Universität Zürich[UZH]

Department of Chemistry

MSc Thesis in Environmental Chemistry

Title of Thesis: Comprehensive evaluation of organofluorine chemicals in wastewater with high-resolution mass spectrometry

Description / Project:
The presence of fluorine-containing chemicals in the aquatic environment is of increasing concern due to their stability and potential impact to organisms in receiving waters and drinking water resources downstream of wastewater treatment plants (WWTPs). Per- and polyfluoroalkyl substances (PFAS) include many compounds with different chain length and functional groups, and are used in industry and different consumer products like textiles, electronics, coatings, and fire-fighting foams. Beside the PFAS, organofluorine compounds, which include fluorine-containing pharmaceuticals and pesticides, also contribute to the total fluorine load. However, little is known about their relative importance or fraction. In this project, we want to evaluate the occurrence and contribution of the organofluorine compounds in wastewater by screening for characteristic MS2 fragments to find known and suspected compounds, but also transformation products of them. Influents and effluents of WWTP will be sampled and analyzed with liquid chromatography coupled to high resolution mass spectrometry (HRMS).

Methods:
Analysis of environmental samples with LC-HRMS using target and suspect screening based on MS2 fragments, optimization of MS2 experiments to most suitably detect organofluorine compounds, suitable data analysis.

What we expect from you:
We are looking for a person with a background in chemical analysis and with interest in programming (scripting with R).

Starting date: Jan/Feb 2023, but an earlier starting date could be discussed.

Responsible IfC professor: Prof. Kathrin Fenner (Universität Zürich und Eawag)

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