Public Health England

PFOS and PFOA

General Information

Key Points

Fire

- In the event of a fire involving PFOS or PFOA, use fine water spray and liquid tight kit with breathing apparatus

Health

- Toxic by ingestion
- Repeated exposure by ingestion can cause stomach upset, liver toxicity and effects on thyroid hormones
- Skin or eye contact can cause irritation
- Prolonged exposure may cause cancer

Environment

- Dangerous for the environment
- Inform Environment Agency of substantial incident

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Background

Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are members of a chemical group known as perfluorinated chemicals (PFCs).

PFOS has been used in various industries including the semiconductor and photographic industries, in some fire fighting foams and in hydraulic fluids used in the aviation industry.

PFOS has also been widely used in the past as a protective coating for materials such as carpets, textiles and leather. It was also used in various household and industrial cleaning products.

PFOA is mainly used in the production of fluoropolymers used in electronics, textiles and non-stick cookware.

PCFs are extremely heat stable and are resistant to breakdown in the environment. PFOS and PFOA may be released into the environment as a result of their production and use.

Due to several reports on PFOS and the potential risks to the environment and human health, 3M the main global manufacturer has phased out the production of PFOS, PFOS related substances and PFOA. In the EU, manufacture and essentially all uses of PFOS are now prohibited under a Directive (2006/122/EC) that came into force in June 2008. PFOA is still manufactured, the main producer being DuPont.

The general public is only exposed to trace levels of PFOS or PFOA as contaminants in food and water. Exposure to higher levels PFOA may occur in the workplace where they are produced or used.

Data on the toxicity of PFOS or PFOA in humans are sparse. Studies with animals fed PFOS or PFOA for a long period showed effects on the stomach, liver and thyroid hormones. Animal studies also indicate that both compounds may cause cancer at relatively high levels. However, the concentrations that people would be exposed to in the environment are not thought to pose any cancer risk.

Neither PFOS nor PFOA are thought to be mutagenic and will not cause adverse effects on the unborn child at the levels that are not dangerous to the mother.

Frequently Asked Questions

What are PFOS and PFOA

Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are members of a group of chemicals known as perfluorinated chemicals (PFCs). Both PFOS and PFOA are very persistent in the environment. PFOS was widely used in the past in products to provide protective coatings to materials such as textiles and leather. It was also used in some fire fighting foams. However, most production of PFOS ceased in 2002. Manufacture and essentially all uses are now prohibited in the EU.

PFOA is still manufactured and is used to produce other chemicals such as fluoropolymers, which are used in electronics and non-stick cookware.

How do PFOS and PFOA get into the environment?

PFOA, and in the past PFOS may be released into the environment following their production or use or when products containing PFOS are used by industry or by consumers. PFOA and PFOS may also enter the environment from landfill sites where products and materials that contain these chemicals are sent for disposal.

How will I be exposed to PFOS or PFOA?

The general public may be exposed to trace amounts of PFOS or PFOA by drinking contaminated water or by eating contaminated food. Individuals who work in industries that use PFOA or use products that contain PFOA may be exposed to higher levels than the general public.

If there is PFOS or PFOA in the environment will I have any adverse health effects?

The presence of PFOS or PFOA in the environment does not always lead to exposure. Clearly, in order for it to cause any adverse health effects you must come into contact with it. You may be exposed by eating or drinking the substance or by skin contact. Following exposure to any chemical, the adverse health effects you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

Data from studies in animals suggest that repeated exposure of sufficient amounts may lead to gastrointestinal irritation, liver toxicity and effects on thyroid hormone levels.

Can PFOS or PFOA cause cancer?

No conclusions can be drawn from the limited data available in humans, but studies in animals suggest that both PFOS and PFOA may be carcinogenic following prolonged exposure to relatively high levels. Exposure to levels likely in the environment is not believed to present any risk of cancer.

Do PFOS or PFOA affect children or damage the unborn child?

The evidence from reproductive toxicity studies in animals suggests that PFOS and PFOA will not have any adverse effects on the unborn child.

What should I do if I am exposed to PFOS or PFOA?

It is very unlikely that the general population will be exposed to a level of PFOS or PFOA high enough to cause adverse health effects.