



19 March 2026

Chemical profile

Perfluoropentanesulfonic acid (PFPeS) and related substances

Summary

- The perfluoropentanesulfonic acid (PFPeS) and related substances group is comprised of substances that dissociate or degrade to the perfluoropentanesulfonate ion in the environment. The group includes direct precursors (acid, salts, sulfonyl fluoride and sulfinic acid) and indirect precursors (sulfonamides).
- Australian use information on PFPeS and related substances is limited, but general information indicates that perfluoroalkylsulfonic acids (PFASs), of which PFPeS is part, are used in mist suppressants for the metal plating industry and in firefighting aqueous film-forming foam (AFFF). PFASs are also used in carpet treatments, curatives, industrial coatings and printing inks.
- Information from international sources indicate that direct precursors to PFPeS may be used as components of etchants for electroplating, in antireflective coatings for photolithography, and in photoresists. Some of the chemicals in this group are used as precursors to prepare fluorochemical surfactants and fluoropolymers. The sulfonamides are also used in surface treatments, cleaning products and floor waxes.
- The Commonwealth environmental risk assessments concluded that PFPeS and related substances are persistent in the environment (P), have uncertain potential for bioaccumulation (uncertain B) and uncertain toxicity (uncertain T).
- The toxicity of PFASs increases with chain length, and the homologues with higher and lower chain lengths, perfluorohexanesulfonic acid (PFHxS) and perfluorobutanesulfonic acid (PFBS), have been identified as toxic (T). It is therefore likely that PFPeS is toxic to aquatic organisms.
- The chemicals in this group are a priority for scheduling to manage risks to the environment posed by using per- and polyfluoroalkyl substances (PFAS).

Chemical identity

The chemicals in this group are PFAS. The chemical group contains substances that dissociate or degrade to perfluoropentanesulfonate ions in the environment, but the scope of the listing covers any chemical found to meet the chemical class name description in the standard listed in the IChEMS Register. All members of the group are derivatives or precursors to a subgroup of PFAS known as perfluoroalkanesulfonic acids (PFASs).

- **Chemical class name:** perfluoropentanesulfonic acid (PFPeS), its salts and any substance containing a perfluoropentanesulfonyl moiety that can degrade to PFPeS.

- **CAS registry number:** 3872-25-1 and others (see CAS RN list).

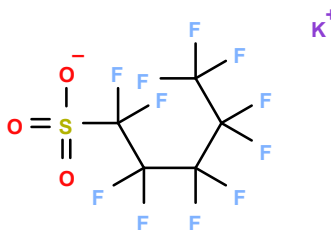


Figure 1. Chemical structure for the PFPeS and related substances group (potassium perfluoropentanesulfonate, CAS RN)

Hazards and risks to the environment

The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) published two environmental risk assessments on PFPeS in 2015: one on direct precursors (salts, NICNAS 2015a) and one on indirect precursors (sulfonamides, NICNAS 2015b).

The chemicals assessed all have the potential to dissociate or degrade to perfluoropentanesulfonate ions in the environment.

The Commonwealth risk assessment on direct precursors concluded that PFPeS is persistent (P) according to criteria equivalent to the *Australian Environmental Criteria for Persistent, Bioaccumulative and/or Toxic Chemicals* (DCCEEW 2022). Due to a lack of data, the risk assessment did not conclude whether PFPeS is bioaccumulative or toxic, so the chemical was characterised as having uncertain bioaccumulation potential (uncertain B), and uncertain toxicity (uncertain T).

The toxicity of PFASs like PFPeS increases with chain length, and the homologues with higher and lower chain lengths, perfluorohexanesulfonic acid (PFHxS) and perfluorobutanesulfonic acid (PFBS), are characterised as toxic (T). It is therefore likely that PFPeS is toxic to aquatic organisms.

Environmental exposure of the chemicals in this group may occur at industrial manufacturing sites and from the use of AFFF in firefighting operations, and diffuse emissions may result from the use of chemical products that contain the chemicals in this group, or from leaching from articles or coated surfaces that contain the chemicals in this group.

Introduction and use of perfluoropentanesulfonic acid (PFPeS) and related substances in Australia

Perfluoropentanesulfonic acid and related substances have been used as replacements for long-chain per- and polyfluoroalkyl substances (PFAS) such as PFHxS (perfluorohexanesulfonic acid) and PFOS (perfluorooctanesulfonic acid), following global action to eliminate their use.

Limited Australian use information on the chemicals in this group is available. PFPeS is part of a subgroup of PFAS known as perfluoroalkylsulfonic acids (PFASs), and information indicates that in Australia these chemicals are predominately used in mist suppressants for the metal plating industry and in fire-fighting aqueous film forming foam (AFFF). PFASs are also used in carpet treatments, curatives, industrial coatings and printing inks. It is likely that PFPeS is unintentionally present in products that contain other PFASs.

In addition, information from international sources indicate that direct precursors to PFPeS are used as components in etchants for electroplating, in antireflective coatings for photolithography, and in photoresists. Some of the chemicals in this group, including the sulfonyl fluoride and some sulfonamides, are used as precursors to prepare other fluorochemical products like chemical surfactants and fluoropolymers. The sulfonamides are also used in surface treatments, cleaning products and floor waxes.

Regulation of perfluoropentanesulfonic acid (PFPeS) and related substances in Australia

Several states and territories have regulated the use of PFAS in AFFF, which may also apply to AFFF formulations that contain PFHpS and related substances. State and territories may have other obligations for users of PFAS chemicals for waste management or environmental protection purposes.

Commonwealth and state and territory governments work closely together to provide nationally consistent responses to PFAS contamination through the *Intergovernmental agreement on a National Framework for Responding to PFAS* and the *National PFAS Position Statement*.

References

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022) [Australian Environmental Criteria for persistent, bioaccumulative and/or toxic chemicals](#), DCCEEW, accessed 14 January 2026.

NICNAS (National Industrial Chemicals Notification and Assessment Scheme) (2015a) [Direct Precursors to perfluoroheptanesulfonate \(PFHpS\), perfluorohexanesulfonate \(PFHxS\) and perfluoropentanesulfonate \(PFPeS\): Environment tier II assessment](#), NICNAS, accessed 2 February 2026.

NICNAS (National Industrial Chemicals Notification and Assessment Scheme) (2015b) [Indirect precursors to perfluoroalkyl sulfonates: Environment tier II assessment](#), NICNAS, accessed 2 February 2026.

More information

Email ichems.enquiry@dcceew.gov.au

Web <https://www.dcceew.gov.au/environment/protection/chemicals-management/national-standard>