

Integrated Process and Product Design for Sustainable Biorefineries

Bio-based economy in Europe involves 22 million people and turns over roughly 2.4 billion €. The full realization of its huge potential, however, requires expert knowledge and synergy of different competencies. In particular, key questions and bottle-necks awaiting clear answers are:

- How to design and integrate flexible and product-tailored processes for the available biomass feedstocks?
- How to integrate chemical and biochemical routes into sustainable biorefining of the given feedstocks?
- How to relate the biomass extraction and separation processes with the properties of the desired products and the sustainable utilization of the depleted matrices?
- How the production processes can be integrated into closed loop production?

The overall goal of IProPBio is to exchange complementary theoretical and experimental knowledge of research Staff while looking for innovative answers to such important questions. Alternative feedstock and high-value products characterization; thermodynamic data analysis and properties prediction; alternative technological flowsheets for economic and eco-compatible conversion of waste biomass into high value products; mass and energy integration studies to reduce wastes and enhance the profitability; life cycle assessment to determine the net contribution of the best designs to environmental pollution, are the main issues approached in the project.

IProPBio will significantly impact:

- the competitiveness of EU bioeconomy
- participants' potential and new carrier perspectives
- exchange and transfer of high-quality multidisciplinary knowledge, advanced expertise, research and innovation between academic and non-academic participants in EU member states and third countries through the dissemination of the results achieved to target groups and the general public.

Project implementation

The project paradigm includes four research-related work packages (WPs) and 2 support packages dedicated to the coordination, knowledge sharing and communication strategy.

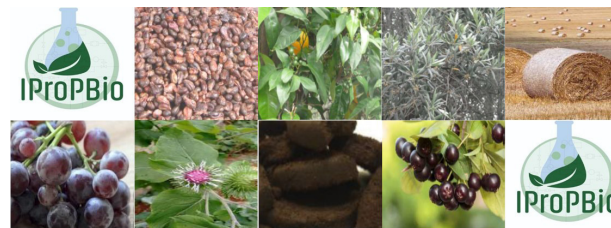
WP1: "Feed and product characterization. Thermodynamic data and property estimation" has as main objectives the identification of different biomasses available in the countries of the project partners, the study of their availability and the characterization of the valuable components obtainable. Moreover, this work package includes the thermodynamic characterization and the components property estimation essential to the developing of reliable process models.

WP2: "Process synthesis" includes the definition of the process alternatives for the production of the valuable compounds identified in the previous work package.

WP3: "Process design and optimization" where the different process alternatives are simulated and optimized following a multi-objective approach that includes the economy, the environmental impact and the process controllability.

WP4: "Process integration, intensification and life cycle assessment" aims to develop methods for energy and mass integration, minimization of the water consumption and life cycle assessment.

The success of the project is based on the partners' knowledge complementarity that ranges from theoretical to experimental, and encompassing programming and modelling. Secondments are the main tool used for exchange of advanced knowledge, expertise, technologies and expanding synergies among the labs of the Consortium. Within the time span of IProPBio four Workshops: "Valuable products from residual biomasses: Towards a greener society (ProGreS)", where the achievements of the research related WPs will be presented, are envisaged to take place at different venues.



Project lifetime:
1 January 2018 – 31 December 2021

Project budget: 594,000,000 €

Project site: ipropbio.sdu.dk

Contact: ipropbio@kbm.sdu.dk

Twitter: @IProPBio

Workshop calendar:

• ProGreS: Biomass selection, characterization and valorization"
Sofia, 23-24 September 2019 "

• Lisbon, September 2020

• Salamanca, July 2021

• Odense, December 2021

