

Producing drop-in hydrocarbon biofuels from lignocellulosic biomass materials

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Biofuels from biomass materials in the form of cellulosic bioethanol is now slowly being implemented to substitute the use of corn as a raw material or for installment of new bioethanol production capacity. While this implementation will ensure that sufficient capacity is present for meeting the need for a gasoline biofuels additive this production will have no influence on the needs by for instance the aviation, shipping and defense sector demanding hydrocarbon biofuels which are similar to the conventional jetfuel and diesel and therefore can be dropped in directly in the current fuel infrastructure. Drop-in hydrocarbon biofuels can be produced using both thermochemical and biochemical conversion schemes.

In the presentation we will focus on the biochemical conversion of biomass material which first of all demands a suitable pretreatment technology for opening the materials and make it suitable for further biochemical conversion with and without enzymatic hydrolysis. The end-product of the fermentation will often be a platform molecule which needs further catalytic upgrading for production of the desired final fuel. We will present data from work done in our laboratory on production of isoprene from cellulosic sugars using *Bacillus* strains as well as direct conversion of pretreated materials using filamentous fungi such as *Gliocladium* species for production of a diesel blend. Finally we will discuss a new concept, BioChemCat, for production of drop-in hydrocarbon biofuels directly from pretreated biomass materials using a stable consortium of thermophilic bacteria. This concept is currently under testing in pilot scale in our laboratory.