Press release

FRACTION project develops novel lignocellulose fractionation process for high purity lignin, hemicellulose and cellulose valorisation into added value products

Helsinki (Finland), 22 June, 2021. – FRACTION develops a novel integrated lignocellulose fractionation approach to maximize the purity and quality of lignin and hemicellulose side streams in 2nd generation biorefineries to achieve its use in the formulation of added value products and keep the high quality of cellulose. The project shows a strong industrial involvement, which ensures successful post-project exploitation and engages with relevant stakeholders. The results will be used to achieve new flexible pretreatment technology which can be optimized for several types of biomasses and be adapted towards certain fractions.

In the light of the latest EU policies, such as the EU Bioeconomy Strategy, the number of 2nd generation lignocellulose biorefineries will continue to grow, outpacing in some years the 1st generation ones. Therefore, the Bio-Based Industries Joint Undertaking (BBI JU) is funding research and demonstration projects for the development and optimization of the lignocellulose-based bioeconomy. To overcome the challenges in 2nd generation biorefineries, the pretreatment methods must be created more efficiently to meet optimal industrial production requirements. This will be achieved thanks to a novel organosolv fractionation process using a mixture of ɣ-valerolactone (GVL) and water, followed by downstream processing and purification technologies aimed to produce high quality end products making the most out of all the lignocellulose components. The uniqueness of this project is the outstanding performance of GVL-based fractionation, including solvent recovery and reutilization. The project will focus on delivering sustainable solutions through each research part in the project. The raw material resources to be valorized are agro residues (bagasse), used corrugated cardboard, and both hardwood (white birch) and softwood (pine).

“The novelty of this research area is that the GVL-organosolv process fractionates and separates in a very efficient manner the three valuable components of the lignocellulose: cellulose, lignin and hemicellulose. Besides rendering high quality cellulose, the project also pursues the transformation of the high purity hemicellulose and lignin streams into valuable platform chemicals, monomers and resin composites. This valorisation can only be achieved because of the superior performance of the GVL-

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organosolv technology in providing high quality streams" says project coordinator Dr. Manuel López Granados from Consejo Superior De Investigaciones Cientificas CSIC.

"FRACTION is a project funded via BBI JU's last Call for proposals" says Dieter Brigitta, Project Officer at BBI JU. "Although bio-based industries have an ever-increasing potential in Europe, FRACTION shows that a lot of biorefinery processing challenges still need to be overcome. FRACTION's focus on GVL-based fractionation technologies, including solvent recovery and reutilization, will contribute to reaching this sustainable potential".

The aim of this three-year long project is to provide a competitive lignocellulosic biorefinery concept, flexible to adapt and optimize the production process to a wide range of feedstocks. FRACTION covers the whole value chains for each end-of-life option with industrial involvement and engages relevant stakeholders to ensure strong post-project utilization and commercialization. In addition, the new technology and developed business model will provide sustainable supply chains, an improved environmental performance and reductions in separation costs.

About FRACTION

FRACTION is an initiative funded by the BBI JU under the European Union's Horizon 2020 research and innovation program with a total volume of €6,2 million. The project is coordinated by the Spanish Institute of Catalysis and Petrochemistry (CSIC) and the interdisciplinary consortium has 12 partners from eight different countries. The partners' profiles include two industrial partners: Stora Enso AB, Kingspan Insulation; five research and technology organisations: Agencia Estatal Consejo Superior De Investigaciones Cientificas, Fundacion Gaiker, Universidad Rey Juan Carlos, VTT Technical Research Centre of Finland five small and medium size enterprises: CLIC Innovation Oy, Process Design Center BV, Ava Biochem, Fundacion Para El Desarrollo y la Innovacion Tecnologica and IFAU APS.

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