GreenSolRes

Deliverable 1.9

Report on site acceptance test, design and construction of levulinic acid 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

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 №:	1.9	
Title	Report on site acceptance test, design and construction of levulinic acid demo plant	
Workpackage:	1	
Responsible beneficiary:	RWTH	
Author:	Kaan Karacasulu, Jan Kampwerth, Jörn Viell, Andreas Jupke	
Reviewers:	Robert Bischof (LENZING)	
Version:	1.0	
Due date of deliverable:	31.12.2019	
Version date:	12.12.2019	
Contact:	RWTH	
Nature:	Report	
Review status	WP leader accepted	26.11.2019
	Reviewer accepted	12.12.2019
	SC accepted	19/12/2019
	Coordinator submitted	20/12/2019

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

Publishable Summary

Tailored process designs for a one- and two-step hydrolysis of lignocellulosic biomass to levulinic acid were investigated and modifications of the established equipment is reported. The focus of the engineering was to enable continuous production of kilograms of levulinic acid from wood, while maintaining process flexibility to mitigate potential risks arising from the scale of production. The progress of the retrofit of RWTH biorefinery includes a newly acquired automated solid biomass feeding and a two reactor setup. All modifications and step sequences necessary for the process variants were implemented and tested as part of a site acceptance test. This also included the testing of controls, tightness at different pressure levels and water runs performed at RWTH-biorefinery. Based on these results, the setup is fully functional and ready for levulinic acid production.