

Greening of Phenolic Resoles (PheRes)

The PheRes project (2015-2017) is a joint undertaking of the University of Oulu and VTT Technical Research Centre of Finland Ltd.

The research focus is on optimization and demonstration of catalytic lignin modification processes. The core technologies are based on selective depolymerization of lignin which is currently regarded as the highest obstacle for its feasible refining. The produced lignin based oligomers are modified by means of chemical and enzyme catalysis to active components to be used in functional resoles. These resoles are tested as bonding agents in abrasive materials and in mineral wools.

The project partners include companies acting in the field of lignocellulose fractionation and lignin production, lignin modifying enzyme production, and lignin end-use. The main financier of PheRes project is Tekes, the Finnish Funding Agency for Innovation. Cooperating companies finance the project with a total share of 10%.



UNIVERSITY of OULU
OULUN YLIOPISTO



Tekes



The refining of lignocellulose is one major development target of bioeconomy. It is the most versatile renewable resource with respect to substitution of fossil chemicals, fuels, monomers of polymers etc. Moreover, regarding its structure and high abundance, lignin in the lignocellulosic biomass is the only realistic renewable source for aromatic chemicals in the future.

The development of competitive processing technologies for the pre-treatment and refining of lignin is essential for bioeconomy development. It influences directly to the feasibility of lignocellulose biorefinery investments. It is highly probable that the use of lignin will also have a crucial role in the planned biorefinery installations in Finland. One suggested use of lignin is the substitution of phenol formaldehyde resoles (PF resoles) that are used in a variety of industrial products. Substitutes are sought to avoid current toxic raw materials, phenol and formaldehyde, and dependency on oil prices.

Contact

Prof. Juha Tanskanen
University of Oulu, Chemical
Process Engineering
juha.tanskanen@oulu.fi

Prof. Kristiina Kruus
VTT, SONE/ Industrial
biotechnology
kristiina.kruus@vtt.fi