PFAS – The Problem That Won't Go Away...

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What are PFAS?

PFAS (Per/Polyfluoroalkyl Substances) are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many others, that have been manufactured and used in a variety of industries around the globe since the 1940s.

PFAS and human health

PFAS enter the environment through production or waste streams.

Due to their widespread use, and their prevalence in the environment many people throughout the world have been exposed to PFAS, with drinking water one of the most common routes through which exposure occurs.

Where are PFAS found?

PFAS chemicals are found in a wide array of consumer and industrial products, and have been highly utilized in various industries due to their unique properties.

They can be found in commonly used products such as:

- **Firefighting foams**
- **Nonstick cookware**
- **Markers**
- **Cleaning products**
- **Food packaging**

Why are PFAS important to industrial and commercial products?

PFAS are considered important in industrial and commercial products due to their extremely stable chemical structure and unique chemical properties, making them long-lived substances (hence the nickname 'Forever Chemicals').

What is the issue with PFAS?

The very characteristics that have made them attractive for use in an array of products, are the ones that have led to their wide-spread contamination of the environment and humans.

Useful VS Harmful

How are humans exposed to PFAS?

Human exposure occurs because when PFAS enter into the water supply, and they do not breakdown, they are then ingested either directly, or through the contamination of the water used in an agricultural or manufacturing processes. Humans are also exposed through food contact materials and household and personal care products. Many people throughout the world have been exposed and have one or more specific PFAS in their blood, especially PFOA and PFOS.

Exposure examples include:

- **Contaminated soil or water**
- **Commercial products**
- **Industrial uses**
- **Drinking water**
- **Eating tainted meat and seafood**

How are PFAS monitored and analyzed?

Researchers measure PFAS in air, drinking water, soils, etc., to understand how and to what degree humans might be exposed. They are seen and can be measured at low ng/L (or parts per trillion) level.

The development and validation of laboratory methods to detect and quantify selected PFAS includes:

- **Water**
- **Stack emissions**
- **soil/biologicals/ biota**

These methods can be used by federal agencies, states, municipal/contract testing labs and local communities to analyze PFAS in the environment and determine safe levels.

Agilent solutions for the detection and analysis of PFAS

Agilent provides complete end-to-end workflows for extraction, quantification, and reporting of PFAS in the environment. This includes sample containment, sample preparation tools, extraction products, and ultra-high performance liquid chromatography coupled to mass spectrometry or extremely low levels measurement of PFAS.

Instruments

Agilent Ultivo Triple Quadrupole LC/MS (LC/TQ)

Agilent 6495C Triple Quadrupole LC/MS

Agilent 6546 LC/Q-TOF

Consumables

Sources:

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8. United Nations Environment Programme: PFAS analysis in water for the Global Monitoring Plan of the Stockholm Convention. https://unitar.org/cwm/sites/unitar.org.cwm/files/uploads/wd.5_guidance_on_pfas_in_water.pdf. Accessed June 2019

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