

Characterisation of flooding phenomena in operation on fuel cells using segmented cell hardware

Topic suitable for Master's Thesis

In the Fuel Cell & Hydrogen research group at CEET, you can become part of a team of experienced researchers, PhD students and motivated Master students with expertise in materials preparation, electrochemistry and cell characterisation. The institute has a fully equipped electrochemical laboratory with the necessary infrastructure for the planned experimental work.

Polymer electrolyte fuel cells (PEFC) are a renewable source of energy that are gaining public interest. The performance of PEFCs is hinged on correct operating procedures, although harmful conditions can still occur. Flooding is the phenomena of liquid water accumulation in the fuel cell, to a degree where gas transport is hindered. To better understand flooding phenomena, which are a usually localized, a segmented fuel cells will be used to conduct measurements. The goal of this work will be **measuring flooding** in the laboratory and subsequent **data evaluation**.

Within this work, an improved humidification system for single cell PEFCs will be developed and tested. **Working packages are:**

- Literature research on flooding and electrochemical reactions.
- Operation and evaluate of data using a segmented fuel cell.
- In situ characterisation of flooding phenomena.

