

Semester project: Performance and stability of metal-supported Solid Oxide Electrolysis Cells.

Location: Group of Energy Materials, EPFL-Valais, Rue de l'industrie 17, 1950 Sion

Function: Semester or Master project, Research & Development

The Group of Energy Materials offers an opportunity for a Master student to carry out investigations on Solid Oxide Electrolysis Cells (SOEC) in the framework of a EU project. Two electrolyte-supported and one new metal-supported SOEC will be studied and their performances and stability compared. Electrolysis of water vapor, CO₂, as well as co-electrolysis of H₂O/CO₂ mixtures will be performed at high temperatures, below and above the thermoneutral voltage, and for periods of 1000 to 2000 h. The redox stability (i.e., the ability of the anode to retain its performance after oxidation/reduction cycle) will also be assessed.

Your tasks:

- Review scientific literature
- Design and execute experimental protocols in the laboratory
- Perform electroanalytical measurements (Voltammetry, Electrochemical Impedance Spectroscopy)
- Analyze and interpret electrochemical data
- Write and present a report on the results
- Collaborate and communicate with the research team and external partners, among others, about post-tests microstructural analyses

Your background:

- materials science, chemistry, mech. engineering or similar
- Knowledge of electrochemistry principles and methods
- Knowledge of solid oxide fuel cells and electrolyzers would be a plus

This position can be accommodated for a semester project as well as for a master thesis. The working language is English. For further information, please contact Jan Van herle and Cédric Frantz

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