Turbo V™ ion source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

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**Note:** If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

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## Planned Maintenance Tasks

2

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**Note:** Perform all procedures using the Turbo V™ ion source, unless otherwise specified.

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## Pre-Planned Maintenance

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**Note:** Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

---

### Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	●
Review the work to be performed with the customer.	✓	—

**Planned Maintenance Tasks**

Task	Complete	N/A
Inspect for front-end contamination. Refer to <a href="#">Inspect for Contamination</a> .	✓	—
Check the status of the RAID 1 hard drives.		—

**Vacuum System Tests**

Task			Complete
Record the turbo pump operational values.			
<b>Parameter</b>	<b>Results</b>		
Temperature (°C)	see notes		
Current (A)	see notes		
Voltage (V)	see notes		
Power (W)	see notes		
Driving frequency (Hz)	see notes		
Inspect the vacuum gauge filament using the Analyst <sup>®</sup> Service Diagnostics (ASD) software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1	<input type="radio"/>	
	2	<input type="radio"/>	

**Pre-PM Pressure Test**

Pre-PM Pressure Test is Complete		✓
Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	$0.4 \times 10^{-5} \text{ torr} \leq P_{\text{CAD } 0} \leq 1.1 \times 10^{-5} \text{ torr}$	0.8e-5
Pressure difference (CAD <sub>12</sub> minus CAD <sub>0</sub> )	$1.8 \times 10^{-5} \text{ torr} \leq (P_{\text{CAD } 12} - P_{\text{CAD } 0}) \leq 2.8 \times 10^{-5} \text{ torr}$	2.5e-5

Planned Maintenance Tasks

**Pre-PM System Tests**

<b>Q1 Positive PPGs Test is Complete: Intensity and Peak Width</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	$\geq 8.0 \times 10^6$	2.1e7	0.6 to 0.8	0.80
500.380	$\geq 8.0 \times 10^6$	3.0e7	0.6 to 0.8	0.99
906.673	$\geq 2.0 \times 10^7$	4.3e7	0.6 to 0.8	0.98
1 952.427	$\geq 8.8 \times 10^5$	8.2e6	0.6 to 0.8	n/a

Planned Maintenance Tasks

**Q3 Positive PPGs Test is Complete: Intensity and Peak Width** ✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

**Note:** After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	$\geq 8.0 \times 10^6$	3.2e7	0.6 to 0.8	0.74
500.380	$\geq 8.0 \times 10^6$	3.3e7	0.6 to 0.8	0.80
906.673	$\geq 2.0 \times 10^7$	5.6e7	0.6 to 0.8	0.84
1 952.427	$\geq 8.8 \times 10^5$	9.8e6	0.6 to 0.8	1.1

**Planned Maintenance Tasks**

<b>Q1 Negative PPGs Test is Complete: Intensity and Peak Width</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	$\geq 1.8 \times 10^7$	1.7e7	0.6 to 0.8	0.66
1 863.306	$\geq 1.4 \times 10^6$	1.8e6	0.6 to 0.8	0.75

Planned Maintenance Tasks

Q3 Negative PPGs Test is Complete				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Guideline	Result	Guideline	Result	
933.636	$\geq 1.8 \times 10^7$	2.8e7	0.6 to 0.8	0.85	
1 863.306	$\geq 2.0 \times 10^6$	3.3e6	0.6 to 0.8	0.69	

**Planned Maintenance Tasks**

<b>Reserpine MS/MS Test is Complete</b>		✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> Reserpine solution 0.167 pmol/μL</li> <li>• <b>Flow rate:</b> 5 μL/min</li> <li>• <b>Scan rate:</b> 10 Da/s (both MS and MS/MS)</li> <li>• <b>Scan mode:</b> Product Ion (MS2)</li> <li>• <b>Product Of:</b> 609.3 (or as calibrated)</li> <li>• <b>Product Ion:</b> 195.1</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>		
<b>Guideline</b>		<b>Result</b>
Transmission efficiency	$\frac{\text{Intensity for ion at } m/z \text{ 195.1}}{\text{Intensity for ion at } m/z \text{ 609.3 (or as calibrated)}} \times 100 \geq 10\%$	4.3%



## Planned Maintenance

### Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
Verify the expiry date on the Powervar UPS battery system, and then recommend replacement of the battery tray, if required.	○	●
If required, replace the roughing pump oil. The recommended interval is every 3 years.  <b>Note:</b> If an oil change is not required, then inspect the oil level and top up, if necessary.  <b>CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.</b>	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	○	●
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	●
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	●	○
Inspect the mass spectrometer, components, and cabling, as required.	✓	—
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet <sup>®</sup> ion guide and IQ0 lens.	✓	—

### Planned Maintenance Tasks

Task	Complete	N/A
(If contamination is detected) Clean the Q0 region.	<input type="radio"/>	<input checked="" type="radio"/>
Start up the system.	✓	—

### Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurbolonSpray® and the APCI probe.	<input checked="" type="radio"/>	<input type="radio"/>
With the TurbolonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	<input type="radio"/>	<input checked="" type="radio"/>

### Software Maintenance

**Note:** This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes.	<input type="radio"/>	<input checked="" type="radio"/>

## Post-Planned Maintenance

Task	Complete
Inspect for front-end contamination. Refer to <a href="#">Inspect for Contamination</a> .	✓

## Voltage Tests

Task	Complete		
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.	✓		
Inspect the detector voltage. Optimize, if required.			
<table border="1" data-bbox="253 993 1224 1037"> <tr> <td>Detector voltage</td> <td>2100</td> </tr> </table>	Detector voltage	2100	
Detector voltage	2100		

Planned Maintenance Tasks

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**Post-PM Pressure Test**

Post-PM Pressure Test is Complete		✓
Test	Specification	Result
Vacuum chamber pressure with CAD gas off	$0.4 \times 10^{-5} \text{ torr} \leq P_{\text{CAD } 0} \leq 1.1 \times 10^{-5} \text{ torr}$	0.8e-5
Pressure difference (CAD <sub>12</sub> minus CAD <sub>0</sub> )	$1.8 \times 10^{-5} \text{ torr} \leq (P_{\text{CAD } 12} - P_{\text{CAD } 0}) \leq 2.8 \times 10^{-5} \text{ torr}$	3.4e-5

## Post-PM System Tests

Q1 Positive PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
175.133	$\geq 8.0 \times 10^6$	2.1e7	0.6 to 0.8	0.75	
500.380	$\geq 8.0 \times 10^6$	2.4e7	0.6 to 0.8	0.72	
906.673	$\geq 2.0 \times 10^7$	3.6e7	0.6 to 0.8	0.72	
1 952.427	$\geq 8.8 \times 10^5$	5.3e6	0.6 to 0.8	0.72	

**Planned Maintenance Tasks**

<b>Q1 Positive PPGs Test is Complete: Peak Width for Identified Masses</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
<b>Mass (Da)</b>	<b>Scan Rate (Da/s)</b>	<b>Cycles</b>	<b>Specification (Da)</b>	<b>Result (Passed)</b>
59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

Q3 Positive PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul> <p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
175.133	$\geq 8.0 \times 10^6$	2.7e7	0.6 to 0.8	0.72	
500.380	$\geq 8.0 \times 10^6$	3.0e7	0.6 to 0.8	0.76	
906.673	$\geq 2.0 \times 10^7$	4.9e7	0.6 to 0.8	0.70	
1 952.427	$\geq 8.8 \times 10^5$	5.4e6	0.6 to 0.8	0.74	

**Planned Maintenance Tasks**

<b>Q3 Positive PPGs Test is Complete: Peak Width for Identified Masses</b>				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> POS PPG, 2e-6 M</li> <li>• <b>Flow rate:</b> 5 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul> <p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
<b>Mass (Da)</b>	<b>Scan Rate (Da/s)</b>	<b>Cycles</b>	<b>Specification (Da)</b>	<b>Result (Passed)</b>
59.050, 175.133, 500.380, 616.464, 906.673, 1 254.925, 1 545.134, 1 952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	



Planned Maintenance Tasks

Q1 Negative PPGs Test is Complete: Intensity and Peak Width				✓	
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>					
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>					
Mass (Da)	Intensity (cps)		Peak Width (Da)		
	Specification	Result	Specification	Result	
933.636	$\geq 1.8 \times 10^7$	2.2e7	0.6 to 0.8	0.76	
1 863.306	$\geq 1.4 \times 10^6$	3.0e6	0.6 to 0.8	0.72	

**Planned Maintenance Tasks**

Q1 Negative PPGs Test is Complete: Peak Width for Identified Masses				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul> <p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

Q3 Negative PPGs Test is Complete: Intensity and Peak Width				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>Scan rate:</b> 10 Da/s</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	$\geq 1.8 \times 10^7$	2.9e7	0.6 to 0.8	0.74
1 863.306	$\geq 2.0 \times 10^6$	4.5e6	0.6 to 0.8	0.74

**Planned Maintenance Tasks**

Q3 Negative PPGs Test is Complete: Peak Width for Identified Masses				✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> NEG PPG, 3e-4 M</li> <li>• <b>Flow rate:</b> 10 µL/min</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>				
<p><b>Note:</b> After calibration, the mass shift result must be within 0.1 Da for all assigned masses.</p>				
Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1 223.845, 1 572.097, 1 863.306, 1 979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1 000	50	0.6 to 0.8	
	2 000	100	0.6 to 0.8	

Planned Maintenance Tasks

<b>Reserpine MS/MS Test is Complete</b>		✓
<ul style="list-style-type: none"> <li>• <b>Test solution:</b> Reserpine solution 0.167 pmol/μL</li> <li>• <b>Flow rate:</b> 5 μL/min</li> <li>• <b>Scan rate:</b> 10 Da/s (both MS and MS/MS)</li> <li>• <b>Scan mode:</b> Product Ion (MS2)</li> <li>• <b>Product Of:</b> 609.3 (or as calibrated)</li> <li>• <b>Product Ion:</b> 195.1</li> <li>• <b>Cycles:</b> 10</li> <li>• <b>MCA:</b> On</li> <li>• <b>Printouts required:</b> Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.</li> </ul>		
<b>Specification</b>		<b>Result</b>
Transmission efficiency	$\frac{\text{Intensity for ion at } m/z \text{ 195.1}}{\text{Intensity for ion at } m/z \text{ 609.3 (or as calibrated)}} \times 100 \geq 10\%$	11.9%

**Planned Maintenance Tasks**

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**Post-PM Tasks**

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	<input type="radio"/>	<input checked="" type="radio"/>
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: <ul style="list-style-type: none"> <li>(Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.</li> </ul>	<input checked="" type="radio"/>	<input type="radio"/>
(Not applicable for MD instrument families) Discuss warranty coverage for the StatusScope <sup>®</sup> Remote Monitoring Service. Determine whether the customer already has StatusScope <sup>®</sup> Remote Monitoring Service installed and, if not, whether it should be installed.  <b>Note:</b> Installation of the StatusScope <sup>®</sup> Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to <a href="https://sciex.com/instrument-service-and-support/statusscope-remote-monitoring">sciex.com/instrument-service-and-support/statusscope-remote-monitoring</a> for a list of eligible contracts.	<input type="radio"/>	<input checked="" type="radio"/>

**StatusScope<sup>®</sup> Remote Monitoring Service Tasks**

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**Note:** The StatusScope<sup>®</sup> remote monitoring service is not applicable for MD systems.

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## Planned Maintenance Tasks

Task	Complete	N/A
<p>If the StatusScope<sup>®</sup> Remote Monitoring Service is not installed, then perform these tasks:</p> <ol style="list-style-type: none"> <li>1. Make sure that the <i>StatusScope<sup>®</sup> Customer Remote Connectivity Authorization</i> and <i>Customer Remote Connectivity Registration</i> forms are both completed.</li> <li>2. Verify the connection to the server for the StatusScope<sup>®</sup> Remote Monitoring Service.</li> <li>3. Install the agent for the StatusScope<sup>®</sup> Remote Monitoring Service.</li> </ol>	<input type="radio"/>	<input checked="" type="radio"/>
Log on to the server for the StatusScope <sup>®</sup> Remote Monitoring Service using the FSE user name and then verify that the assets under the customer organization are connected to the server for the StatusScope <sup>®</sup> Remote Monitoring Service.	<input type="radio"/>	<input checked="" type="radio"/>
Perform the post-PM fault test to verify that the mass spectrometer fault generated is shown in the StatusScope <sup>®</sup> Remote Monitoring Service.	<input type="radio"/>	<input checked="" type="radio"/>


## Wrap Up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: <ul style="list-style-type: none"> <li>• Review the test results with the customer.</li> <li>• Provide the customer with the completed document and the test data.</li> <li>• If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.</li> </ul>	✓	—

# Signoff

3

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Organization	Shealy Environmental		
Mass spectrometer serial number	EB250231807	Service request number	4534266
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2020-03-09
FSE signature			



## Comments and Exceptions

Due to administrative restrictions, I was unable to use ASD to perform vacuum system test.  
Oil and filter changes were not performed during this PM because they were not due. LER 09Mar2020

## Inspect for Contamination

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**A**

1. Run the **Q1 Pos PPG** method for 10 minutes, monitoring the TIC for degradation of the signal or sensitivity drops.
2. Change the polarity to negative, and then scan for one minute.
3. Change the polarity to positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

If the signal sensitivity is restored temporarily but it starts to degrade again, then the charging effect is present.

## Guidelines for Identifying Components to be Cleaned

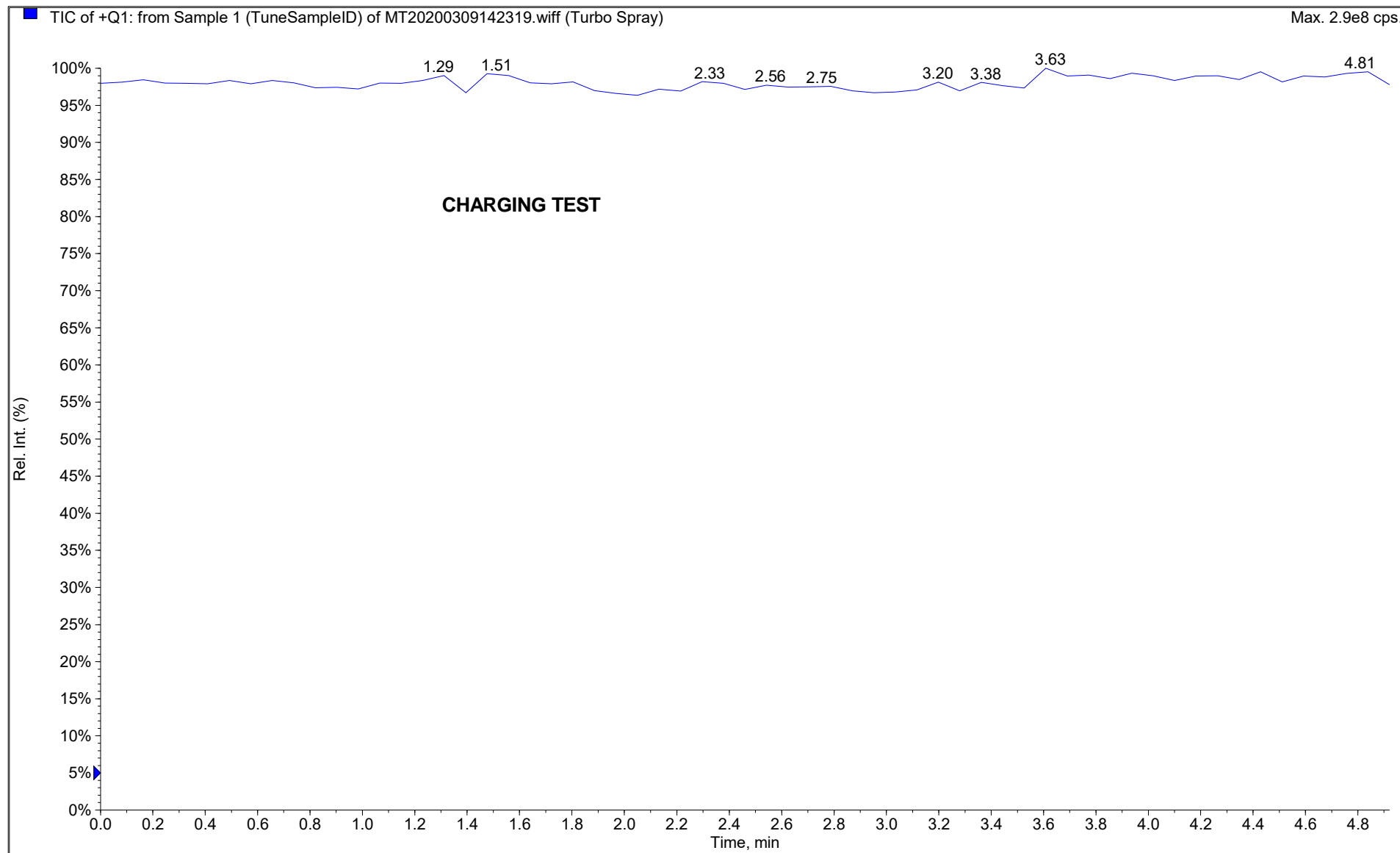
If the Q1 quadrupole is showing the charging effect and signal drop out, then clean the Q0 and the vacuum interface components (the curtain plate, orifice plate, the QJet<sup>®</sup> ion guide, and the Q0 side of the IQ0 and IQ1 lens) using the customer cleaning procedure, with the rod and tissues. In most cases, this will remove the contamination.

### Notes:

- Do not remove the ion optics during a PM. This is considered to be a repair activity and requires a separate service call to be opened.
- Consider cleaning the Q1 quadrupole as well as other components (the stubbies and the IQ1 lens), if cleaning the front end does not eliminate the contamination.
- This guideline does not provide complete troubleshooting for all possible technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurbolonSpray<sup>®</sup> probe or electrode, method parameters that are not optimized, and so on.

Acq. Time: 14:23  
Acq. Date: Monday, March 09, 2020

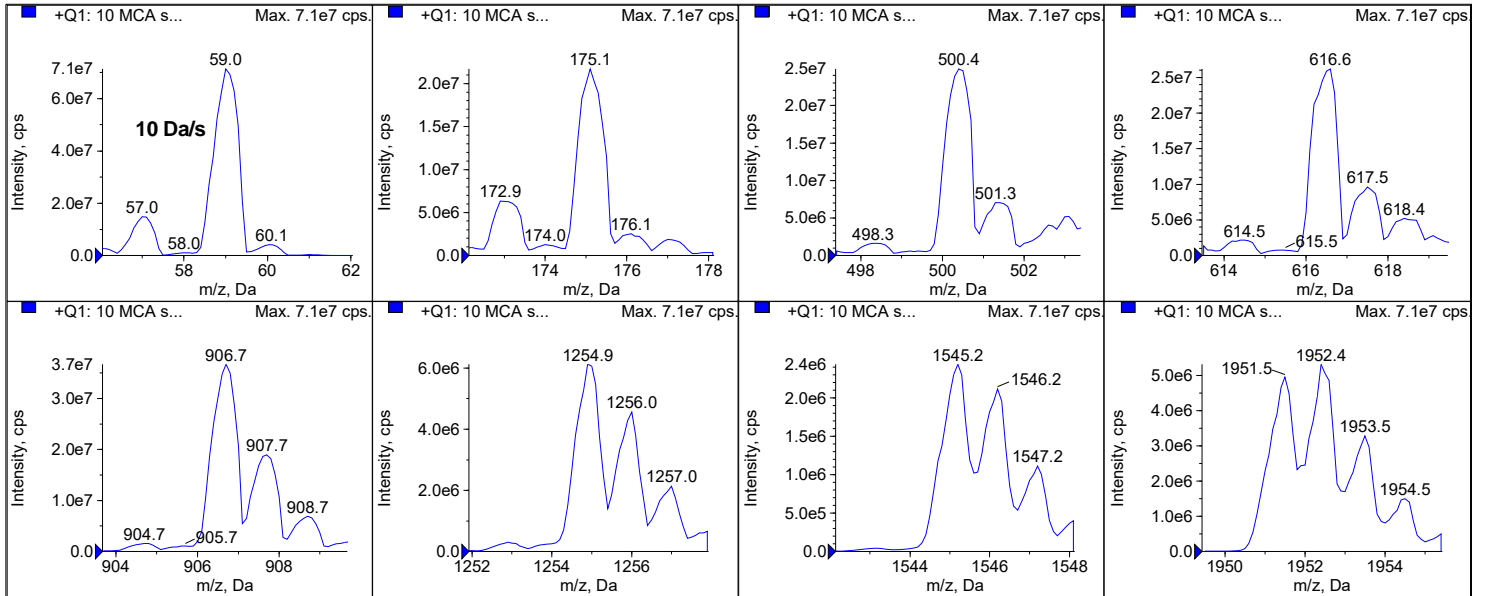
Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: 14:33  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



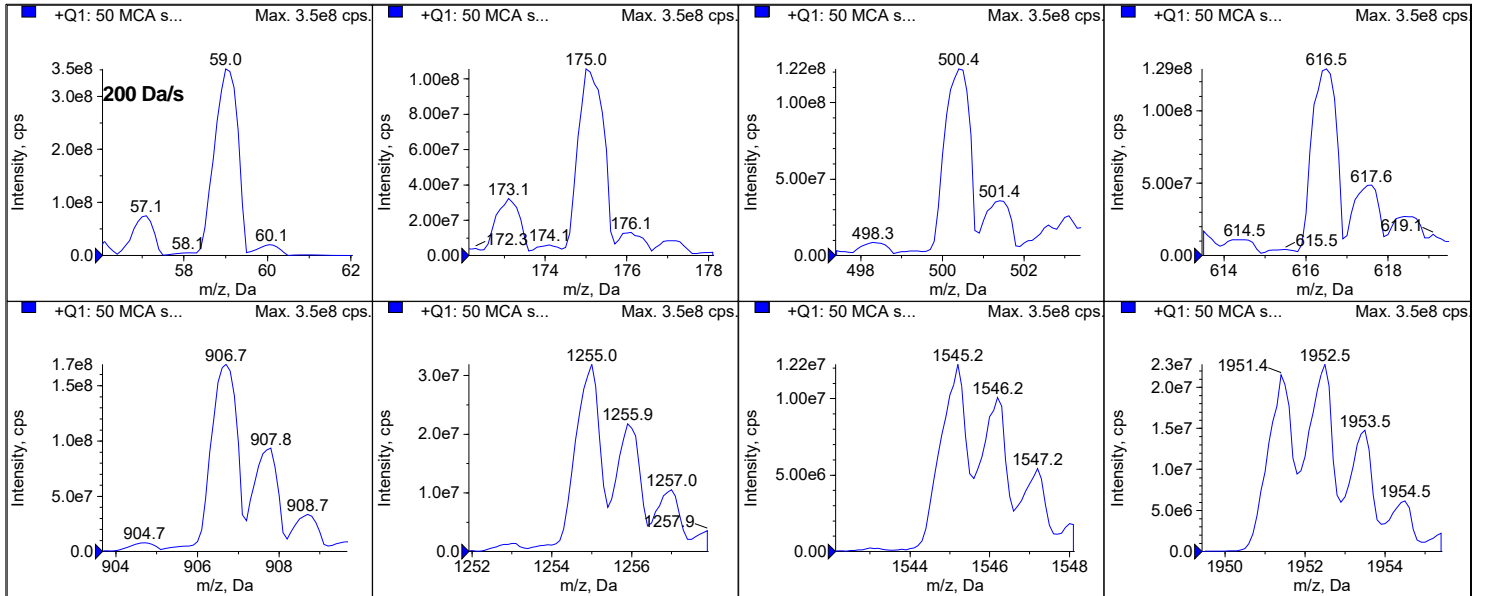
Peak List for "+Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309143328.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0403	7.1359e7	0.6692	9.6940e-3
2	175.1330	175.1170	2.1686e7	0.7574	0.0160
3	500.3800	500.4049	2.4873e7	0.7296	-0.0249
4	616.4640	616.4564	2.6201e7	0.7194	7.6080e-3
5	906.6730	906.6762	3.6657e7	0.7211	-3.2397e-3
6	1254.9250	1254.9156	6.1174e6	0.7141	9.4336e-3
7	1545.1340	1545.1477	2.4373e6	0.7781	-0.0137
8	1952.4270	1952.4311	5.3103e6	0.7239	-4.1026e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:40  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



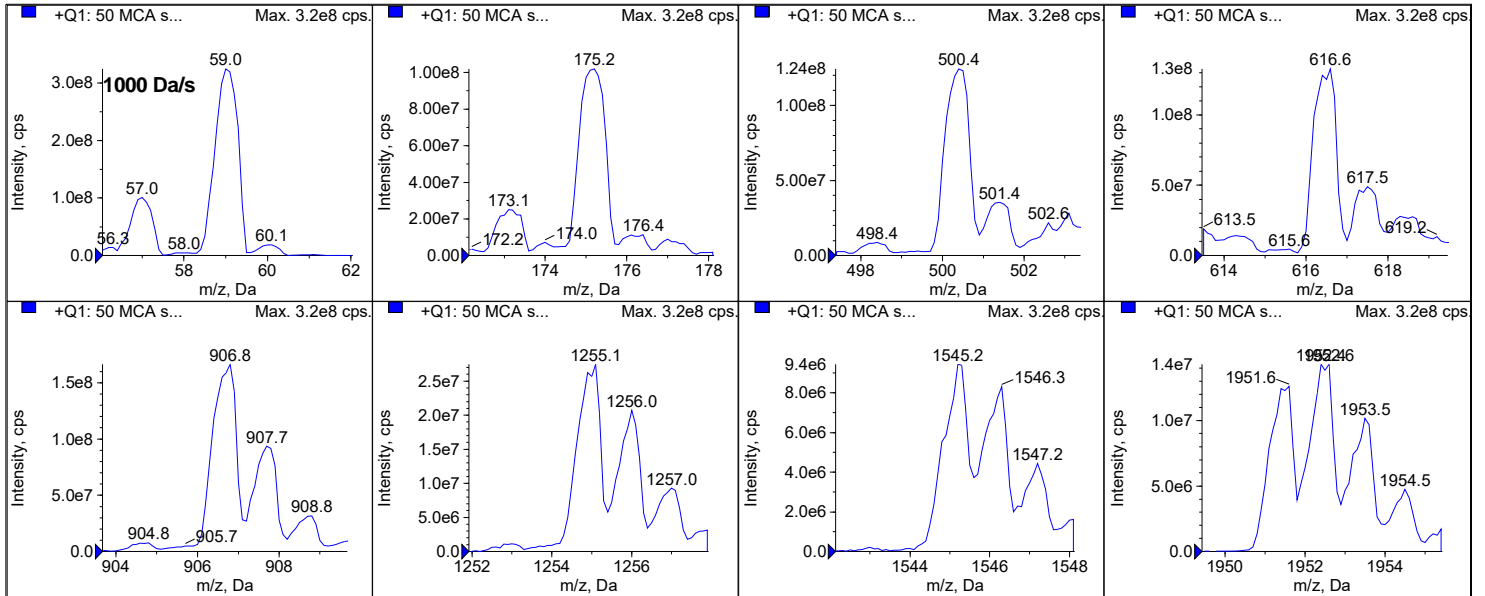
Peak List for "+Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309143958.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0426	3.5185e8	0.6526	7.3620e-3
2	175.1330	175.1285	1.0569e8	0.7634	4.4530e-3
3	500.3800	500.3824	1.2207e8	0.7427	-2.3841e-3
4	616.4640	616.4559	1.2884e8	0.7249	8.1053e-3
5	906.6730	906.6721	1.6932e8	0.7323	8.6040e-4
6	1254.9250	1254.9208	3.1914e7	0.6958	4.2190e-3
7	1545.1340	1545.1217	1.2244e7	0.7698	0.0123
8	1952.4270	1952.3998	2.2800e7	0.7075	0.0272

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:42  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



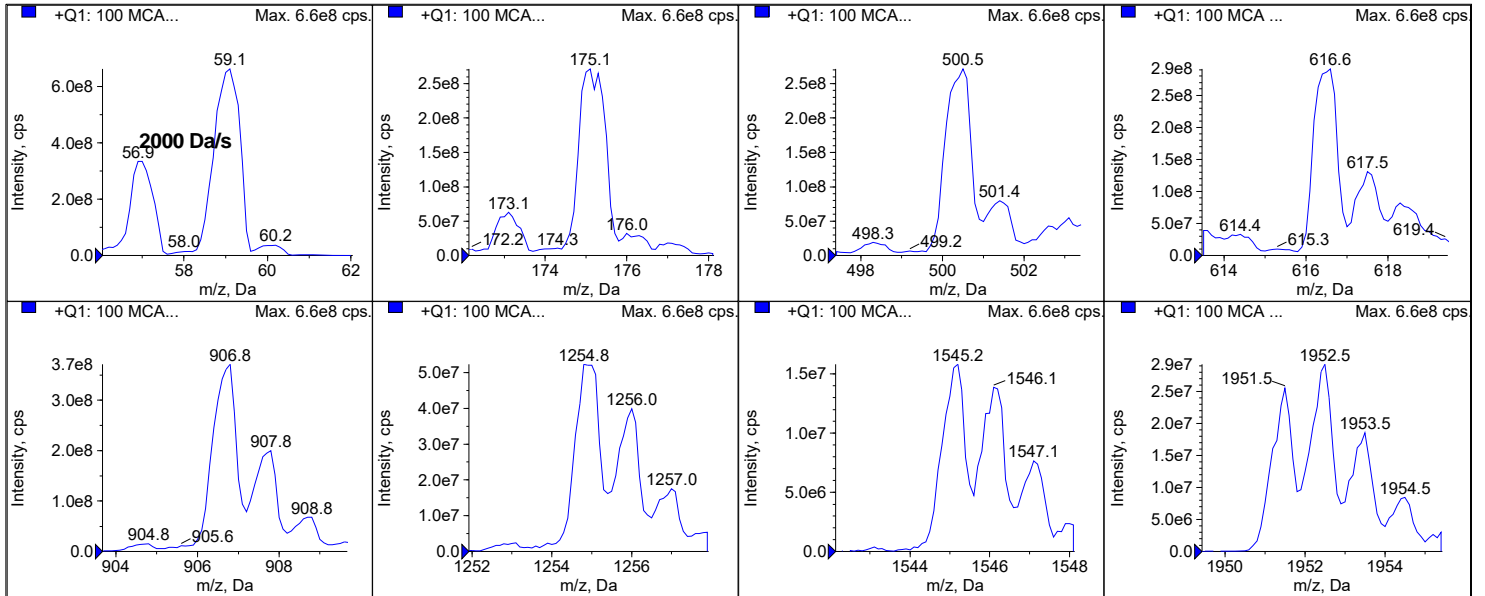
Peak List for "+Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309144214.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0447	3.2454e8	0.6334	5.2631e-3
2	175.1330	175.1572	1.0197e8	0.7487	-0.0242
3	500.3800	500.3686	1.2434e8	0.6955	0.0114
4	616.4640	616.4687	1.3271e8	0.6439	-4.7115e-3
5	906.6730	906.6772	1.6629e8	0.6655	-4.1937e-3
6	1254.9250	1254.9605	2.7440e7	0.6670	-0.0355
7	1545.1340	1545.1771	9.4300e6	0.7409	-0.0431
8	1952.4270	1952.4754	1.4280e7	0.6846	-0.0484

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:47  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



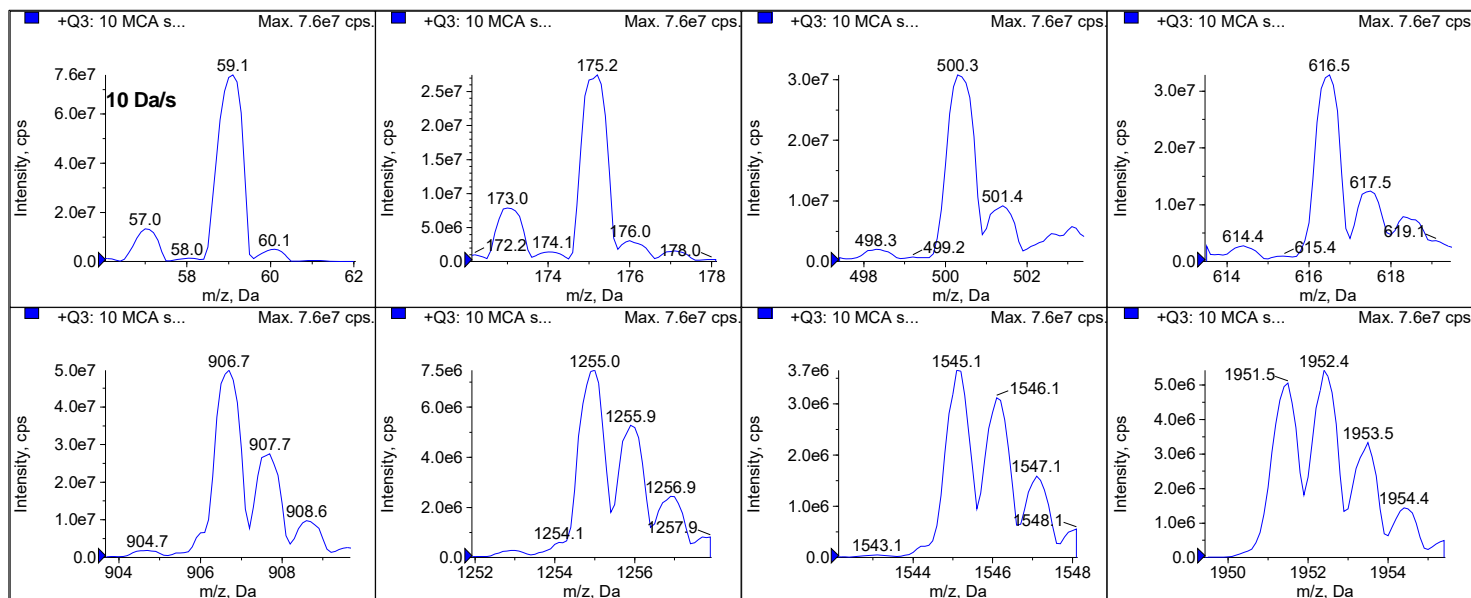
Peak List for "+Q1: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309144752.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0522	6.6290e8	0.7172	-2.2374e-3
2	175.1330	175.1580	2.7148e8	0.7493	-0.0250
3	500.3800	500.3949	2.7144e8	0.7271	-0.0149
4	616.4640	616.4704	2.9130e8	0.6476	-6.3561e-3
5	906.6730	906.6744	3.7100e8	0.6497	-1.3994e-3
6	1254.9250	1254.9073	5.2260e7	0.6858	0.0177
7	1545.1340	1545.1120	1.5800e7	0.6532	0.0220
8	1952.4270	1952.4295	2.9220e7	0.6414	-2.5268e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 14:53  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



Peak List for "+Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309145335.wiff (Turbo Spray)"

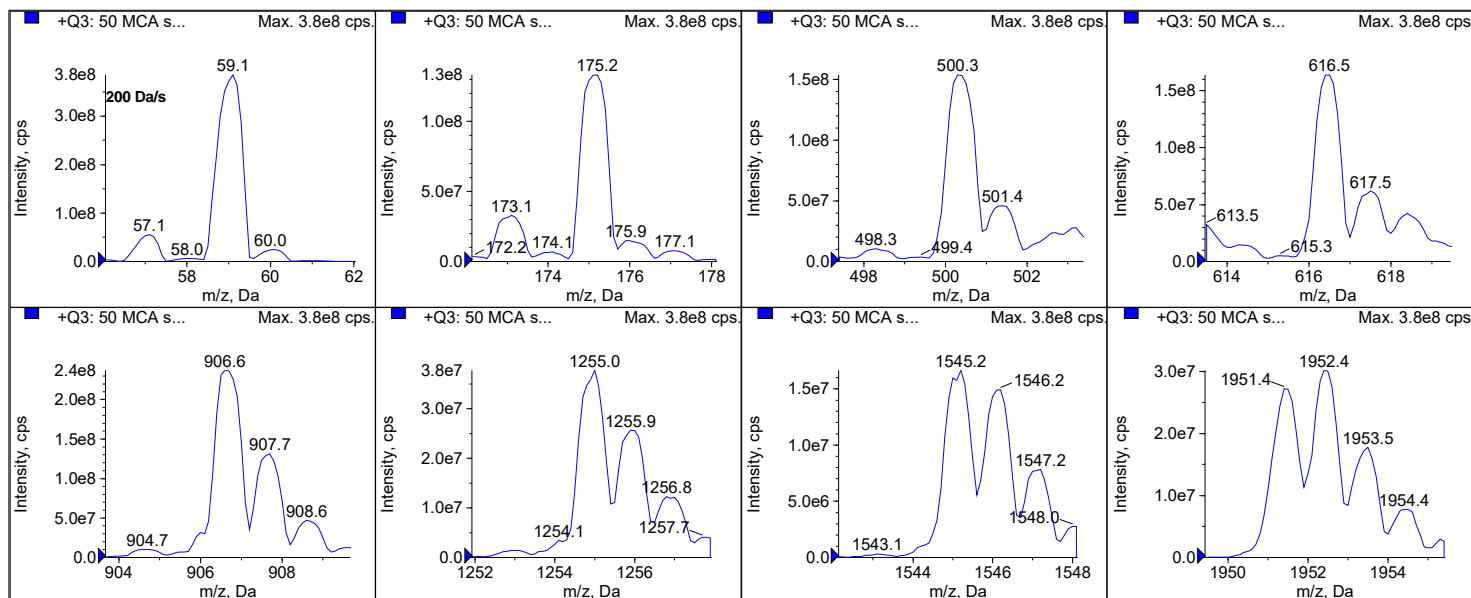
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0513	7.5905e7	0.6954	-1.3188e-3
2	175.1330	175.1236	2.7460e7	0.7285	9.3617e-3
3	500.3800	500.3774	3.0791e7	0.7606	2.5750e-3
4	616.4640	616.4578	3.2865e7	0.6715	6.2175e-3
5	906.6730	906.6698	4.9688e7	0.7026	3.2171e-3
6	1254.9250	1254.9194	7.4667e6	0.7363	5.5598e-3
7	1545.1340	1545.1297	3.6516e6	0.7119	4.2899e-3
8	1952.4270	1952.4240	5.4222e6	0.7396	2.9901e-3

\*Post-PM  
 \*FSE: Lynne Russell



Acq. Time: 14:59  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



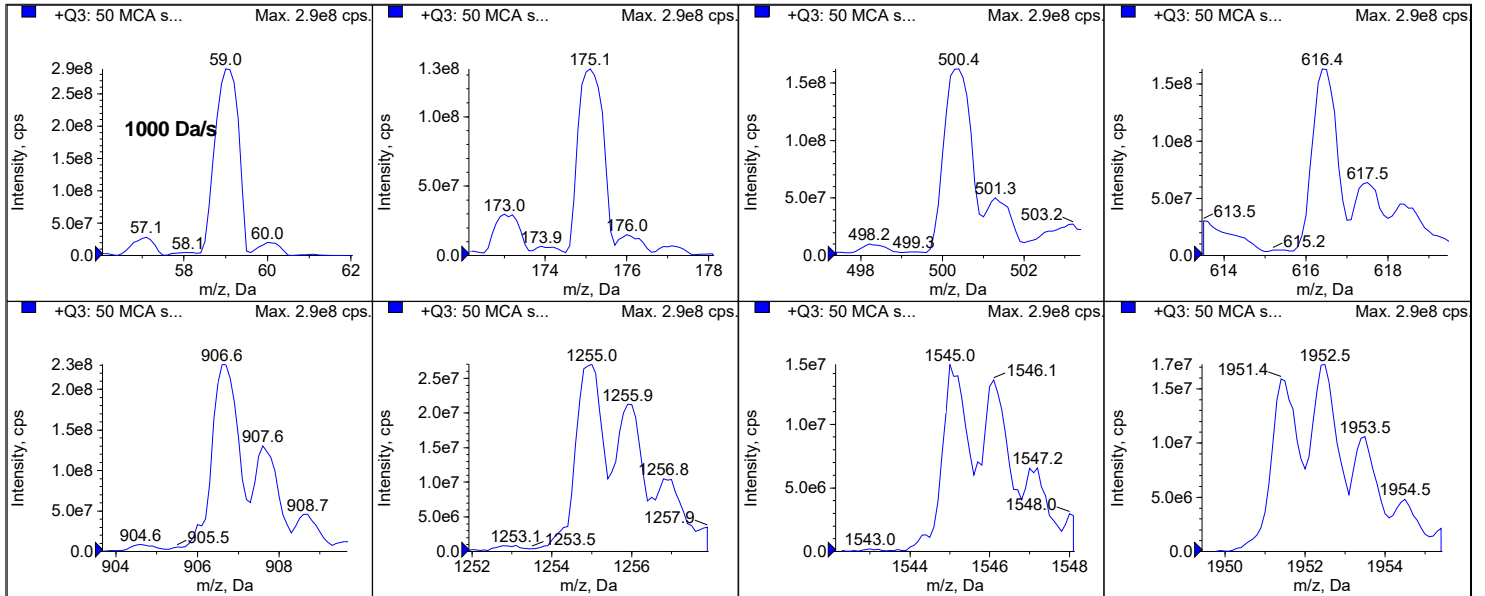
Peak List for "+Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309145908.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0417	3.8495e8	0.6883	8.2519e-3
2	175.1330	175.1206	1.3316e8	0.7429	0.0124
3	500.3800	500.3761	1.5378e8	0.7795	3.8903e-3
4	616.4640	616.4581	1.6392e8	0.6983	5.8954e-3
5	906.6730	906.6698	2.3689e8	0.7180	3.1950e-3
6	1254.9250	1254.9230	3.7754e7	0.7466	2.0402e-3
7	1545.1340	1545.1237	1.6638e7	0.7683	0.0103
8	1952.4270	1952.4323	3.0168e7	0.7410	-5.3377e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:01  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



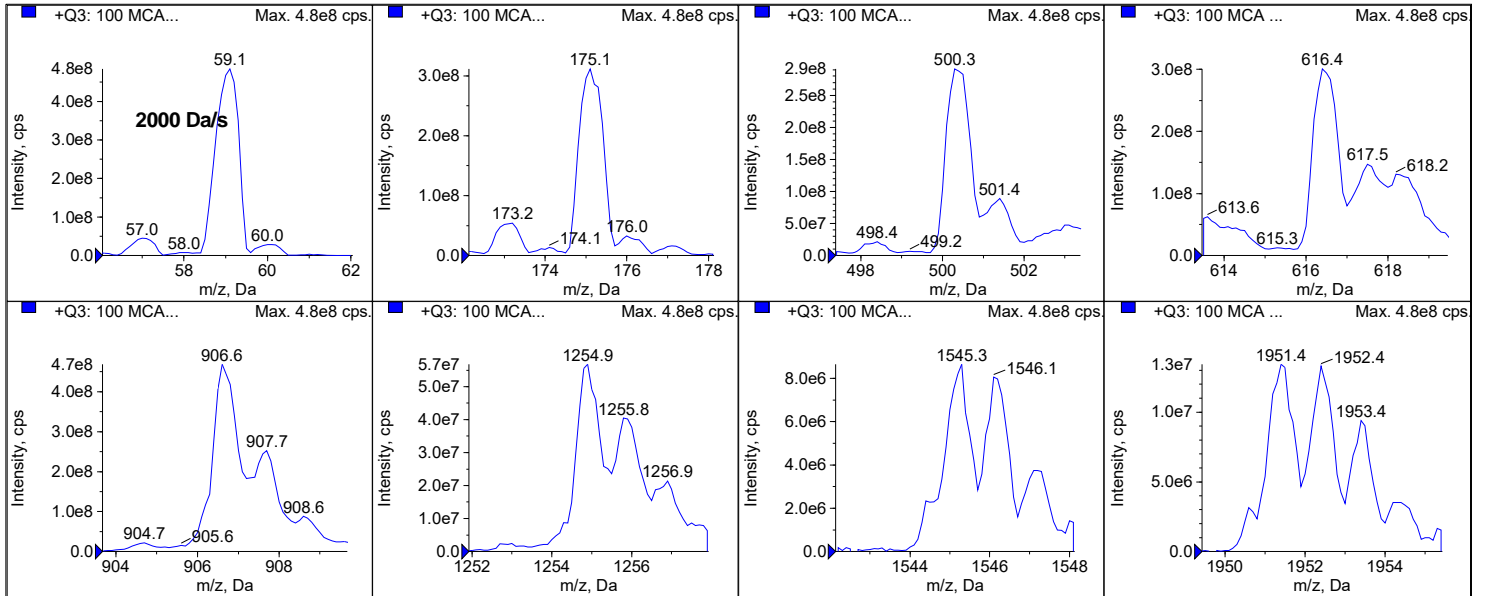
Peak List for "+Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309150124.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0456	2.8843e8	0.6720	4.3685e-3
2	175.1330	175.1080	1.3443e8	0.7289	0.0250
3	500.3800	500.3716	1.6225e8	0.7737	8.4217e-3
4	616.4640	616.4572	1.6319e8	0.6772	6.8124e-3
5	906.6730	906.6761	2.3076e8	0.7093	-3.1097e-3
6	1254.9250	1254.9430	2.7010e7	0.7649	-0.0180
7	1545.1340	1545.1274	1.4710e7	0.7307	6.5536e-3
8	1952.4270	1952.4675	1.7250e7	0.7893	-0.0405

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:08  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



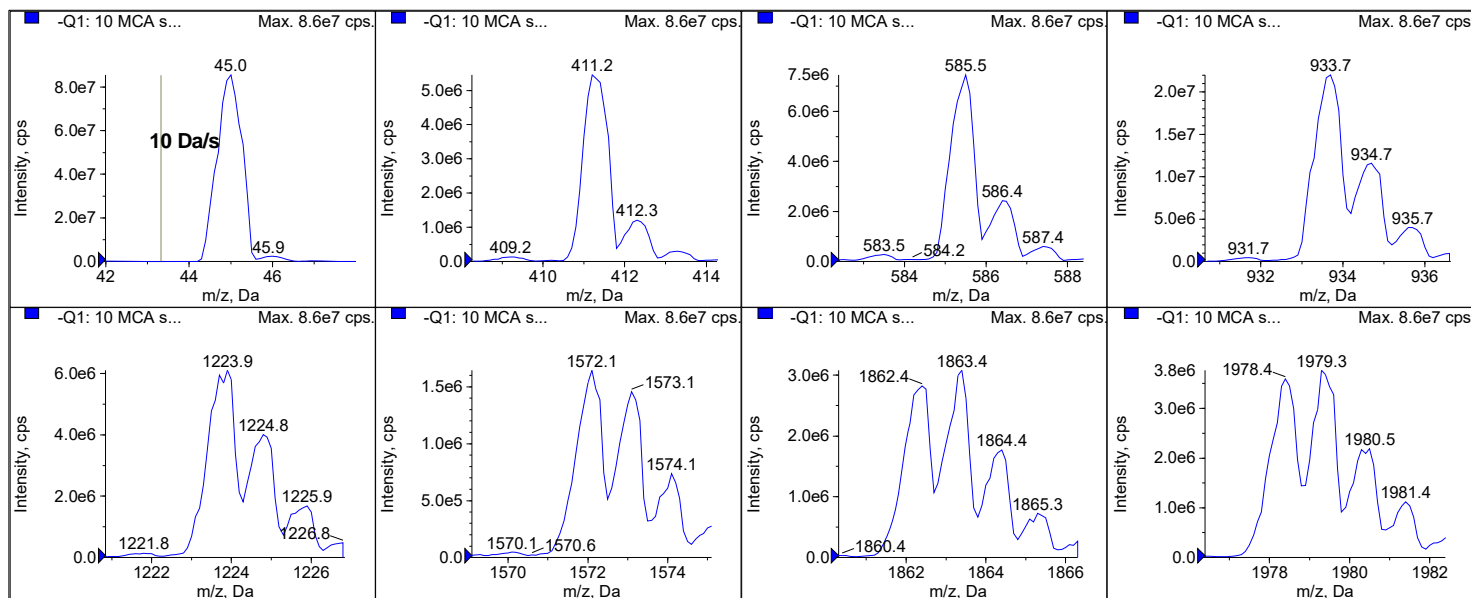
Peak List for "+Q3: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309150800.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	59.0500	59.0586	4.8450e8	0.6461	-8.6402e-3
2	175.1330	175.1219	3.1148e8	0.6940	0.0111
3	500.3800	500.3758	2.9134e8	0.6873	4.1700e-3
4	616.4640	616.4724	3.0084e8	0.7039	-8.3635e-3
5	906.6730	906.6726	4.6822e8	0.6683	4.4023e-4
6	1254.9250	1254.9151	5.6720e7	0.6771	9.9478e-3
7	1545.1340	1545.2148	8.6400e6	0.7237	-0.0808
8	1952.4270	1952.4301	1.3300e7	0.6979	-3.0947e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:28  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



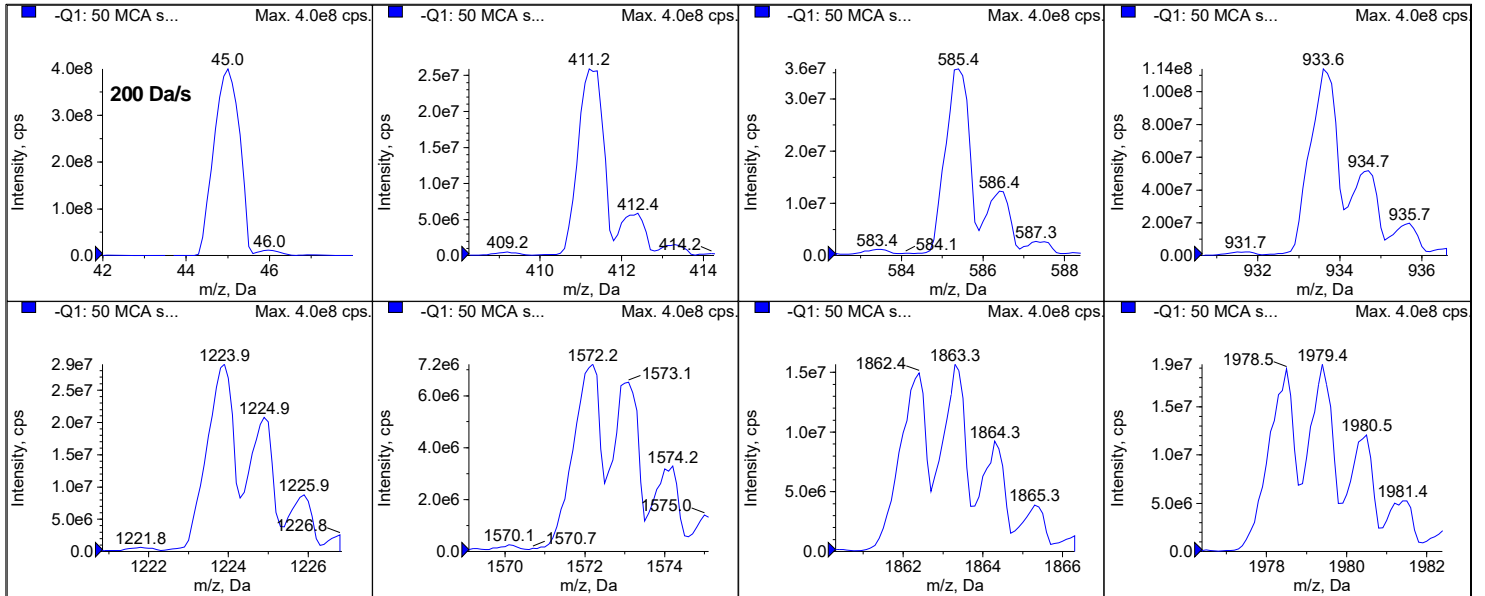
Peak List for "-Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309152824.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9918	8.5579e7	0.7257	6.1756e-3
2	411.2590	411.2931	5.4518e6	0.7033	-0.0341
3	585.3850	585.4343	7.4578e6	0.6701	-0.0493
4	933.6360	933.6510	2.2008e7	0.7625	-0.0150
5	1223.8450	1223.7823	6.0980e6	0.7651	0.0627
6	1572.0970	1572.0645	1.6439e6	0.7243	0.0325
7	1863.3060	1863.3143	3.0768e6	0.7252	-8.3485e-3
8	1979.3890	1979.3712	3.7634e6	0.7084	0.0178

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:33  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



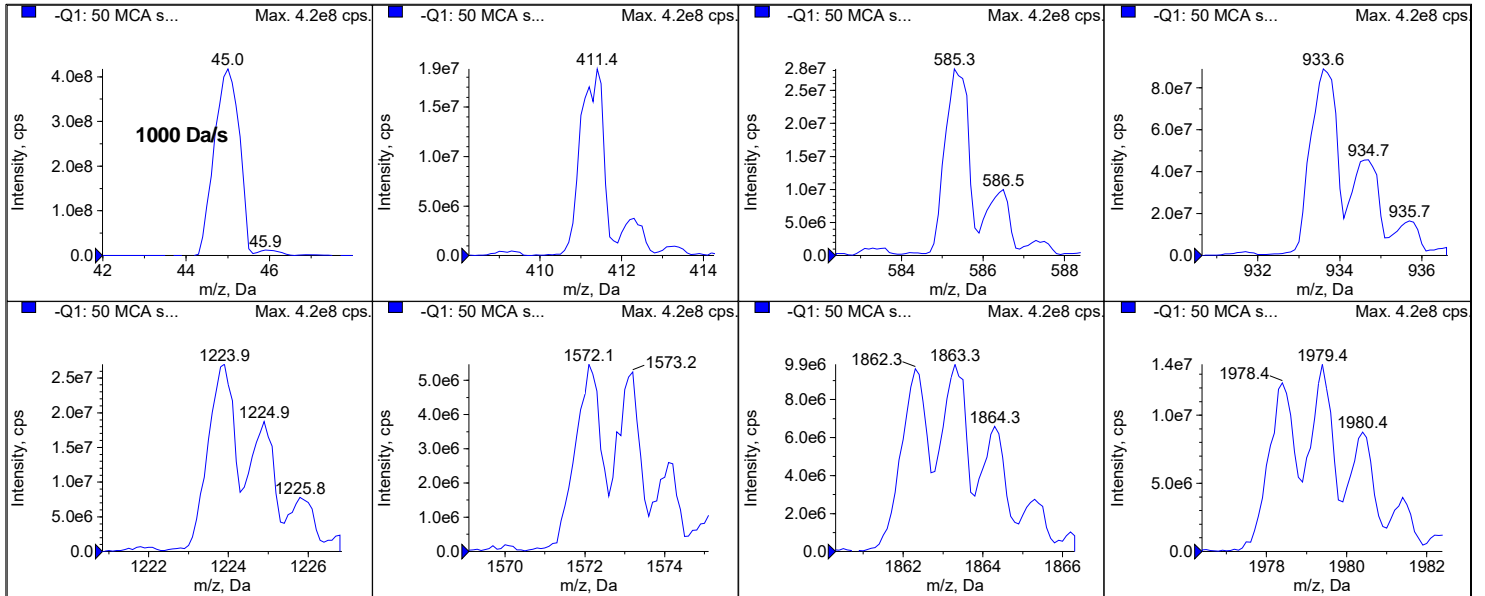
Peak List for "-Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309153334.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9917	3.9936e8	0.7353	6.3073e-3
2	411.2590	411.2565	2.5886e7	0.6981	2.5178e-3
3	585.3850	585.3937	3.5740e7	0.6784	-8.7106e-3
4	933.6360	933.6327	1.1394e8	0.7673	3.2736e-3
5	1223.8450	1223.8361	2.8978e7	0.7422	8.8585e-3
6	1572.0970	1572.1208	7.2060e6	0.7626	-0.0238
7	1863.3060	1863.3024	1.5666e7	0.6735	3.5534e-3
8	1979.3890	1979.3764	1.9374e7	0.7004	0.0126

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:35  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



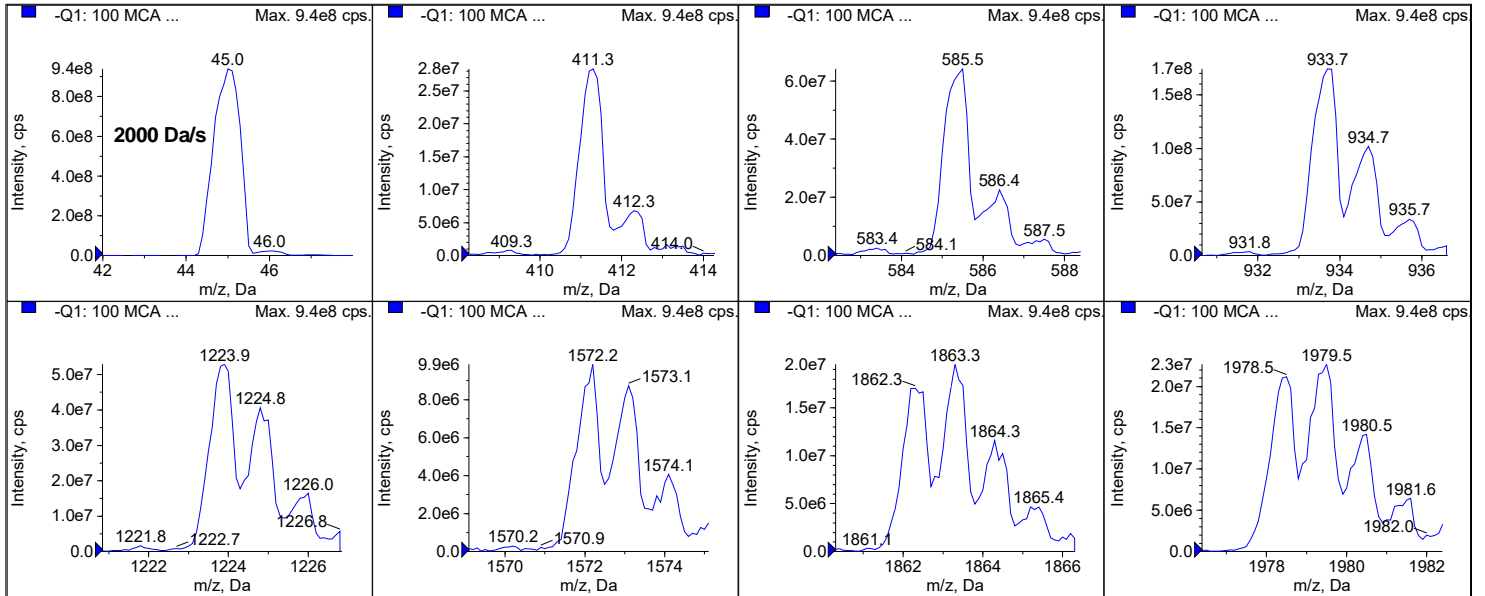
Peak List for "-Q1: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309153557.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9936	4.1751e8	0.7157	4.4174e-3
2	411.2590	411.2776	1.8850e7	0.6512	-0.0186
3	585.3850	585.3771	2.8250e7	0.6670	7.8938e-3
4	933.6360	933.6294	8.9130e7	0.7626	6.5713e-3
5	1223.8450	1223.8444	2.6960e7	0.7422	6.2591e-4
6	1572.0970	1572.1041	5.4600e6	0.7252	-7.0655e-3
7	1863.3060	1863.2936	9.8500e6	0.7713	0.0124
8	1979.3890	1979.3925	1.3720e7	0.6952	-3.4915e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:40  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



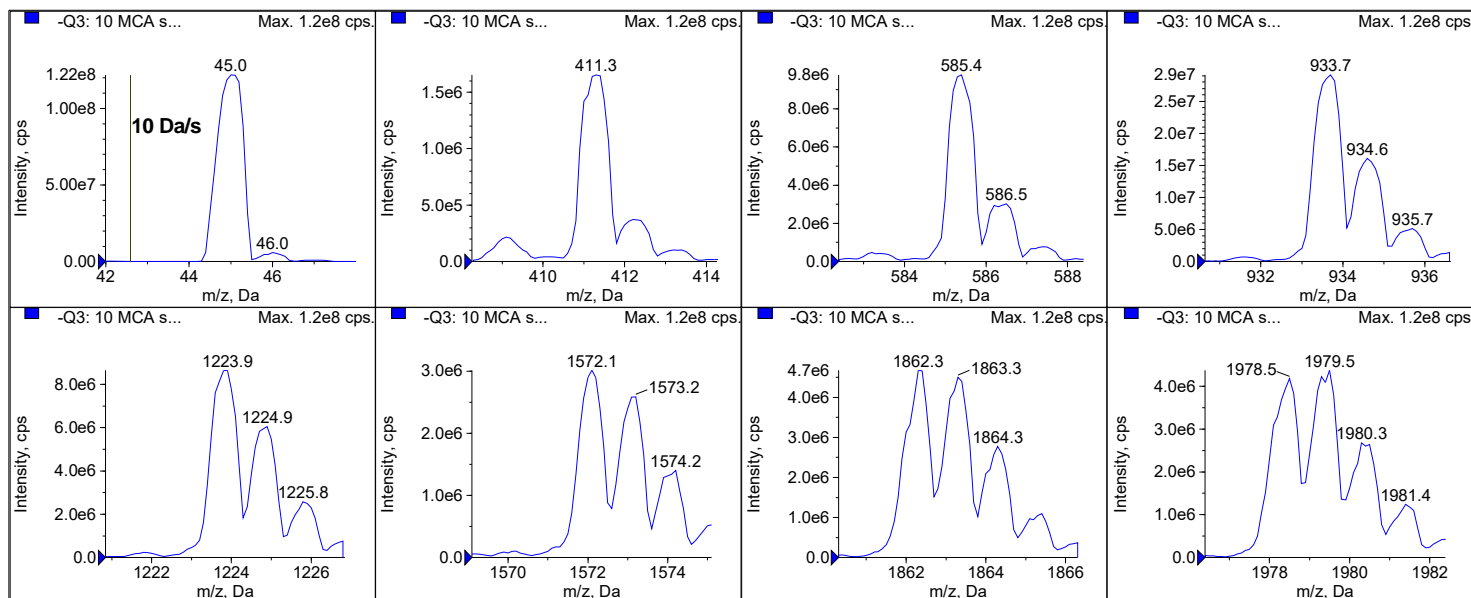
Peak List for "-Q1: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309154037.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0003	9.3880e8	0.7560	-2.2824e-3
2	411.2590	411.2703	2.8340e7	0.6287	-0.0113
3	585.3850	585.3487	6.4180e7	0.6800	0.0363
4	933.6360	933.6511	1.7412e8	0.6811	-0.0151
5	1223.8450	1223.8511	5.2840e7	0.6856	-6.0596e-3
6	1572.0970	1572.1135	9.8600e6	0.6499	-0.0165
7	1863.3060	1863.3165	1.9540e7	0.6589	-0.0105
8	1979.3890	1979.3944	2.2660e7	0.7319	-5.3568e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 15:47  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309154715.wiff (Turbo Spray)"

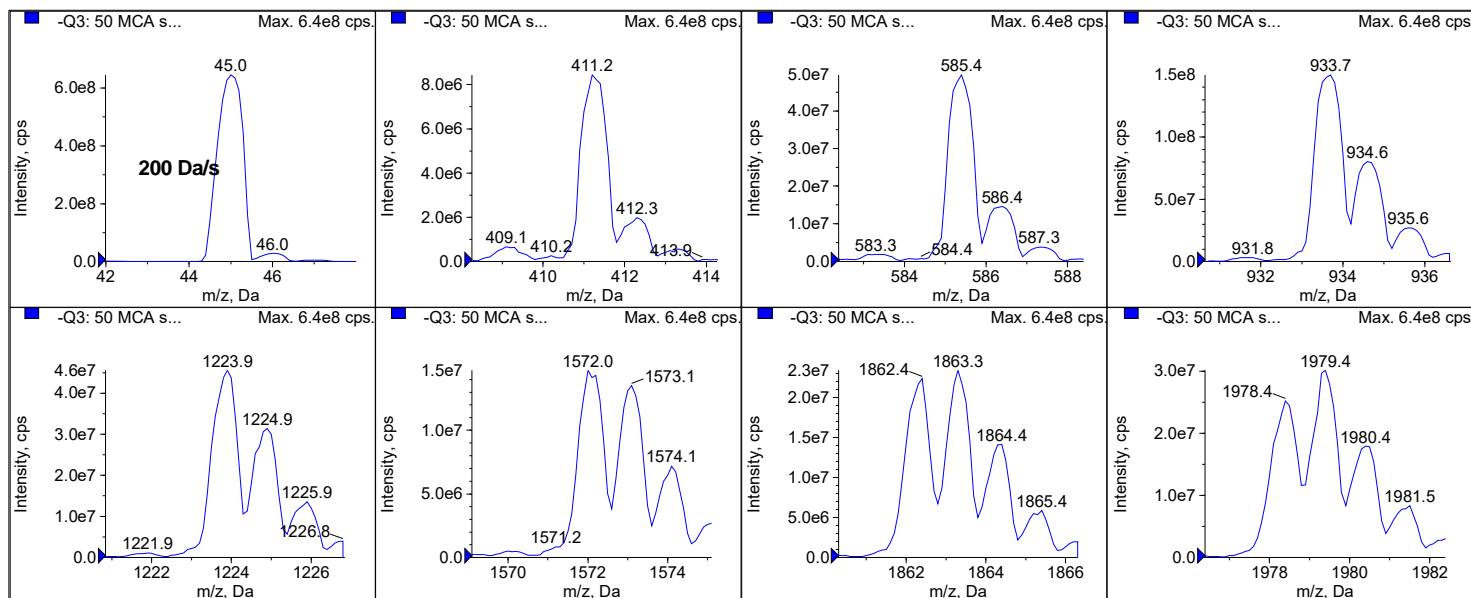
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0082	1.2180e8	0.7404	-0.0102
2	411.2590	411.2610	1.6539e6	0.7632	-2.0391e-3
3	585.3850	585.3872	9.7699e6	0.6984	-2.2009e-3
4	933.6360	933.6266	2.9123e7	0.7487	9.4038e-3
5	1223.8450	1223.8149	8.6389e6	0.7511	0.0301
6	1572.0970	1572.0850	3.0115e6	0.7067	0.0120
7	1863.3060	1863.2855	4.5025e6	0.7447	0.0205
8	1979.3890	1979.3871	4.3712e6	0.7716	1.9019e-3

\*Post-PM  
 \*FSE: Lynne Russell



Acq. Time: 15:57  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



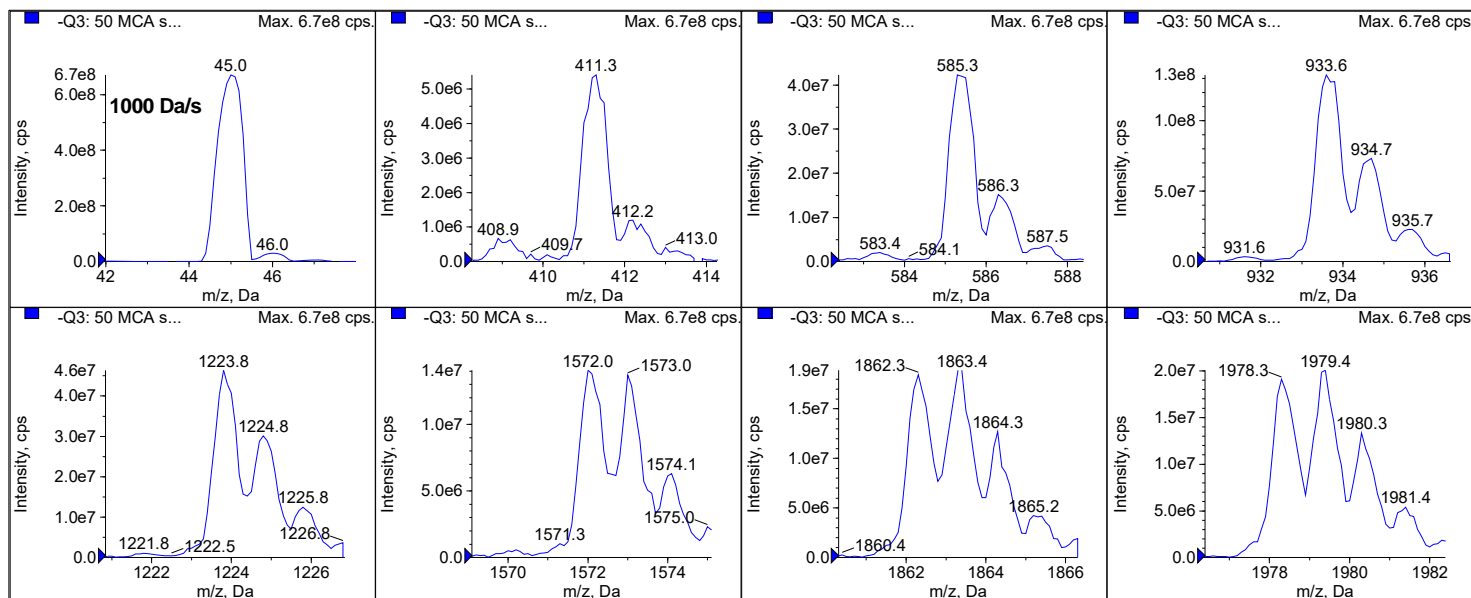
Peak List for "-Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309155701.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0060	6.4463e8	0.7254	-7.9934e-3
2	411.2590	411.2441	8.4440e6	0.7402	0.0149
3	585.3850	585.3776	4.9526e7	0.7000	7.4079e-3
4	933.6360	933.6448	1.4994e8	0.7558	-8.8291e-3
5	1223.8450	1223.8427	4.5540e7	0.7303	2.3178e-3
6	1572.0970	1572.0873	1.4708e7	0.7224	9.6943e-3
7	1863.3060	1863.3116	2.3372e7	0.6821	-5.6179e-3
8	1979.3890	1979.3871	3.0114e7	0.7684	1.9144e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:04  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



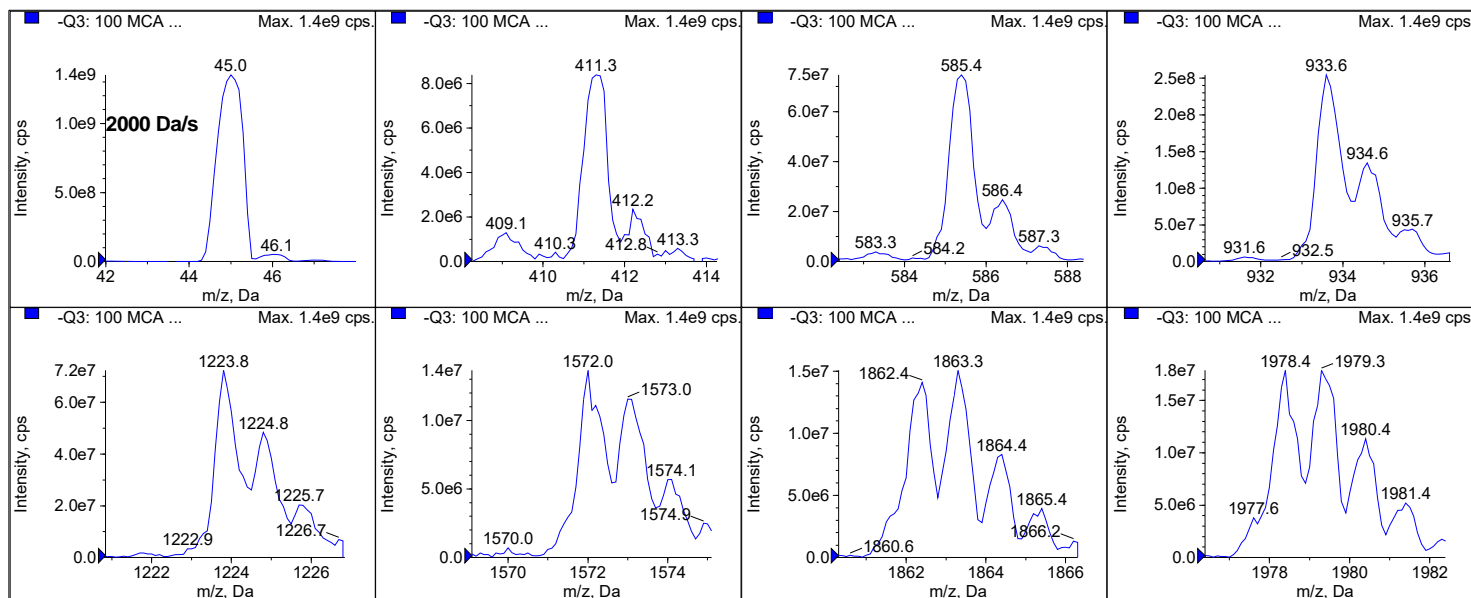
Peak List for "-Q3: 50 MCA scans from Sample 1 (TuneSampleID) of MT20200309160443.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0043	6.7129e8	0.7277	-6.3300e-3
2	411.2590	411.2666	5.4100e6	0.6845	-7.6259e-3
3	585.3850	585.3966	4.2290e7	0.6976	-0.0116
4	933.6360	933.6496	1.3258e8	0.6805	-0.0136
5	1223.8450	1223.8557	4.6330e7	0.6552	-0.0107
6	1572.0970	1572.0882	1.4050e7	0.7080	8.8257e-3
7	1863.3060	1863.3356	1.8880e7	0.7932	-0.0296
8	1979.3890	1979.3810	2.0050e7	0.7797	7.9747e-3

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:10  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



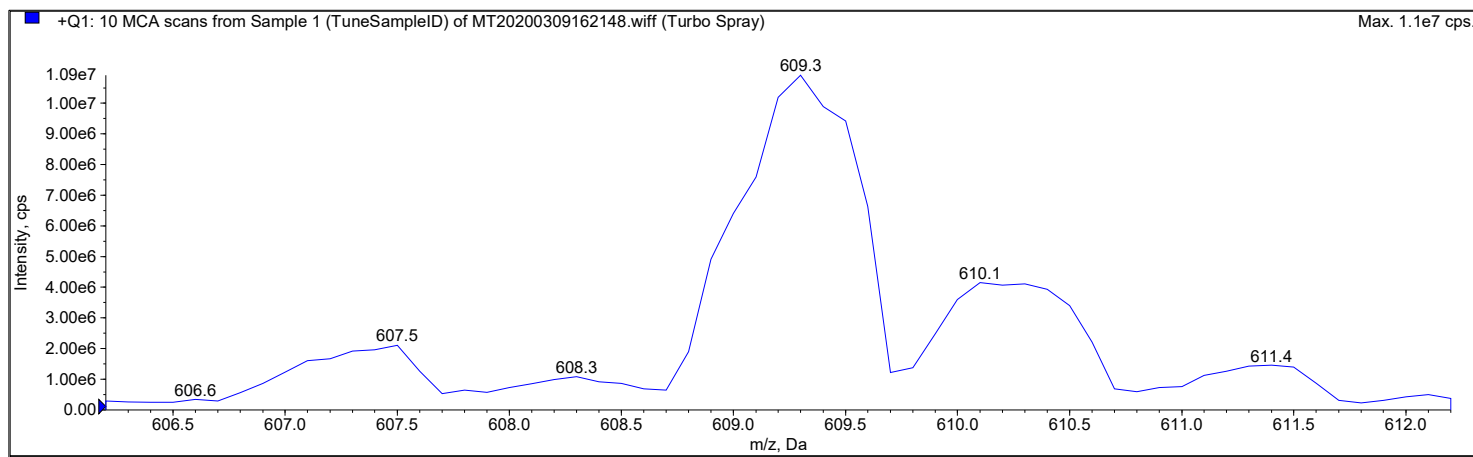
Peak List for "-Q3: 100 MCA scans from Sample 1 (TuneSampleID) of MT20200309161002.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0025	1.3512e9	0.7334	-4.5334e-3
2	411.2590	411.2920	8.3800e6	0.6384	-0.0330
3	585.3850	585.3849	7.4680e7	0.6377	5.1195e-5
4	933.6360	933.6396	2.5452e8	0.6599	-3.5625e-3
5	1223.8450	1223.8458	7.2340e7	0.6032	-7.8090e-4
6	1572.0970	1572.0918	1.3640e7	0.7449	5.2106e-3
7	1863.3060	1863.3134	1.5060e7	0.7096	-7.4095e-3
8	1979.3890	1978.4049	1.7860e7	0.7051	0.9841

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: 16:21  
 Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
 \*SN: EB250231807



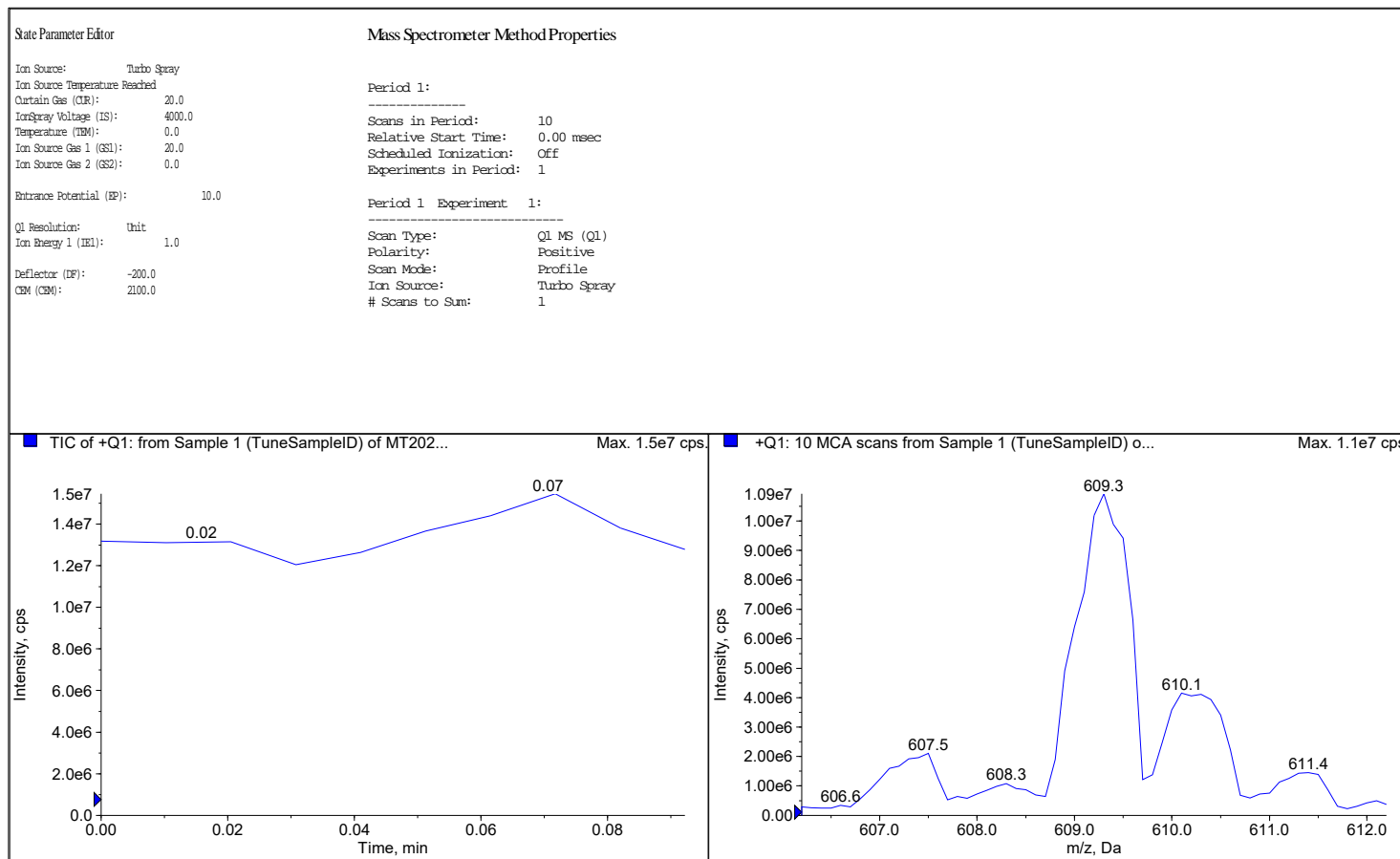
Peak List for "+Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309162148.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	174.1000	n/a	n/a	n/a	n/a
2	195.1000	n/a	n/a	n/a	n/a
3	397.2000	n/a	n/a	n/a	n/a
4	448.1000	n/a	n/a	n/a	n/a
5	609.2810	609.3177	1.0915e7	0.6852	-0.0367

\*Post-PM  
 \*FSE: Lynne Russell

Acq. Time: N/A  
Acq. Date: N/A

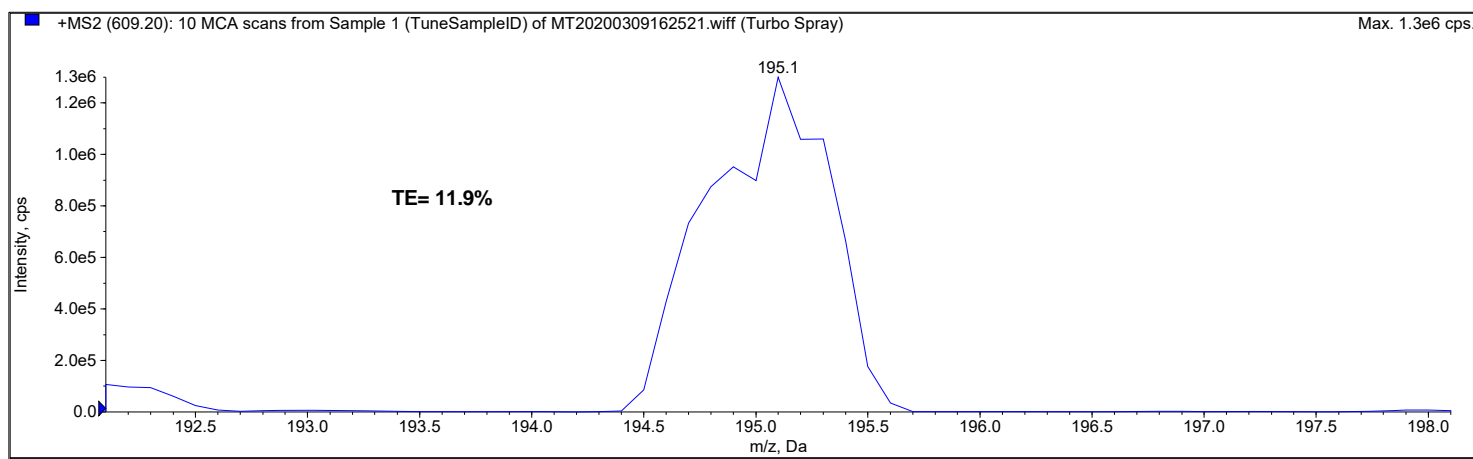
Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: 16:25  
Acq. Date: Monday, March 09, 2020

Analyst Version: 1.7.0  
\*SN: EB250231807



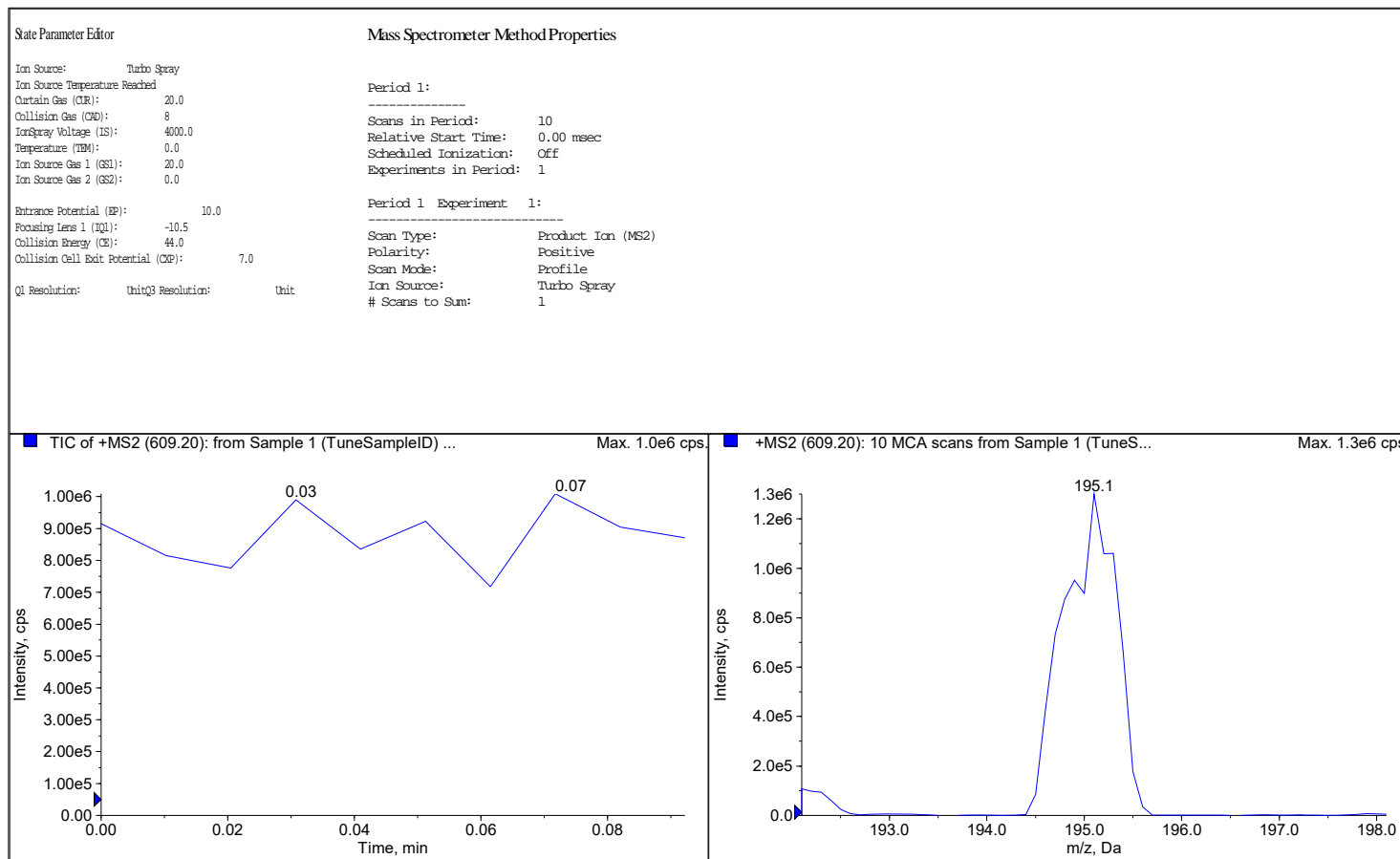
Peak List for "+MS2 (609.20): 10 MCA scans from Sample 1 (TuneSampleID) of MT20200309162521.wiff (Turbo Spray)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	174.1000	n/a	n/a	n/a	n/a
2	195.1000	195.0747	1.3007e6	0.7298	0.0253
3	397.2000	n/a	n/a	n/a	n/a
4	448.1000	n/a	n/a	n/a	n/a
5	609.2810	n/a	n/a	n/a	n/a

\*Post-PM  
\*FSE: Lynne Russell

Acq. Time: N/A  
Acq. Date: N/A

Analyst Version: 1.7.0  
\*SN: EB250231807



\*Post-PM  
\*FSE: Lynne Russell

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820007.d  
Injection Date: 28-Dec-2020 10:17:01 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 97  
Lab Sample ID: ID IBLK A Lab Prep. Batch:  
Sample Info: ID IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA</b>	CAS: SESI-0111												
217 > 172		1.699	1.696	1	623573	24	>100:1			1001.00	899.10	96	
<b>8 Perfluoro-n-butanoic acid (PFBA)</b>	CAS: 375-22-4												U
212.9 > 168.9	46		1.696		ND								
<b>D 50 13C5_PFPeA</b>	CAS: SESI-0112												
267.9 > 223		2.067	2.072	0	662325	17	>100:1			1001.00	962.84	99.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA)</b>	CAS: 2706-90-3												U
262.9 > 218.9	50		2.072		ND								
<b>D 44 13C3_PFBS</b>	CAS: SESI-0116												
302 > 80		2.130	2.125	1	225478	17	>100:1			1001.00	979.36	94.7	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS)</b>	CAS: 375-73-5												U
298.9 > 80	44		2.125		ND								
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS)</b>	CAS: 2706-91-4												U
349 > 80	44		2.450		ND								
<b>D 63 13C2_4:2 FTS_2</b>	CAS: SESI-0104												
329 > 81		2.380	2.379	1	126304	20	>100:1			5005.00	5217.38	87.7	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)</b>	CAS: 757124-72-4												U
327 > 307	63		2.388		ND								
<b>D 49 13C5_PFHxA</b>	CAS: SESI-0113												
318 > 273		2.416	2.423	0	728345	19	>100:1			1001.00	988.16	98	
<b>15 Perfluoro-n-hexanoic acid (PFHxA)</b>	CAS: 307-24-4												U
313 > 269	49		2.423		ND								
<b>D 66 13C3_GenX</b>	CAS: SESI-0121												
287 > 185		2.523	2.530	0	1381088	20	>100:1			5005.00	5185.16	98.6	
<b>28 Hexafluoropropylene oxide dimer acid (GenX)</b>	CAS: 13252-13-6												U
285 > 119	66		2.530		ND								
<b>D 47 13C4_PFHpA</b>	CAS: SESI-0114												
367 > 322		2.773	2.772	1	580067	20	>100:1			1001.00	956.19	91.5	
<b>13 Perfluoro-n-heptanoic acid (PFHpA)</b>	CAS: 375-85-9												U
363 > 319	47		2.772		ND								
<b>D 45 13C3_PFHxS</b>	CAS: SESI-0096												
402 > 80		2.782	2.790	0	164128	21	>100:1			1001.00	958.53	94.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS)</b>	CAS: 355-46-4												U
399 > 80	45		2.790		ND								
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)</b>	CAS: 919005-14-4												U
377 > 251	45		2.808		ND								
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS)</b>	CAS: 375-92-8												U
449 > 80	45		3.154		ND								
<b>D 64 13C2_6:2 FTS_2</b>	CAS: SESI-0105												
429 > 81		3.122	3.114	1	95819	24	>100:1			5005.00	4975.44	91.8	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)</b>	CAS: 27619-97-2												U
427 > 407	64		3.128		ND								



Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA</b> CAS: SESI-0097													
421 > 376		3.142	3.141	1	550452	24	>100:1			1001.00	930.03	87.7	
<b>20 Perfluoro-n-octanoic acid (PFOA)</b> CAS: 335-67-1													U
413 > 369	53		3.148		ND								
<b>D 54 13C8_PFOS</b> CAS: SESI-0098													
507 > 80		3.514	3.520	0	155665	22	>100:1			1001.00	1038.26	102	
<b>18 Perfluorooctanesulfonic acid (PFOS)</b> CAS: 1763-23-1													U
499 > 80	54		3.520		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)</b> CAS: 756426-58-1													U
531 > 351	54		3.722		ND								
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS)</b> CAS: 68259-12-1													U
549 > 80	54		3.865		ND								
<b>9 Perfluoro-1-decanesulfonic acid (PFDS)</b> CAS: 335-77-3													U
599 > 80	54		4.169		ND								
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)</b> CAS: 763051-92-9													U
631 > 451	54		4.317		ND								
<b>34 Perfluorododecanesulfonic acid (PFDOS)</b> CAS: 79780-39-5													U
699 > 80	54		4.663		ND								
<b>D 56 13C9_PFNA</b> CAS: SESI-0099													
472 > 427		3.514	3.520	0	716227	23	>100:1			1001.00	953.74	93.3	
<b>17 Perfluoro-n-nonanoic acid (PFNA)</b> CAS: 375-95-1													U
463 > 419	56		3.520		ND								
<b>D 55 13C8_PFOA</b> CAS: SESI-0107													
506 > 78		3.842	3.849	0	304692	20	>100:1			1001.00	984.26	98.7	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA)</b> CAS: 754-91-6													U
498 > 78	55		3.841		ND								
<b>D 65 13C2_8:2 FTS_2</b> CAS: SESI-0106													
529 > 81		3.858	3.857	1	90194	21				5005.00	4862.17	89.8	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)</b> CAS: 39108-34-4													U
527 > 507	65		3.873		ND								
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS)</b> CAS: 120226-60-0													U
627 > 607	65		4.455		ND								
<b>D 51 13C6_PFDA</b> CAS: SESI-0115													
519 > 474		3.866	3.865	1	630115	20	>100:1			1001.00	949.92	93.6	
<b>10 Perfluoro-n-decanoic acid (PFDA)</b> CAS: 335-76-2													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA</b> CAS: SESI-0102													
573 > 419		4.019	4.029	0	772875	19	>100:1			5005.00	5384.41	97.6	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)</b> CAS: 2355-31-9													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA</b> CAS: SESI-0110													
589 > 419		4.179	4.178	1	700086	19	>100:1			5005.00	5271.15	95.7	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)</b> CAS: 2991-50-6													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFUdA</b> CAS: SESI-0117													
570 > 525		4.179	4.178	1	589472	18	>100:1			1001.00	932.60	91.6	
<b>25 Perfluoro-n-undecanoic acid (PFUdA)</b> CAS: 2058-94-8													U
563 > 519	52		4.178		ND								
<b>D 61 d7-MeFOSE</b> CAS: SESI-0129													
623 > 59		4.288	4.287	1	102472	17	>100:1			1001.00	946.99	97.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)</b> CAS: 24448-09-7													U
616 > 59	61		4.297		ND								
<b>D 57 d3-MeFOA</b> CAS: SESI-0109													
515 > 169		4.308	4.307	1	51560	15	>100:1			1001.00	974.36	99.5	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOA)</b> CAS: 31506-32-8													U
512 > 169	57		4.317		ND								
<b>D 62 d9-EtFOSE</b> CAS: SESI-0130													
639 > 59		4.456	4.455	1	130023	18	>100:1			1001.00	1036.90	94.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62		4.464		ND								
<b>D 38 13C2_PFDa CAS: SESI-0118</b>													
615 > 570		4.447	4.455	0	604373	19	>100:1			1001.00	998.44	98.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 59 d5-EtFOA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	52678	19	>100:1			1001.00	1072.99	105	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOA) CAS: 4151-50-2</b>													U
526 > 169	59		4.482		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	779886	19	>100:1			1001.00	925.74	95.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	864210	19	>100:1			1001.00	953.70	92.4	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	6105	15	32:1	Target = 11.43		10.823	10.823		
813 > 269	40	5.275	5.282		535	18	21:1	11.41 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													U
913 > 869	40		5.625		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	710000	19	>100:1					97	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	733845	18	>100:1					100	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	630788	25	>100:1					105	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	627476	24	>100:1					103	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	174703	22	>100:1					107	

### Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

### QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820007.d

Injection Date: 28-Dec-2020 10:17:01

Inst. ID: LCMSMS02

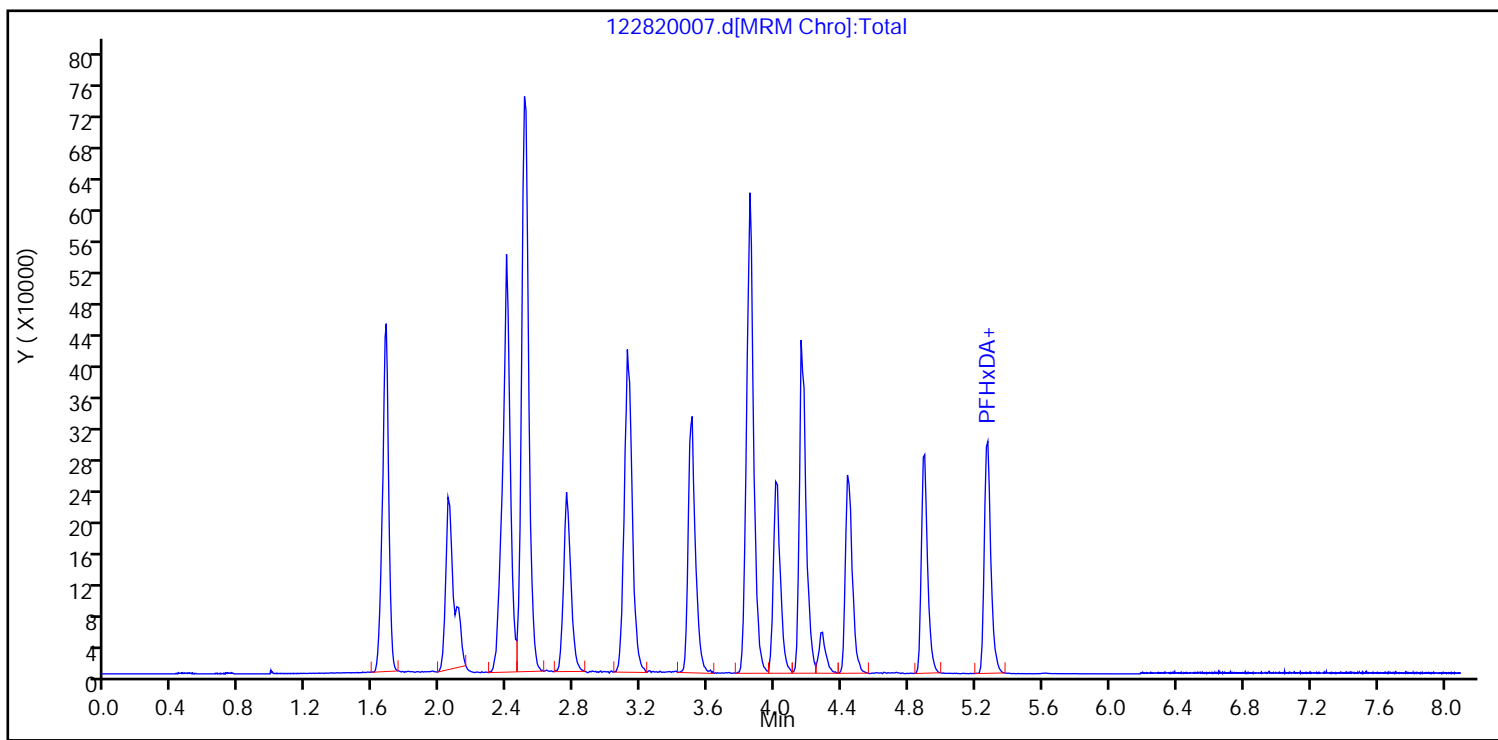
Client ID:

Lab ID: ID IBLK A

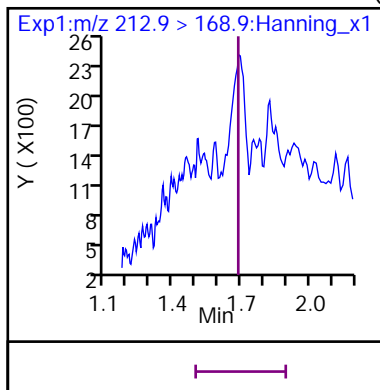
Sample Info: ID IBLK A

Dil. Factor: 1

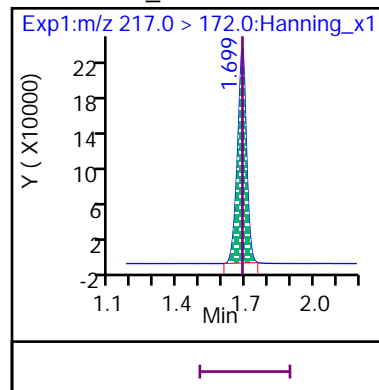
Operator: Matthew M. Miller



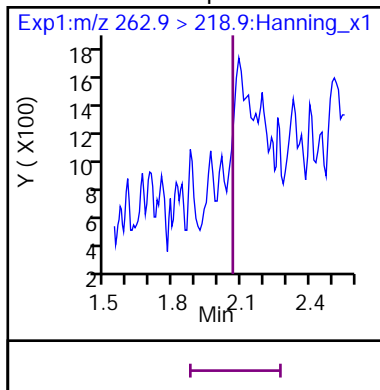
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



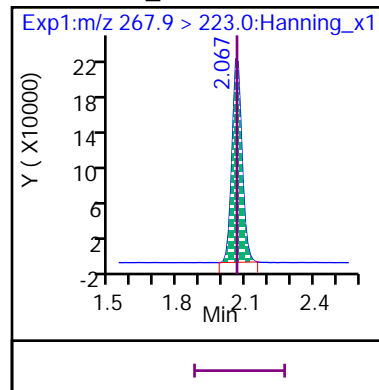
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)

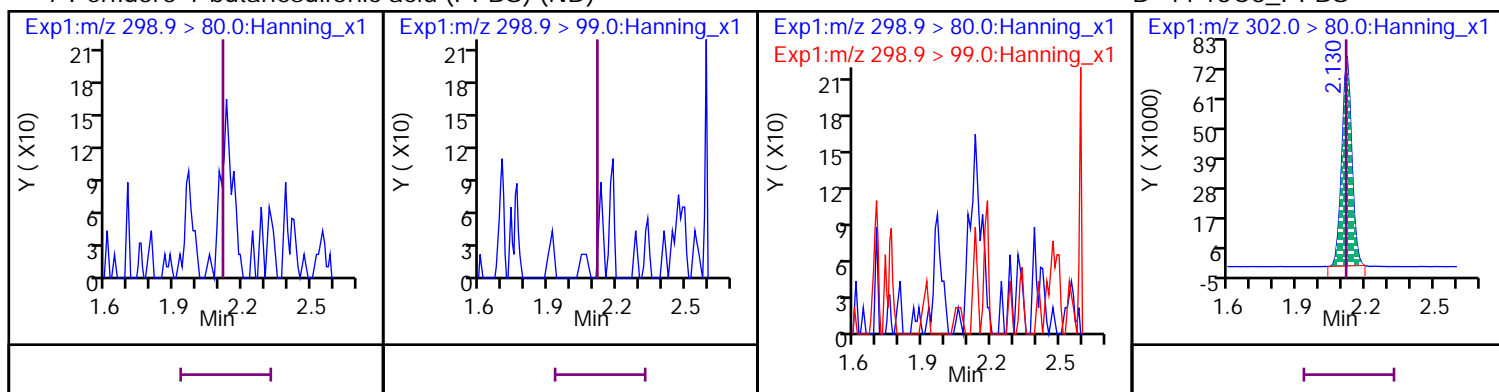


D 50 13C5\_PFPeA



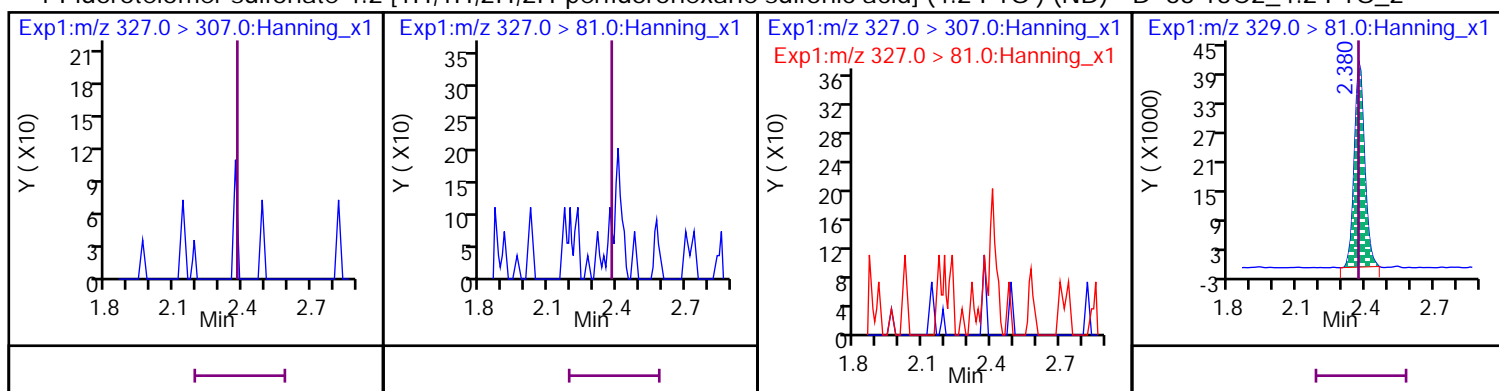
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



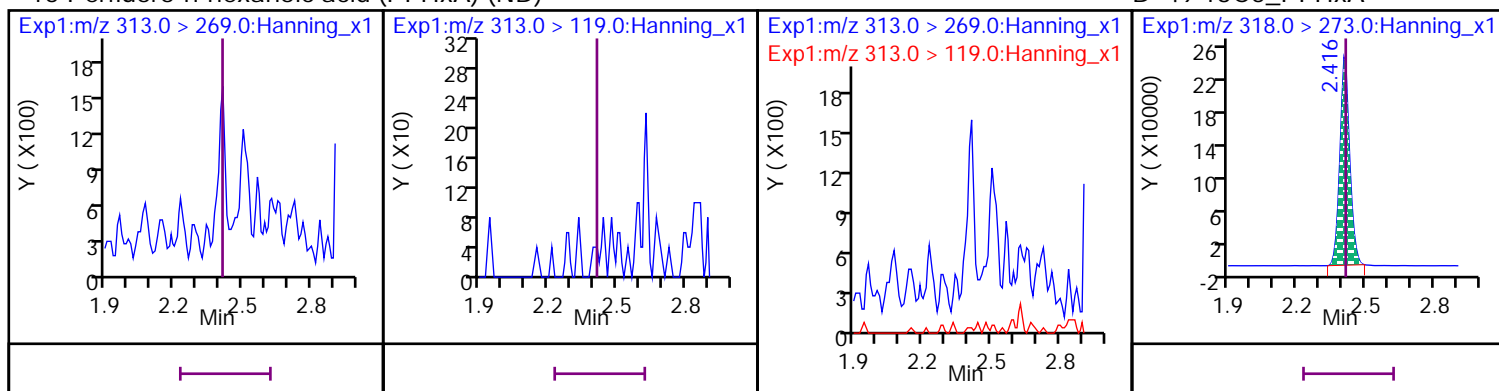
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



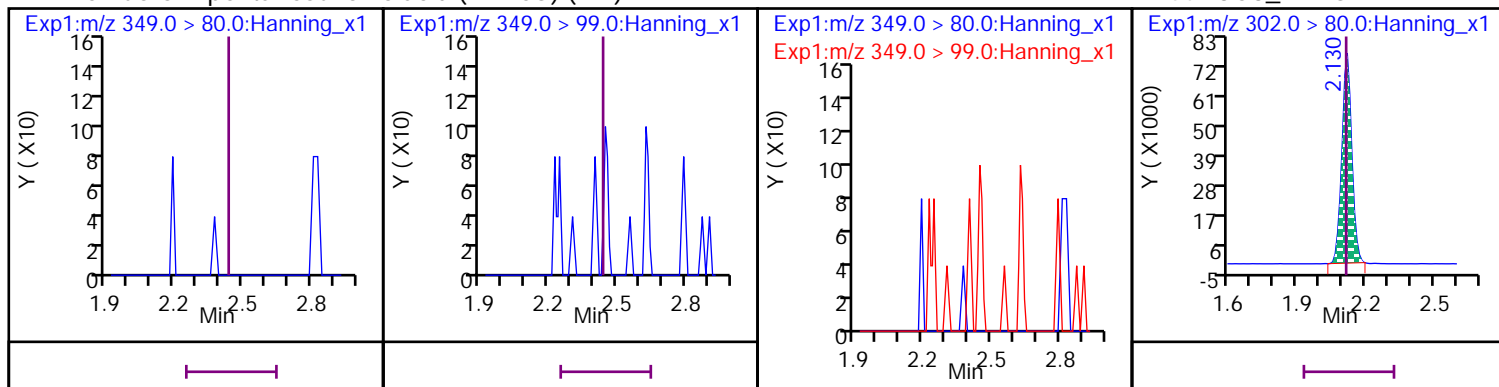
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



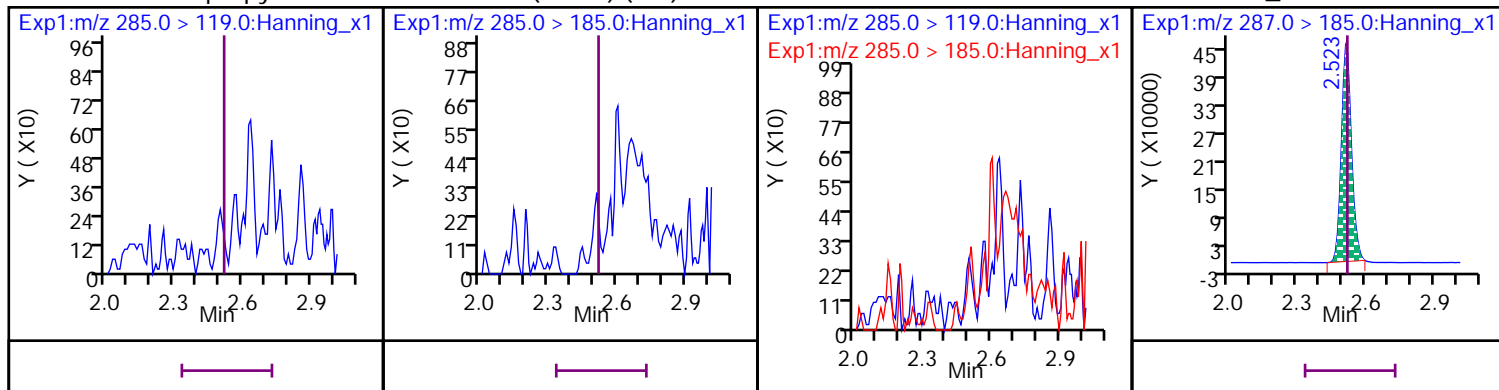
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

D 44 13C3\_PFBS



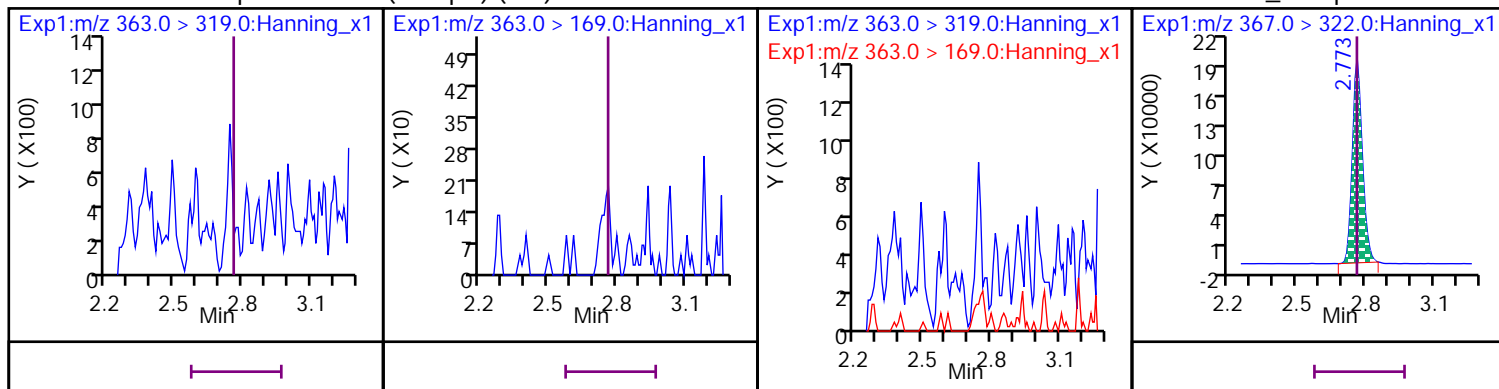
28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



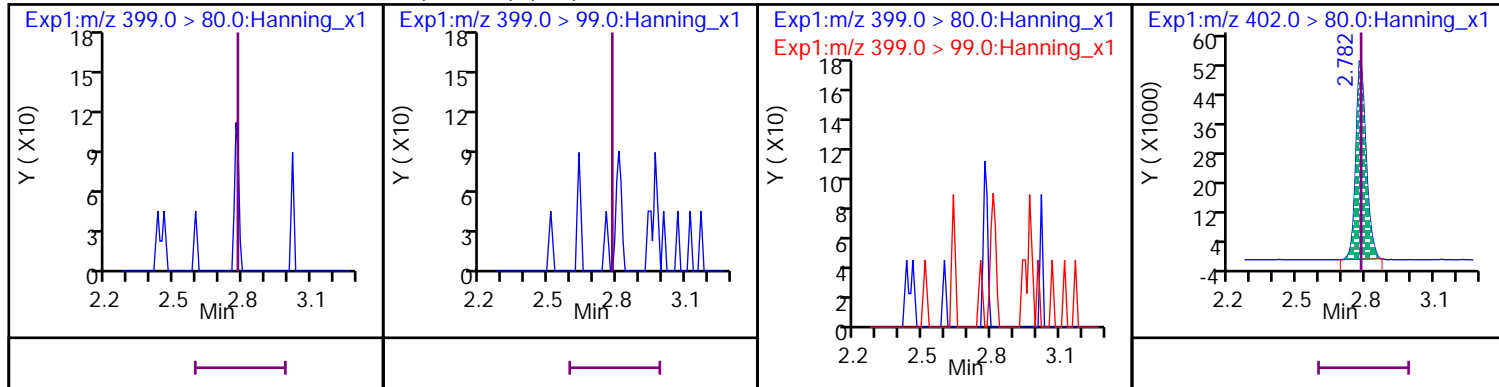
13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



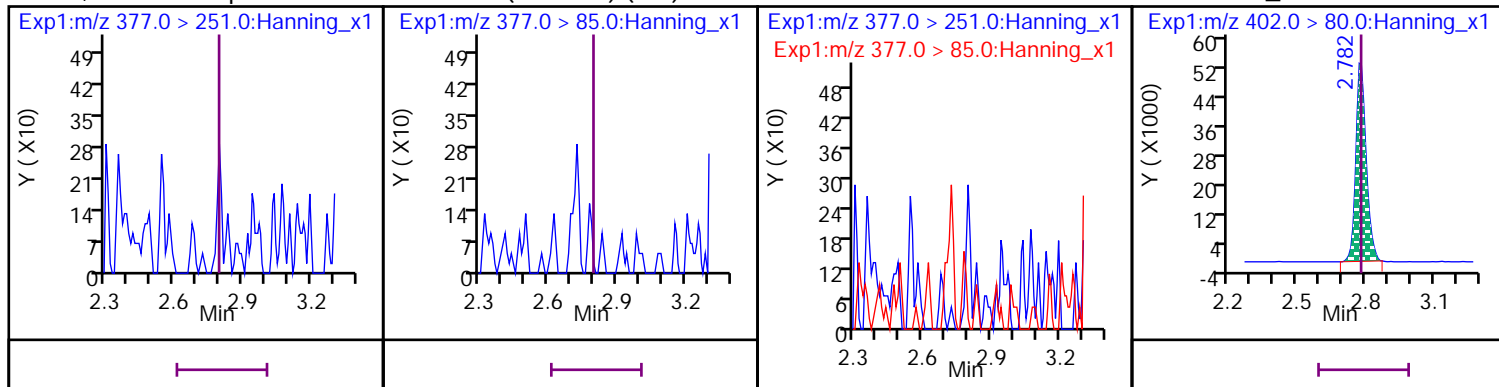
14 Perfluorohexanesulfonic acid (PFHxS) (ND)

D 45 13C3\_PFHxS

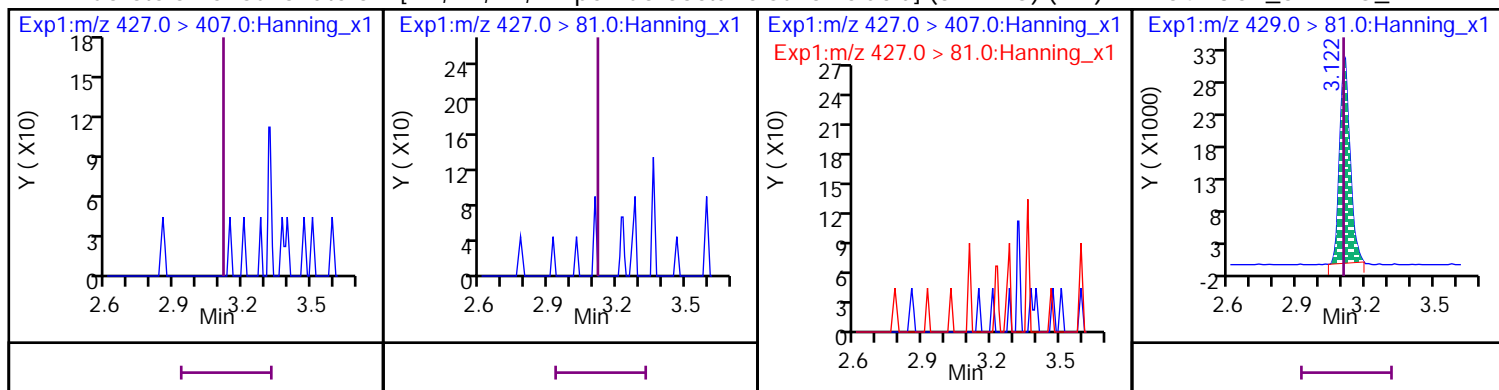


29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS

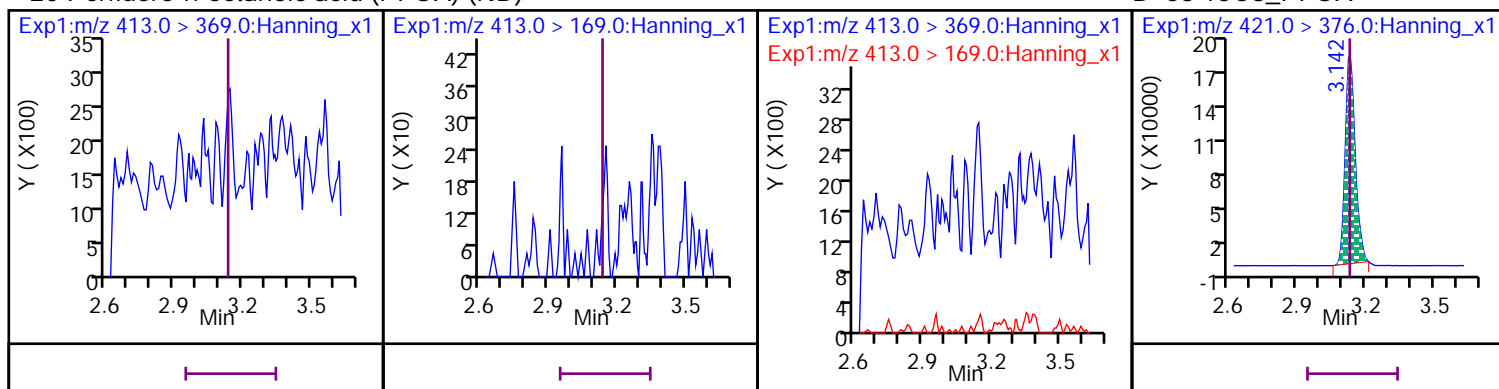


## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



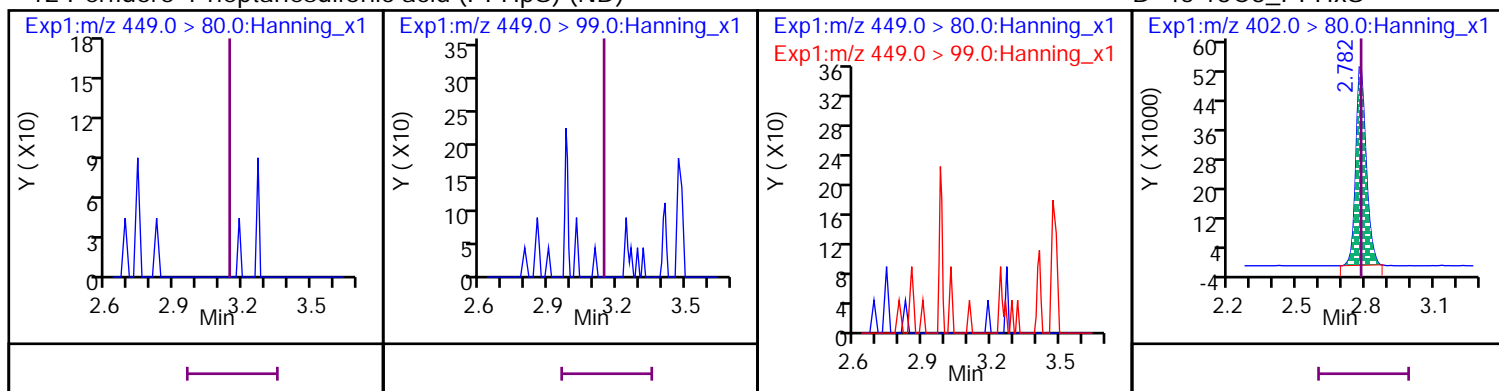
## 20 Perfluoro-n-octanoic acid (PFOA) (ND)

## D 53 13C8\_PFOA



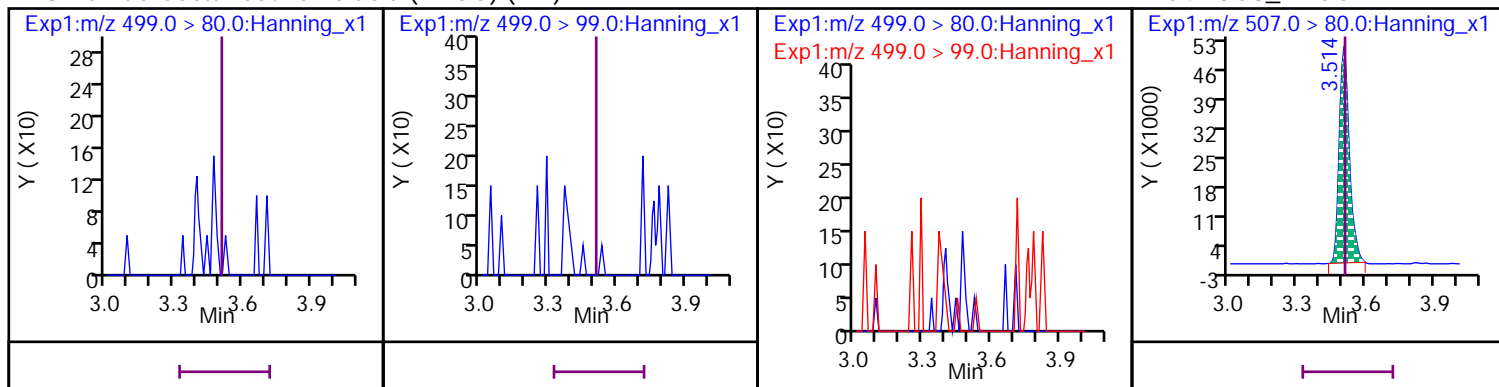
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

## D 45 13C3\_PFHxS



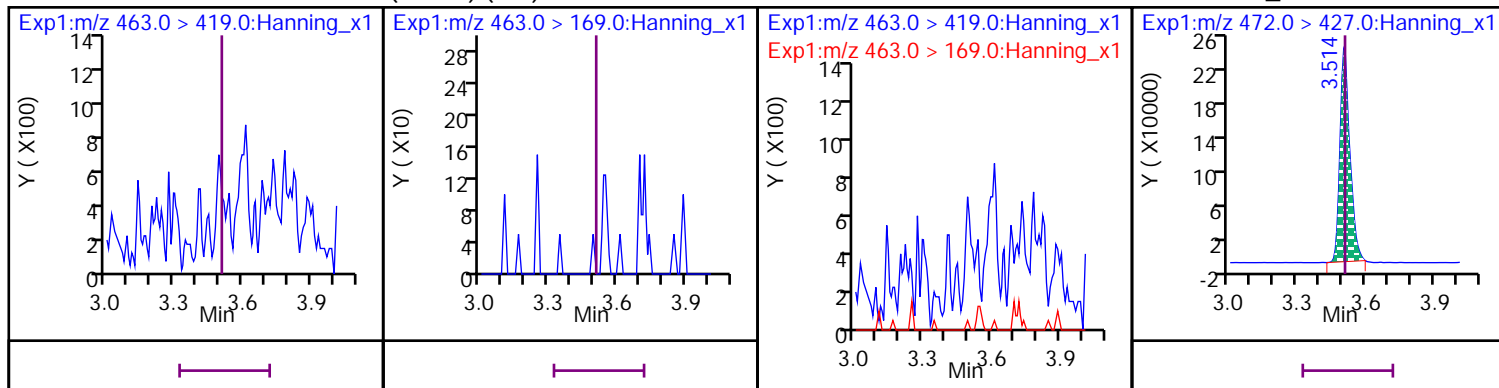
## 18 Perfluorooctanesulfonic acid (PFOS) (ND)

## D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



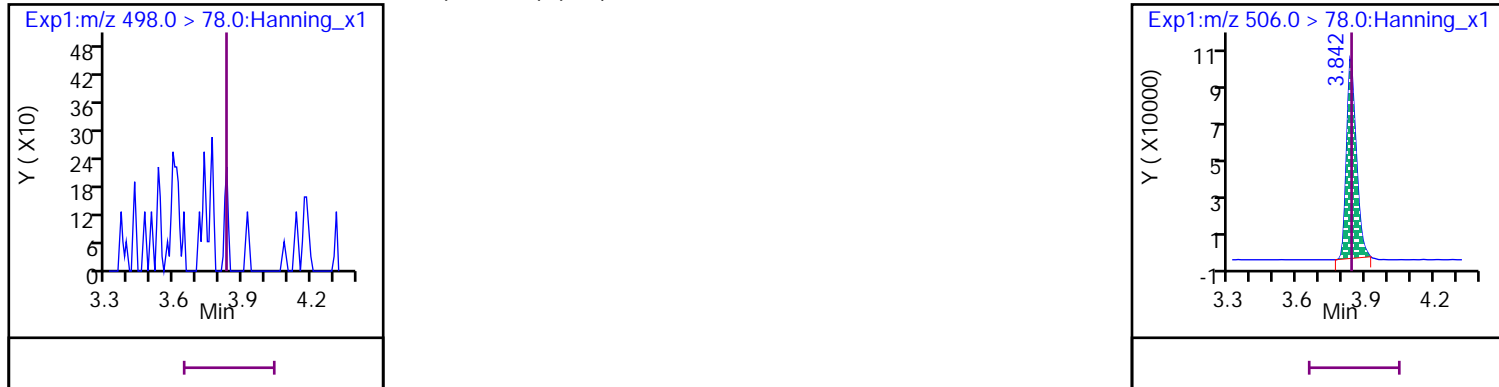
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



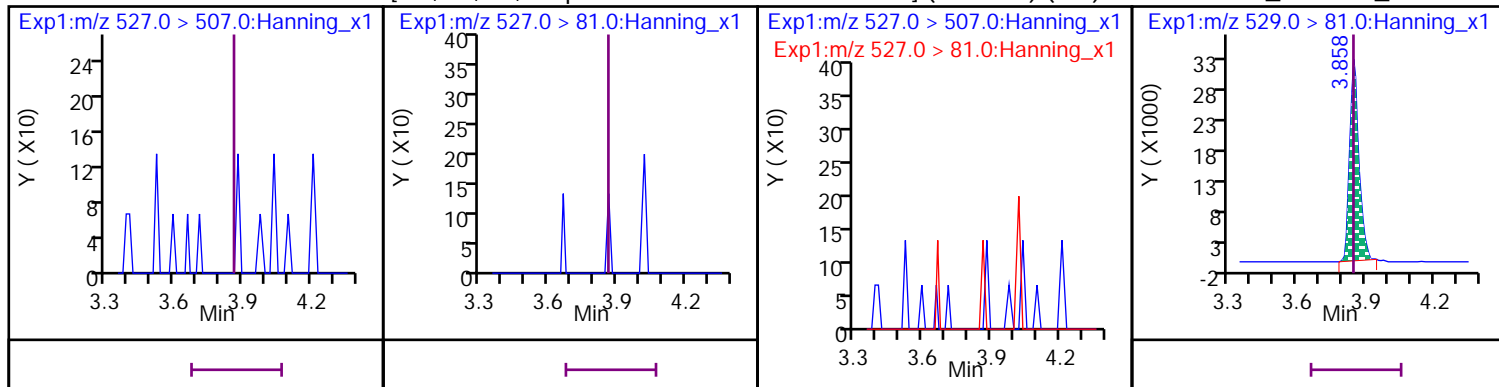
19 Perfluoro-1-octanesulfonamide (PFOSA) (ND)

D 55 13C8\_PFOSA



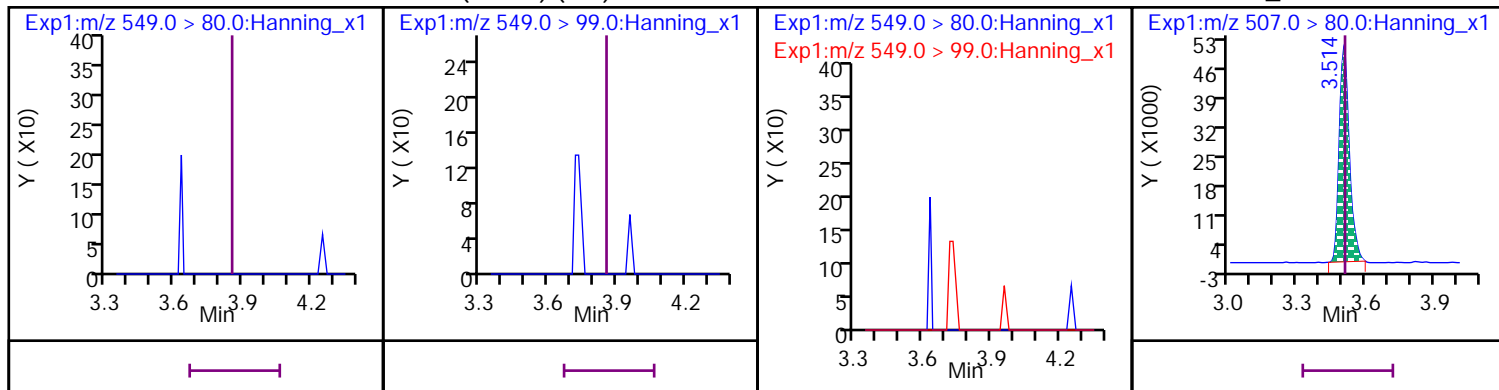
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



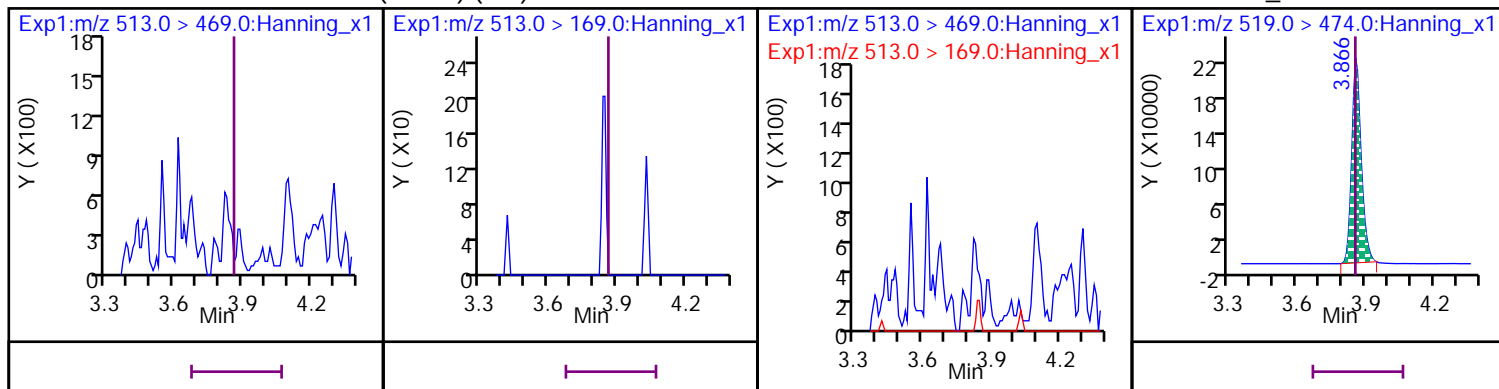
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



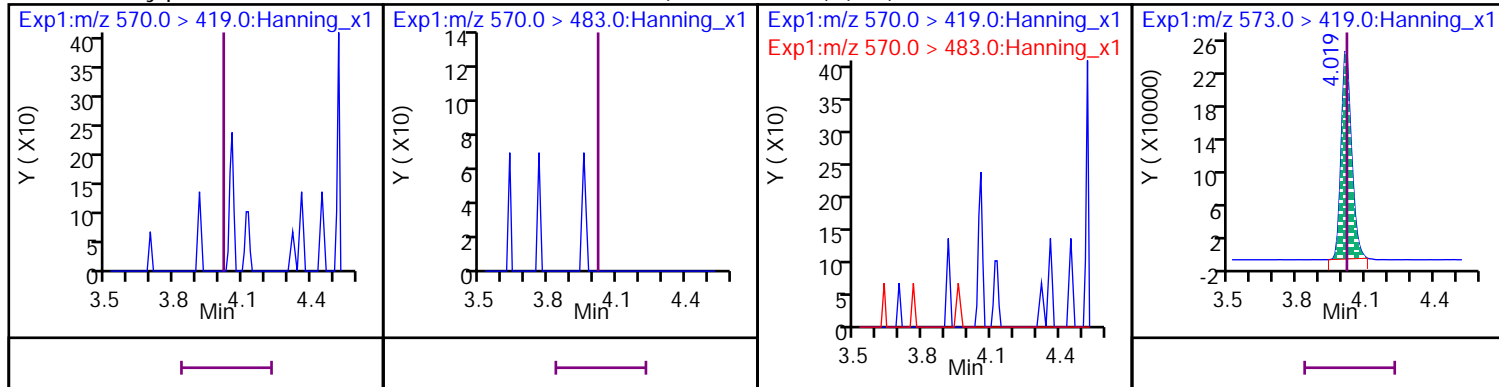
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



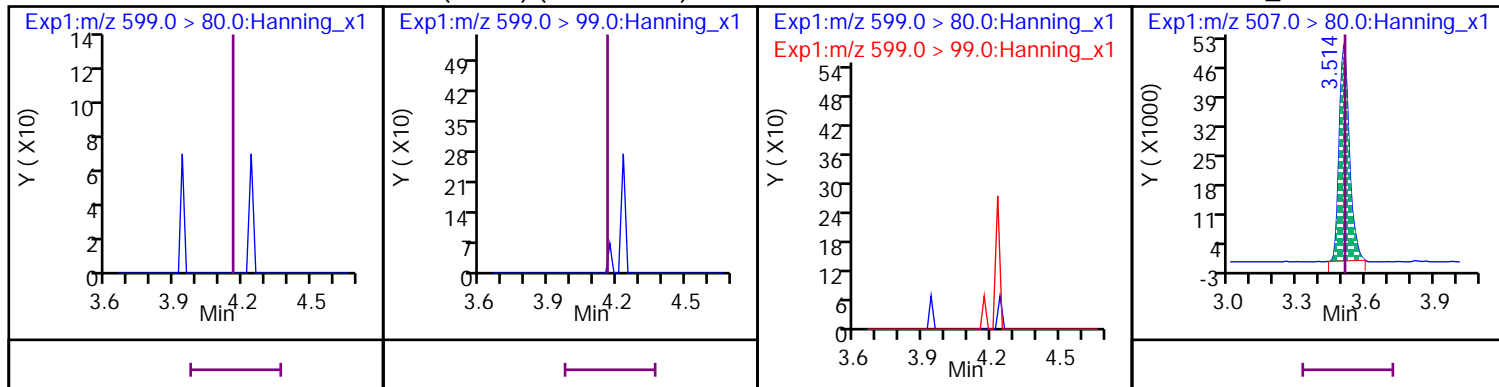
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



9 Perfluoro-1-decanesulfonic acid (PFDS) (Marked ND)

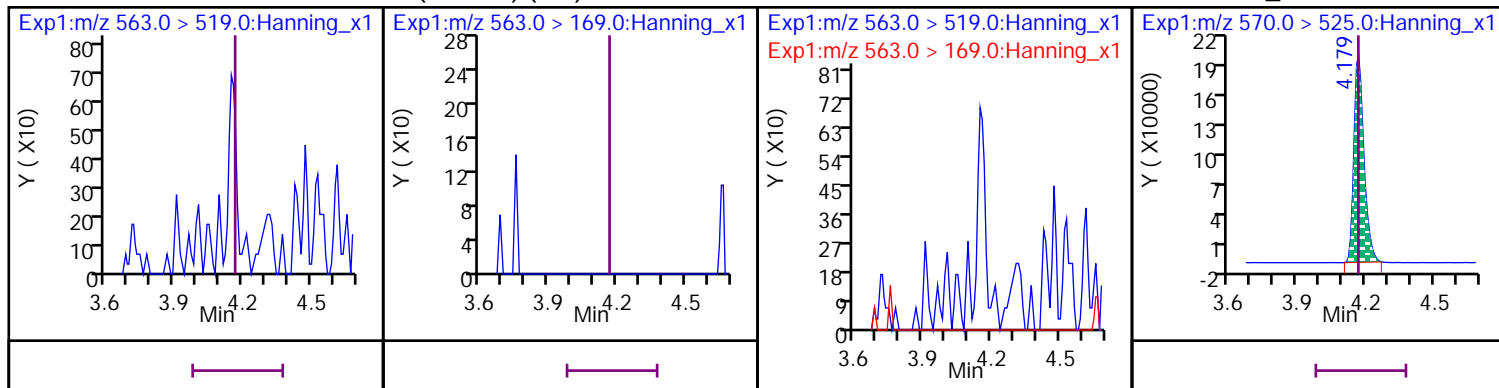
D 54 13C8\_PFOS





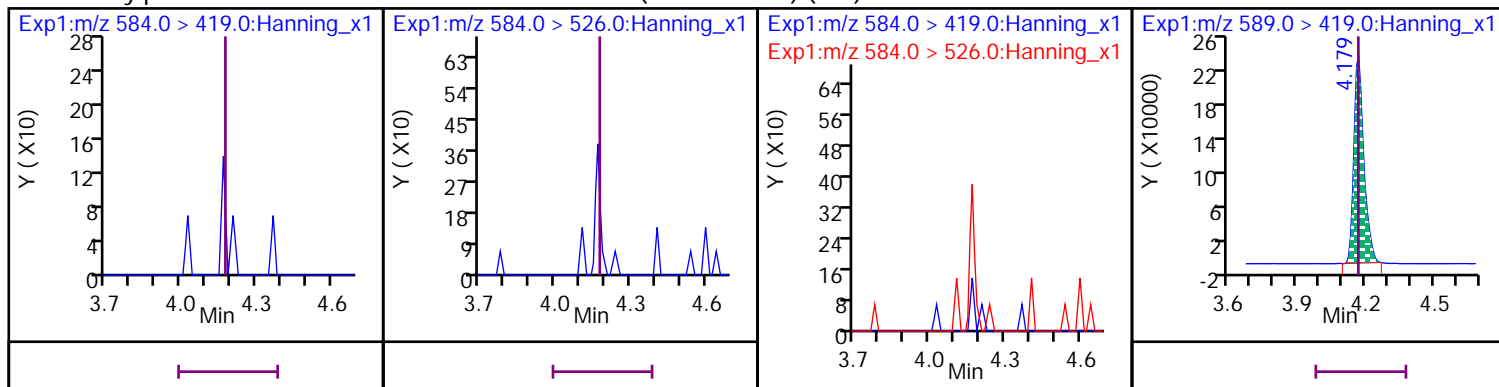
## 25 Perfluoro-n-undecanoic acid (PFUDa) (ND)

D 52 13C7\_PFUdA



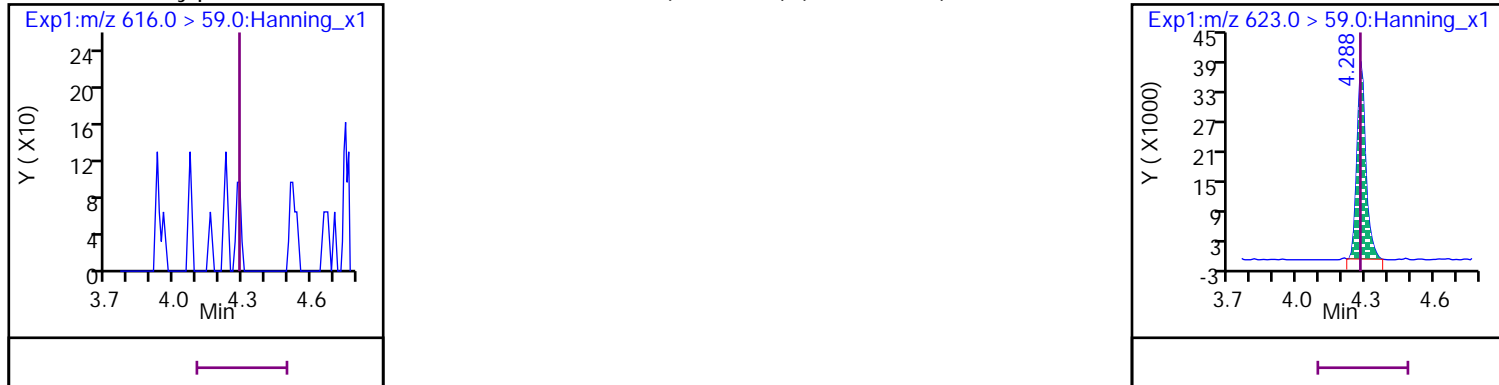
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



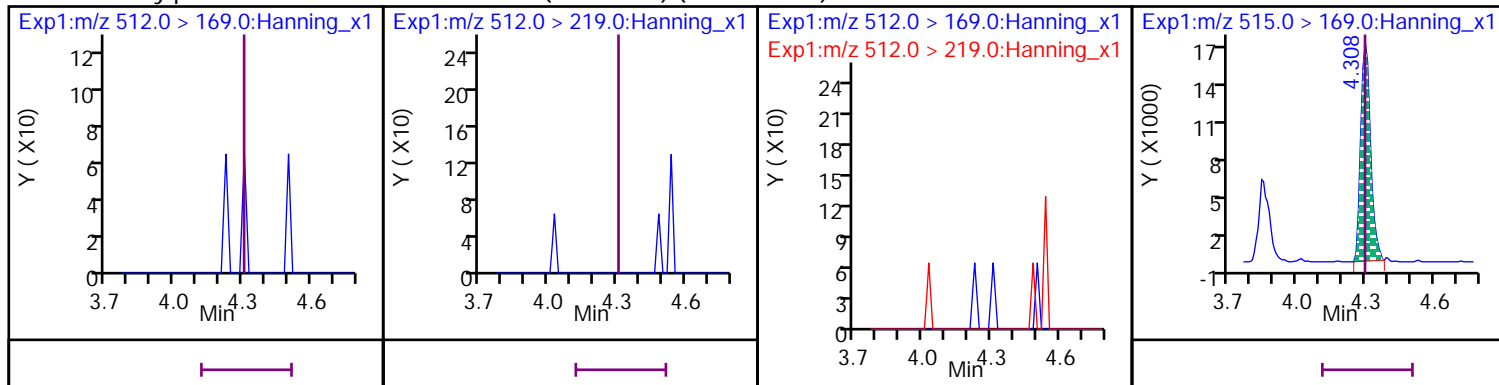
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (Marked ND)

D 61 d7-MeFOSE

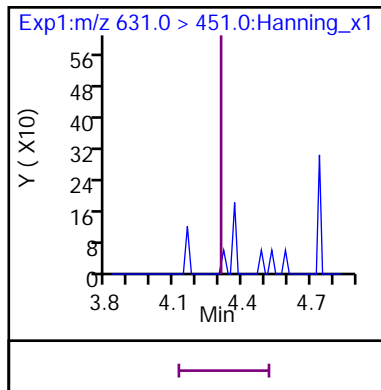


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (Marked ND)

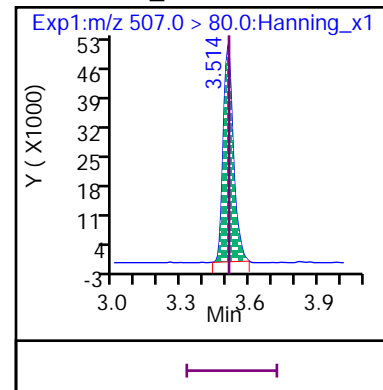
D 57 d3-MeFOSA



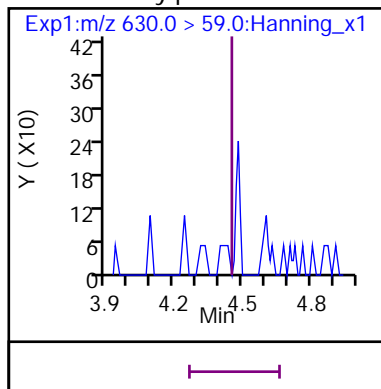
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



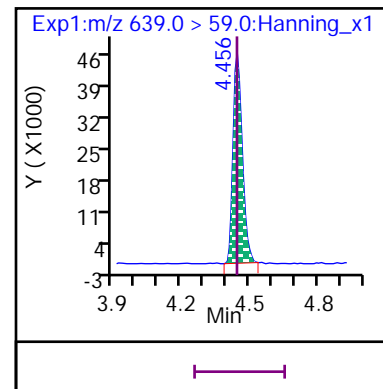
D 54 13C8\_PFOS



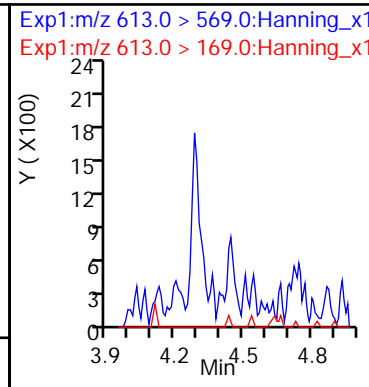
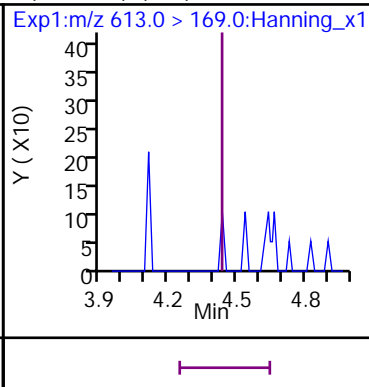
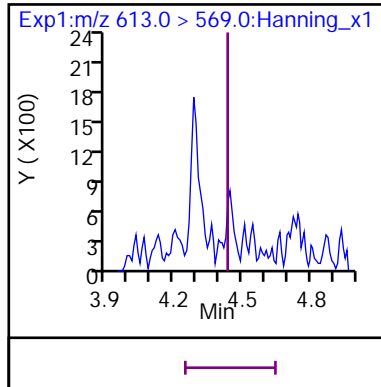
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (Marked ND)



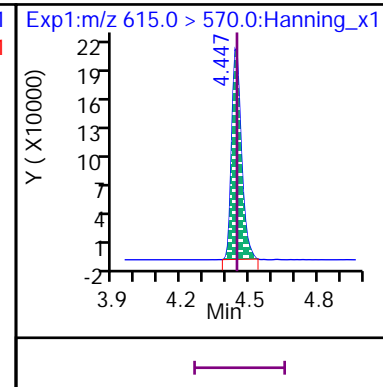
D 62 d9-EtFOSE



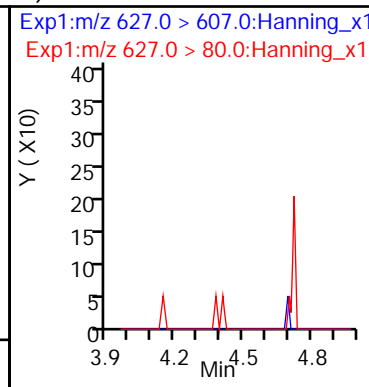
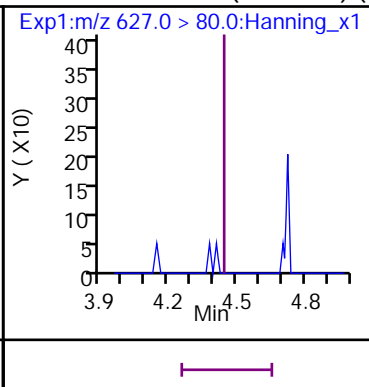
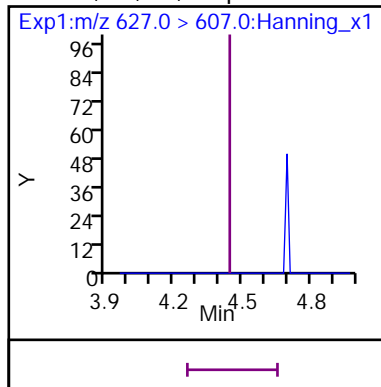
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



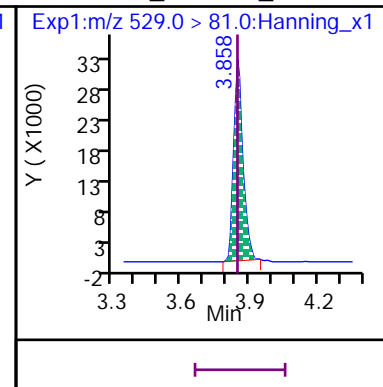
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

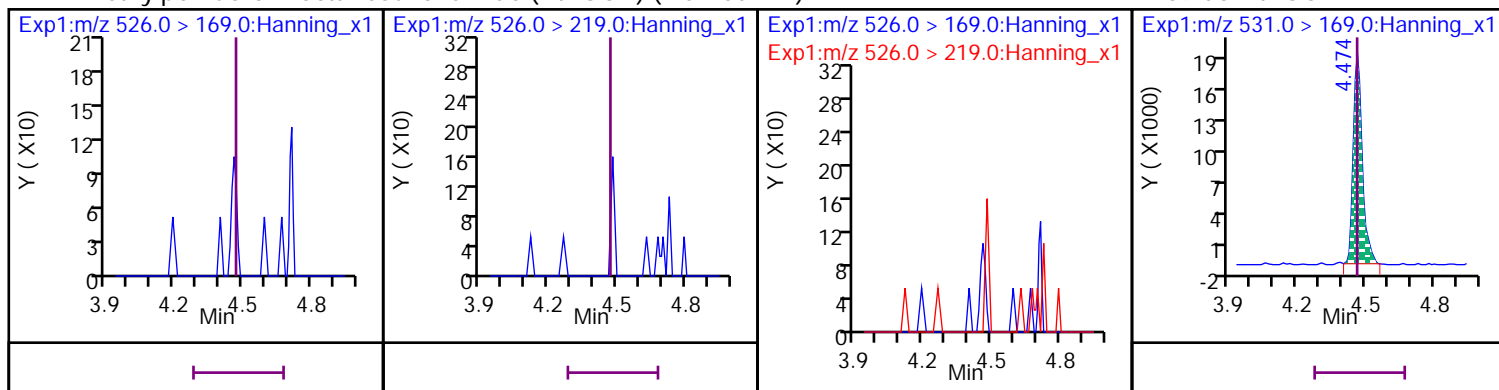


D 65 13C2\_8:2 FTS\_2



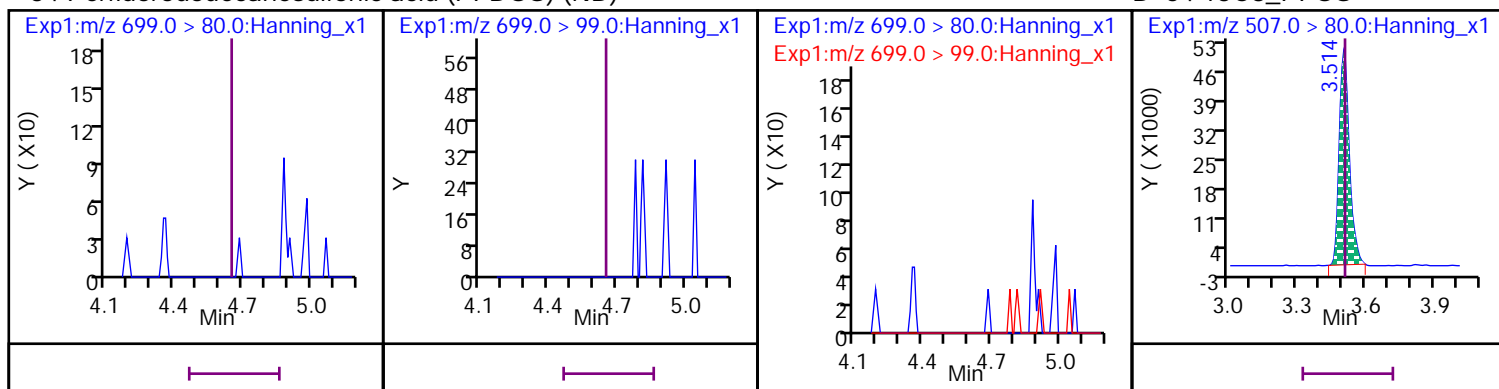
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (Marked ND)

D 59 d5-EtFOSA



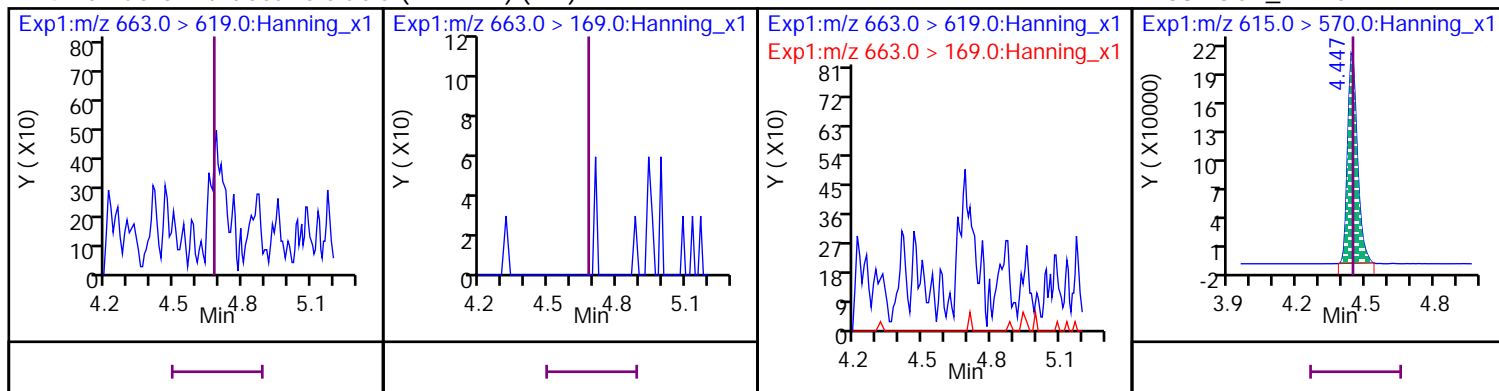
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

D 54 13C8\_PFOS



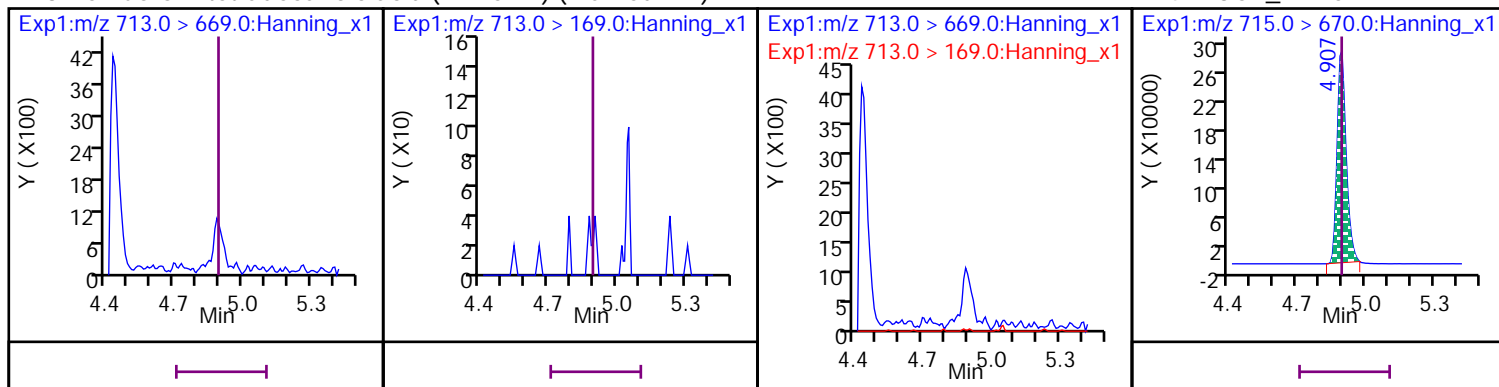
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

D 38 13C2\_PFDaA



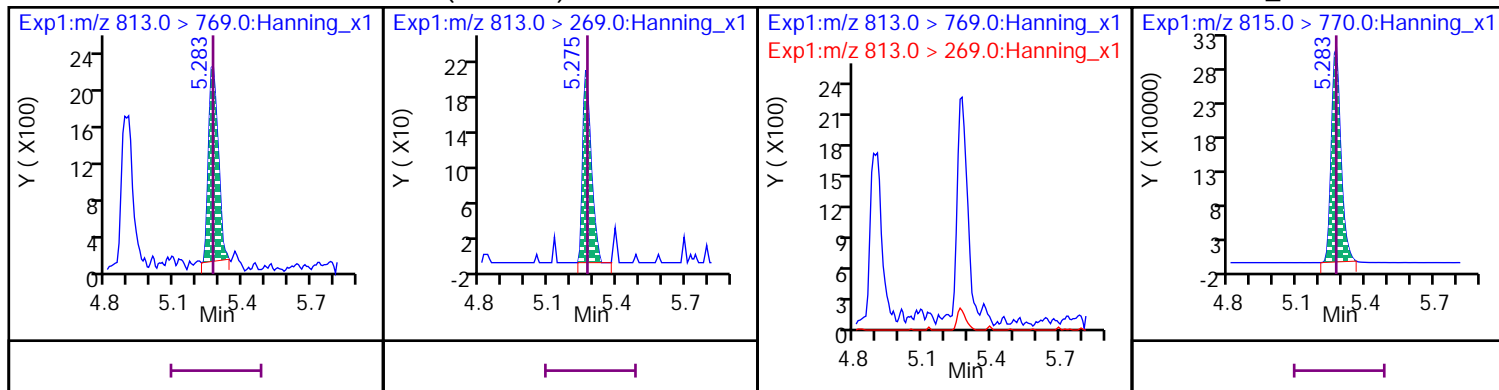
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (Marked ND)

D 42 13C2\_PFTeDA



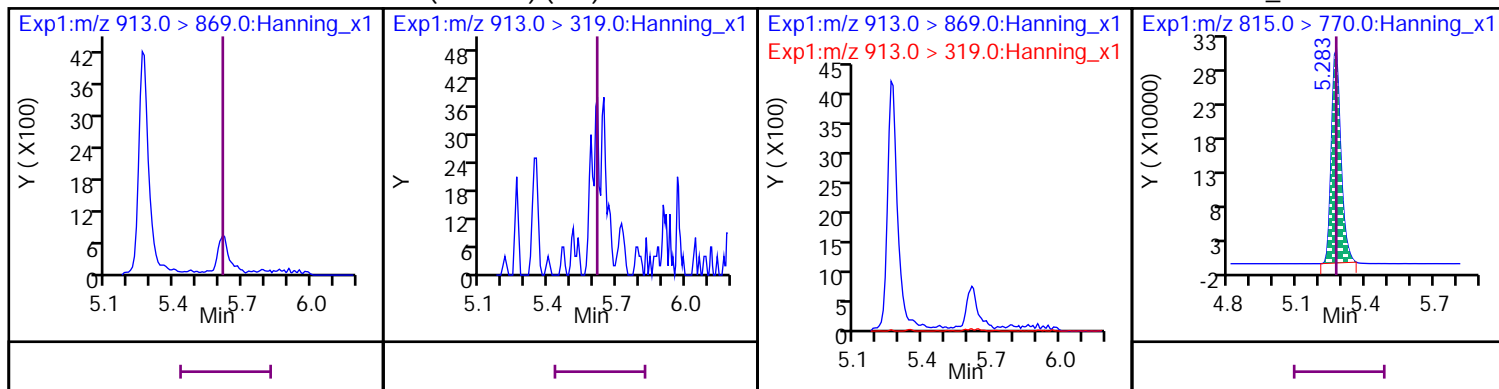
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

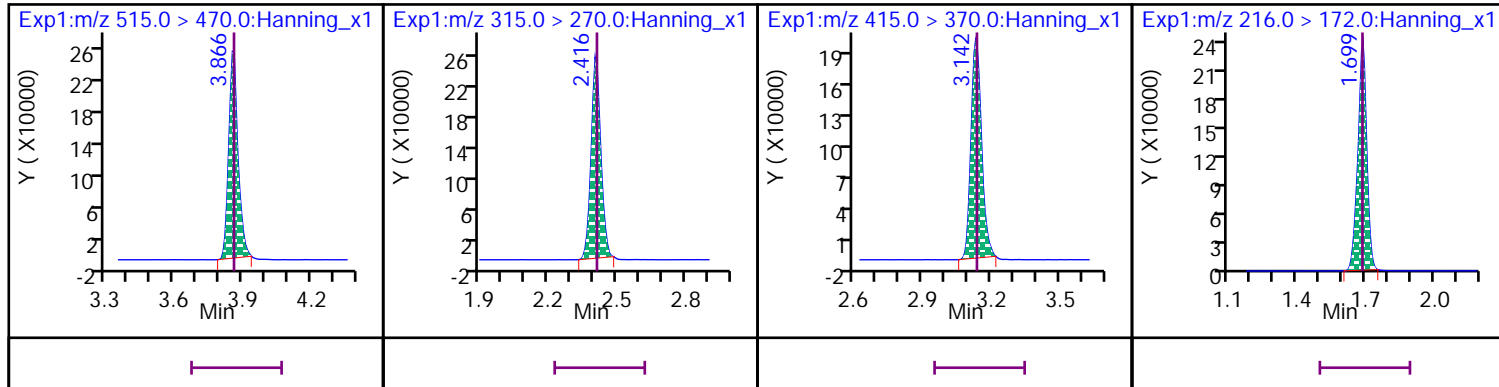


\* 37 13C2\_PFDA

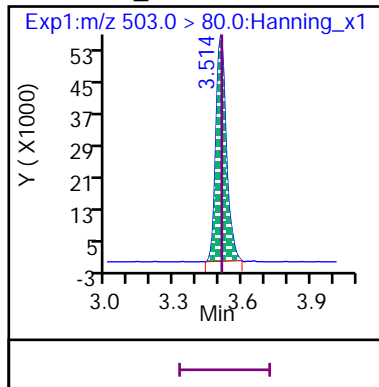
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920007.d  
Injection Date: 29-Dec-2020 10:34:46 Injection Vol: 10.0 uL  
Sample Type: InstBlk Auto Sampler: 97  
Lab Sample ID: ID IBLK A Lab Prep. Batch:  
Sample Info: ID IBLK A Misc. Info:  
Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
Calib Method: PFAS-ID Lock State: Unlocked  
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 46 13C4_PFBA CAS: SESI-0111</b>													
217 > 172		1.705	1.702	1	638819	23	>100:1			1001.00	921.08	95.4	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46		1.709		ND								U
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.080	0	638871	17	>100:1			1001.00	928.75	92.8	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.080		ND								U
<b>D 44 13C3_PFBS CAS: SESI-0116</b>													
302 > 80		2.130	2.133	0	221882	18	>100:1			1001.00	963.74	92	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.133		ND								U
<b>22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4</b>													
349 > 80	44		2.446		ND								U
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.389	2.393	0	122115	20	>100:1			5005.00	5044.34	89.6	
<b>1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4</b>													
327 > 307	63		2.393		ND								U
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.416	2.429	0	714980	19	>100:1			1001.00	970.03	94.6	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.420		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.536	0	1379453	20	>100:1			5005.00	5179.02	97.4	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.536		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.777	0	586753	20	>100:1			1001.00	967.21	95.6	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.786		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.795	0	174078	19	>100:1			1001.00	1016.64	93.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.795		ND								U
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.823		ND								U
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45		3.166		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.129	3.132	0	93105	21	>100:1			5005.00	4834.51	88.4	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64		3.139		ND								U

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.159	0	580424	24	>100:1			1001.00	980.67	95.6	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53		3.159		ND								U
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.529	3.533	0	152225	21	>100:1			1001.00	1015.32	99.1	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54		3.533		ND								U
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54		3.740		ND								U
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54		3.879		ND								U
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54		4.175		ND								U
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54		4.334		ND								U
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54		4.677		ND								U
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.529	3.533	0	726557	22	>100:1			1001.00	967.50	92.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56		3.533		ND								U
<b>D 55 13C8_PFOSA CAS: SESI-0107</b>													
506 > 78		3.858	3.854	1	295957	20	>100:1			1001.00	956.04	92.8	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55		3.854		ND								U
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.874	3.879	0	811103	20	>100:1			5005.00	4372.10	77.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65		3.911		ND								U
<b>4 1H,1H,2H,2H-perfluorodecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65		4.479		ND								U
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.882	3.887	0	636152	21	>100:1			1001.00	959.03	90.7	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51		3.887		ND								U
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.038	4.034	1	720480	18	>100:1			5005.00	5019.39	99.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58		4.043		ND								U
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.188	4.193	0	655689	19	>100:1			5005.00	4936.87	92.3	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60		4.203		ND								U
<b>D 52 13C7_PFUdA CAS: SESI-0117</b>													
570 > 525		4.188	4.193	0	605392	17	>100:1			1001.00	957.79	94.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52		4.193		ND								U
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.298	4.294	1	102814	17	>100:1			1001.00	950.15	106	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61		4.304		ND								U
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.318	4.314	1	54151	16	>100:1			1001.00	1023.32	103	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57		4.334		ND								U
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.465	4.461	1	114941	16	>100:1			1001.00	916.63	93.1	

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920007.d

Signal	Quant Std	RT (min.)	Exp RT (min.)	T RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													U
630 > 59	62		4.470		ND								
<b>D 38 13C2_PFDa CAS: SESI-0118</b>													
615 > 570		4.465	4.461	1	555212	18	>100:1			1001.00	917.23	91	
<b>11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1</b>													U
613 > 569	38		4.461		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.701		ND								
<b>D 59 d5-EtFOA CAS: SESI-0108</b>													
531 > 169		4.483	4.479	1	48293	20	>100:1			1001.00	983.67	101	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOA) CAS: 4151-50-2</b>													U
526 > 169	59		4.479		ND								
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.915	4.918	0	749318	18	>100:1			1001.00	889.46	95.3	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.918		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.292	5.296	0	860084	20	>100:1			1001.00	949.15	94.6	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.292	5.296	0/0	5846	19	28:1	Target = 11.43		10.413	10.413		
813 > 269	40	5.300	5.296		563	22	22:1	10.38 (5.71-17.16)					
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													U
913 > 869	40		5.643		ND								
<b>* 37 13C2_PFDA</b>													
515 > 470		3.882	3.887	0	660754	21	>100:1					96	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.429	0	698337	19	>100:1					95.5	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.152	0	592404	25	>100:1					96.1	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.705	1.702	1	607795	24	>100:1					95	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.529	3.533	0	160917	25	>100:1					93.5	

## Compound Type Legend

D - Isotopic Dilution Std.

\* - ISTD

## QC Flag Legend

U - Result Less Than Method Detection Limit

Data File: \\organics\LL\LCMSMS02.i\122920-DOD.b\122920007.d

Injection Date: 29-Dec-2020 10:34:46

Inst. ID: LCMSMS02

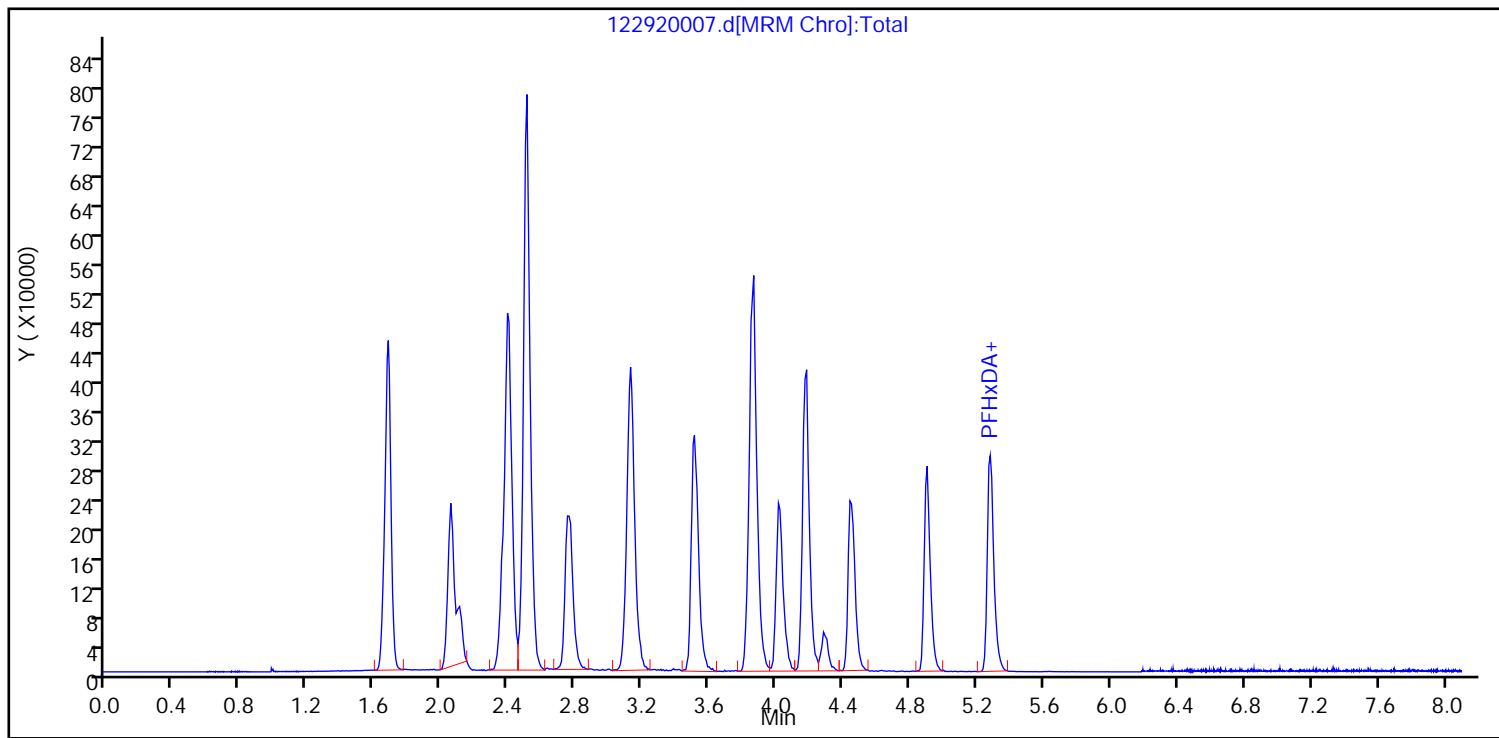
Client ID:

Lab ID: ID IBLK A

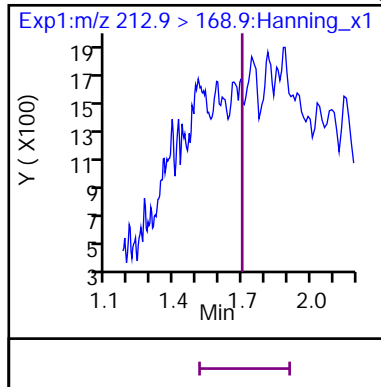
Sample Info: ID IBLK A

Dil. Factor: 1

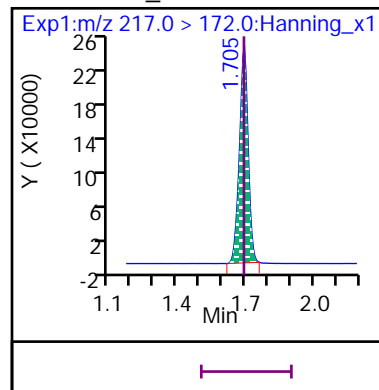
Operator: Matthew M. Miller



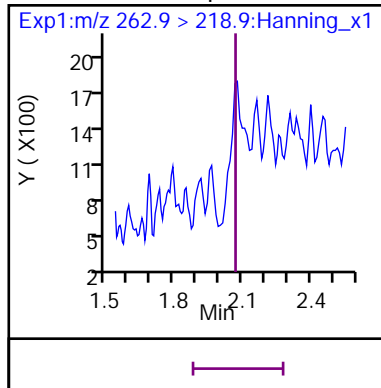
8 Perfluoro-n-butanoic acid (PFBA) (ND)



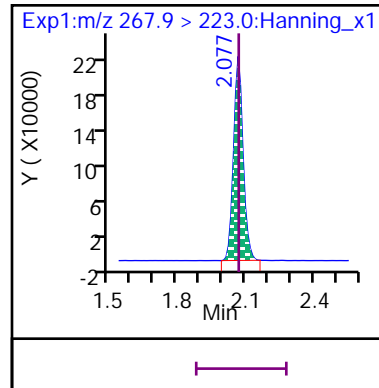
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (Marked ND)



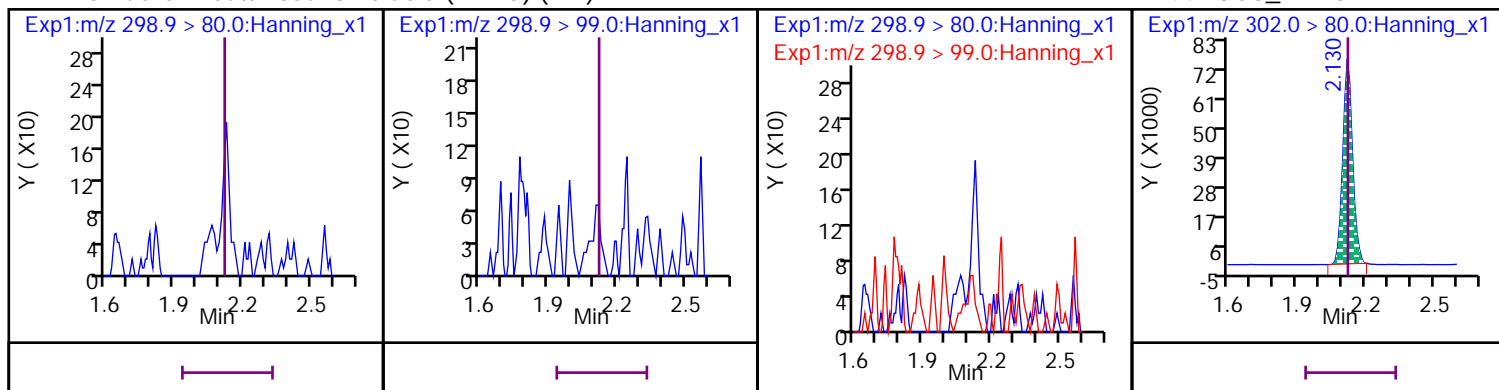
D 50 13C5\_PFPeA





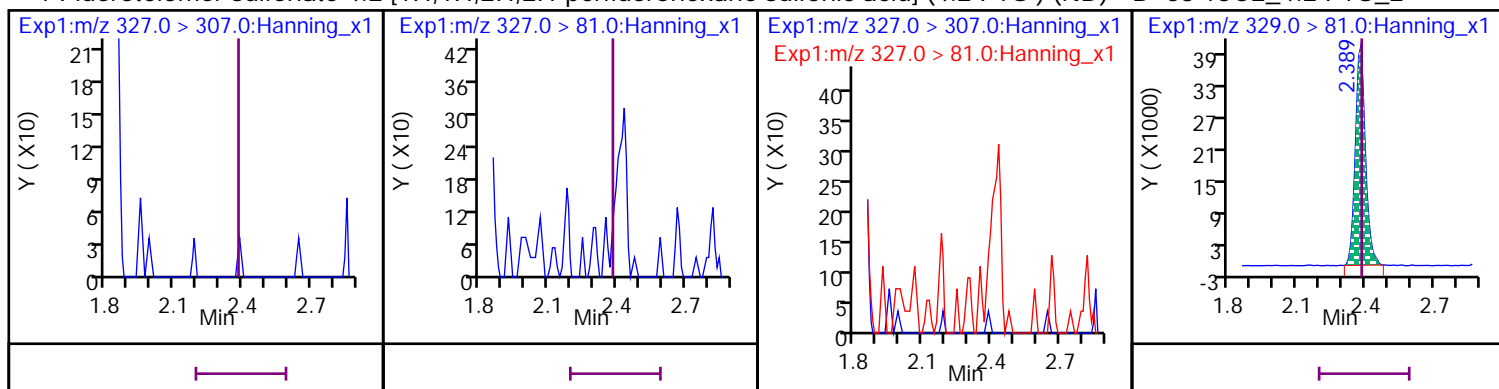
7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



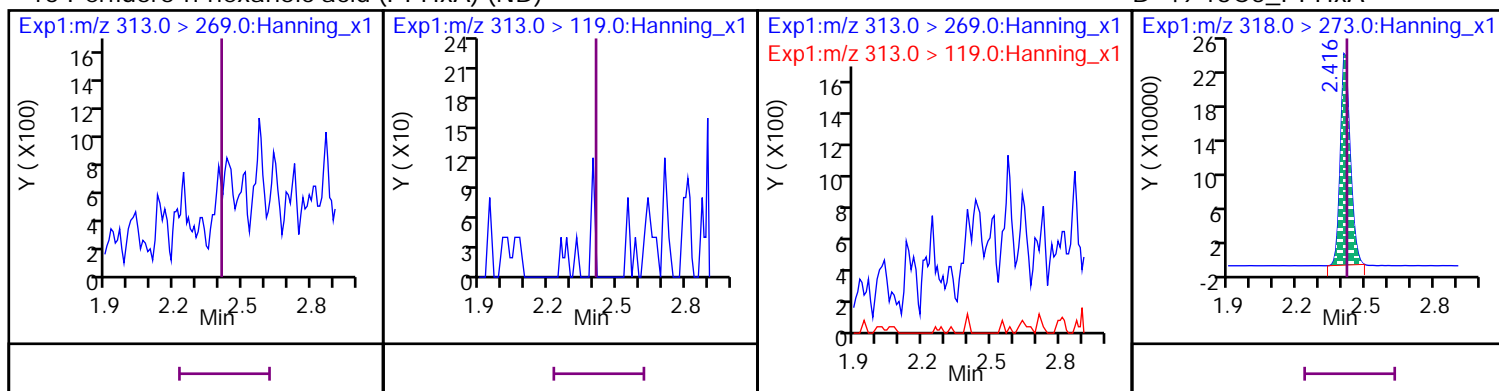
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) (ND)

D 63 13C2\_4:2 FTS\_2



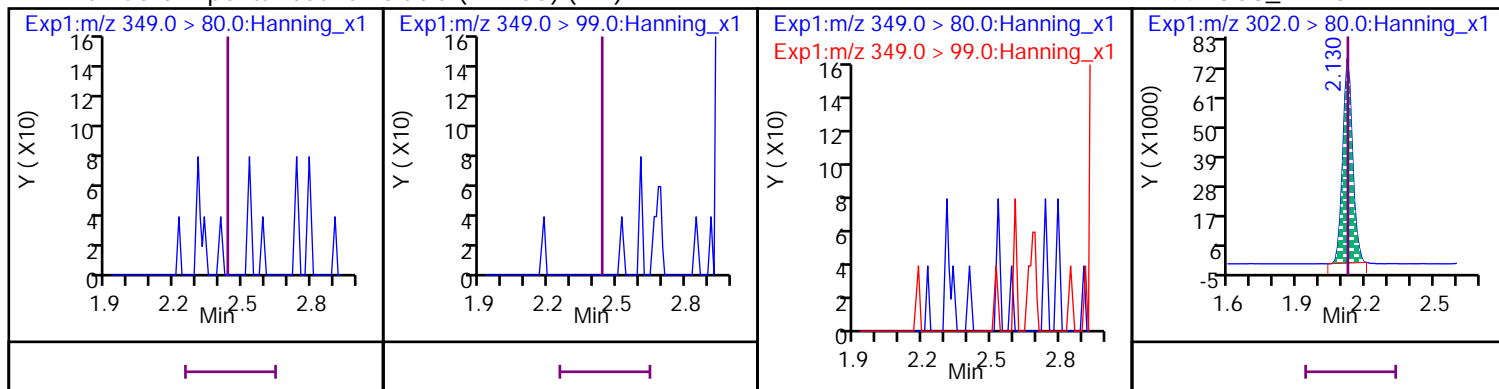
15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



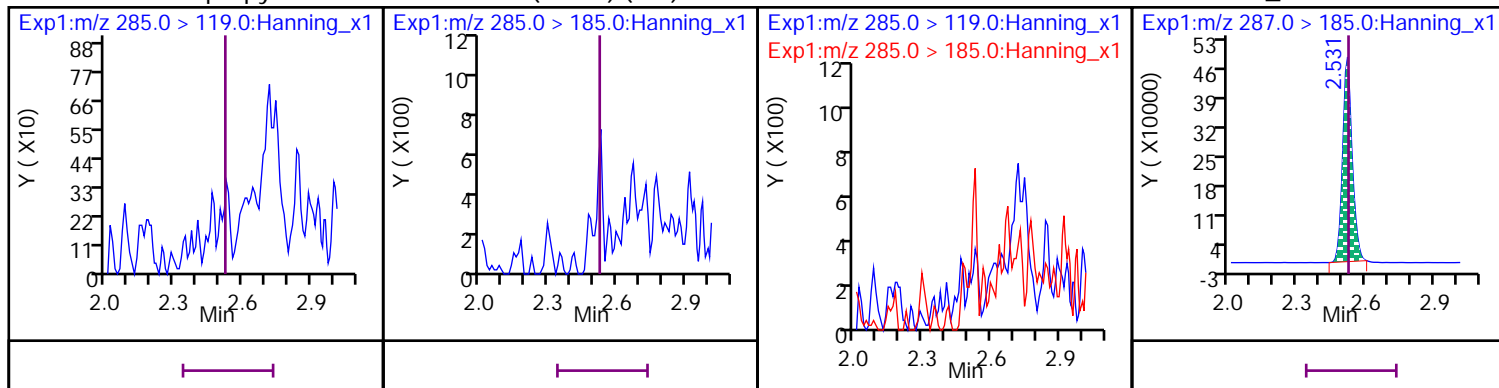
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (ND)

D 44 13C3\_PFBS



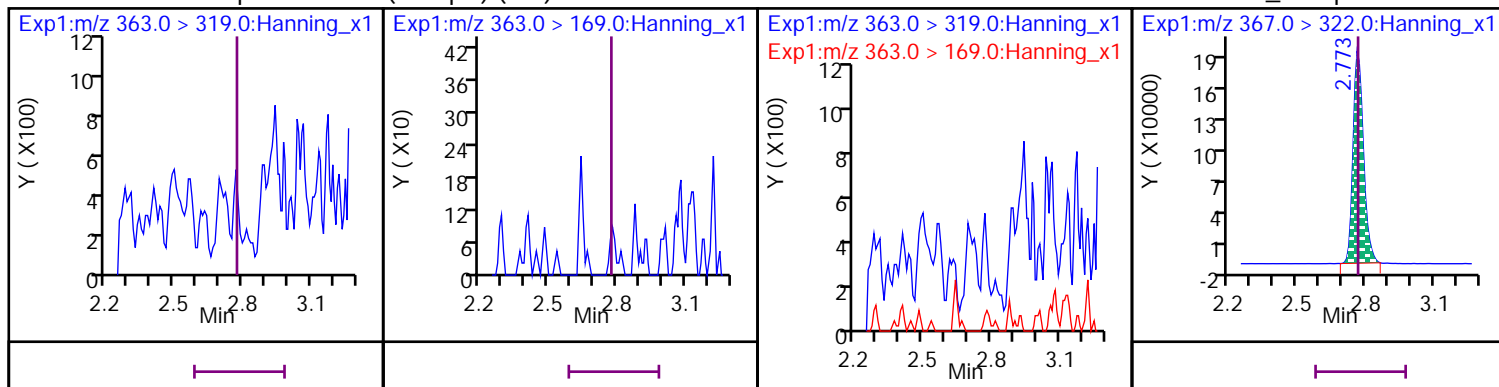
## 28 Hexafluoropropylene oxide dimer acid (GenX) (ND)

D 66 13C3\_GenX



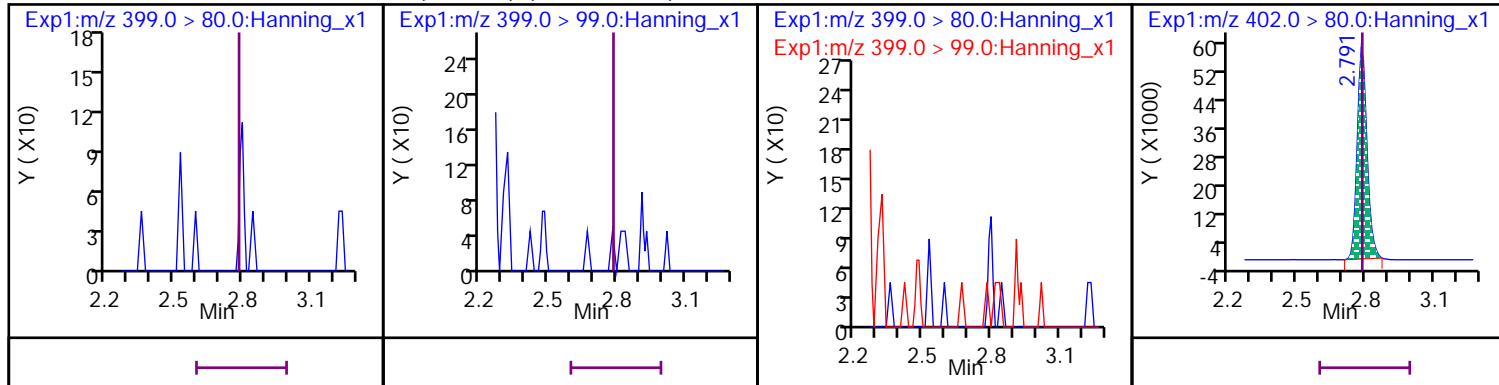
## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

D 47 13C4\_PFHpA



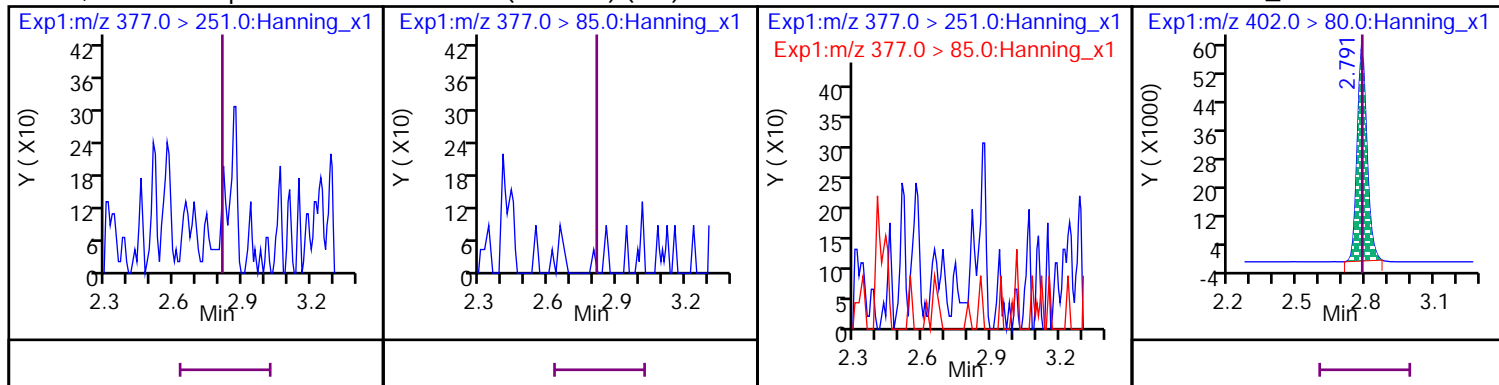
## 14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS

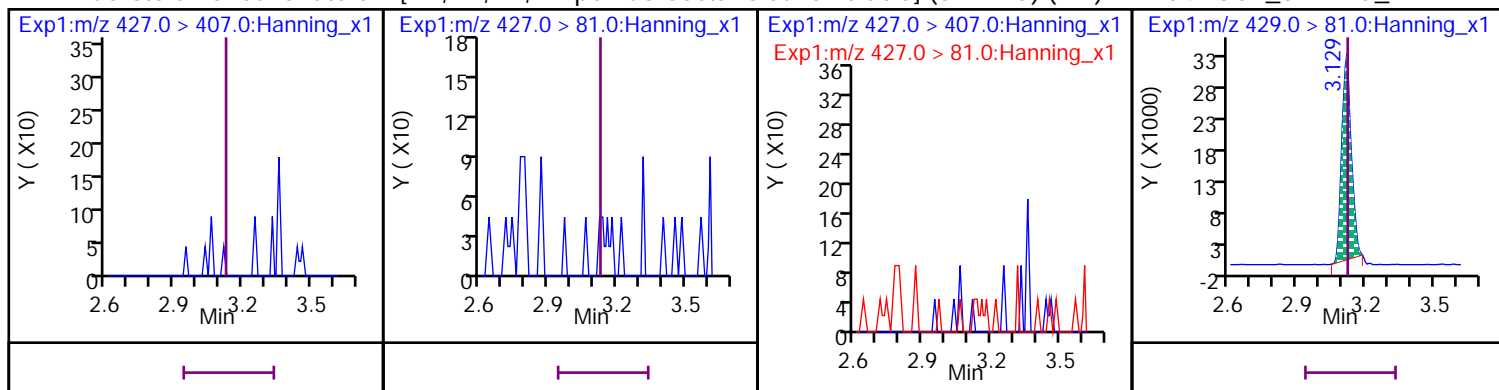


## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS

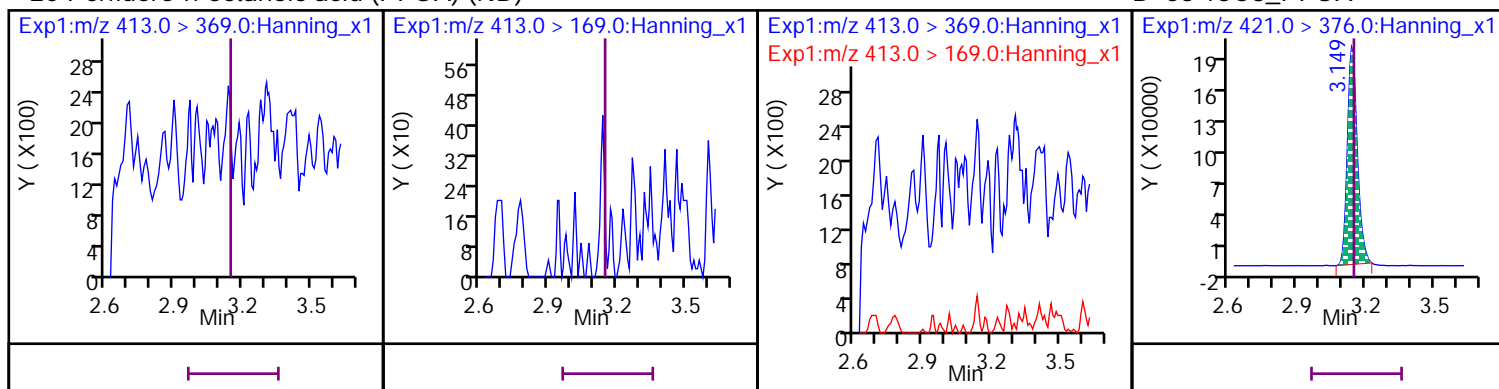


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND) D 64 13C2\_6:2 FTS\_2



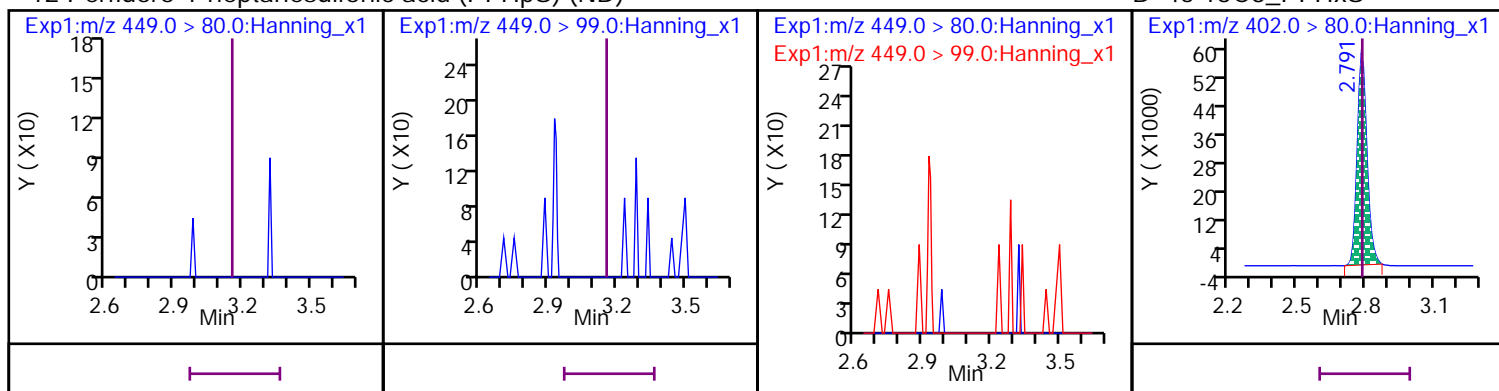
20 Perfluoro-n-octanoic acid (PFOA) (ND)

D 53 13C8\_PFOA



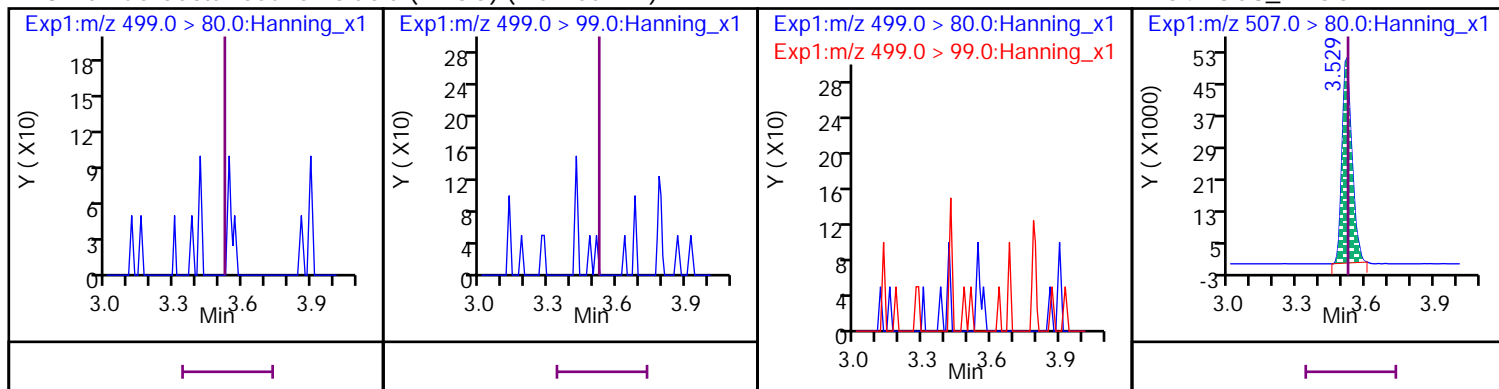
12 Perfluoro-1-heptanesulfonic acid (PFHpS) (ND)

D 45 13C3\_PFHxS



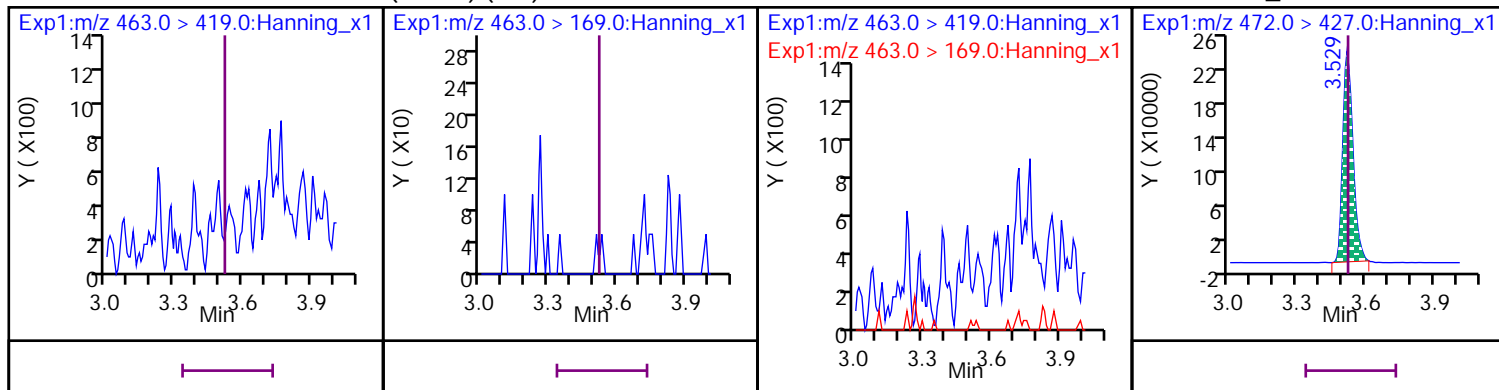
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



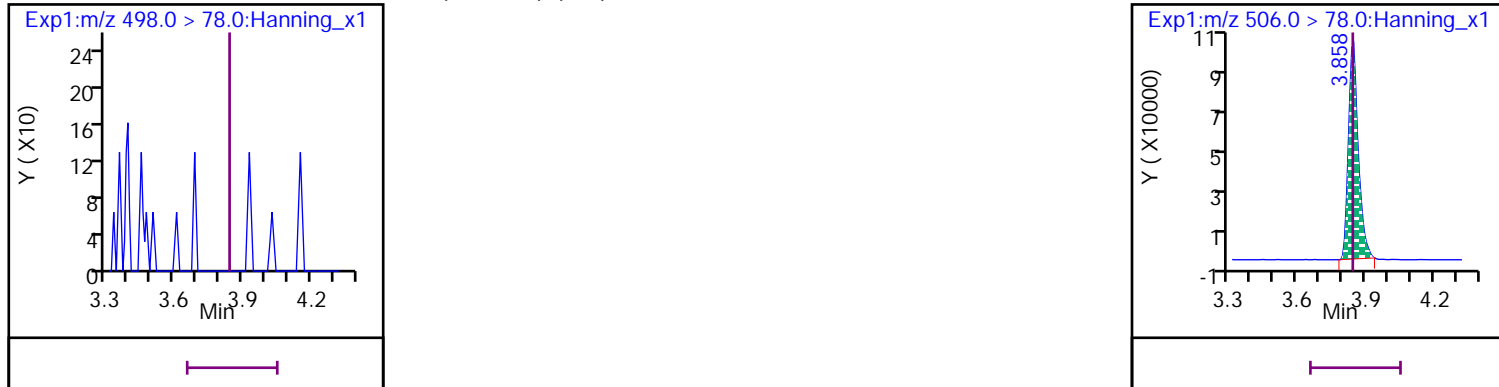
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

D 54 13C8\_PFOS



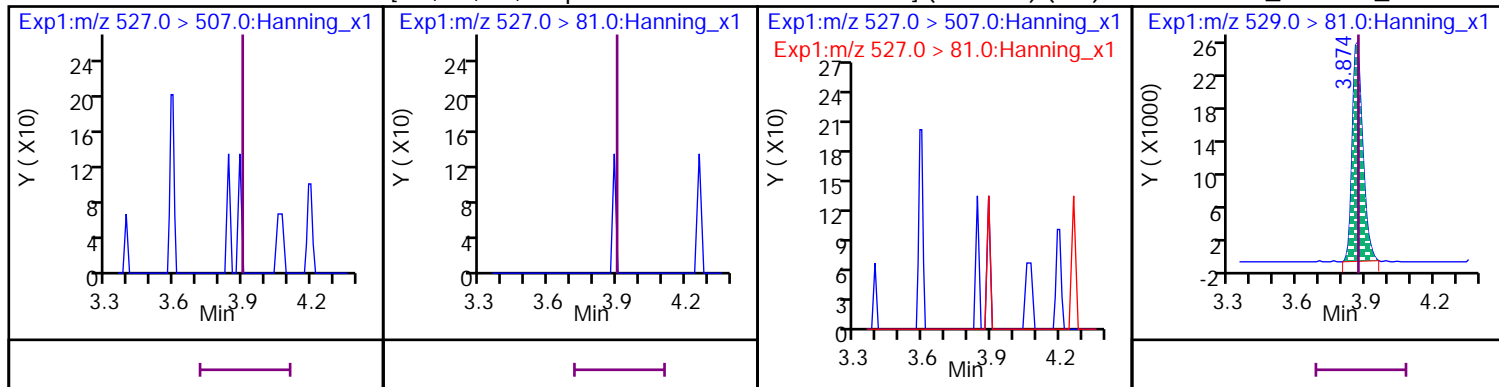
19 Perfluoro-1-octanesulfonamide (PFOSA) (ND)

D 55 13C8\_PFOSA



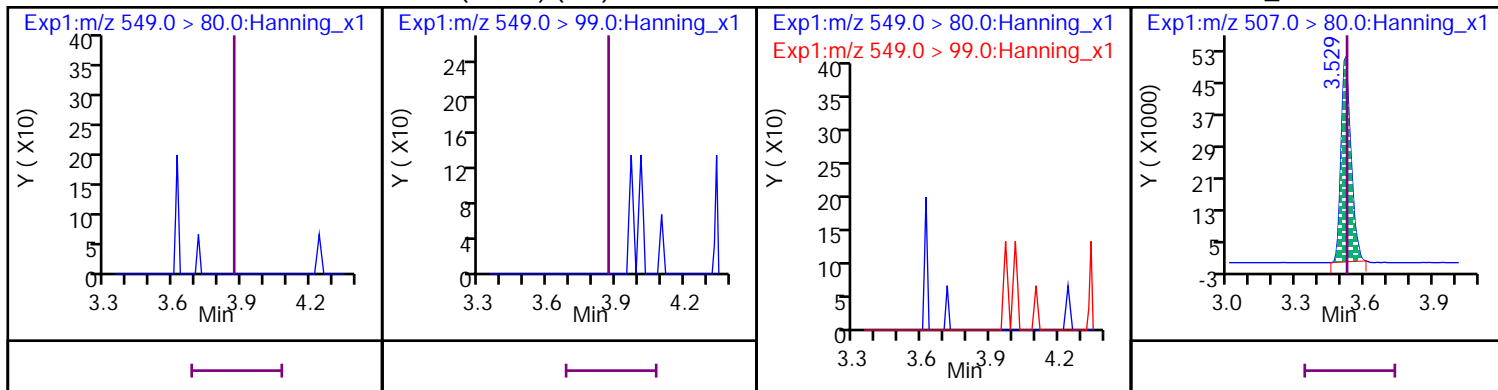
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (ND)

D 65 13C2\_8:2 FTS\_2



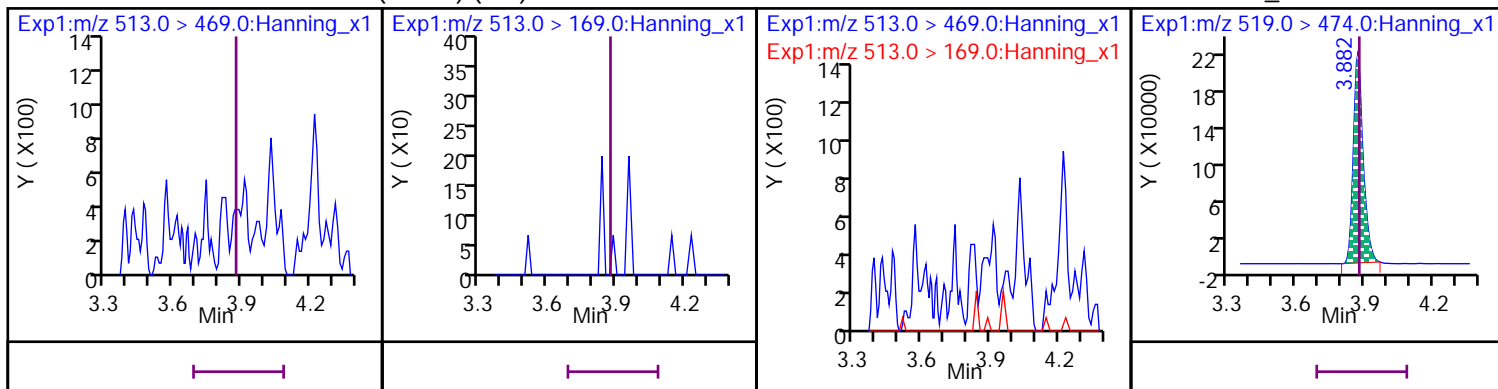
16 Perfluoro-1-nonanesulfonic acid (PFNS) (ND)

D 54 13C8\_PFOS



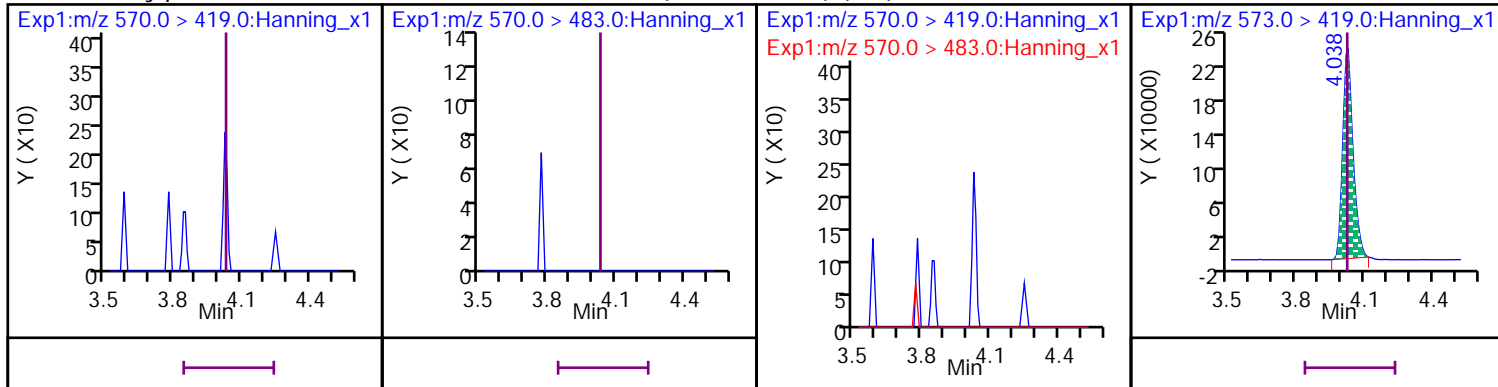
10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



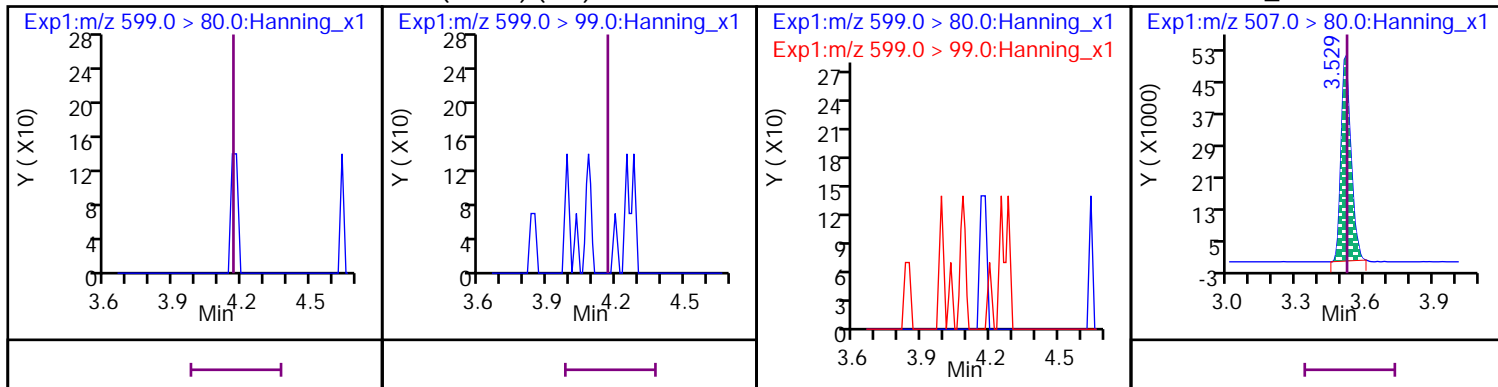
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (ND)

D 58 d3-MeFOSAA



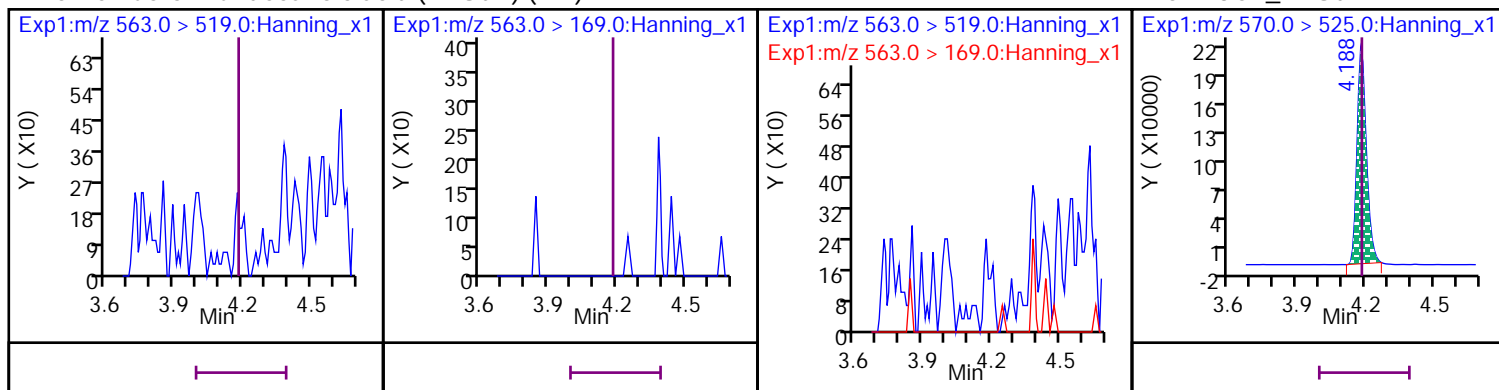
9 Perfluoro-1-decanesulfonic acid (PFDS) (ND)

D 54 13C8\_PFOS



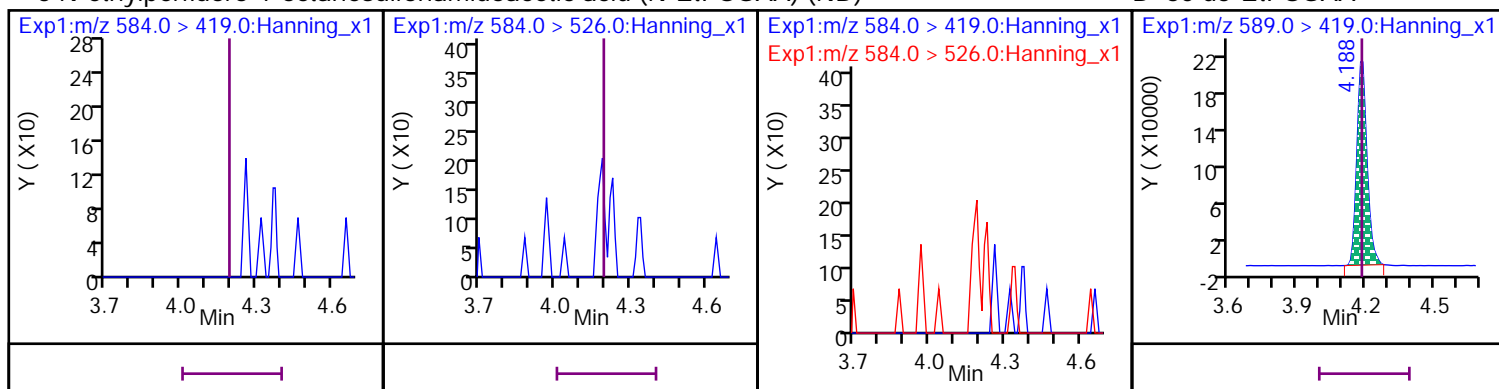
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA



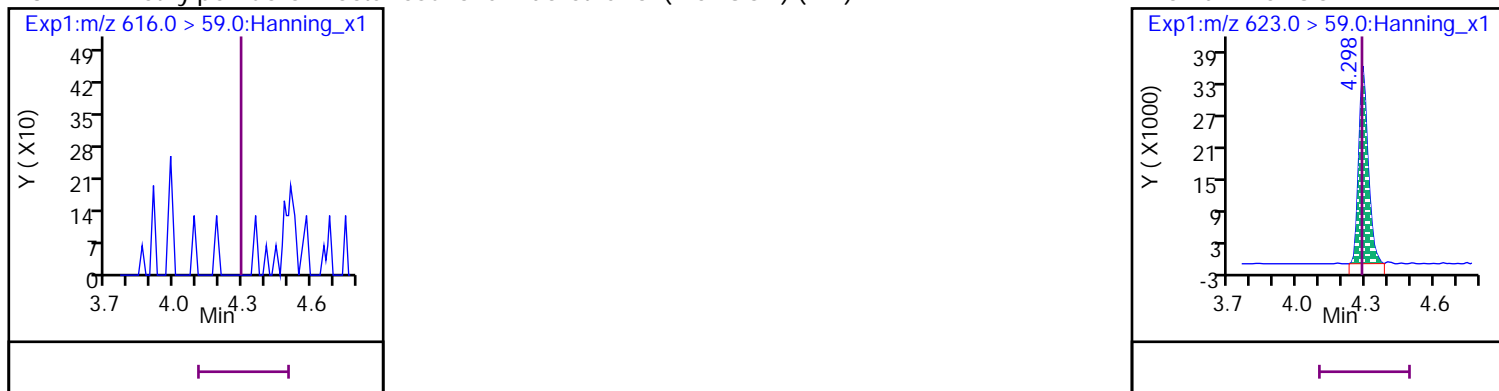
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

D 60 d5-EtFOSAA



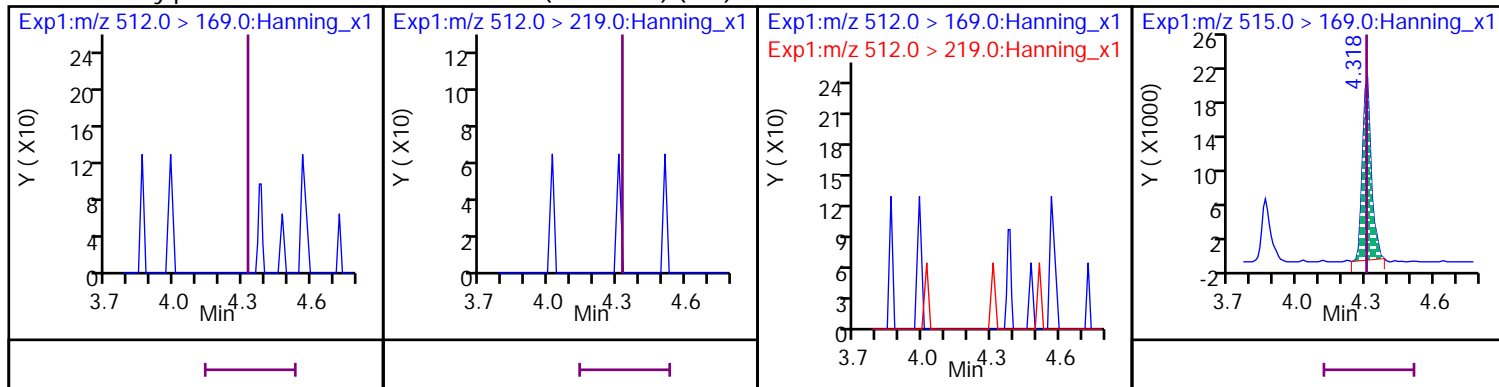
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) (ND)

D 61 d7-MeFOSE

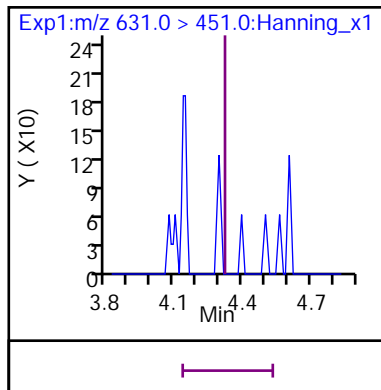


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) (ND)

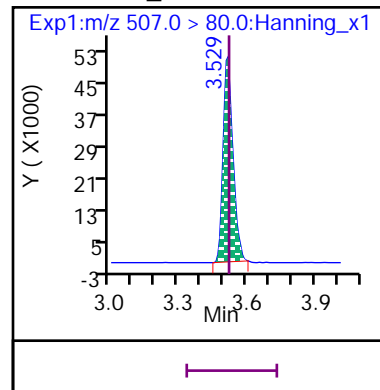
D 57 d3-MeFOSA



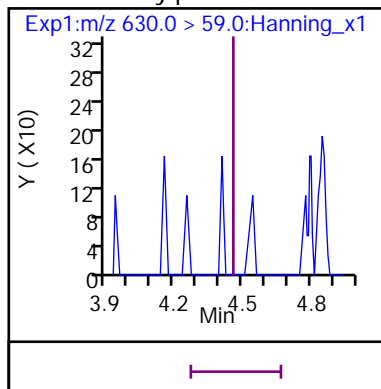
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



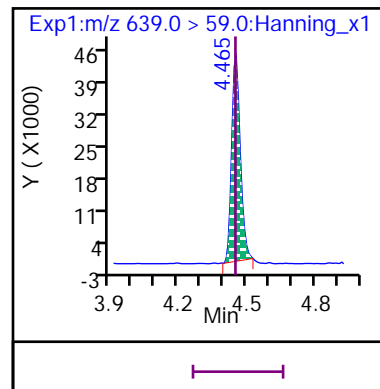
D 54 13C8\_PFOS



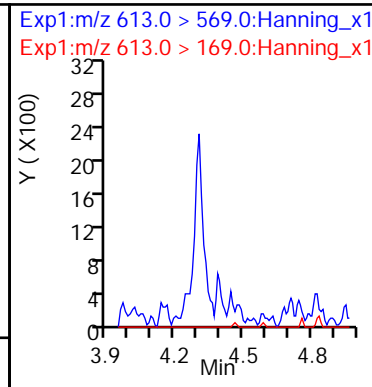
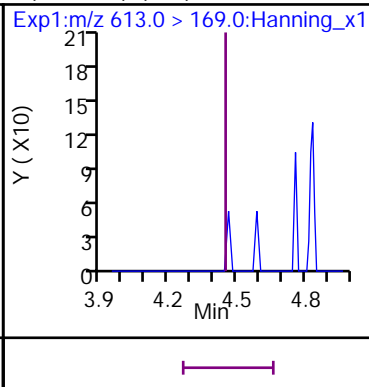
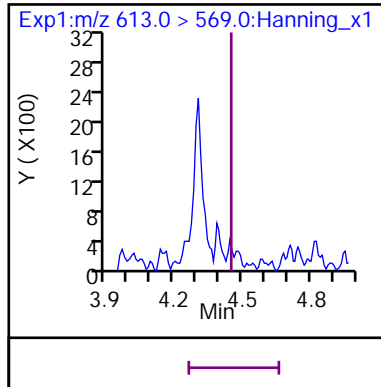
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) (ND)



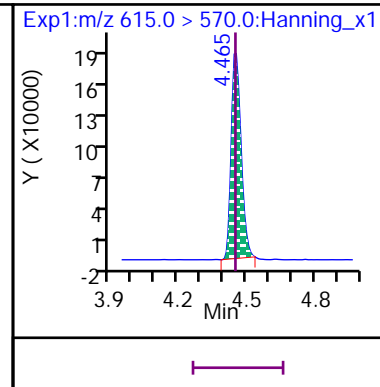
D 62 d9-EtFOSE



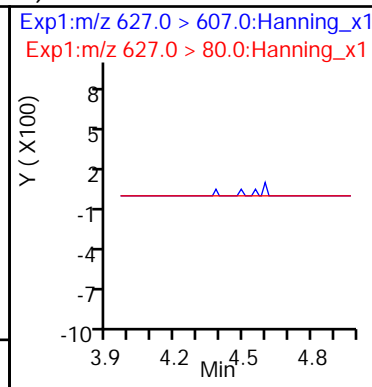
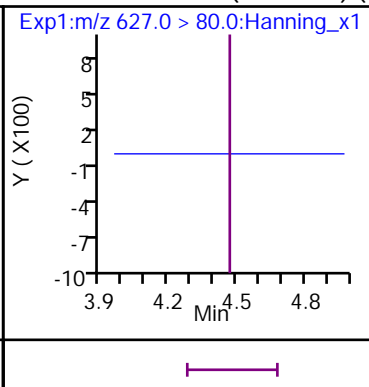
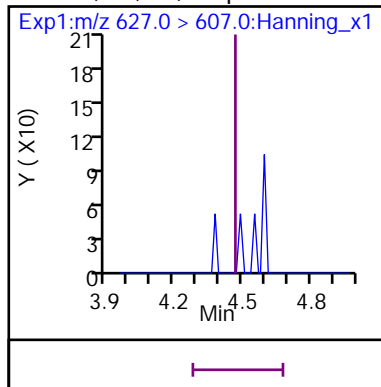
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



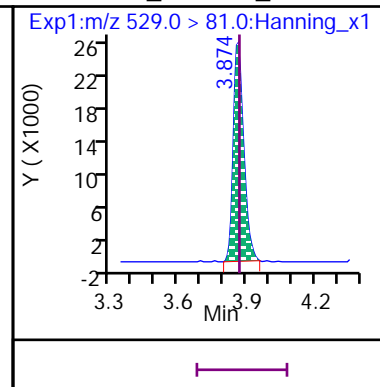
D 38 13C2\_PFDoA



4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) (ND)

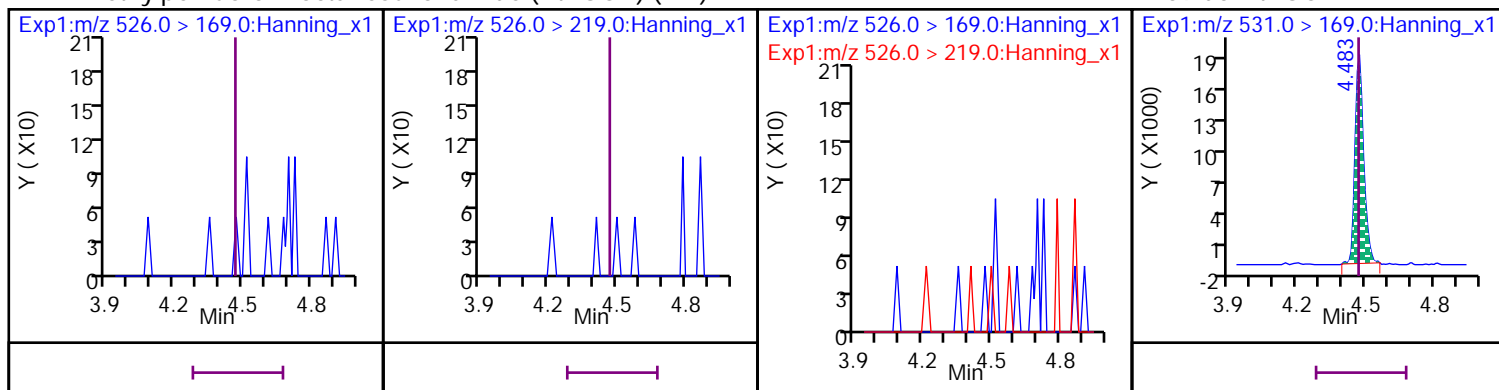


D 65 13C2\_8:2 FTS\_2



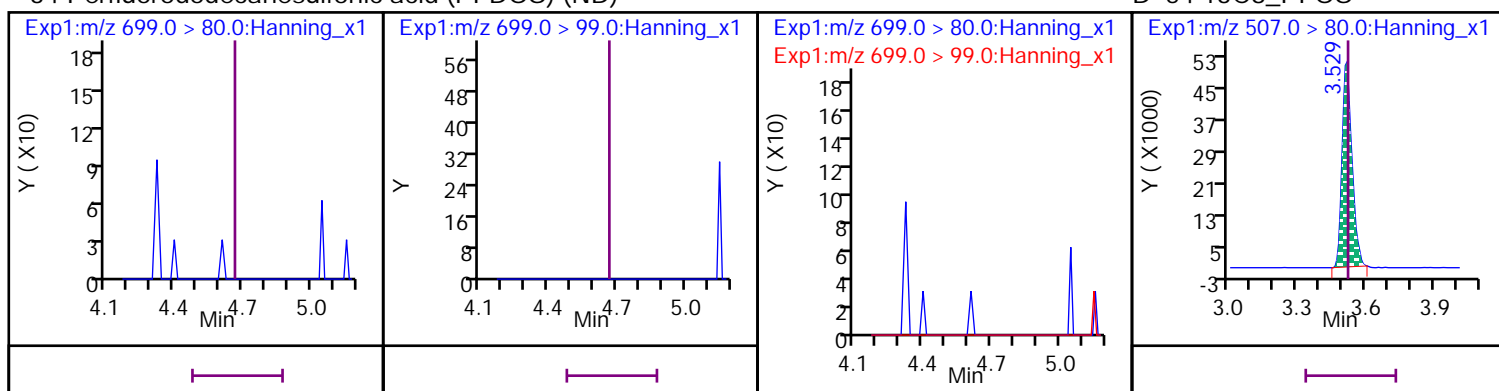
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (ND)

## D 59 d5-EtFOSA



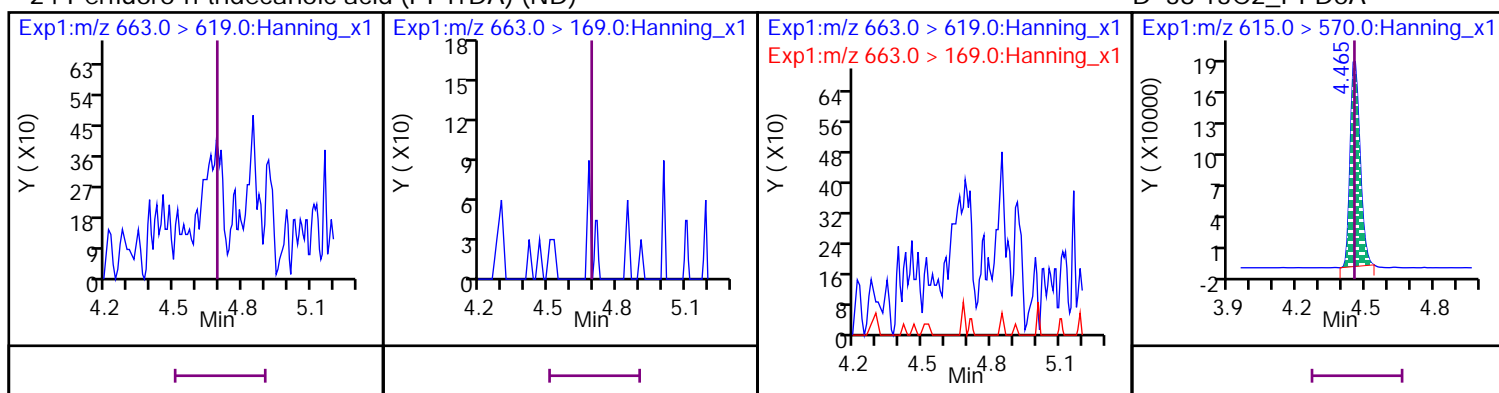
## 34 Perfluorododecanesulfonic acid (PFDOS) (ND)

## D 54 13C8\_PFOS



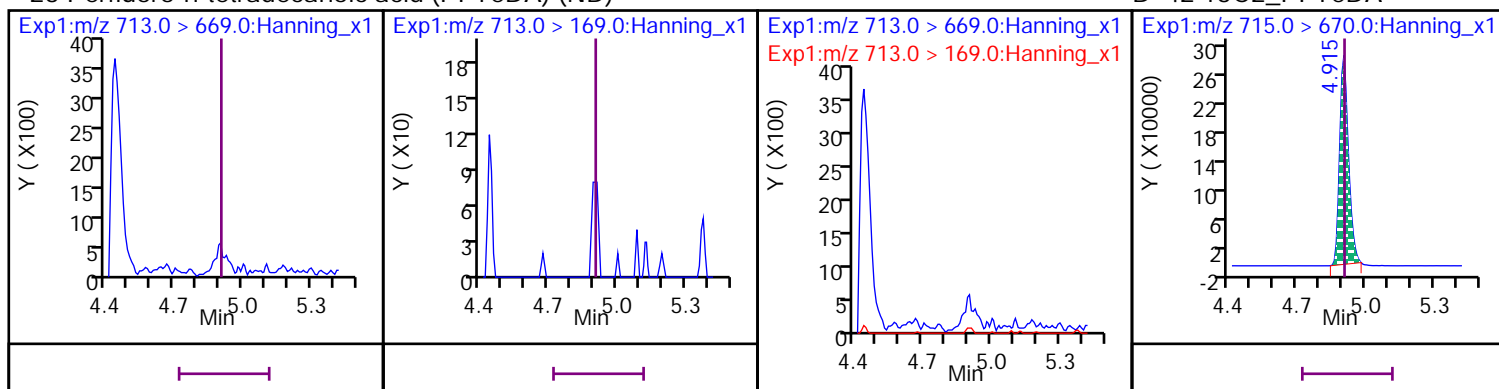
## 24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)

## D 38 13C2\_PFDaA



## 23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)

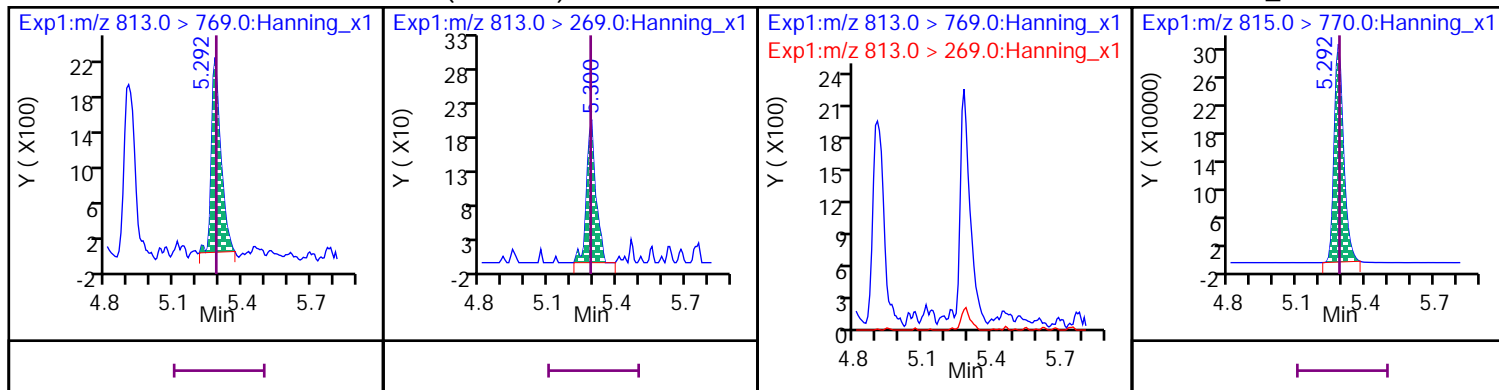
## D 42 13C2\_PFTeDA





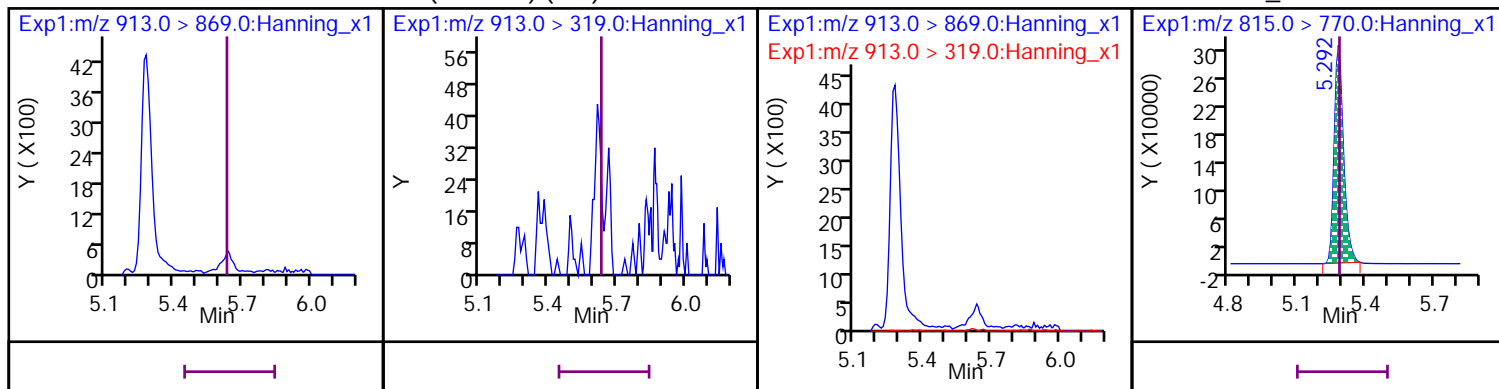
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA) (ND)

D 40 13C2\_PFHxDA

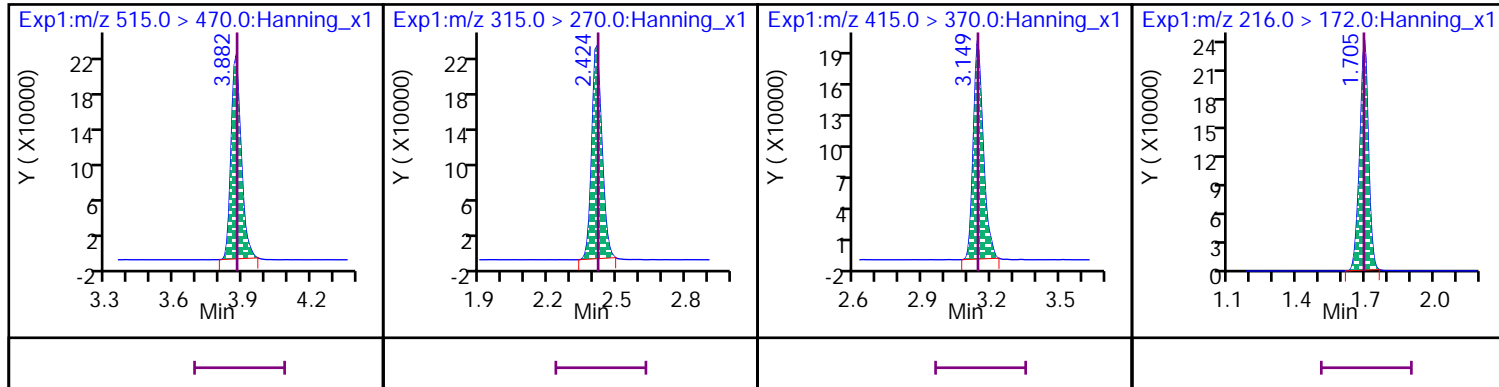


\* 37 13C2\_PFDA

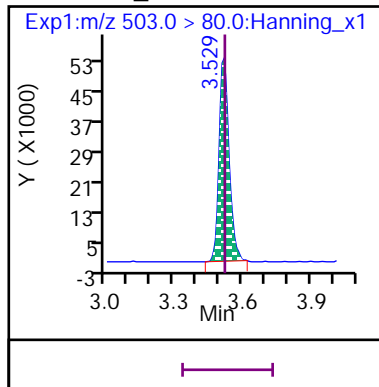
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9CI-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
11CI-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/28/2020 1038
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFDaA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/28/2020 1038

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		99	50-150
13C2_8:2FTS		87	50-150
13C2_PFDaA		94	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		91	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: VQ77741-001

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820009.d  
 Injection Date: 28-Dec-2020 10:38:17 Injection Vol: 10.0 uL  
 Sample Type: MBik Auto Sampler: 1  
 Lab Sample ID: VQ77741-001 Lab Prep. Batch: 77741  
 Sample Info: VQ77741-001 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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<b>D 46 13C4_PFBFA CAS: SESI-0111</b>													
217 > 172		1.699	1.696	1	624383	23	>100:1			1001.00	900.27	96.1	
<b>8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4</b>													
212.9 > 168.9	46		1.696		ND								U
<b>D 50 13C5_PFPeA CAS: SESI-0112</b>													
267.9 > 223		2.077	2.072	1	662143	17	>100:1			1001.00	962.58	99.4	
<b>21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3</b>													
262.9 > 218.9	50		2.072		ND								U
<b>D 44 13C3_PFBFS CAS: SESI-0116</b>													
302 > 80		2.130	2.125	1	213409	16	>100:1			1001.00	926.94	89.6	
<b>7 Perfluoro-1-butanesulfonic acid (PFBS) CAS: 375-73-5</b>													
298.9 > 80	44		2.125		ND								U
<b>D 63 13C2_4:2 FTS_2 CAS: SESI-0104</b>													
329 > 81		2.380	2.379	1	124651	20	>100:1			5005.00	5149.10	86.5	
<b>D 49 13C5_PFHxA CAS: SESI-0113</b>													
318 > 273		2.415	2.423	0	709136	19	>100:1			1001.00	962.10	95.4	
<b>15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4</b>													
313 > 269	49		2.423		ND								U
<b>D 66 13C3_GenX CAS: SESI-0121</b>													
287 > 185		2.531	2.530	1	1432072	20	>100:1			5005.00	5376.57	102	
<b>28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6</b>													
285 > 119	66		2.530		ND								U
<b>D 47 13C4_PFHpA CAS: SESI-0114</b>													
367 > 322		2.773	2.772	1	596955	19	>100:1			1001.00	984.02	94.2	
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47		2.772		ND								U
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	153626	20	>100:1			1001.00	897.20	88.2	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45		2.790		ND								U
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45		2.808		ND								U
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	103313	23	>100:1			5005.00	5364.57	99	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													U
427 > 407	64		3.128		ND								
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	582299	22	>100:1			1001.00	983.84	92.7	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													U
413 > 369	53		3.148		ND								
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	130102	21	>100:1			1001.00	867.76	85.3	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													U
499 > 80	54		3.520		ND								
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													U
531 > 351	54		3.722		ND								
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUs) CAS: 763051-92-9</b>													U
631 > 451	54		4.317		ND								
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	746365	21	>100:1			1001.00	993.88	97.2	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													U
463 > 419	56		3.520		ND								
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.851	3.849	1	311458	20	>100:1			1001.00	1006.12	101	
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.859	3.857	1	87372	18				5005.00	4710.05	87	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													U
527 > 507	65		3.873		ND								
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.867	3.865	1	669340	20	>100:1			1001.00	1009.06	99.5	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													U
513 > 469	51		3.873		ND								
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.020	4.029	0	770662	19	>100:1			5005.00	5368.99	97.4	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													U
570 > 419	58		4.029		ND								
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.180	4.178	1	665043	19	>100:1			5005.00	5007.30	90.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													U
584 > 419	60		4.187		ND								
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.180	4.178	1	590298	20	>100:1			1001.00	933.91	91.7	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													U
563 > 519	52		4.178		ND								
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.289	4.287	1	100797	16	>100:1			1001.00	931.51	95.6	
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.309	4.307	1	41967	16	>100:1			1001.00	793.07	81	
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.458	4.455	1	123079	19	>100:1			1001.00	981.53	89.8	
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.449	4.455	0	574510	19	>100:1			1001.00	949.11	94	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													U
613 > 569	38		4.446		ND								
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													U
663 > 619	38		4.688		ND								
<b>D 59 d5-EtFOFA CAS: SESI-0108</b>													
531 > 169		4.476	4.473	1	41291	20	>100:1			1001.00	841.05	82.1	
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.900	4.906	0	749903	18	>100:1			1001.00	890.15	92.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													U
713 > 669	42		4.906		ND								
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.284	5.282	1	821262	19	>100:1			1001.00	906.31	87.8	
<b>* 37 13C2_PFDA</b>													
515 > 470		3.867	3.873	0	713455	20	>100:1					97.4	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	757700	19	>100:1					104	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	636826	24	>100:1					106	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	620234	23	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.522	3.520	1	169241	23	>100:1					104	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

U - Result Less Than Method Detection Limit

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820009.d

Injection Date: 28-Dec-2020 10:38:17

Inst. ID: LCMSMS02

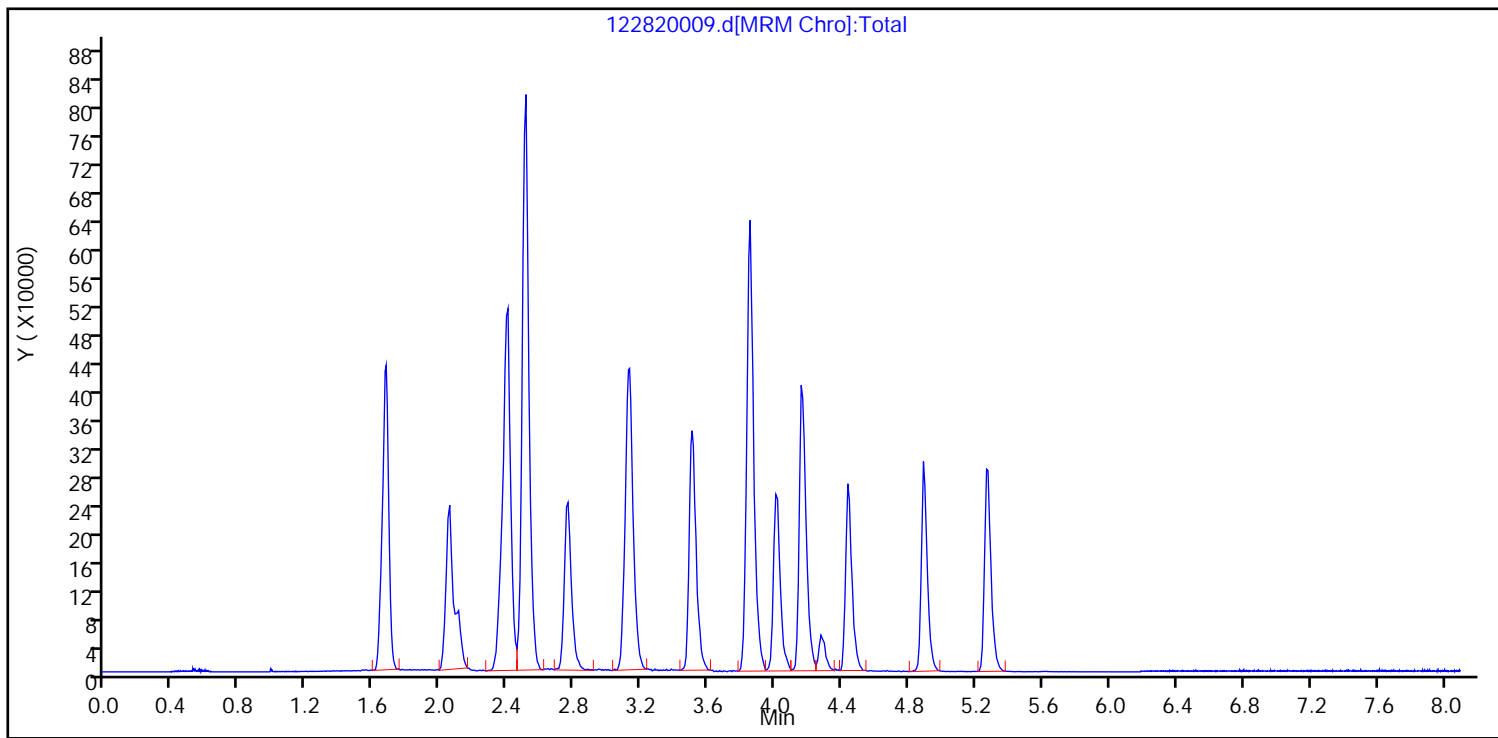
Client ID:

Lab ID: VQ77741-001

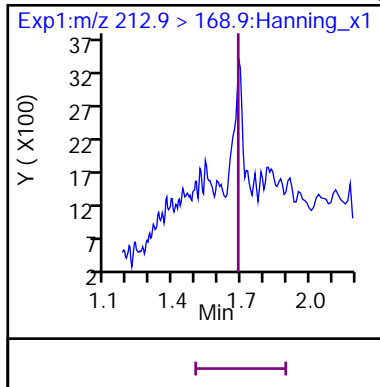
Sample Info: VQ77741-001

Dil. Factor: 1

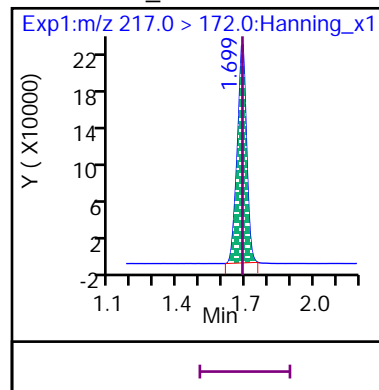
Operator: Matthew M. Miller



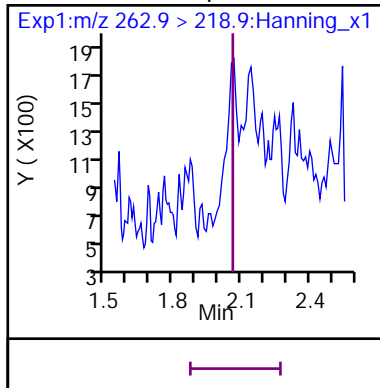
8 Perfluoro-n-butanoic acid (PFBA) (Marked ND)



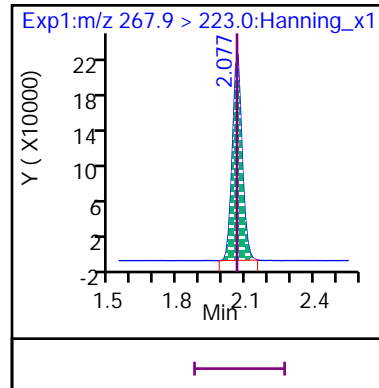
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA) (ND)

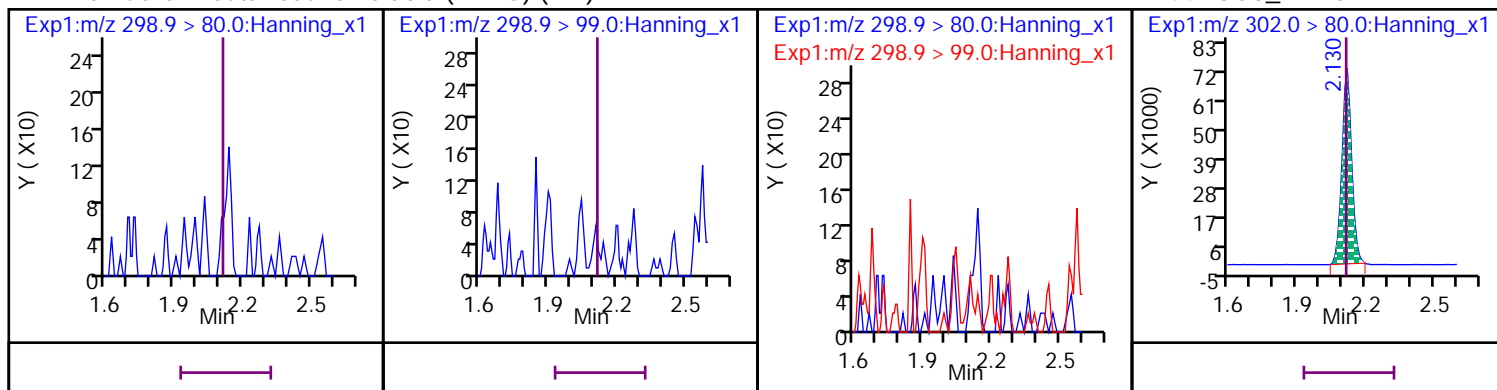


D 50 13C5\_PFPeA



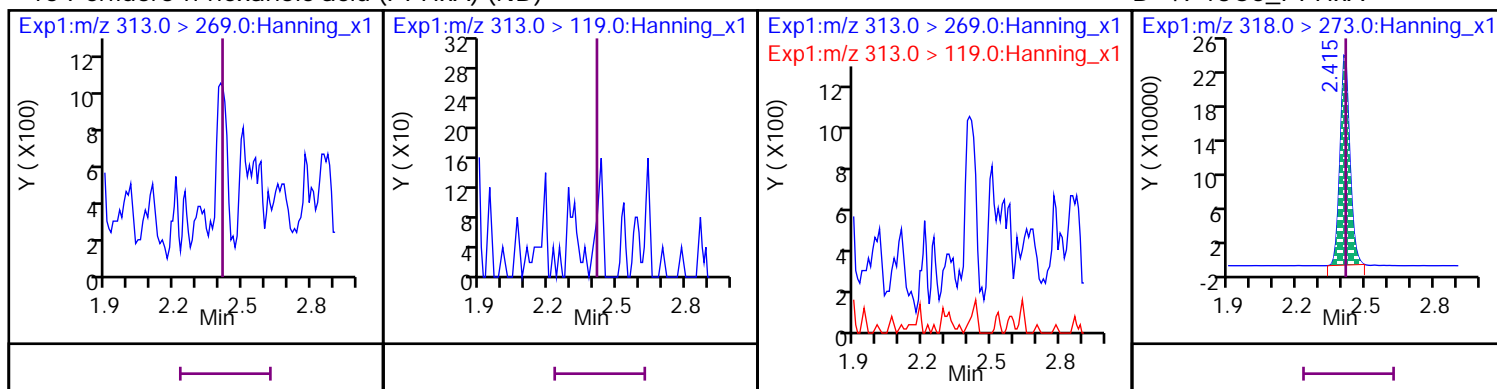
## 7 Perfluoro-1-butanesulfonic acid (PFBS) (ND)

D 44 13C3\_PFBS



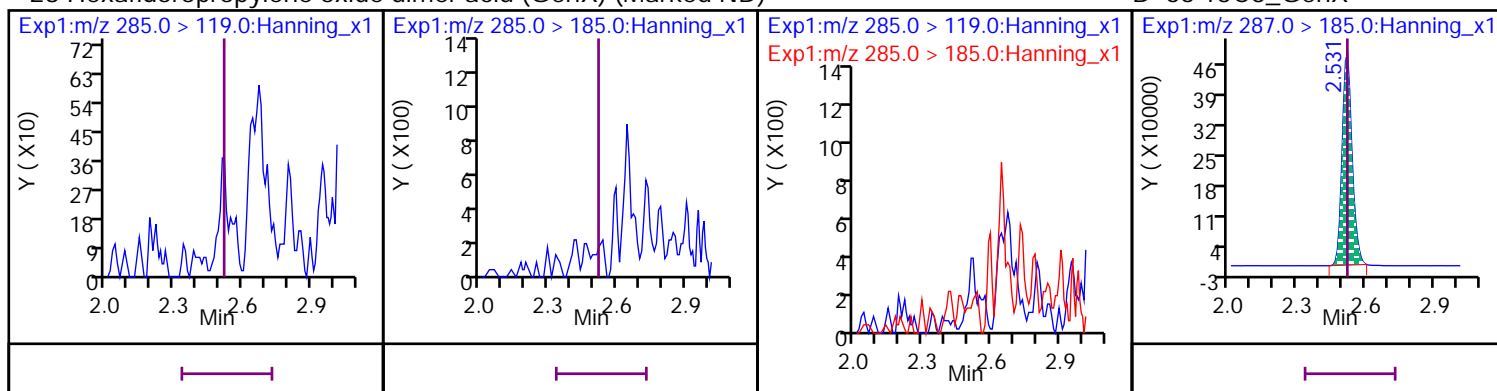
## 15 Perfluoro-n-hexanoic acid (PFHxA) (ND)

D 49 13C5\_PFHxA



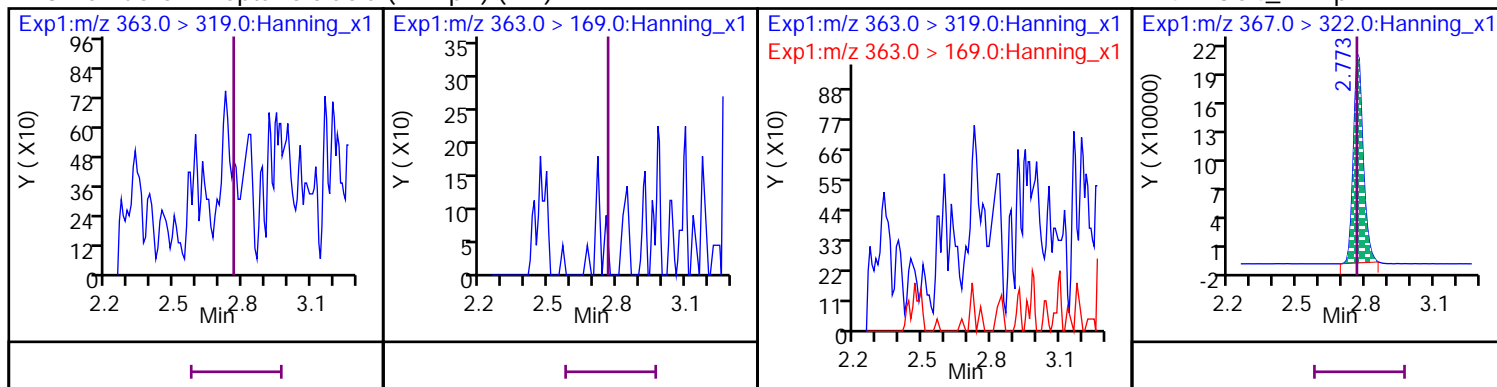
## 28 Hexafluoropropylene oxide dimer acid (GenX) (Marked ND)

D 66 13C3\_GenX



## 13 Perfluoro-n-heptanoic acid (PFHpA) (ND)

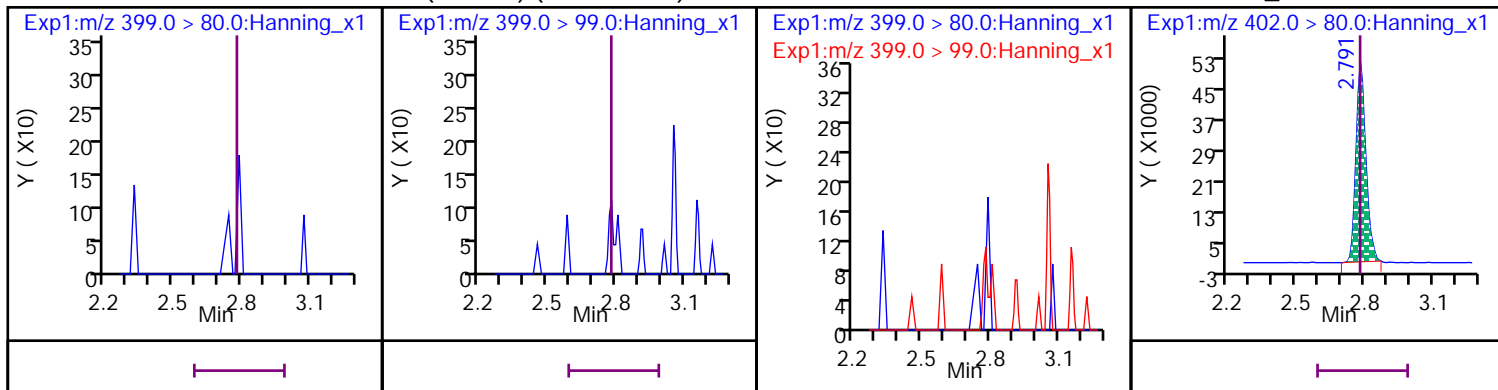
D 47 13C4\_PFHpA





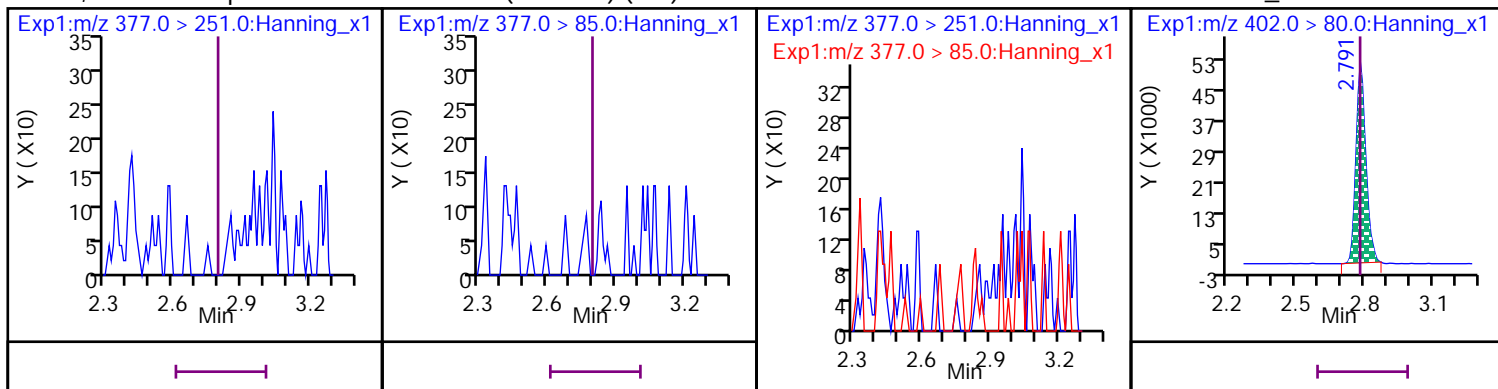
14 Perfluorohexanesulfonic acid (PFHxS) (Marked ND)

D 45 13C3\_PFHxS



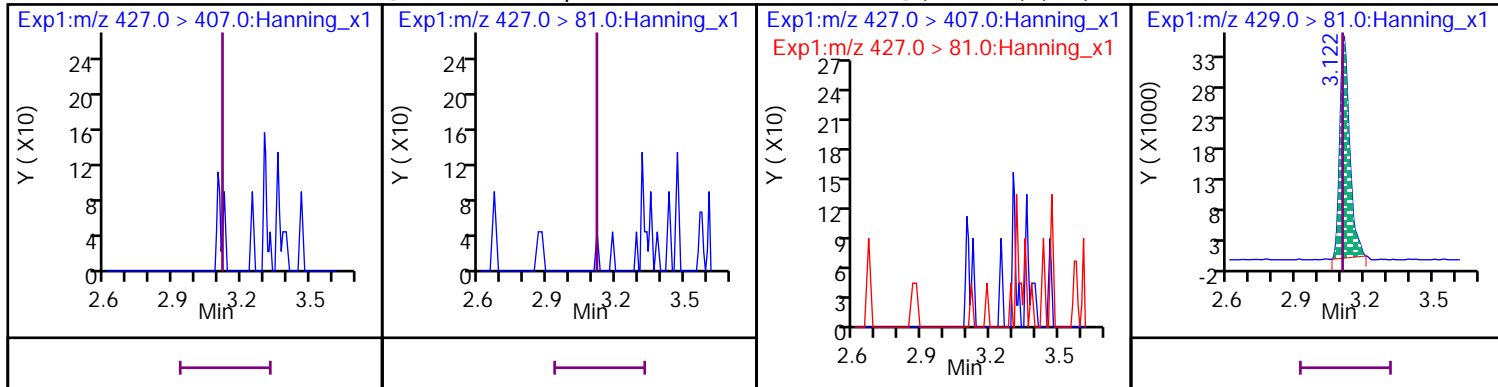
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND)

D 45 13C3\_PFHxS



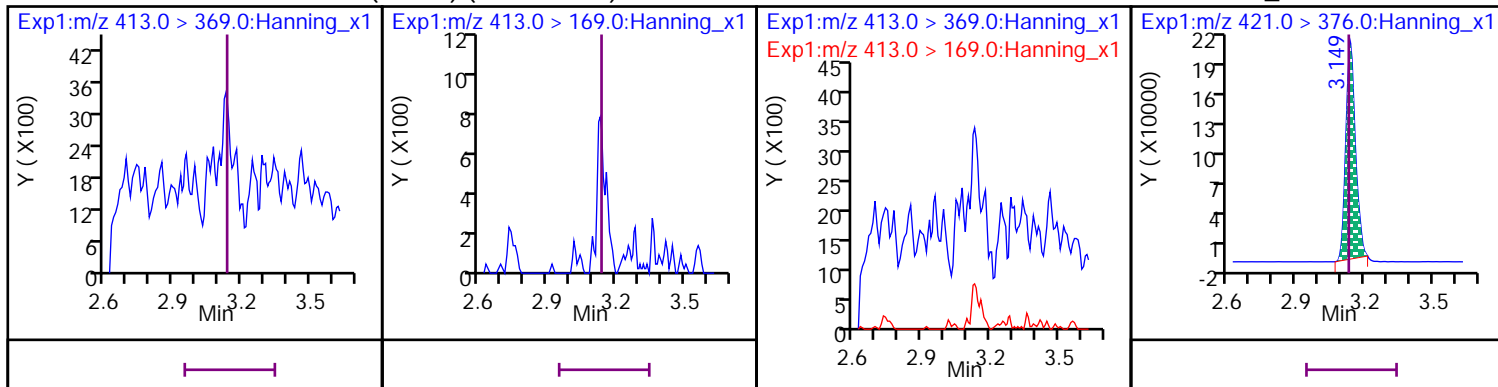
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) (ND)

D 64 13C2\_6:2 FTS\_2



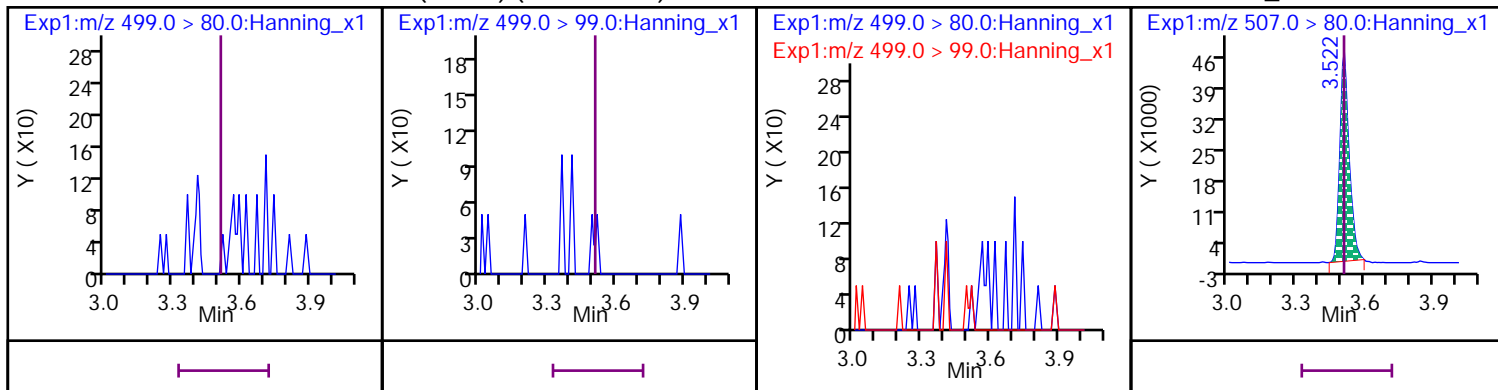
20 Perfluoro-n-octanoic acid (PFOA) (Marked ND)

D 53 13C8\_PFOA



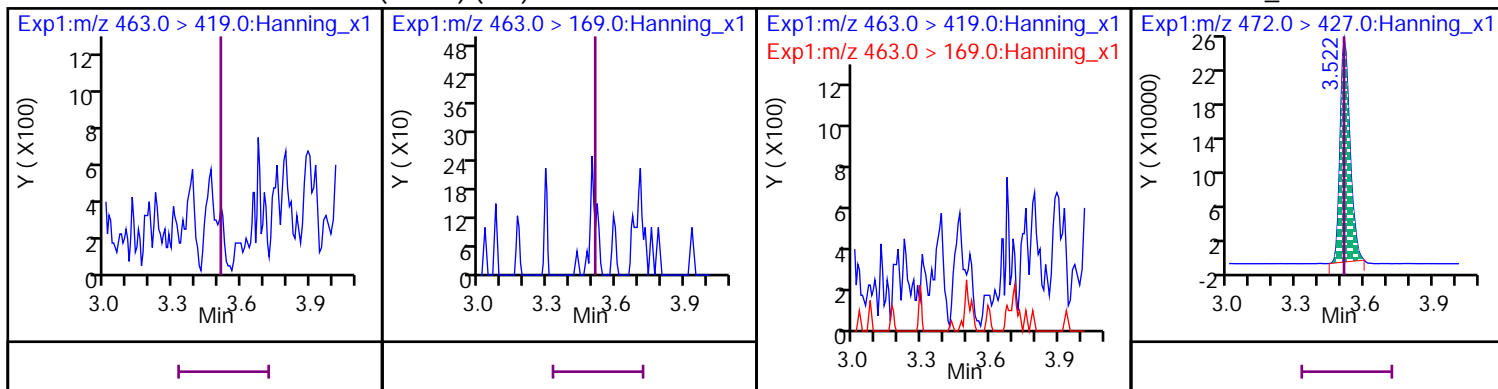
18 Perfluorooctanesulfonic acid (PFOS) (Marked ND)

D 54 13C8\_PFOS



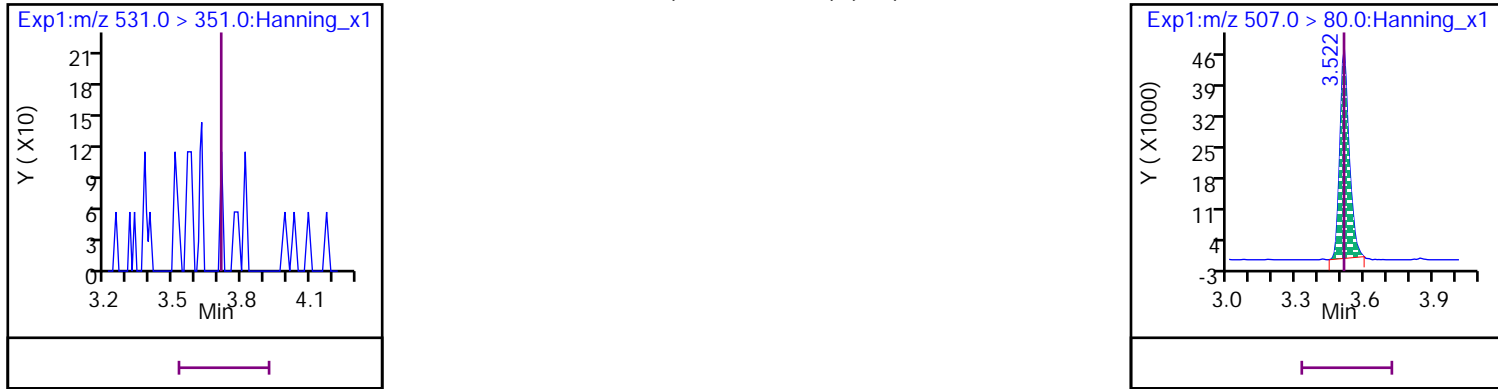
17 Perfluoro-n-nonanoic acid (PFNA) (ND)

D 56 13C9\_PFNA



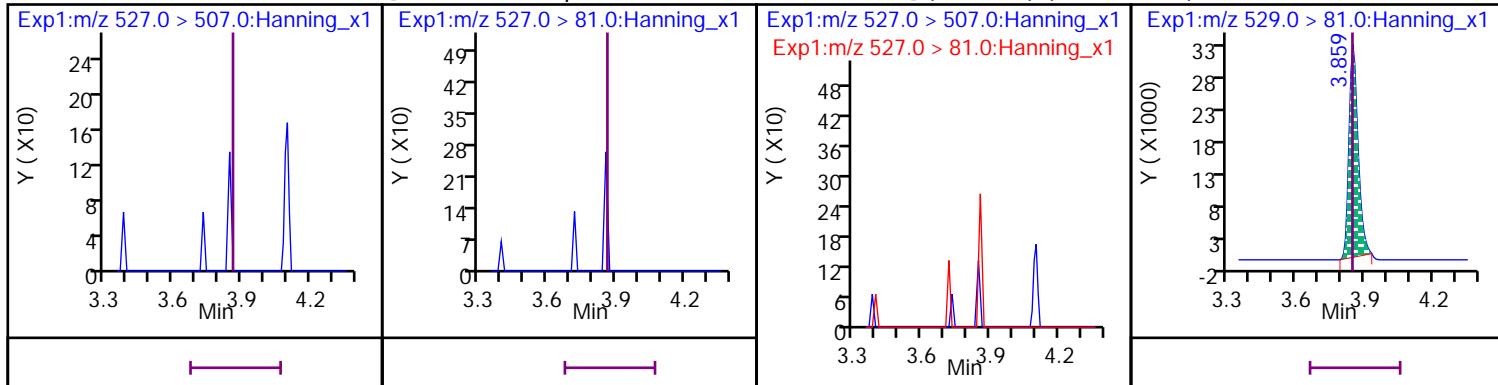
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (ND)

D 54 13C8\_PFOS



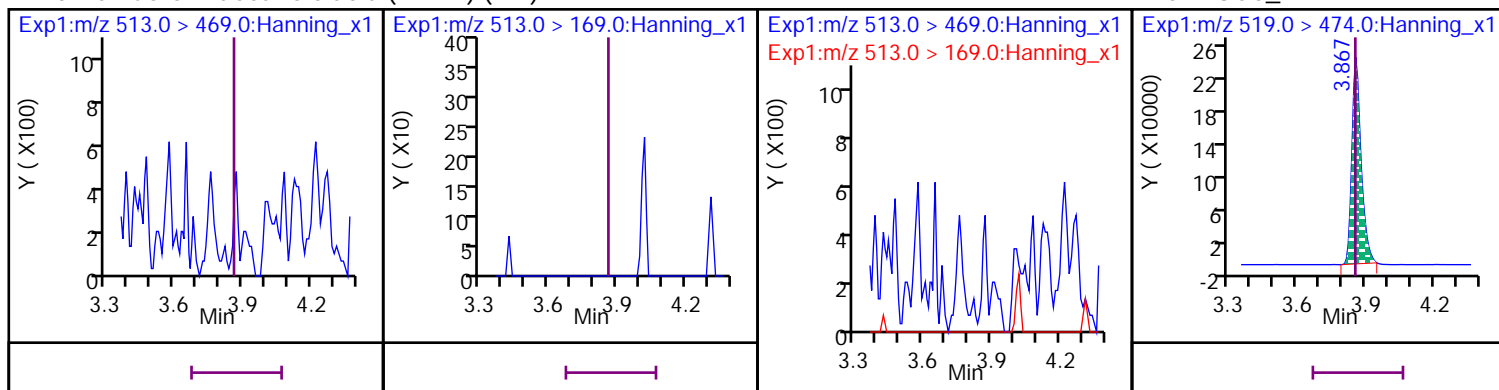
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) (Marked ND)

D 56 13C2\_8:2 FTS\_2



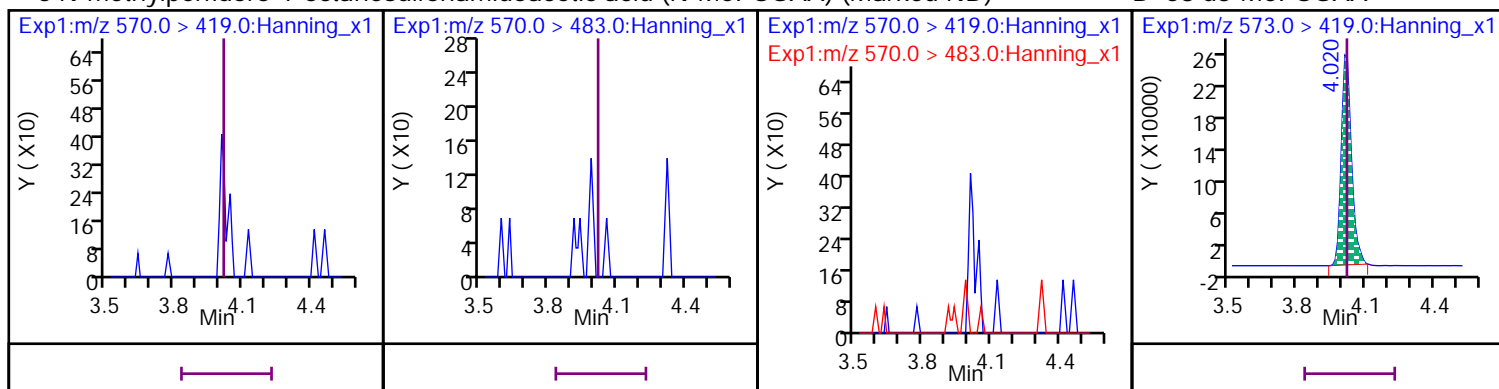
## 10 Perfluoro-n-decanoic acid (PFDA) (ND)

D 51 13C6\_PFDA



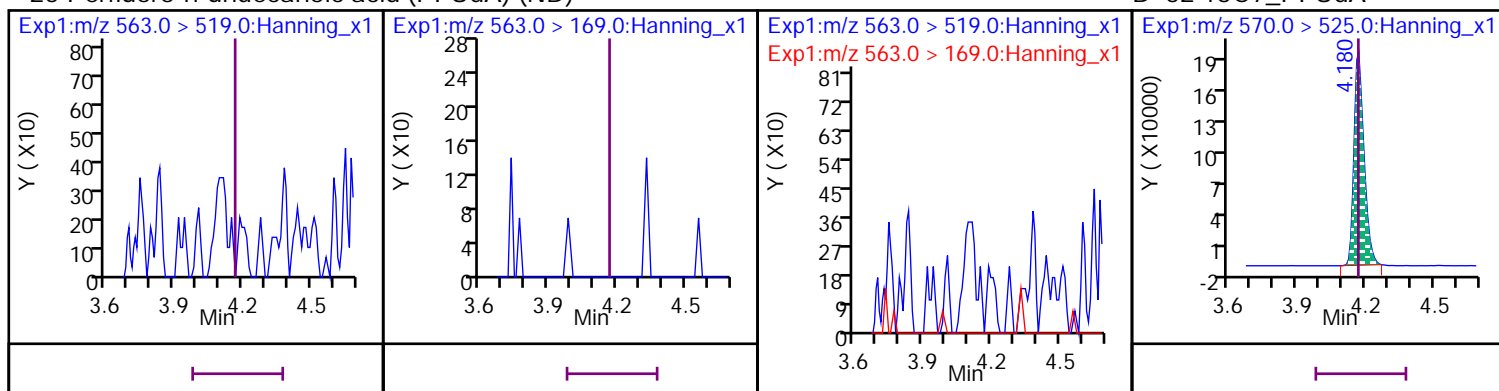
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)

D 58 d3-MeFOSAA



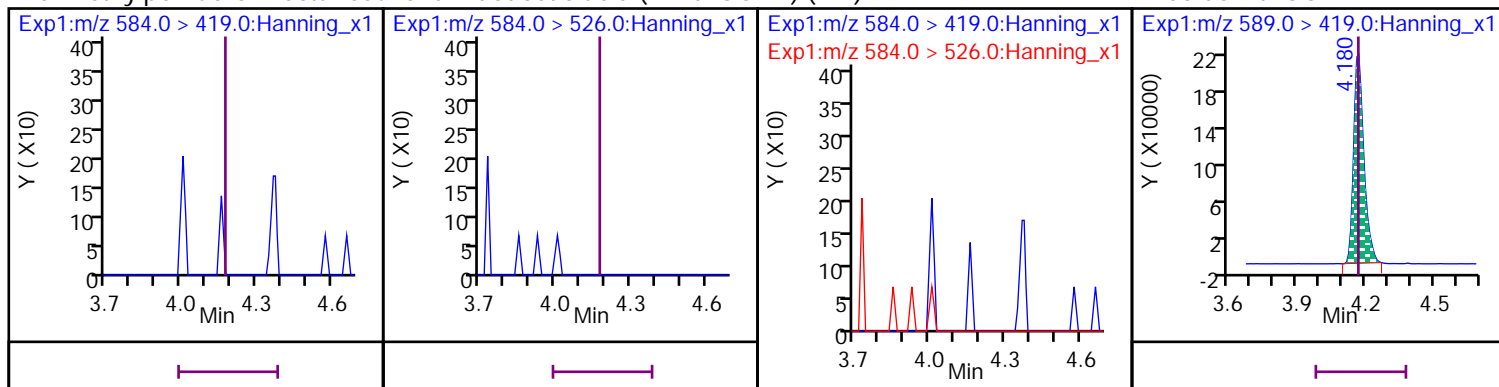
## 25 Perfluoro-n-undecanoic acid (PFUdA) (ND)

D 52 13C7\_PFUdA

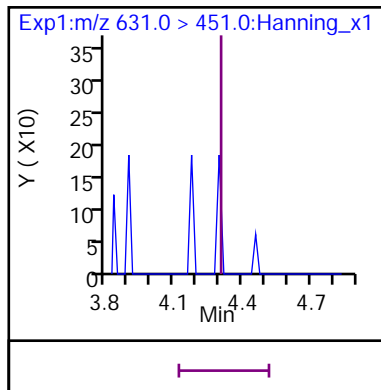


## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)

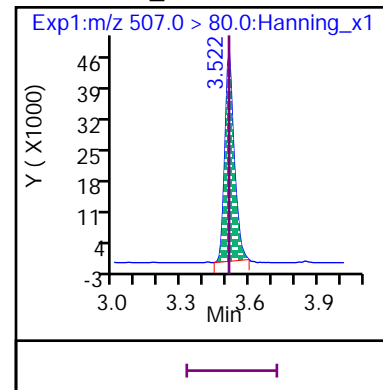
D 60 d5-EtFOSAA



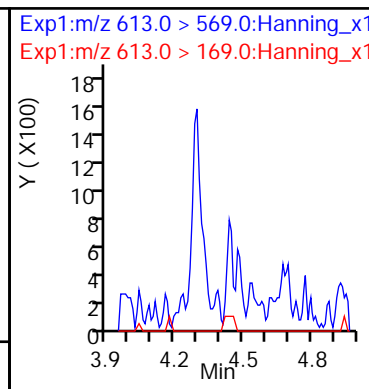
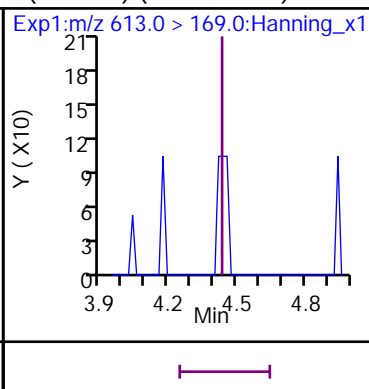
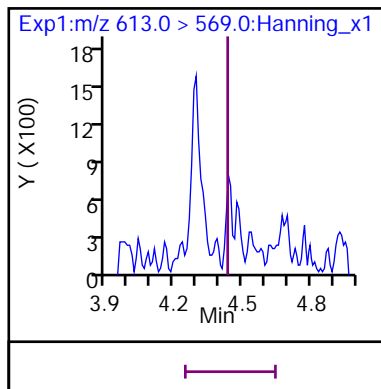
31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)



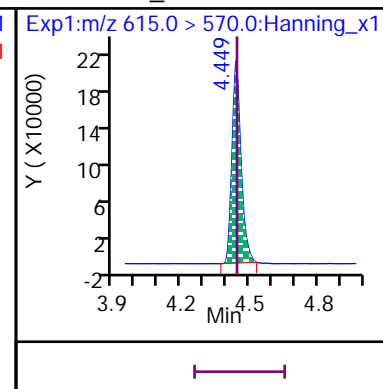
D 54 13C8\_PFOS



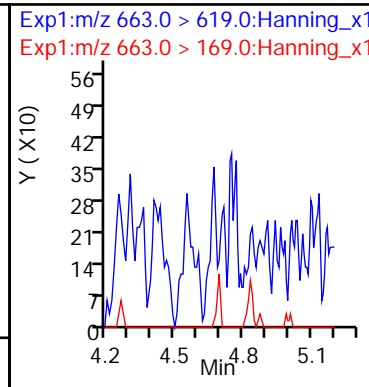
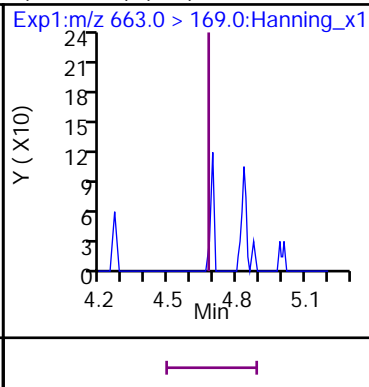
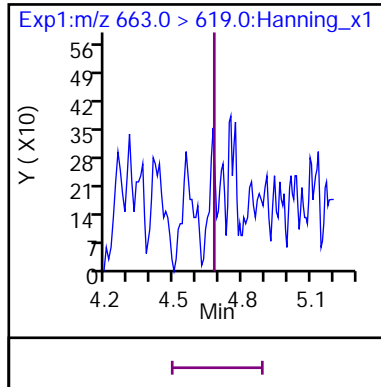
11 Perfluoro-n-dodecanoic acid (PFDoA) (Marked ND)



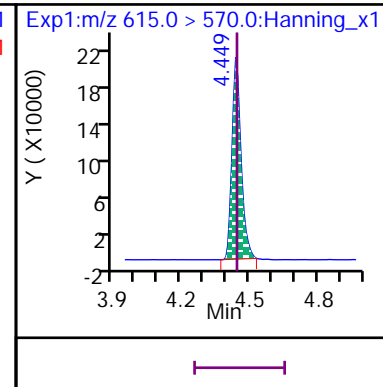
D 38 13C2\_PFDoA



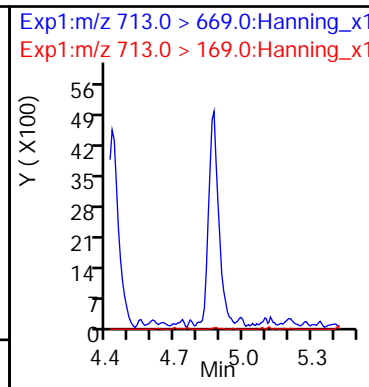
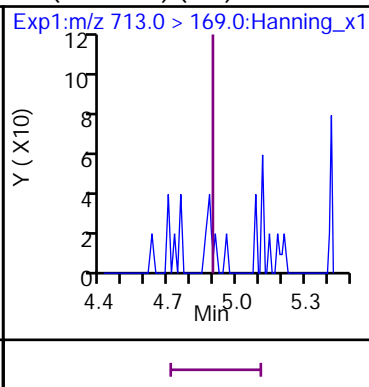
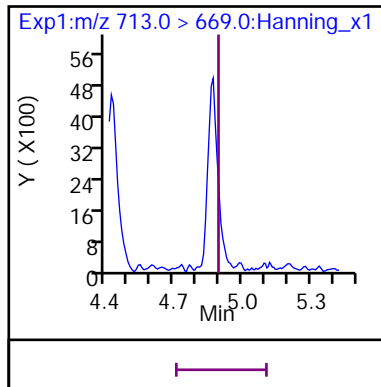
24 Perfluoro-n-tridecanoic acid (PFTeDA) (ND)



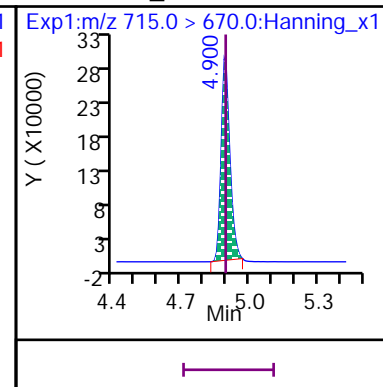
D 38 13C2\_PFDoA



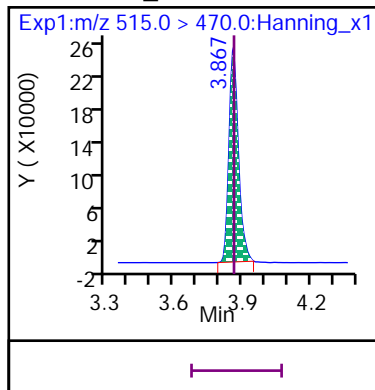
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



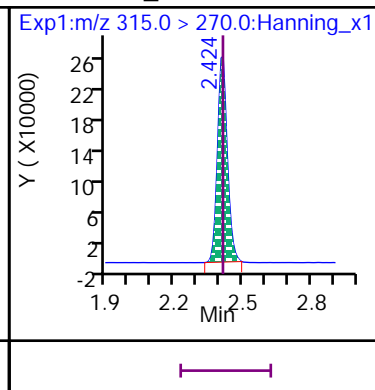
D 42 13C2\_PFTeDA



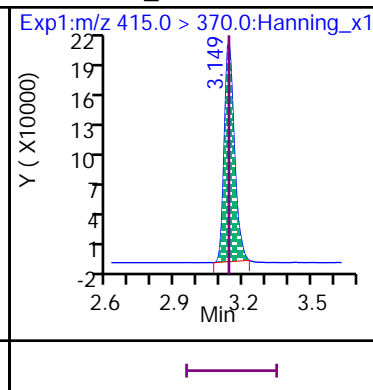
\* 37 13C2\_PFDA



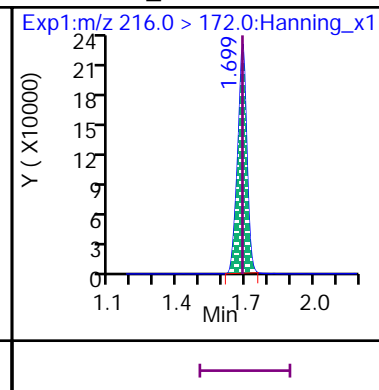
\* 39 13C2\_PFHxA



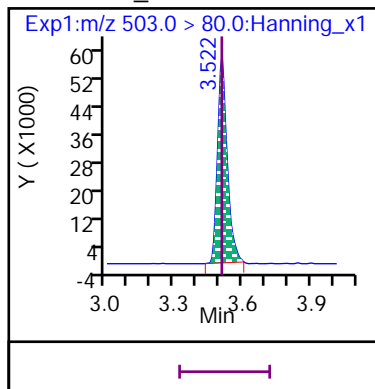
\* 41 13C2\_PFOA



\* 43 13C3\_PFBa



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	70-150	12/28/2020 1048
11CI-PF3OUdS	15	16		1	106	70-150	12/28/2020 1048
8:2 FTS	15	15		1	100	67-138	12/28/2020 1048
6:2 FTS	15	16		1	109	64-140	12/28/2020 1048
GenX	32	31		1	96	70-150	12/28/2020 1048
ADONA	15	15		1	101	70-150	12/28/2020 1048
EtFOSAA	16	16		1	98	61-135	12/28/2020 1048
MeFOSAA	16	16		1	99	65-136	12/28/2020 1048
PFBS	14	13		1	94	72-130	12/28/2020 1048
PFHxS	15	14		1	95	68-131	12/28/2020 1048
PFBA	16	16		1	99	73-129	12/28/2020 1048
PFDA	16	16		1	100	71-129	12/28/2020 1048
PFDaA	16	15		1	94	72-134	12/28/2020 1048
PFHpA	16	15		1	93	72-130	12/28/2020 1048
PFHxA	16	15		1	95	72-129	12/28/2020 1048
PFNA	16	16		1	99	69-130	12/28/2020 1048
PFOA	16	16		1	99	71-133	12/28/2020 1048
PFPeA	16	15		1	95	72-129	12/28/2020 1048
PFTeDA	16	16		1	102	71-132	12/28/2020 1048
PFTrDA	16	15		1	95	65-144	12/28/2020 1048
PFUdA	16	16		1	97	69-133	12/28/2020 1048
PFOS	15	15		1	103	65-140	12/28/2020 1048

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		87	50-150
13C2_8:2FTS		85	50-150
13C2_PFDaA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBs		86	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBa		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		90	50-150
13C6_PFDa		92	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		86	50-150
13C8_PFOS		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		83	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: VQ77741-002

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d  
 Injection Date: 28-Dec-2020 10:48:51 Injection Vol: 10.0 uL  
 Sample Type: LCS Auto Sampler: 2  
 Lab Sample ID: VQ77741-002 Lab Prep. Batch: 77741  
 Sample Info: VQ77741-002 Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0439560$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	250	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
 Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 584162 24 >100:1 1001.00 842.28 89.9

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.699 1.696 1/0 208974 24 >100:1 359.53 15.804

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.077 2.072 1 598149 17 >100:1 1001.00 869.55 89.8

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/0 208586 16 >100:1 347.19 15.261

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 204996 17 >100:1 1001.00 890.39 86.1

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 73217 16 >100:1 Target = 3.34 303.23 13.329

298.9 > 99 44 2.130 2.125 19690 16 >100:1 3.71 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.460 2.450 1/0 58830 20 >100:1 Target = 3.09 331.16 14.557

349 > 99 44 2.451 2.450 19956 21 >100:1 2.94 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.379 1 116364 21 >100:1 5005.00 4806.78 80.8

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.380 2.388 0/-1 18870 18 >100:1 Target = 1.64 406.68 17.876

327 > 81 63 2.380 2.388 9745 19 58:1 1.93 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.415 2.423 0 666661 20 >100:1 1001.00 904.47 89.7

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.424 2.423 1/1 226693 19 >100:1 Target = 17.01 344.77 15.155

313 > 119 49 2.415 2.423 11688 19 >100:1 19.39 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.531 2.530 1 1265137 20 >100:1 5005.00 4749.83 90.3

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.531 2.530 1/0 127037 20 >100:1 Target = 0.79 699.51 30.748

285 > 185 66 2.531 2.530 157020 21 >100:1 0.80 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 560783 20 >100:1 1001.00 924.40 88.5



Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.782	2.772	1/0	196642	19	>100:1	Target = 3.79		338.40	14.875		
363 > 169	47	2.782	2.772		55820	21	>100:1	3.52 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	156371	20	>100:1			1001.00	913.23	89.8	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	52381	27	>100:1	Target = 3.80	0.17	316.25	13.901		
399 > 99	45	2.791	2.790		16635	25	>100:1	3.14 (1.90-5.71)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.819	2.808	1/0	344889	19	>100:1	Target = 2.97		347.75	15.286		
377 > 85	45	2.819	2.808		117100	20	>100:1	2.94 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.154	1/0	47675	21	>100:1	Target = 3.09		335.95	14.767		
449 > 99	45	3.155	3.154		14431	20	93:1	3.30 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	90418	21	>100:1			5005.00	4694.99	86.7	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	14671	29	>100:1	Target = 1.77		374.78	16.474		
427 > 81	64	3.129	3.128		9850	27	>100:1	1.48 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.149	3.141	1	542508	23	>100:1			1001.00	916.61	86.4	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	198462	22	>100:1	Target = 2.85		359.20	15.789		
413 > 169	53	3.149	3.148		63325	22	>100:1	3.13 (1.42-4.28)					
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	124373	21	>100:1			1001.00	829.55	81.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/0	51170	38	>100:1	Target = 6.80	0.29	347.54	15.277		
499 > 99	54	3.529	3.520		13738	45	88:1	3.72 (3.40-10.20)	0.13				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/0	149731	23	>100:1			357.97	15.735		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/-1	33618	20		Target = 3.03		353.56	15.541		
549 > 99	54	3.858	3.865		12970	18	90:1	2.59 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.170	4.169	1/0	32182	18	>100:1	Target = 2.74		356.90	15.688		
599 > 99	54	4.162	4.169		14166	15	69:1	2.27 (1.37-4.11)					
<b>31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.317	1/0	128417	15	>100:1			363.93	15.997		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.663	1/0	34089	19	>100:1	Target = 3.16		341.74	15.022		
699 > 99	54	4.656	4.663		9103	17	69:1	3.74 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	675290	21	>100:1			1001.00	899.23	88	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	242297	22	>100:1	Target = 6.19		359.15	15.787		
463 > 169	56	3.522	3.520		37088	20	>100:1	6.53 (3.09-9.28)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	269071	20				1001.00	869.19	87.1	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	94483	19	>100:1			356.69	15.679		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	84871	26	>100:1			5005.00	4575.22	84.5	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-1	12294	38	47:1	Target = 2.11		349.97	15.383		
527 > 81	65	3.866	3.873		6717	22	53:1	1.83 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.455	1/0	16088	15	>100:1	Target = 3.05		410.55	18.046		
627 > 80	65	4.465	4.455		4038	26		3.98 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	618003	19	>100:1			1001.00	931.66	91.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.873	0/-1	219934	19	>100:1	Target = 13.22		362.54	15.936		
513 > 169	51	3.866	3.873		14311	26	84:1	15.36 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.019	4.029	0	678929	18	>100:1			5005.00	4729.92	85.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.038	4.029	1/1	37378	29	>100:1	Target = 1.34	0.09	358.71	15.768		
570 > 483	58	4.030	4.029		28161	36		1.32 (0.67-2.02)	0.18				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	606722	19	>100:1			5005.00	4568.18	82.9	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.188	4.187	1/0	42849	35	>100:1	Target = 1.71	0.13	355.04	15.606		M
584 > 526	60	4.179	4.187		24943	31	>100:1	1.71 (0.85-2.57)	0.20				
<b>D 52 13C7_PFDuA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	549831	17	>100:1			1001.00	869.88	85.4	
<b>25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.178	1/0	182663	20	>100:1	Target = 16.05		353.82	15.553		
563 > 169	52	4.170	4.178		13553	15	86:1	13.47 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.287	1	85533	17	>100:1			1001.00	790.45	81.1	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.297	1/0	29797	17	>100:1			371.13	16.314		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.307	1	34543	17	>100:1			1001.00	652.78	66.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.317	0/-1	14735	18	>100:1	Target = 1.18		378.47	16.636		
512 > 219	57	4.308	4.317		14841	20	>100:1	0.99 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	107210	17	>100:1			1001.00	854.98	78.2	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.464	1/0	35266	16	>100:1			370.10	16.268		
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	548164	20	>100:1			1001.00	905.58	89.7	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	189460	20	>100:1	Target = 10.35		341.64	15.017		
613 > 169	38	4.456	4.446		16320	23	95:1	11.60 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	185572	18	>100:1	Target = 8.56		344.05	15.123		
663 > 169	38	4.689	4.688		21880	22	>100:1	8.48 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	39394	17	>100:1			1001.00	802.41	78.3	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	12386	15	>100:1	Target = 1.08		288.08	12.663		
526 > 219	59	4.483	4.482		13300	24		0.93 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	708398	19	>100:1			1001.00	840.89	87.1	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	226612	20	40:1	Target = 11.29		369.57	16.245		
713 > 169	42	4.907	4.906		18507	18	>100:1	12.24 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	812791	19	>100:1			1001.00	896.96	86.9	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	191203	21	75:1	Target = 11.43		360.39	15.842		
813 > 269	40	5.283	5.282		16184	16	>100:1	11.81 (5.71-17.16)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Drift/%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.626	5.625	1/0	256113	25	40:1	Target = 13.84		356.32	15.662		
913 > 319	40	5.619	5.625		17145	22	>100:1	14.93 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	716350	20	>100:1					97.8	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.424	2.423	1	769824	20	>100:1					105	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.149	3.148	1	612735	25	>100:1					102	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	623700	23	>100:1					102	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	171360	20	>100:1					105	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d

Injection Date: 28-Dec-2020 10:48:51

Inst. ID: LCMSMS02

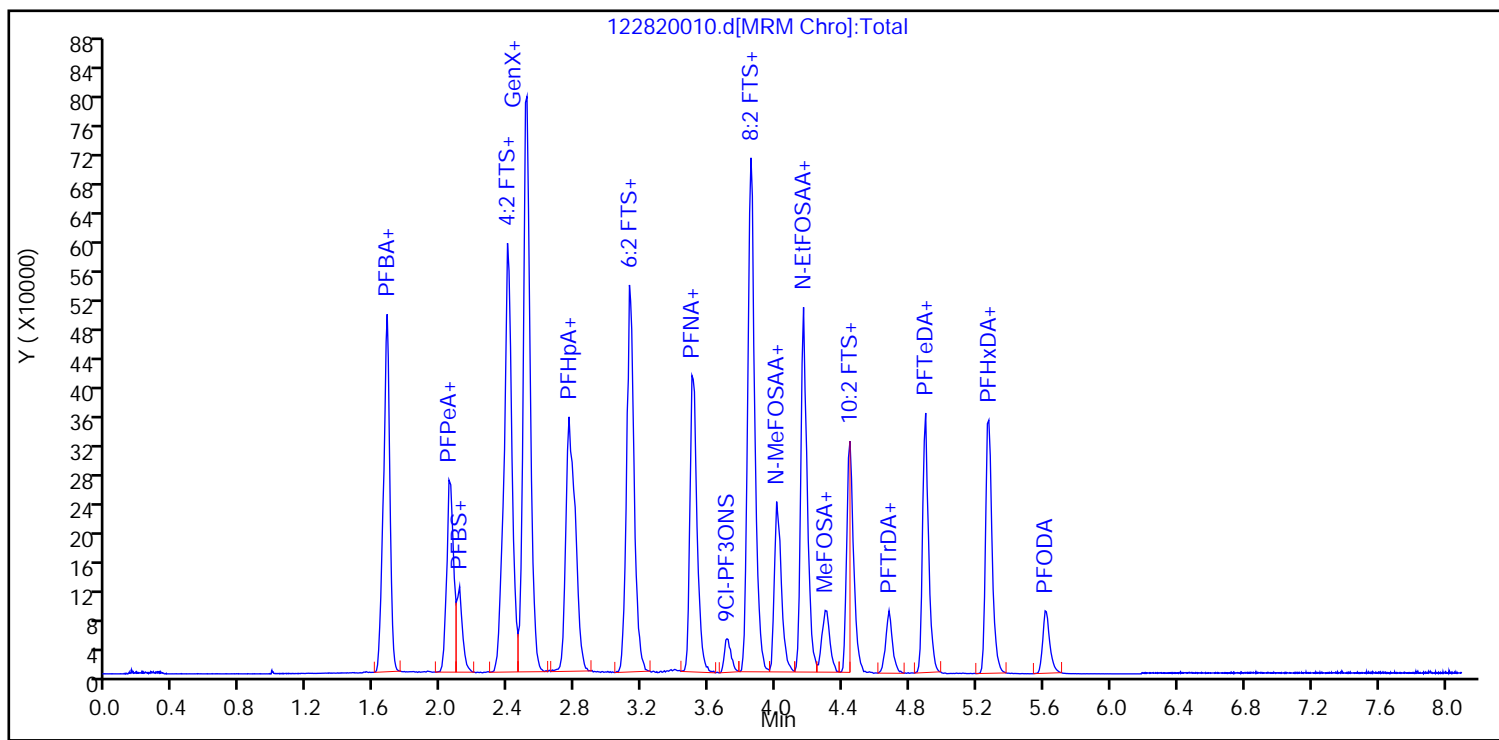
Client ID:

Lab ID: VQ77741-002

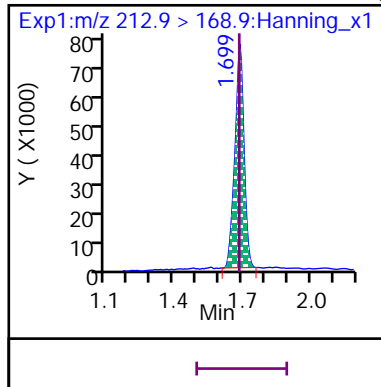
Sample Info: VQ77741-002

Dil. Factor: 1

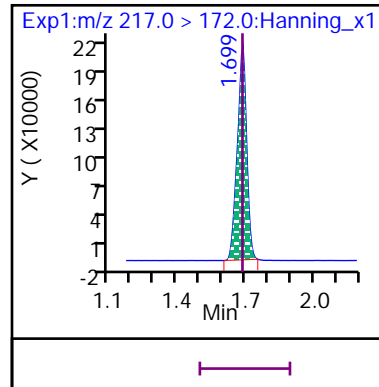
Operator: Matthew M. Miller



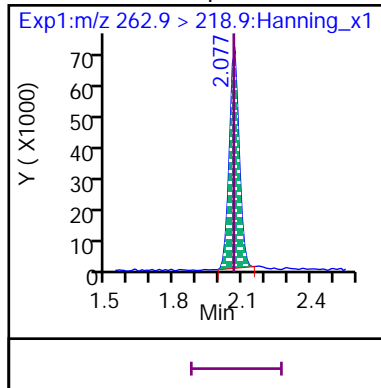
8 Perfluoro-n-butanoic acid (PFBA)



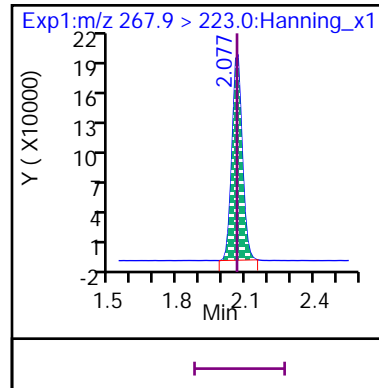
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

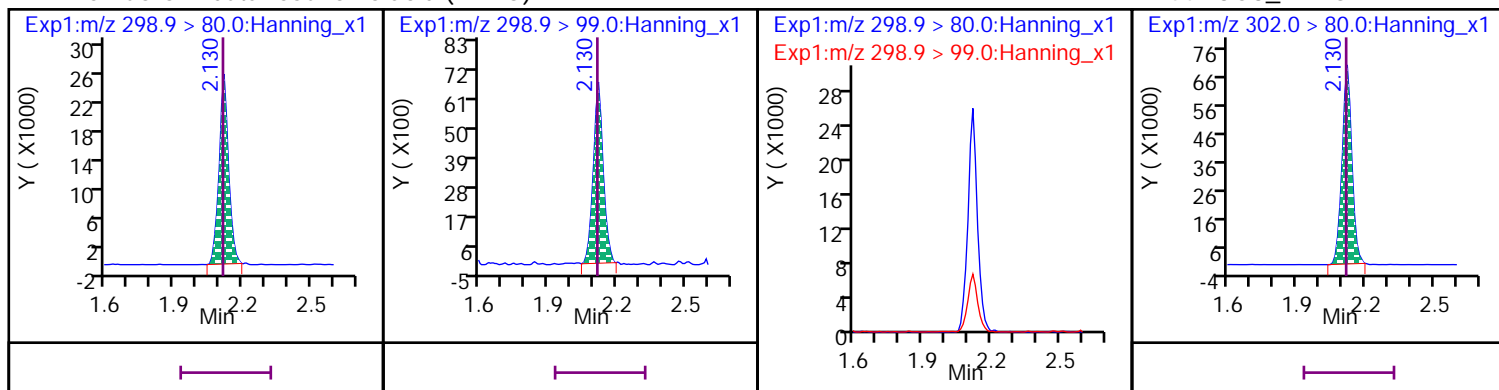


D 50 13C5\_PFPeA



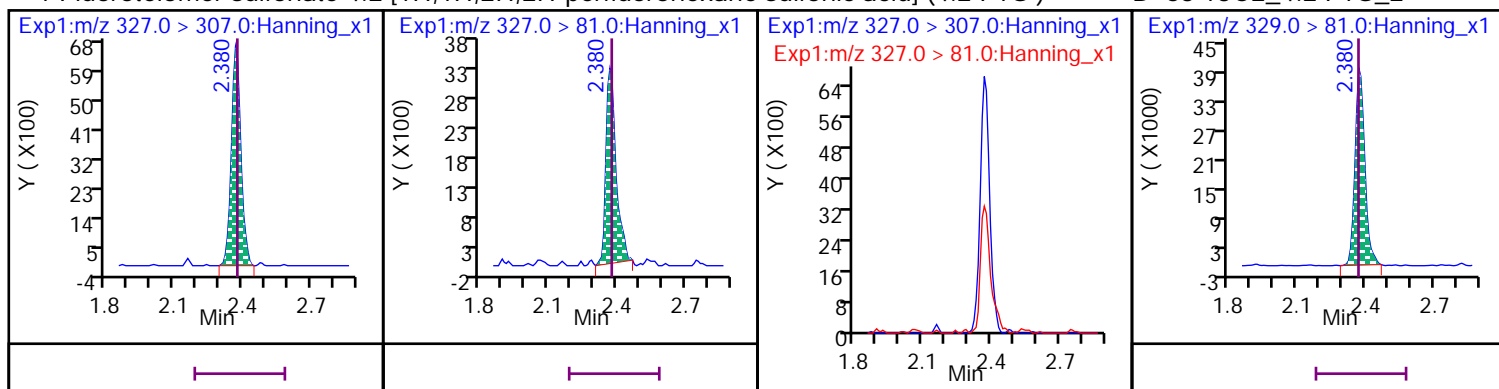
## 7 Perfluoro-1-butan-1-ylsulfonic acid (PFBS)

D 44 13C3\_PFBS



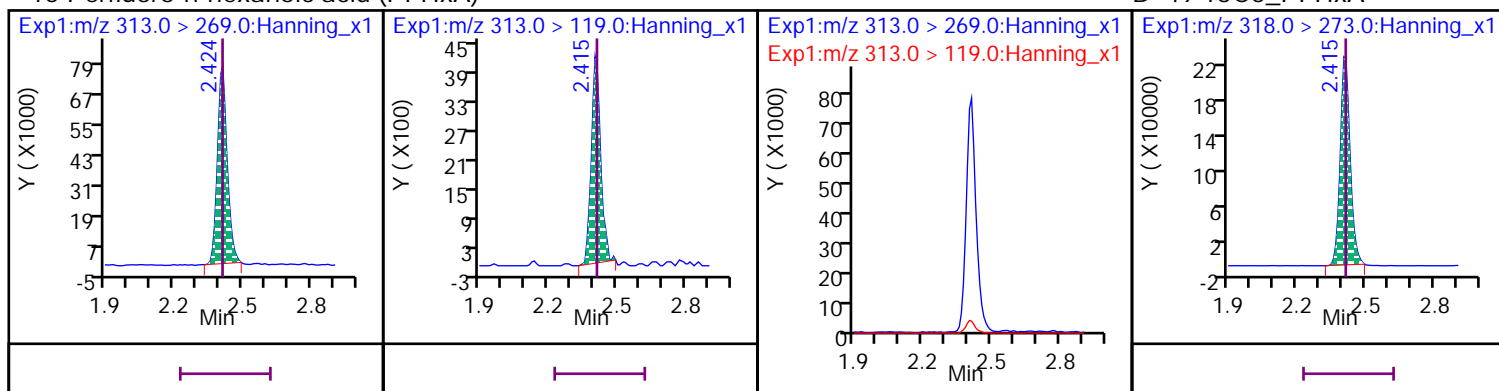
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



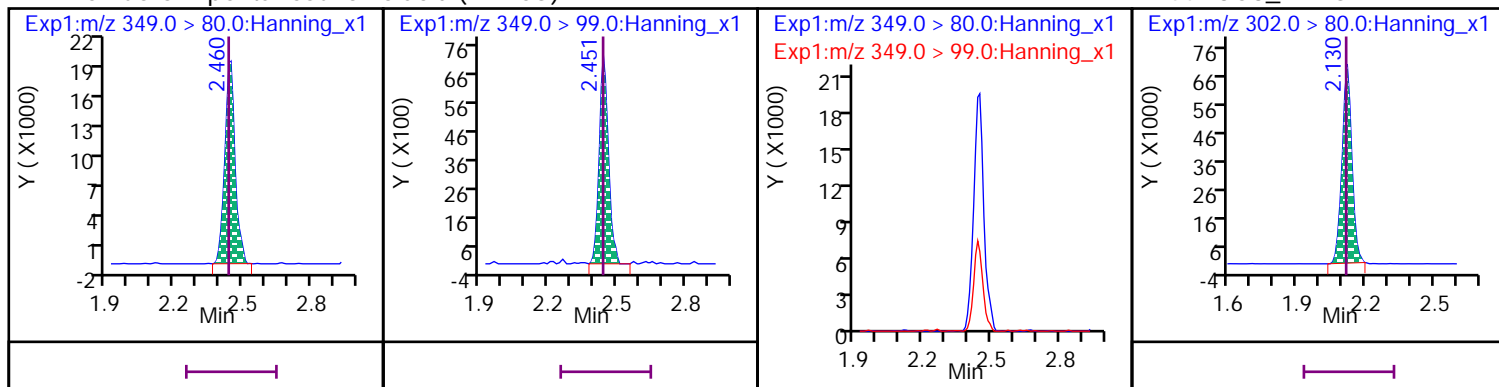
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



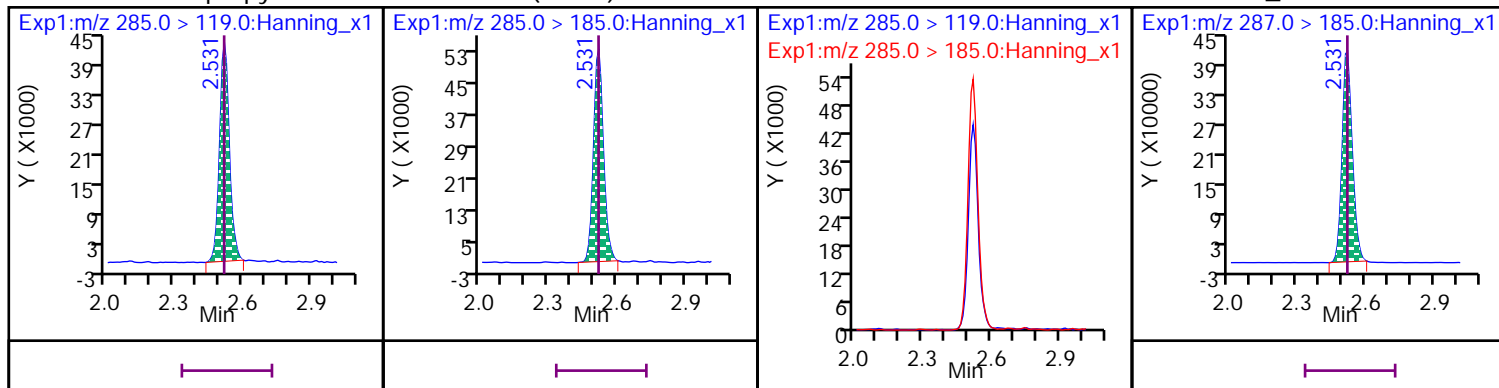
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



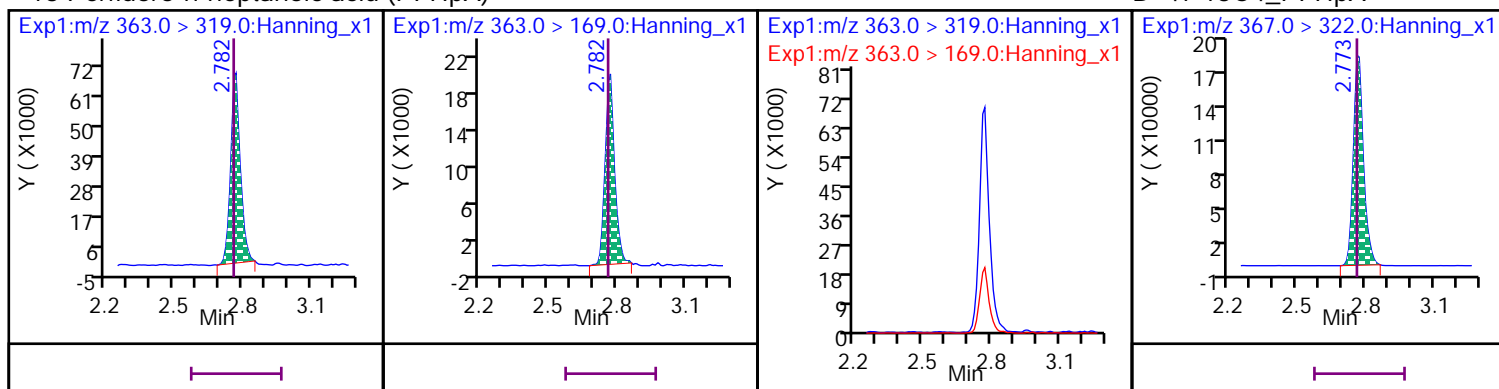
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



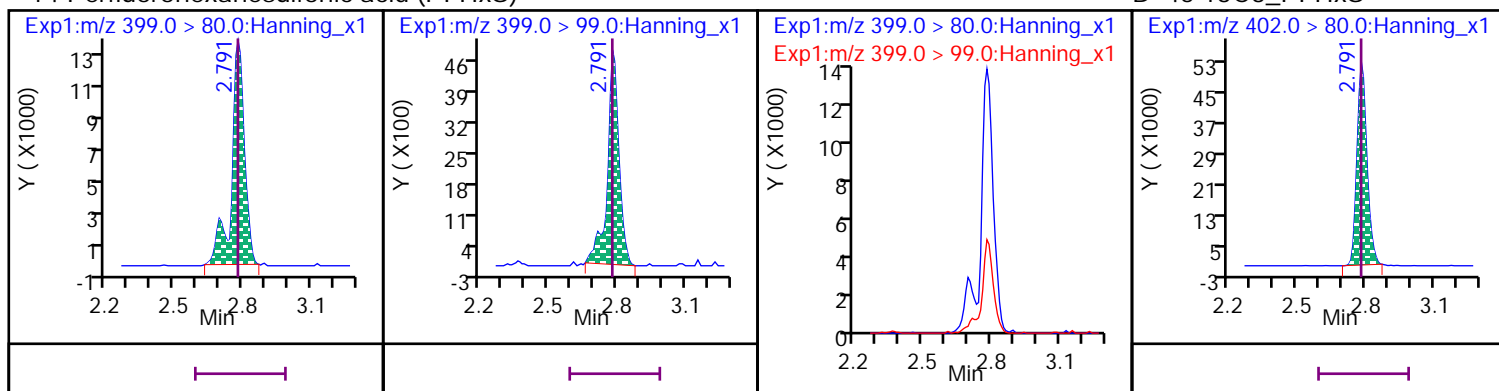
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



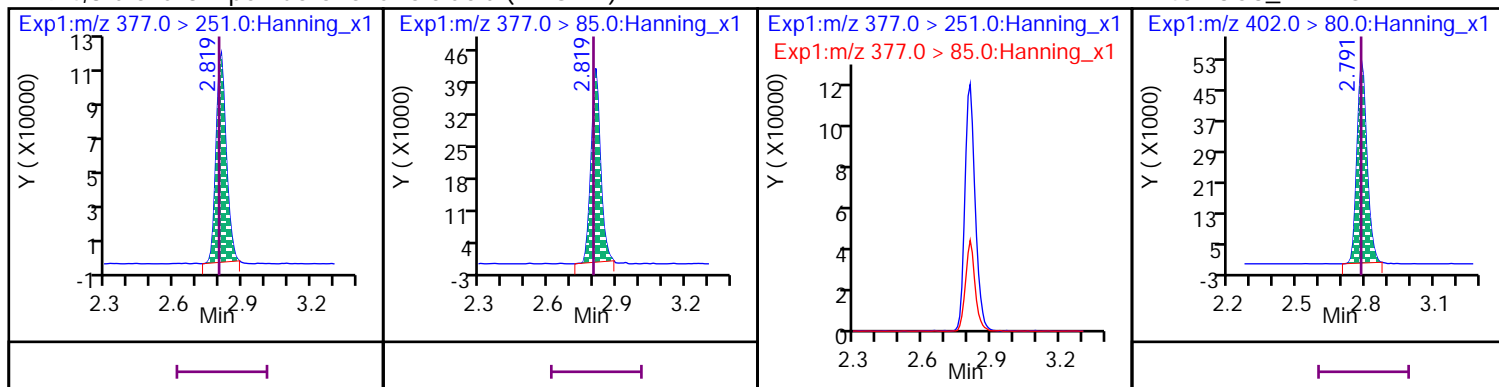
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



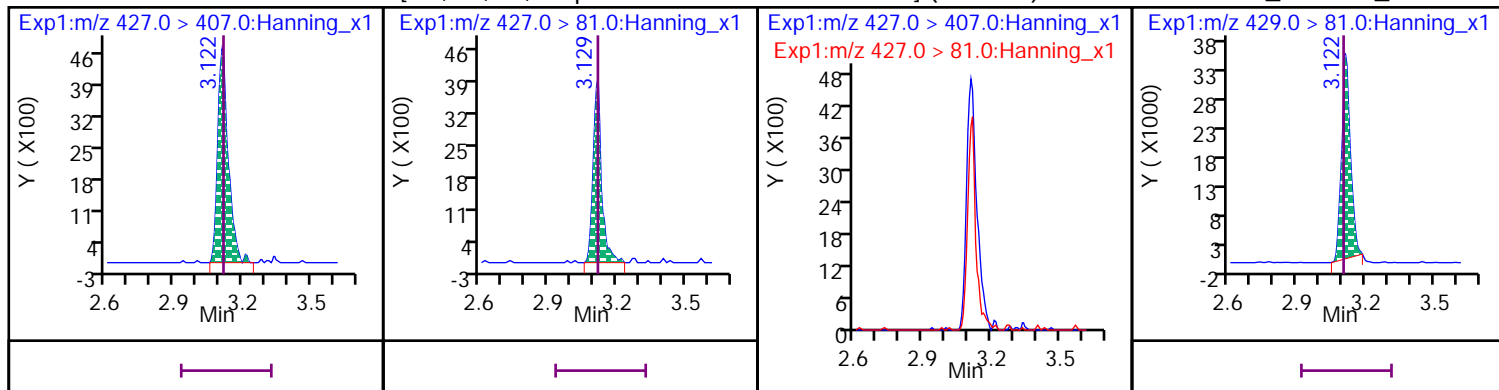
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



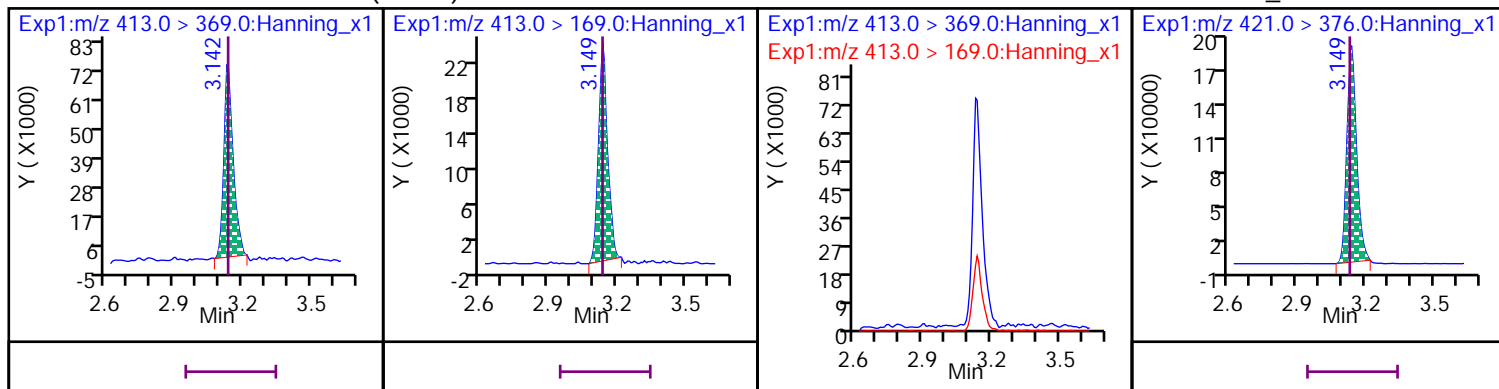
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



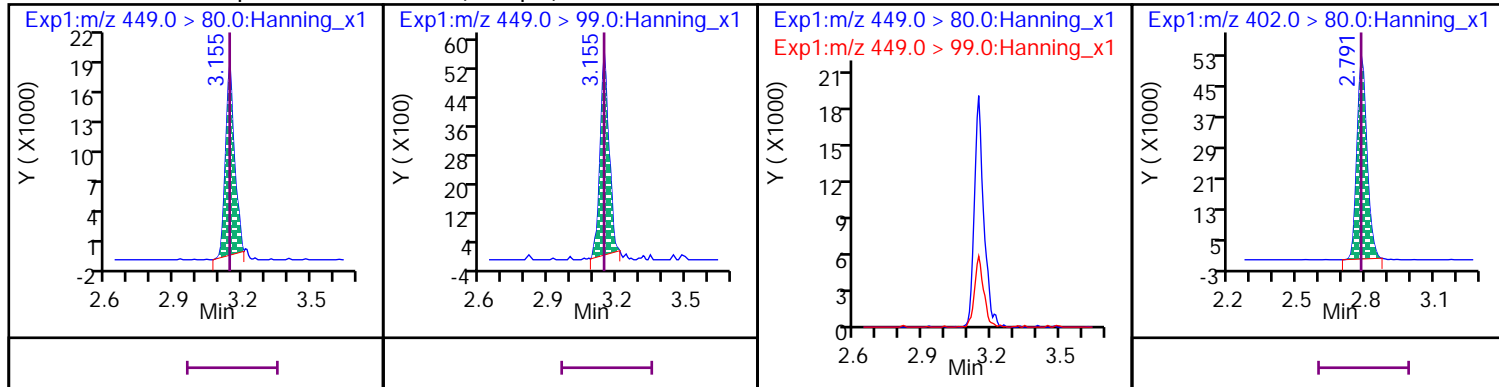
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



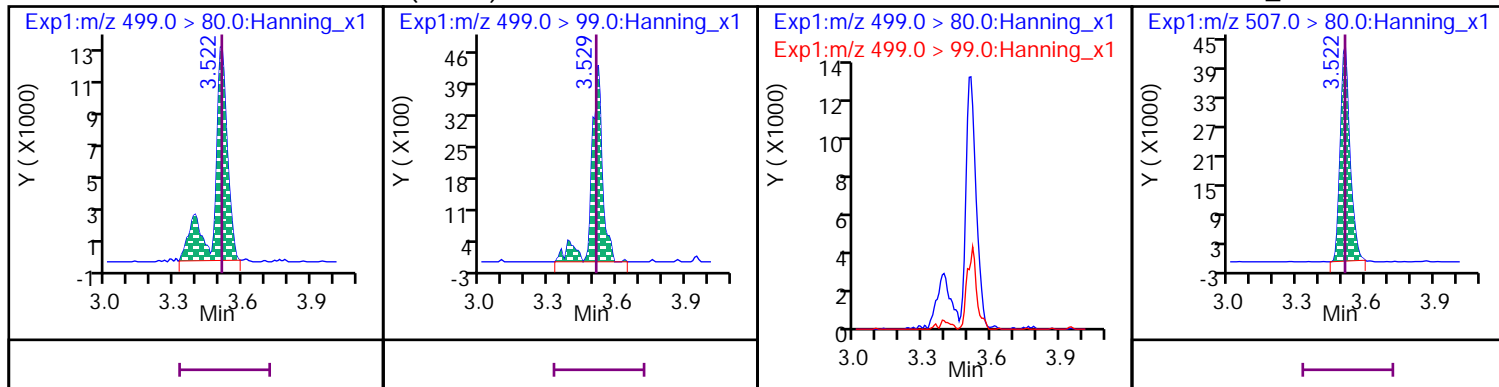
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



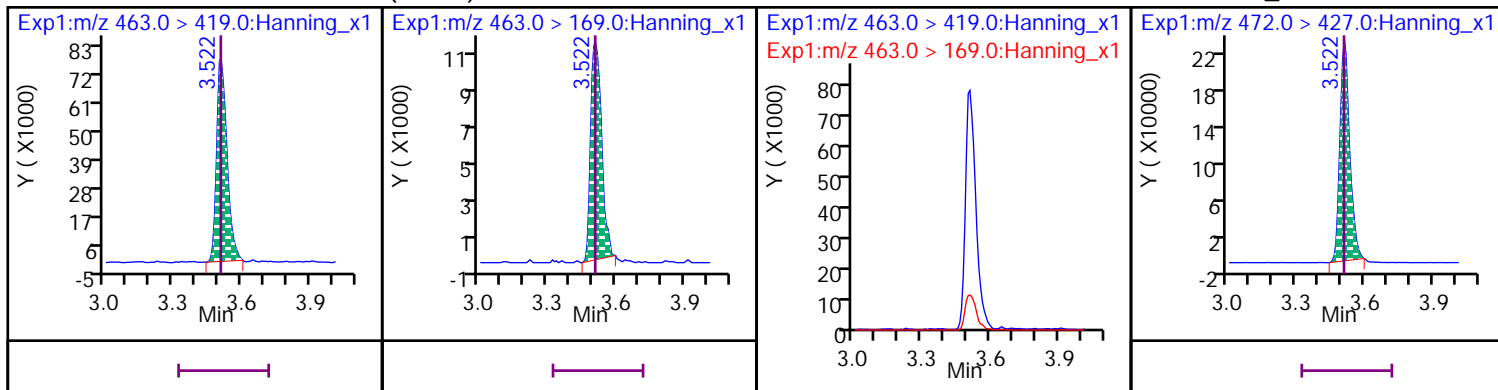
18 Perfluorooctanesulfonic acid (PFOS)

D 54 13C8\_PFOS



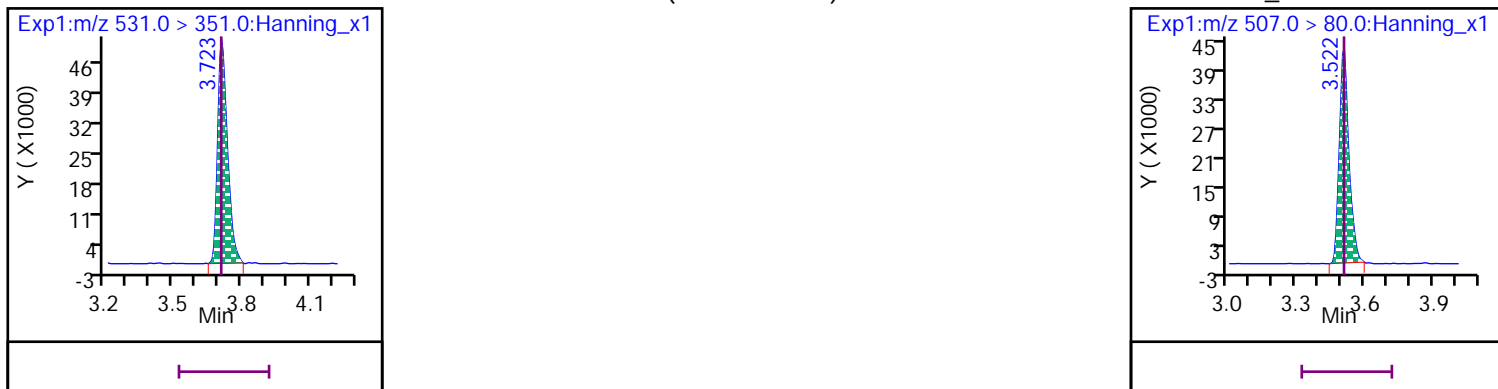
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



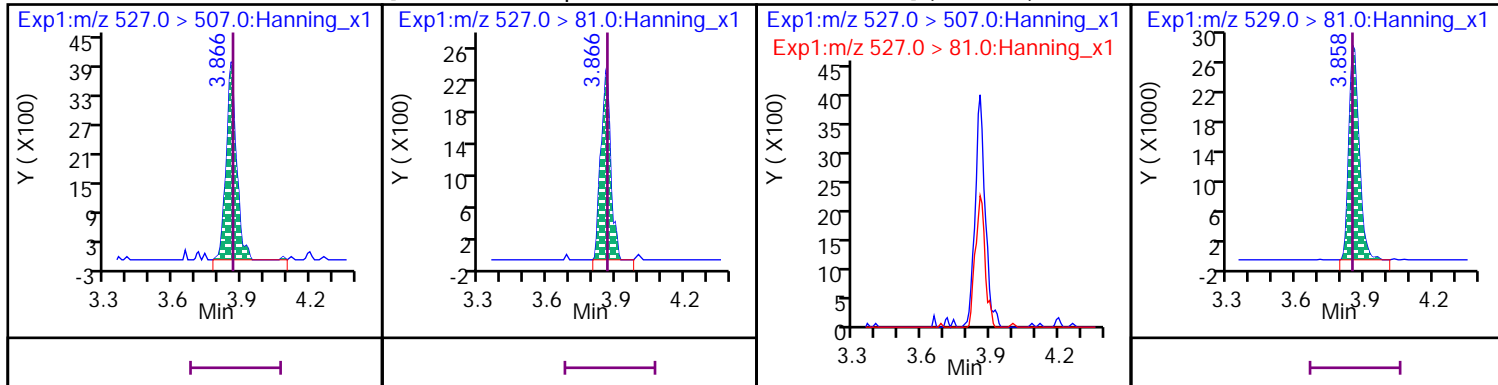
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

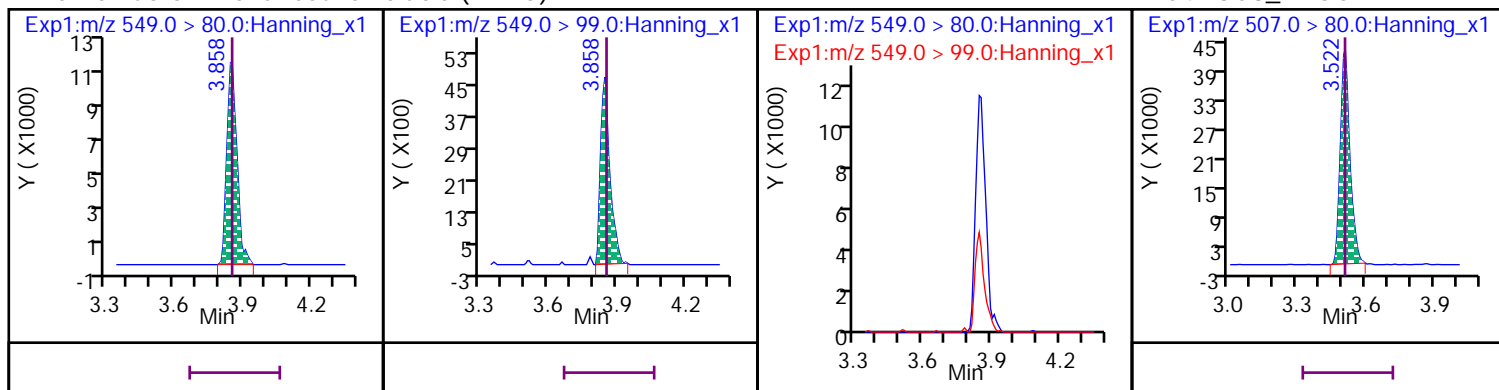
D 65 13C2\_8:2 FTS\_2





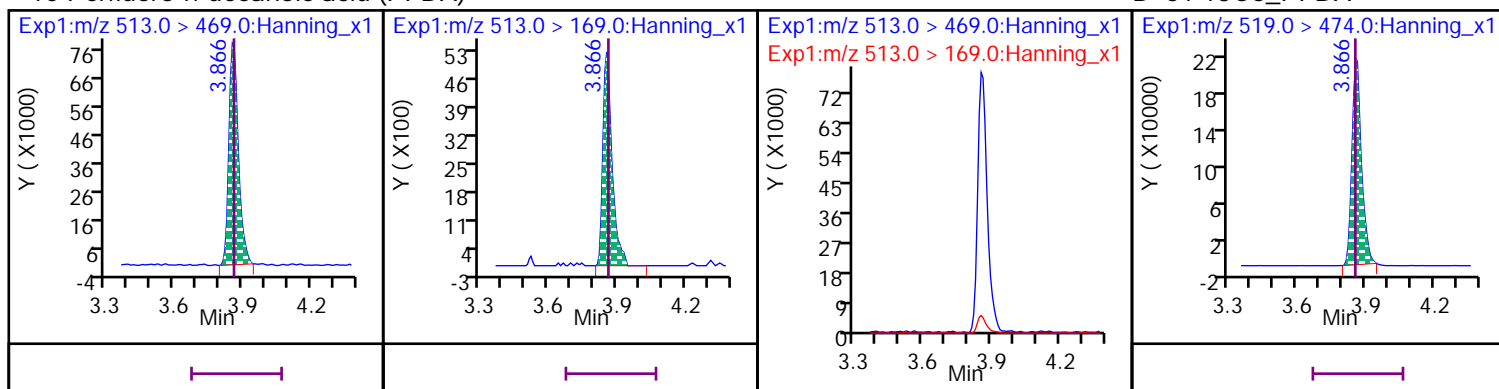
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



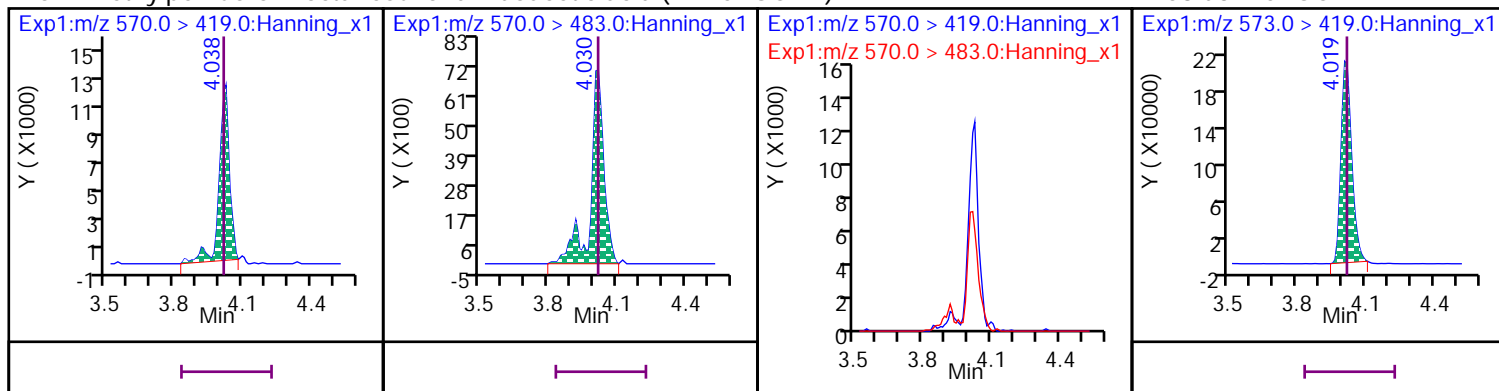
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



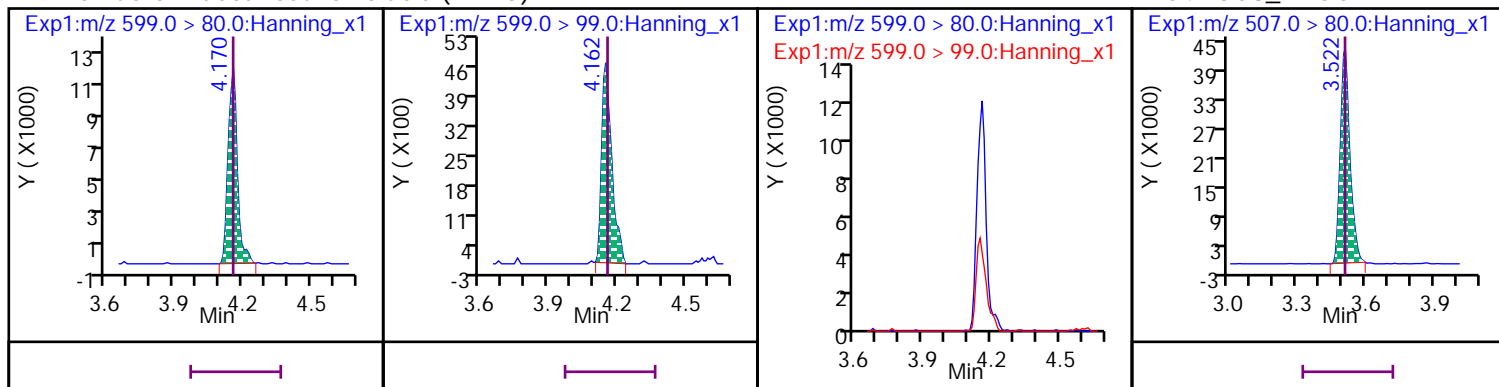
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



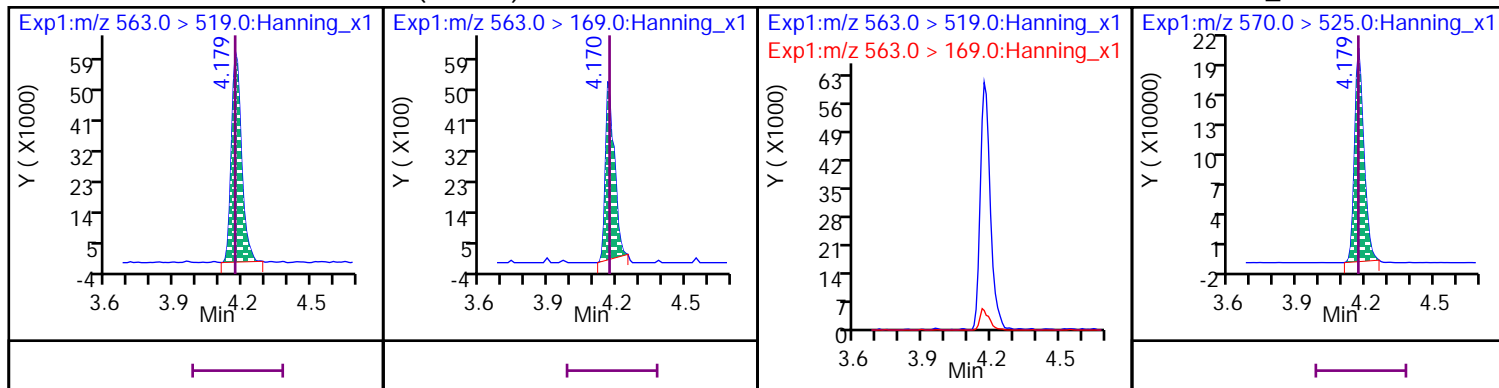
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



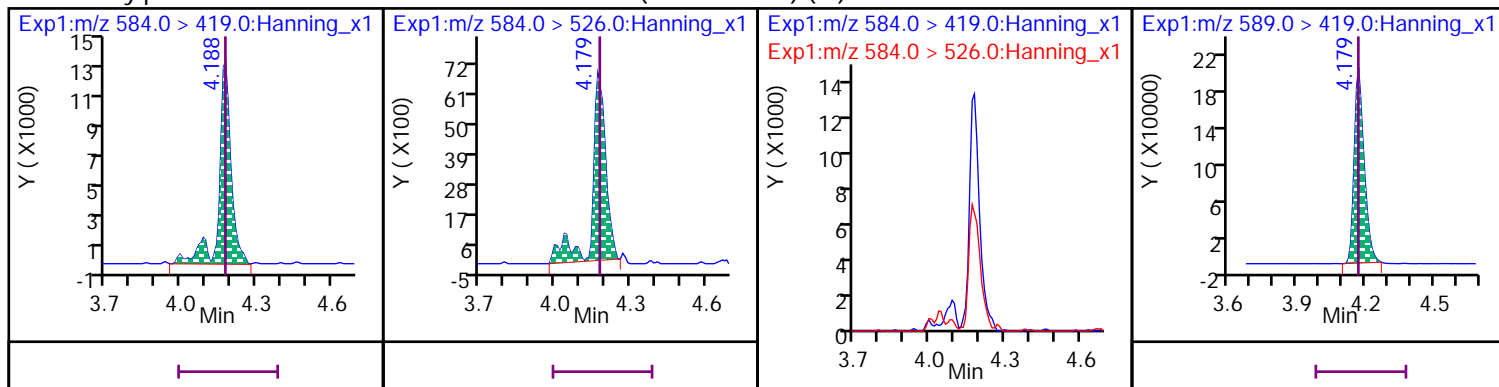
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



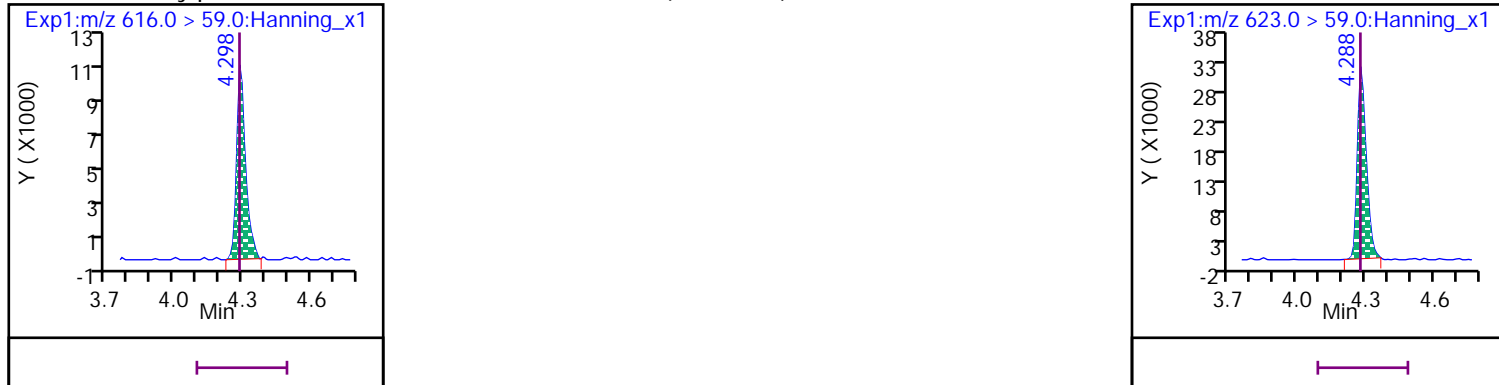
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (M)

D 60 d5-EtFOSAA



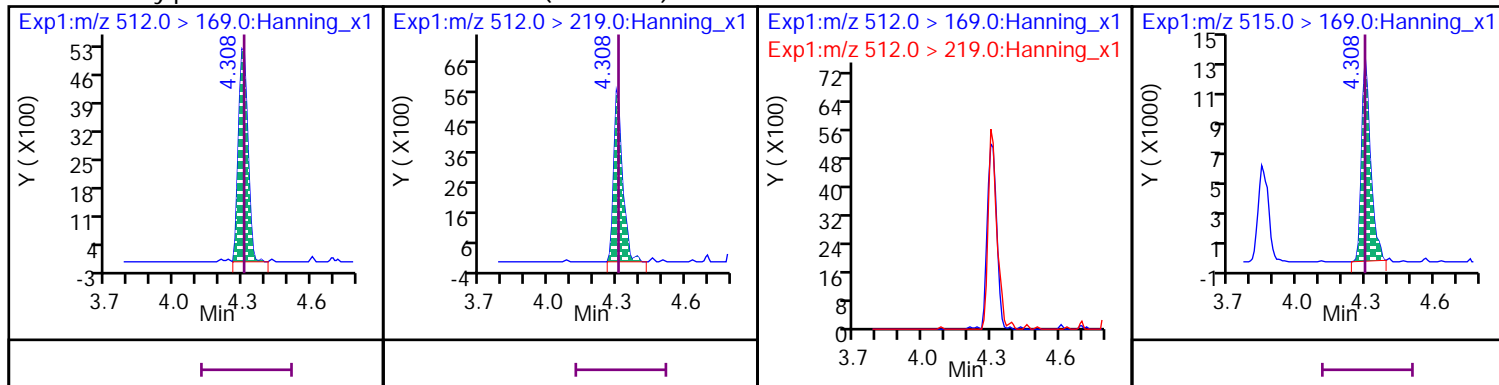
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

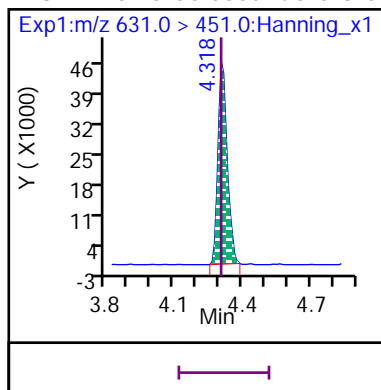


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

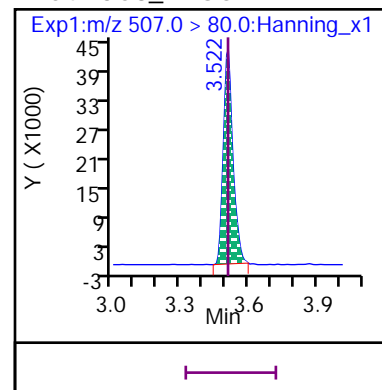
D 57 d3-MeFOSA



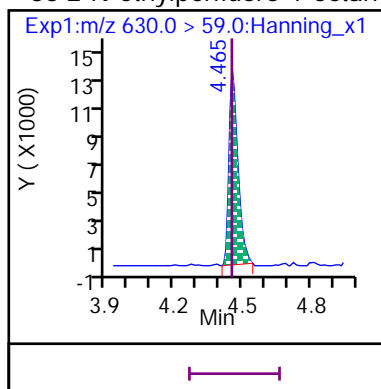
## 31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



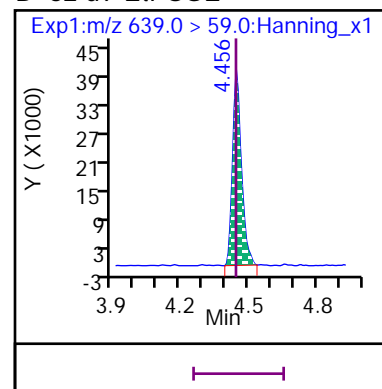
## D 54 13C8\_PFOS



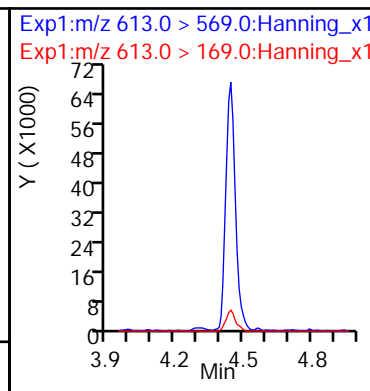
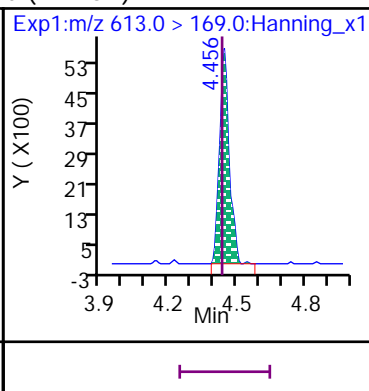
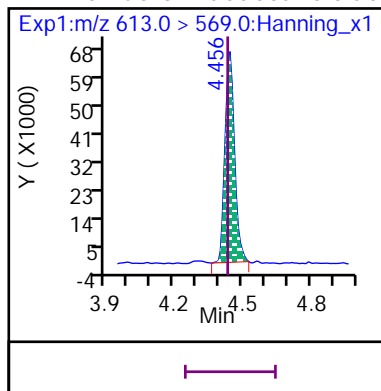
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



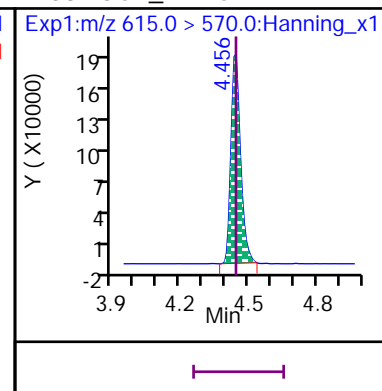
## D 62 d9-EtFOSE



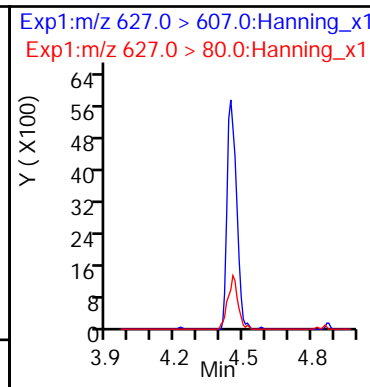
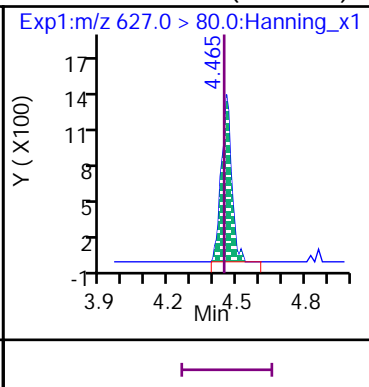
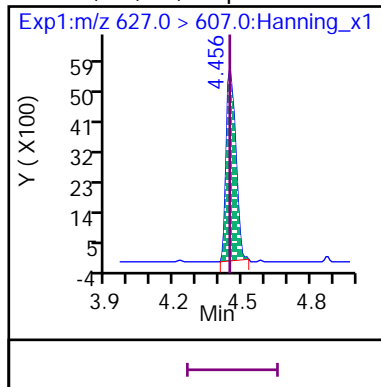
## 11 Perfluoro-n-dodecanoic acid (PFDaA)



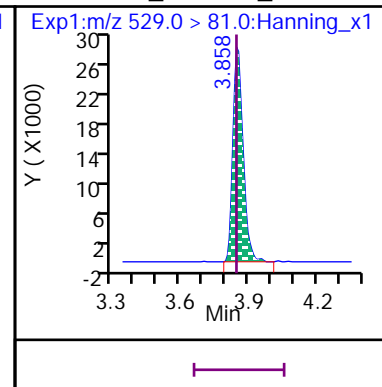
## D 38 13C2\_PFDaA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

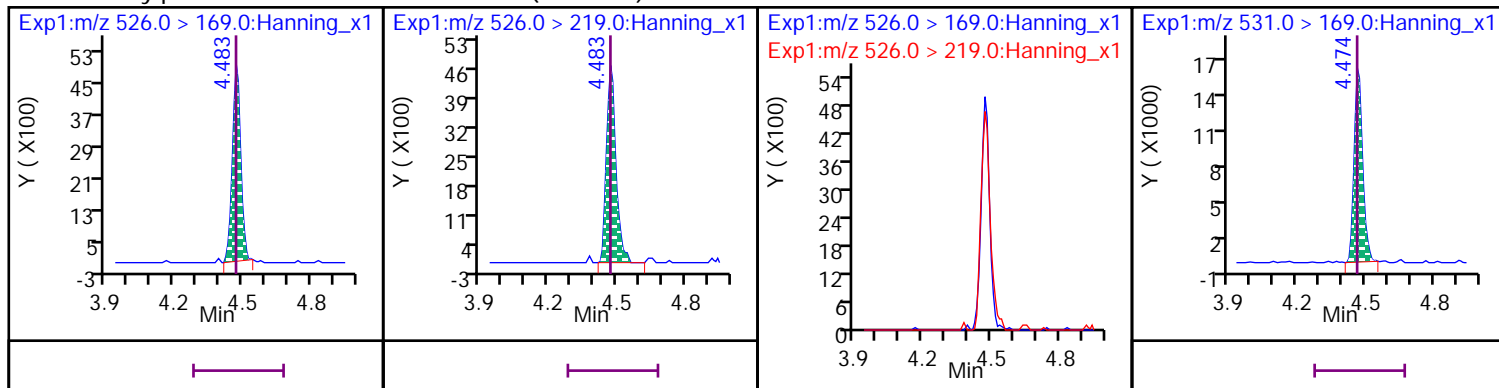


## D 65 13C2\_8:2 FTS\_2



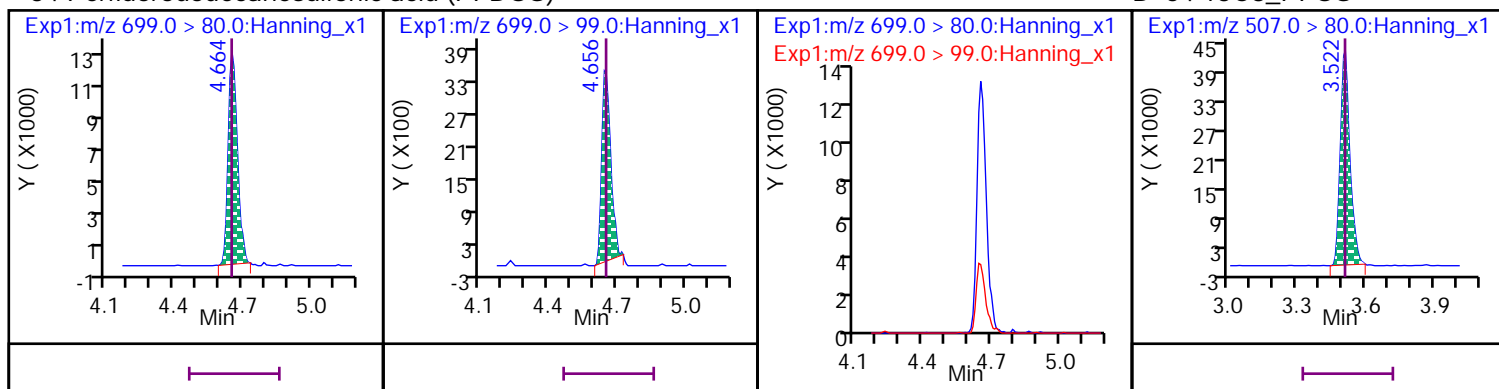
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



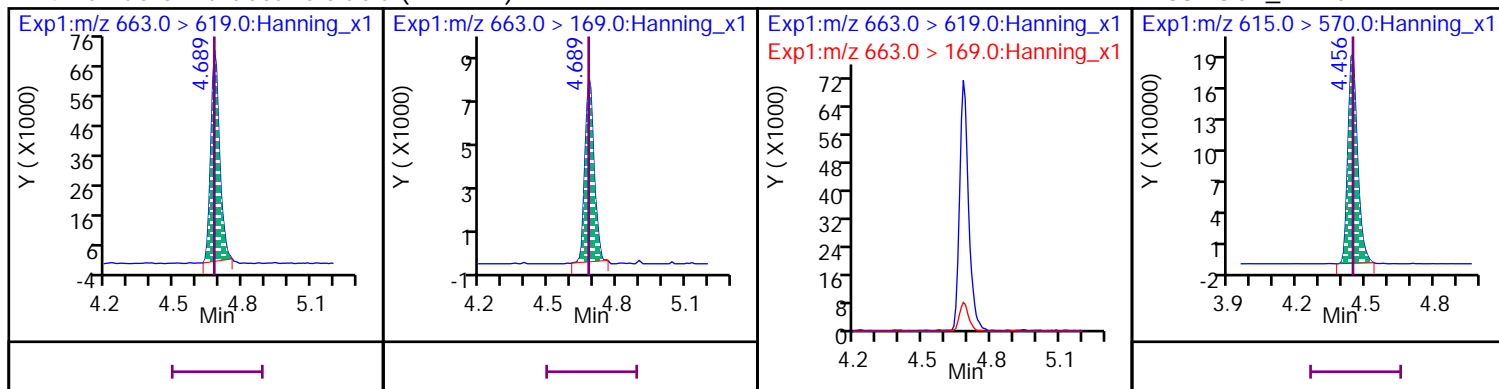
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



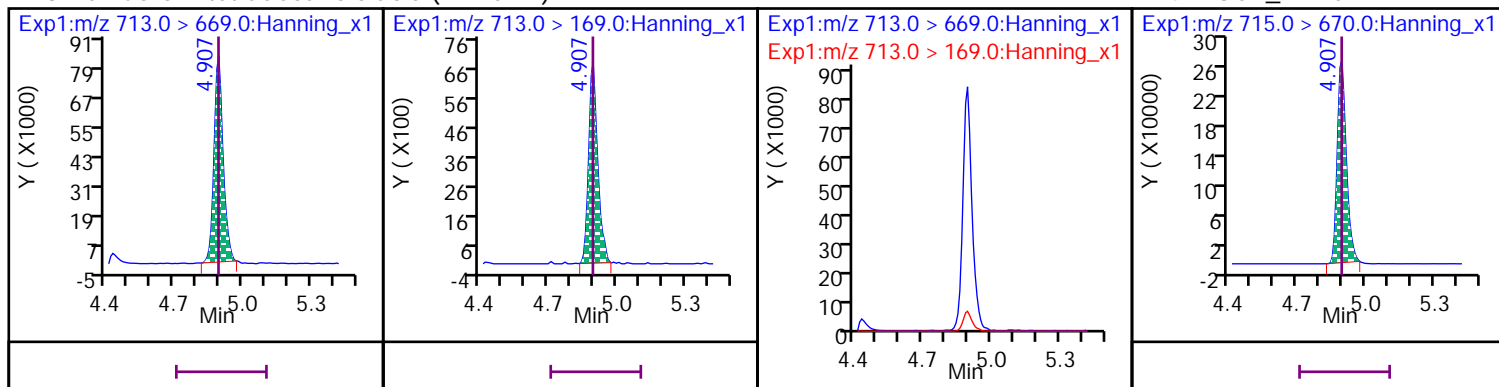
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



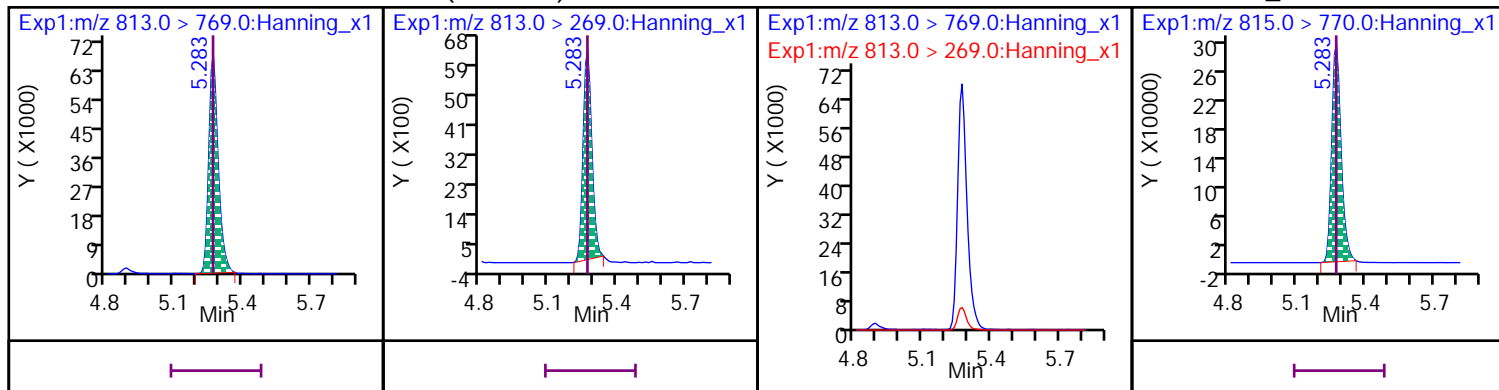
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



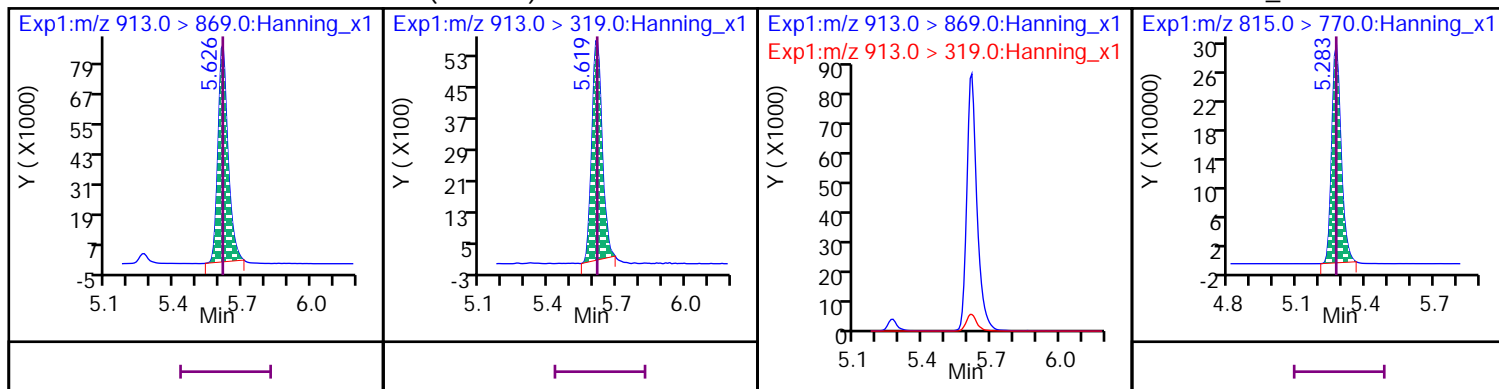
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

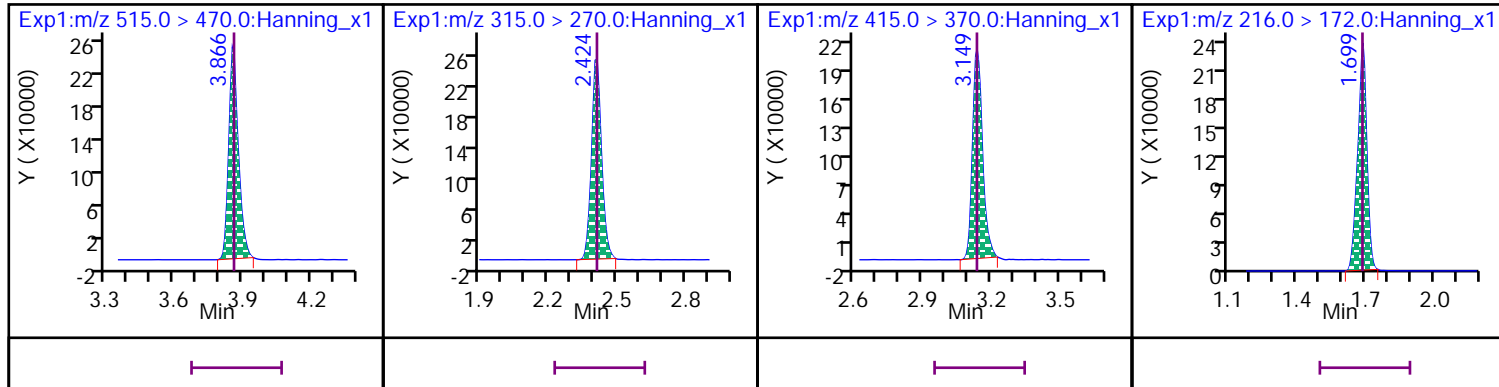


\* 37 13C2\_PFDA

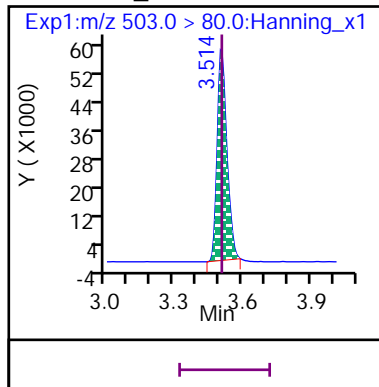
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820010.d

Injection Date: 28-Dec-2020 10:48:51

Inst. ID: LCMSMS02

Client ID:

Lab ID: VQ77741-002

Sample Info: VQ77741-002

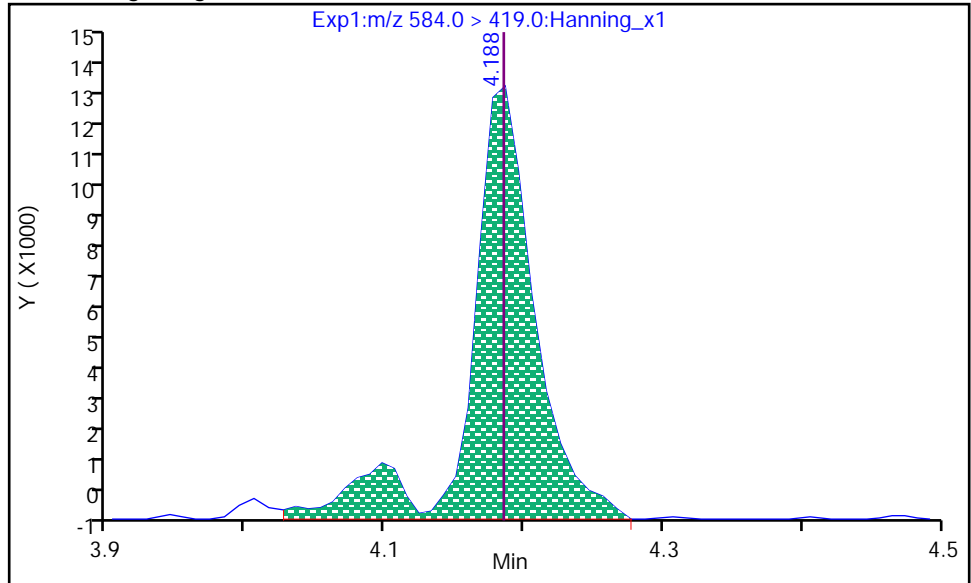
Dil. Factor: 1

Operator: Matthew M. Miller

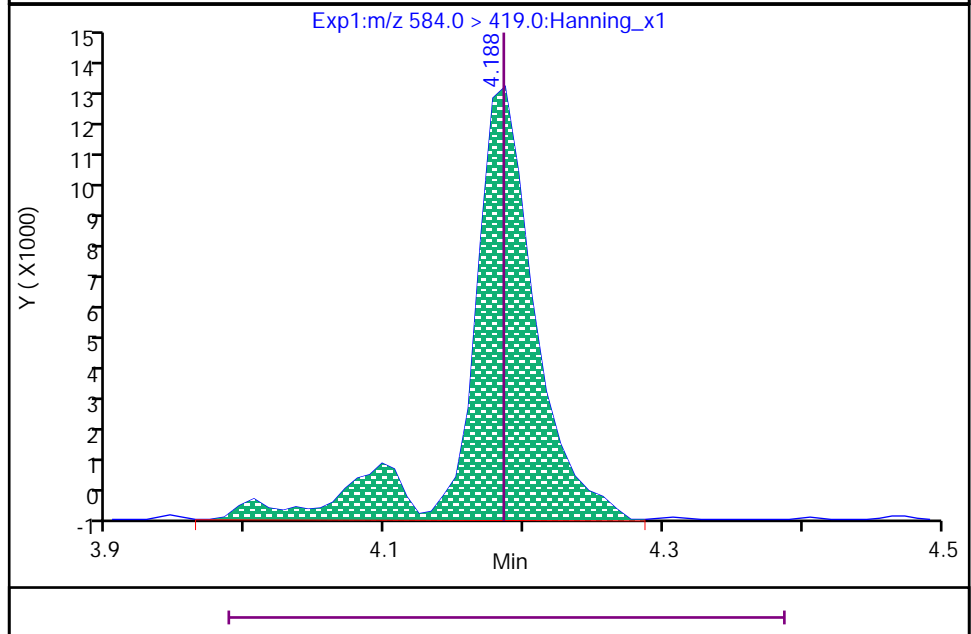
5 N-EtFOSAA, CAS: 2991-50-6

Processing Integration Results

RT: 4.188  
Area: 41350  
Conc: 15.060  
Conc Units: ng/L



RT: 4.188  
Area: 42849  
Conc: 15.606  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:27:34

Audit Action: Mint

Audit Reason: Invalid Integration

# PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9CI-PF3ONS	ND	14	13		1	93	70-150	12/28/2020 1235
11CI-PF3OUdS	ND	14	12		1	90	70-150	12/28/2020 1235
8:2 FTS	ND	14	12		1	87	67-138	12/28/2020 1235
6:2 FTS	8.1	14	19		1	78	64-140	12/28/2020 1235
GenX	ND	29	27		1	93	70-150	12/28/2020 1235
ADONA	ND	14	14		1	100	70-150	12/28/2020 1235
EtFOSAA	ND	15	14		1	98	61-135	12/28/2020 1235
MeFOSAA	ND	15	16		1	112	65-136	12/28/2020 1235
PFBS	4.6	13	16		1	88	72-130	12/28/2020 1235
PFHxS	17	13	19	N	1	14	68-131	12/28/2020 1235
PFBA	110	15	97	N	1	-57	73-129	12/28/2020 1235
PFDA	ND	15	13		1	90	71-129	12/28/2020 1235
PFDoA	ND	15	15		1	100	72-134	12/28/2020 1235
PFHpA	2.2	15	17		1	100	72-130	12/28/2020 1235
PFHxA	4.6	15	17		1	87	72-129	12/28/2020 1235
PFNA	ND	15	14		1	98	69-130	12/28/2020 1235
PFOA	9.1	15	21		1	80	71-133	12/28/2020 1235
PFPeA	11	15	23		1	82	72-129	12/28/2020 1235
PFTeDA	ND	15	14		1	98	71-132	12/28/2020 1235
PFTrDA	ND	15	14		1	97	65-144	12/28/2020 1235
PFUdA	ND	15	15		1	101	69-133	12/28/2020 1235
PFOS	8.5	14	17		1	66	65-140	12/28/2020 1235

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		125	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		91	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		102	50-150
13C8_PFOS		89	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		92	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MS

Sample ID: VL11043-001MS

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820020.d  
 Injection Date: 28-Dec-2020 12:35:00 Injection Vol: 10.0 uL  
 Sample Type: MS Auto Sampler: 12  
 Lab Sample ID: VL11043-001MS Lab Prep. Batch: 77741  
 Sample Info: VL11043-001MS Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0401059$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	274	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
 Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 669462 22 >100:1 1001.00 965.27 103

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.705 1.696 1/0 1609403 34 84:1 2416.11 96.900

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 674402 18 >100:1 1001.00 980.40 101

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.077 2.072 1/1 396808 18 51:1 585.80 23.494

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 216622 16 >100:1 1001.00 940.89 90.9

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 101695 18 61:1 Target = 3.34 398.57 15.985

298.9 > 99 44 2.130 2.125 31333 17 98:1 3.24 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.451 2.450 1/0 75636 18 >100:1 Target = 3.09 402.92 16.159

349 > 99 44 2.442 2.450 24822 20 85:1 3.04 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.379 1 188026 18 >100:1 5005.00 7767.00 131

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.380 2.388 0/-1 27513 17 >100:1 Target = 1.64 366.96 14.717

327 > 81 63 2.380 2.388 11862 14 27:1 2.31 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 720410 18 >100:1 1001.00 977.40 96.9

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.423 0/0 306984 19 92:1 Target = 17.01 432.05 17.328

313 > 119 49 2.416 2.423 18362 17 81:1 16.71 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1328501 18 >100:1 5005.00 4987.73 94.8

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.532 2.530 1/1 129772 20 >100:1 Target = 0.79 680.49 27.292

285 > 185 66 2.523 2.530 164125 19 >100:1 0.79 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 565617 20 >100:1 1001.00 932.37 89.3

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	245662	17	>100:1	Target = 3.79		419.14	16.810		
363 > 169	47	2.773	2.772		63766	17	>100:1	3.85 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	167876	18	>100:1			1001.00	980.42	96.4	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	84054	26	>100:1	Target = 3.80	0.18	472.69	18.958		
399 > 99	45	2.791	2.790		29456	24	>100:1	2.85 (1.90-5.71)	0.08				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.810	2.808	1/0	363629	19	>100:1	Target = 2.97		341.52	13.697		
377 > 85	45	2.810	2.808		114548	19	>100:1	3.17 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.156	3.154	1/0	49706	20	>100:1	Target = 3.09		326.26	13.085		
449 > 99	45	3.149	3.154		16320	20	>100:1	3.04 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	130502	20	>100:1			5005.00	6776.37	125	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	26216	22	>100:1	Target = 1.77		470.91	18.886		
427 > 81	64	3.129	3.128		14736	25	88:1	1.77 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	640931	23	>100:1			1001.00	1082.90	102	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	338593	36	>100:1	Target = 2.85	0.14	518.72	20.804		
413 > 169	53	3.142	3.148		121552	38	>100:1	2.78 (1.42-4.28)	0.17				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.514	3.520	0	134927	23	>100:1			1001.00	899.94	88.5	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.522	3.520	1/1	69089	58	>100:1	Target = 6.80	0.56	432.54	17.348		
499 > 99	54	3.514	3.520		19501	40	>100:1	3.54 (3.40-10.20)	0.31				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/1	143403	21	>100:1			316.02	12.674		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/0	33725	21	>100:1	Target = 3.03		326.94	13.112		
549 > 99	54	3.858	3.865		12166	26	53:1	2.77 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.169	0/0	38274	25	>100:1	Target = 2.74		391.26	15.692		
599 > 99	54	4.153	4.169		12476	15		3.06 (1.37-4.11)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.328	4.317	1/1	117577	16	>100:1			307.15	12.318		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.663	1/1	31750	19	>100:1	Target = 3.16		293.40	11.767		
699 > 99	54	4.664	4.663		9628	17	>100:1	3.29 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	734650	21	>100:1			1001.00	978.28	95.7	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	260962	22	>100:1	Target = 6.19		355.56	14.260		
463 > 169	56	3.522	3.520		44827	28	>100:1	5.82 (3.09-9.28)					
<b>D 55 13C8_PFOA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	299195	18	>100:1			1001.00	966.50	96.9	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	104704	18	>100:1			355.47	14.257		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	99437	22	>100:1			5005.00	5360.44	99	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.866	3.873	0/-1	12622	18	82:1	Target = 2.11		304.59	12.216		
527 > 81	65	3.866	3.873		7382	21	63:1	1.70 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.455	1/0	14593	25	>100:1	Target = 3.05		317.85	12.748		
627 > 80	65	4.456	4.455		3873	38		3.76 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	651627	21	>100:1			1001.00	982.35	96.8	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.874	3.873	1/0	210481	17	>100:1	Target = 13.22		329.06	13.197		
513 > 169	51	3.866	3.873		16545	16	69:1	12.72 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	742392	18	>100:1			5005.00	5172.04	93.8	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.039	4.029	1/0	46431	33	>100:1	Target = 1.34	0.10	407.50	16.343		
570 > 483	58	4.030	4.029		29543	33	>100:1	1.57 (0.67-2.02)	0.23				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	671322	18	>100:1			5005.00	5054.58	91.8	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.188	4.187	1/0	47696	32	>100:1	Target = 1.71	0.14	357.17	14.325		
584 > 526	60	4.188	4.187		29369	30	91:1	1.62 (0.85-2.57)	0.20				
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	590083	18	>100:1			1001.00	933.57	91.7	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.178	1/0	204325	20	>100:1	Target = 16.05		368.78	14.790		
563 > 169	52	4.179	4.178		14616	16	57:1	13.97 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.287	1	98200	19	>100:1			1001.00	907.51	93.2	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.308	4.297	1/0	27760	17	>100:1			301.16	12.078		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.307	1	35822	14	>100:1			1001.00	676.95	69.1	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.318	4.317	1/0	18076	15	>100:1	Target = 1.18		447.71	17.956		
512 > 219	57	4.308	4.317		19485	16	94:1	0.92 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	102619	16	>100:1			1001.00	818.36	74.8	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.464	1/0	39016	17	>100:1			427.78	17.156		
<b>D 38 13C2_PFDaA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	573929	20				1001.00	948.15	93.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDaA) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	211489	17	>100:1	Target = 10.35		364.25	14.608		
613 > 169	38	4.456	4.446		19251	17	>100:1	10.98 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	198432	20	>100:1	Target = 8.56		351.38	14.092		
663 > 169	38	4.689	4.688		24630	23	>100:1	8.05 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	41662	22	>100:1			1001.00	848.61	82.9	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	15357	15	83:1	Target = 1.08		337.73	13.545		
526 > 219	59	4.483	4.482		13912	17	59:1	1.10 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	698383	19	>100:1			1001.00	829.00	85.9	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	215678	19	35:1	Target = 11.29		356.78	14.309		
713 > 169	42	4.907	4.906		19406	18	>100:1	11.11 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	726927	19	>100:1			1001.00	802.20	77.7	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	174440	18	68:1	Target = 11.43		367.64	14.744		
813 > 269	40	5.283	5.282		15238	20	>100:1	11.44 (5.71-17.16)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.619	5.625	0/-1	221702	25	39:1	Target = 13.84		344.88	13.832		
913 > 319	40	5.619	5.625		14523	20	>100:1	15.26 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.874	3.873	1	744047	19	>100:1					102	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	805628	18	>100:1					110	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	711218	22	>100:1					119	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	704555	21	>100:1					116	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	170395	23	>100:1					105	

**Compound Type Legend**

D - Isotopic Dilution Std.  
 \* - ISTD

**QC Flag Legend**

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820020.d

Injection Date: 28-Dec-2020 12:35:00

Inst. ID: LCMSMS02

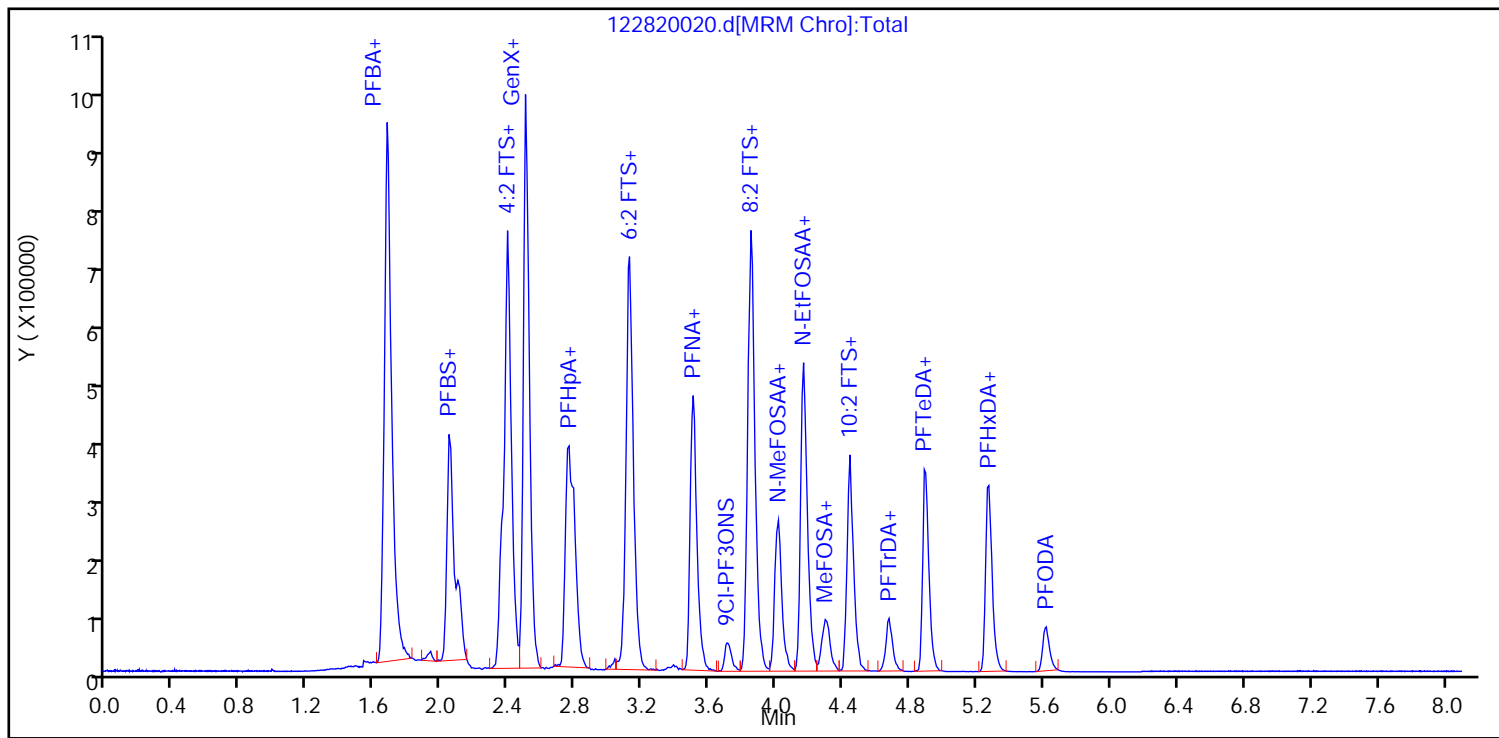
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Lab ID: VL11043-001MS

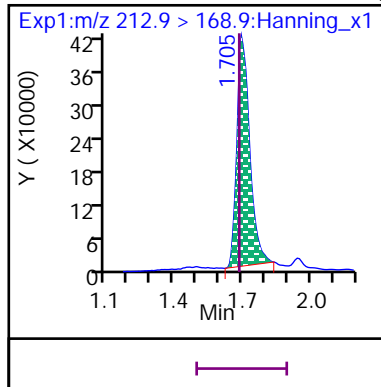
Sample Info: VL11043-001MS

Dil. Factor: 1

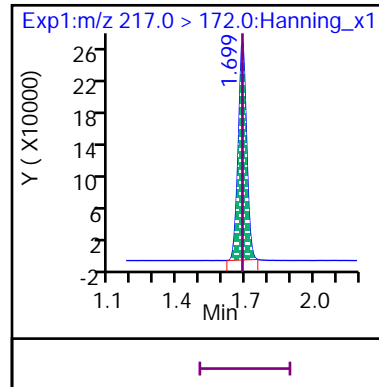
Operator: Matthew M. Miller



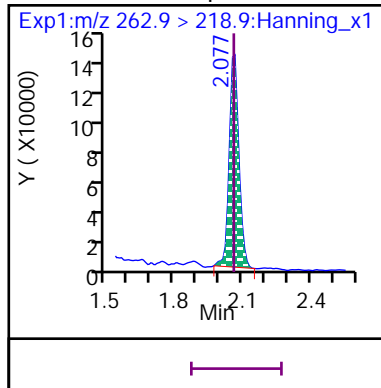
8 Perfluoro-n-butanoic acid (PFBA)



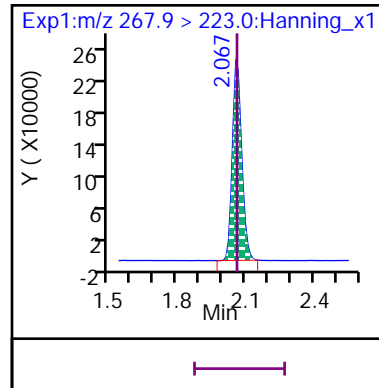
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

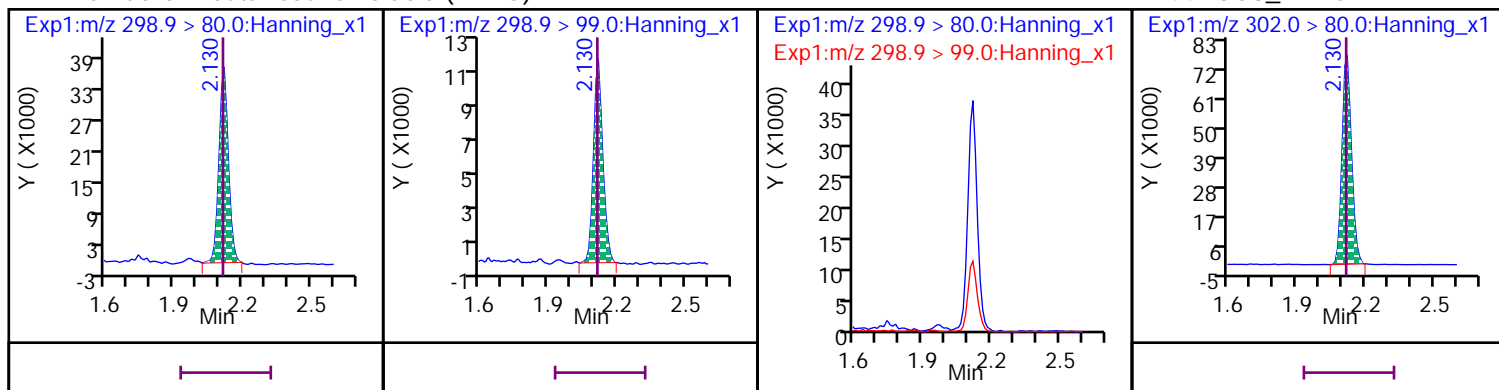


D 50 13C5\_PFPeA



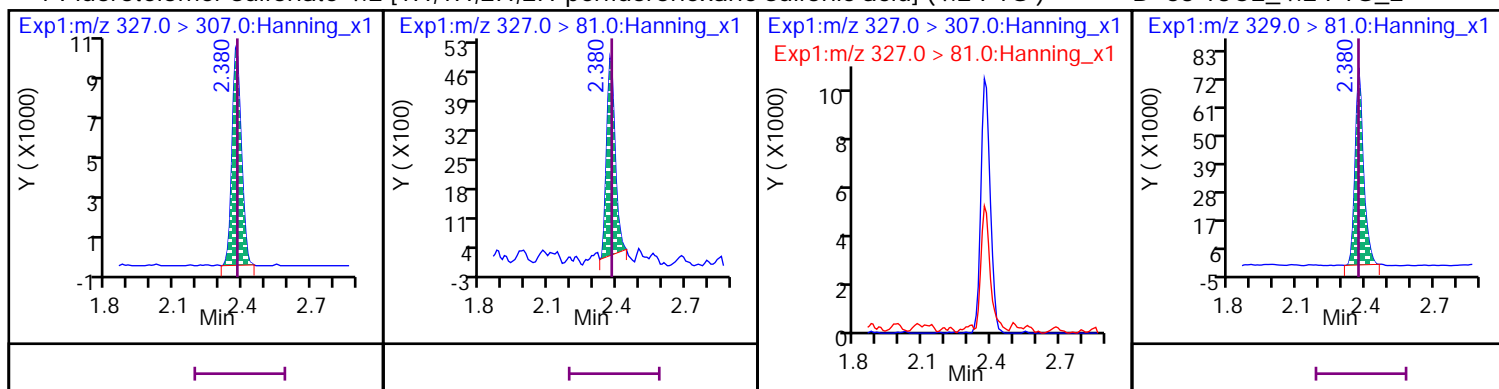
## 7 Perfluoro-1-butan-1-ylsulfonic acid (PFBS)

D 44 13C3\_PFBS



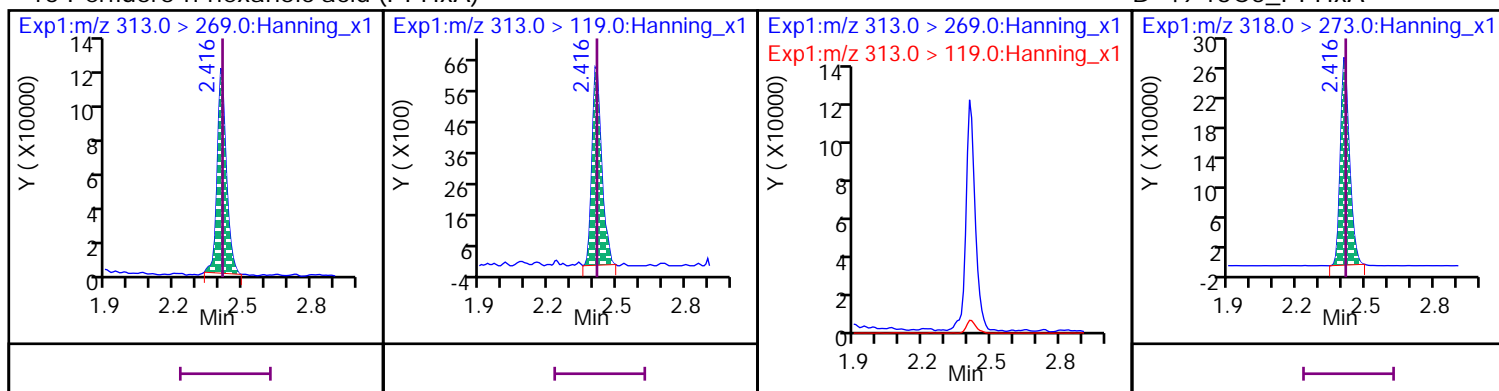
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



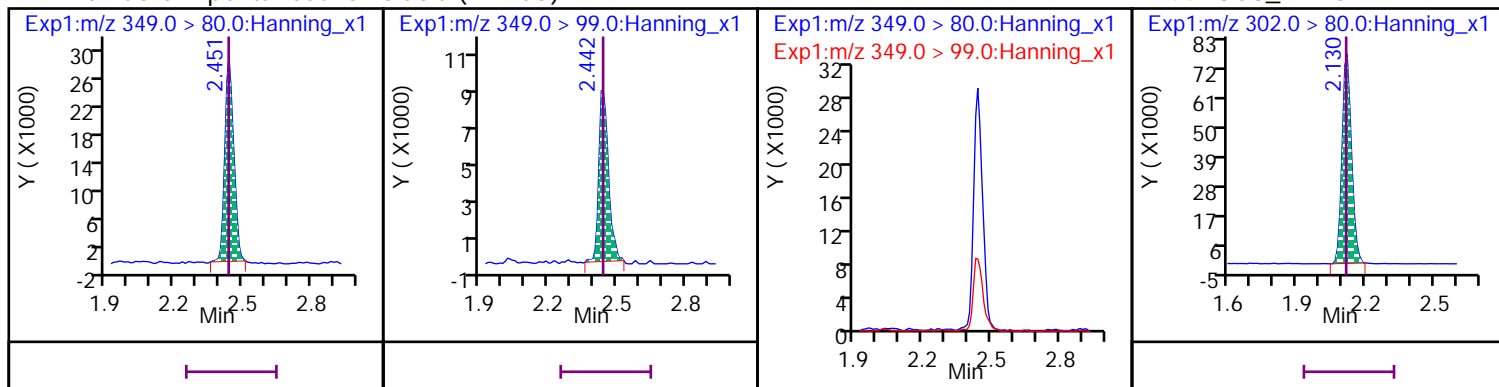
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



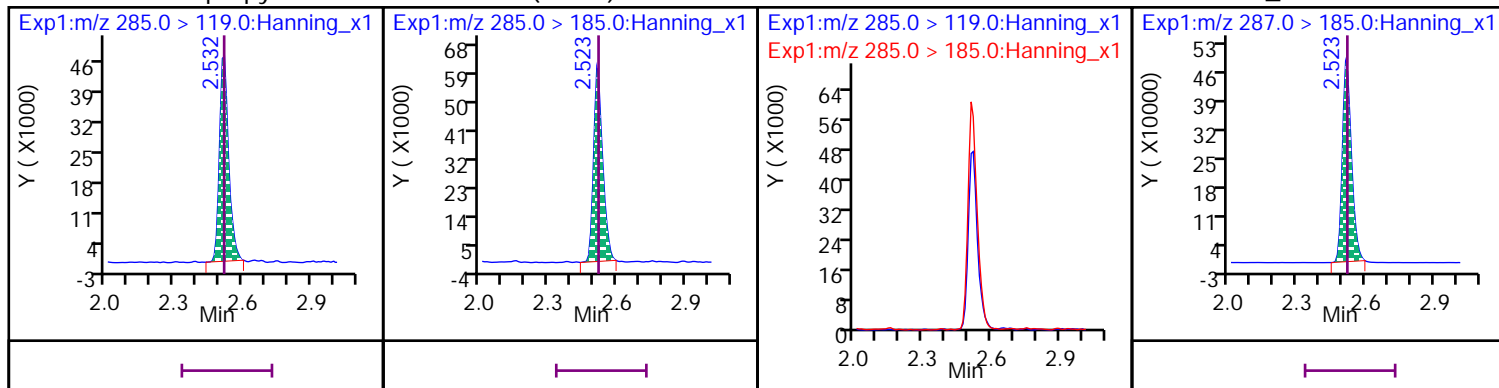
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



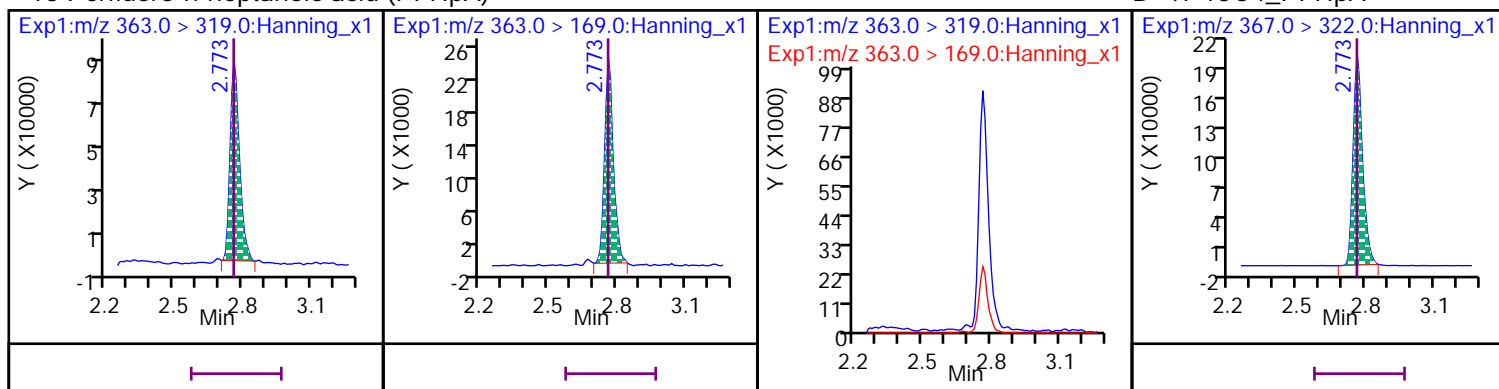
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



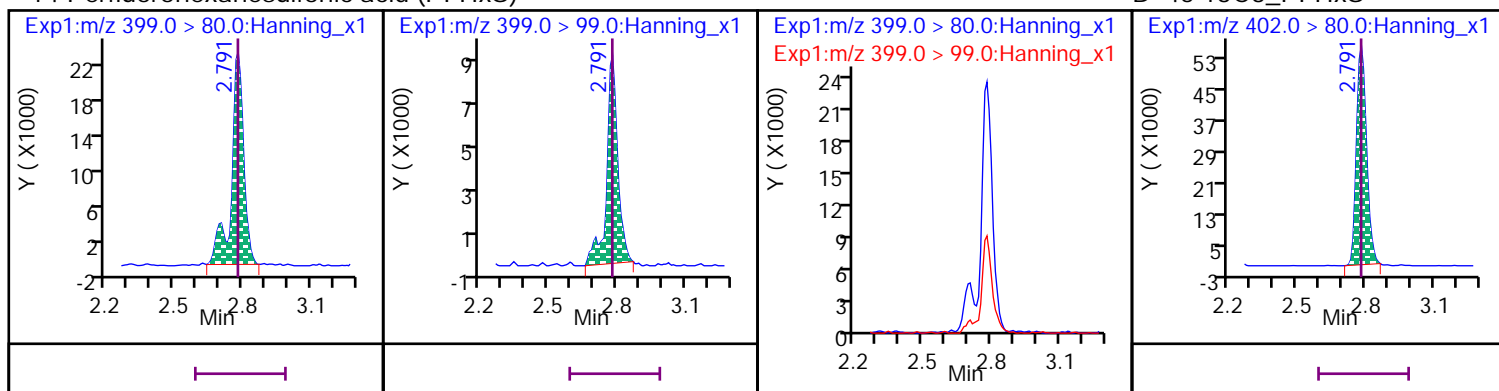
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



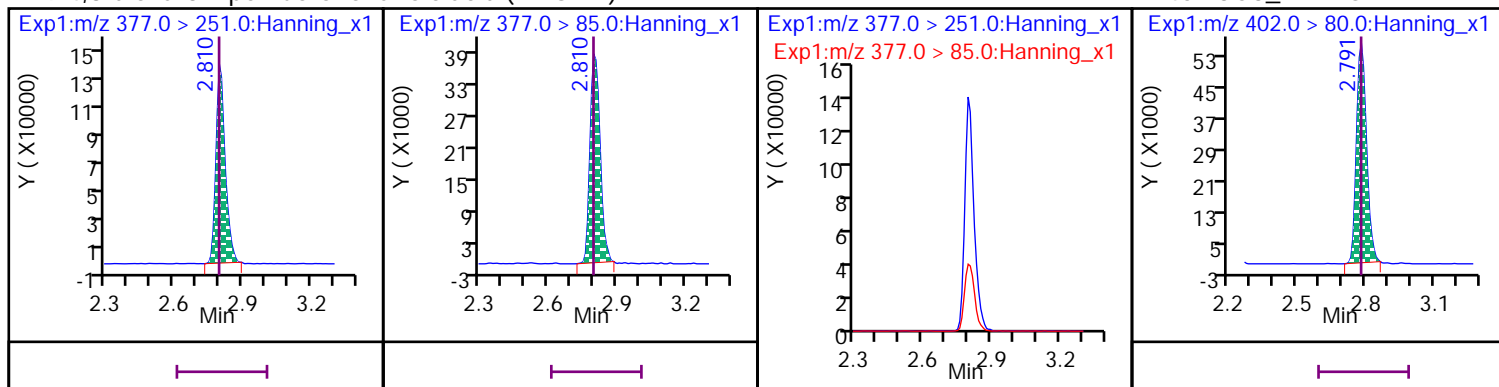
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



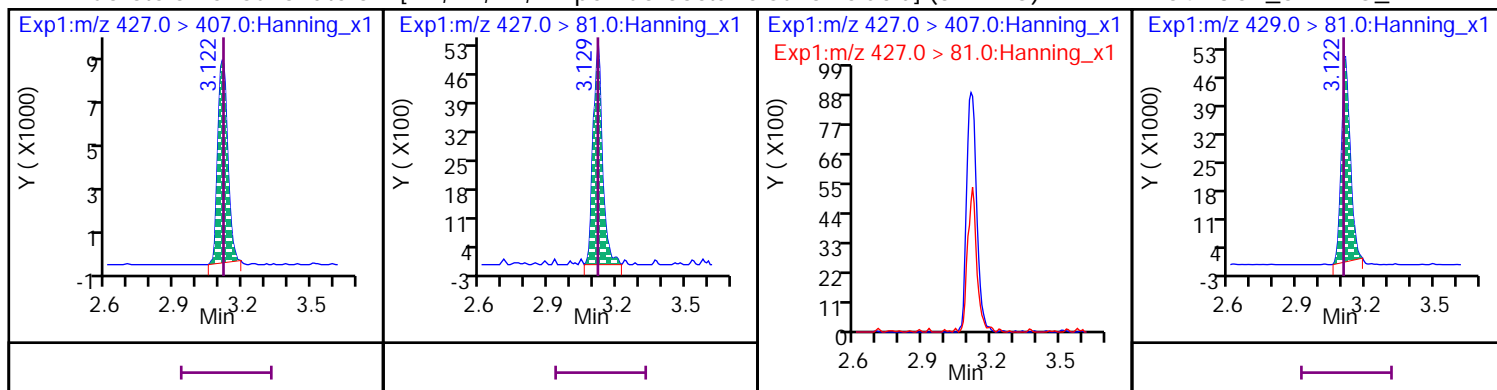
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



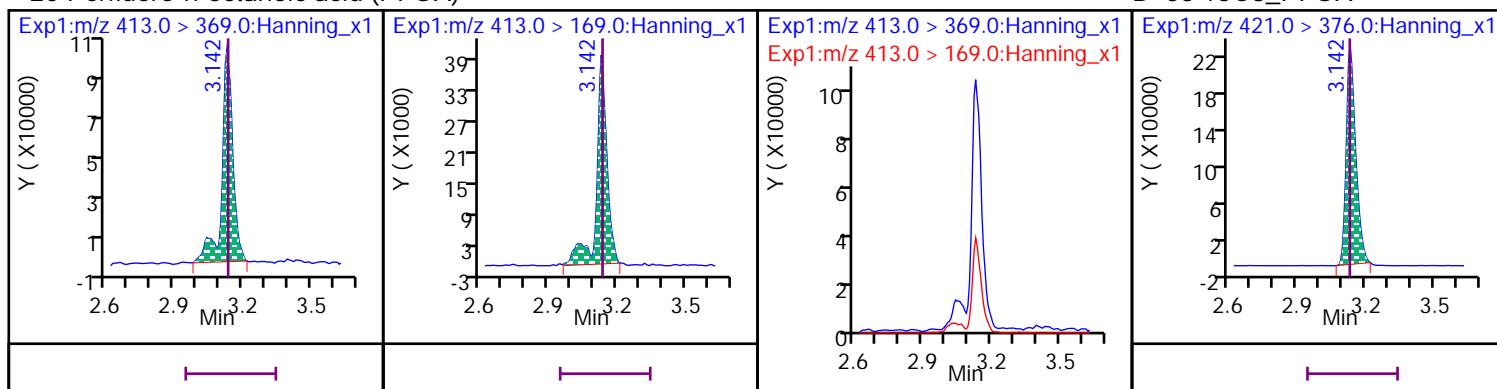
## 2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



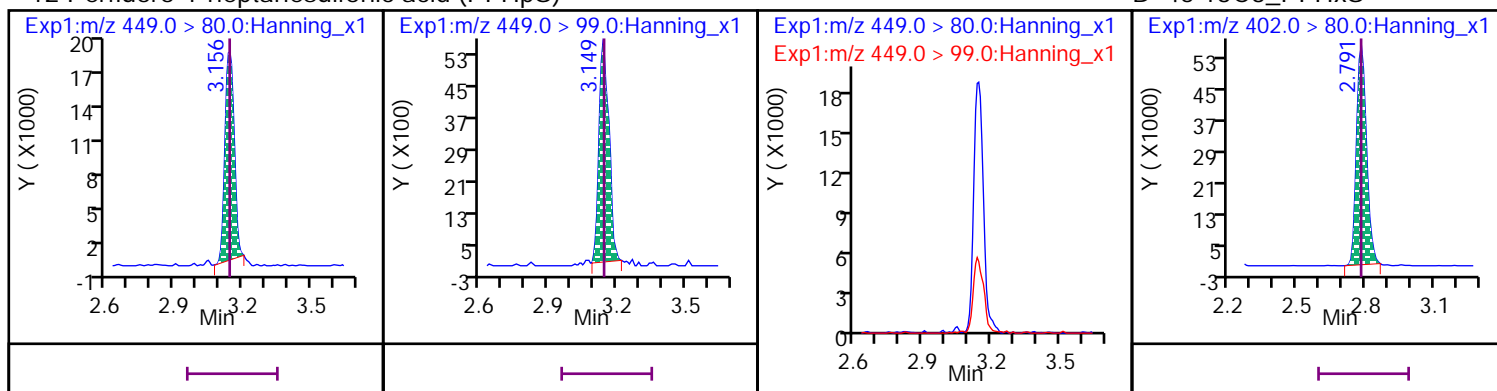
## 20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



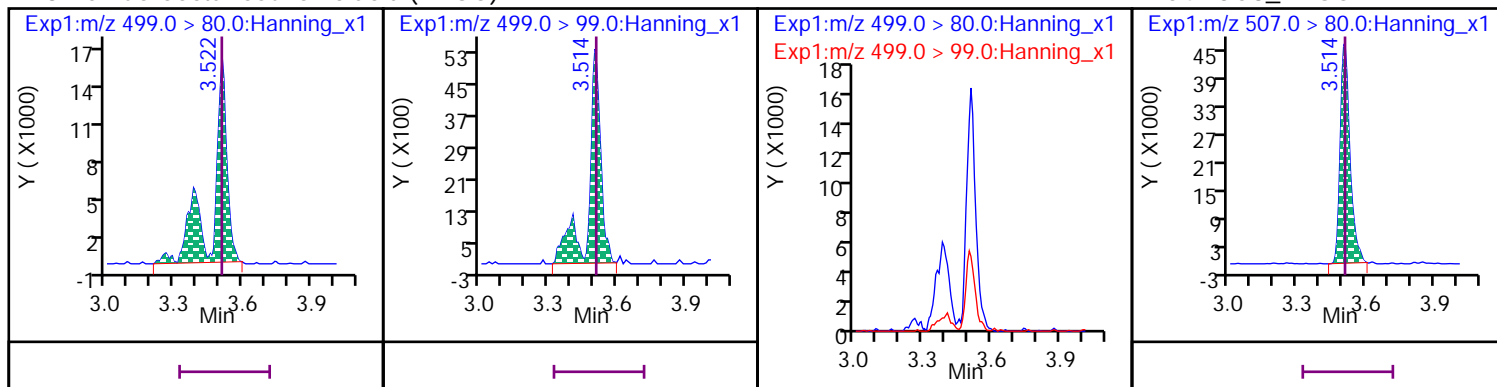
## 12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



## 18 Perfluorooctanesulfonic acid (PFOS)

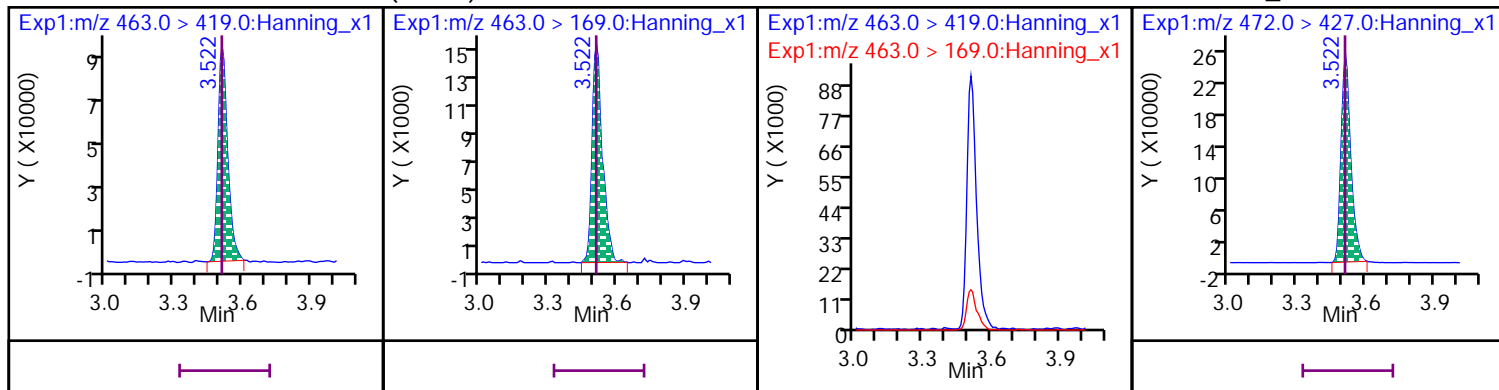
D 54 13C8\_PFOS





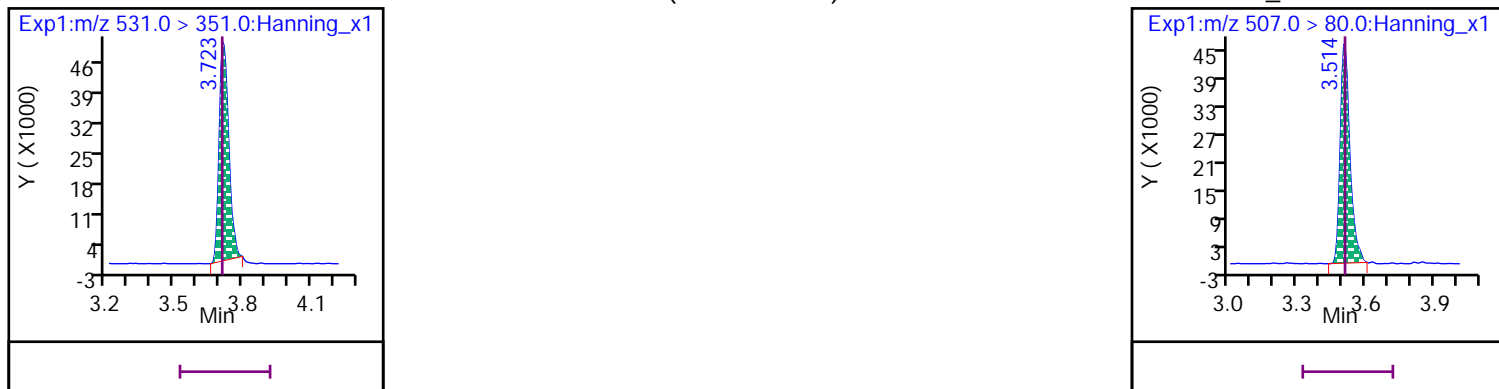
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



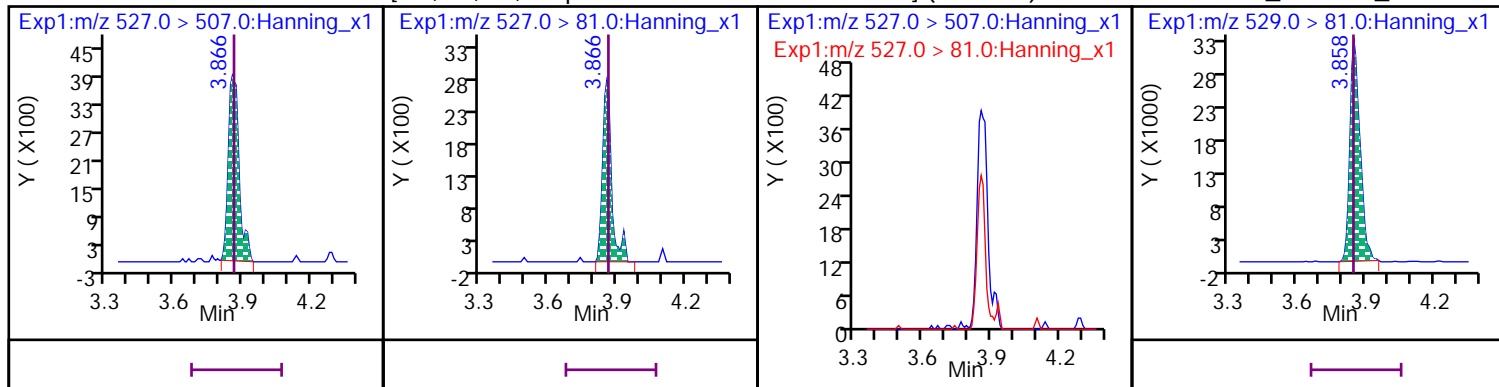
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



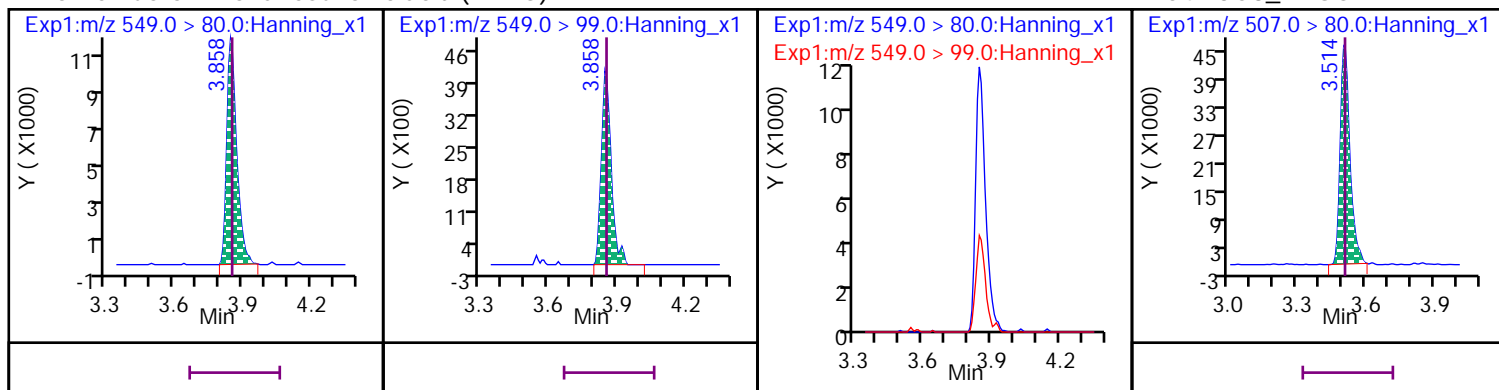
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



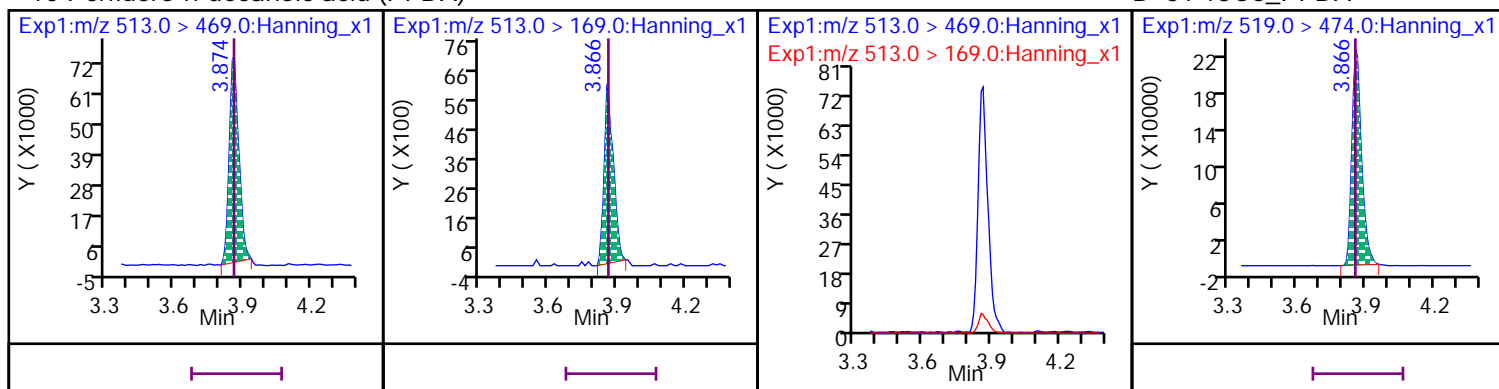
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



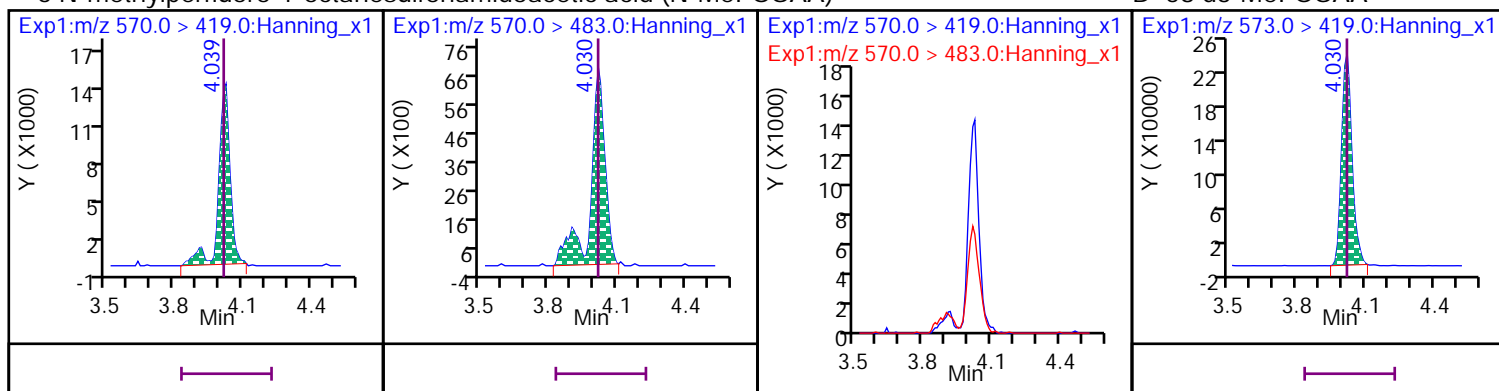
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



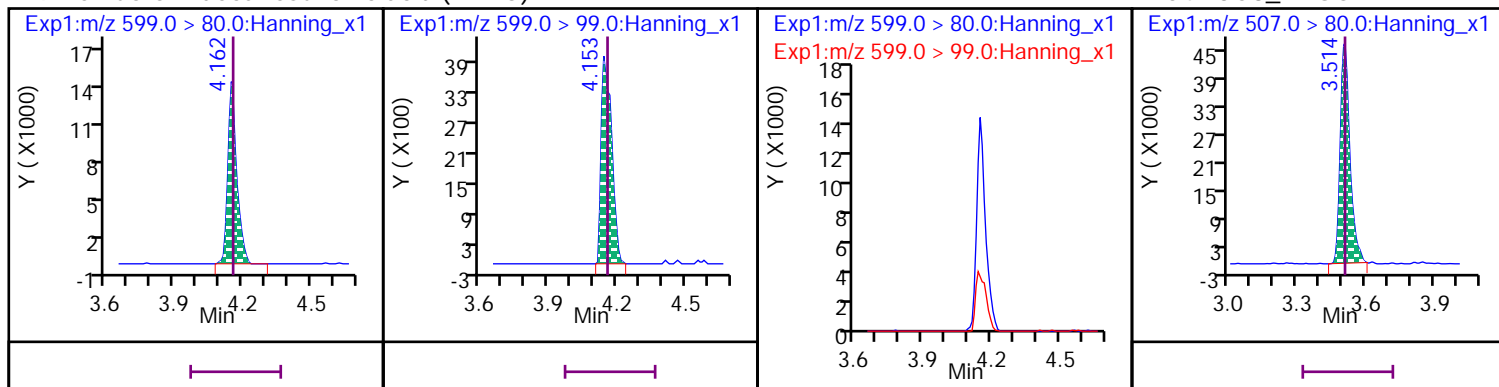
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)

D 58 d3-MeFOSAA



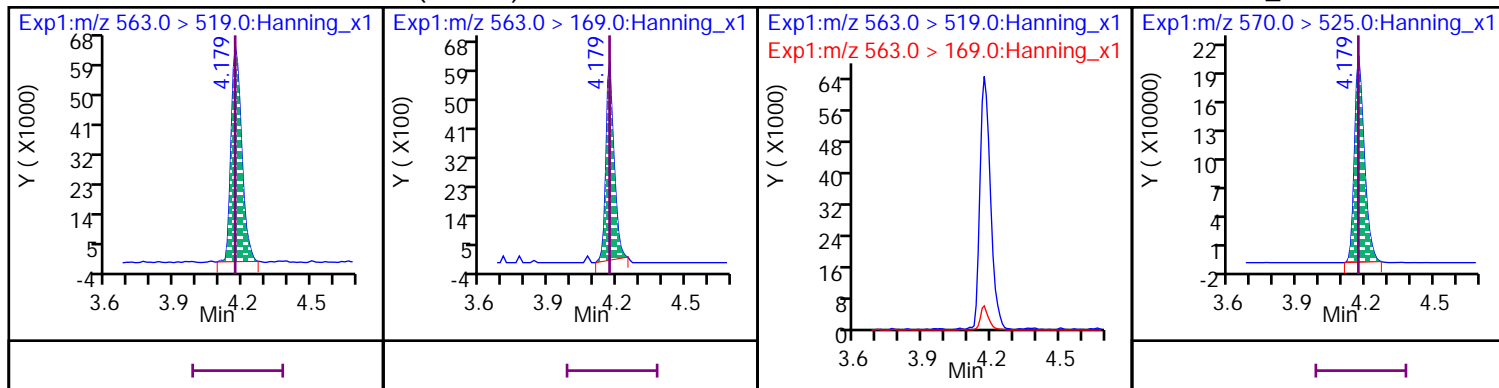
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



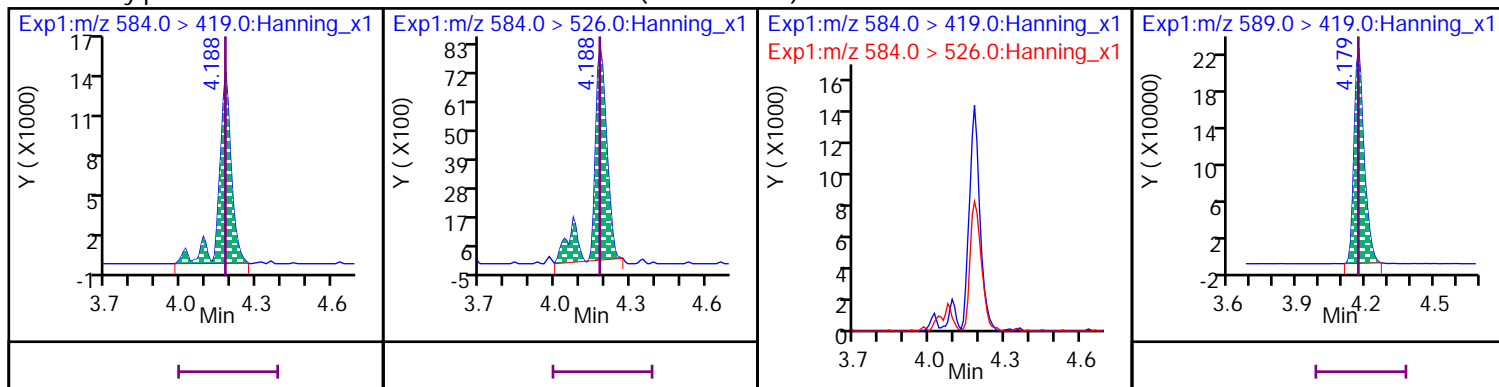
## 25 Perfluoro-n-undecanoic acid (PFUDa)

D 52 13C7\_PFUdA



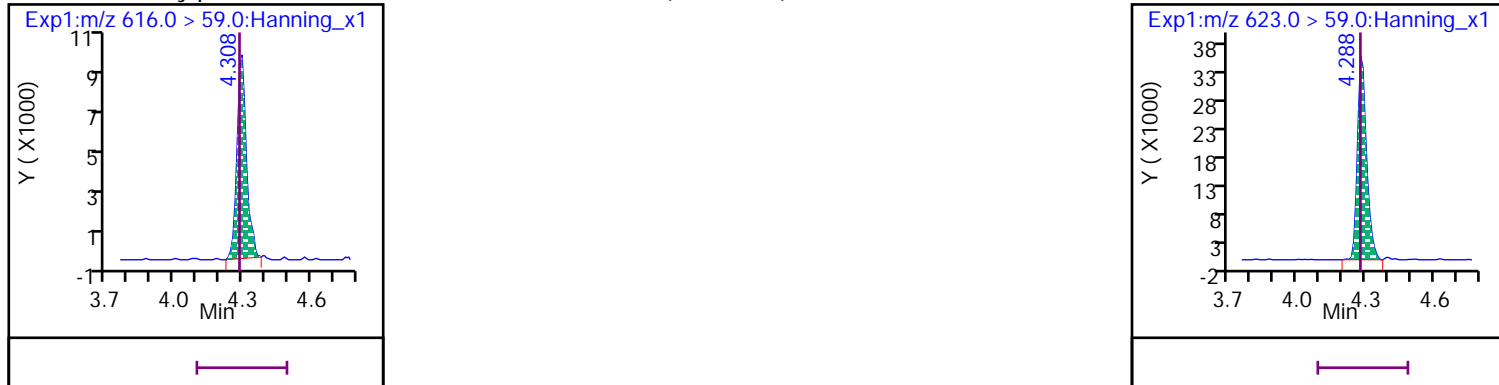
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

D 60 d5-EtFOSAA



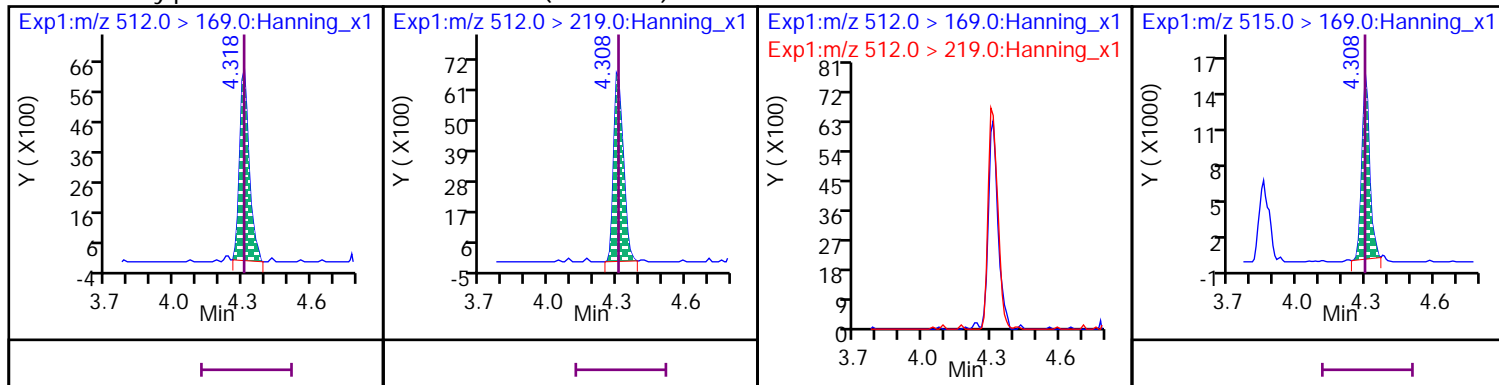
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

D 61 d7-MeFOSE

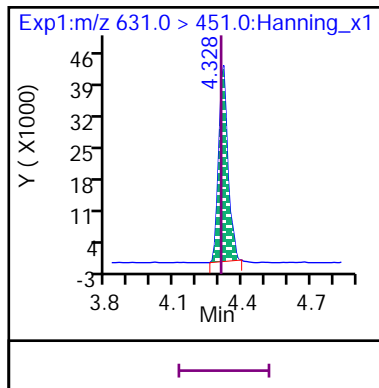


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

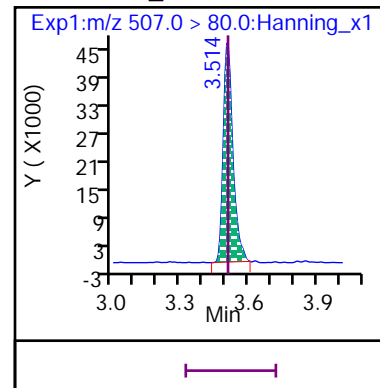
D 57 d3-MeFOSA



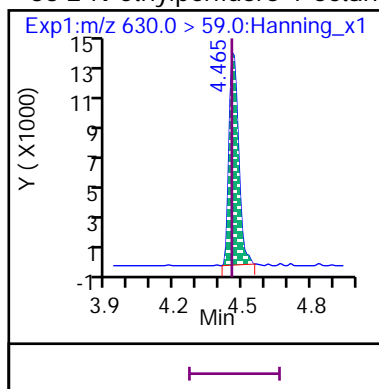
## 31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



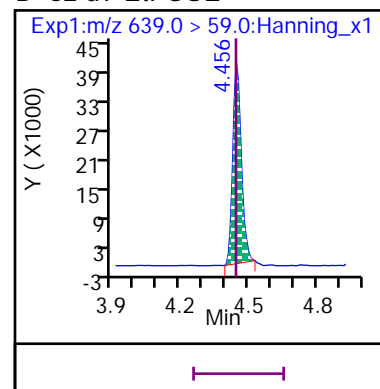
## D 54 13C8\_PFOS



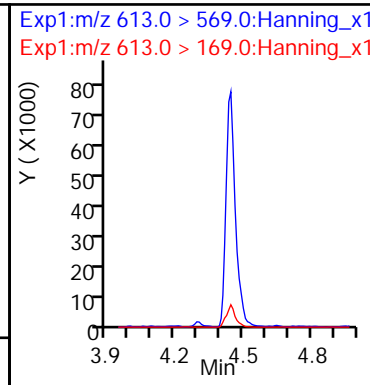
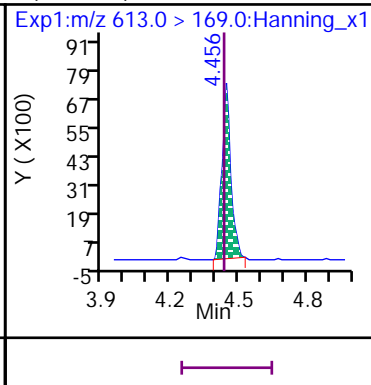
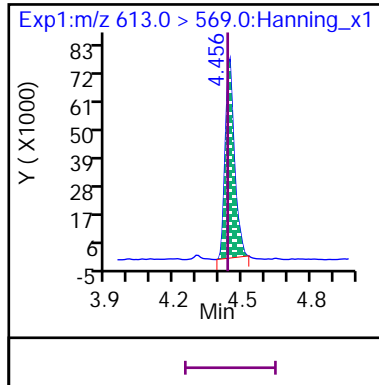
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



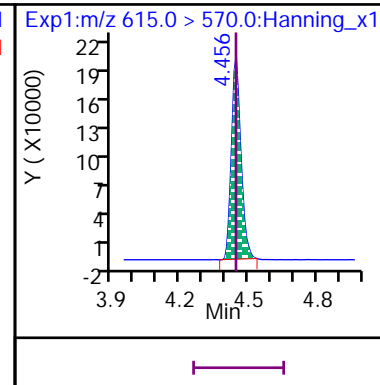
## D 62 d9-EtFOSE



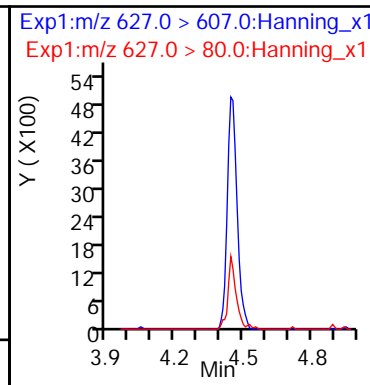
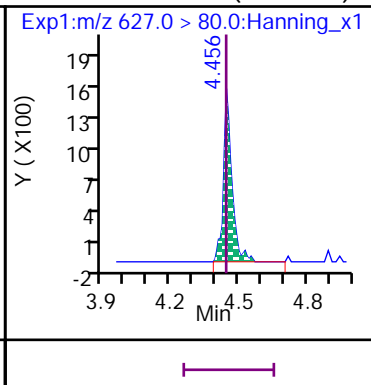
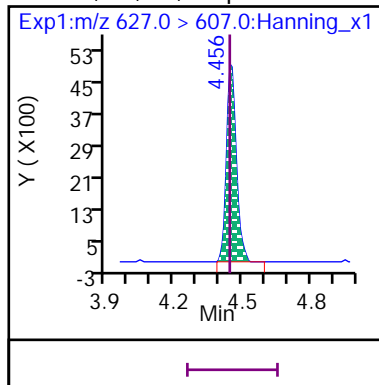
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



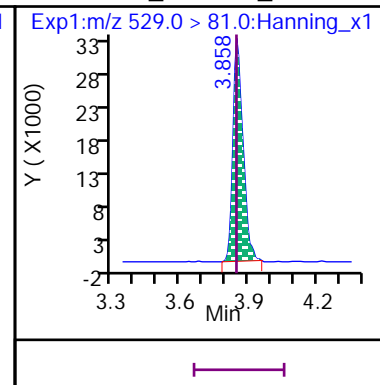
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

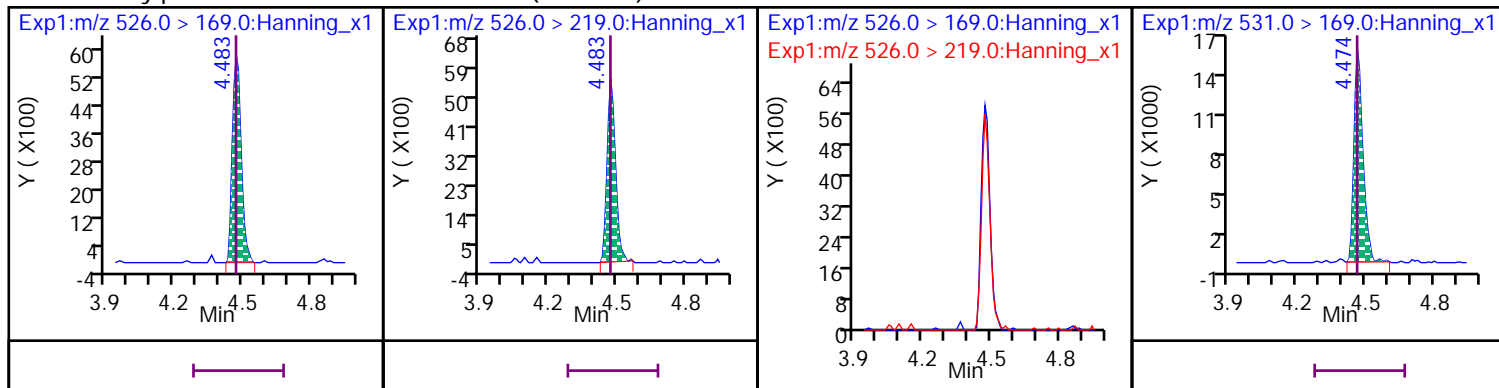


## D 65 13C2\_8:2 FTS\_2



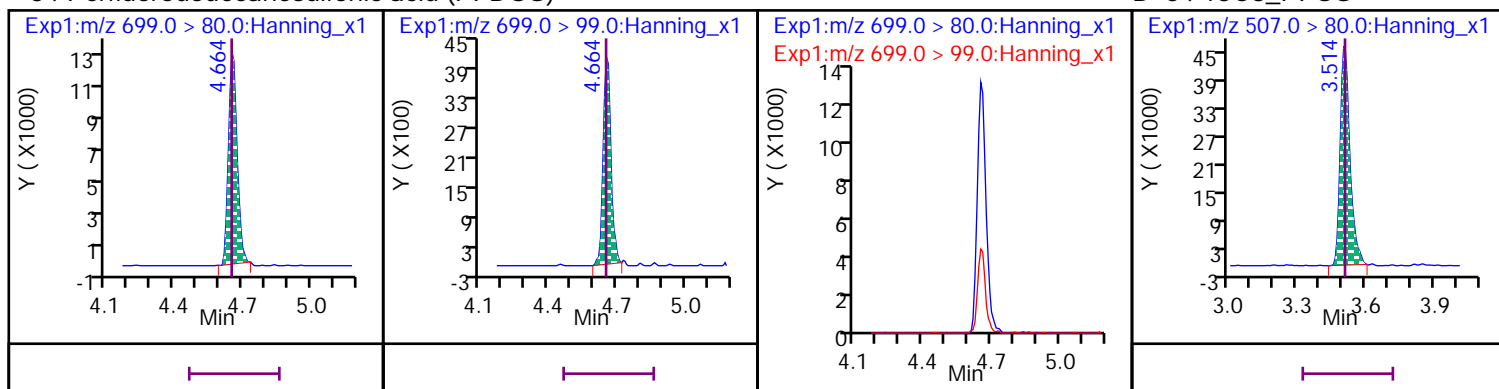
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



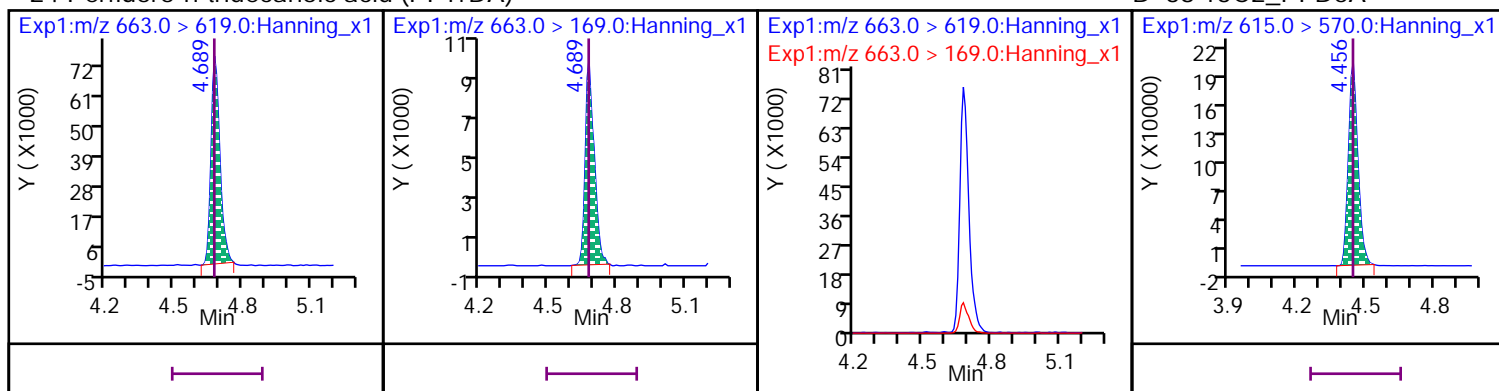
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



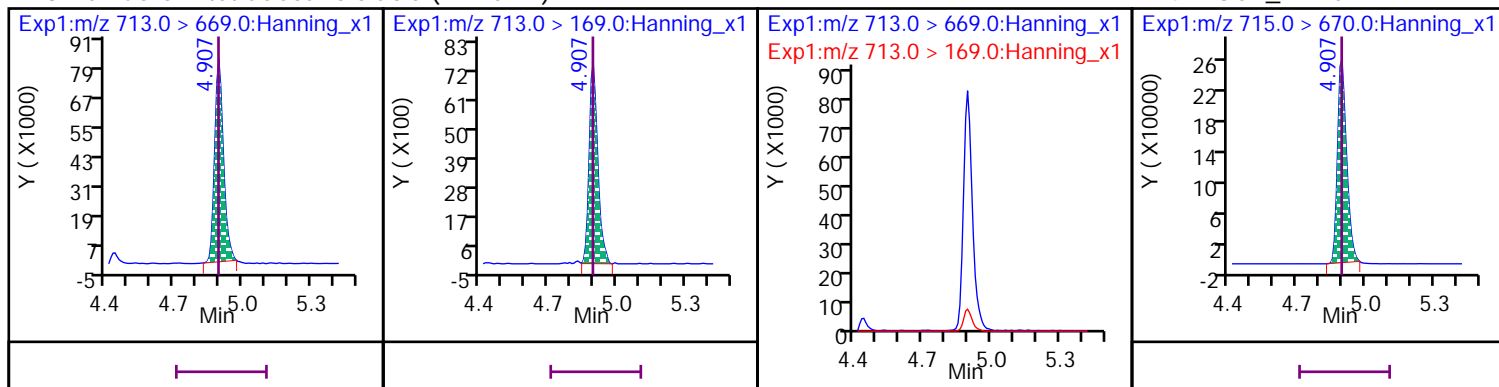
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



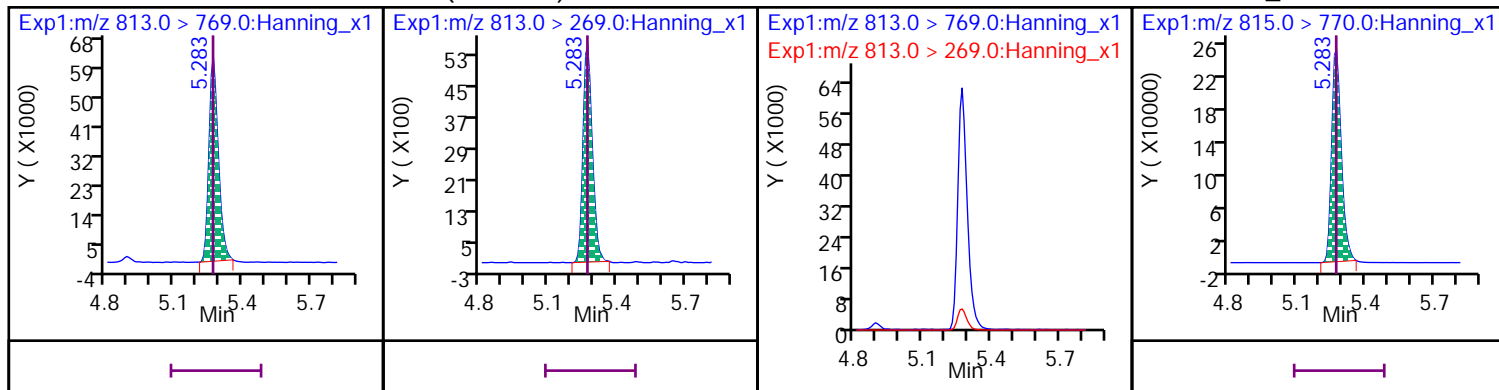
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



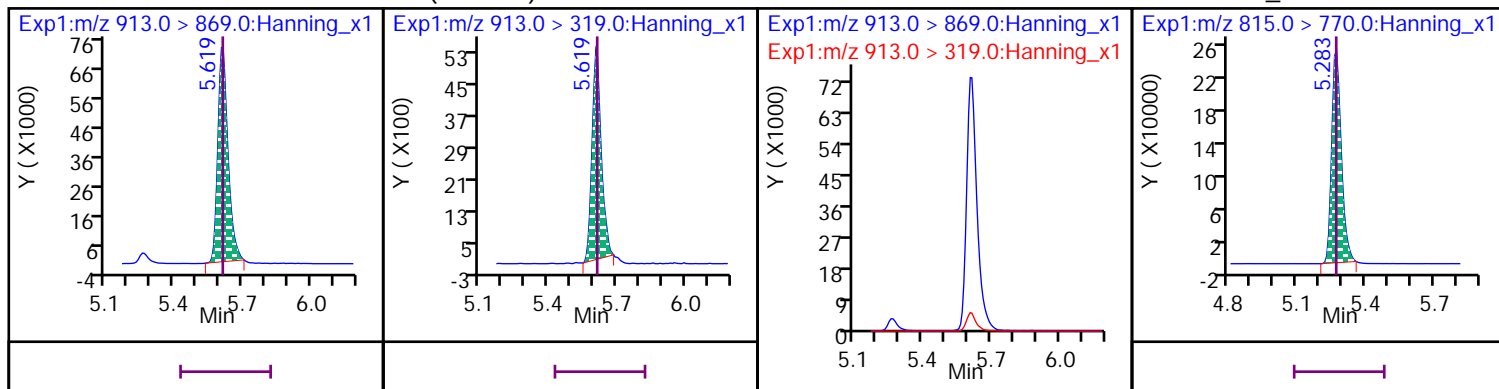
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

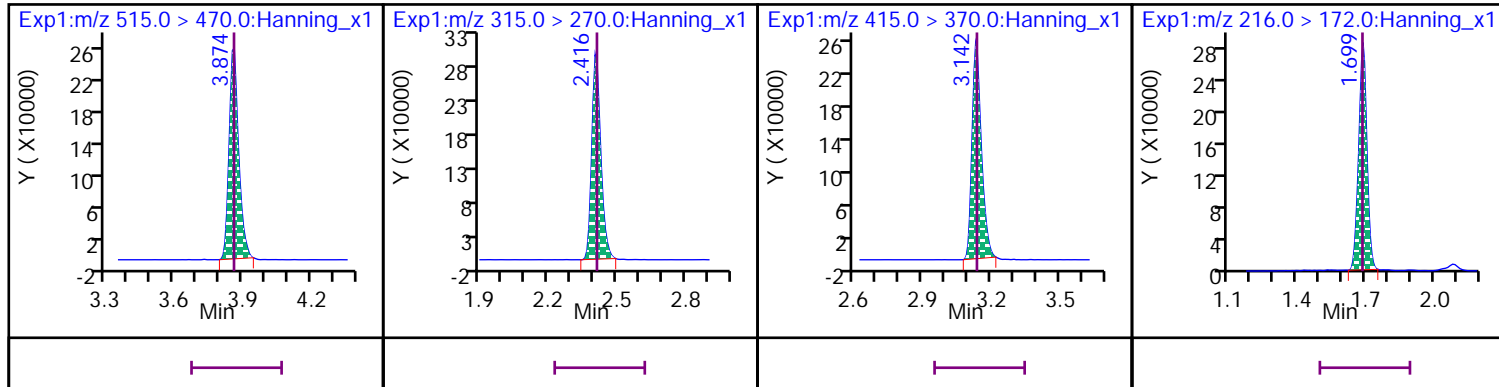


\* 37 13C2\_PFDA

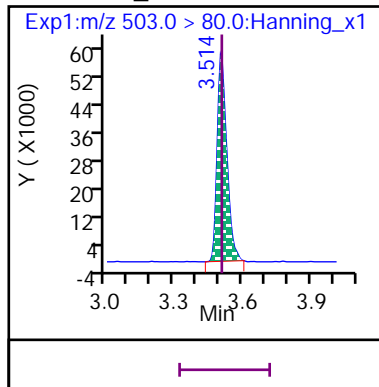
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



# PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
9CI-PF3ONS	ND	13	13		1	100	2.7	70-150	30	12/28/2020 1245
11CI-PF3OUdS	ND	13	12		1	93	0.47	70-150	30	12/28/2020 1245
8:2 FTS	ND	13	15		1	111	19	67-138	30	12/28/2020 1245
6:2 FTS	8.1	13	18		1	76	4.5	64-140	30	12/28/2020 1245
GenX	ND	28	25		1	90	8.6	70-150	30	12/28/2020 1245
ADONA	ND	13	13		1	101	3.2	70-150	30	12/28/2020 1245
EtFOSAA	ND	14	13		1	90	14	61-135	30	12/28/2020 1245
MeFOSAA	ND	14	13		1	91	25	65-136	30	12/28/2020 1245
PFBS	4.6	12	15		1	82	7.9	72-130	30	12/28/2020 1245
PFHxS	17	13	20	N	1	20	3.8	68-131	30	12/28/2020 1245
PFBA	110	14	100	N	1	-22	5.2	73-129	30	12/28/2020 1245
PFDA	ND	14	14		1	103	8.1	71-129	30	12/28/2020 1245
PFDoA	ND	14	15		1	104	0.63	72-134	30	12/28/2020 1245
PFHpA	2.2	14	16		1	98	5.8	72-130	30	12/28/2020 1245
PFHxA	4.6	14	17		1	90	0.88	72-129	30	12/28/2020 1245
PFNA	ND	14	14		1	102	0.11	69-130	30	12/28/2020 1245
PFOA	9.1	14	21		1	85	0.69	71-133	30	12/28/2020 1245
PFPeA	11	14	23		1	83	2.0	72-129	30	12/28/2020 1245
PFTeDA	ND	14	14		1	100	3.1	71-132	30	12/28/2020 1245
PFTrDA	ND	14	13		1	96	5.1	65-144	30	12/28/2020 1245
PFUdA	ND	14	15		1	108	1.4	69-133	30	12/28/2020 1245
PFOS	8.5	13	19		1	80	8.0	65-140	30	12/28/2020 1245

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		140	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		86	50-150
13C3_PFBs		97	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		105	50-150
13C8_PFOS		87	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		95	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MSD

Sample ID: VL11043-001MD

Matrix: Aqueous

Batch: 77741

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP QSM B-15

Prep Date: 12/27/2020 1725

Surrogate	Q	% Rec	Acceptance Limit
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation

U = Not detected at or above the LOQ

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

LOD = Limit of Detection

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



Pace Environmental Services, LLC  
Analyte Quantitation Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820021.d  
 Injection Date: 28-Dec-2020 12:45:33 Injection Vol: 10.0 uL  
 Sample Type: MSD Auto Sampler: 13  
 Lab Sample ID: VL11043-001MD Lab Prep. Batch: 77741  
 Sample Info: VL11043-001MD Misc. Info:  
 Inst. ID: LCMSMS02 Operator: Matthew M. Miller  
 Method Name: LCMSMS02\_PFAS-ID Version: 2020-09-22 16:12:14  
 Calib Method: PFAS-ID Lock State: Unlocked  
 Quant Method: IsoDil Integrator: picker

Final Conc.: Amt \* DF \* CF Matrix/Level: Aqueous

Concentration Formula:  $CF = (VF/1000) * 1/VI * (1/AlsDf) = 0.0382892$

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	287	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml  
 Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml  
 Reagent: Analytes Conc. Level: 100x PDS Vol. Added: 0.2000 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
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**D 46 13C4\_PFBFA CAS: SESI-0111**

217 > 172 1.699 1.696 1 692294 22 >100:1 1001.00 998.19 107

**8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4**

212.9 > 168.9 46 1.711 1.696 1/0 1836383 34 82:1 2665.94 102.08

**D 50 13C5\_PFPeA CAS: SESI-0112**

267.9 > 223 2.067 2.072 0 697873 17 >100:1 1001.00 1014.52 105

**21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3**

262.9 > 218.9 50 2.067 2.072 0/0 421609 18 66:1 601.48 23.030

**D 44 13C3\_PFBFS CAS: SESI-0116**

302 > 80 2.130 2.125 1 231000 17 >100:1 1001.00 1003.34 97

**7 Perfluoro-1-butanefulfonic acid (PFBS) CAS: 375-73-5**

298.9 > 80 44 2.130 2.125 1/0 104999 17 65:1 Target = 3.34 385.90 14.776

298.9 > 99 44 2.130 2.125 30996 18 96:1 3.38 (1.67-5.02)

**22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4**

349 > 80 44 2.451 2.450 1/0 76664 19 >100:1 Target = 3.09 382.97 14.664

349 > 99 44 2.451 2.450 23819 20 92:1 3.21 (1.54-4.64)

**D 63 13C2\_4:2 FTS\_2 CAS: SESI-0104**

329 > 81 2.380 2.379 1 181234 18 >100:1 5005.00 7486.43 126

**1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS) CAS: 757124-72-4**

327 > 307 63 2.380 2.388 0/-1 22760 18 >100:1 Target = 1.64 314.95 12.059

327 > 81 63 2.371 2.388 13802 16 21:1 1.64 (0.82-2.46)

**D 49 13C5\_PFHxA CAS: SESI-0113**

318 > 273 2.416 2.423 0 733722 19 >100:1 1001.00 995.46 98.7

**15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4**

313 > 269 49 2.416 2.423 0/0 324616 20 >100:1 Target = 17.01 448.57 17.176

313 > 119 49 2.416 2.423 19245 16 >100:1 16.86 (8.50-25.52)

**D 66 13C3\_GenX CAS: SESI-0121**

287 > 185 2.523 2.530 0 1359980 18 >100:1 5005.00 5105.91 97.1

**28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6**

285 > 119 66 2.523 2.530 0/0 127695 18 >100:1 Target = 0.79 654.10 25.045

285 > 185 66 2.523 2.530 163999 17 >100:1 0.77 (0.39-1.18)

**D 47 13C4\_PFHpA CAS: SESI-0114**

367 > 322 2.773 2.772 1 606371 20 >100:1 1001.00 999.54 95.7

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9</b>													
363 > 319	47	2.773	2.772	1/0	260200	18	>100:1	Target = 3.79		414.11	15.856		
363 > 169	47	2.773	2.772		63102	18	>100:1	4.12 (1.89-5.69)					
<b>D 45 13C3_PFHxS CAS: SESI-0096</b>													
402 > 80		2.791	2.790	1	168381	18	>100:1			1001.00	983.37	96.7	
<b>14 Perfluorohexanesulfonic acid (PFHxS) CAS: 355-46-4</b>													
399 > 80	45	2.791	2.790	1/0	91752	27	>100:1	Target = 3.80	0.19	514.44	19.697		
399 > 99	45	2.791	2.790		26454	26	>100:1	3.46 (1.90-5.71)	0.11				
<b>29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4</b>													
377 > 251	45	2.809	2.808	1/0	369906	18	>100:1	Target = 2.97		346.37	13.262		
377 > 85	45	2.809	2.808		119385	17	>100:1	3.09 (1.48-4.46)					
<b>12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8</b>													
449 > 80	45	3.155	3.154	1/0	54060	21	>100:1	Target = 3.09		353.77	13.546		
449 > 99	45	3.155	3.154		16007	19	91:1	3.37 (1.54-4.64)					
<b>D 64 13C2_6:2 FTS_2 CAS: SESI-0105</b>													
429 > 81		3.122	3.114	1	145865	20	>100:1			5005.00	7574.10	140	
<b>2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS) CAS: 27619-97-2</b>													
427 > 407	64	3.122	3.128	0/-1	29336	21	>100:1	Target = 1.77		471.49	18.053		
427 > 81	64	3.129	3.128		18008	24	91:1	1.62 (0.88-2.66)					
<b>D 53 13C8_PFOA CAS: SESI-0097</b>													
421 > 376		3.142	3.141	1	660477	22	>100:1			1001.00	1115.93	105	
<b>20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1</b>													
413 > 369	53	3.142	3.148	0/-1	368012	32	>100:1	Target = 2.85	0.11	547.11	20.948		
413 > 169	53	3.149	3.148		134006	36	>100:1	2.74 (1.42-4.28)	0.14				
<b>D 54 13C8_PFOS CAS: SESI-0098</b>													
507 > 80		3.522	3.520	1	132081	20	>100:1			1001.00	880.96	86.6	
<b>18 Perfluorooctanesulfonic acid (PFOS) CAS: 1763-23-1</b>													
499 > 80	54	3.514	3.520	0/-1	76779	62	>100:1	Target = 6.80	0.74	491.05	18.802		
499 > 99	54	3.514	3.520		18145	43	45:1	4.23 (3.40-10.20)	0.26				
<b>30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) CAS: 756426-58-1</b>													
531 > 351	54	3.723	3.722	1/0	151053	22	>100:1			340.05	13.020		
<b>16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1</b>													
549 > 80	54	3.858	3.865	0/-1	35414	20	>100:1	Target = 3.03		350.72	13.429		
549 > 99	54	3.858	3.865		14391	24	>100:1	2.46 (1.51-4.55)					
<b>9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3</b>													
599 > 80	54	4.162	4.169	0/-1	30718	16	>100:1	Target = 2.74		320.78	12.283		
599 > 99	54	4.162	4.169		11419	23	50:1	2.69 (1.37-4.11)					
<b>31 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS) CAS: 763051-92-9</b>													
631 > 451	54	4.318	4.317	1/0	119997	18	>100:1			320.22	12.261		
<b>34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5</b>													
699 > 80	54	4.664	4.663	1/0	32436	22	>100:1	Target = 3.16		306.19	11.724		
699 > 99	54	4.664	4.663		9176	27		3.53 (1.58-4.75)					
<b>D 56 13C9_PFNA CAS: SESI-0099</b>													
472 > 427		3.522	3.520	1	737442	22	>100:1			1001.00	982.00	96.1	
<b>17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1</b>													
463 > 419	56	3.522	3.520	1/0	274680	19	>100:1	Target = 6.19		372.84	14.276		
463 > 169	56	3.529	3.520		43091	18	>100:1	6.37 (3.09-9.28)					
<b>D 55 13C8_PFOSA CAS: SESI-0107</b>													
506 > 78		3.850	3.849	1	318705	21	>100:1			1001.00	1029.53	103	
<b>19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6</b>													
498 > 78	55	3.850	3.841	1/0	106999	21	>100:1			341.03	13.058		
<b>D 65 13C2_8:2 FTS_2 CAS: SESI-0106</b>													
529 > 81		3.858	3.857	1	96087	22	>100:1			5005.00	5179.85	95.7	
<b>3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS) CAS: 39108-34-4</b>													
527 > 507	65	3.858	3.873	0/-1	15333	23	>100:1	Target = 2.11		387.24	14.827		
527 > 81	65	3.858	3.873		8711	26	25:1	1.76 (1.05-3.16)					
<b>4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS) CAS: 120226-60-0</b>													
627 > 607	65	4.456	4.455	1/0	11334	21	>100:1	Target = 3.05		255.47	9.7818		
627 > 80	65	4.447	4.455		4801	17	44:1	2.36 (1.52-4.57)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>D 51 13C6_PFDA CAS: SESI-0115</b>													
519 > 474		3.866	3.865	1	647641	18	>100:1			1001.00	976.35	96.3	
<b>10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2</b>													
513 > 469	51	3.866	3.873	0/-1	237725	21	>100:1	Target = 13.22		373.94	14.318		
513 > 169	51	3.866	3.873		15541	24	46:1	15.29 (6.61-19.83)					
<b>D 58 d3-MeFOSAA CAS: SESI-0102</b>													
573 > 419		4.030	4.029	1	760770	18	>100:1			5005.00	5300.08	96.1	
<b>6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9</b>													
570 > 419	58	4.030	4.029	1/0	38830	33	>100:1	Target = 1.34		332.56	12.734		M
570 > 483	58	4.038	4.029		32749	32	>100:1	1.18 (0.67-2.02)	0.22				
<b>D 60 d5-EtFOSAA CAS: SESI-0110</b>													
589 > 419		4.179	4.178	1	691410	19	>100:1			5005.00	5205.83	94.5	
<b>5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6</b>													
584 > 419	60	4.188	4.187	1/0	44908	31	>100:1	Target = 1.71	0.12	326.52	12.502		
584 > 526	60	4.188	4.187		31630	29	78:1	1.41 (0.85-2.57)	0.18				
<b>D 52 13C7_PFuDA CAS: SESI-0117</b>													
570 > 525		4.179	4.178	1	585452	17	>100:1			1001.00	926.24	91	
<b>25 Perfluoro-n-undecanoic acid (PFuDA) CAS: 2058-94-8</b>													
563 > 519	52	4.179	4.178	1/0	215372	17	>100:1	Target = 16.05		391.80	15.002		
563 > 169	52	4.188	4.178		16315	22	>100:1	13.20 (8.02-24.08)					
<b>D 61 d7-MeFOSE CAS: SESI-0129</b>													
623 > 59		4.288	4.287	1	91317	16	>100:1			1001.00	843.90	86.6	
<b>32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7</b>													
616 > 59	61	4.298	4.297	1/0	32503	16	>100:1			379.19	14.519		
<b>D 57 d3-MeFOSA CAS: SESI-0109</b>													
515 > 169		4.308	4.307	1	43361	12	>100:1			1001.00	819.42	83.6	
<b>26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8</b>													
512 > 169	57	4.308	4.317	0/-1	16390	16	>100:1	Target = 1.18		335.37	12.841		
512 > 219	57	4.318	4.317		14925	22	>100:1	1.09 (0.59-1.77)					
<b>D 62 d9-EtFOSE CAS: SESI-0130</b>													
639 > 59		4.456	4.455	1	107943	18	>100:1			1001.00	860.82	78.7	
<b>33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2</b>													
630 > 59	62	4.465	4.464	1/0	35777	20	83:1			372.92	14.279		
<b>D 38 13C2_PFDoA CAS: SESI-0118</b>													
615 > 570		4.456	4.455	1	573933	19	>100:1			1001.00	948.15	93.9	
<b>11 Perfluoro-n-dodecanoic acid (PFDa) CAS: 307-55-1</b>													
613 > 569	38	4.456	4.446	1/0	220142	20	>100:1	Target = 10.35		379.15	14.517		
613 > 169	38	4.447	4.446		21553	15	>100:1	10.21 (5.17-15.53)					
<b>24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8</b>													
663 > 619	38	4.689	4.688	1/0	197516	22	>100:1	Target = 8.56		349.76	13.392		
663 > 169	38	4.689	4.688		26439	18	>100:1	7.47 (4.28-12.84)					
<b>D 59 d5-EtFOSA CAS: SESI-0108</b>													
531 > 169		4.474	4.473	1	38046	16	>100:1			1001.00	774.95	75.7	
<b>27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2</b>													
526 > 169	59	4.483	4.482	1/0	14380	22	>100:1	Target = 1.08		346.30	13.260		
526 > 219	59	4.483	4.482		13972	26	>100:1	1.02 (0.54-1.62)					
<b>D 42 13C2_PFTeDA CAS: SESI-0119</b>													
715 > 670		4.907	4.906	1	699352	19	>100:1			1001.00	830.15	86	
<b>23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7</b>													
713 > 669	42	4.907	4.906	1/0	219371	19	35:1	Target = 11.29		362.39	13.876		
713 > 169	42	4.907	4.906		16872	19	>100:1	13.00 (5.64-16.94)					
<b>D 40 13C2_PFHxDA CAS: SESI-0103</b>													
815 > 770		5.283	5.282	1	710682	19	>100:1			1001.00	784.27	76	
<b>35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5</b>													
813 > 769	40	5.283	5.282	1/0	174170	20	67:1	Target = 11.43		375.46	14.376		
813 > 269	40	5.283	5.282		14636	19	>100:1	11.90 (5.71-17.16)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	c RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
<b>36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6</b>													
913 > 869	40	5.619	5.625	0/-1	217514	25	39:1	Target = 13.84		346.10	13.252		
913 > 319	40	5.619	5.625		15508	26	>100:1	14.02 (6.92-20.76)					
<b>* 37 13C2_PFDA</b>													
515 > 470		3.866	3.873	0	710921	18	>100:1					97.1	
<b>* 39 13C2_PFHxA CAS: SESI-0120</b>													
315 > 270		2.416	2.423	0	749586	17	>100:1					103	
<b>* 41 13C2_PFOA CAS: 864071-08-9</b>													
415 > 370		3.142	3.148	0	714642	23	>100:1					119	
<b>* 43 13C3_PFBA</b>													
216 > 172		1.699	1.696	1	692988	22	>100:1					114	
<b>* 48 13C4_PFOS CAS: 2795-39-3</b>													
503 > 80		3.514	3.520	0	178367	23	>100:1					109	

**Compound Type Legend**

D - Isotopic Dilution Std.  
\* - ISTD

**QC Flag Legend**

M - Compound Hit/Peak Manually Integrated

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820021.d

Injection Date: 28-Dec-2020 12:45:33

Inst. ID: LCMSMS02

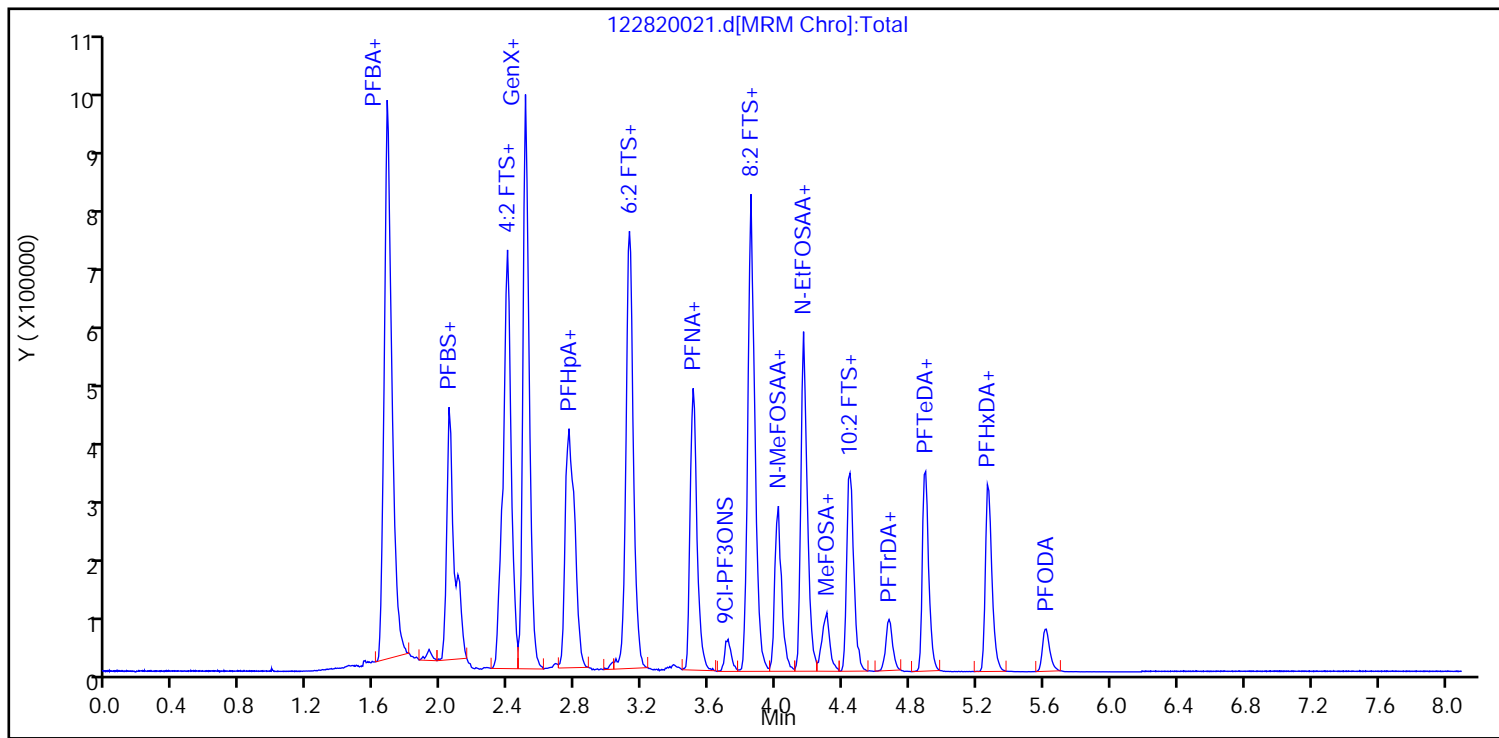
Client ID:

Lab ID: VL11043-001MD

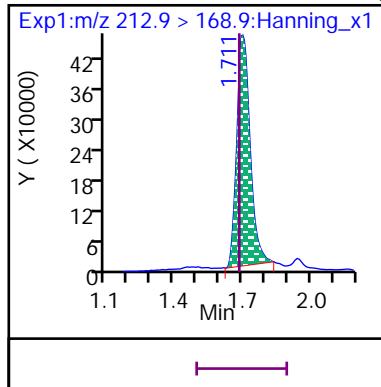
Sample Info: VL11043-001MD

Dil. Factor: 1

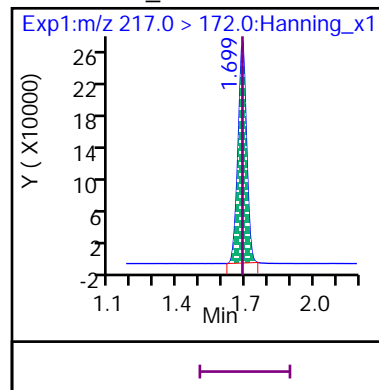
Operator: Matthew M. Miller



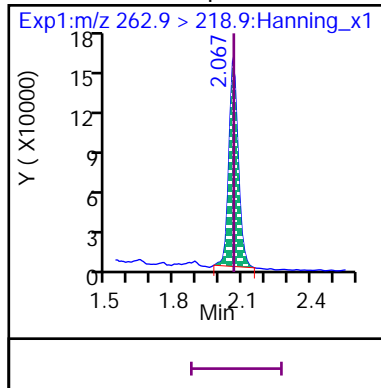
8 Perfluoro-n-butanoic acid (PFBA)



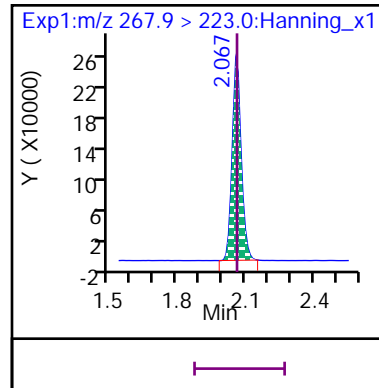
D 46 13C4\_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)

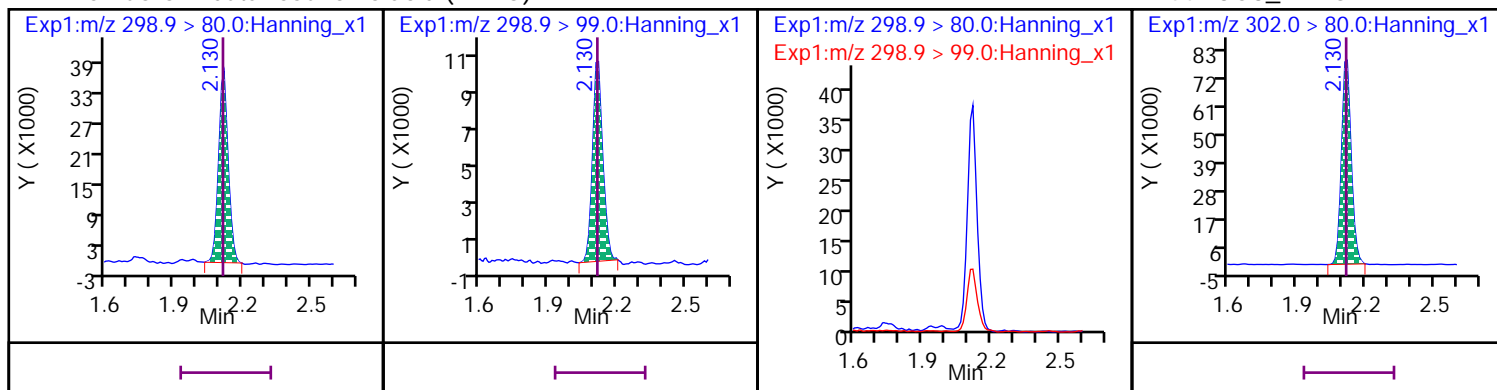


D 50 13C5\_PFPeA



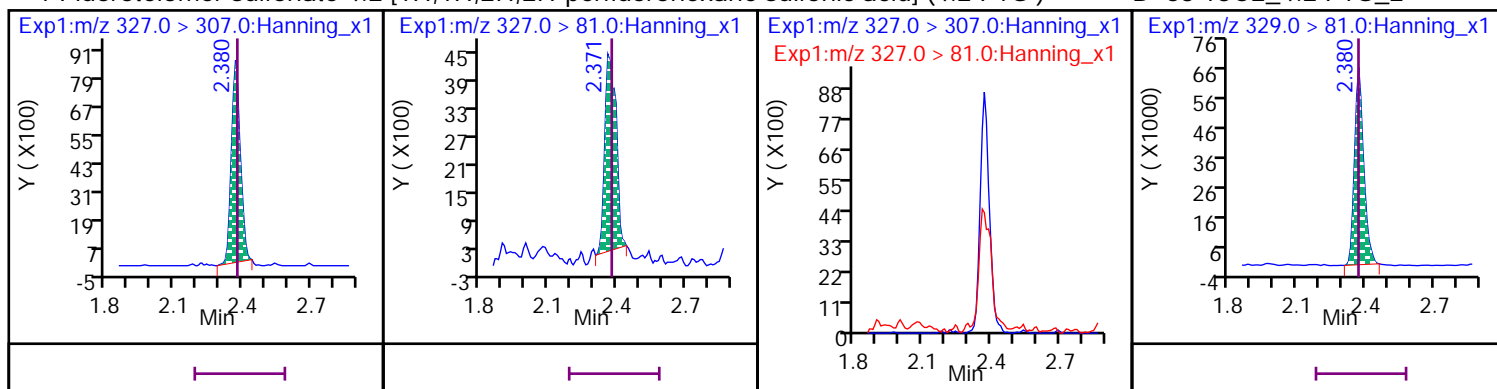
## 7 Perfluoro-1-butanesulfonic acid (PFBS)

D 44 13C3\_PFBS



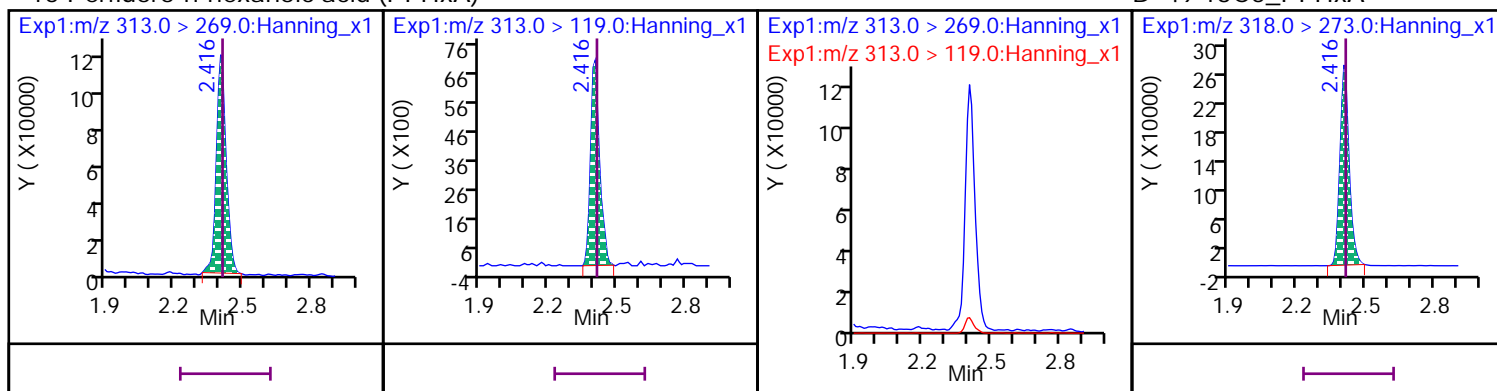
## 1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonic acid] (4:2 FTS)

D 63 13C2\_4:2 FTS\_2



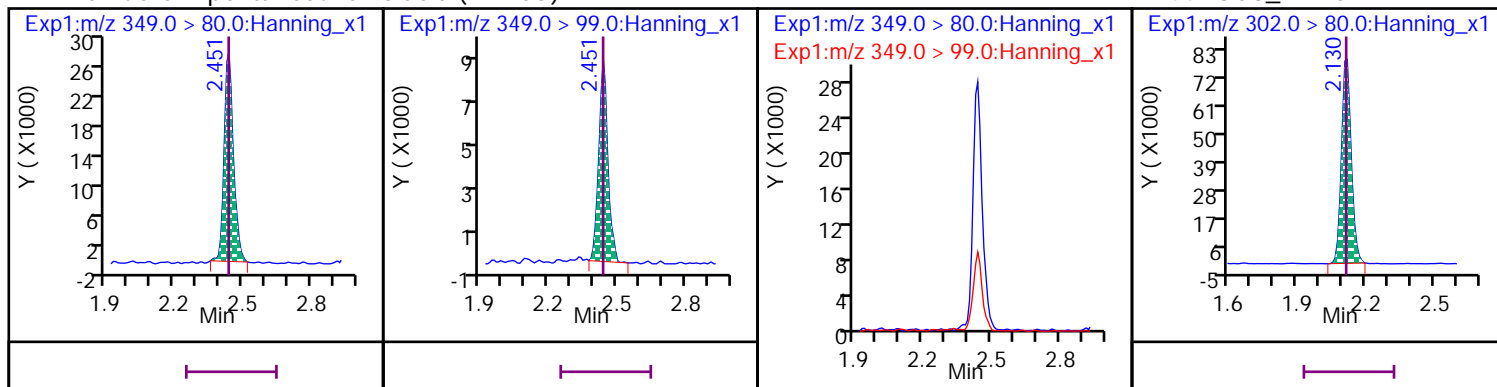
## 15 Perfluoro-n-hexanoic acid (PFHxA)

D 49 13C5\_PFHxA



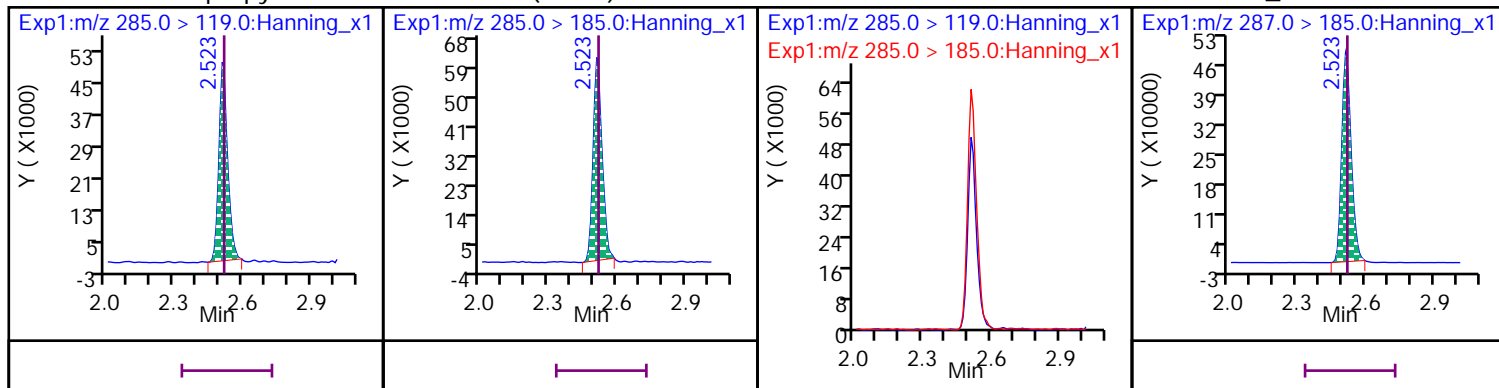
## 22 Perfluoro-1-pentanesulfonic acid (PFPeS)

D 44 13C3\_PFBS



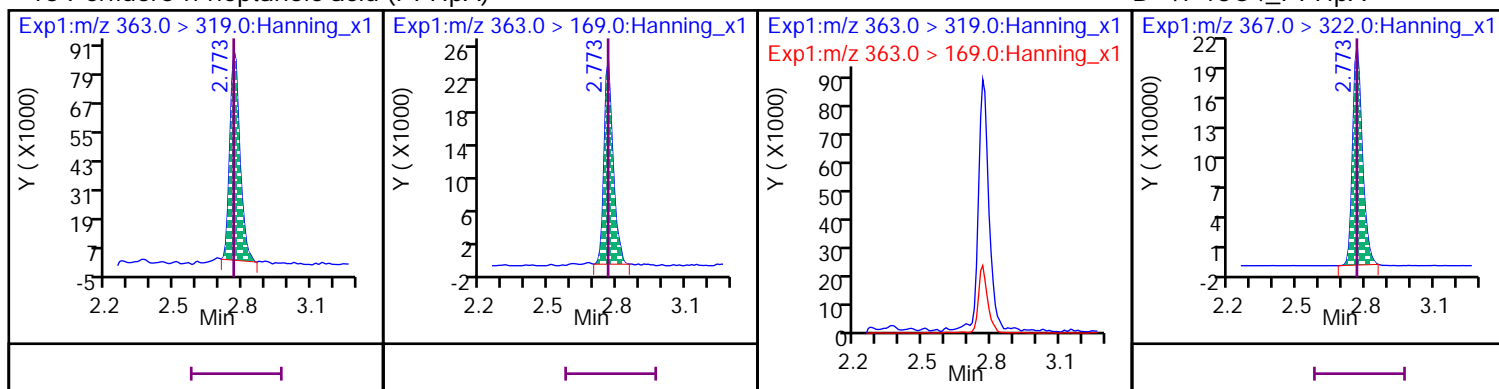
## 28 Hexafluoropropylene oxide dimer acid (GenX)

D 66 13C3\_GenX



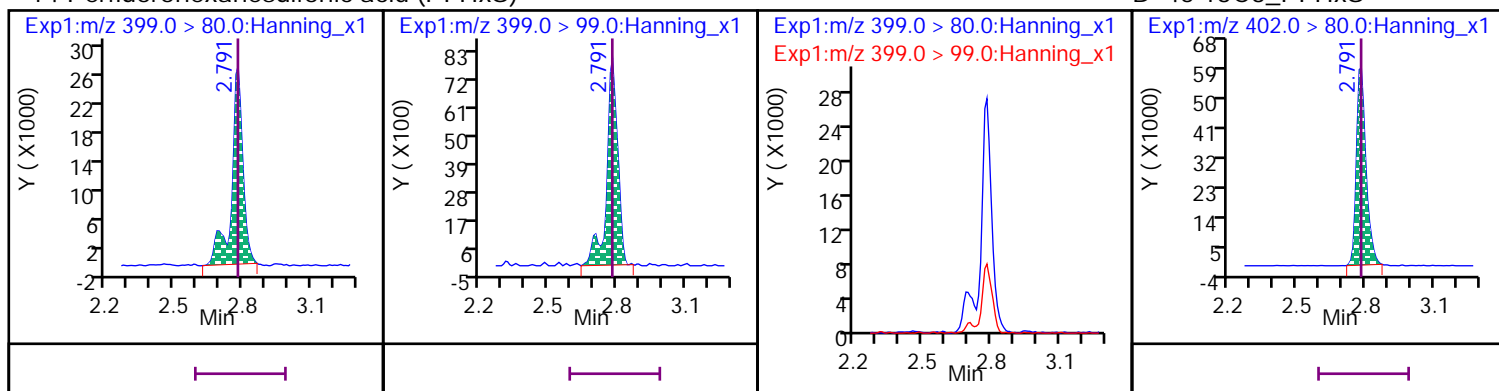
## 13 Perfluoro-n-heptanoic acid (PFHpA)

D 47 13C4\_PFHpA



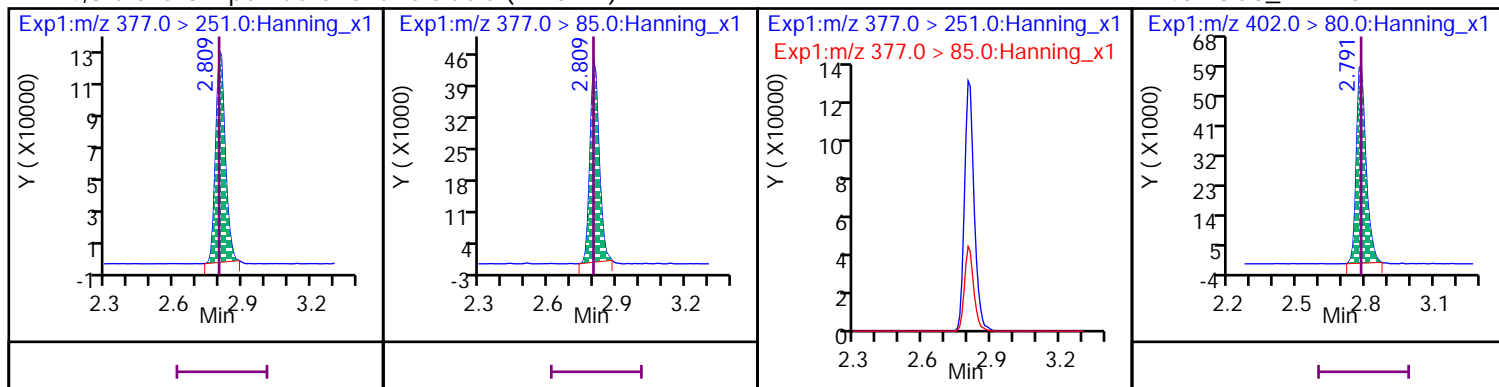
## 14 Perfluorohexanesulfonic acid (PFHxS)

D 45 13C3\_PFHxS



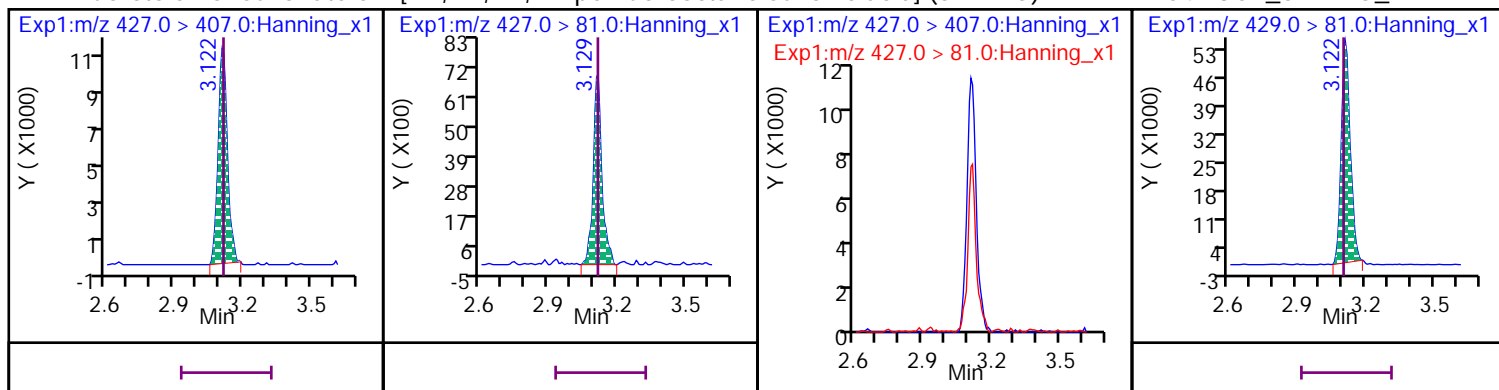
## 29 4,8-dioxa-3H-perfluorononanoic acid (ADONA)

D 45 13C3\_PFHxS



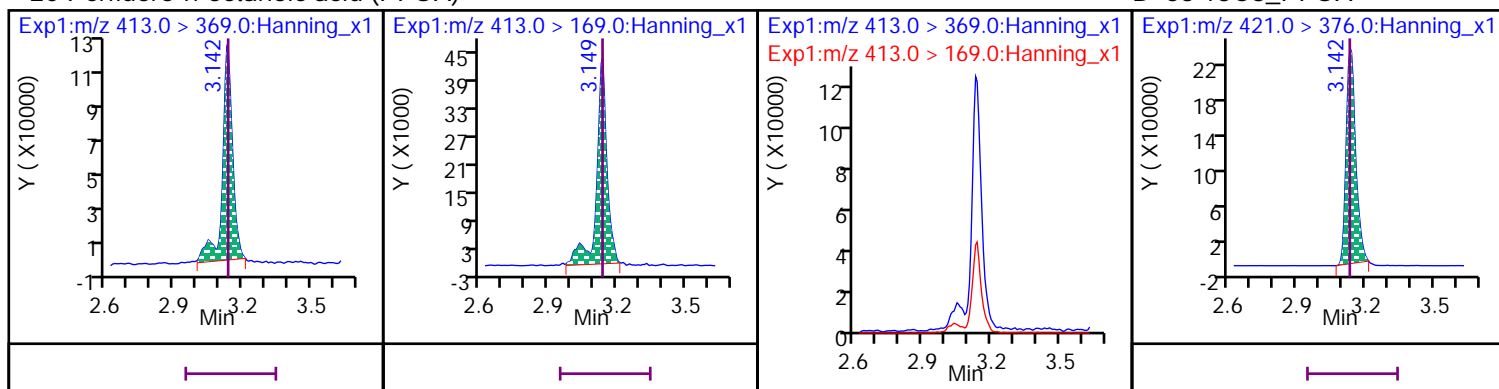
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonic acid] (6:2 FTS)

D 64 13C2\_6:2 FTS\_2



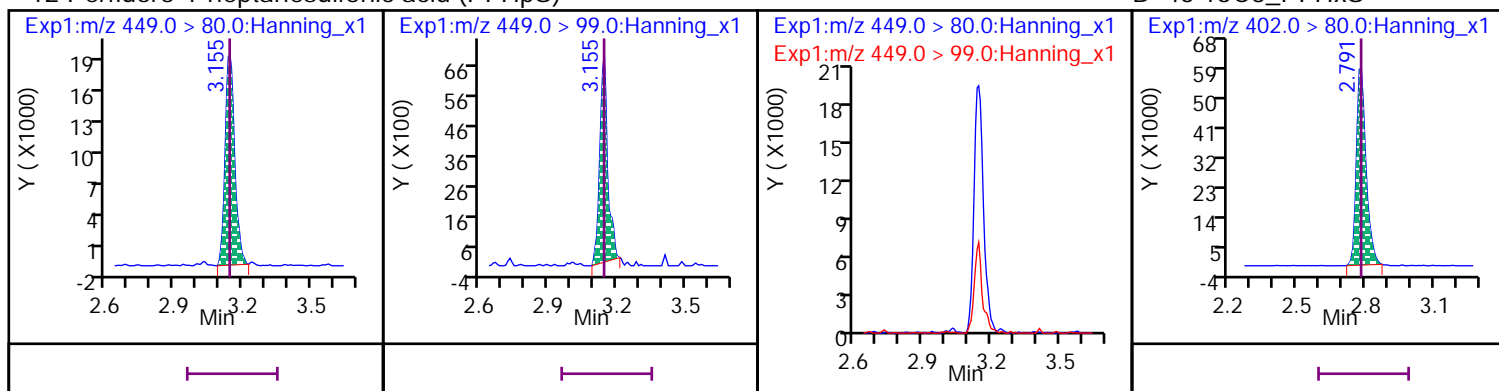
20 Perfluoro-n-octanoic acid (PFOA)

D 53 13C8\_PFOA



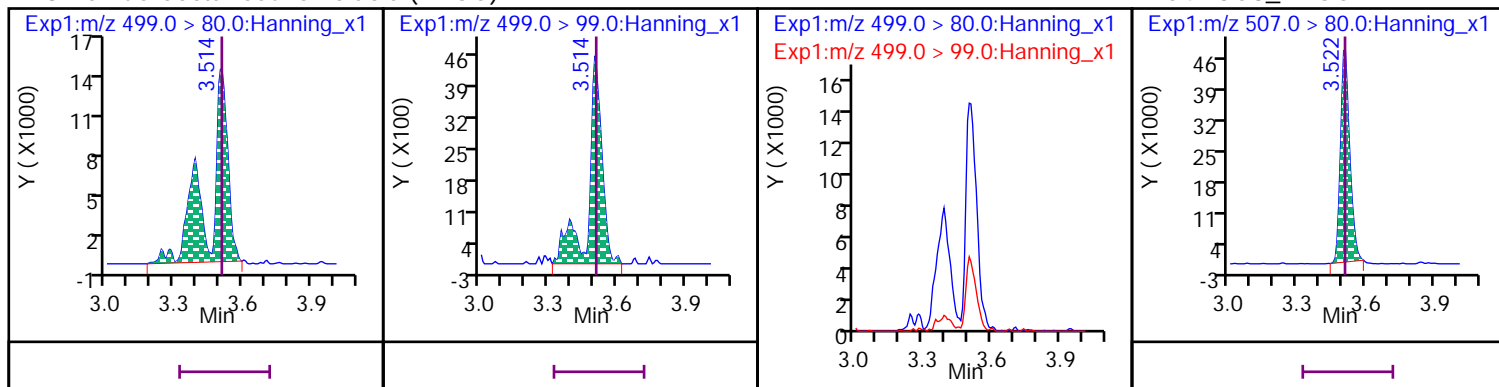
12 Perfluoro-1-heptanesulfonic acid (PFHpS)

D 45 13C3\_PFHxS



18 Perfluorooctanesulfonic acid (PFOS)

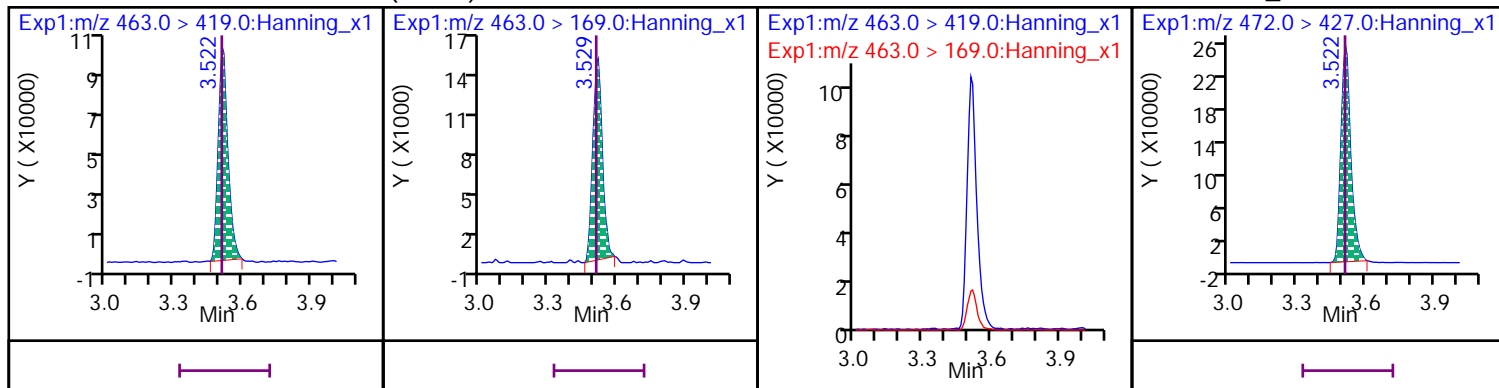
D 54 13C8\_PFOS





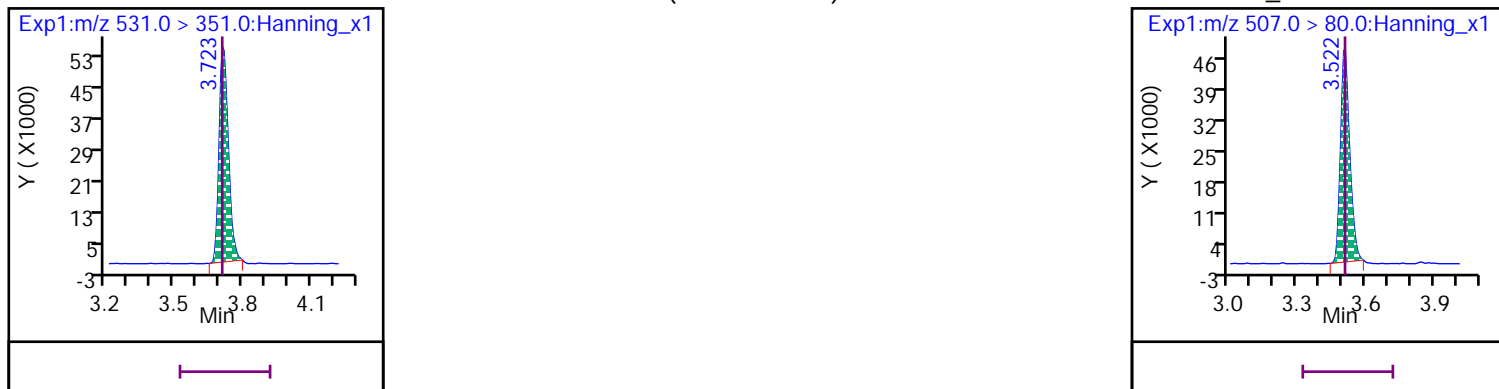
17 Perfluoro-n-nonanoic acid (PFNA)

D 56 13C9\_PFNA



30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)

D 54 13C8\_PFOS



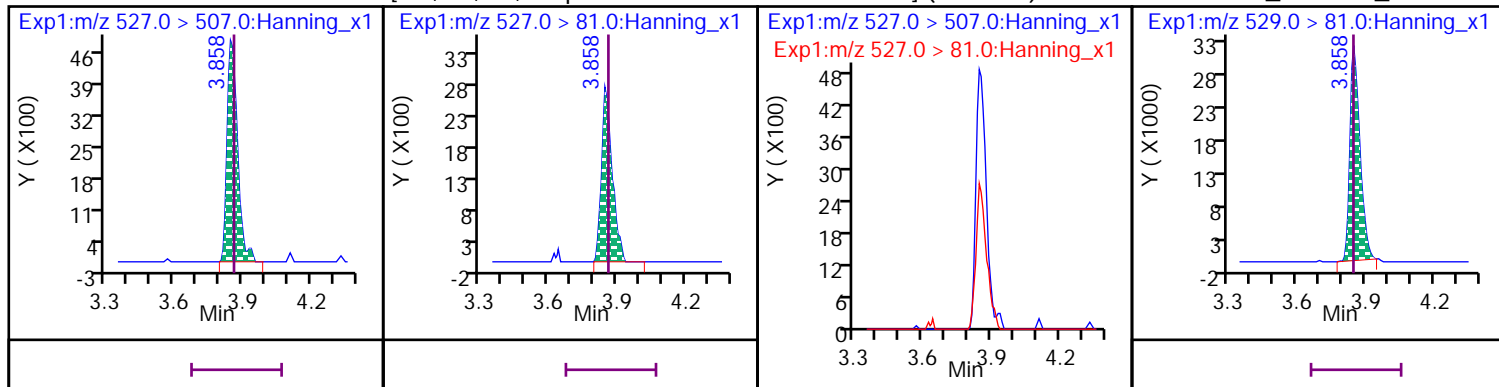
19 Perfluoro-1-octanesulfonamide (PFOSA)

D 55 13C8\_PFOSA



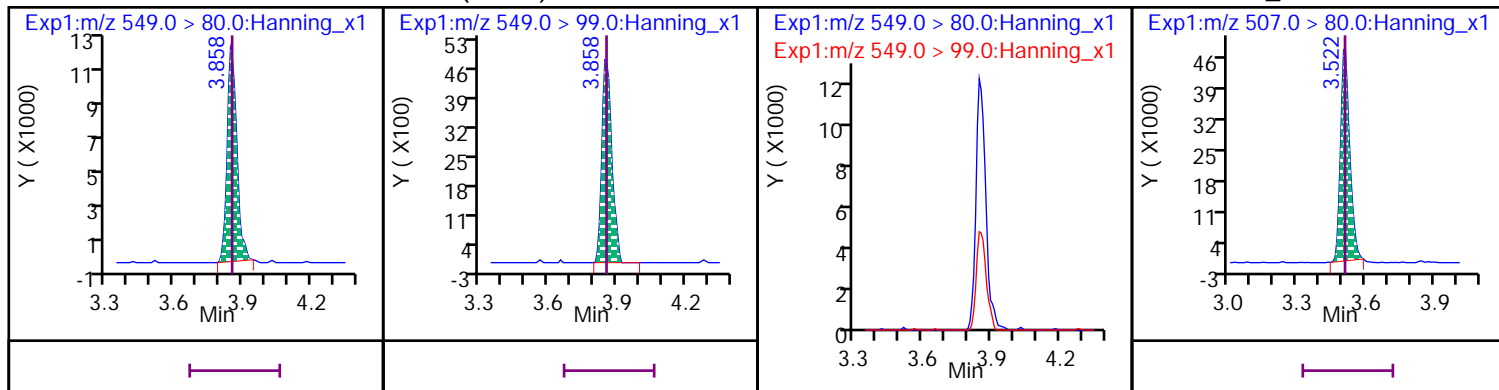
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonic acid] (8:2 FTS)

D 65 13C2\_8:2 FTS\_2



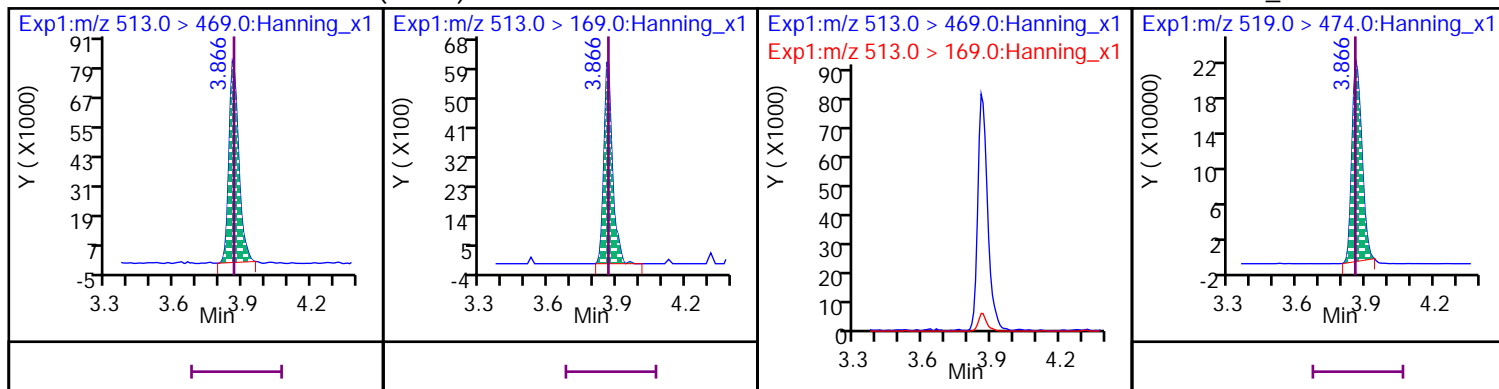
## 16 Perfluoro-1-nonanesulfonic acid (PFNS)

D 54 13C8\_PFOS



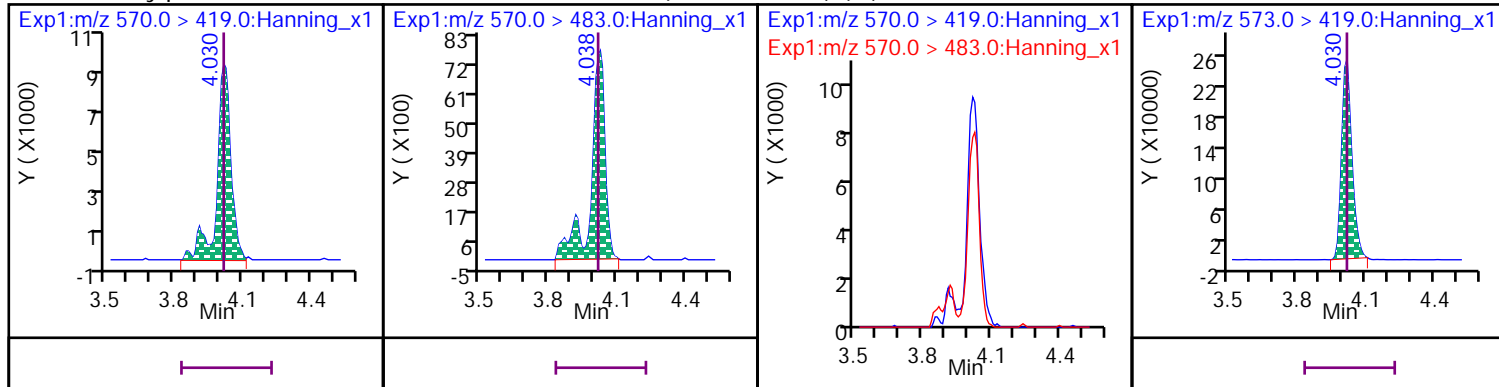
## 10 Perfluoro-n-decanoic acid (PFDA)

D 51 13C6\_PFDA



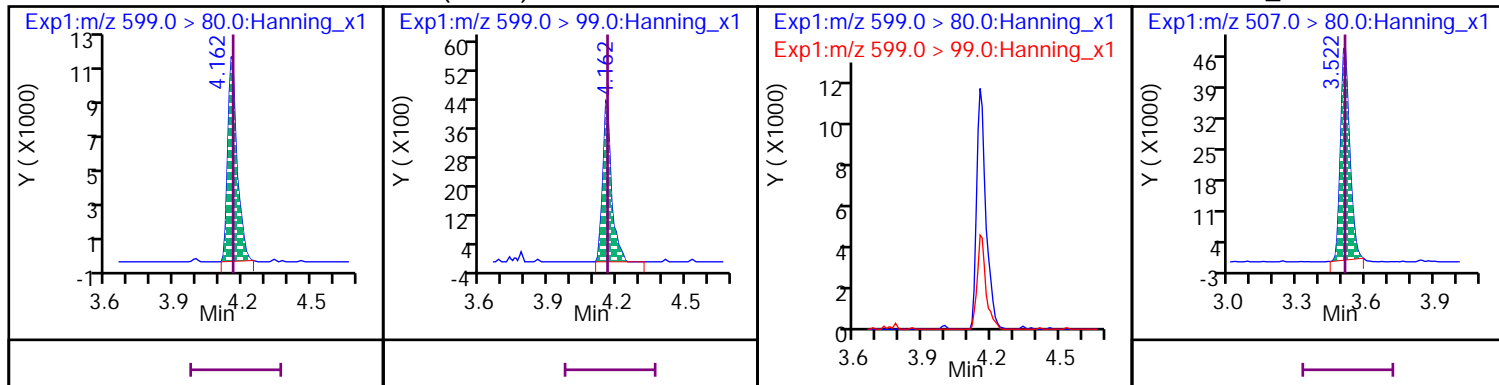
## 6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (M)

D 58 d3-MeFOSAA



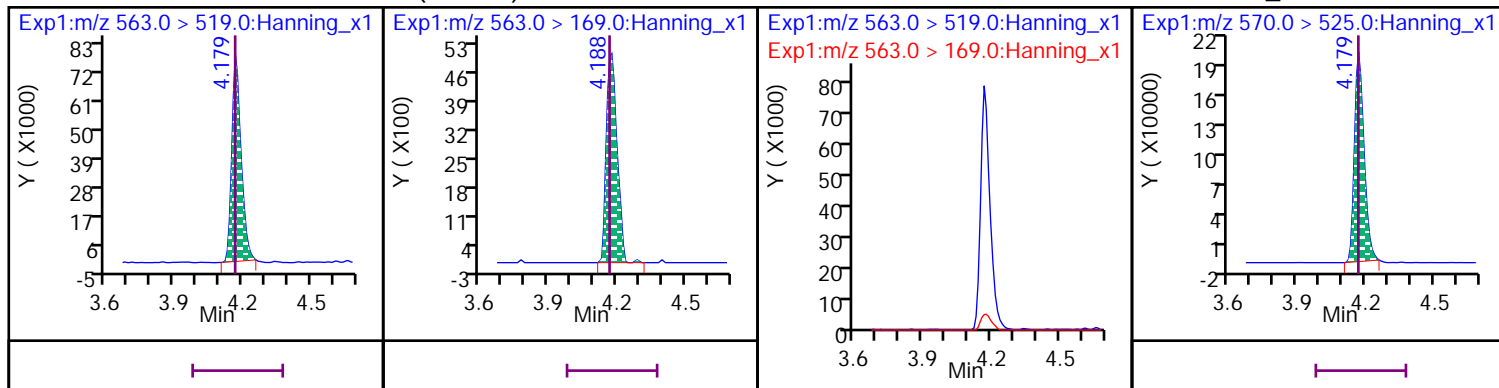
## 9 Perfluoro-1-decanesulfonic acid (PFDS)

D 54 13C8\_PFOS



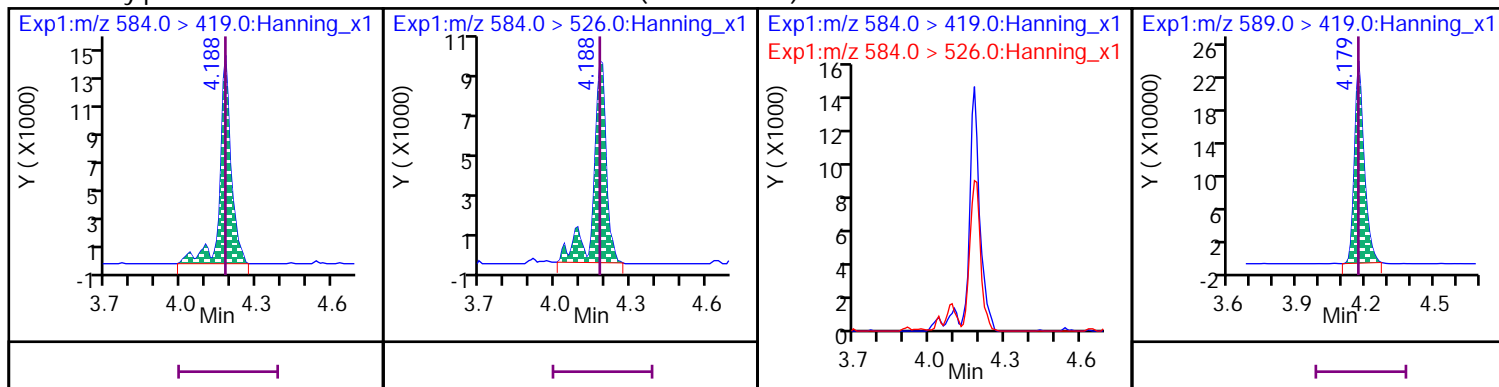
## 25 Perfluoro-n-undecanoic acid (PFUDa)

## D 52 13C7\_PFUdA



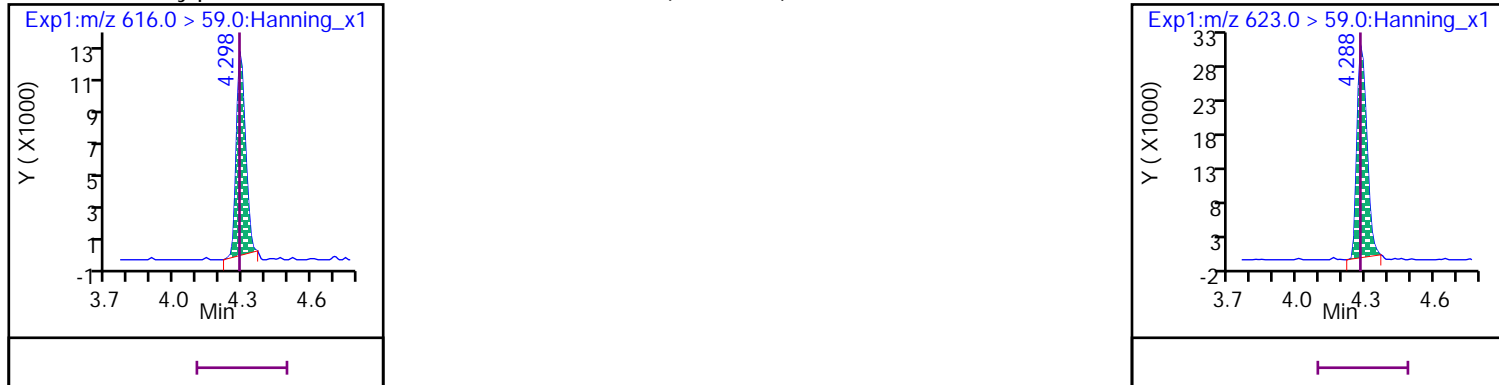
## 5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)

## D 60 d5-EtFOSAA



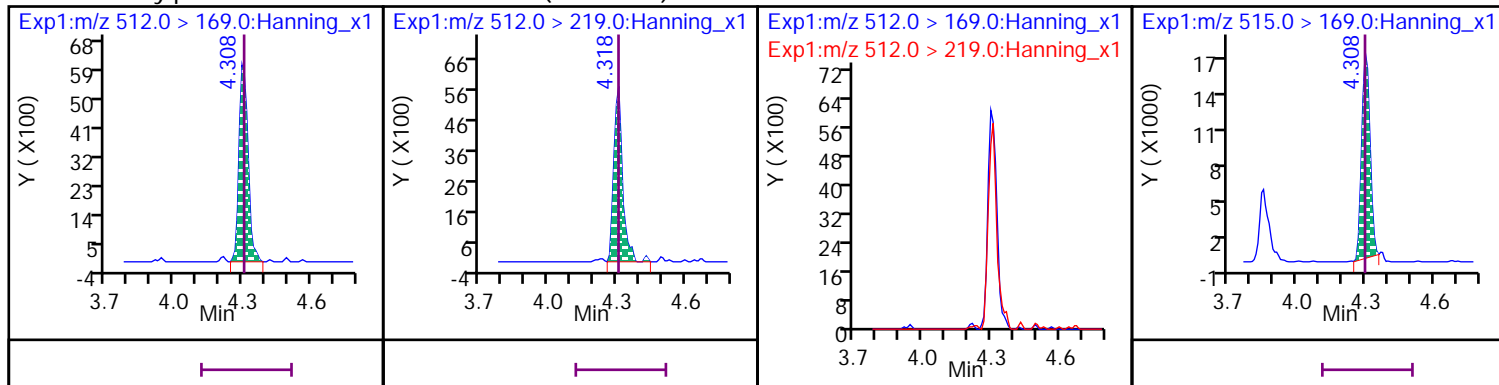
## 32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)

## D 61 d7-MeFOSE

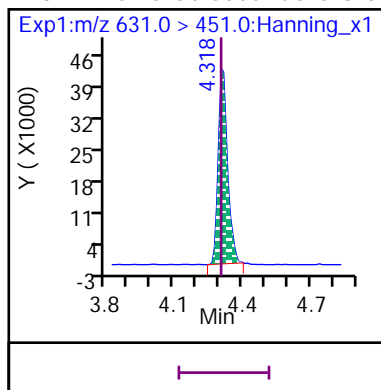


## 26 N-methylperfluoro-1-octanesulfonamide (MeFOSA)

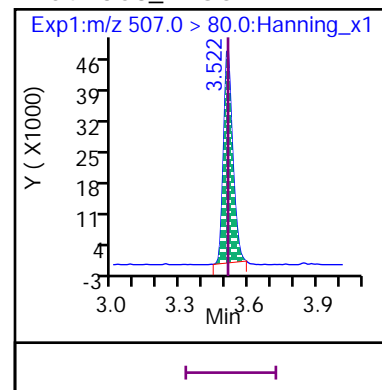
## D 57 d3-MeFOSA



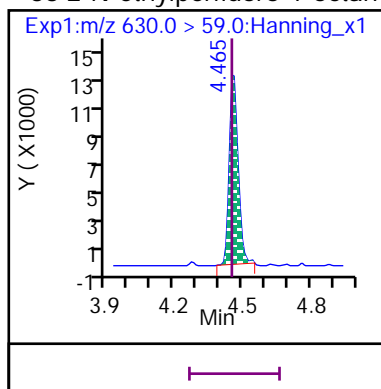
## 31 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)



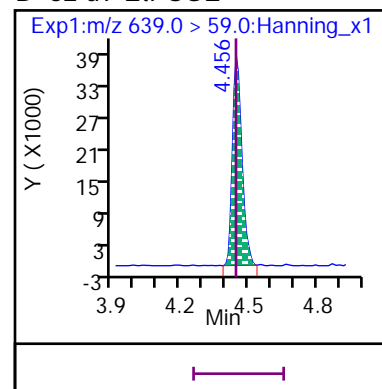
## D 54 13C8\_PFOS



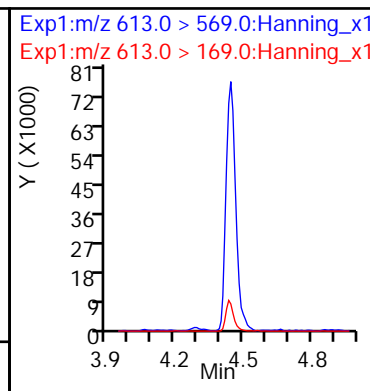
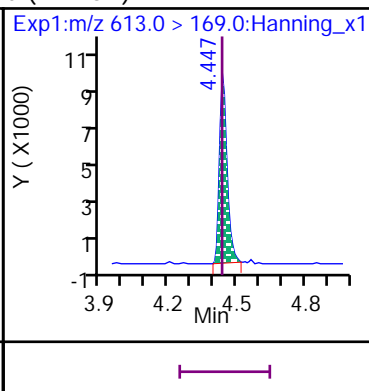
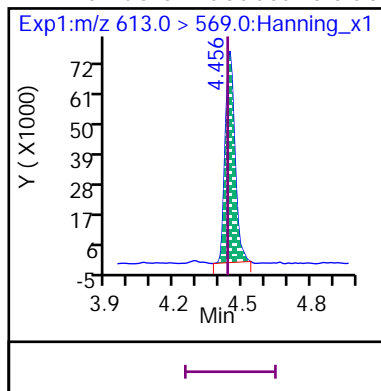
## 33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)



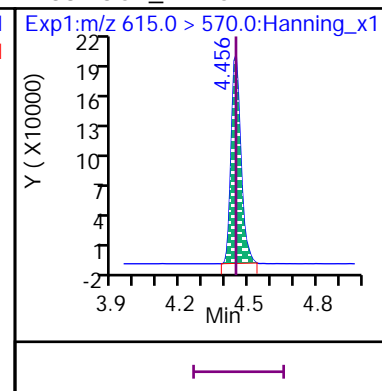
## D 62 d9-EtFOSE



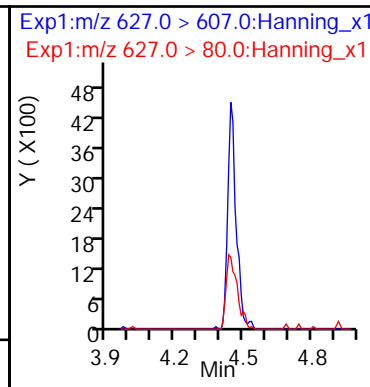
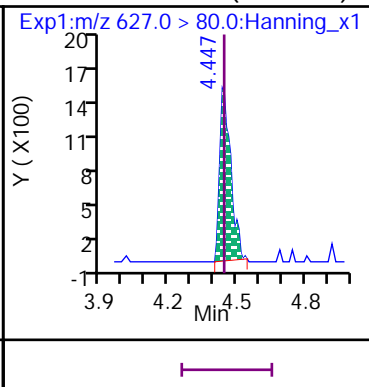
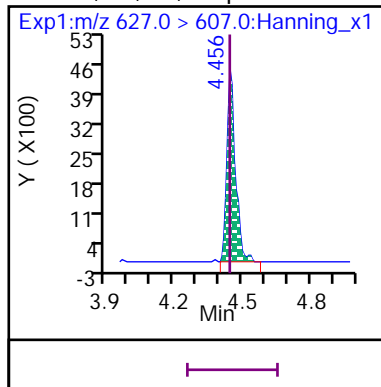
## 11 Perfluoro-n-dodecanoic acid (PFDoA)



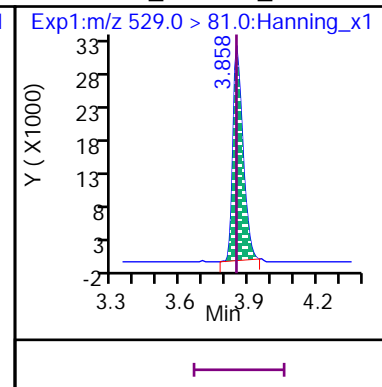
## D 38 13C2\_PFDoA



## 4 1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2FTS)

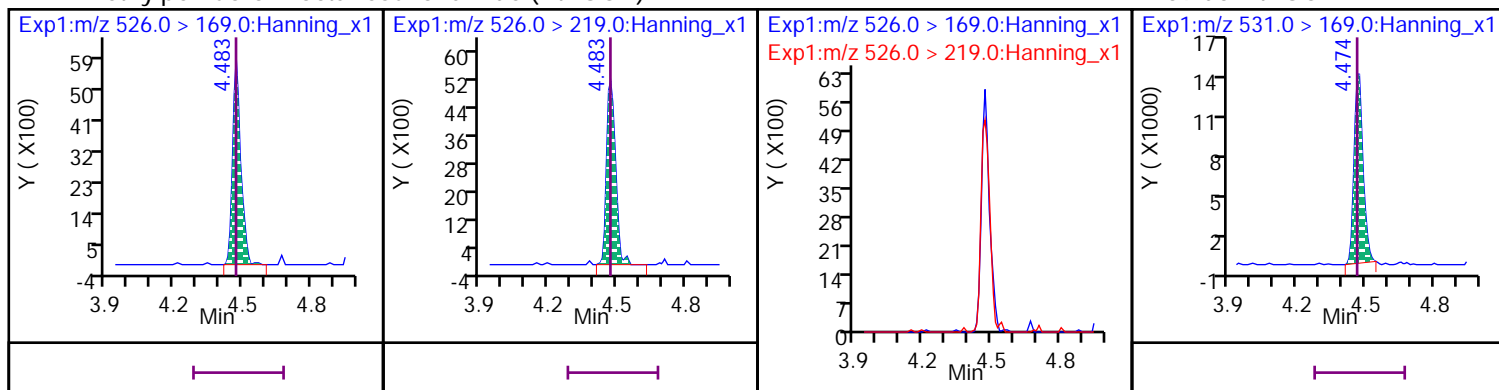


## D 65 13C2\_8:2 FTS\_2



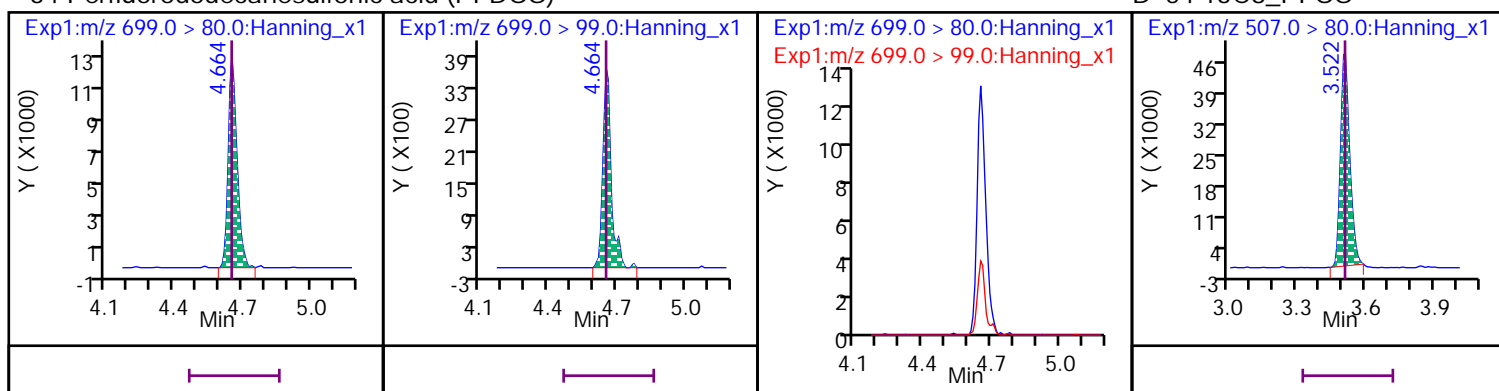
## 27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA)

## D 59 d5-EtFOSA



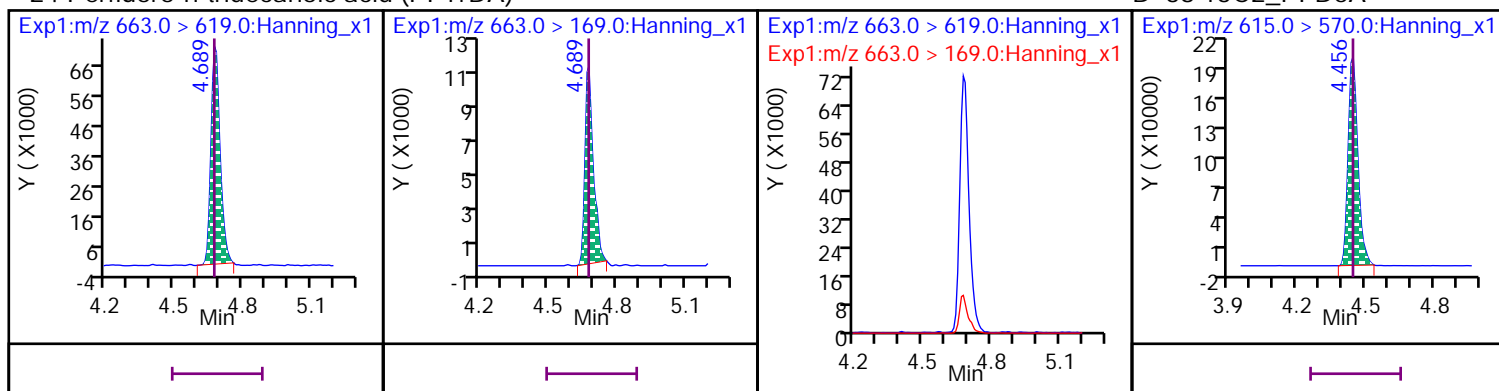
## 34 Perfluorododecanesulfonic acid (PFDOS)

## D 54 13C8\_PFOS



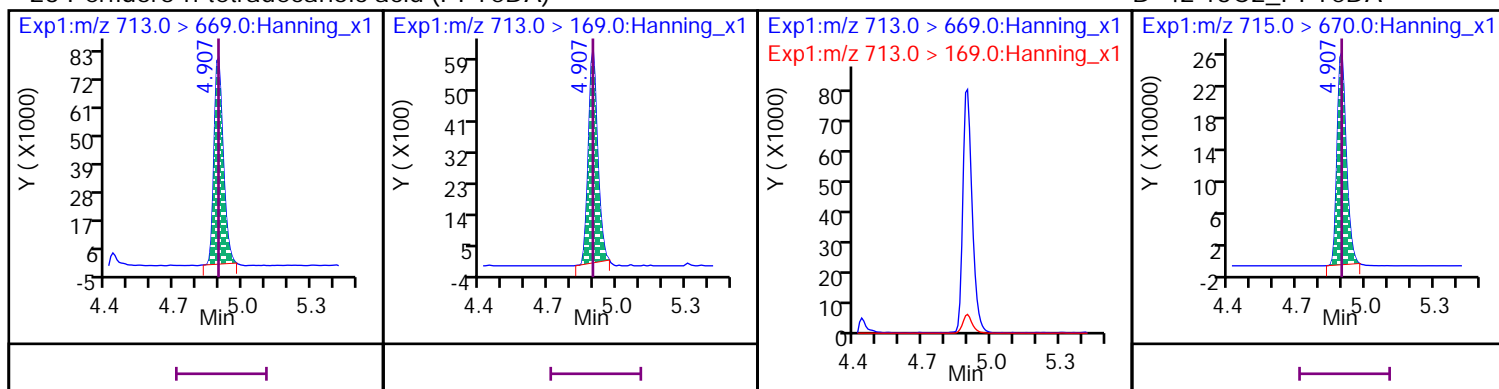
## 24 Perfluoro-n-tridecanoic acid (PFTrDA)

## D 38 13C2\_PFDaA



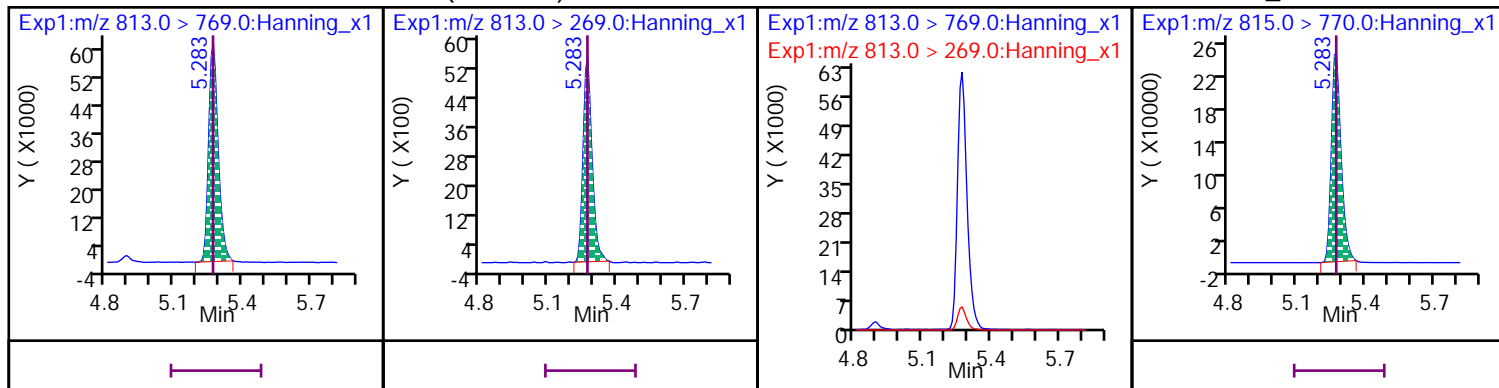
## 23 Perfluoro-n-tetradecanoic acid (PFTeDA)

## D 42 13C2\_PFTeDA



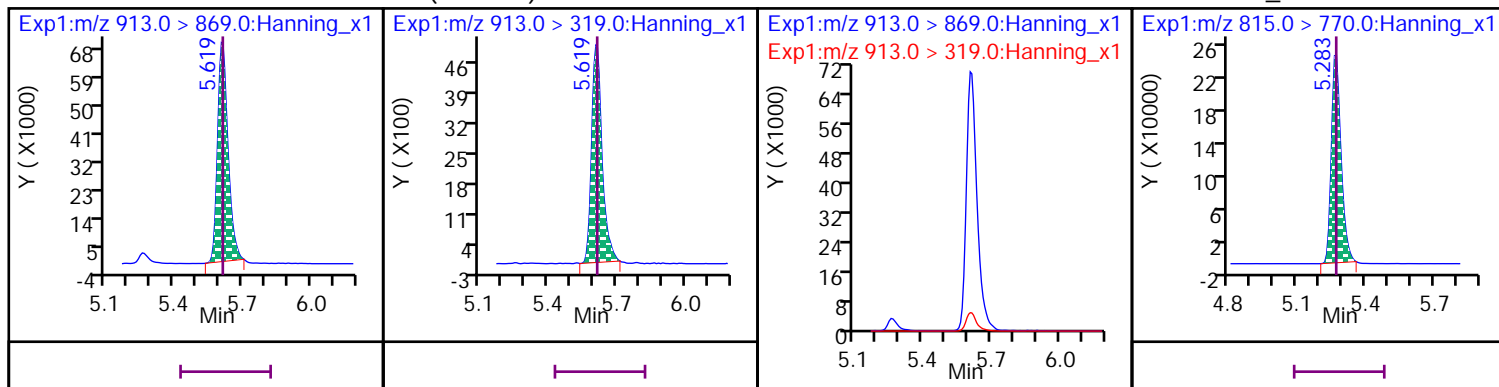
35 Perfluoro-n-hexadecanoic acid (PFHxDA)

D 40 13C2\_PFHxDA



36 Perfluoro-n-octadecanoic acid (PFODA)

D 40 13C2\_PFHxDA

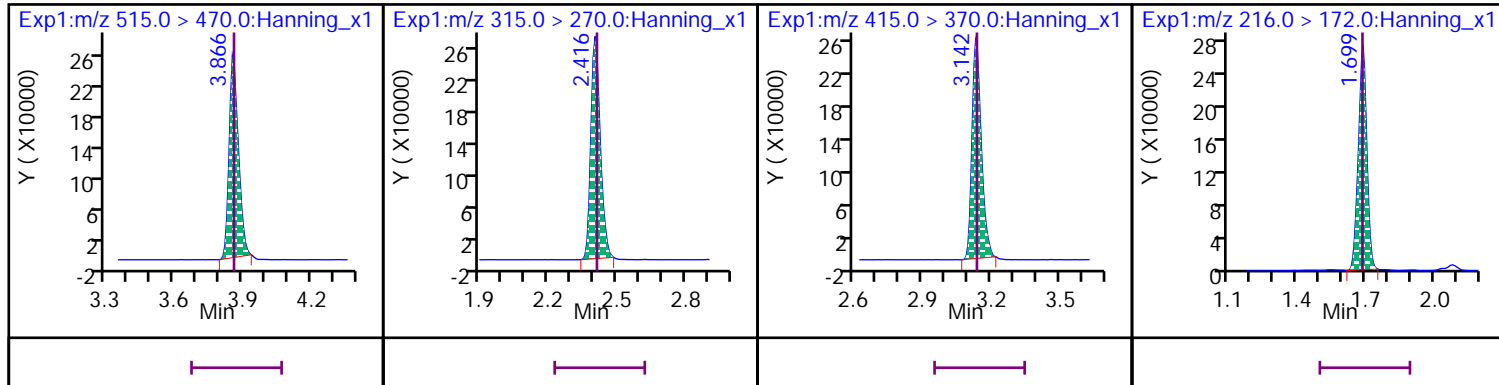


\* 37 13C2\_PFDA

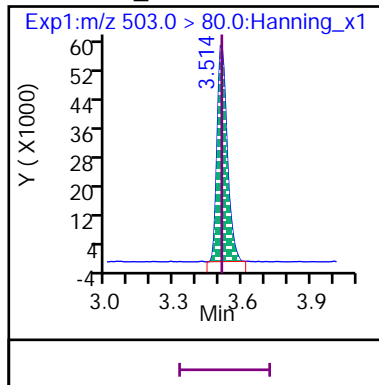
\* 39 13C2\_PFHxA

\* 41 13C2\_PFOA

\* 43 13C3\_PFBA



\* 48 13C4\_PFOS



Manual Integration Report

Data File: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b\122820021.d

Injection Date: 28-Dec-2020 12:45:33

Inst. ID: LCMSMS02

Client ID:

Lab ID: VL11043-001MD

Sample Info: VL11043-001MD

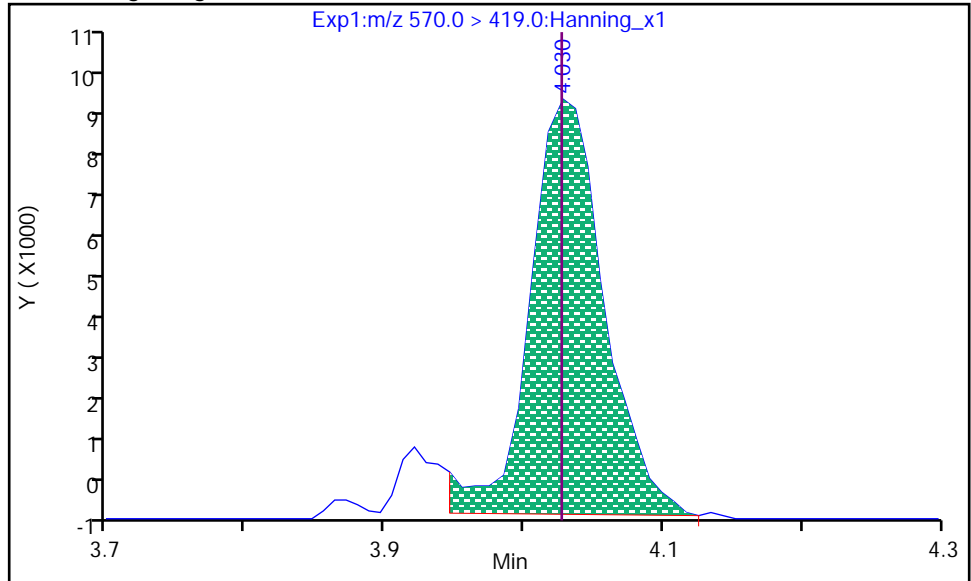
Dil. Factor: 1

Operator: Matthew M. Miller

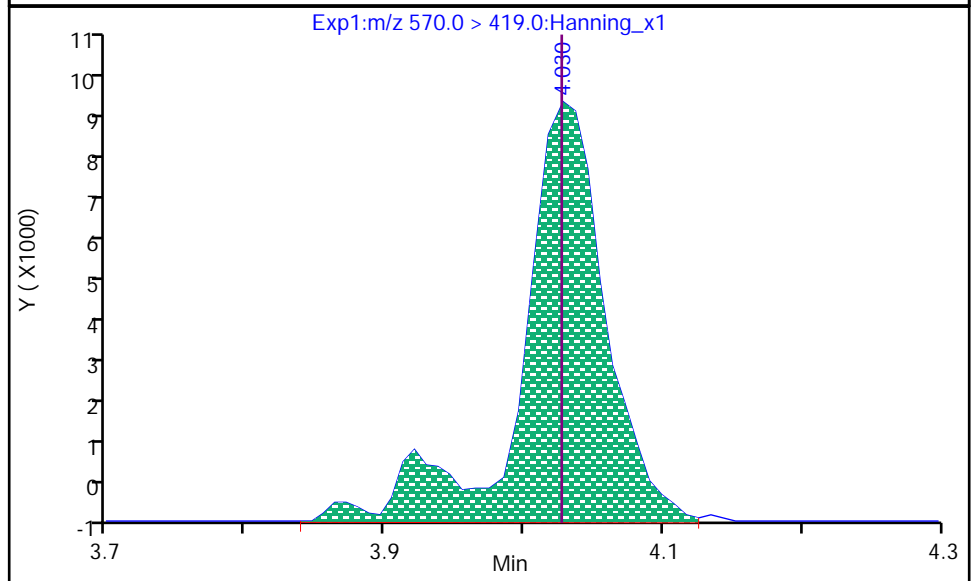
6 N-MeFOSAA, CAS: 2355-31-9

Processing Integration Results

RT: 4.030  
Area: 33341  
Conc: 10.934  
Conc Units: ng/L



RT: 4.030  
Area: 38830  
Conc: 12.734  
Conc Units: ng/L



Data Editor: matthew.miller, 29-Dec-2020 15:34:33

Audit Action: Mint

Audit Reason: Invalid Integration

# MISC. DATA



### Extract Dilution Preparations

<b>537</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
<b>ID Aq</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V <sub>o</sub> )	5* (FV/V <sub>o</sub> )	10* (FV/V <sub>o</sub> )	20* (FV/V <sub>o</sub> )	50* (FV/V <sub>o</sub> )	100* (FV/V <sub>o</sub> )	200* (FV/V <sub>o</sub> )	500* (FV/V <sub>o</sub> )	1000* (FV/V <sub>o</sub> )	2000* (FV/V <sub>o</sub> )
<b>DAI</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
<b>ID Solid</b>	<b>1X</b>	<b>5X</b>	<b>10X</b>	<b>20X</b>	<b>50X</b>	<b>100X</b>	<b>200X</b>	<b>500X</b>	<b>1000X</b>	<b>2000X</b>
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V <sub>E</sub> /(M*S))/ 0.91)/1000	((V <sub>E</sub> /(M*S))/ 0.2)/1000	((V <sub>E</sub> /(M*S))/ 0.1)/1000	((V <sub>E</sub> /(M*S))/ 0.05)/1000	((V <sub>E</sub> /(M*S))/ 0.02)/1000	((V <sub>E</sub> /(M*S))/ 0.01)/1000	((V <sub>E</sub> /(M*S))/ 0.005)/1000	((V <sub>E</sub> /(M*S))/ 0.002)/1000	((V <sub>E</sub> /(M*S))/ 0.001)/1000	((V <sub>E</sub> /(M*S))/ 0.0005)/1000

**NOTE:** Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b  
 Method: LCMSMS02\_PFA5-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFA5-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1219	17-Dec-2020 12:22:20	121720006.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1220	17-Dec-2020 12:32:59	121720007.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1221	17-Dec-2020 12:43:32	121720008.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1222	17-Dec-2020 12:54:06	121720009.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1248	17-Dec-2020 13:04:45	121720010.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1224	17-Dec-2020 13:15:20	121720011.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1225	17-Dec-2020 13:25:55	121720012.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1226	17-Dec-2020 13:36:34	121720013.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1227	17-Dec-2020 13:47:15	121720014.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1228	17-Dec-2020 13:57:55	121720015.d	ICal					Analytes	L-10	1.00		
11	IBLK A	17-Dec-2020 14:08:35	121720016.d	InstBlk					Surrogates	Smp	0.1100		
12	ICV 500_SVLC-1202	17-Dec-2020 14:19:09	121720017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1189	17-Dec-2020 14:29:42	121720018.d	CheckStd					IsomerCheck	Smp	1.00		
22	537.1 CCV 1000_SVLC-1248	17-Dec-2020 16:37:01	121720030.d	CCV					Analytes	L-5	1.00		
23	VQ76684-001	17-Dec-2020 16:47:37	121720031.d	MBIk		Soil	1	76684	Surrogates	Smp	0.1100		
24	VQ76684-002	17-Dec-2020 16:58:12	121720032.d	LCS		Soil	1	76684	Analytes	100x PDS	0.1000		
25	VQ76697-001	17-Dec-2020 17:08:54	121720033.d	MBIk		Soil	1	76697	Surrogates	Smp	0.1100		
26	VQ76697-002	17-Dec-2020 17:19:30	121720034.d	LCS		Soil	1	76697	Analytes	100x PDS	0.1000		
27	VQ77059-001	17-Dec-2020 17:30:06	121720035.d	MBIk		Aqueous	1	77059	Surrogates	Smp	0.1100		
28	VQ77059-002	17-Dec-2020 17:40:48	121720036.d	LCS		Aqueous	1	77059	Analytes	100x PDS	0.2000		
29	VQ77059-003	17-Dec-2020 17:51:26	121720037.d	LCS		Aqueous	1	77059	Analytes	100x PDS	0.2000		
31	VL02035-001	17-Dec-2020 18:12:47	121720039.d	Client	TT017 P+T1 GAC	Soil	50	76547	Surrogates	Smp	0.1100		
32	VL02035-003	17-Dec-2020 18:23:22	121720040.d	Client	TT017 VPGAC 1	Soil	1	76547	Surrogates	Smp	0.1100		
33	VL02035-004	17-Dec-2020 18:33:58	121720041.d	Client	TT017 VPGAC 2	Soil	1	76547	Surrogates	Smp	0.1100		
34	VL02035-007	17-Dec-2020 18:44:34	121720042.d	Client	Area H VPGAC 1	Soil	1	76543	Surrogates	Smp	0.1100		
35	VL02035-008	17-Dec-2020 18:55:14	121720043.d	Client	Area H VPGAC 2	Soil	1	76543	Surrogates	Smp	0.1100		
36	VL03019-002	17-Dec-2020 19:05:53	121720044.d	Client	MCAAP-IDW-2-SO-120220	Soil	1	76543	Surrogates	Smp	0.1100		
37	ID CCV 1000A_SVLC-1248	17-Dec-2020 19:16:32	121720045.d	CCV					Analytes	L-5	1.00		
39	VL03003-001	17-Dec-2020 19:37:48	121720047.d	Client	Thinx-Super-Hiphugger-Du	Soil	1	76547	Surrogates	Smp	0.1100		
40	VL03003-001MS	17-Dec-2020 19:48:27	121720048.d	MS		Soil	1	76547	Analytes	100x PDS	0.1000		
41	VL03003-001MD	17-Dec-2020 19:59:08	121720049.d	MSD		Soil	1	76547	Analytes	100x PDS	0.1000		
42	VL03003-002	17-Dec-2020 20:09:42	121720050.d	Client	Thinx-Moderate-Sport-Bei	Soil	1	76547	Surrogates	Smp	0.1100		SUR, RR
43	VL03003-003	17-Dec-2020 20:20:17	121720051.d	Client	Thinx-Moderate-Hiphugger	Soil	1	76547	Surrogates	Smp	0.1100		SUR, ND - NCM
44	VL03020-006	17-Dec-2020 20:30:54	121720052.d	Client	MCAAP-B34-2-SO-120120	Soil	1	76543	Surrogates	Smp	0.1100		
45	VL03020-006MS	17-Dec-2020 20:41:36	121720053.d	MS		Soil	1	76543	Analytes	100x PDS	0.1000		
46	VL03020-006MD	17-Dec-2020 20:52:13	121720054.d	MSD		Soil	1	76543	Analytes	100x PDS	0.1000		
47	VL03020-007	17-Dec-2020 21:02:50	121720055.d	Client	MCAAP-FD-2-SO-120120	Soil	1	76543	Surrogates	Smp	0.1100		
48	VL03020-009	17-Dec-2020 21:13:33	121720056.d	Client	MCAAP-B34-3-SO-120120	Soil	1	76543	Surrogates	Smp	0.1100		
49	VL06027-001	17-Dec-2020 21:24:12	121720057.d	Client	SB023-0.5	Soil	1	76543	Surrogates	Smp	0.1100		
50	VL06027-002	17-Dec-2020 21:34:50	121720058.d	Client	SB023-2	Soil	1	76543	Surrogates	Smp	0.1100		
51	VL06027-003	17-Dec-2020 21:45:29	121720059.d	Client	SB023-4	Soil	1	76543	Surrogates	Smp	0.1100		
52	ID CCV 1000B_SVLC-1248	17-Dec-2020 21:56:04	121720060.d	CCV					Analytes	L-5	1.00		
53	VL06027-004	17-Dec-2020 22:06:41	121720061.d	Client	SB023-6	Soil	1	76543	Surrogates	Smp	0.1100		
54	VL06027-005	17-Dec-2020 22:17:16	121720062.d	Client	SB024-0.5	Soil	1	76543	Surrogates	Smp	0.1100		

Batch Path: \\organics\LL\LCMSMS02.i\121720-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
55	VL06027-006	17-Dec-2020 22:27:55	121720063.d	Client	SB024-2	Soil	1	76543	Surrogates	Smp	0.1100		
56	VL06027-007	17-Dec-2020 22:38:36	121720064.d	Client	SB024-3	Soil	1	76543	Surrogates	Smp	0.1100		
57	VL06027-008	17-Dec-2020 22:49:17	121720065.d	Client	SB025-0.5	Soil	1	76543	Surrogates	Smp	0.1100		
58	VL06027-009	17-Dec-2020 22:59:55	121720066.d	Client	SB025-2	Soil	1	76543	Surrogates	Smp	0.1100		
59	VL06027-010	17-Dec-2020 23:10:40	121720067.d	Client	SB025-4	Soil	1	76543	Surrogates	Smp	0.1100		
60	VL06027-011	17-Dec-2020 23:21:20	121720068.d	Client	SB025-6	Soil	1	76543	Surrogates	Smp	0.1100		
61	VL06027-012	17-Dec-2020 23:32:00	121720069.d	Client	SB025-7	Soil	1	76543	Surrogates	Smp	0.1100		
62	VL06027-013	17-Dec-2020 23:42:40	121720070.d	Client	SB026-0.5	Soil	1	76543	Surrogates	Smp	0.1100		
63	ID CCV 1000C_SVLC-1248	17-Dec-2020 23:53:18	121720071.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\ORGANICS\LL\LCMSMS02.i\122820-DOD.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	28-Dec-2020 09:55:50	122820005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1221	28-Dec-2020 10:06:27	122820006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Dec-2020 10:17:01	122820007.d	InstBlk					Surrogates	Smp	0.1100		
98	ID IS 20_SVLC-1267	28-Dec-2020 10:27:37	122820008.d	InstBlk					Surrogates	Smp	0.1100		
1	VQ77741-001	28-Dec-2020 10:38:17	122820009.d	MBlk		Aqueous	1	77741	Surrogates	Smp	0.1100		
2	VQ77741-002	28-Dec-2020 10:48:51	122820010.d	LCS		Aqueous	1	77741	Analytes	100x PDS	0.2000		
3	VL11001-006	28-Dec-2020 10:59:26	122820011.d	Client	FFS-MW01-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
4	VL11001-007	28-Dec-2020 11:10:00	122820012.d	Client	T-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
5	VL11001-008	28-Dec-2020 11:20:38	122820013.d	Client	JAW-60-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-5X
6	VL11001-009	28-Dec-2020 11:31:12	122820014.d	Client	ET-3-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR+C/O
7	VL11001-010	28-Dec-2020 11:41:48	122820015.d	Client	FD02-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
8	VL11001-011	28-Dec-2020 11:52:30	122820016.d	Client	EB01-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
9	VL11001-012	28-Dec-2020 12:03:09	122820017.d	Client	EB02-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
10	VL11001-013	28-Dec-2020 12:13:48	122820018.d	Client	TB01-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
11	VL11043-001	28-Dec-2020 12:24:27	122820019.d	Client	FFS-MW05-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-62F5 SUR
12	VL11043-001MS	28-Dec-2020 12:35:00	122820020.d	MS		Aqueous	1	77741	Analytes	100x PDS	0.2000		
13	VL11043-001MD	28-Dec-2020 12:45:33	122820021.d	MSD		Aqueous	1	77741	Analytes	100x PDS	0.2000		
14	VL11043-002	28-Dec-2020 12:56:08	122820022.d	Client	FFS-MW04-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
15	ID CCV 1000_SVLC-1248	28-Dec-2020 13:06:43	122820023.d	CCV					Analytes	L-5	1.00		
16	VL11043-003	28-Dec-2020 13:17:18	122820024.d	Client	JAW-63-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
17	VL11043-004	28-Dec-2020 13:27:56	122820025.d	Client	C-00-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
18	VL11043-005	28-Dec-2020 13:38:33	122820026.d	Client	FTA-TT-MW-03-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-5X
19	VL11043-006	28-Dec-2020 13:49:08	122820027.d	Client	FTP-MWS-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-1X-C/O
20	VL11043-007	28-Dec-2020 13:59:47	122820028.d	Client	FTA-99-1-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
21	VL11043-008	28-Dec-2020 14:10:27	122820029.d	Client	TB01-121020	Aqueous	1	77741	Surrogates	Smp	0.1100		
22	VL11044-002	28-Dec-2020 14:21:06	122820030.d	Client	IDW-L-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		RR-SUR
23	VL15017-007	28-Dec-2020 14:31:41	122820031.d	Client	FTHU-MW-POC2-DEB-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
24	VL15017-009	28-Dec-2020 14:42:15	122820032.d	Client	FTHU-MW-POC2-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
25	VL15017-010	28-Dec-2020 14:52:56	122820033.d	Client	FTHU-MW-POC1-DEB-120820	Aqueous	1	77741	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1248	28-Dec-2020 15:03:32	122820034.d	CCV					Analytes	L-5	1.00		
27	VQ77740-001	28-Dec-2020 15:14:10	122820035.d	MBlk		Soil	1	77740	Surrogates	Smp	0.1100		
28	VQ77740-002	28-Dec-2020 15:24:51	122820036.d	LCS		Soil	1	77740	Analytes	100x PDS	0.1000		
29	VL11044-001	28-Dec-2020 15:35:28	122820037.d	Client	IDW-S-1220	Soil	1	77740	Surrogates	Smp	0.1100		
30	ID CCV 1000B_SVLC-1248	28-Dec-2020 15:46:06	122820038.d	CCV					Analytes	L-5	1.00		
31	VL11077-001	28-Dec-2020 15:56:46	122820039.d	Client	FLW-IDW-SO-121020	Soil	1	77740	Surrogates	Smp	0.1100		
32	VL15017-001	28-Dec-2020 16:07:20	122820040.d	Client	FTHU-WWTP1-01-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
33	VL15017-002	28-Dec-2020 16:17:56	122820041.d	Client	FTHU-WWTP1-02-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
34	VL15017-003	28-Dec-2020 16:28:32	122820042.d	Client	FTHU-WWTP1-03-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
35	VL15017-004	28-Dec-2020 16:39:08	122820043.d	Client	FTHU-WWTP1-04-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
36	VL15017-005	28-Dec-2020 16:49:49	122820044.d	Client	FTHU-WWTP1-05-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
37	VL15017-006	28-Dec-2020 17:00:27	122820045.d	Client	FTHU-WWTP1-06-SO-120720	Soil	1	77740	Surrogates	Smp	0.1100		
38	VL15017-006MS	28-Dec-2020 17:11:04	122820046.d	MS		Soil	1	77740	Analytes	100x PDS	0.1000		
39	VL15017-006MD	28-Dec-2020 17:21:41	122820047.d	MSD		Soil	1	77740	Analytes	100x PDS	0.1000		
40	ID CCV 1000C_SVLC-1248	28-Dec-2020 17:32:21	122820048.d	CCV					Analytes	L-5	1.00		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
41	VL11078-001	28-Dec-2020 17:43:00	122820049.d	Client	FLW-IDW-GW-121020	Aqueous	1	77367	Surrogates	Smp	0.1100		SUR CONFIRMS, NEED RX
42	VL02035-005	28-Dec-2020 17:53:38	122820050.d	Client	Area H LPGAC 1	Soil	100	76697	Surrogates	Smp	0.1100		REPORT 10X
43	VL02035-005	28-Dec-2020 18:04:16	122820051.d	Client	Area H LPGAC 1	Soil	10	76697	Surrogates	Smp	0.1100		REPORT THIS
94	ID BLK B2	28-Dec-2020 18:14:52	122820052.d	InstBlk					Surrogates	Smp	0.1100		
52	ID CCV 1000D_SVLC-1248	28-Dec-2020 19:50:36	122820061.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC  
Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\122920-DOD.b  
 Method: LCMSMS02\_PFAS-ID.M Instrument: LCMSMS02  
 Cal Start Date: 17-Dec-2020 12:22:20 Cal End Date: 17-Dec-2020 13:57:55  
 Method Lock: Unlocked Lock Date:  
 No. Compounds: 66 Integrator: picker  
 Calib Method: PFAS-ID

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1220	29-Dec-2020 10:13:38	122920005.d	CCV					Analytes	L-2	1.00		All dilutions refortified w/EIS SVLC-1264
96	ID CCV 200_SVLC-1221	29-Dec-2020 10:24:12	122920006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	29-Dec-2020 10:34:46	122920007.d	InstBlk					Surrogates	Smp	0.1100		
1	VL11001-006	29-Dec-2020 10:45:23	122920008.d	Client	FFS-MW01-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
2	VL11001-008	29-Dec-2020 10:55:58	122920009.d	Client	JAW-60-1220	Aqueous	5	77741	Surrogates	Smp	0.1100		
3	VL11001-009	29-Dec-2020 11:06:35	122920010.d	Client	ET-3-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
4	VL11001-010	29-Dec-2020 11:17:10	122920011.d	Client	FD02-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
5	VL11043-001	29-Dec-2020 11:27:47	122920012.d	Client	FFS-MW05-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
6	VL11043-005	29-Dec-2020 11:38:23	122920013.d	Client	FTA-TT-MW-03-1220	Aqueous	5	77741	Surrogates	Smp	0.1100		
7	VL11043-006	29-Dec-2020 11:49:02	122920014.d	Client	FTP-MW5-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		
8	VL11044-002	29-Dec-2020 11:59:40	122920015.d	Client	IDW-L-1220	Aqueous	1	77741	Surrogates	Smp	0.1100		sur confirms, need RX
9	ID CCV 1000_SVLC-1248	29-Dec-2020 12:10:17	122920016.d	CCV					Analytes	L-5	1.00		
10	VQ77766-001	29-Dec-2020 12:20:56	122920017.d	MBlk		Aqueous	1	77766	Surrogates	Smp	0.1100		
11	VQ77766-002	29-Dec-2020 12:31:36	122920018.d	LCS		Aqueous	1	77766	Analytes	100x PDS	0.2000		
15	VL09008-003	29-Dec-2020 13:13:53	122920022.d	Client	Secondary Effluent Blank	Aqueous	1	77766	Surrogates	Smp	0.1100		
16	VL09008-004	29-Dec-2020 13:24:34	122920023.d	Client	Landfill Leachate	Aqueous	1	77766	Surrogates	Smp	0.1100		RX - MB 6:2 FTS; SUR - MATRIX
22	ID CCV 1000_SVLC-1248	29-Dec-2020 14:28:22	122920029.d	CCV					Analytes	L-5	1.00		

Analyst: MBR

Level 2 Analyst: NA

Prep Batch: 77741

Printed: 01/18/21 07:29

Status: Level 1 review released

Matrix: Aqueous

## PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 17:25

Conc Analyst: MBR

End Date: 12/27/2020 22:04

Conc Start Date: 12/27/2020 22:04

Conc End Date: 12/27/2020 22:04

Ext Solvent: MECH+96%(MECH+4%+H2O)

Surrogate: SMLG-1252A

Reagents Vol. (mL): 10

Surrogate Vol. (mL): 0.110

Chem ID: 20-2645&gt;20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VQ77741-001	MB		1	FFAS by ID SOP QSM B-15	280	30	250		0.000	10.0	MB init: 305.6g, fin: 31.26g, LCS init: 296.17g, fin: 31.86g, Sorbent dry start/end: 1st: 1909/1914, 2nd: 2048/2053, Buf 332
VQ77741-002	LCS		1	FFAS by ID SOP QSM B-15	280	30	250	SVLG-1247	0.200	10.0	Arm: MeCHSV/20-343(4mL); QC Water: 20- 2823; Bottletop#329; Pipettes: 20- 2533, 374, 393; QC Bottles: M0-266- 03BB; XL-AW: 20-2546
VL11001-006	Sample	FFS-MA01-1220	1	FFAS by ID SOP QSM B-15	305.92	31.67	274		0.000	10.0	Reservoirs: 20-2623; Filter cartridges: 20- 2752; Elution tubes: 20-2654; Falcon tubes: 20-2756; Centrifuge tubes: 20-2012
VL11001-007	Sample	T-1-1220	1	FFAS by ID SOP QSM B-15	327.04	31.1	296		0.000	10.0	Storage bottles: 20-2252; MeCH Ext: 4mL, Filtr: 2mL; IS: SVLG-1250(0.010mL); ASV/Caps: 20-2670/20-2671
VL11001-008	Sample	JAW-60-1220	1	FFAS by ID SOP QSM B-15	309.21	31.92	277		0.000	10.0	
VL11001-009	Sample	ET-3-1220	1	FFAS by ID SOP QSM B-15	322.35	31.21	291		0.000	10.0	NCM#45740
VL11001-010	Sample	FD02-1220	1	FFAS by ID SOP QSM B-15	326.29	31.68	295		0.000	10.0	
VL11001-011	Sample	EB01-120820	1	FFAS by ID SOP QSM B-15	291.19	31.76	259		0.000	10.0	
VL11001-012	Sample	EB02-120820	1	FFAS by ID SOP QSM B-15	296.25	31.87	264		0.000	10.0	
VL11001-013	Sample	TB01-120820	1	FFAS by ID SOP QSM B-15	311.16	45.82	265		0.000	10.0	
VL11043-001	Sample	FFS-MA05-1220	1	FFAS by ID SOP QSM B-15	309.49	31.77	278		0.000	10.0	

Analyst: MBR

Level 2 Analyst: NA

Prep Batch: 77741

Printed: 01/18/21 07:29

Status: Level 1 review released

Matrix: Aqueous

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 17:25

Conc Analyst: MBR

End Date: 12/27/2020 22:04

Conc Start Date: 12/27/2020 22:04

Conc End Date: 12/27/2020 22:04

Surrogate: SMLG-1252A

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%/MECH4%/H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645>20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
VL11043-001	MSMS		1	FFAS by ID SOP QSM B-15	306.26	32	274	SMLG-1247	0.200	10.0	
VL11043-001	MDMSD		1	FFAS by ID SOP QSM B-15	318.91	32.26	287	SMLG-1247	0.200	10.0	
VL11043-002	Sample	FFS-MW04-1220	1	FFAS by ID SOP QSM B-15	320.71	32.21	289		0.000	10.0	
VL11043-003	Sample	JAW-63-1220	1	FFAS by ID SOP QSM B-15	317.82	31.86	286		0.000	10.0	
VL11043-004	Sample	G00-1-1220	1	FFAS by ID SOP QSM B-15	317.45	32.03	285		0.000	10.0	
VL11043-005	Sample	FTA-TT-MW03-1220	1	FFAS by ID SOP QSM B-15	328.3	31.48	297		0.000	10.0	
VL11043-006	Sample	FTPMA5-1220	1	FFAS by ID SOP QSM B-15	310.67	32.01	279		0.000	10.0	
VL11043-007	Sample	FTA-99-1-1220	1	FFAS by ID SOP QSM B-15	315.95	32.34	284		0.000	10.0	
VL11043-008	Sample	TB01-121020	1	FFAS by ID SOP QSM B-15	315.88	45.08	271		0.000	10.0	
VL11044-002	Sample	IDWL-1220	1	FFAS by ID SOP QSM B-15	307.91	32.09	276		0.000	10.0	
VL15017-007	Sample	FTHJ-MW-FOC2-DEB-120820	1	FFAS by ID SOP QSM B-15	300.98	32.55	268		0.000	10.0	
VL15017-009	Sample	FTHJ-MW-FOC2-120820	1	FFAS by ID	289.65	32.83	257		0.000	10.0	



Analyst: MBR

Level 2 Analyst: NA

Prep Batch: 77741

Printed: 01/18/21 07:29

Status: Level 1 review released

Matrix: Aqueous

PFAS Prep by ID SOP QSM B-15 - PFAS Aqueous Preparation

Start Date: 12/27/2020 17:25

Conc Analyst: MBR

End Date: 12/27/2020 22:04

Conc Start Date: 12/27/2020 22:04

Conc End Date: 12/27/2020 22:04

Surrogate: SMLG-1252A

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%/MECH4%/H2O

Reagents Vol. (mL): 10

Chem ID: 20-2645>20-2645/20-2823

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
				SOPQSM B-15							
VL15017-010	Sample	FTHJMW/FOCI-DEB-120820	1	PFAS by ID SOPQSM B-15	292.88	32.55	260		0.000	10.0	

(end of report)

Total Samples: 20



## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>KMM2</u>	Mix ID #: <u>SVLC-1202</u>	Level 2 Reviewed by: <u>ARC2</u>
Prep. Date: <u>11/11/2020</u>	Mix Name: <u>PFAS Full List ICV, 500ppt</u>	Date: <u>11/12/2020</u>
Exp. Date: <u>7/8/2021</u>	Solvent ID #: <u>20-2394/20-1948</u>	
Pipet ID: <u>317,393</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/mL	Aliquoted Volume uL	Dilution Volume mL	Final Conc. pg/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
PFAS ICV 100X Mix	SVLC-1025	20,000.0	50	2	500	1,2	-	6/8/2020	9/20/2022	
ID SUR 20ppb	SVLC-1181	20,000.0	100		1000	1	-	10/16/2020	8/24/2021	
ID IS 20ppb	SVLC-1192	20,000.0	100		1000	1	-	10/27/2020	7/8/2021	
Methanol	20-2394	pure	1,680		#VALUE!	1	5/31/2025	11/10/2020	5/31/2025	
Water	20-1948	pure	70		#VALUE!	1	8/31/2025	9/18/2020	8/31/2025	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at a final concentration of 2500 pg/mL

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1219</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>50 ppt PFAS FL ICAL (L1)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
Full List 1000X PDS	SVLC-1218	2,000	125	5	50	1,2	-	11/20/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	4,375		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1220</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>100 ppt PFAS FL ICAL (L2)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
								Full List 1000X PDS	SVLC-1218	2,000
ID SUR 20ppb	SVLC-1209	20,000.0	500	1000	1	-	11/16/2020	8/27/2021		
ID IS 20ppb	SVLC-1208	20,000.0	500	1000	1	-	11/16/2020	7/8/2021		
96% Methanol	20-298	pure	8,500	#VALUE!	1	-	11/13/2020	11/13/2021		

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC-1221</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>200 ppt PFAS FL ICAL (L3)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
Full List 1000X PDS	SVLC-1218	2,000	1,000	10	200	1,2	-	11/20/2020	3/9/2021
ID SUR 20ppb	SVLC-1209	20,000.0	500		1000	1	-	11/16/2020	8/27/2021
ID IS 20ppb	SVLC-1208	20,000.0	500		1000	1	-	11/16/2020	7/8/2021
96% Methanol	20-298	pure	8,000		#VALUE!	1	-	11/13/2020	11/13/2021

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed



## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1223</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>1000 ppt PFAS FL ICAL (L5)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
Full List 100X PDS	SVLC-1217	20,000	750	15	1000	1,2	-	11/20/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	750		1000	1	-	11/16/2020	8/27/2021	
ID IS 20ppb	SVLC-1208	20,000.0	750		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	12,750		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed
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## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1225</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>5000 ppt PFAS FL ICAL (L7)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
		pg/ml	ul					Date Opened	Date Expired	
Full List 10X PDS	SVLC-1215	200,000	125	5	5000	1,2	-	11/19/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	250		1000	1	-	11/16/2020	8/27/2021	
ID IS 20ppb	SVLC-1208	20,000.0	250		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	4,375		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1226</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>10000 ppt PFAS FL ICAL (L8)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.		Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/ml	ul						Date Opened	Date Expired
Full List 10X PDS	SVLC-1215	200,000	500	10	10000	1,2	-	11/19/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	500		1000	1	-	11/16/2020	5/10/1903	
ID IS 20ppb	SVLC-1208	20,000.0	500		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	8,500		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1227</u>	Level 2 Reviewed by: <u>KMM2</u>
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>15000 ppt PFAS FL ICAL (L9)</u>	Date: <u>11/23/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>	
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.		Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
		pg/ml	ul						Date Opened	Date Expired
Full List 10X PDS	SVLC-1215	200,000	750	10	15000	1,2	-	11/19/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	500		1000	1	-	11/16/2020	5/11/1903	
ID IS 20ppb	SVLC-1208	20,000.0	500		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	8,250		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

**Footnotes:**

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1228</u>	Level 2 Reviewed by: <u>KMM2</u>	
Prep. Date: <u>11/20/2020</u>	Mix Name: <u>20000 ppt PFAS FL ICAL (L10)</u>	Date: <u>11/23/2020</u>	
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2394/20-2381</u>		
Pipet ID: <u>20-2533,383</u>	Solvent Name: <u>Methanol/Water</u>		

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.	Aliquoted Volume	Dilution Volume	Final Conc.	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
		pg/ml	ul	ml	pg/ml			Date Opened	Date Expired	
Full List 10X PDS	SVLC-1215	200,000	1,500	15	20000	1,2	-	11/19/2020	3/9/2021	
ID SUR 20ppb	SVLC-1209	20,000.0	750		1000	1	-	11/16/2020	5/12/1903	
ID IS 20ppb	SVLC-1208	20,000.0	750		1000	1	-	11/16/2020	7/8/2021	
96% Methanol	20-298	pure	12,000		#VALUE!	1	-	11/13/2020	11/13/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:  
 1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1247</u>	Level 2 Reviewed by: <u>ARC2</u>
Prep. Date: <u>12/16/2020</u>	Mix Name: <u>PFAS Full List 100X PDS</u>	Date: <u>12/28/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>Methanol/Water</u>	
Pipet ID: <u>374,20-2533</u>	Solvent Name: <u>20-2645/20-2564</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std.  ng/mL	Aliquoted Volume  uL	Dilution Volume  mL	Final Conc.  ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule	
								Date Opened	Date Expired
								Full List Stock PDS (10X)	SVLC-1215
96% Methanol	20-329	pure	13,500	#VALUE!	1	-	12/8/2020	12/8/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water. 2. GenX is present at twice (2x) the concentration listed - 40ng/mL

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: <u>mmm</u>	Mix ID #: <u>SVLC- 1248</u>	Level 2 Reviewed by: <u>ARC2</u>
Prep. Date: <u>12/16/2020</u>	Mix Name: <u>1000 ppt PFAS FL ICAL (L5)</u>	Date: <u>12/28/2020</u>
Exp. Date: <u>3/9/2021</u>	Solvent ID #: <u>20-2645/20-2564</u>	
Pipet ID: <u>374, 20-2533</u>	Solvent Name: <u>Methanol/Water</u>	

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. pg/ml	Aliquoted Volume ul	Dilution Volume ml	Final Conc. pg/ml	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
Full List 100X PDS	SVLC-1247	20,000	750	15	1000	1,2	-	12/16/2020	3/9/2021	
ID SUR 20ppb	SVLC-1239	20,000.0	750		1000	1	-	12/6/2020	10/7/2021	
ID IS 20ppb	SVLC-1240	20,000.0	750		1000	1	-	12/6/2020	7/8/2021	
96% Methanol	20-329	pure	12,750		#VALUE!	1	-	12/8/2020	12/8/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. GenX is present at twice (2x) the concentration listed

## Working Standards Prep Log - LC/MS/MS Semi-volatiles

Initials: MBR  
 Prep. Date: 12/21/2020  
 Exp. Date: 11/23/2021  
 Pipet ID: 383,20-2535

Mix ID #: SVLC- 1252  
 Mix Name: PFAS ID 100ppb SUR  
 Solvent ID #: 20-2645/20-2564  
 Solvent Name: Methanol/Water

Level 2 Reviewed by: ARC2  
 Date: 12/30/2020

Component	Stock Std. # or Shealy ID #	Conc. of Stock Std. ng/mL	Aliquoted Volume uL	Dilution Volume mL	Final Conc. ng/mL	Foot Notes (if applicable)	MFG. Exp Date	Ampoule		
								Date Opened	Date Expired	
MPFAC-C-ES	20-2667	2,000.0	1,100	22	100	1	8/19/2025	12/21/2020	12/21/2021	
ID 50X SUR Mix	SVLC-1245A	1,000.0	2,200		100	1,2	-	12/10/2020	11/23/2021	
Methanol	20-2645	pure	17,908		#VALUE!	1	5/31/2025	12/21/2020	12/21/2021	
Water	20-2564	pure	792		#VALUE!	1	9/30/2025	12/21/2020	12/21/2021	

Refer to COA for specific compound concentrations for mixed standards.

Footnotes:

1. Final solvent composition of this standard is 96:4% (v/v) methanol:water 2. 13C3-GenX, 13C2-4:2FTS, 13C2-6:2FTS, 13C2-8:2FTS, d5-EtFOSAA, and d3-MeFOSAA are present at 500ppb = 500ng/mL (5x normal concentration)



# Data Quality Evaluation Report, Iowa Army Ammunition Plant, Middletown, Iowa

*Prepared for*

U.S. Army Corps of Engineers  
Louisville District

600 Dr. Martin Luther King Jr. Place  
Louisville, Kentucky 40202-2232



February 2021



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# Data Quality Evaluation Report

## 1. Introduction

This report contains the data quality evaluation for groundwater samples collected December 7–10, 2020 as part of the per- and polyfluoroalkyl substances (PFAS) remedial investigation at the Iowa Army Ammunition Plant, Middletown, Iowa. The report evaluates whether the analytical data obtained in the investigation are of sufficient quality and quantity to accomplish the project objectives.

The analytical work was conducted in accordance with the project-specific *Uniform Federal Policy-Quality Assurance project Plan (UFP-QAPP) for a Site Inspection for Per- and Polyfluoroalkyl Substances (PFAS) at the Iowa Army Ammunition Plant, Middletown, Iowa* (CH2M 2020).

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC) as described in the UFP-QAPP. This report is intended as a general data quality assessment designed to summarize data issues.

### 1.1 Analytical Laboratories and Analytical Methods

The samples were collected and shipped via overnight carrier to Pace Analytical Services, LLC. (formerly Shealy Environmental Services Inc.), South Carolina. The samples were analyzed for PFAS in accordance with QSM version 5.3 Table B-15 (DoD 2019).

Two sample delivery groups were evaluated for data quality. Table 1 lists the sample delivery groups, sample identifications, and collection and analysis chronology associated with the project samples.

## 2. Field Sample Collection

The fieldwork was conducted December 7–10, 2020. Fifteen groundwater samples and two groundwater field duplicates were collected.

Matrix spike/matrix spike duplicates (MS/MSDs) and source water blanks (labeled as TB) were collected at the required frequency for the sampling effort. Table 2 summarizes the field samples collected by date.

### **3. Data Review and Validation Process**

#### **3.1 Data Validation Definition**

Analytical data from this investigation were evaluated as described in the UFP-QAPP. One hundred percent of definitive analytical results were validated, Stage 2B. The assessment of definitive data includes a review of the following laboratory summary forms as defined in the UFP-QAPP:

- Chain-of-custody documentation
- Holding time compliance
- Sample results and detection limit checks
- Quality control sample frequencies
- Blanks (method, field, calibration)
- Laboratory control sample recoveries
- MS/MSD recoveries and precision
- Initial and continuing calibration summary information
- Extracted internal standards
- Tuning criteria
- Field duplicate precision
- Case narrative review, laboratory flagging review, and other method-specific criteria

#### **3.2 Overall Data Validation Findings**

An overall summary of the data validation is contained in the following sections and presented in Table 3. Table 3 is presented so that each validation flag applied to a method/matrix/analyte is shown, to provide the percentage of results impacted by a specific data quality condition or flag, with respect to the total results available for any target analyte/matrix. Only out-of-control conditions noted during the data validation are discussed in Table 3 and in the following subsections.

#### **3.3 Results Detected Between the Detection Limit and Reporting Limit**

Analytes that were detected at concentrations greater than the detection limit, but less than the limit or quantitation, were qualified as "J" per the UFP-QAPP to reflect the uncertainty associated with concentrations of analytical data between the detection limit and the limit or quantitation. Nondetected sample results were reported to the limit of detection.

#### **3.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD samples were analyzed as required and accuracy and precision criteria were in control with overall. One sample exceeded the MS/MSD recovery with a low bias for perfluorohexanesulfonic acid. The

data were qualified as estimated detected results and flagged "J" in the parent sample. Qualified results are shown in Table 4.

### **3.5 Extracted Internal Standards**

Extracted internal standards were added to the samples as required by the method and were in control overall. Three samples and a field duplicate showed some out of control recoveries both high and low bias. The data were qualified as estimated detected and nondetected results and flagged "J/UJ".

When extracted internal standards were out of control, samples were reanalyzed to confirm the condition. Qualified data are shown in Table 5.

### **3.6 Field and Laboratory Duplicates**

One field duplicate sample pair exceeded the precision criteria for one target compound. One laboratory duplicate exceeded the precision criteria for four target compounds. The out-of-control data were qualified as estimated detected and nondetected results and flagged "J/UJ". The qualified results are shown in Table 6.

## **4. Summary of Precision, Accuracy, Representativeness, Comparability, and Completeness**

The quality of the field sampling efforts and laboratory results were evaluated for compliance with project data quality objectives through a review of overall PARCC. Procedures used to assess PARCC are in accordance with the respective analytical methods and the UFP-QAPP requirements.

### **4.1 Precision**

Precision of the data were verified through the review of the field and laboratory data quality indicators that include field duplicate, laboratory duplicate, LCS/LCSD, MS/MSD. There were a few instances where samples were qualified for field duplicate and laboratory duplicate precision; however, overall precision was in control.

### **4.2 Accuracy**

Accuracy of the data was verified through the review of the calibration data, LCS/LCSD, extracted internal standard and MS/MSD recoveries, as well as the evaluation of method/calibration/field blank data. Although a few analytes were qualified as estimated due to MS/MSD recovery, overall accuracy was in control.

### **4.3 Representativeness**

Sample data are representative of the site conditions at the time of sample collection. All samples were properly stored and preserved. Analytical data were reported from an analysis within the project-specified hold-time. Laboratory and field blank contamination was free of contamination.

### **4.4 Appropriateness of Reporting limits**

This project was designed to allow risk-based decisions to be made based on the results of common U.S. Environmental Protection Agency-approved analytical methodologies. Detection limits achieved are the best possible based on sample variables.

### **4.5 Comparability**

Comparability of the data was verified through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

### **4.6 Completeness**

All results are usable for project objectives. There are no results rejected for project use. The completeness objective of 90 percent was met. Project completeness data are summarized in Table 7.

### **4.7 Conclusions**

The data generated from sample analyses are of sufficient quality and quantity necessary for accomplishing project objectives. Sample results accurately indicate the presence and/or absence of target analyte contamination at sampled locations. Samples were collected and analyzed as specified in the project QAPP.

## **5. References**

CH2M. 2020. *Uniform Federal Policy-Quality Assurance project Plan (UFP-QAPP) for a Site Inspection for Per- and Polyfluoroalkyl Substances (PFAS), Iowa Army Ammunition Plant, Middletown, Iowa*. October.

DoD (U.S. Department of Defense). 2019. *Department of Defense (DoD) and Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*. Version 5.3. May.



TABLE 1

## Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date	
Shealy	VL11001	C-00-3-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		EB01-120820	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/28/2020	
		EB02-120820	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/28/2020	
		ET-3-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/29/2020	
		ET-3-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/31/2020	1/4/2021	
		FD01-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		FD02-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/31/2020	1/4/2021	
		FD02-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/28/2020	
		FFS-MW01-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/27/2020	12/28/2020	
		FFS-MW01-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/31/2020	1/4/2021	
		FFS-MW02-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		FFS-MW03-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		G-5-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		G-5-1220MS	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/22/2020	12/27/2020	
		JAW-60-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/28/2020	
		JAW-60-1220	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/29/2020	
		T-1-1220	PFAS by ID SOP QSM	12/7/2020	12/9/2020	12/27/2020	12/28/2020	
		TB01-120820	PFAS by ID SOP QSM	12/8/2020	12/9/2020	12/27/2020	12/28/2020	
		VL11043	C-00-1-1220	PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020
			FFS-MW04-1220	PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020
	FFS-MW05-1220		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020	
	FFS-MW05-1220		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/31/2020	1/4/2021	
	FFS-MW05-1220MS		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/31/2020	1/4/2021	
	FFS-MW05-1220MS		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020	
	FFS-MW05-1220SD		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020	
	FFS-MW05-1220SD		PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/31/2020	1/4/2021	
	FTA-99-1-1220		PFAS by ID SOP QSM	12/10/2020	12/11/2020	12/27/2020	12/28/2020	
	FTA-TT-MW-03-1220		PFAS by ID SOP QSM	12/10/2020	12/11/2020	12/27/2020	12/28/2020	
	FTA-TT-MW-03-1220	PFAS by ID SOP QSM	12/10/2020	12/11/2020	12/27/2020	12/29/2020		
	FTP-MW5-1220	PFAS by ID SOP QSM	12/10/2020	12/11/2020	12/27/2020	12/29/2020		
JAW-63-1220	PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020			
TB01-121020	PFAS by ID SOP QSM	12/9/2020	12/11/2020	12/27/2020	12/28/2020			

SDG = sample delivery group

Shealy = &lt;&lt;&lt;Undefined in tblLab&gt;&gt;&gt;

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
VL11001	12/07/2020	WATER	N	C-00-3-1220	VL11001	Shealy
	12/08/2020		EB	EB01-120820	VL11001	Shealy
			EB	EB02-120820	VL11001	Shealy
			N	ET-3-1220	VL11001	Shealy
	12/07/2020		FD	FD01-1220	VL11001	Shealy
	12/08/2020		FD	FD02-1220	VL11001	Shealy
	12/07/2020		N	FFS-MW01-1220	VL11001	Shealy
			N	FFS-MW02-1220	VL11001	Shealy
			N	FFS-MW03-1220	VL11001	Shealy
			N	G-5-1220	VL11001	Shealy
			MS	G-5-1220MS	VL11001	Shealy
	12/08/2020		N	JAW-60-1220	VL11001	Shealy
	12/07/2020		N	T-1-1220	VL11001	Shealy
	12/08/2020		TB	TB01-120820	VL11001	Shealy
VL11043	12/09/2020	WATER	N	C-00-1-1220	VL11043	Shealy
			N	FFS-MW04-1220	VL11043	Shealy
			N	FFS-MW05-1220	VL11043	Shealy
			MS	FFS-MW05-1220MS	VL11043	Shealy
			SD	FFS-MW05-1220SD	VL11043	Shealy
	12/10/2020		N	FTA-99-1-1220	VL11043	Shealy
			N	FTA-TT-MW-03-1220	VL11043	Shealy
			N	FTP-MW5-1220	VL11043	Shealy
	12/09/2020		N	JAW-63-1220	VL11043	Shealy
			TB	TB01-121020	VL11043	Shealy

TABLE 2

Sample Summary by COC - Data Summary

---

SDG = Sample delivery group

Shealy = <<<Undefined in tblLab>>>

**QAQC Type**

EB = Equipment (Rinsate) Blank

FD = Field Duplicate

MS = Matrix Spike

N = Normal

SD = Matrix Spike Duplicate

TB = Trip Blank

TABLE 3

## Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples		
<b>WATER</b>					
<b>PFAS by ID SOP QSM</b>					
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2)</b>			17		
<i>Validation Flag Category:</i> Duplicate			1	J	Flags ( 5.88% ) for Lab duplicate exceeds RPD criteria
<i>Validation Flag Category:</i> InternalStandard			4	J	Flags ( 23.53% ) for Extracted Internal Standard greater than upper control limit
<b>Hexafluoropropylene oxide dimer acid (GenX)</b>			17		
<i>Validation Flag Category:</i> InternalStandard			2	UJ	Flags ( 11.76% ) for Extracted Internal Standard less than lower control limit
<b>Perfluoro-1-butanesulfonic acid (PFBS)</b>			17		
<i>Validation Flag Category:</i> Duplicate			1	J	Flags ( 5.88% ) for Lab duplicate exceeds RPD criteria
<i>Validation Flag Category:</i> FieldDuplicate			1	UJ	Flags ( 5.88% ) for Field duplicate exceeds RPD criteria
<i>Validation Flag Category:</i> FieldDuplicate			1	J	Flags ( 5.88% ) for Field duplicate exceeds RPD criteria
<b>Perfluorohexanesulfonic acid (PFHxS)</b>			17		
<i>Validation Flag Category:</i> Duplicate			1	J	Flags ( 5.88% ) for Lab duplicate exceeds RPD criteria
<i>Validation Flag Category:</i> Matrix			1	J	Flags ( 5.88% ) for Matrix spike recovery less than lower control limit
<i>Validation Flag Category:</i> Matrix			1	J	Flags ( 5.88% ) for Matrix spike duplicate recovery criteria less than lower control limit
<b>Perfluoro-n-butanoic acid (PFBA)</b>			17		
<i>Validation Flag Category:</i> InternalStandard			2	J	Flags ( 11.76% ) for Extracted Internal Standard less than lower control limit
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>			17		
<i>Validation Flag Category:</i> InternalStandard			1	J	Flags ( 5.88% ) for Extracted Internal Standard less than lower control limit
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>			17		
<i>Validation Flag Category:</i> InternalStandard			1	J	Flags ( 5.88% ) for Extracted Internal Standard less than lower control limit

TABLE 3

## Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples	
<b>WATER</b>				
<b>PFAS by ID SOP QSM</b>				
		<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	17	
<i>Validation Flag Category:</i>	InternalStandard		2	J Flags ( 11.76% ) for Extracted Internal Standard less than lower control limit
		<b>Perfluorooctanesulfonic acid (PFOS)</b>	17	
<i>Validation Flag Category:</i>	Duplicate		1	J Flags ( 5.88% ) for Lab duplicate exceeds RPD criteria

Note: The total number of validation flags may exceed the actual number of samples if multiple flags were applied to the same sample. Consequently, the percentage of total flags (flags applied/number of samples) may exceed 100 percent.

\* The most severe flag for each analyte becomes the final validation flag.

**Qualifier Description:**

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

TABLE 4

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
<b>Method (Matrix):</b> PFAS by ID SOP QSM B (WATER)					
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	FFS-MW05-1220	17 NG/L	J	%R = 14 LCL=68 UCL=131	MS<LCL
	FFS-MW05-1220	17 NG/L	J	%R = 20 LCL=68 UCL=131	SD<LCL

%R = percent recovery

LCL = lower control limit

UCL = upper control limit

NG/L = nanogram per liter

\* The most severe flag for each analyte becomes the final validation flag.

**Qualifier Description:**

J = The analyte was positively identified, the quantitation is an estimate.

**Criteria:**

MS<LCL = Matrix spike recovery less than lower control limit

SD<LCL = Matrix spike duplicate recovery criteria less than lower control limit

TABLE 5

Extracted Internal Standards -

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
<b>Method (Matrix):</b> PFAS by ID SOP QSM B (WATER)				
ET-3-1220	Hexafluoropropylene oxide dimer aci	3.5 NG/L	UJ	EIS<LCL
	Perfluoro-n-butanoic acid (PFBA)	380 NG/L	J	EIS<LCL
	Perfluoro-n-pentanoic acid (PFPeA)	80 NG/L	J	EIS<LCL
	1H, 1H, 2H, 2H-perfluorooctane sulfo	6.3 NG/L	J	EIS>UCL
FD02-1220	Hexafluoropropylene oxide dimer aci	3.4 NG/L	UJ	EIS<LCL
	Perfluoro-n-butanoic acid (PFBA)	390 NG/L	J	EIS<LCL
	Perfluoro-n-heptanoic acid (PFHpA)	27 NG/L	J	EIS<LCL
	Perfluoro-n-hexanoic acid (PFHxA)	86 NG/L	J	EIS<LCL
	Perfluoro-n-pentanoic acid (PFPeA)	84 NG/L	J	EIS<LCL
	1H, 1H, 2H, 2H-perfluorooctane sulfo	5.5 NG/L	J	EIS>UCL
FFS-MW01-1220	1H, 1H, 2H, 2H-perfluorooctane sulfo	17 NG/L	J	EIS>UCL
FFS-MW05-1220	1H, 1H, 2H, 2H-perfluorooctane sulfo	8.1 NG/L	J	EIS>UCL

NG/L = nanogram per liter

\* The most severe flag for each analyte becomes the final validation flag.

**Qualifier Description:**

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

**Criteria:**

EIS&lt;LCL = Extracted Internal Standard less than lower control limit

EIS&gt;UCL = Extracted Internal Standard greater than upper control limit

TABLE 6  
Field Duplicate Precision - Qualified Data

Analyte	Sample Identification	Result	Field Duplicate Qualifier*	Criteria	Validation Comments
<b>Method (Matrix): PFAS by ID SOP QSM B (WATER)</b>					
<b>1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2)</b>	FFS-MW03-1220	140 NG/L	J	Lab Dup RPD	
<b>Perfluoro-1-butanefulfonic acid (PFBS)</b>	ET-3-1220	1.7 NG/L	UJ	FD>RPD	Analyte detected in only 1/2 of duplicate pair, Difference > RL X 2: 25.14 vs 0
	FD02-1220	26 NG/L	J	FD>RPD	Analyte detected in only 1/2 of duplicate pair, Difference > RL X 2: 25.14 vs 0
	FFS-MW03-1220	15 NG/L	J	Lab Dup RPD	
<b>Perfluorohexanesulfonic acid (PFHxS)</b>	FFS-MW03-1220	45 NG/L	J	Lab Dup RPD	
<b>Perfluorooctanesulfonic acid (PFOS)</b>	FFS-MW03-1220	5.9 NG/L	J	Lab Dup RPD	

RPD = relative percent difference

NG/L = nanogram per liter

\* The most severe flag for each analyte becomes the final validation flag.

**Qualifier Description:**

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

**Criteria:**

Difference > RL X 2 = The difference between the native result and the field duplicate result is greater than 2 times the reporting limit

FD>RPD = Field duplicate exceeds RPD criteria

Lab Dup RPD = Lab duplicate exceeds RPD criteria



TABLE 7

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences					Contractor R-Flags	Contractor Total Completeness (%)	Overall Completeness (%)
			Analyses	Detects	Non- detects	Blank Flags	J-Flags			
PFAS by ID SOP QSM B	11-chloroeicosafuoro-3-oxaundecane-1-sulfonic aci	NG/L	17		17				100	100
	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2	NG/L	17		17				100	100
	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2	NG/L	17	13	4		6		100	100
	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NG/L	17		17				100	100
	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (	NG/L	17		17				100	100
	Hexafluoropropylene oxide dimer acid (GenX)	NG/L	17		17		2		100	100
	N-ethylperfluoro-1-octanesulfonamidoacetic acid (E	NG/L	17	1	16		1		100	100
	N-methylperfluoro-1-octanesulfonamidoacetic acid (	NG/L	17		17				100	100
	Perfluoro-1-butanefluoric acid (PFBS)	NG/L	17	14	3		4		100	100
	Perfluorohexanesulfonic acid (PFHxS)	NG/L	17	15	2		4		100	100
	Perfluoro-n-butanefluoric acid (PFBA)	NG/L	17	17			5		100	100
	Perfluoro-n-decanoic acid (PFDA)	NG/L	17		17				100	100
	Perfluoro-n-dodecanoic acid (PFDoA)	NG/L	17		17				100	100
	Perfluoro-n-heptanoic acid (PFHpA)	NG/L	17	11	6		5		100	100
	Perfluoro-n-hexanoic acid (PFHxA)	NG/L	17	14	3		4		100	100
	Perfluoro-n-nonanoic acid (PFNA)	NG/L	17	1	16		1		100	100
	Perfluoro-n-octanoic acid (PFOA)	NG/L	17	14	3		3		100	100
	Perfluoro-n-pentanoic acid (PFPeA)	NG/L	17	14	3		5		100	100
	Perfluoro-n-tetradecanoic acid (PFTeDA)	NG/L	17	1	16		1		100	100
	Perfluoro-n-tridecanoic acid (PFTrDA)	NG/L	17		17				100	100
Perfluoro-n-undecanoic acid (PFUdA)	NG/L	17		17				100	100	
Perfluorooctanesulfonic acid (PFOS)	NG/L	17	14	3		2		100	100	

% = Percent

J-Flags = Estimated results

R-Flags = Rejected results

NG/L = nanogram per liter