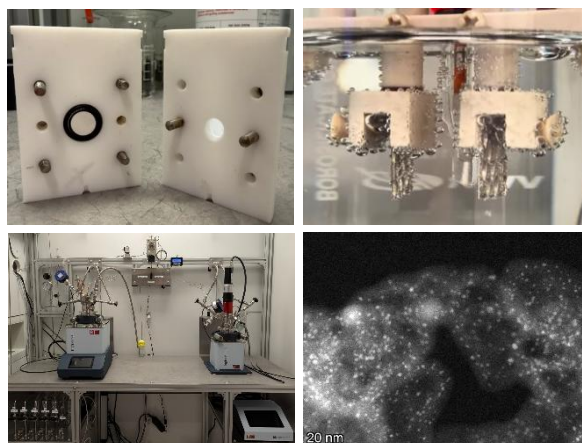


Master Thesis

Electrocatalytic and thermocatalytic hydroamination of lignin-derived compounds in aqueous solution using carbon-based noble metal catalysts

Lignin is the most abundant natural source of aromatic compounds. In contrast to the conventional, fossil fuel-based aromatic feedstock, a biorefinery based on lignin valorization offers a promising sustainable pathway for highly functionalized key- and drop-in chemicals. One especially desired group of intermediates are primary di- and polyamines, (e.g., for biobased polymer production), and they can be synthesized from biomass-derived molecules through reductive amination (hydroamination).



This master thesis will investigate the electrocatalytic hydroamination of lignin-derived compounds in aqueous solution. Carbon-based noble metal catalysts are synthesized using state-of-the-art procedures, e.g., Incipient Wetness Impregnation (IWI), and characterized structurally and physiochemically (HAADF-STEM, Chemisorption, Physisorption, etc.). The self-made catalysts will then be used to produce electrodes for the electrocatalytic investigations. You will learn to independently operate a thermocatalytic/ electrocatalytic batch pressure reactor and analyze your product mixtures using high-performance liquid chromatography (HPLC).

Finally, the novel electrocatalytic pathway should be compared to the established thermocatalytic pathway, which has been investigated previously in our group.

Topics: electrocatalysis, thermocatalysis, biomass valorization, carbon catalysis, pressure autoclave reactors, HPLC

Qualifications:

- Experience in a technical-chemical laboratory
- Preferably electrochemical background knowledge
- 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
- Critical thinking and interpretation, as well as presentation of research results



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Interested?

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