One year post-doctoral position

Decontamination of water from pharmaceutical molecules and PFAS using inorganic fluorinated compounds

Project :

The water requirements for all human activities are placing increasing pressure on freshwater resources. Periods of water stress are becoming a long-term phenomenon on a global scale, exacerbating water shortages and the resulting tensions. The report by the Global Commission on the Economy of Water (UN, 2023) highlights that demand for drinking water is projected to exceed the supply of renewable freshwater as early as 2030. The reuse of treated wastewater (REUT) is a means of reducing withdrawals from water bodies and groundwater aquifers. However, with less than 1 per cent of treated wastewater being reused, the practice of REUT remains marginal in our country. Developing REUT is therefore a strategic priority for France. The EPURE project brings together eight laboratories at the Clermont-Ferrand site (France) working on the reuse of wastewater, focusing on two areas: “microbiological monitoring” and “wastewater treatment”.

Within this consortium, ICCF is involved in the second area, developing several processes tailored to each pollutant. The aim of this postdoctoral position will be to test the ability of various inorganic fluorinated materials, developed in the laboratory, to adsorb and/or degrade targeted molecules (PFAS and pharmaceutical molecules) in model water samples. To this end, she/he will synthesize the identified materials (in thin film or in powder) and develop protocols for monitoring the target molecules during these tests.

About ICCF :

The Institute of Chemistry (ICCF) organizes its research around three main areas. The Chemistry and Environment research area studies pollutants and develops more environmentally friendly processes. The Chemistry and Materials research area designs innovative materials for energy, imaging and detection. Finally, the Chemistry for Life program develops molecules and materials intended, in particular, for healthcare and the medical sector. The ICCF collaborates with major industrial groups and SMEs, drawing on its expertise in these fields and its wide range of analytical and modelling tools. The Inorganic Materials team develops and studies innovative materials using various synthesis methods, notably fluorination,

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plasma processes and mild chemistry, which enable the nanostructuring of materials. Its research addresses several major societal challenges, such as energy storage, energy-efficient lighting, pollution control and the reduction of the environmental impact of industrial processes.

The successful candidate will have access to all of the ICCF's experimental and analytical facilities, and in particular to the 'Inorganic Materials' team. They will thus have at their disposal the tools required for materials development (chemistry laboratory, plasma process reactor, etc.) and materials analysis techniques (XRD, FTIR, Raman, UV-Vis, electron microscopy, NMR-RPE, ICP, mass spectrometry, etc.)

Application :

The candidate for this post-doctoral position should have a PhD in Materials Science, Physico-chemistry or analytical chemistry. The candidate will need to be autonomous and curious in order to tackle the different aspects of this project and to work in interaction with the different researchers involved in its large project. In addition, she/he will need to demonstrate an excellent ability to share knowledge in English. Applications should include a CV, a covering letter, and a letter of recommendation from the current supervisor.

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