

Pretreatment as the starting point for producing aviation biofuels with focus on the Advanced Wet Explosion (AWEx) process

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Pretreatment is needed for using a biochemical route for production of aviation biofuels. Pretreatment will open the recalcitrant structure of the biomass and make it accessible for enzymatic hydrolysis into C5 and C6 sugars. These sugars can then be fermented to intermediate products such as alcohols and acids which can be further upgraded to aviation biofuels through catalysis. In the NARA project we have used the AWEx pretreatment technology to treat different samples of Douglas fir and for producing samples for fermentation testing. During the AWEx process hemicellulose is hydrolyzed together with small fractions of the lignin and the whole slurry is subjected to enzymes leading to a hydrolysate high in sugars. The process uses no chemicals and the hydrolysate has been found to be easy digestible when subjected to different microbial strains including mutant of *Saccharomyces cerevisiae*. In the presentation we will show results and differences when pretreating Douglas fir and Loblolly pine.

BioChemCat is an alternative pathway to aviation fuel where the pretreated biomass material is directly converted into carboxylic acids by a mixed anaerobic culture without the need for enzymes. The acids can then be further upgraded to aviation biofuels. In the presentation we will discuss this process and its perspective.