

Exploring the impact of PFAS

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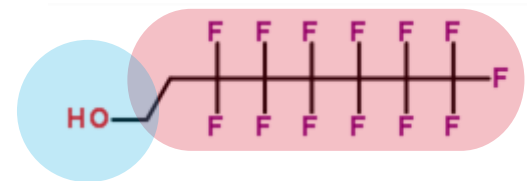
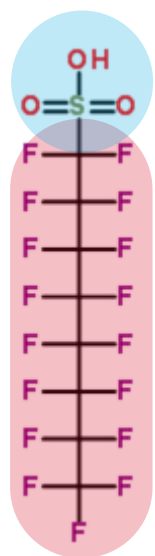
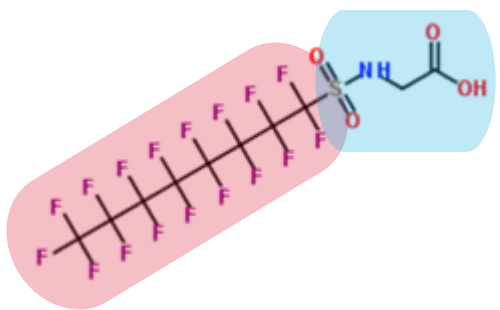
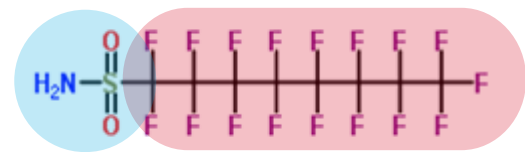
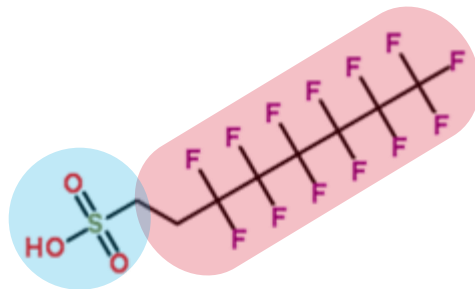
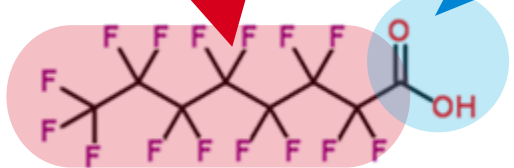


PFAS (Per/Polyfluoroalkyl Substances)

Examples of compound classes

Hydrophobic fluorocarbon

Hydrophilic group



Estimation: > 4000 PFAS compounds have been produced¹⁾

1) <https://pubs.acs.org/doi/full/10.1021/acs.est.6b04806>

PFAS related products

Common household products and industrial uses

Non-stick surfaces



Grease-proof food packaging



Surfactants and lubricants



Fire-fighting foams

Stain guards

Water repellents



PFAS related products

Common laboratory materials

Solvent caps,
filters and
tubing

Caps on
samples vials

Pump seals,
frits, degasser
materials



Air conditioning
filters

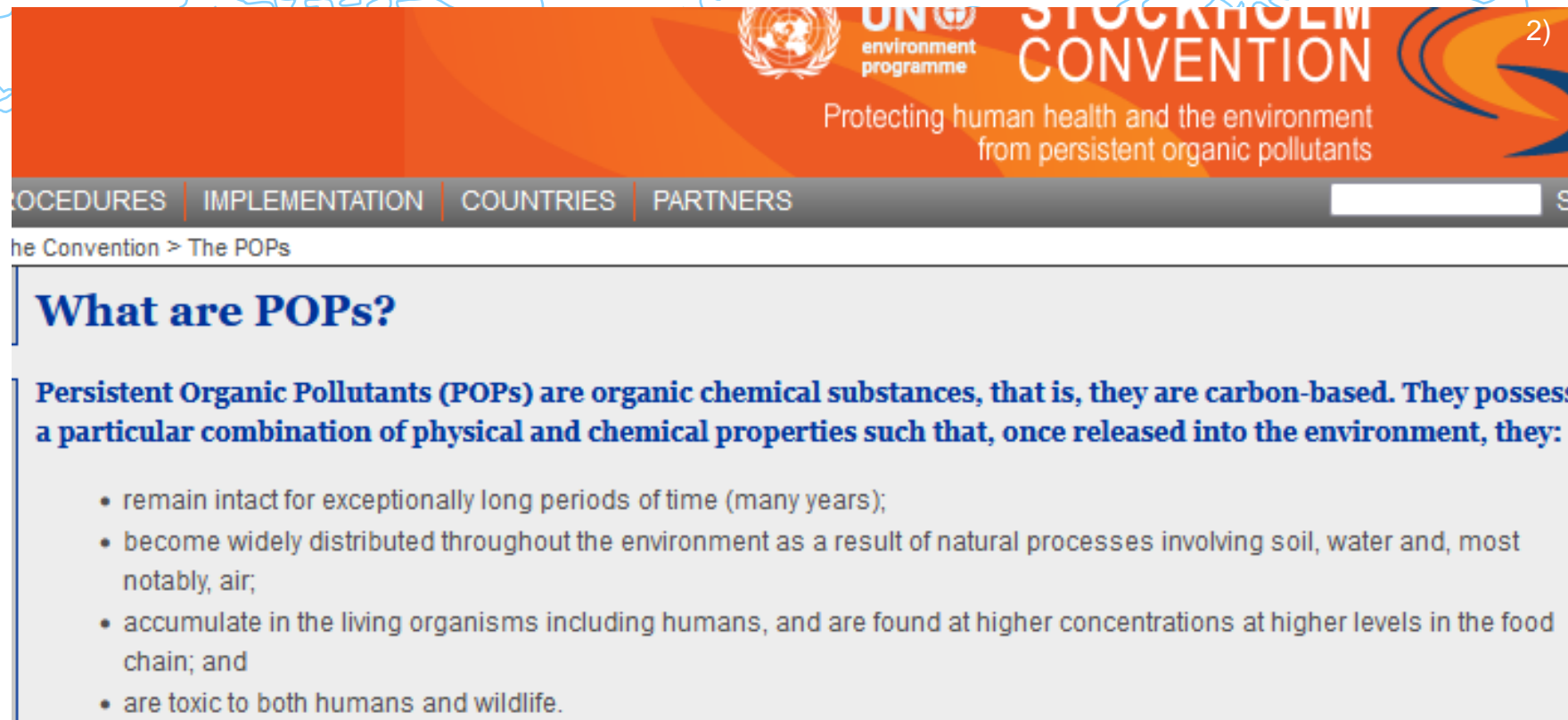
Gloves/Coats

Sample
preparation
consumables

PFAS Regulations

United Nations: Stockholm Convention^{1) 2)}

Ban of PFOA and PFOS¹⁾



The screenshot shows the header of the Stockholm Convention website, featuring the UN Environment Programme logo and the text "STOCKHOLM CONVENTION" and "Protecting human health and the environment from persistent organic pollutants". Below the header is a navigation menu with "PROCEDURES", "IMPLEMENTATION", "COUNTRIES", and "PARTNERS". A search bar is visible on the right. The main content area is titled "What are POPs?" and defines Persistent Organic Pollutants (POPs) as organic chemical substances that are carbon-based, persistent, and toxic. A list of characteristics follows:

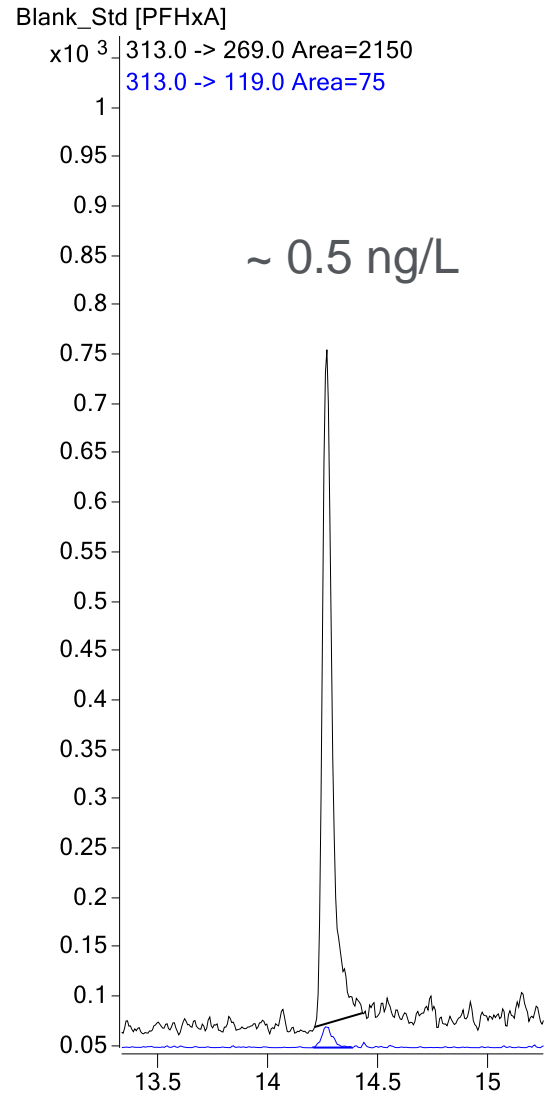
- remain intact for exceptionally long periods of time (many years);
- become widely distributed throughout the environment as a result of natural processes involving soil, water and, most notably, air;
- accumulate in the living organisms including humans, and are found at higher concentrations at higher levels in the food chain; and
- are toxic to both humans and wildlife.

1) <https://www.pops.int/TheConvention/ThePOPs/AllPOPs/tabid/2509/Default.aspx>

2) <https://www.pops.int/TheConvention/ThePOPs/tabid/673/Default.aspx>

Sub ppt (ng/L) detection limits

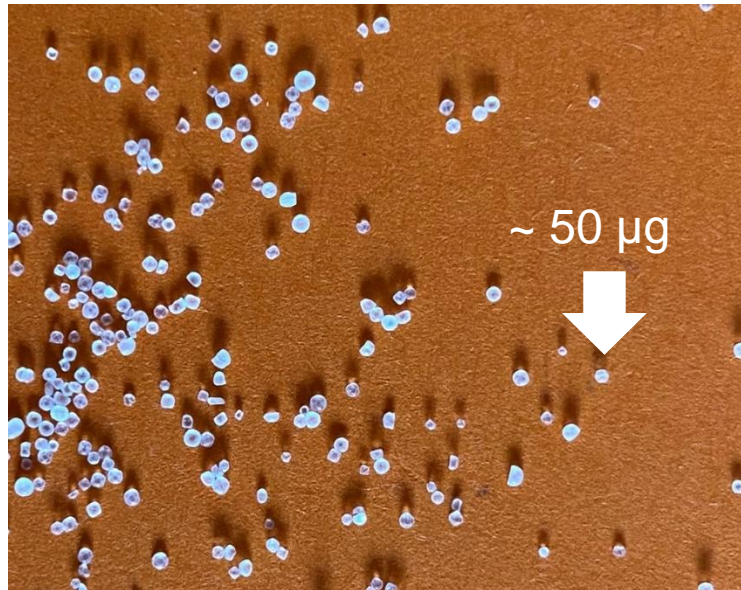
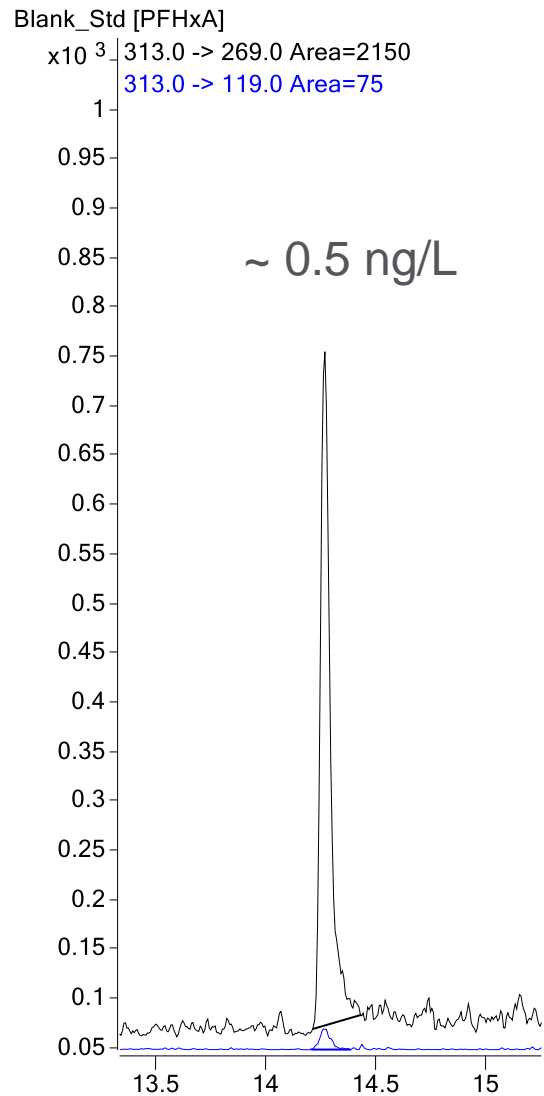
What does that mean?



Sub ppt (ng/L) detection limits

What does that mean?

Table Salt



Blank values - where do they come from?

What does that mean?

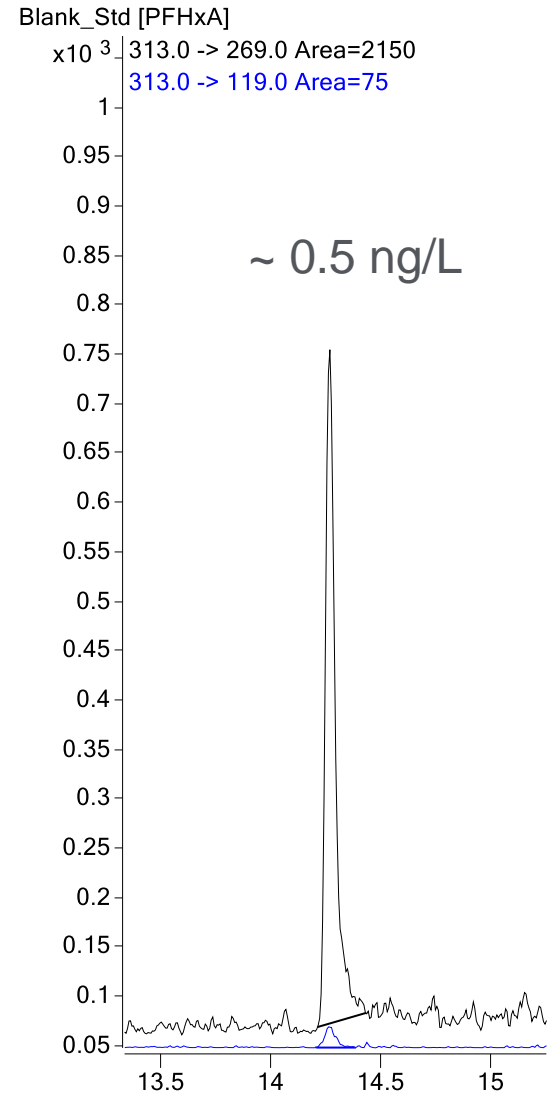
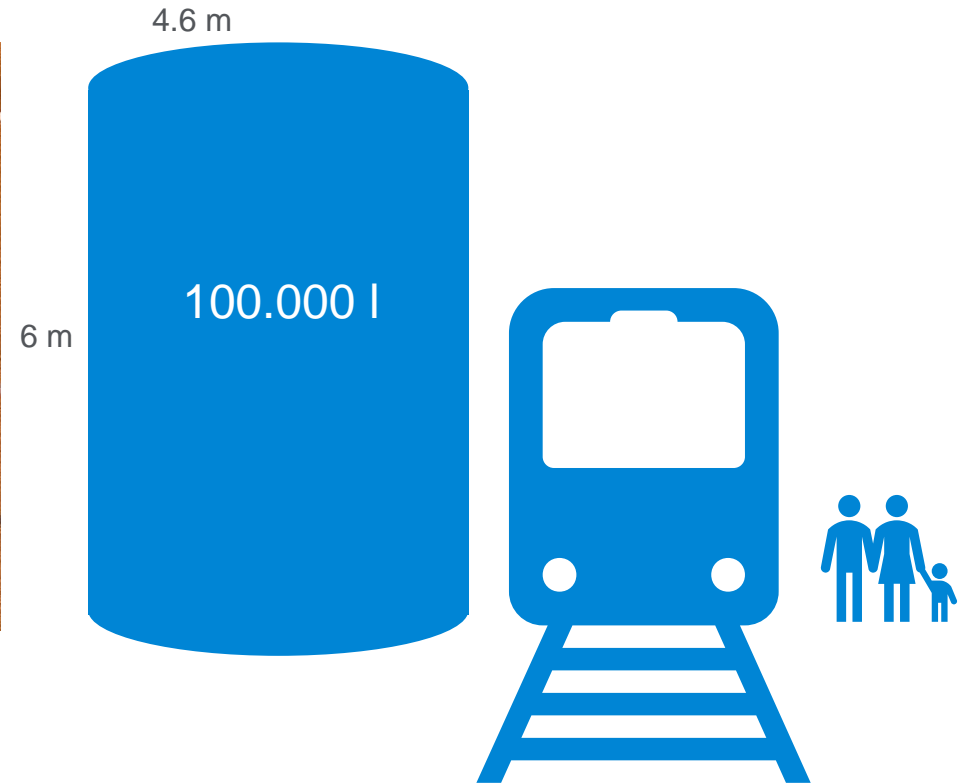
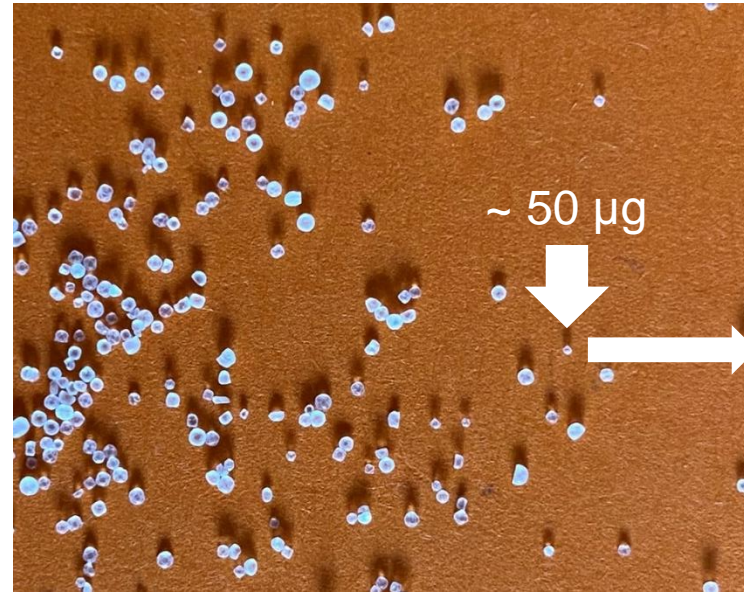


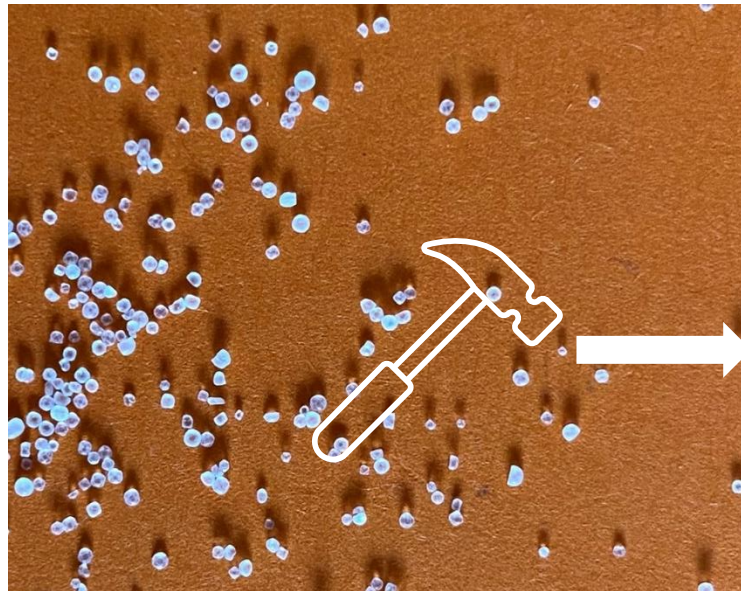
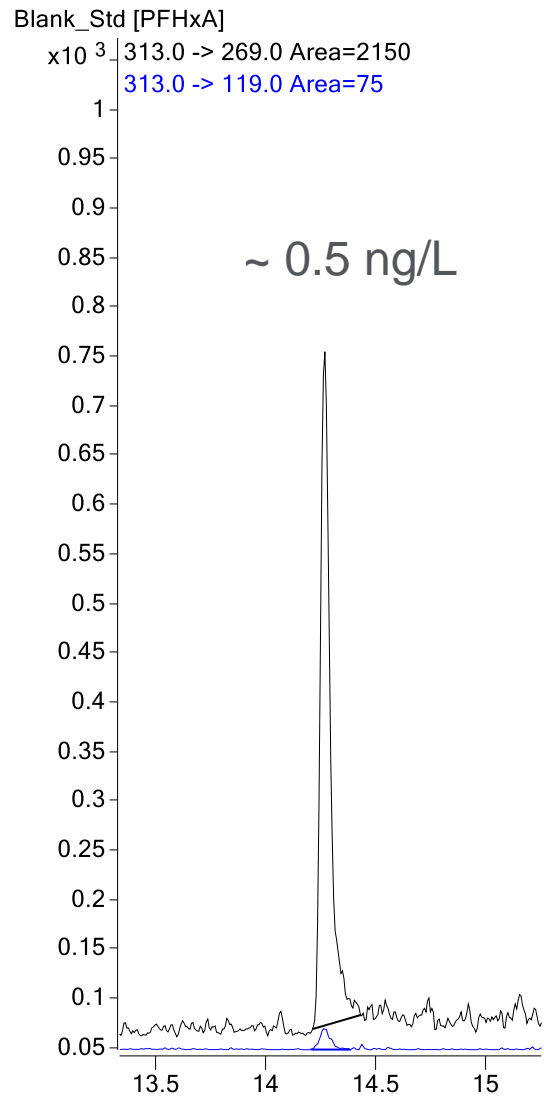
Table Salt



Sub ppt (ng/L) detection limits

What does that mean?

Table Salt



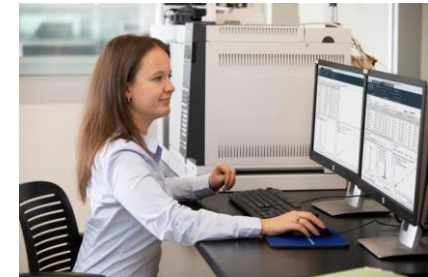
100.000.000 parts

1/100.000.000



1 ml

PFAS testing, Analytical Workflow



Sampling

Sample Preparation

Sample Analysis

Data analysis,
Reporting



enrichment



clean up



filtration



Standards



Vials



Columns



Solvents

LC/MS



ICP/MS



GC/MS

Agilent PFAS-free consumables and kits

Future of testing for PFAS



Targeted Analysis:
Analyze **more compounds** in **more matrices** with **lower detection limits**



Food

- More commodities
- Food contact materials



Consumer goods

- Toys, Textiles
- Cosmetics



Pharma

- contaminants
- leachables



Environmental

- Water, Soil,
- Air, indoor dust



Advanced materials

- Waste water,
- workplace safety

Untargeted Analysis:
Find and identify unknown PFAS





Many thanks!