

In-situ accelerated stress testing of durable polymer electrolyte fuel cell catalyst

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 efficient energy converters to generate electricity from hydrogen and therefore a key component in seasonal storage of wind and solar energy. High material costs and insufficient durability still hinder large scale deployment. This challenge can be solved by integrating a resource-efficient and corrosion-resistant electrocatalysts for the PEFC, that have to be tested under application oriented conditions.

Within this thesis you will study the corrosion of the electrodes by accelerated stress testing. **Working packages are:**

- Literature review on application oriented accelerated stress test designs
- Performing accelerated stress testing with various in-house produced membrane electrode assemblies and studying of carbon corrosion behaviour.
- Analysis of the electrode degradation products in the exhaust gas and condensed water vapour.

