Regeneration of DES

Publieke samenvatting / Public summary

Aanleiding

Currently applied technologies for biomass fractionation for producing papermaking pulp were developed more than a century ago, and have been optimized ever since. Some of those processes still require fossil chemicals, have high energy consumption and/or create valueless side streams. The ISPT DES cluster develops an innovative technology that operates at lower temperatures and pressure using environmentally friendly solvents. These solvents, the so-called Deep Eutectic Solvents (DES), are nature-based, renewable, biodegradable, low-volatile and cost-effective.

Doelstelling

The overall objective of the DES cluster is to achieve 90% energy reduction and 80% CO2 emission reduction in papermaking by the application of Deep Eutectic Solvents: • To develop a radically new, sustainable and techno-economically feasible pulping technology for lignocellulose raw materials based on DESs • Via DES: to isolate lignin, hemicellulose and cellulose at low temperature and atmospheric pressure for further processing into materials and chemicals with a high added value.

Korte omschrijving

In the past three and a half years we been very successful in developing DES that selectively isolate lignin from lignocellulose and a process at low temperature and pressure. Of crucial importance for an economical feasible process is the recovery and recycling of the solvent, which includes the selective isolation of the components dissolved in the DES. A technology for lignin recovery was developed in the

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cluster, but it has appeared that also hemicelluloses are dissolved in the DES. The underlying research project is focused on fundamental research on how (in what functionality) hemicellulose is dissolved and the development of technologies to recover these hemicelluloses from DES. Moreover research will be performed on the effect of the regenerated DES in subsequent DES pulping processes.

Resultaat

The project should lead to a proof of principle for the total recovery technology for DES and its dissolved components. A proof of principle for the DES regeneration is required to enter into the next step, namely realizing pilot facilities for the total DES concept.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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