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Special Issue on

Perfluoroalkyl and Polyfluoroalkyl Substances Environmental Fate, Toxicity, Risk Management, and Removal

CALL FOR PAPERS

Perfluoroalkyl and polyfluoroalkyl substances (PFASs) are characterised by the complete/partial substitution of hydrogen with fluorine atoms: the strong C-F bonds are responsible for the peculiar chemical and physical properties of these compounds.

PFASs have been widely employed since the fifties, due to their excellent hydrophobicity and endurance, either directly or indirectly, for the synthesis of surfactants and polymers. The huge amount of diversified industrial applications (as protective coatings in paper and textile fabrics, wetting agents, nonstick coatings on cookware, upholstery, electrical wire casing, fire-fighting foams, cosmetics, paints, agrochemicals, etc.) led to the ubiquitous presence of these molecules. Therefore, PFASs have been found worldwide in all the environmental matrices, that is, soil, sediment and sludge, biota, fresh/marine/drinking/ground/wastewater, and air particulate, where they are emitted by point and nonpoint sources. They are, indeed, recalcitrant to abiotic and biotic degradation, hence, persistent and bioaccumulative; at the same time, however, in case of living organisms, they mostly concentrate in serum with respect to fatty tissues.

Since the last two decades, the increased toxicological evidence about PFASs, with particular regard to perfluoroalkyl carboxylates (PFCAs), led industries and governments to implement targeted actions to reduce the content of PCFAs in the final products and to change the processing methods by replacing the precursor reagents with shorter-chain homologues or nonfluorinated compounds. Nevertheless, the environmental and human blood concentrations of PFCAs are still high, exhibiting only a dramatically slow decrease. Regarding human health, this fact can be now mainly attributed to the indirect exposure, via commercial fluorinated surfactants, such as the polyfluoroalkyl phosphates and the fluorotelomer building blocks, such as acrylates, alcohols, and iodides. These compounds undergo metabolic transformations up to PFCAs and, besides, exert specific toxicity.

Despite the gained knowledge of the aforementioned pollutants, attested by the strong and intensive scientific output, there are still lots of open questions about chemical and physical properties (e.g., the determination of sorption and distribution coefficients), exposure sources of humans and other organisms at different trophic levels, potential toxicity across multiple generations, differences in toxicity profiles accordingly with species and gender, treatment removal efficiency, and risk assessment and management.

Potential topics include but are not limited to the following:

- Definition of chemical and physical properties of PFASs and their alternative compounds/precursor/reaction by-products
- Investigation of fate and behavior of these molecules throughout significant time lapses and within wide areas, including different matrices
- Assessment of possible risks due to direct and indirect expositions
- Exploration of removal techniques (physical, chemical, and biological) from water matrices: full scale experiments are preferred
- State of the art of prescriptions enacted by governments and public health authorities and voluntary regulations

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jchem/environmental.chemistry/ppse/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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