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**Production of Furfural and Levulinic Acid in a Two-Stage Hydrothermal Conversion
Process as Precursor for GVL**

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Population growth and climate change will lead to a shortage of agricultural land per capita. Therefore, agricultural products must be used as effectively as possible in the future. Against this backdrop, the development of bio-based building blocks or chemicals from agricultural residues plays an important role. As part of an ongoing research project, a two-stage hydrothermal process for converting agricultural residues into sugar-based platform chemicals such as furfural, levulinic acid and γ -valerolactone (GVL) is being developed. While in the first stage, carbohydrates are hydrothermally fractionated using phosphoric acid as catalyst, in the second stage hydrothermal conversion of hemicellulose fraction into furfural is carried out by using a vapor-releasing reaction system. The cellulose fraction is then converted to levulinic acid by the use of Brønsted/Lewis acid combinations. The aim of the project is to produce GVL from those process liquors enriched with furfural and levulinic acid by in-situ hydrogenation with the aid of heterogeneous catalysts. As the hydrogen donor, formic acid, a by-product of the hydrothermal treatment and hence also present in the process liquor, will be used. The heterogeneous catalysts are developed by our project partner and show promising results.

Preliminary results of the hydrothermal pretreatment show a well fractionation of the used biomass. Results of the furfural and levulinic acid production should be presented at the conference.

An oral presentation is preferred, otherwise the contribution is also available for a poster presentation.