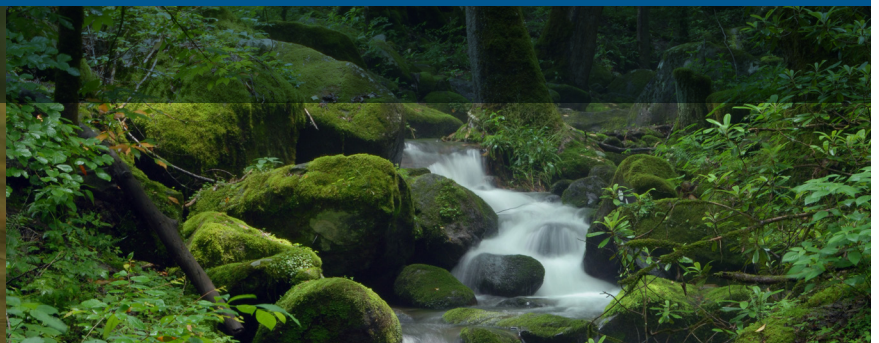


Meet or Exceed Regulatory Requirements for PFAS



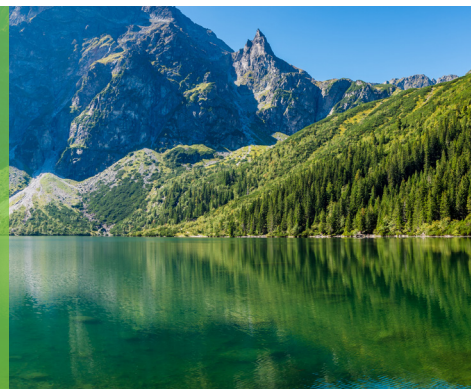


A Public Health Crisis Decades in the Making

Per- and polyfluoroalkyl substances (PFAS) are man-made substances widely used in industry and manufacturing because of their unique properties. These compounds have been used for several decades in many applications like non-stick cookware, stain-repellent clothes, food contact materials, detergents, cleaning products, and fire-fighting foams. The widespread use of these compounds has led to them being almost ubiquitous in the environment. Studies have indicated that PFAS are also present in most humans. Research on these compounds have identified them as being persistent and bioaccumulative (especially PFAS with a carbon chain length $>C7$), while toxic effects including tumors and thyroid disruption have been attributed to some of them. This has resulted in regulatory guidance in water and the environment, and facilitated monitoring and identification of these compounds.



Regulatory Overview



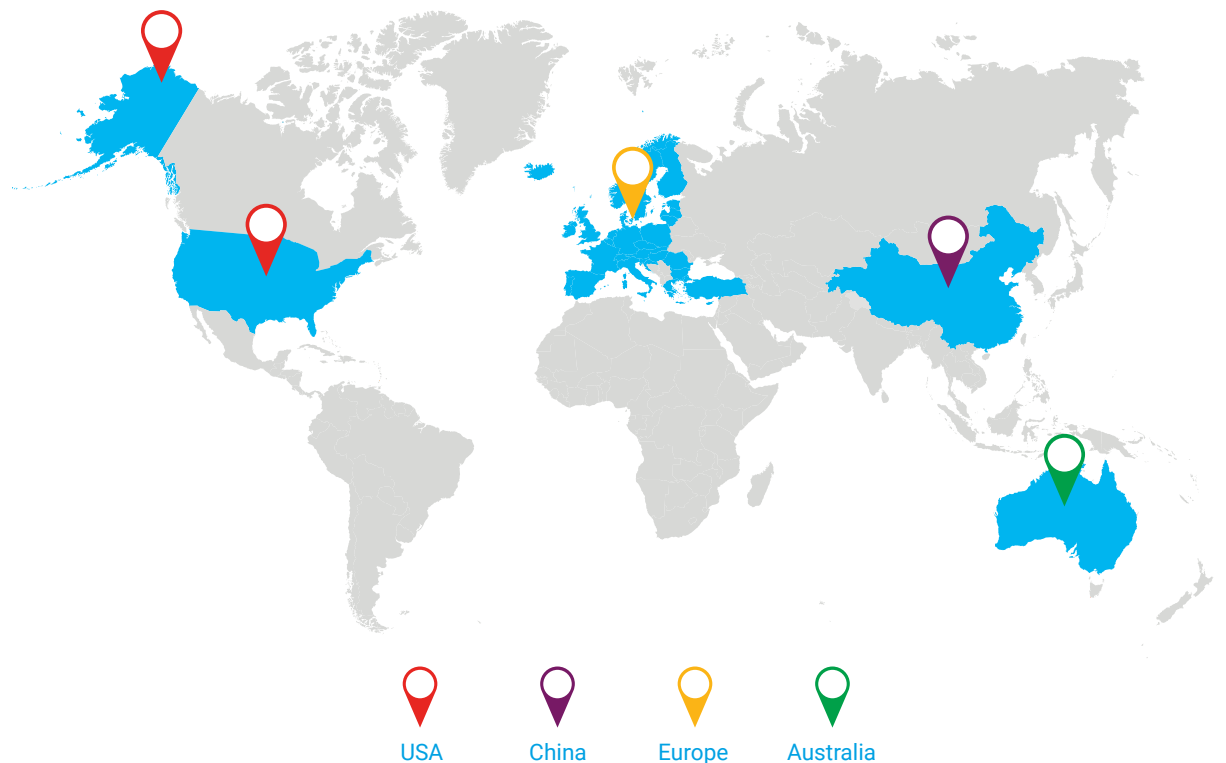
There are more than 4,800 known PFAS compounds that have been in commercial products. Regulatory guidance and restrictions exist for just a few of them, leading to unrestricted use for the rest.

- In 2009, perfluorooctanesulfonic acid (PFOS) and its salts were listed as persistent organic pollutants (POPs) under the *Stockholm Convention*. All parties are required to eliminate the release of these compounds into the environment.
- *The European Union (EU) Water Framework Directive* lists PFOS as a priority hazardous substance that poses a “significant risk to the aquatic environment.” It has established an annual average environmental quality standard (AA-EQS) of 0.65 ng/L in inland surface waters, and an AA-EQS of 0.13 ng/L for other surface waters (Directive 2013/39/EU).
- *The UK Chemical Investigation Program* requires measurement of PFOS and perfluorooctanoic acid (PFOA) down to 0.09 ng/L. Similarly, in October 2018, the EU Parliament approved a proposal to recast its Drinking Water Directive with revised limits for monitoring PFOS and PFOA in drinking water. The new limits are 100 ng/L, with combined PFAS concentrations not to exceed 500 ng/L (COM (2017) 753 1.2.2018).
- Several European countries, including those in the *Nordic region*, have guidance levels for PFAS in drinking water and surface water. In *Sweden*, recommended levels for a sum of 11 PFAS in drinking water should not exceed 90 ng/L.
- In the *United States*, the US EPA has established a drinking water health advisory level for PFOS and PFOA at a combined 70 ppt (ng/L). Several states have their own advisories for PFOA, PFOS, and other PFAS—such as perfluorononanoic acid (PFNA), and GenX—at the low ppt range.

Other initiatives are also in the works. These include the [PFAS Action Act \(Jan 2019\)](#), the [US EPA PFAS Plan \(Feb 2019\)](#), and the [US EPA Commitment to PFAS Drinking Water Standards \(Feb 2019\)](#).

- *Australia, China*, and several other countries are implementing restrictions (or establishing maximum amounts) for drinking water and receiving water regulations for PFOA, PFOS, and newer PFAS detected at low ng/L to pg/L levels.

As newer PFAS are identified in the environment, and as more toxicological information becomes available, further guidelines and regulations are almost certain.



Current Standards and Consensus methods for PFAS analysis in the environment

Method	Matrix Tested	No. of Analytes	Sample Preparation Procedure	Quantification Technique
EPA 537	Drinking water	14	Solid phase extraction	Internal standard correction
EPA 537.1	Drinking water	18	Solid phase extraction	Internal standard correction
EPA 8327 (draft)	Surface water, ground water, wastewater influent and effluent	24	Dilute and shoot	External calibration (isotope dilution also allowed)
ASTM 7979	Surface water, ground water, wastewater influent and effluent	21	Dilute and shoot	External calibration (isotope dilution also allowed)
ASTM 7968	Soil and solids	21	Organic extraction with MeOH	External calibration
ISO/DIS 21675 (draft)	Drinking water, sea water, fresh water, wastewater (<0.2% solids)	30	Solid phase extraction	Internal standard correction



Sample Preparation Techniques to Maximize PFAS Recoveries and Minimize Contamination

Due to their widespread use in clothing, protective gear, and consumer products, PFAS have been found in human and environmental samples in all regions of the world. Use these best practices to avoid contaminating your sample with PFAS during collection and storage.

Do:

- Wear well-washed lab coats and nitrile lab gloves.
- Use high-density polyethylene (HDPE) or polypropylene (PP) containers and caps as recommended in US EPA and ASTM methods.
- Refrigerate samples below 6 °C during storage.

Don't:

- Wear personal care products (such as sunscreen and hand creams) during sampling.
- Wear waterproof clothing or shoes that may be lined with PFAS or stain-repellent material.
- Use sample collection apparatus that may contain polytetrafluoroethylene (PTFE) or other plastics containing PFAS.
- Use aluminum foil to cover openings of sample containers, as PFAS can be transferred from foil.

Proper sample cleanup and concentration are essential to robust, accurate, and reliable analysis. As the world's chromatography leader, Agilent supports your efforts with innovative LC columns, solid phase extraction (SPE) cartridges, vials, and filters manufactured to demanding specifications. All are tested under strict conditions for reliable analysis of PFAS in water.

Extracting PFAS from water

Several regulatory methods, including US EPA 537, call for extracting PFAS from drinking water using SPE cartridges followed by LC/MS/MS analysis.

Here we evaluated the extraction recovery of 30 PFAS—including all PFAS in US EPA method 537, plus 16 PFAS in LC grade and drinking water. Four replicates of 250 mL water samples were spiked with 4 ng/L of PFAS (except for the three FTA-es spiked at 80 ng/L). Extraction was performed using the Agilent weak anion exchange (WAX; p/n 5982-3667) SPE cartridge. See application note [5994-0250EN](#) for full details.

Your single source for environmental testing standards

Regardless of the type of PFAS workflow being tested, success depends on the initial calibration. Agilent standards are rigorously tested and manufactured using ISO certifications, letting you calibrate with confidence—and maximize accuracy.

Agilent PFAS reference materials include neat, singles, mixtures, and custom standards. Shop now at www.agilent.com/en/product/chemical-standards.

From instruments, columns, and supplies... to fast, worldwide delivery... to decades of method development expertise... Agilent supports your entire workflow.



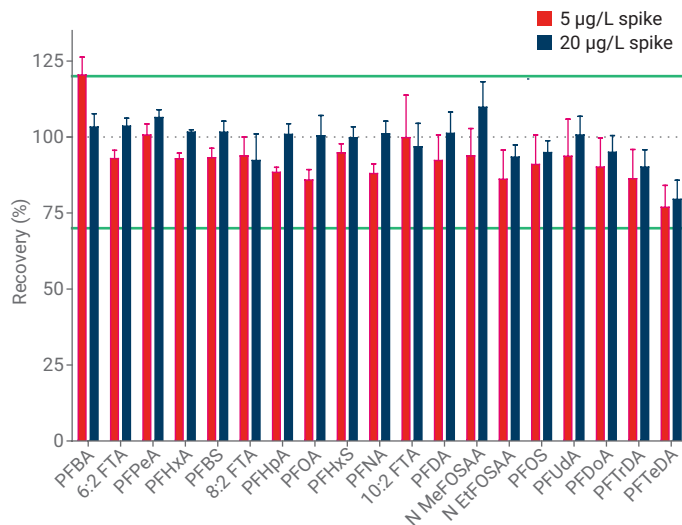
Name	LC Grade Water Average Recovery	LC Water RSD (%)	Tap Water Average Recovery	Tap Water RSD (%)
EPA 537 Compounds				
PFBS	85	14	99	1
PFDA	101	5	95	6
PFDoA	86	3	88	2
PFHpA	105	10	101	3
PFHxS	97	15	102	1
PFHxA	104	8	107	2
PFNA	100	5	104	3
PFOS	92	13	94	3
PFOA	102	10	106	2
PFTrDA	91	3	103	15
PFUdA	100	6	102	3
PFTrDA	91	3	103	15
N-MeFOSAA	84	11	79	10
N-EtFOSAA	84	9	89	3
Additional Compounds				
PFDoA	86	3	88	2
PFTeDA	96	10	86	8
FOSA	57	14	67	20
FHEA	107	6	90	8
FOEA	61	13	52	14
FDEA	56	21	58	15
PFHpPA	47	27	46	14
4-2 FTS	91	10	91	13
6-2 FTS	87	16	100	6
8-2 FTS	104	10	101	10
6-2 FTUA	118	8	106	3
8-2 FTUA	96	11	78	13
PFPeS	97	15	104	2
PFHpS	83	11	83	3
PFNS	93	12	91	8
PFDS	85	4	81	6

All 30 PFAS were recovered, and US EPA 537 compounds had recoveries between 70 and 130% with RSD <15% for both water qualities. These results comply with US EPA method QA/QC requirements. In addition, only four of the 30 compounds had recoveries below 70%, but all four were above 40%. The 14 compounds in the US EPA method produced acceptable recovery using the Agilent WAX SPE cartridge. The 16 other PFAS, including compounds on the ASTM list, also have good recoveries and can be analyzed with this method.

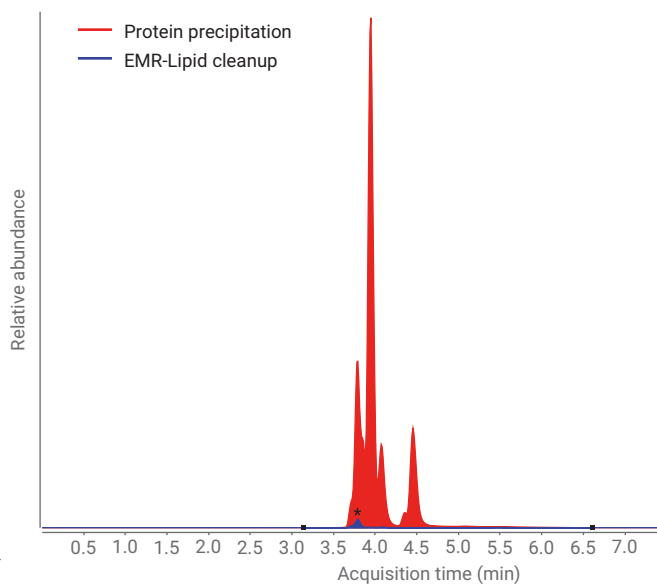
Analyzing PFAS in biota

PFAS compounds are readily adsorbed into animal and human tissue. Since these substances have been used in industry for many years, their existence in human blood and serum—as well as presence in fish, salmon, and other wildlife—is pervasive. Research has shown that longer chain PFAS (>C7) have the potential to bioaccumulate, increasing both the need and urgency to test and analyze for PFAS levels in biota and biological fluids.

SPE and supported liquid extraction (SLE) can be time consuming and complicated to perform on biological samples. Agilent Captiva EMR-Lipid makes it easy to remove interferences, particularly phospholipids, without PFAS loss. Its pass-through format is fast and repeatable, and delivers a clean extract with minimal ion suppression extending column life and reducing the frequency of MS cleaning.



PFAS recovery fell between 30 and 70% with most compounds having an extraction recovery of >90%. The full procedure for extraction with Agilent Captiva EMR-Lipid is detailed in application note [5991-8656EN](#), and shows how this simple technique can be performed in minutes.

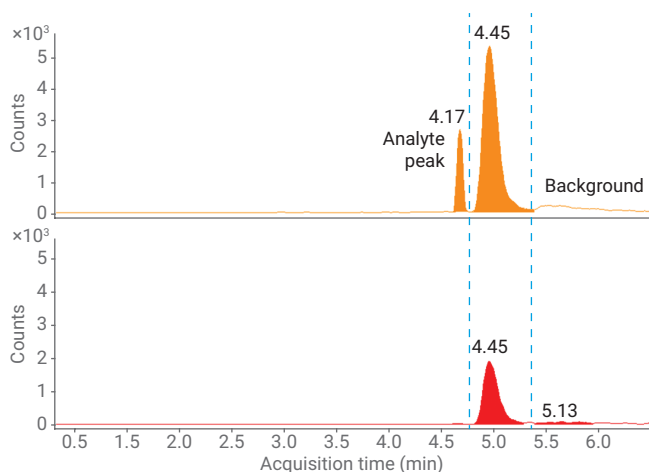


Phospholipid cleanup compared to protein precipitation. We reduced MS cleaning and increased column life without sacrificing PFAS recovery.

Configure Your LC for Success: PFAS Elimination

Fluoropolymers are commonly found in industrial products, including some that are used for analysis, extraction, and cleanup in the lab. Materials used in supplies such as solvents, syringes, pipettes, and SPE devices can contain trace PFAS levels that may contaminate your samples and affect your results. Some LC instrument parts can also contribute to trace-level contamination.

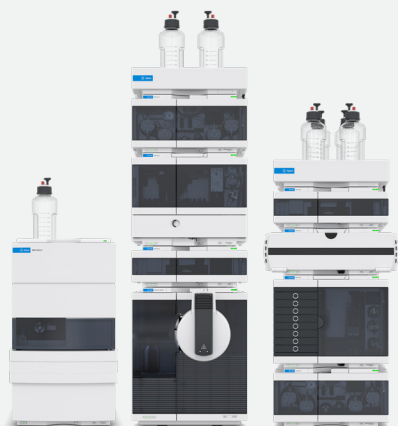
One recommendation to reduce the risk of contamination is to place a column after the pump mixer to delay any background contamination introduced during sample preparation and extraction, or from high-purity LC/MS solvents.



Time delay of PFOS background peak from that of the real sample. We suggest using an Agilent ZORBAX Eclipse Plus C18, 4.6 x 50 mm, 3.5 μm delay column (p/n 959943-902).

Want to completely eliminate PFAS from your LC flow path?

No problem. Agilent has identified all areas where PTFE and other fluorinated polymers may be present. And we have suitable replacements that reduce the risk of PFAS contamination. Consult application note [5991-7863EN](#) for full details or speak with your local Agilent applications expert.



InfinityLab LC instruments: Efficiency for any application and budget

Agilent InfinityLab HPLC and UHPLC systems feature the latest technology while maintaining full compatibility with legacy LC instrumentation.

- The Agilent 1220 Infinity II LC delivers high-quality results at an affordable price.
- The Agilent 1260 Infinity II LC is the flexible choice for operational efficiency.
- The Agilent 1290 Infinity II LC embodies the next generation of liquid chromatography with ultrahigh performance for superior outcomes.

Meet Regulatory Guidance Levels with Unparalleled Robustness

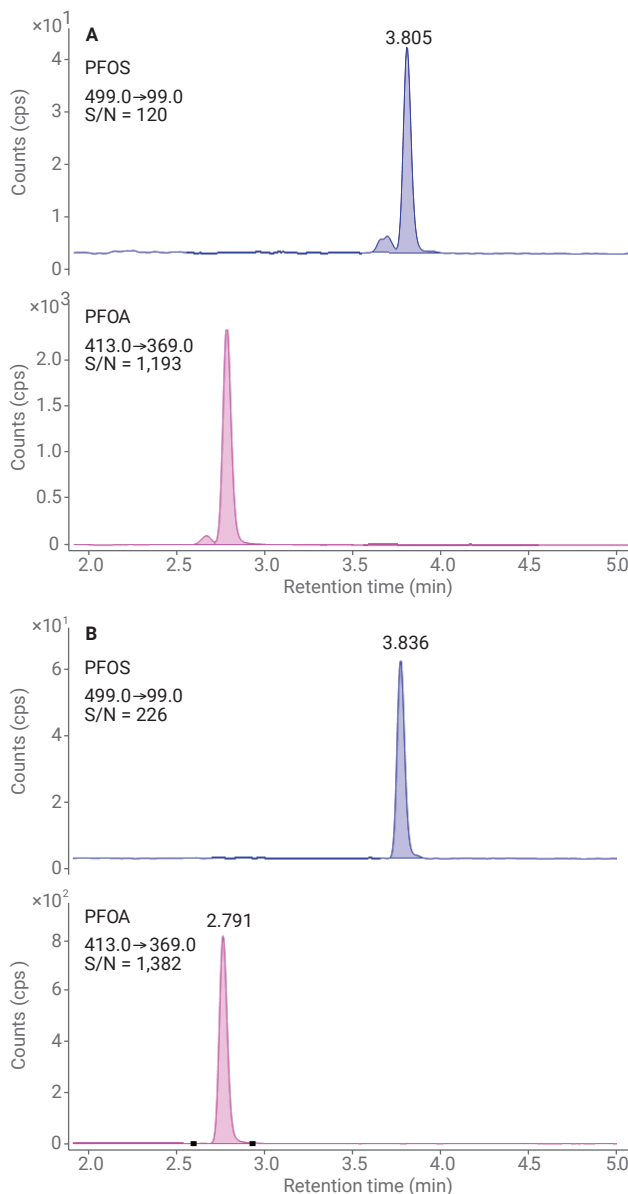
Global regulations for PFOS and PFOA

PFOS and PFOA are the two most commonly measured PFAS, and have regulatory guidance levels in regions including China, Europe, the United States, and Australia.

PFOS and its formulations are listed as priority (POPs) in the Stockholm Convention. The EPA safe drinking water guidelines for PFOS and PFOA are not to exceed 70 ng/L. However, several regulatory and municipal bodies require monitoring and detection of PFAS at low single digit ng/L levels in water and soil to provide good baseline occurrence data.

Here, we used our WAX SPE cartridges to extract these compounds from water and soil.

The Agilent Ultivo triple quadrupole LC/MS is the best way to quantify very low levels (ppt) of PFOA and PFOS in water and soil. The Agilent Poroshell 120 EC-C18 (2.1 x 100 mm, 2.7 µm) column allows for effective separation of linear and branched isomers for PFOA. Recoveries between 80 and 120% for both compounds in surface water, wastewater (2.5, 40, and 200 ng/L), soil, and sediment (0.5, 5, and 20 ng/g) were achieved at different spiking levels. Consult application note [5994-0437EN](#) for full details.

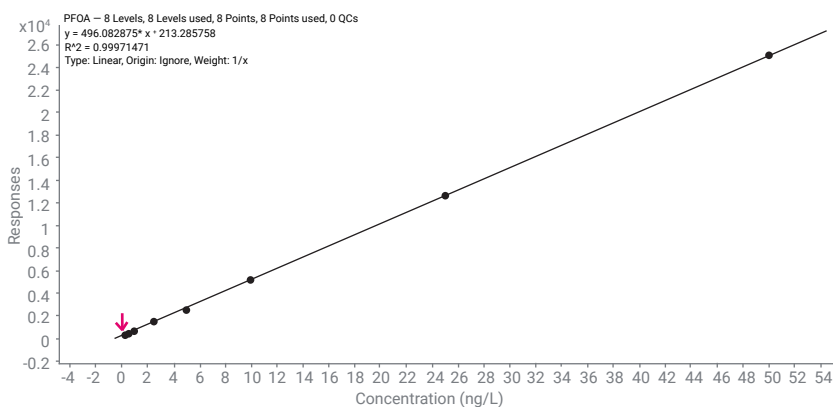
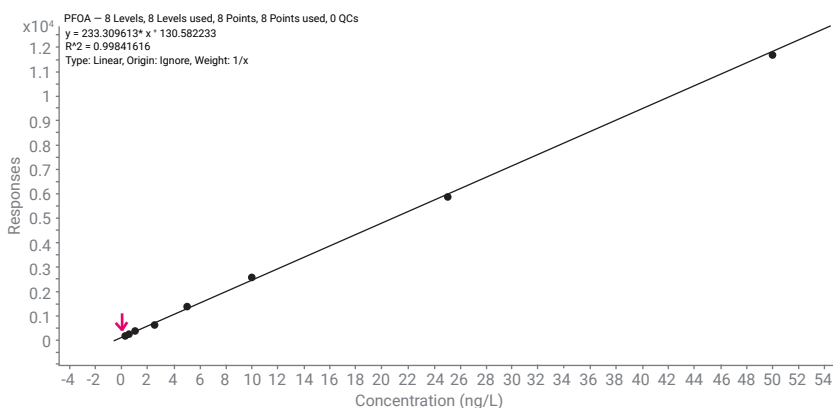


Chromatograms for PFOA and PFOS spiked at 2.5 ng/L in water (A) and 0.5 µg/kg in blank soil (B) respectively. Note: only a quantitative ion chromatogram was illustrated for each compound.

EU regulations

The EU already has an environmental quality standard of 0.65 ng/L in water bodies for PFOS, and researchers anticipate similarly low reporting levels for PFOA in water. The ultimate sensitivity of the Agilent 6495B triple quadrupole LC/MS lets you achieve these low levels by direct aqueous injection. You can also skip the time-consuming and laborious sample concentration step.

We generated these linear calibration curves for PFOS and PFOA standards (0.25, 0.5, 1, 2.5, 5, 10, 25, and 50 ng/L with $R^2 > 0.99$) using direct aqueous injection on the 6495B triple quadrupole LC/MS.



Calibration curves for PFOS and PFOA, standards at 0.25, 0.5, 1, 2.5, 5, 10, 25, and 50 ng/L.

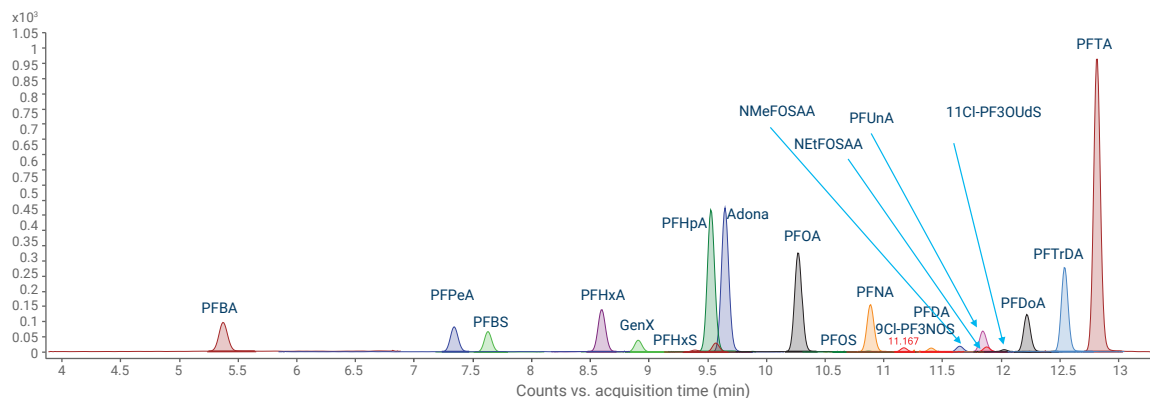
Compound	0.5 ng/L Standard		1.0 ng/L Standard	
	Average Area	RSD (%)	Average Area	RSD (%)
PFOS	423.3	5.3	668.3	4.9
PFOA	280.1	5.0	387.7	4.4

Enhanced sensitivity allows you to measure PFAS at extremely low levels without any loss in reproducibility or robustness. The RSD for both PFOS and PFOA at a 0.5 ng/L concentration was <6%.

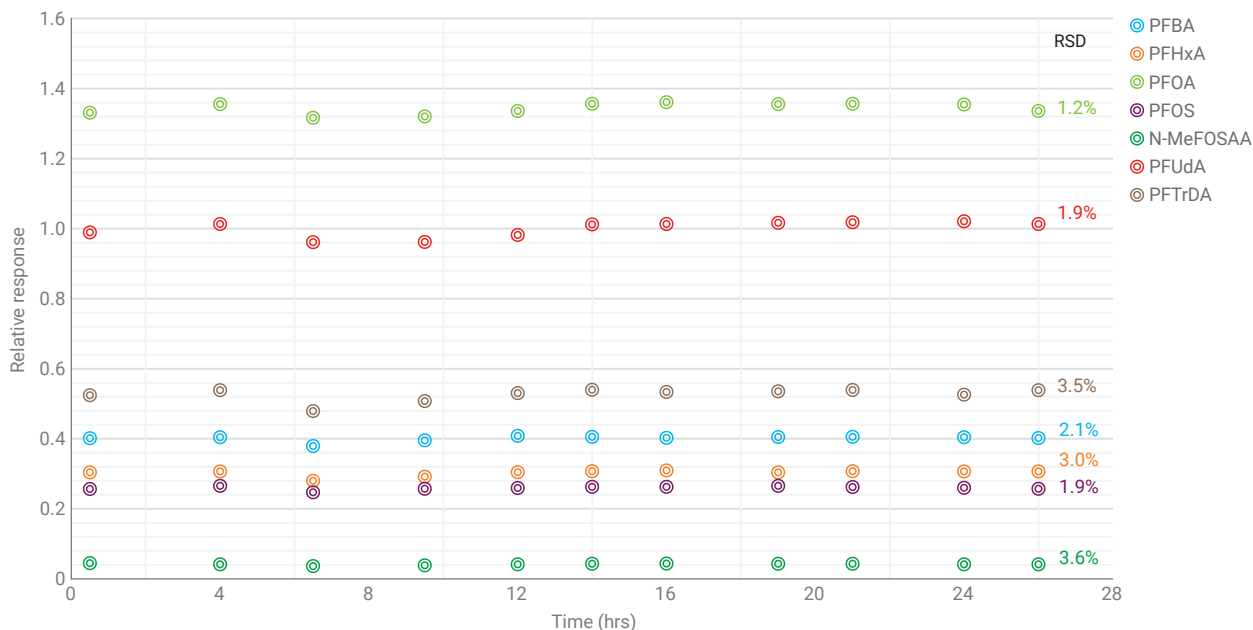
US EPA methods

US EPA method 537.1 analyzes 18 PFAS, including PFOS and PFOA, in drinking water using SPE followed by LC/MS/MS.

The following chromatogram shows the separation and detection of PFAS using an Agilent ZORBAX Eclipse Plus C18, 3.0 × 50 mm, 1.8 μm column (p/n 959757-302). Samples were analyzed on the Ultivo triple quadrupole LC/MS.



In addition to meeting and exceeding reporting levels required by the US EPA method, you must also achieve robustness across a batch of real water samples. Here we show a relative response in area counts for 11 continuing calibration water samples run over a 26-hour batch for US EPA 537.



The Ultivo LC/MS/MS system allows you to run routine US EPA methods for PFAS with the desired sensitivity and reproducibility. Its small footprint lets you fit approximately four Ultivo systems in the space needed for one traditional LC/MS/MS instrument. Consult application note [5991-8969EN](#) for full details.

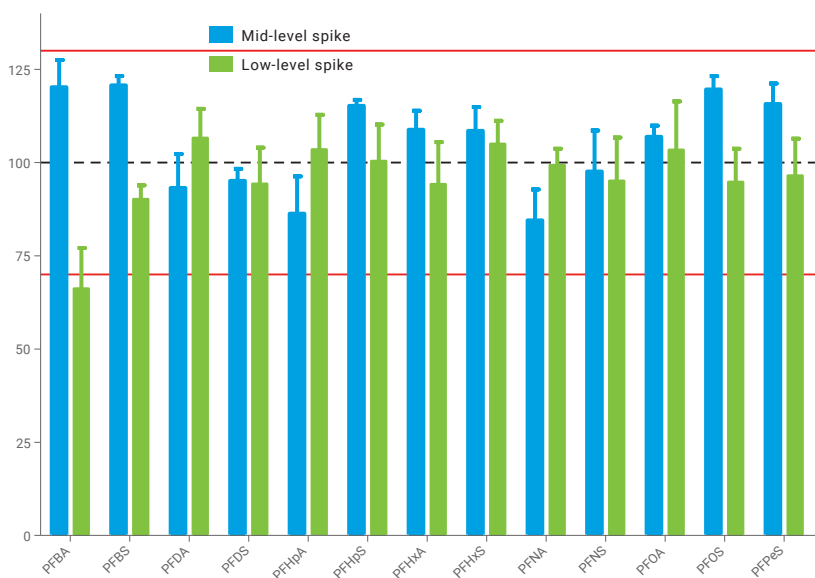
Eliminating sample preparation for US EPA 537

SPE sample preparation and extraction is a critical step for cleanup and interference removal. However, it can be time consuming and tedious, and can increase sources of PFAS contamination into the sample.

For labs looking to monitor the PFAS listed on US EPA method 537, the 6495B triple quadrupole LC/MS system is an ideal choice. It eliminates the hassle of sample preparation in clean water samples, and gets you from sample collection to data reporting quickly. In addition, it delivers ultimate sensitivity and increased throughput without any sacrifice in method reporting levels.

A method developed on the 6495B LC/MS quantified 14 PFAS present in US EPA 537. The analysis took less than six minutes, with a direct injection of 80 μ L of sample diluted slightly with methanol to achieve detection levels of 0.83 to 3.3 ng/L.

The following table shows the recovery of these PFAS at two spiking levels.



Spike recoveries of PFAS at low level (10 ng/L; 2 ng/L for PFOS and PFOA) and mid-level (40 ng/L) in drinking water samples.

ASTM methods

ASTM method 7979-17 analyzes 21 PFAS in nonpotable waters—including surface water, ground water, and wastewater. It uses a simplified methanol dilution and large-volume (30 μ L) injection onto an LC/MS/MS. The EPA 8327 (draft) uses a very similar preparation protocol and same injection volume as this method too.

Briefly, the method requires 5 mL of sample to be diluted with 5 mL of methanol, acidified, filtered, and injected onto an LC/MS/MS. This sample preparation technique increases throughput and reduces contamination sources. Reporting levels for most compounds in this method are 10 ng/L with an expected calibration range of up to 400 ng/L. Analysis at low ng/L levels demands a sensitive mass spectrometer with robustness to deal with different water matrices. It also requires strategies to eliminate any PFAS background and contamination from the sample preparation and potentially the instrument.

A simple technique for PFAS removal

To perform the ASTM 7979 efficiently, we eliminated PFAS quickly and easily using an Agilent delay column and replacing any PTFE-containing tubing with PEEK. The Agilent 6470 triple quadrupole LC/MS achieved the detection limits required for all 21 PFAS in ASTM 7979. It also detected seven other PFAS, including ADONA and 9CI-PF3ONS (component in F53-B), that are being monitored as “emerging” PFAS.

The following table shows recoveries for 28 PFAS including those in the ASTM 7979 and EPA 8327 methods at the low limit of quantification (LLOQ) levels of 10 and 20 ng/L with the Agilent 6470 triple quadrupole LC/MS. It includes six replicates with recoveries between 50 and 150%, as stated in the ASTM method for all compounds. Most compounds showed recoveries between 80 to 120%, and the relative standard deviation (RSD) was below 20% for all compounds. Complete method and analytical performance details for the ASTM 7979 and EPA 8327 (draft) methods can be found in application note [5994-0678EN](#).

Name	Spike Recovery, % at 10 ng/L		Spike Recovery, % at 20 ng/L	
	Average	RSD (%)	Average	RSD (%)
11CI-PF3OUdS	119	1.8	116	3.6
4:2 FTS	115	5.8	96	8.6
8:2 FTS	103	15.2	114	0.8
9CI-PF3ONS	110	10.5	108	6.8
ADONA	107	11.1	102	4.6
N-EtFOSAA	122	12.3	111	2.7
N-MeFOSAA	118	16.4	117	17.1
PFBA	101	10.7	104	10.6
PFBS	108	8.4	117	3.2
PFDA	110	17.1	107	6.6
PFDoA	101	13.3	106	13.3
PFDS	65	36.0	90	16.7
PFEESA	55	2.3	125	6.1
PFHpA	125	15.4	114	13.6
PFHpS	83	15.5	129	8.7
PFHxA	104	5.0	118	11.7
PFHxS	114	12.6	100	11.3
PFMBA	141	4.2	125	4.6
PFNA	102	18.8	106	9.4
PFNS	100	19.4	106	18.2
PFOA	121	11.1	108	9.1
PFOS	97	9.9	116	16.3
PFOSA	94	11.1	94	10.0
PFPeA	105	3.9	111	2.9
PFPeS	106	9.3	99	15.6
PFTreA	100	8.0	102	8.4
PFTriA	105	10.1	106	6.6
PFUnA	116	12.4	106	1.1

Spike recoveries and RSD (%) at 10 ng/L and 20 ng/L for all 28 PFAS, including those in ASTM 7979. Consult application note [5994-0678EN](#) for full method parameters.

Future-Proof Your Lab to Address the Growing List of PFAS

More than 4,000 PFAS are known to currently have been used, and this list continues to expand, but current regulatory monitoring lists globally only look at a very limited subset of PFAS. While regulatory lists may vary across regions, it is safe to assume that many additional PFAS will be monitored across the globe in time.

The following table shows method detection and method quantification levels (MDLs and MQLs) of more than 50 PFAS representing 16 different classes of legacy and emerging PFAS analyzed in water. We used a single analytical method that covered both legacy and emerging PFAS, including diPAPs, ADONA, and PFESAs (components of F-53B). Samples were analyzed on the 6495B triple quadrupole LC/MS, making use of its enhanced sensitivity to analyze all these PFAS in one injection without compromising detection levels.

The results can be summarized as follows:

- Instrument detection limits (IDLs) ranged from 2.5 to 469 fg on column for all compounds.
- Calculated IDLs were below 10 fg on column for 22 compounds from the classes PFCA, PFSA, FTS, FOSAA, and Cl-PFAES—plus the compounds FOSA, diSAMPAP, and ADONA.
- MDLs ranged from 0.28 to 18 ng/L. MQLs ranged from 0.35 to 26 ng/L, with 46 PFAS having quantification levels below 5 ng/L.
- Run time was less than 12 minutes.

MDLs for the 53 PFAS were calculated based on US EPA 40 CFR Part 136, Appendix B, Revision 2. Seven 250 mL aliquots of ultrapure water were spiked at 5 ng/L for all compounds except FTCA, FOSEs, and PFDPA, which were spiked at 20 ng/L. Consult application note [5994-0919EN](#) for full details.

PFAS analysis using SPE extraction and triple quadrupole LC/MS

Compound	MDL (ng/L)	MQL (ng/L)	Extraction Method Accuracy (%)	Method Precision RSD (%)
PFBA	0.59	0.75	93	4
PFPeA	0.71	0.89	92	5
PFHxA	0.87	1.1	90	6
PFHpA	0.84	1.1	96	6
PFOA	0.28	0.35	93	2
PFNA	0.61	0.77	98	4
PFDA	0.71	0.89	98	4
PFUnA	0.80	1.0	85	6
PFD _o A	1.2	1.5	93	8
PFT _r A	1.4	1.8	78	12
PFT _e A	0.67	0.84	93	5
PFBS	0.49	0.62	89	3
PFP _e S	1.2	1.5	100	9
PFH _x S	0.69	0.88	91	5
PFH _p S	0.79	1.0	99	6
PFOS	0.78	1.0	95	5
PFNS	1.0	1.3	87	7
PFDS	1.1	1.3	83	8
PFD _o S	1.4	1.8	72	13
ADONA	0.82	1.0	88	6
6:2 FTCA	13	17	103	16
8:2 FTCA	16	19	92	23
10:2 FTCA	17	21	67	28
6:2 FTUCA	1.7	2.1	121	9
8:2 FTUCA	1.6	2.0	111	10
10:2 FTUCA	2.8	3.6	87	19
3:3 FTCA	1.4	1.7	118	7

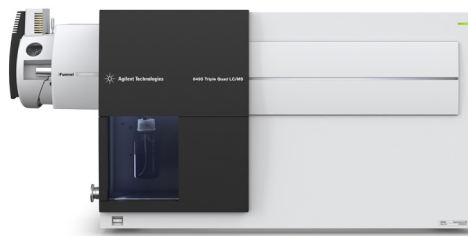
PFAS analysis using SPE extraction and triple quadrupole LC/MS

Compound	MDL (ng/L)	MQL (ng/L)	Extraction Method Accuracy (%)	Method Precision RSD (%)
5:3 FTCA	1.8	2.3	103	11
7:3 FTCA	2.4	3.1	75	20
PFHxPA	2.9	3.4	104	17
PFOPA	4.6	5.8	100	26
PFDPA	18	26	82	10
6:2 diPAP	1.9	2.4	81	14
6:2/8:2 diPAP	1.9	2.4	123	11
8:2 diPAP	0.83	1.1	93	6
6:2 Cl-PFESA	1.3	1.7	88	9
8:2 Cl-PFESA	1.1	1.4	80	9
4:2 FTS	2.7	3.4	93	16
6:2 FTS	0.56	0.7	90	4
8:2 FTS	1.3	1.7	87	9
10:2 FTS	1.4	1.8	66	13
FOSA	0.76	1.0	70	7
MeFOSA	4.0	5.0	127	18
EtFOSA	2.1	2.7	80	19
FOSAA	3.2	4.0	91	17
MeFOSAA	1.4	1.7	106	8
EtFOSAA	1.5	1.9	93	10
MeFOSE	2.9	3.7	96	5
EtFOSE	4.9	6.2	93	9
6:6 PFPIA	1.2	1.5	74	10
6:8 PFPIA	1.8	2.3	95	12
8:8 PFPIA	3.1	4.0	138	11
diSAmPAP	3.3	3.0	76	19

Ultrapure water blanks (n=7) were extracted alongside method validation samples. Method accuracy was expressed as the mean recovery of method validation samples for the expected concentration as a percentage and relative standard deviation.

The versatility, accuracy, and robustness of our triple quadrupole LC/MS systems let you add several PFAS to your method without sacrificing sensitivity or throughput. If you need to add new or novel PFAS to your methods, Agilent LC/MS compound optimizer automates the process and provides reliable compound parameters in minutes.

In addition, Agilent consultants can help make your PFAS analysis hassle free. Our decades of experience, combined with our MRM and method data capabilities, can get your lab up to speed quickly.



Agilent 6495B triple quadrupole

For more information on the analysis, fate, and removal of PFAS in water treatment plants using the 6495 LC/MS, please watch this [on-demand webinar](#) by Prof. Bradley Clarke.



Identifying New PFAS Using High-Resolution LC/Q-TOF

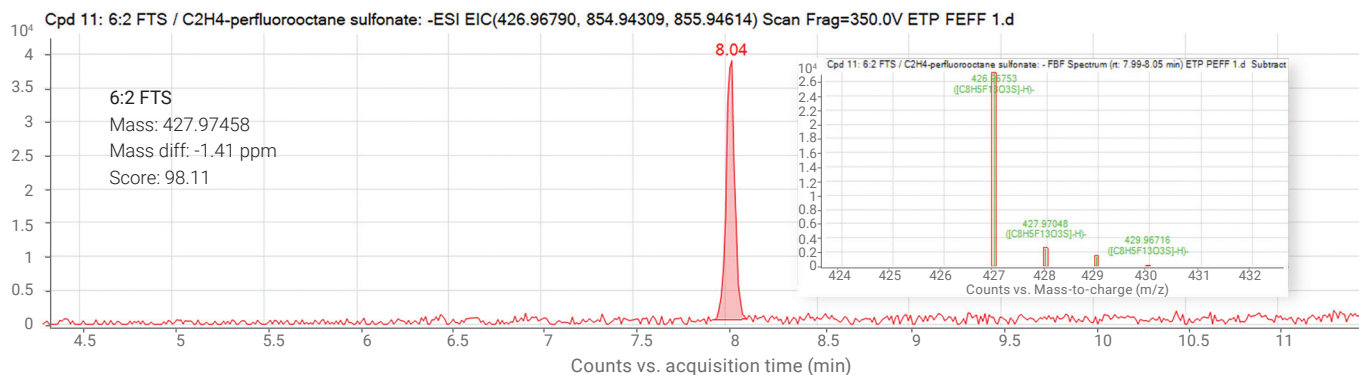
Triple quadrupole LC/MS is a great tool for measuring known PFAS at extremely low levels. However, several thousand PFAS are used in commerce, and many have yet to be identified in the environment. This is where a quadrupole time-of-flight (Q-TOF) mass spectrometer shows its value.

LC/Q-TOF instruments allow you to perform untargeted analysis and to identify unknown PFAS. You can also use libraries to screen for PFAS without the need for analytical reference standards. In addition, LC/Q-TOF technology lets you acquire data over a wide dynamic range. That means you can analyze trace sample amounts next to abundant peaks in the same spectrum. Together with simultaneous high sensitivity and high resolution, Agilent LC/Q-TOF instruments are ideal for identifying unknown PFAS in environmental samples.

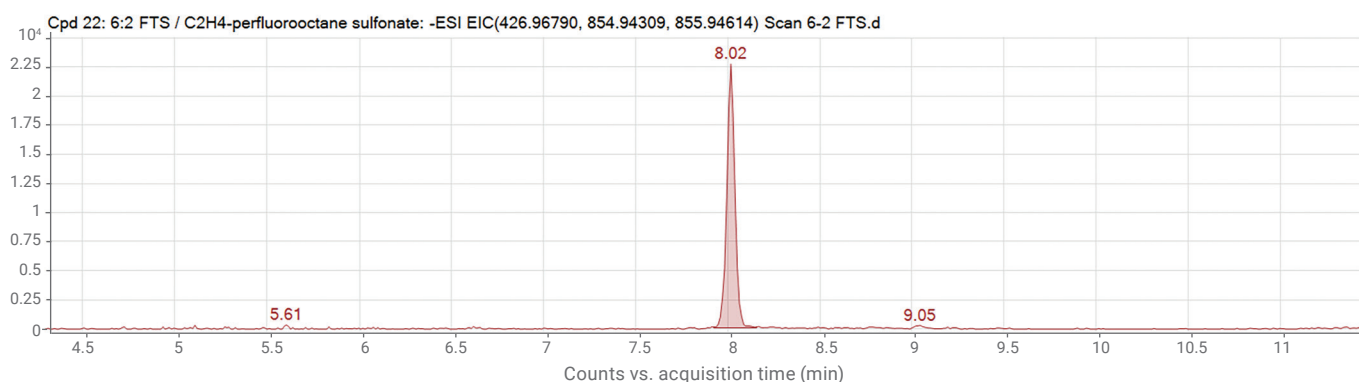
In the following spectra, we identified 6:2 FtS with high mass accuracy and isotope fidelity in a wastewater sample. The compound was later verified with a reference standard to have the same retention time by LC/Q-TOF.

Identification of PFAS PCDL + Std ID

WWTP1 Final Effluent



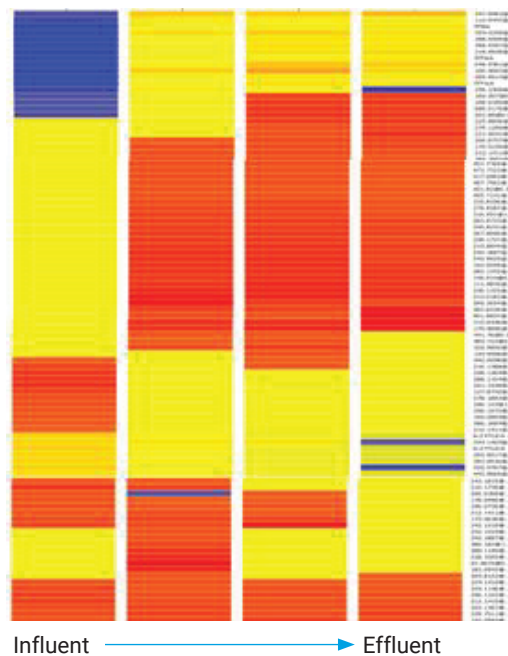
Standard



Since LC/Q-TOF collects all ionizable species in the analysis, you are able to retroactively mine for data and identify compounds without sample reinjection. Here, 6:2 Fts samples were identified at all treatment stages of the wastewater plant samples. Therefore, the abundance of this compound could be plotted to track efficacy in the wastewater treatment plant.

Alternatively, an LC/Q-TOF system can be used for fingerprinting PFAS sources, or for studying PFAS composition in aqueous film-forming foams (AFFF).

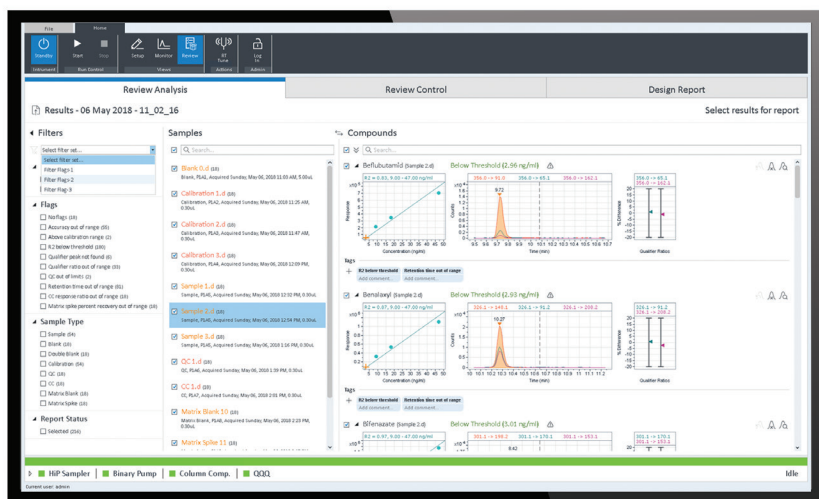
Mass Profiler Professional (MPP) software can be used to identify new PFAS, and perform source appropriation and fingerprinting studies. It includes statistical profiling tools like principal component analysis (PCA), hierarchical clustering, and Kendrick mass defect plots.



Capture, Analyze, and Share Water Quality Data

The advanced data mining and processing tools in the Agilent MassHunter software suite let you quickly and accurately extract available information from the analytes in your samples.

- Take advantage of powerful data collection, processing, and reporting tools. Breeze through application-specific workflows with comprehensive support of GC, GC/MS, and LC/MS technology.
- Use one software for all Agilent GC, GC/MS, and LC/MS instruments, including single quadrupole, tandem quadrupole, and Q-TOF.
- Analyze complex environmental samples with compound-based analysis and reporting workflows, using Agilent MassHunter Quantitative Analysis with Quant-My-Way customization.
- Simplify data analysis with powerful application-specific software, such as personal compounds, databases, and libraries.



Agilent CrossLab services. From insight to outcome.

CrossLab is an Agilent capability that integrates services and consumables to support workflow success and important outcomes like improved productivity and operational efficiency. Through CrossLab, Agilent strives to provide insight in every interaction to help you achieve your goals. CrossLab services include method optimization, flexible service plans, and training for all skill levels. We have many other products and services to help you manage your instruments and your lab for best performance.

Learn more about Agilent CrossLab, and see examples of insight that leads to great outcomes, at www.agilent.com/crosslab.

Learn more:

www.agilent.com/chem/environmental

Buy online:

www.agilent.com/chem/store

Find a local Agilent customer center
in your country:

www.agilent.com/chem/contactus

U.S. and Canada

1-800-227-9770

agilent_inquiries@agilent.com

Europe

info_agilent@agilent.com

Asia Pacific

inquiry_lsca@agilent.com

This information is subject to change without notice.