Technology Offer: Method for production of biobased phenols

The production of industrially relevant aromatic chemicals from lignin requires efficient methods for defunctionalization, that is, removing extra substituents. A new synthetic methodology developed by the University of Antwerp provides a cheap and scalable way for the production of biobased phenol derivatives. The method can be used by companies active in fine chemicals or speciality chemicals sectors.



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Situation before

Phenols are important chemicals for many applications and chemical intermediates for different products. Phenols are currently petrochemically, produced and suitable methods for their industrial production from biomass are not yet developed. For example, lignin portion of biomass contains aromatic units which may be ideal precursors for phenols. However, treatment of biomass (e.g. wood) produces aromatic derivatives with multiple extra substituents. In order to produce phenols, defunctionalization reactions need to be undertaken to remove extra substituents. State-of-the-art does not provide simple methods for such transformations.

Technology

We have found a surprisingly simple method to perform defunctionalization of various aromatic derivatives, e.g. removing various substituents from the aromatic ring, directly giving phenols. Reactions are performed in water, at high pressure and high temperature. Only cheap and green catalysts are used. No toxic and expensive transition metal catalysts are needed, and no organic solvents are required. O-Demethylation occurs with nearly quantitative yield. Also other substituents present on the aromatic ring can be directly removed. For example ferulic acid gives catechol in about 90% yield.

Partners we search for

By now, we have implemented our methods on lab scale (up to 100 g). We are interested in collaborations with industrial partners to upscale the method for selected molecules to kg scale, as well as to test selected molecules in specific applications and products.

About the researchers

The ORSY research group belongs to the Chemistry Department of the University of Antwerp. Our research is focused on the development of new, sustainable synthetic methodologies in accordance with principles of green chemistry. Prof. Bert Maes is an internationally recognized expert in homogeneous transition, metal catalysis and heterocyclic chemistry.

IP position

Patent application 'Method for the deacylation and/or dealkylation of compounds' published under number WO2019025535.



More information

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