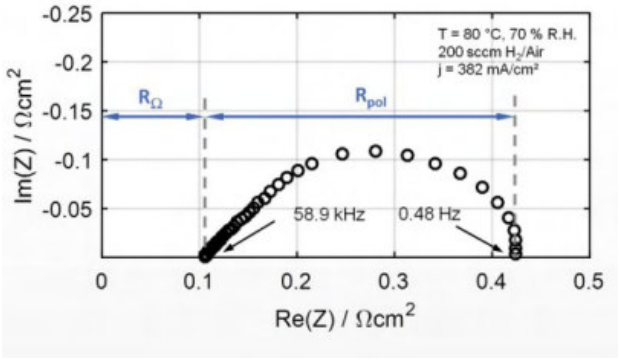
Investigations into the degradation of PEM fuel cells for construction machinery and mining vehicles



Short Description

The very harsh operating environment of construction machinery and mining vehicles poses particular challenges for PEM fuel cells. The service life of the fuel cell is especially affected by high levels of contaminant gases and particles in the cathode air, vibrations, and thermally demanding boundary conditions.

As part of this bachelor thesis, typical loads for construction machinery and mining vehicles are to be simulated on a stack test bench using an accelerated stress test and analyzed with regard to degradation using EIS measurements (electrochemical impedance spectroscopy). The aim is to draw conclusions about the potential service life of PEM fuel cells in this environment.

Content / Time table:

- Getting started with the project, its objectives, and the tasks of the bachelor thesis (1 week)
- Preparation of a measurement plan for the defined tasks and assembly of the short stack on the stack test bench and commissioning (2 weeks)
- Test bench measurements according to the developed measurement program (1 months)
- Evaluation and analysis of the measurement results (2 weeks)
- Written documentation and presentation of the results (3 weeks)

Start: as of now

Duration: approx. 3 months

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