GreenSolRes

Deliverable 2.11

Report on process stability with impurities in the feed of levulinic acid

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

Horizon 2020 European Union Funding for Research & Innovation

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 most of them rely on sugar and starch crops for feedstock. 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 for the production of high added value adhesives and consumer products. This project was started in September 2016 and has a duration of five years.

Project Coordinator

RWTH AACHEN UNIVERSITY

Project Office

SYNCOM

Consortium

RWTH AACHEN UNIVERSITY

Henkel

Catalysis LIKAT Leibniz-Institut für Katalyse e.V.

SYNCOM

Hybrid Catalysis Custom Synthesis & Screening

vito

BASF We create chemistry

Lenzing Innovative by nature

About this document

Deliverable №:	D2.11	
Title	Report on process stability with impurities in the feed of levulinic acid	
Workpackage:	2	
Responsible beneficiary:	RWTH Aachen	
Author:	Pascal Albrecht, Celine Jung, Jürgen Klankermayer	
Reviewers:	BASF	
Version:	1.0	
Due date of deliverable:	31.01.2021	
Version date:	06.01.2021	
Contact:	Jürgen Klankermayer	
Nature:	Report/Demonstration	
Review status	WP leader accepted	22/12/2020
	Reviewer accepted	12/01/2021
	SC accepted	20/01/2021
	Coordinator submitted	21/01/2021

Dissemination Level		
PU	Public	
CO	Confidential, only for members of the consortium (including the Commission Services)	X

Publishable Summary

Tailored ruthenium / triphos complexes have recently been established as effective and highly active molecular catalysts for the hydrogenation of levulinic acid (LVA), which enable high yields of γ-valerolactone (GVL) and 1-methyl-1,4-butanediol (MeBDO). In the next development step, the entire value chain from biomass to the planned consumer goods should be determined. This requires the adaptation of the developed catalyst system to the LVA substrate obtained from biomass and the respective impurities from the production process. As a result, catalytic reactions have been performed in the presence of contaminants associated with the biomass-based LVA process. This study enabled a detailed analysis of the influence of selected process impurities on the catalyst performance in the hydrogenation of LVA to GVL and MeBDO and the subsequent adaptation of the catalyst system.