

Green chemistry and biorefineries – common future?

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Abstract

Green Chemistry and Biorefinery concepts are two approaches helping to develop new and more sustainable processes.¹ The implementation of both methodologies impels to fossil-independent future with bioeconomy based on natural feedstock like biowaste and industrial by-products. The development of technologies for valorisation of these resources is a key role of society in the creation of sustainable and more environmentally friendly future.

Shortly after the Rio Declaration on Environment and Development, Anastas and Warner presented 12 Principles of Green Chemistry² but more a decade before Trevor Kletz in his Jubilee lecture entitled “What you don’t have, can’t leak”³ draw the frames in which scientific and industrial work should be performed. This basis of green chemistry created a fundament for further development and implementation of Anastas and Warner principles of green chemistry. One of these frames is integration of green chemistry principles in the biorefinery concept. The biorefinery is an industrial facility (or network of facilities) that cover an extensive range of combined technologies aiming to full sustainable transformation of biomass into their building blocks with the concomitant production of biofuels, energy, chemicals and materials, preferably of value added products.⁴

One of the principles of green chemistry is the use of more sustainable solvents. Some examples of them are ionic liquids (ILs) and supercritical fluids (scF).⁵⁻¹⁴

This work will demonstrate the successful examples of lignocellulosic biomass valorisation using green solvents answering the question regarding the feasibility of future biorefineries made in a greener manner.

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