Semester- / Masterarbeit

(Theoretical)

Biofuels/ e-Fuels production: Kinetic modelling of Fischer-Tropsch synthesis in Aspen Plus

Description:

As part of the "H2-Reallabor Burghausen" project, concepts for the transformation of the ChemDelta Bavaria towards climate neutrality are being developed. One part of the project involves the production of sustainable aviation fuels, with different routes being simulated and compared with each other.

The aim of this study is to model iron-based Fischer-Tropsch (FT) synthesis within a Power-and-Biomass-to-Liquid (PBtL) process chain for the production of sustainable kerosene based on straw and electrolysis hydrogen. Cobalt-based FT synthesis is already implemented in a detailed python modeled coupled with Aspen Plus but an iron-based kinetic model is not yet developed. Consequently, a model of iron-based FT synthesis is to be developed in python or Aspen Plus and the process performance is to be evaluated.

Requirements:

- Interest in technical solutions to achieve climate neutrality

- Good knowledge of process engineering

- Experience in Aspen Plus and/or Python helpful, but not required

Work packages:

- Familiarization with the topic and existing models

- Literature review on iron catalyzed FT reaction kinetics

- Implementation of the kinetic model in Aspen Plus and analysis via parameter studies

- *Master's Thesis: Techno-economic assessment of Fe-FT within the PBtL process chain*

Start from: immediately

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