PhD position in Analytical Chemistry: Sources and fate of PFAS in the Environment

We are looking for a graduate student in Chemistry with specialization in Analytical Chemistry

Description of project:

Persistent per- and polyfluorinated alkyl substances – commonly known as PFAS chemicals, are poorly removed in conventional Wastewater Treatment plants (WWTPs), while waste waters can contain various PFAS compounds at different concentrations. PFAS partitioning to sludge depends on their chemical structure but ultimately leads to the contamination of end-products (e.g. fertilizer extracted from sewage sludge, reclaimed water,…), which limits circularity in the water cycle. A consistent evaluation of WWTP effluent as well as sludge treatment technologies are missing due to a lack of characterization of PFAS content and fate in the solid and liquid fluxes along the treatment and valorization processes.

Main research activity will consist of developing analytical methods for wastewaters, solid sludge, and fertilizer samples for PFAS, including precursors and transformation products. Complementary monitoring strategies will be deployed, using different analytical processes, from global organic fluorine content measurement, using CIC technology to targeted analyses on selected PFAS through LC and GC-MS/MS approaches. Specific attention will be paid to sample preparations and extractions considering very complex matrices targeted (soil, sediment, sludge, waste water).

The developed monitoring strategies will be applied on European demonstration cases with different objectives, a) characterization of PFAS molecular pattern in relation to emitting industries b) determination of mass balance of PFAS fate during sludge treatment to provide insight on how PFAS substances are transferred to recovered fertilizers and c) proposal of monitoring strategies for European Sludge Directive.

This research study is developed in the frame of the PROMISCES European Project funded by European Research Executive Agency (REA) (Green deal Call, H2020 2021-2025). This study will be conducted in close cooperation with BRGM (Water, Environment, Process and Analysis Department) and IPGP (Biogeochemistry at the Anthropocene of Elements and Emerging Contaminants Unit) and in collaboration with the other PROMISCES partners.

Appointment period: The PhD position is for three years, located in Orleans (France - https://www.brgm.fr/en) in cooperation with IPGP (Paris, France (http://www.ipgp.fr/en)), with travels in Europe, in the frame of exchanges with the partners of the PROMISCES project.

Desired skills and experience

Requirements

A person fulfils the general entry requirements if he/she:

- has been awarded a Master of Science degree in analytical chemistry, environmental chemistry

Specific requirements also include

- knowledge in the field of analytical chemistry of organic micropollutants
- experience on method development for organic pollutants in complex matrices
- be able to solve problems
- have the ability to work independently (in autonomy) as well as interact well in a research group
- demonstrated ability to work effectively in a multi-disciplinary team
- a high proficiency in written and spoken English.

Assessment grounds

- experience of working with advanced analytical techniques for organic micropollutants and urban water cycle would place the candidate at an advantage
- the ability to speak French would also be a merit.

If interested please contact Anne Togola a.togola@brgm.fr and Eric van Hullebusch vanhullebusch@ipgp.fr

Apply

Candidates should submit electronic copies of

- An updated CV
- A 1-page statement of interest
- Copies of recent transcripts
- TOEFL/TOEIC score or English proficiency level
- Contact information of 2 referees

PhD school

The student selected for this position will be registered at Earth and Science Doctoral School STEP'UP (https://ed560.ed.univ-paris-diderot.fr/en/the-doctoral-school/)