

PhD Student (f/m/d)

with background in Engineering, Physics, Material Science or similar

Development of fluorine-free water electrolyzers

Context

Proton exchange membrane water electrolysis is a central technology for the production of green hydrogen. The proton exchange membrane is usually based on perfluorosulfonic acids, as these have a high level of stability. However, membrane materials based on hydrocarbons have the potential to significantly outperform the standard perfluorosulfonic acid materials due to a significantly lower gas permeability. In addition, the synthesis of hydrocarbon membranes does not involve fluorine chemistry, so that the production of this type of membrane is potentially much cheaper and more environmentally friendly than the production of perfluorosulfonic acids. To take advantage of the positive characteristic of hydrocarbon materials the planned project targets to increase the life-time of hydrocarbon based water electrolyzers by simultaneously maintaining high performance.



Your task

You will be working on the fabrication of fluorine-free membranes and membrane-electrode-assemblies with the aim to improve the performance and life-time of fluorine-free water electrolyzers. For this purpose, you will fabricate reinforcement materials by electrospinning and integrate them into the membrane. You will characterize the membranes ex-situ e.g. by stress-strain-measurements and in-situ by electrochemical characterisation of the fabricated membrane-electrode-assemblies. For a thorough analysis of the materials you will employ further methods (e.g. SEM, EDX).

Your profile

- Excellent communication skills and team spirit are absolutely necessary
- You are interested in the development of novel materials for a sustainable society
- You work target-oriented and structured
- You enjoy working with measurement methods and are interested in the physical relationships

The position

- We offer excellent working conditions in the interdisciplinary “electrochemical energy systems” EES group with a nice atmosphere
- Cutting edge equipment for fuel cells and material characterization
- Typical duration of a PhD is planned for three years (80% TV-L 13)
- The working language is English or German
- Earliest possible start: April 2021
- Family friendly, flexible working hours

Please send your application via mail to

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