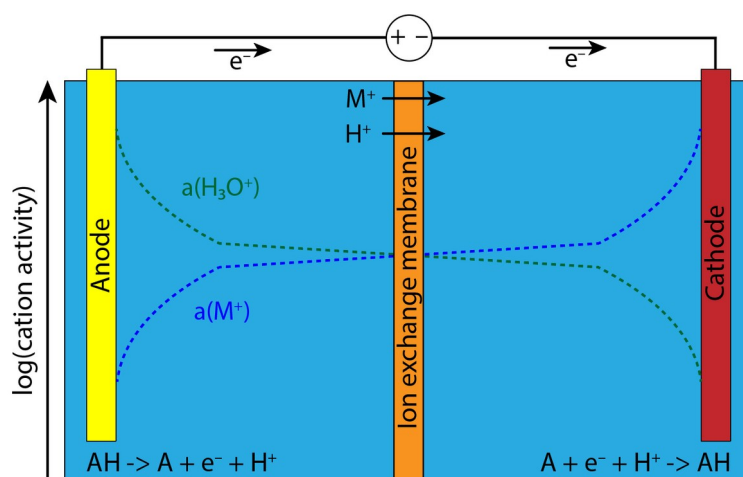


Master Thesis in Ion Migration Studies

The thesis deals with method development to measure ion migration of non-ideal electrolytes in electrochemical cells by using the hydrogen/proton redox potential. We want to resolve the ion gradient of electrochemical devices during operation. In the long term, we will determine ion transport across non-aqueous media such as ion-selective polymer membranes and solid-state membranes.

This research is relevant to all electrochemical devices where ion migration phenomena across the system is of high importance, such as batteries, fuel cells and electrolyzers.

The electrochemical cell we have constructed allows us to isolate the contributions of diffusion and migration on the ion gradient, independent of convection, and has been experimentally optimized by a previous research student. Your task will be to improve the last aspects of the setup to achieve high-quality measurements. After measurement quality has been successfully assured, you will determine the ion transport under various conditions, such as electrolyte activity, pH, etc. Depending on your progress, implementing ion-selective polymer membranes and measuring the ion migration through them may be feasible.



What do you bring?

- Interest in electrochemistry and ion transport
- Motivation to learn new things
- Ability to think critically about data

What do we offer?

- Opportunity to work on fundamental problems in electrochemistry
- Close supervision
- Automated data analysis using Python (optional)



Are you interested? Please, contact florian.musialek@tum.de for further information.