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Catalytic Conversion of Lignocellulosic Biomass: Potential of Porous Materials

Michael Stöcker

The current status of the bio-refinery concept is discussed, with focus on the catalytic conversion of lignocellulosic biomass using porous materials. In a time where the focus is on global warming, CO₂ emission, increased competition, secure energy supply, less consumption of fossil based fuels etc., the use of biomass as renewable energy resource becomes quite essential. Multiple biomass resources are discussed with respect to a variety of fuels, valuable chemicals and energy products and an integrated concept for sustainable technologies within the lignocellulosic bio-refinery concept is presented.

The first generation of bio-fuels are addressed whereas the focus of this lecture will be on the second generation of bio-fuels, with synfuels and phenols as the main target products. The challenges regarding the processing of lignocellulosic materials (wooden based biomass) will be highlighted along with the application of porous materials as catalysts for the biomass-to-liquids (BtL) track within the bio-refinery concept. Challenges related to the catalytic conversion of wooden based biomass, like mechanistic understanding of the complex reactions taking place, the catalyst and process developments as well as the product pattern to be envisaged will be discussed.

Finally, co-processing of bio oils with petroleum fractions in FCC units will be addressed.

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