

Post-Doctorate

Characterization of lamellar materials based on transition metal oxides for the catalysis in liquid phase.

In the frame of a joint research project (Labex EMC3) between 2 laboratories from Caen (France), the Laboratoire Catalyse et Spectrochimie (LCS) and the Laboratoire de Cristallographie et sciences des Matériaux (CRISMAT), we are looking for a candidate for a post-doctoral position for a one year contract.

Context and project description

The increasing use of biomass compounds, as substituents or in addition to petroleum products, will influence the nature of materials used as heterogeneous catalysts. The intrinsic characteristics and the conditions of production of this new feedstock indeed indicate that reactions will often occur in liquid phase and/or in presence of water. In addition, this change in reaction conditions induces new expectations in terms of characterization of the working catalyst, as the characterization of the active sites is rarely conducted in liquid phase.

This project aims at the development of new solid catalysts for the liquid phase, stable including in presence of water. In particular, the project will concern the study of promising lamellar oxides and related organic-inorganic hybrid materials (see [1-2] as an illustration) with the evaluation of their potential use as catalysts for the conversion of biomass molecules. In parallel to structural and microstructural characterizations of the materials (XRD, MET), the modifications induced during the reaction will be studied by Operando Raman spectroscopy. This aspect of the project will allow the development of new methodologies for the study of solid catalysts immersed in liquid phase.

[1] M. Kudo, H. Ohkawa, W. Sugimoto, N. Kumada, Z. Liu, O. Terasaki and Y. Sugahara, *Inorganic Chemistry* 42 (2003) 4479-4484.

[2] M.R. Waller, T.K. Townsend, J. Zhao, E.M. Sabio, R.L. Chamousis, N.D. Browning and F.E. Osterloh, *Chemistry of Materials* 24 (2012) 698-704.

Formation

Post-Doctoral position open to candidates who recently (less than 2 years) obtained a **PhD in Catalysis, Spectroscopy or Materials Science**.

The candidate needs to justify sufficient experience preferentially in at least two of the following themes :

- Heterogeneous catalysis solid/liquid
- Characterization by Raman spectroscopy
- Characterization of organic-inorganic hybrid materials by X-ray powder diffraction Basic knowledge on how to operate a transmission electron microscope (image and diffraction modes)

Localisation

The work will be carried out jointly at LCS and CRISMAT both located at ENSICAEN (Caen), under the supervision of Guillaume Clet (Associate Professor, LCS) and Philippe Boullay (Research Director CNRS, CRISMAT).

Salary and contract

Funding : LABEX.

Salary : ca. 2045 € net /month.

Starting : January-March 2017.

Period : 1 year.

Contact

A cover letter, the CV and contact information of referees (recommendation letters will be appreciated) should be sent to :

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