



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).

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.

YOUR PLUS:

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

TESTING PACKAGES OF THE AGROLAB GROUP

There are no standardized methods for TOP and AOF required by authorities. We therefore offer you AOF analysis according to our in-house method MP-02348-DE. The analysis of the individual PFAS after the TOP-Assay is carried out according to the corresponding DIN method, for which we have many years of experience. The oxidation is carried out according to our in-house method MP-02514-DE.



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



TOP-Assay in leachates
Package P779048
Limit of quantification 0,01 µg/L



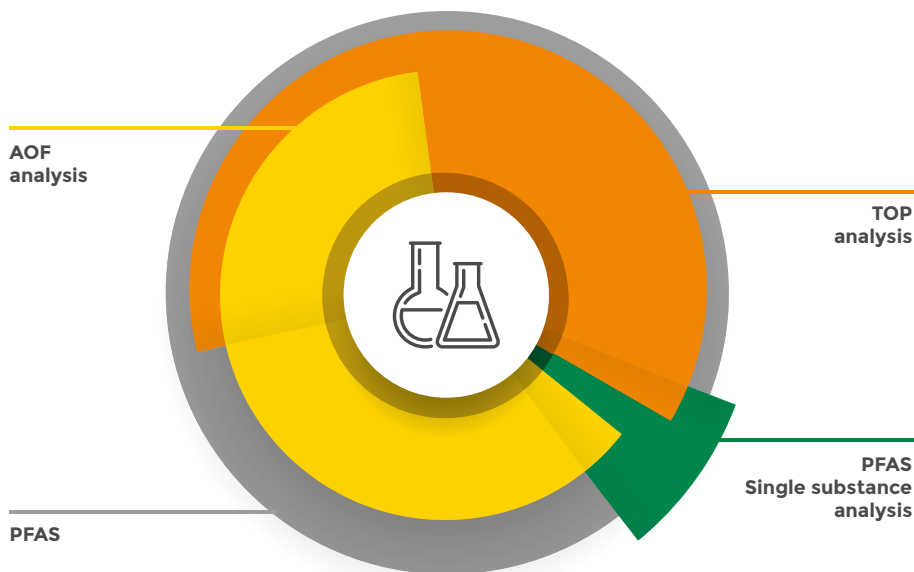
AOF in wastewater
Parameter E87471
Limit of quantification 3 µg/L



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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Your labs. Your service.

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	Abbreviation	Affiliation	Precursor
Perfluorobutanoic acid (PFBA)	PFBA	PFCA (PerFluoro Carboxylic Acid)	
Perfluoropentanoic acid (PFPeA)	PFPeA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorohexanoic acid (PFHxA)	PFHxA	PFCA (PerFluoro Carboxylic Acid)	
Perfluoroheptanoic acid (PFHpA)	PFHpA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorooctanoic acid (PFOA)	PFOA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorononanoic acid (PFNA)	PFNA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorodecanoic acid (PFDA)	PFDA	PFCA (PerFluoro Carboxylic Acid)	
Perfluoroundecanoic acid (PFUnA)	PFUNA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorododecanoic acid (PFDoA)	PFDoA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorotridecanoic acid (PFTTrDA)	PFTTrDA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorotetradecanoic acid (PFTeA)	PFTeDA	PFCA (PerFluoro Carboxylic Acid)	
Perfluorobutanesulfonic acid (PFBS)	PFBS	PFSA (PerFluoro Sulfonic Acid)	
Perfluoropentanesulfonic acid (PFPeS)	PFPeS	PFSA (PerFluoro Sulfonic Acid)	
Perfluorohexanesulfonic acid (PFHxS)	PFHxS	PFSA (PerFluoro Sulfonic Acid)	
Perfluoroheptanesulfonic acid (PFHpS)	PFHpS	PFSA (PerFluoro Sulfonic Acid)	
Perfluorooctanesulfonic acid (PFOS)	PFOS	PFSA (PerFluoro Sulfonic Acid)	
Perfluorodecanesulfonic acid (PFDS)	PFDS	PFSA (PerFluoro Sulfonic Acid)	
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 (PolyFluoro Carboxylic Acid)	✓
1H,1H,2H,2H-perfluorohexane sulfonic acid	4:2FTS	PFCA (PolyFluoro Carboxylic Acid)	✓
1H,1H,2H,2H-perfluorooctane sulfonic acid	6:2FTS	PFCA (PolyFluoro Carboxylic Acid)	✓
1H,1H,2H,2H-perfluorodecane sulfonic acid (8:2 FTS)	8:2FTS	PFCA (PolyFluoro Carboxylic Acid)	✓
2H,2H-perfluorodecanoic acid (H2PFDA)	H2PFDA	PFCA (PolyFluoro Carboxylic Acid)	✓
2H,2H,3H,3H-perfluoroundecanoic acid (H4PFUnA)	H4PFUnA	PFCA (PolyFluoro Carboxylic Acid)	✓
7H-dodecane fluoroheptanoic acid (HPFHpA)	HPFHpA	PFCA (PolyFluoro Carboxylic Acid)	✓
ADONA/DONA	(A)DONA	PFECAs (PerFluoro Ether Carboxylic Acid)	✓
Hexafluoropropylene oxide dimer acid (HFPO-DA)	HFPO-DA GenX	PFECAs (PerFluoro Ether Carboxylic Acid)	✓
11Cl-PF3OUds	11Cl-PF3OUds	PFESAs (PerFluoroalkyl Ether Sulfonic Acid)	✓
9Cl-PF3ONS	9Cl-PF3ONS	PFESAs (PerFluoroalkyl Ether Sulfonic Acid)	✓

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/>