

Hydrogen Spillover on Reducible Metal Oxides & Hydrodeoxygenation of Lignin Model Compounds

Summary: Millions of tons of lignin (byproduct from trees) are going to waste every year, although it is possible to extract the valuable aromatic compounds from it. One use case is the production of renewable jet fuels.

The catalysts and mechanism behind this refining step are still not fully understood. The research is about uncovering the mechanisms behind this reaction and on linking them to the structural properties of the catalyst. This hopefully allows for better rational design of future catalysts.

Topics:

-Testing Hydrodeoxygenation using Nb_2O_5

Summary: You will be synthesizing and characterizing various Nb_2O_5 samples and load them with noble metals like Pd/Pt/Ru etc. With autoclave reactions, their reactivity will be determined. Various spectroscopy methods like XRD, XAS, SEM, NMR, *in-situ* FT-IR etc. will be used. You will have a high degree of independence and can choose the direction of the research.

Degree?: For Master students

Start?: Immediately

Language: German or English

-Catalytic reactions on a continuous flow reactor

Summary: You will perform catalytic reactions on a large custom built reactor. Depending of the start of the work, you may also help in the construction of the reactor. There, the reactivity of various MoO_3 and Nb_2O_5 catalysts will be tested. The work may also involve the synthesis and characterization of the catalysts. Various spectroscopy methods like XRD, XAS, SEM, NMR, *in-situ* FT-IR etc. will be used.

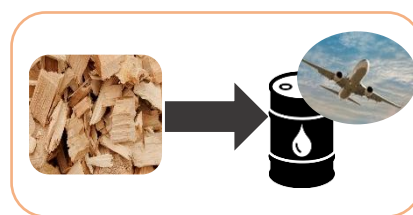
Degree?: For Bachelor & Master students

Start?: May-June 2025, depending on reactor's state. Contact me for more information.

Language: German or English

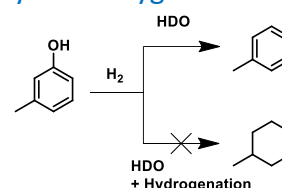
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Pure magic?



We don't think so!

Hydrodeoxygenation



Picture of a similar reactor