GreenSolRes

Deliverable 1.6

Report on Long Term Performance of the RWTH Demo Plant

Demonstration of solvent and resin production from lignocellulosic biomass via the platform chemical levulinic acid

The project leading to this application has received funding from the Bio Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 720695

BBI JU

Bio-based Industries Consortium

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About GreenSolRes

The need to establish economic and sustainable large-scale operations for the conversion of renewable resources to chemical building blocks is becoming increasingly urgent in the context of climate change and depleting fossil fuel reservoirs. Pathways for manufacturing of bio-based fuels and chemicals have been developed but often rely on sugar and starch crops for feedstock. The European Demonstration project - GreenSolRes aims at a sustainable and competitive industrial production of the platform chemical levulinic acid (LVA) from non-food lignocellulosic biomass. Further, the conversion of LVA and LVA esters into industry relevant building blocks γ-valerolactone (GVL), 1-methyl-1,4-butanediol (MeBDO) and 2-methyltetrahydrofuran (2-MTHF) will take place by new catalytic methods developed during the course of this project. Finally, these chemicals will be upgraded to solvents and resin monomers to produce high added value adhesives and consumer products.

Project Coordinator

Project Office

Consortium

About this document

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Publishable Summary

The reactor unit at the NGP^2 Biorefinery at RWTH was successfully retrofitted and commissioned to enable LVA production from lignocellulosic feedstocks on a demo scale. The design of the demo plant is highly flexible and can therefore be operated in different modes. Based on laboratory scale experiments, 21 batch campaigns were conducted in the demo plant and the conversion rates and product concentrations could be verified.
After a technical retrofit, continuous LVA production in integrated multi-reactor mode was successfully carried out.
Several technical complications, mainly due to corrosion, prevented further continuous production campaigns. The corrosion-related problems led to a systematic investigation of suitable materials, and important insights were gained. New corrosion-resistant parts are currently being ordered and further durability tests are being carried out. We expect that with the help of these equipment optimizations and the increased durability of the demo plant, integrated multi-reactor operation with a higher degree of robustness will be possible.