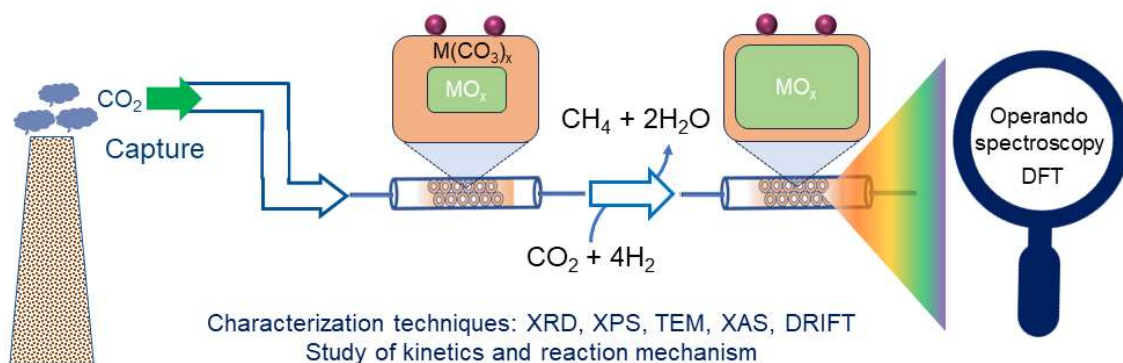


Fast Isothermal CO₂ Trapping and Methanation

CO₂ capture and utilization (CCU) will play a prominent role in the restructuring of the energy sector and the fight against global warming. The conversion of carbon dioxide into methane is a practical way of recycling CO₂ and storing energy at off-peak conditions when H₂ can be produced cheaply. This project aims at determining the optimal properties of sorbent-catalysts used for the sequential trapping and methanation of carbon dioxide under isothermal conditions. The project will investigate promising metal-oxide combinations to allow both strong CO₂ adsorption and CO₂ hydrogenation with H₂ on the same material. The consortium involves experts in catalyst synthesis, characterization and testing, as well as modelers, to be able to develop structure-activity relationships that will help develop better systems. The objectives are to understand the limiting factors of CO₂ sorption and methane production. The structural evolution and ageing of the materials under continued cycling under CO₂/H₂O/O₂ and H₂ atmospheres will also be of strong importance. The project aims at proposing adequate and cheap formulations based mostly on cheap and widely available metals and oxides as well as the range of conditions of use for practical applications.



The thesis work is part of a collaborative ANR project involving IRCE Lyon and ICGM. The project involves another doctoral student (theoretical chemistry) and several master students. The recruited PhD will work on supported catalyst preparation/characterization and heterogeneous catalysis.

Interested candidates should apply on <https://emploi.cnrs.fr/Offres.aspx>.

Application:

The ideal candidate should have background in inorganic chemistry or materials science, as well as experience in heterogeneous catalysis. Knowledge of in-situ spectroscopy will be an advantage. This ambitious 3-years PhD project will offer to the PhD student the opportunity to acquire a solid experience in supported catalysis, operando spectroscopy, and knowledge in modeling. Both chemists and chemical Engineers are welcome to apply. Please send your CV, a letter of motivation, and at least one letter of recommendation for the application.

Deadline for application: August 6, 2024. **Earliest starting date:** 1st of November, 2024

Employer: CNRS

Gross salary: 2135 € per month.

Contact: For more information, please contact Prof. Philippe Serp (philippe.serp@ensiacet.fr) and Dr. Bidyut Bikash Sarma (bidyut-bikash.sarma@lcc-toulouse.fr)

Website: <https://www.lcc-toulouse.fr/en/catalysis-and-fine-chemistry-team-c/>