

Master Thesis

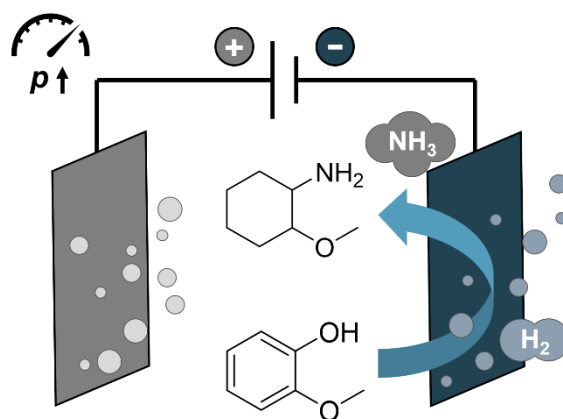
A new pressure electrolysis setup for electrochemical hydroamination of Kraft lignin-based model molecules

Lignin is the second most abundant biopolymer, containing the largest amount of aromatics in nature. Due to its complex and unique structure, it has been in the focus of research to replace crude oil-based feedstocks for the production of drop-in- and fine chemicals. However, thermochemical lignin conversion is intrinsically energetically intensive, and requires rough reaction conditions. Electrochemical conversion is a promising alternative pathway for lignin valorization.

This master thesis is embedded in a research project supported by the Federal Ministry of Food and Agriculture and focuses on the electrochemical valorization of lignin, which can play an important role in the Power-to-X technologies as an alternative carbon source. A novel, custom electrochemical setup for pressure electrosynthesis shall be designed and verified using known electrochemical reactions, such as HER (alkaline water electrolysis). Using carbon supported and spray-coated noble metal catalysts, produced in our lab, the electrochemical conversion of a lignin-based model molecule under pressure will be investigated.

Additionally, the experimental setup can be controlled and automated using LABVIEW/ Python, allowing for highly efficient experimental procedure.

Topics: electrochemistry, alkaline water electrolysis, HER, electrosynthesis, process- and reactor design, electrode manufacturing, LABVIEW, Python



Qualifications:

- Experience and conscientious, clean working in a technical-chemical laboratory
- Ability to work independently as well as in a group environment
- Personal initiative and creativity in new fields of research; open to learning new things
- Preferably proficient in fundamentals of electrochemistry (three-electrode-setup, methods, etc.)
- Critical thinking and interpretation, as well as presentation of research results



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From now



Interested?

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