



PERFLUOROALKYL SUBSTANCES (PFAS) IN WATER

INTRODUCTION

PFAS – What are they?

Perfluoroalkyl Substances (PFAS), formerly referred to as Perfluorochemicals (PFCs), are a class of synthetic compounds widely used in industrial applications that are characterized by a fully fluorinated hydrophobic linear carbon chain attached to a hydrophilic functional group. PFAS' are of interest due to their extreme persistence in the environment, ability to bioaccumulate, toxicity potential, and adverse human health effects.

What is the sources of PFAS?

The chemical structure of PFAS' gives them unique properties, such as thermal stability and the ability to repel water and oil, making them useful in a wide variety of industrial and consumer products (fabric stain protectors, waterproofing of fabric, non-stick cookware, food packaging, lubricants, firefighting foams).

METHOD INFORMATION

Test Parameter: PFOA and PFOS

Test Method: In House Method based on USEPA Method 537.1 and USEPA 8327

Limit of Reporting: 0.02 ug/L

Sample size required: 250mL

Turnaround time: 5-7 working days from the receipt of samples.

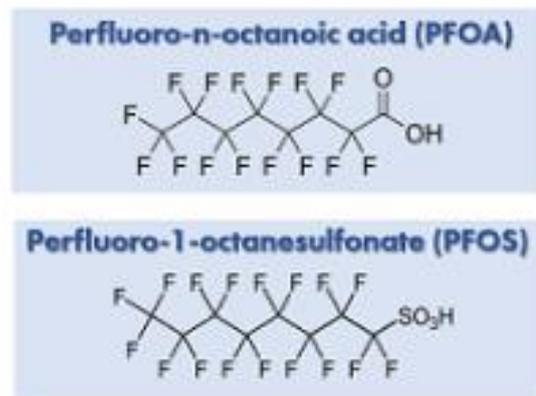
What are PFOA and PFOS?

Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are two of the best known and most studied PFAS'. In their ionic form, they are water soluble and can readily migrate from soil to groundwater, where they can be transported long distances. PFOS is the predominant PFAS found in aquatic species around the world.

PFOS and PFOA are man-made fluorinated chemicals of considerable global concern. The toxicity and bio-accumulating properties of PFOS/PFOA are such that in May 2009 the Stockholm Convention added these to the Persistent Organic Pollutants (POPs) listing.

PFOA and PFOS, which are also known as "C8" PFAS because of its 8 carbon atoms chain, are man-made chemicals which have the potential to be a health concern because they can stay in the environment and in the human body for long periods of time.

Figure 1: Chemical Structure of PFOA and PFOS



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Background on PFOA and PFOS?

In 1999, the USEPA began investigating perfluorinated chemicals and soon after 3M, the major U.S. producer, announced a phase-out of PFOS/PFOA manufacture. This may still occur in China. PFOS is detected in the blood serum of almost all people in the US although levels are decreasing, whereas blood levels of PFOS appear to be rising in China.

Perfluorinated substances including PFOS are both lipid-repellent and water-repellent and a key use is providing soil, oil and water resistance to a wide range of products. Specific uses include fire fighting foams, carpets and textiles; paper and packaging; coatings, industrial and household cleaning products, pesticides and insecticides, the photographic and semiconductor industries, and in metal plating. To put usage in perspective, the EU estimated (in 2004) that 10,000kg of PFOS were used in metals plating per annum.

PFOS can be found in surface water, soil, sediment, treatment plant effluents and landfill leachates plus human serum, fish and other biota with high levels found in many species from birds and dolphins to polar bears and mink.

The EPA Science Advisory Board suggests that PFOA is likely to be carcinogenic and the American Conference of Governmental Industrial Hygienists has classified PFOA as a Group 3 carcinogen. The U.S. National Health and Nutrition Survey indicates serum PFOA and PFOS are associated with thyroid disease in the U.S. population and several PFAS' are now part of the EPA UCMR-3 list.

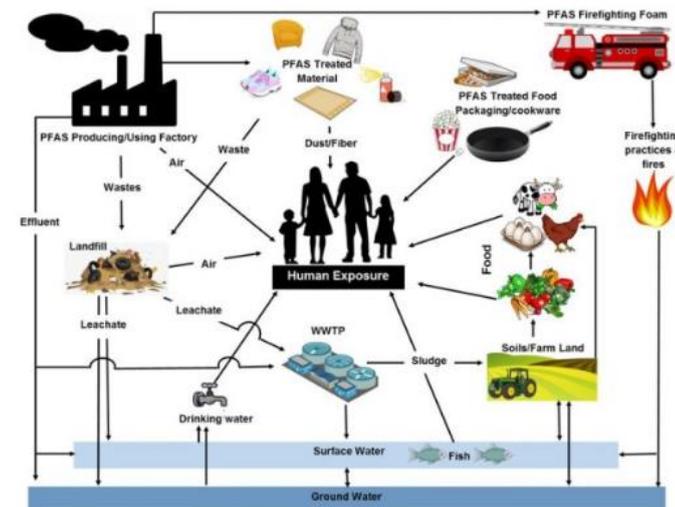


Geneva – May 2009: Excerpts from the UNEP Press Release

“Nine additional POPs were listed under the Stockholm Convention in May 2009, including PFOS and PFOA. Over 160 Governments recently concluded a one week conference with practical decisions that will strengthen the effort to eradicate some of the most toxic chemicals known to mankind. The conference marked a historic week for with the Stockholm Convention amended to include nine new chemicals – many of which are still widely used today. The amendment to the convention reflects international concern on the need to reduce and eventually eliminate such substances throughout the global community.

The conference also reviewed the process for evaluating the Convention’s effectiveness in reducing POPs over time. A global monitoring programme building on various regional systems will build a worldwide picture in trends and quantities of POPs in the environment and in the Human body.”

Figure 2: Human Exposure and Sources of PFAS



Please contact us to discuss your analysis requirement and we will assist you with the proposal.

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