

Keynote Speaker Abstracts

[KEY.01]

Green and resource-efficient innovative technologies for biopolymers production

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Large amounts of wastes generated worldwide poses several environmental problems. On the other hand, some of these wastes are potential resources of high-value chemicals and materials. A more efficient and sustainable use of resources must be envisaged aiming at simultaneously reduction and valorisation of residues. Biopolymers can be used in a wide range of applications. The replacement of the synthetic polymers by biodegradable biopolymers is hindered by the highest market price of the latter. Polyhydroxyalkanoates (PHAs) are biodegradable biopolymers that can be synthesized by several microorganisms and internally accumulated as carbon and energy reserves. The use of agro industrial wastes as feedstocks, as well as novel process operation strategies for PHA production may contribute for the reduction of the polymer final price. Other class of biopolymers are the polysaccharides, which have a wide spectrum of applications due to their functional properties. Nowadays, the market is still dominated by the polysaccharides obtained from plants and algae. On the other hand, extracellular polysaccharides or exopolysaccharides (EPS) can be secreted by microorganism. The microbial EPS processes are usually more productive and less resource intensive than plant and algae-derived polysaccharides. The production of microbial biopolymers by using renewable resources and less energy intensive approaches contribute to lower the process operational costs. In this presentation, sustainable processes for PHA and EPS production at lab and pilot scale will be presented.

[KEY.02]

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BSG Refinery: Recycling protein and amino acids from brewer's spent grains

Protein is an essential part of any diet and therefore, it has extensive use as ingredient in the food and feed industries. With the growing population, the global demand for protein in 2030 is expected to exceed the current production capacities. The global amino acids market is also expected to grow significantly over the next decade, driven by the increased demand for nutraceuticals, animal feed products, and amino acids fortified foods. Finding alternative sources of protein and amino acids is therefore a topic of great interest today to meet the future demand of the population for these components. In this sense, exploiting and utilizing natural sources of protein, particularly crop and cereal by-products and side streams, has been considered of great relevance since they can be potential sources of protein. Brewer's spent grains (BSG), for example, an agro-industrial by-product resulting from the beer manufacturing, is rich in protein, which corresponds to approximately 20% of its composition in a dry weight basis. The BSG Refinery project is focused on the development of sustainable process technologies to convert BSG into valuable products. Different pre-treatment strategies have been evaluated to recover protein and amino acids from BSG. Important results were already obtained, which revealed the influence of process variables on the recovery yield as well as the range of values more suitable to increase the product yield. The necessity of defatting BSG previous the extraction process was also evaluated. Finally, as different protein sources may provide different amino acids composition, the amino acids recovered from BSG were also identified and quantified. Financial support: Novo Nordisk Foundation (Denmark). The authors also thank Carlsberg (Denmark) for the BSG donation.

[KEY.03]

Energy crops for biobased solutions

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The growth of a bioeconomy involves the replacement of fossil by biogenic (*ie.* biomass) resources to provide products processes and services within the framework of a sustainable economic system. Sustainable production

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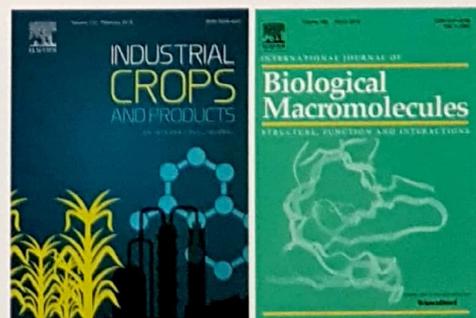
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