PhD offer: Hybrid polymer-functionalized mesoporous films for micropollutant removal

Starting date: 1 November 2024
Qualifications: Master or engineering degree in Physical Chemistry, Material Science or Polymer Science.
Project term: 36 months
Location: Institute Charles Gerhardt of Montpellier (ICGM, France)

Project description

The project will be mostly hosted by the ICGM's Porous and Hybrid Materials Department https://www.icgm.fr/en/the-institute/the-departments/d3/ (in collaboration with the Macromolecular Chemistry & Materials Department https://www.icgm.fr/en/the-institute/the-departments/d2/) and funded by the ANR. It aims to develop thin hybrid films with ordered mesopores intrinsically functionalized by micropollutant-complexing block copolymers for depollution. The control of the textural and chemical properties of the supported films and membranes (pore diameter and topology, and functions – acid, basic, cyclodextrin – in the mesopores), will allow to evaluate their performances in the reversible sorption of anionic, cationic and hydrophobic micropollutants based on electrostatic interactions or host-guest complexes.

Due to its interdisciplinary nature, encompassing copolymer synthesis, micelle engineering, self-assembled thin films, sol-gel, and nanostructured materials for micropollutant adsorption, this project will offer great opportunities for researchers to add to their knowledge.

Main responsibilities

The Doctoral Fellow will be responsible for the development of copolymers, their controlled micellization, and the synthesis of mesoporous hybrid films with tailored nanostructures. These activities represent two of the main tasks from the ANR project. The Doctoral Fellow will develop multidisciplinary skills, including experimental development, data interpretation and some dissemination. He/she will be supported by experts from ICGM, in fields such as (co)polymer synthesis (Patrick Lacroix-Desmazes at ICGM-D2), (co)polymer self- and co-assembly, sol-gel synthesis, thin-film processing and physico-chemical analysis of nanotextured materials. Training will be provided in all the techniques that make up the project, but demonstrable experience in a number of them is a plus. The Doctoral Fellow may also have the opportunity to supervise students, assist with project management, and take responsibility of beamtime applications to synchrotrons.

Technics to be used and learned: Quartz crystal microbalance (QCM), ellipsometry-porosimetry, AFM, SEM, TEM, EDX, GISAXS, XPS, DLS, NMR.

Qualification requirements

We are looking for a motivated candidate with a master degree (or equivalent) in physical chemistry, polymers, materials chemistry or relevant previous experience.

Assessment criteria: During the appointment process, particular attention will be paid to research skills in the fields of thin films, sol-gel, (co)polymer materials and porous materials. The ideal

candidate will have a problem-solving and collaborative spirit, combined with technical knowledge of materials chemistry and/or polymers. Previous knowledge of thin-film processing and mesoporous films is an advantage but not mandatory.

Work context: The position is funded by the ANR at the Institute Charles Gerhardt (ICGM, France) in collaboration with 3 other laboratories: the European Membrane Institute (IEM, Montpellier), Paris Condensed Matter Chemistry Laboratory (LCMCP, Paris) and Marcoule Institute of Separative Chemistry (ICSM, Marcoules). This consortium provides a unique scientific environment for multidisciplinary research using scientific platforms (ICP, S/TEM, AFM, SAXS, NMR, EC-QCM, EIS) and dedicated home-made apparatus. The collaborative work will be supported by frequent meetings, travels and sample exchanges.

Terms of employment

The position involves full-time employment for 36 months. The starting date is 2024-11-01. The job offer is valid until the position is filled. The University of Montpellier and the ICGM strive to be a workplace without discrimination and with equal opportunities for all. Salary will be based on the CNRS salary scale (2 135 € gross per month,). A salary supplement is possible if the doctoral student teaches at the University of Montpellier.

Application
Applications should be performed online on the following website:

https://emploi.cnrs.fr/Offres/Doctorant/UMR5253-GAURYD-002/Default.aspx

Please include the following information with your application

- Your contact details and personal data
- Your highest degree
- Your language skills
- Contact details for 2 references

and, in addition, please include the following documents

- Cover letter
- CV – degrees and other completed courses, work experience
- Scores in your last two years (Master)

Contact
For more information, please contact us:

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