Grenoble INP - UGA is a renowned public institution of higher education and research, and a major player in the Grenoble ecosystem. It is the engineering and management institute of Grenoble Alpes University, and plays a leading role in the scientific and industrial community.

Researcher in Electrochemistry and materials sciences

<table>
<thead>
<tr>
<th>Job number</th>
<th>2024-RESELECTMAT-LEPMI</th>
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<tbody>
<tr>
<td>Research field</td>
<td>Advanced characterization of hydrogen oxidation/evolution catalysts</td>
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<tr>
<td>Host laboratory</td>
<td>LEPMI (UMR 5279 Grenoble-INP, UGA, USMB et CNRS)</td>
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<td><a href="https://lepmi.grenoble-inp.fr/">https://lepmi.grenoble-inp.fr/</a></td>
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<tr>
<td>Requested profile</td>
<td>First stage researcher (R1)</td>
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<tr>
<td>Location</td>
<td>Grenoble, France</td>
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<tr>
<td>Hiring date / contract term</td>
<td>01/09/2024 (12 months)</td>
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<tr>
<td>Contacts</td>
<td><a href="mailto:Marian.Chatenet@grenoble-inp.fr">Marian.Chatenet@grenoble-inp.fr</a></td>
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Grenoble INP - UGA is an equal opportunity employer committed to sustainability. Grenoble INP-UGA celebrates diversity and equity and is committed to creating an inclusive environment for all employees. All qualified applications will be considered without discrimination of any kind.
LEPMI is a laboratory specialized in electrochemistry, whose topics are essentially centered on environmental sciences and green energies [http://lepmi.grenoble-inp.fr/]. The research will be undergone in the team of electrocatalysis. The post-doctorate will take part in the joint laboratory between LEPMI and Michelin.

**Job description:**

Nanostructured Pt-group-metal-based carbon-supported catalysts (the usual hydrogen oxidation/evolution catalysts) degrade very fast and deeply in alkaline media, which compromises the AEMFC/AEMWE durability. The degradation mechanisms remain poorly understood, which prevents one to propose relevant mitigation strategies to counter these degradations. In addition, the fate of non-noble catalysts in this environment is not clear and requires further work to be unveiled.

In this work, accelerate stress tests (AST) will be made in “model” conditions, to provide insight into such materials degradation mechanisms in conditions that mimic AEMFC/AEMWE operation, both at the hydrogen and oxygen electrodes.

Pt and Pd-based catalysts will be studied at first (commercial references), and then home-made catalysts based on Ni. The potential window of the AST will be adapted to the targeted conditions (-0.2 – 0.5 V vs. RHE for hydrogen reactions, and 0.6 – 1.0 V vs. RHE or 1.0 – 1.6 V vs. RHE for oxygen reactions); the effects of the temperature (25 and 60°C) the gas atmosphere (Ar, H₂ and O₂) will also be evaluated. The way the active surface area and the activity for the target reaction do evolve will be measured in rotating disk electrode (RDE) or gas diffusion electrode (GDE). These electrochemical markers will be compared to the physicochemical and textural properties of the materials, determined from TEM, XRD, and ICP-MS.

The use of *in situ* coupled techniques (FTIRS, DEMS, ICP-MS), and advanced microscopies (STEM-HAADF-XEDS, identical location TEM: ILTEM), will help unveiling the degradation mechanisms at stake and their dependence to the operating conditions.

**Specific requirements or conditions**

Proficiency in English and French is required. In addition, international experience will be a decisive asset.

PhD diploma, with a profile of materials sciences, chemical engineering or electrochemistry.

**Specifics of the position**

Knowledge in electrochemistry/electrocatalysis, and materials characterization (in particular transmission electron microscopy) techniques are *mandatory*.

**The candidate shall justify his proficiency in TEM operation.**

Curiosity and autonomy are two essential qualities to fulfill this study.

The candidate shall be capable to work in the joint laboratory between LEPMI and Michelin.

**Position assigned to a restricted area: YES**

(Device for the protection of the scientific and technical potential of the nation, conditioning the appointment of the researcher to the authorization of the Defense Security Officer).

**How to apply**

Applications must be sent to: Marian.Chatenet@grenoble-inp.fr

Application deadline: April 10th, 2024