

For LabSolutions™ LCMS

LC/MS/MS Method Package for PFAS in Drinking Water



LCMS-8050

Provides Procedures and Methods for Analyzing Organofluorine Compounds in Drinking Water According to EPA Methods 533 and 537.1

Per- and Polyfluoroalkyl Substances (PFAS) have been used in coatings, surface treatment agents, emulsifiers, fire extinguishing media, and a wide variety of other products due to their water repellency, heat resistance, chemical resistance, and other characteristics. Meanwhile, due to concerns about their persistence, bioaccumulation, toxicity to biological organisms, and mobility over long distances in the environment, some PFASs have been targeted as substances governed by the Stockholm Convention on Persistent Organic Pollutants (POPs Convention)¹. In principle, the convention bans or restricts the manufacture, use, and import/export of target substances in the signatory states. As various countries implement regulations and assess the presence of PFASs in the environment and drinking water, there is a need to standardize the analytical methods used to quantitatively evaluate PFAS concentrations. The United States Environmental Protection Agency (EPA) developed and published EPA Method 537.1 in 2018 for analyzing 18 PFAS compounds in drinking water, and EPA Method 533 in 2019, which lists 25 PFAS compounds. The EPA plans to use Methods 533 and 537.1 as the analytical methods for assessing the status of 29 PFAS compounds in drinking water throughout the United States, based on the Fifth Unregulated Contaminant Monitoring Rule (UCMR5²) scheduled for implementation between 2023 and 2025. The LC/MS/MS Method Package for Analyzing PFASs in Drinking Water includes ready-to-use analytical methods for EPA Methods 533 and 537.1, examples of analytical procedures for the two methods, and various other information, such as precautions for sample preparation and analysis. Using this product, 52 PFAS compounds³ in drinking water can be analyzed.

LC/MS/MS Method Package for PFAS in Drinking Water

1. Ready-to-Use Analytical Methods

The package includes optimized analytical conditions for LC/MS/MS analysis, enabling analysis to start as soon as the system, reagents, and columns are available. There is no need to conduct a time-consuming process to determine analytical conditions.

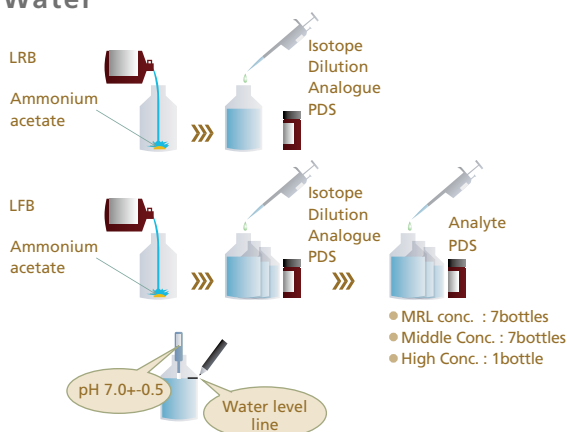
2. Illustrated Examples of Analysis Procedures

Examples of analysis procedures compliant with the EPA methods are illustrated with diagrams. The illustrations help with understanding the difficult-to-interpret EPA methods.

In addition, each procedural step includes the corresponding original text from the relevant EPA method as a reference when necessary.

3. Precautions and Advice for Analysis

Precautions and advice for ensuring an efficient analysis process are included.

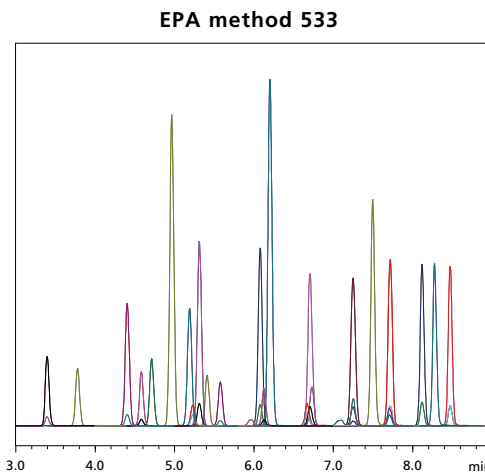
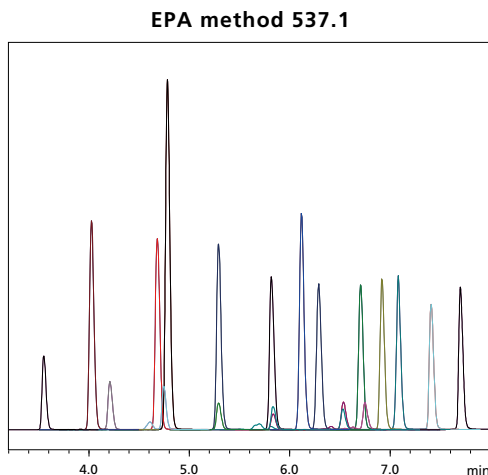


Optional Kit for PFAS Analysis

An "Optional Kit for PFAS Analysis" (sold separately) is available to minimize elution of organofluorine compounds from liquid contact surfaces in the LC system. Using the method package in combination with this kit enables organofluorine compound analysis with even higher reliability and robustness.

LC/MS/MS Method Package for PFAS in Drinking Water

Typical Chromatograms



List of Registered Compounds

EPA method 537.1

Analyte	Internal Standard	Surrogate
HFPO-DA	PFNA	13C2-PFOA
NEtFOSAA	PFOS	13C4-PFOS
NMeFOSAA	PFOA	d3-NMeFOSAA
PFBS	PFTA	d5-NEtFOSAA
PFDoA	PFTDA	13C3-HFPO-DA
PFHpA	PFUnA	
PFHxS	11CI-PF3OUdS	
PFHxA	9CI-PF3ONS	
	ADONA	

EPA method 533

Analyte	Isotope Performance Standard	Isotope Dilution Analogue
11CI-PF3OUdS	4:2 FTS	13C3-PFBA
9CI-PF3ONS	PFHxS	13C4-PFBA
ADONA	PFHxA	13C5-PFPeA
HFPO-DA	PFMBA	13C3-PFBS
NFDHA	PFMBA	13C2-4:2FTS
PFBA	PFNA	13C5-PFHxA
PFBS	6:2 FTS	13C3-HFPO-DA
8:2 FTS	PFOS	13C4-PFHpA
PFDA	PFOA	13C3-PFHxS
PFDoA	PFPeA	13C2-6:2FTS
PFEESA	PFPeS	13C8-PFOA
PFHpS	PFUnA	13C9-PFNA
PFHpA		13C8-PFOS
		13C2-8:2FTS
		13C6-PFDA
		13C7-PFUnA
		13C2-PFDoA

Target compounds of both EPA Methods 533 and 537.1 are indicated in red.

*1 Stockholm Convention:
<http://chm.pops.int/TheConvention/ThePOPs/TheNewPOPs/tabid/2511/Default.aspx>
 (viewed January 14, 2022)

*2 UCMRS:
<https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule>
 (viewed January 14, 2022)

*3 Including internal standard substances, surrogates, etc.

Precautions

1. Requires LabSolutions LCMS Ver. 5.113 or later and LabSolutions Insight™ Ver. 3.8 SP3 or later.
2. This method package is intended for research use only. It may not be used for clinical diagnostic applications.

LabSolutions and LabSolutions Insight are trademarks of Shimadzu Corporation or its affiliated companies in Japan and/or other countries.



Shimadzu Corporation
www.shimadzu.com/an/

For Research Use Only. Not for use in diagnostic procedures.

This publication may contain references to products that are not available in your country. Please contact us to check the availability of these products in your country.
 Company names, products/service names and logos used in this publication are trademarks and trade names of Shimadzu Corporation, its subsidiaries or its affiliates, whether or not they are used with trademark symbol "TM" or "®".
 Third-party trademarks and trade names may be used in this publication to refer to either the entities or their products/services, whether or not they are used with trademark symbol "TM" or "®".
 Shimadzu disclaims any proprietary interest in trademarks and trade names other than its own.

The contents of this publication are provided to you "as is" without warranty of any kind, and are subject to change without notice. Shimadzu does not assume any responsibility or liability for any damage, whether direct or indirect, relating to the use of this publication.