Internship for Master student in Chemistry – Materials Science

Enantioselective Catalysis in Flow Using Homochiral MOF-Based Porous Polymer Microreactors

This internship is part of the ECaSep ANR project and is primarily focused on chiral organic synthesis and enantioselective catalytic reactions performed under continuous-flow conditions. The student will develop and study asymmetric organic transformations in flow, using innovative catalytic microreactors based on porous polymer monoliths decorated with homochiral metal–organic frameworks (MOFs). These hybrid catalytic materials will serve as confined, stereochemically defined environments to promote enantioselective synthesis with high activity and selectivity.

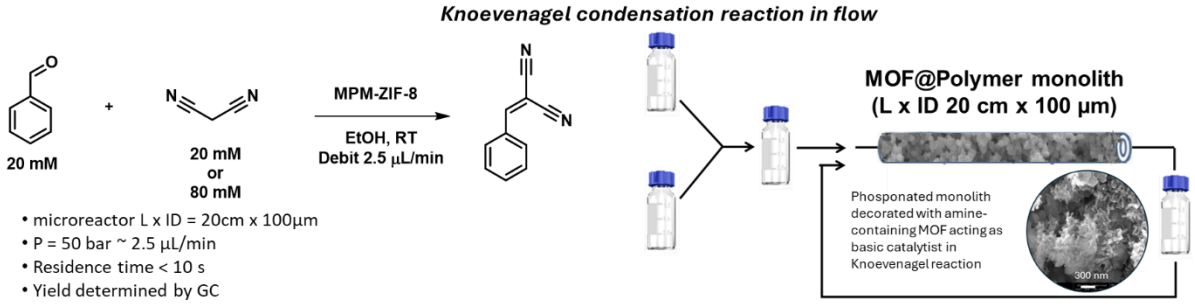

Figure 1: Scheme of the general strategy applied for performing flow catalytic reacting using amine-containing MOF-based porous polymer microreactor.

The project will be highly interdisciplinary, combining expertise in:

- Organic synthesis under continuous-flow conditions, including reaction optimization and scale-up in microreactors,
- Chiral analysis of reaction products, with particular emphasis on enantiomeric excess determination using chiral chromatography (HPLC/GC),
- Synthesis and structural characterization of homochiral metal–organic frameworks (MOFs) using X-ray diffraction (XRD), Raman spectroscopy, and complementary spectroscopic techniques,
- Synthesis and functionalization of porous polymer monoliths, characterized by scanning and transmission electron microscopy (SEM, TEM), surface and porosity analyses (SPS), and spectroscopic methods.

The work will be carried out in the frame of a collaborative ANR project between the Institut de Chimie et des Matériaux Paris-Est belonging to the Université Paris-Est Créteil (ICMPE), a well-known research group in the field of polymer science and continuous flow processes and the Laboratoire de Réactivité de Surface (LRS), located in Sorbonne University, a research group expert in the field of heterogeneous catalysis and MOF.

Profile of the candidate: Master's degree student or Engineering school student with a backround in chemistry and a strong interest (and knowledge) for material chemistry and physico-chemical characterization of porous materials. Excellent openness and curiosity, as well as motivation, autonomy and rigour are required.

Internship duration: 5-6 months starting from March 2026.

Funding: monthly grant in compliance with the applicable French regulations on internship remuneration

PhD opportunity: applying for a PhD grant is possible at the outcome of the internship.

Host laboratories : ICMPE – Université Paris-Est Créteil, 2 Rue Henri Dunant, 94320 Thiais et LRS – Sorbonne Université, 4 place Jussieu, 75005 Paris.

Contact : Dr Julien reboul, julien.reboul@sorbonne-universite.fr et Pr Benjamin Carbonnier, benjamin.carbonnier@cnrs.fr.

Applications: A detailed CV and a cover letter must be attached.