Development of a Low-Temperature Direct Ammonia Liquid Fuel Cell – Laboratory Study

Description

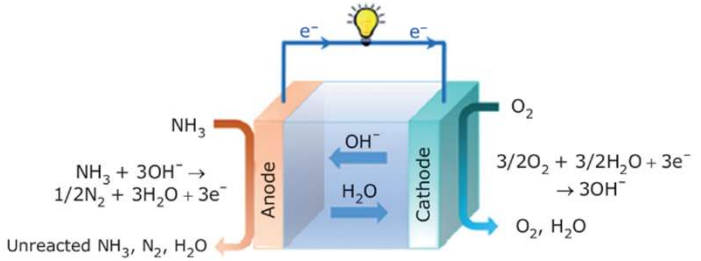
Ammonia is one of the most promising energy carriers to shape a future based on renewable energy sources, due to its high energy/hydrogen density, well established logistics and potential for economically viable green production.

It can serve as an energy vector either through thermocatalytic cracking for hydrogen release or via direct conversion to power, potentially enhancing overall system efficiency and simplifying the supply chain.

Direct ammonia fuel cells (DAFCs) represent a compelling route for the latter, enabling the anodic oxidation of ammonia without the intermediate step of hydrogen production, thereby reducing complexity and energy losses.

The goal of this thesis is to set up and test a novel low-temperature direct ammonia liquid fuel cell (single cell with 5 cm² active area), and to determine its characteristics and operating parameters.

Testzellensystem qCf FC25/100: https://balticfuelcells.de/htmdocs/de/testgeraete_qcf-fc25.shtml



DAFC schematic: Cai, Andrew; Rozario, Zoe (2022): Direct Ammonia Fuel Cells. In Johnson Matthey Technology Review 66 (4), pp. 479–489. DOI: 10.1595/205651322X16584143272416.

Work Packages

- Setup of fuel cell test bench
- Laboratory testing of single cell
- Analysis of test data
- Writing of Thesis Report

Your Profile:

- Currently enrolled in a Master's program in Chemistry, Chemical & Process Engineering, Physics, or a related discipline
- Hands-on experience with laboratory experimentation and analytical techniques
- Proficient in data analysis tools such as MATLAB, Python or similar

- **Start**: from November
- **Duration**: approx. 6 months
- **Paid Master Thesis**
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