



General information

Reference

PsD-DES-26-0135

Type of offer

Post-doctoral recruitment

Unit description

Do you want your research to have a real impact on the energy transition? The CEA-LITEN is the ideal place for a post-doctoral position. The teams at LITEN work with our industrial partners to develop the innovative technological solutions of tomorrow. More specifically, you will contribute to a collaborative project that combines extensive expertise in catalytic reactions and chemical energy storage technologies, with a strong commitment to technology development and transfer to industrial partners.

Job description

Job title: Operando Investigation of Data-Guided Catalysts for Low-Temperature Ammonia Synthesis and Cracking

Contract

Post-doctoral position

Contract duration

18 months

Context

Ammonia is a promising carbon-free hydrogen carrier due to its high hydrogen density and existing industrial infrastructure. However, its current production through the Haber-Bosch process remains energy-intensive, centralized and largely dependent on fossil-based hydrogen. A sustainable ammonia pathway requires new catalysts able to operate under milder temperature and pressure conditions, compatible with electrolytic hydrogen and intermittent renewable energy.

Within the CATANA-2 project, CEA will contribute to the accelerated discovery and understanding of heterogeneous catalysts for ammonia synthesis and ammonia cracking. The project combines catalyst synthesis, experimental screening, DFT-machine learning approaches, and in situ/operando characterization to identify active phases, reaction mechanisms, deactivation processes and regeneration strategies.

Your tasks



The postdoctoral researcher will contribute to the preparation, handling and characterization of catalytic materials for NH_3 synthesis and decomposition. The work will focus on sensitive materials such as hydrides, nitrides, amides, carbides and supported transition-metal systems.

The candidate will study the behavior of these materials under reactive NH_3 , H_2 and N_2 atmospheres, using laboratory characterization techniques such as Raman, IR, XRD and complementary physicochemical analyses. They will also contribute to in situ and operando experiments in collaboration with consortium partners and synchrotron facilities.

The objective will be to establish structure–reactivity relationships, identify active catalytic phases, understand activation and deactivation mechanisms, and provide experimental data to support catalyst optimization and DFT-ML modelling. The researcher will also participate in data analysis, project meetings, reports, publications and scientific presentations.

Skills required

The candidate should hold a PhD in materials chemistry, inorganic chemistry, heterogeneous catalysis, physical chemistry, chemical engineering or a related field.

Experience in catalyst synthesis, solid-state chemistry, solid–gas reactions, and the handling of air- or moisture-sensitive materials would be highly appreciated. Knowledge of ammonia catalyst, electrides, hydrides, nitrides, ammonia chemistry or hydrogen storage materials would be an advantage.

Practical experience with heterogeneous catalyst synthesis, characterization techniques such as XRD, Raman, IR, XPS, thermal analysis or gas–solid reactivity measurements is expected. Experience with in situ/operando methods, synchrotron experiments, catalytic testing or data analysis would be a plus.

The position requires autonomy, careful experimental practice, scientific curiosity and the ability to work in an interdisciplinary consortium. Good English communication and scientific writing skills are expected. French language skills are not mandatory but would be an advantage for daily interactions within the laboratory environment and with project partners.

What you can expect:

- In the heart of the Alps, an exceptional and internationally recognized, in a city committed to the environmental transition, a balance between private and professional life (50 days off/year), an active Works Council for leisure and extra-professional activities;
- Salary according to your qualifications and experience, access to a savings scheme funded by the CEA;
- Industrial-grade facilities for research;
- Participation to scientific conferences;



- Training to strengthen your skills or acquire new ones.

Interested? Apply online now. We look forward to getting to know you!

Site

Position location

17 Avenue des Martyrs, 38000 Grenoble
France, Rhône-Alpes

Candidate criteria

Language

English (fluent)

Program

CEA segment

Decarbonized non-nuclear energies

Applicant

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Job availability: from October 2026