

Post-doc position

Selective transformation of CO₂ into methanol by hybrid bi-functional metallic nanoparticles- polymerized ionic liquids catalysts

Funded by the GPR "Post Petroleum Materials" at the Univ. of Bordeaux, France

UMR 5629 (LCPO)

UMR 5255 (ISM)

Project description

While the valorization of CO₂ has attracted much attention, its selective transformation into higher-value products is still very challenging. Thus, this project is dedicated to the selective hydrogenation of CO₂ into methanol by a hybrid bi-functional catalyst composed of metallic nanoparticles (MNPs) stabilized by polymerized ionic liquids (PILs). This process involves a two steps reaction, where CO₂ is first transformed into the corresponding cyclic carbonate by reaction with an epoxide. In a second step, the ensuing carbonate is hydrogenated into methanol (from CO₂) and a diol (derived from the epoxide) by the MNPs. While model epoxide, such as propylene oxide, will be first considered, bio-sourced epoxides derived from fatty acids will then be investigated. This inter-disciplinary subject will involve the skills of LCPO for the synthesis and characterization of the hybrid catalysts (polymer chemistry and organometallic chemistry) and the skills of ISM for the use of H₂/CO₂ pressurized homemade reactors for *in operando* spectroscopic studies of the reaction conversion, kinetics and selectivity.

Desired skills

We are looking for candidates with strong skills in organic and/or organometallic molecular chemistry with good notions in polymer chemistry. Good skills in the handling of air-sensitive compounds are also required. Candidates should also be familiar with structural characterization techniques, such as FTIR, Raman, NMR, mass spectrometry, TEM, XPS or WAXS. Complementary skills in high pressure technology would also be appreciated.

Principal supervisor(s):

Dr. Joan VIGNOLLE, joan.vignolle@enscbp.fr, +33556847949.

Dr. Thierry TASSAING, thierry.tassaing@u-bordeaux.fr, +33540002892.

Applications / Candidatures:

The candidates will submit their application, consisting of a cover letter, a detailed CV with the name and address of at least one referee, to the supervisors mentioned in the job description ASAP.

Terms of employment

Place of work: University of Bordeaux/ LCPO-ENSCBP, UMR 5629 CNRS, 33607 Pessac and ISM, UMR 5255 CNRS, 33405 Talence.

Contract duration: 18 months

Expected starting date of the contract: Flexible, from 01/01/2023

Full-time job

Main funding: GPR "Post Petroleum Materials"

Salary:

Monthly gross salary: 2500-2900 € according to experience.