



Bachelor/Master Thesis

Electrochemical Analysis of an Electrosynthesis Process

Research Area

- ☐ Batteries
- ☐ Fuels Cells and Electrolysis
- ☒ Electrocatalysis / Power-to-X

Alignment

- ☒ Experimental
- ☒ Electrochemical Characterization
- ☐ Material Analysis
- ☐ Modelling
- ☐ Simulation
- ☒ Literature Research

Course of study

- ☒ Electrical Engineering
- ☒ Mechanical Engineering
- ☒ Chemical Engineering
- ☒ Physics
- ☐ Mathematics
- ☐ Industrial Engineering

Language

- ☒ English
- ☐ German

Starting date

As soon as possible

Contact person

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Motivation

Technical organic electrosynthesis holds essential significance for sustainable chemistry and addressing global challenges. Electrosynthesis chemicals has so far been a niche technology. Still, it is becoming a key technology for the chemical industry due to the advancing energy and resource transition, the need for defossilization and expanded use of electrical energy necessitated by climate change. However, there is only slow progress. It lacks engineering know-how for the identification of optimal process conditions.

In this Bachelor or Master thesis, you will get an opportunity to participate in research into this key technology and to become familiar with various research methods.

Your tasks:

Performing electrochemical measurements and analysis:

- Polarization curves at different operating conditions
- Dynamic analysis of reactions at electrode surface with cyclic voltammetry
- Analysis of the electrochemical processes by electrochemical impedance spectroscopy

Only in case for a master thesis:

- Setup of a microkinetic model and its parameterization and validation with experimental data

How to Apply:

Enjoy an exciting topic in the field of sustainable and green energy technologies and work together with a motivated and interdisciplinary team in a friendly working atmosphere. We offer excellent support throughout the duration of your thesis. If we raised your interest, please feel free to contact us. We kindly ask you to send your CV and transcript to Sonam Tamang (sonam.tamang@kit.edu). If you have further questions, do not hesitate to contact us or to visit our institute.

