PhD proposal
Bourse Ministère 2022

Evaluation of membranes chemical degradation levels as a function of accelerated stress test. Comparison with long-term field returns

1 – Administrative attachment

University : UGA
Doctoral School : Ingénierie Matériaux, Mécanique, Environnement, Energétique, Procédés, Production
Speciality : Matériaux, Mécanique, Génie civil, Electrochimie (2MGE)
Research unit: LEPMI UMR CNRS 5279 – Equipe GUIDE basée au Bourget-du-Lac (Chambéry - 73000)

2 – PhD proposal

Thesis director : Pr. BAS Corine
Co-supervisor : Dr. DUBELLEY Florence

Keys words : Fuel Cells – Accelerated Stress Test – Durability – IR and Raman microscopy – Ionomer membranes degradations – Physico-chemical characterizations

Abstract:

This project aims at providing new information on the fuel cell systems durability light vehicles application through a better understanding of PFSA membranes degradation mechanisms. It thus proposes to work on two main axes:

- Relating accelerated or condensed tests to real conditions from the point of view of chemical degradation and cationic contamination of the membrane;
- To set up accelerated stress tests for the validation of new materials in order to simulate the operating conditions of the membrane

Durability objectives will be measured by reliable accelerated stress test (AST) protocols, at the stack and system scale, validated on real cycles and under real operating conditions. These systems will be supplied by SYMBIO company.

The experimental part will rely heavily on the characterization techniques developed in the laboratory. Adaptations of these techniques will be necessary to analyze the new materials, which are increasingly thin in terms of thickness.

More informations on the project are available on the ADUM website

3 - Application

Profil and skills required :

The candidate must have a Master II or an engineering degree in chemistry or materials science. In addition, knowledge of fuel cell systems and/or the field of ionomers will be greatly appreciated. The person recruited should be able to evolve in a multidisciplinary group, to work within a team and to gain autonomy with regard to his/her research project.

EVALUATION CRITERIA :

Candidates will first be selected on the basis of their application. An interview by videoconference or in person will then be organized.

- Motivation to prepare a PhD / will to do research,
- Adequacy between the Master's degree (or equivalent) and the thesis subject
- Master's notes and rankings, and regularity in the university curriculum ,
- Candidate's ability to present his work
- Professional experience of internship(s) in laboratory; any research work already carried out (reports, publications).

French level: B2
English level: B2

Apply

Send your CV, a cover letter and your master reports to Florence Dubelley (florence.dubelley@univ-smb.fr)

Thesis beginning : 10/01/2022
Closing date for application : 05/07/2022
Interviews will be organized with as they arise