

Post-doctoral researcher

Development of electrodes for enzymatic electrolyzers

Context and goal

In the framework of a project led by the H2WIN company, the Department of Chemical Engineering recruits a post-doctoral researcher with a strong background in (electro)chemistry and/or materials and interface science.

The general aim of the project is to **develop and validate a new technology of electrolyzer based on enzymatic catalysis, in order to improve electrolysis yield and decrease its costs.** In that ambit, the H2WIN company has developed a process for enzyme production. After thorough characterization and measurement of their catalytic activity, these specific enzymes need to be properly incorporated within the structure of a Membrane-Electrodes Assembly (using PEM-type membranes as electrolyte) so as to be used in a final electrolysis cell. The final goal is to validate the behavior of the enzymes at both anode and cathode within a complete electroenzymatical cell in order to develop a full electrolysis device. If possible, and in a further step, the materials and methods will be adapted to a PEM fuel cell system for power generation, using appropriate enzymes.

Role of the research engineer

The main role of the hired researcher will be to manufacture and characterize the electrodes and the Membrane-Electrode Assemblies from its constituents. The first step will be to select the appropriate materials (besides the enzymes) to build the electrodes, starting from ink formulation using components and conditions compatible with the use of the specific enzymes produced by H2WIN. Fundamental characterization of enzymes/support material interfaces and catalytic activity in simplified environment will be performed in collaboration with another laboratory in Belgium. The second step will be to assemble the electrodes together with the chosen membrane and then to compare the enzymes' behavior under that configuration with that obtained at fundamental level. Finally, the researcher will contribute to the design of the final device including the developed MEAs.

Information

- *General:* The researcher will be hired by ULiège (Belgium) in the framework of the collaboration with the H2WIN company. The research will take place in Liège, at the Department of Chemical Engineering (Sart-Tilman campus).
- *Profile:* PhD in Engineering or Sciences, with a focus on electrochemistry, enzymatic catalysis or materials/interface science.
- *Language:* fluent English (mandatory), a good level in French is an asset.
- *Duration:* 18 months
- *Start:* July 2024
- *Application:* please send a detailed CV and a motivation letter highlighting your skills and interests related to this specific project to Nathalie.Job@uliege.be
- *Application deadline:* March 31st 2024
- *Supervisor:* Prof. Nathalie Job - Department of Chemical Engineering