

Industrial manufacturing method of durable membrane electrode assemblies for polymer electrolyte fuel cells

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. Lack of easily scalable production methods for the membrane electrode assembly (MEA) are a major bottleneck in the deployment of the technology.

Within this thesis you will develop a scalable manufacturing method for the MEA using the slot die coating method and our corrosion resistant catalyst material.

Working packages are:

- Literature review on MEA production with slot die coating
- Optimisation of coating process with the slot die coater and production of 7 layer MEA.
- Characterisation of the inks using a Rheometer and the produced layers using high resolution light microscopy, SEM-EDX and single cell performance and durability testing of the material.

