PRODUCT INFORMATION

PER- AND POLYFLUORINATED ALKYL SUBSTANCES (TOP, AOF AND PFAS)

Analytical support by PFAS single substance chromatography and the sum parameters TOP and AOF

AGROLAB has expanded its comprehensive analytical scope of PFAS analyses and now offers the sum parameters TOP (Total Oxidizable Precursors) and AOF (adsorbable organic fluorine). These parameters can be determined in all aqueous matrices: waste water, ground and surface water, and leachates.

PFAS are industrially produced organic compounds, with a fully (per-) or partially (poly-) fluorinated carbon backbone. There are both short-chain and long-chain PFAS, the best known long-chain representatives being PFOA (a perfluorocarboxylic acid) and PFOS (a perfluorosulfonic acid).

YOUR PLUS:

- **Sum parameter TOP**
- **Sum parameter AOF**
- **Standardized packages for PFAS single substance analyses**
- **Large analytical capacity**
- **Short processing times**

There are more than 4,700 known individual PFAS, thus a conventional analysis is not always effective, as not all components can be quantified by single-substance chromatography. This applies in particular to the polyfluorinated precursors and metabolites. PFAS precursors are partially transformed in situ and can be oxidized to perfluorinated carboxylic acids (PFCA) in the laboratory using the TOP Assay. This enables their quantification in aqueous matrices in the form of a sum parameter (TOP). In addition, the adsorbable organic fluorine (AOF) can be used to determine the total fluorine in aqueous media. The determination of these additional sum parameters offers the possibility to complete the single-substance LC/MS/MS PFAS determination.

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The individual PFAS are analysed according to the corresponding DIN method, for which we can look back on many years of experience and accreditation. There are currently no standardised methods for TOP, which is why we offer oxidation according to our in-house method MP-02514-DE. We analyse AOF for you accredited with DIN 38409-59.

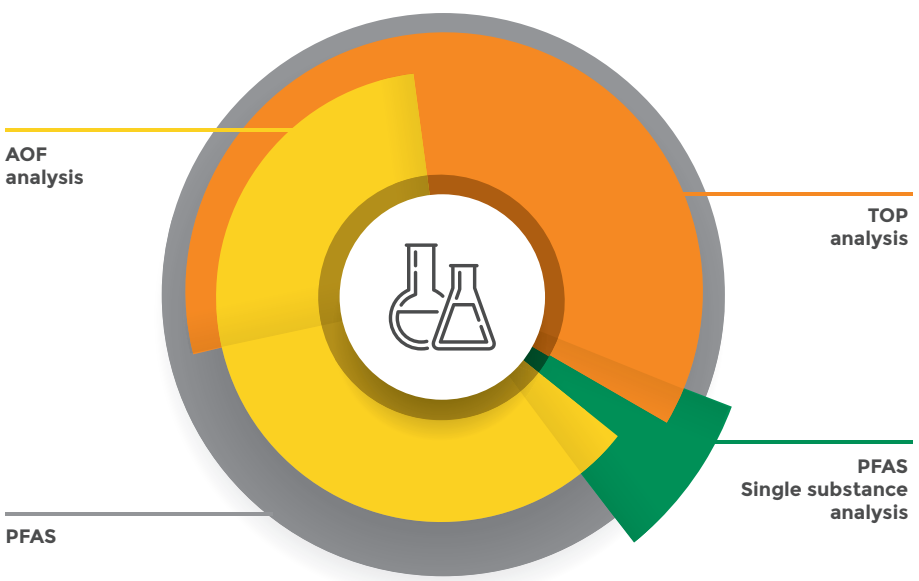
TOP-Assay in groundwater
Package P779031
Limit of quantification 0,01 µg/L

TOP-Assay in leachates
Package P779048

AOF in wastewater
Parameter E87471
Limit of quantification 3 µg/L

AOF in ground or surface water
Parameter E86508
Limit of quantification 1 µg/L

AOF in leachates
Parameter E87472
Limit of quantification 1 µg/L



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PFAS single substance analysis

For the analysis of individual substances, a large number of packages with limits of quantification in line with current requirements and regulations as well as accredited analytical procedures are available for drinking water, ground water, seepage, surface and waste water, sewage sludge, solids and solid eluate. We currently offer a total of up to 31 individual compounds in accordance with DIN 38407-42 for aqueous samples and DIN 38414-14 for sewage sludge and solids.

Name		Affiliation	Precursor
Perfluorobutanoic acid (PFBA)	PFBA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluoropentanoic acid (PFPeA)	PFPeA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorohexanoic acid (PFHxA)	PFHxA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluoroheptanoic acid (PFHpA)	PFHpA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorooctanoic acid (PFOA)	PFOA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorononanoic acid (PFNA)	PFNA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorodecanoic acid (PFDA)	PFDA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorundecanoic acid (PFUnA)	PFUNA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorododecanoic acid (PFDoA)	PFDoA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorotridecanoic acid (PFTrDA)	PFTrDA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorotetradecanoic acid (PFTeA)	PFTeDA	PFCA (**P**er**F**luoro **C**arboxylic **A**cid)	
Perfluorobutanesulfonic acid (PFBS)	PFBS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluoropentanesulfonic acid (PFPeS)	PFPeS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluorohexanesulfonic acid (PFHxS)	PFHxS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluoroheptanesulfonic acid (PFHpS)	PFHpS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluorooctanesulfonic acid (PFOS)	PFOS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluorodecanesulfonic acid (PFDS)	PFDS	PFSA (**P**er**F**luoro **S**ulfonic **A**cid)	
Perfluorooctanesulfonamide (PFOSA)	PFOSA	Perfluoroalkylsulfonamides	✓
Capstone B	CDPOS	Polyfluorinated alkyl compounds	✓
Capstone A	DPOSA	Polyfluorinated alkyl compounds	✓
3,7-dimethylperfluorooctanoic acid (3,7-DMPFOA)	3.7-DMPFOA	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
1H,1H,2H,2H-perfluorohexane sulfonic acid	4:2FTS	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
1H,1H,2H,2H-perfluorooctane sulfonic acid	6:2FTS	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
1H,1H,2H,2H-perfluorodecane sulfonic acid (8:2 FTS)	8:2FTS	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
2H,2H-perfluorodecanoic acid (H2PFDA)	H2PFDA	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
2H,2H,3H,3H-perfluoroundecanoic acid (H4PFUnA)	H4PFUnA	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
7H-dodecane fluoroheptanoic acid (HPFHpA)	HPFHpA	PFCA (**P**oly**F**luoro **C**arboxylic **A**cid)	✓
ADONA/DONA	(A)DONA	PFECAs (**P**er**F**luoro **E**ther **C**arboxylic **A**cid)	✓
Hexafluoropropylene oxide dimer acid (HFPO-DA)	H F P O - D A GenX	PFECAs (**P**er**F**luoro **E**ther **C**arboxylic **A**cid)	✓

If you have any questions regarding these analyses, our Sales Representatives and Customer Relationship Managers will be pleased to prove further advice!

The chemical authorities of Germany, Denmark, the Netherlands, Norway and Sweden are currently working on a proposal for a comprehensive ban on per- and polyfluorinated chemicals (PFAS). This is being done within the framework of the European chemicals regulation REACH. All uses of these substances that are not considered „essential to society as a whole“ are to be banned in future.

Chemical details and further information on the PFAS can be found e.g. at:
https://www.umweltbundesamt.de/pfc-portal-regelungen-empfehlungen
https://www.umweltbundesamt.de/publikationen/sanierungsmanagement-fuer-lokale-flaechenhafte-pfas
https://www.umweltbundesamt.de/publikationen/schwerpunkt-1-2020-pfas-gekommen-um-zu-bleiben
https://www.bmu.de/faqs/per-und-polyfluorierte-chemikalien-pfas/
https://www.lgl.bayern.de/lebensmittel/chemie/kontaminanten/pfas/index.htm
https://pfas-1.itrcweb.org/2-2-chemistry-terminology-and-acronyms/