

PhD position at UMR 5805 EPOC / University of Bordeaux, France

Occurrence and time trends of fluoroalkyl compounds (PFASs) in continental and estuarine hydrosystems

In the context of global change, a major consequence of human activities is the chemical pressure exerted on ecosystems. The latter partly results from the introduction into the environment of numerous synthetic organic compounds that may present a risk of health and ecotoxic impact, especially in aquatic systems. In such environments, the sedimentary compartment plays a special role in the fate of micropollutants, especially for the most persistent compounds, which are often organohalogen compounds. For these chemicals, fine sediments can represent a significant sink and thus they may contribute to the constitution of major stocks of contaminants. The study of sedimentary archives can make it possible to reconstitute the time trends of the contamination levels of pilot sites, which is essential to better understand the dynamics of these micropollutants in the environment, in connection with that of their uses and their emissions.

This work will mainly contribute to filling the current lack of knowledge on a complex family of micropollutants of "emerging interest", namely fluoroalkylated compounds (PFASs), which occurrence and fate in hydrosystems remain poorly characterized. This work will have the originality of proposing a dual approach to understand *i*) the current spatial distribution of PFASs and its determinants in the surface sediments of continental and estuarine hydrosystems and *ii*) their temporal dynamics in the four major French basins. These measurements, based on samples taken *in situ*, will be supplemented by experiments performed under controlled laboratory conditions to study the controlling factors of novel PFAS sorption onto sediments, as well as the potential for biotransformation of selected compounds (in collaboration with McGill University in Montreal, Canada).

In addition to sample collection during field campaigns, this work will also include the optimisation and the validation of innovative analytical methods. The PhD candidate will use techniques such as solid phase extraction, turbulent flow chromatography, liquid chromatography and tandem or high resolution mass spectrometry. These methods will then be used routinely for data acquisition, the exploitation of which will involve multivariate statistical approaches.

This work will be supported by various multidisciplinary projects involving environmental chemists, geochemists and sedimentologists, thus promoting the acquisition of a broad scientific culture by the PhD candidate. The project will also be undertaken in partnership with stakeholders such as French Water Agencies or the French Agency of the Biodiversity, within the LPTC research group (Physico & Toxicology-Chemistry of the Environment) at UMR 5805 EPOC (University of Bordeaux, <http://www.epoc.u-bordeaux.fr/>). The activities of the LPTC group include the investigation of the sources, fate and impact of organic micropollutants in the environment.

Keywords

Micropollutants of emerging interest, per- and polyfluoroalkyl compounds, sediment, aquatic ecosystems, water quality management, Analytical Chemistry, Environmental Chemistry

Candidate profile

The candidate will ideally have a background in Analytical Chemistry or Environmental Chemistry. In addition, he or she will demonstrate his/her autonomy but also his/her motivation for team work, in the field (sampling campaigns) and in the laboratory (analytical developments, experiments in controlled conditions, data acquisition and exploitation)

Required documents

- Detailed CV
- Motivation letter
- Short summary of the Master's degree research project
- Mark transcripts of the last years (S7 and S8 of M1; S9 of M2 for students from French universities; « Bachelor » and « Master » for students from foreign universities)

Applications should be sent by 21st May 2018 by e-mail.

Contact

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