RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

ENSI CAEN
ÉCOLE PUBLIQUE D'INGÉNIEURS
CENTRE DE RECHERCHE

ID STUDENT develop low-pressure hydrogenation catalytic process of LOHCs (liquid organic hydrogen carriers) using raw hydrogen (W/F)

Date limite de candidature 24 aout 2025:

Description du poste

Job Information

Organization/Company: ENSICAEN – Laboratoire Catalyse et Spectrochimie

Research Field: CHIMIE -Catalysis

Researcher Profile: Master degree

Positions: PHD Positions

Country: France

Application Deadline: 24/08/2025

Type of Contract: Temporary

Job Status: Full-time

start of contract : 1st October 2025 for 3 years

Research Framework Programme: ANR H2Recover

Offer Description

The H2RECOVER project aims to develop low-pressure hydrogenation process of LOHCs (liquid organic hydrogen carriers) using raw hydrogen (Raw-H_2), a low-cost but impure feedstock that poisons conventional catalysts.

This PhD work will focus on the design, synthesis, and mechanistic study of novel platinum-based catalysts encapsulated in microporous zeolites (Pt@LTA and Pt@SOD), capable of activating hydrogen via the spillover effect while resisting poisoning by H_2S or CO.

The research plan includes:

- automated synthesis of Pt@zeolites using a high-throughput robot (ZINSSER ANALYTIC),
- advanced physico-chemical characterization (XRD, FTIR, NMR, HR-STEM, TPR…),
- *operando* FTIR experiments to monitor hydrogen spillover,
- catalytic tests on a model LOHC (dibenzyl-toluene),
- and evaluation of resistance to gas-phase contaminants.

Affaire suivie par : service des ressources humaines
Tél.: 02.31.45. 29.53
Mél.: srh@ensicaen.fr
6 bd Maréchal juin 14050Caencedex 4

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The work will provide fundamental insights into hydrogen spillover kinetics and help unlock alternative low-energy hydrogenation strategies for energy transition.

Where to apply

E-mail / ludovic.pinard@ensicaen.fr

Requirements

Research Field: Catalysis

Skills/Qualifications:

Solid knowledge in:

- **Catalysis** (heterogeneous or homogeneous)
- **Solid-state chemistry** or **materials chemistry**
- **Characterization techniques**: IR, XRD, NMR, BET, TPR, TEM, etc.

Experience or strong interest in:

- **Synthesis of porous materials** (especially zeolites or MOFs)
- **Physico-chemical analysis** of catalysts or nanostructured solids
- **Spectroscopic operando or in situ** methods (a plus)

Familiarity with:

- Laboratory good practices and safety procedures
- Scientific writing and data analysis

Programming or modeling skills (Python, Matlab, Origin, or similar) are appreciated but not mandator

Specific Requirements:

The candidate should demonstrate:

- A strong motivation for research and energy transition topics
- The ability to work **collaboratively within a multidisciplinary consortium**
- Good communication and organizational skills
- Readiness to work between **Caen (LCS)** and **Lyon (IRCELYON)** during the PhD duration

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Previous experience with **zeolite synthesis**, **encapsulation of metals**, or **hydrogenation catalysis** will be considered an asset

Languages: ENGLISH **Level:** Excellent

Languages: FRENCH **Level:** Basic

Additional Information

Selection process

A complete application must contain:

- Personal letter with a brief description of your research interests and your motivation letter, as well as your contact information
- Curriculum vitae (CV)
- Copy of the diplomas of your Master degree
- At least one letter of recommendation

Please email the required documents listed above to ludovic.pinard@ensicaen.fr and marie-francoise.lecanu@ensicaen.fr

The subject of your application email must contain the reference of the job offer.

People selected for an interview will be directly contacted by e-mail in the beginning of **September**

Additional comments

The research will be carried out at the Laboratoire Catalyse et Spectrochimie (LCS).

The LCS laboratory is a joint research unit under the auspices of the CNRS (UMR 6506), the University of Caen Normandy and ENSICAEN, the host institution. The LCS is recognized for its research activities, which are organized into two teams: one working on the rational design of porous zeolitic materials for targeted applications (catalysis, adsorption, sensors, medical applications…), and the other focusing on in-situ and operando spectroscopic methods for molecular-scale understanding of catalytic and adsorption phenomena. The person recruited will be inserted in

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this latter team. The LCS is heavily involved in major energy and pollution abatement projects and has long-standing strong interactions with numerous industrial groups.

The laboratory employs over 80 people, including 32 permanent staff (19 researchers, 14 administrative and technical staff). One of the laboratory's strengths also lies in the state-of-the art equipment, original tools and skills developed within its 5 technical platforms (Synthesis; Adsorption Catalysis; NMR; Vibrational Spectroscopy).

Website for additional job details

https://www.lcs.ensicaen.fr/

Work Location(s)

Company/Institute ENSICAEN - LCS research unit/ENSICAEN

Country France

City Caen

Contact

City Caen

Website https://www.lcs.ensicaen.fr/

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