



Post-doctoral position in nanomaterials chemistry

Institution & location

Sorbonne Université, Lab. Condensed Matter Chemistry of Paris ([LCMCP](#)), France

Starting date and duration

As soon as possible. 2 years.

The lab

At [LCMCP](#) we are developing basic and applied research in materials science addressing some of the most urgent challenges of our societies, from energy crisis to medicine. We are searching for ways to understand how materials form in Nature, how to design new materials, how to process them and how to target specific properties and applications. Our lab is affiliated to CNRS and Sorbonne Université, two prestigious research institutions in France and worldwide. It is located in the center of Paris on the campus of Sorbonne Université.

Your team and project

You will work in the Novel Advanced Nano-Objects (NANO) team gathering chemists and materials scientists, who are joining to perform research in nanochemistry, with the aim of developing new nanomaterials. This project will be headed by David Portehault, experienced in nanomaterials synthesis and properties. It will be performed in collaboration with the RMES team (Christel Laberty-Robert) focused on energy conversion technologies and with the SMILES team (Christel Gervais) for spectroscopic materials characterization.

The topic is the **design of 2D nanomaterials combining transition metals and p-block elements** for electrocatalytic water splitting. This project is part of a larger research effort in the design of architected electrodes using nanomaterials and additive manufacturing, with the [Institute of Research for Ceramics](#) at Limoges (IRCER, Samuel Bernard) and the [Institute of Chemistry of Media and Materials of Poitiers](#) (IC2MP, Stéphane Célérier & Aurélien Habrioux). The position is funded by the French Agency for Research.

The goal of the LCMCP team in this project is three-fold:

- (1) We want to study exfoliation of layered metal carbides (MAX phases) into bidimensional nanomaterials (MXenes) in inorganic molten salts. This approach has been demonstrated for simple MAX phases, but we want to generalize it to more challenging compounds and to understand the underlying mechanisms with *in situ* characterization.
- (2) We want to chemically modify MXenes by using colloidal chemistry.
- (3) We will study the electrocatalytic properties of these 2D nanomaterials for the production of dihydrogen from water (electrocatalytic water splitting).
- (4) The most active materials will be processed by additive manufacturing into porous architected electrodes at IRCER. The electrochemical properties of these electrodes will then be assessed under industrially-relevant conditions at IC2MP.

Required skills

- PhD in chemistry of materials
- Expertise in materials synthesis & characterization
- Expertise in colloidal nanoparticles synthesis
- Good publication record
- Good level of English (written and spoken)
- Independent thinking and time management
- Ability to actively participate in a collaborative, inclusive and multicultural team



Compensation package

Competitive salary. The grant also covers health care. Sorbonne Université holds a specialized team to help foreigners to manage French paper work.

Application

Applications must be submitted by email with a **CV** including the contact details of **2 references**, and a **cover letter** mentioning why you want to be part of the team.

Deadline: the position will remain open until filled.

Contact: David PORTEHAULT

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