Synthesis of biobased ionic liquids from the choline for lignin derivatization

Souvenir Zafindrajaona, Mahasoa-Salina
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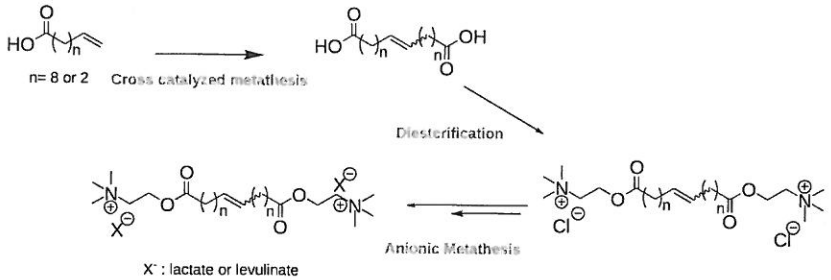
Student: Mahasoa-Salina Souvenir Zafindrajaona, MSc.
Supervisors: Prof. Sandrine Bouquillon, Ing. Magdalena Bendová, Ph.D.
Supervising Expert: Dr. Jean-Pierre Mbakidi

Lignin, the second most abundant biopolymer after cellulose, is a heteropolymer composed of three monomers linked via different bonds such as among other β-O-4 or carbon-carbon.[1] Its complex structure is a hindrance to its valorization. Despite this, the valorization of lignin is an issue for scientists and industries. Thanks to theee major entities of which the lignin is composed and which represent a great interest for the chemical industry, it is therefore a real challenge to find a way to valorize it.[2] Indeed, for a few years, studies on the dissolution and the treatment of lignin have been developed to valorize this biopolymer. Scientists have used different ionic liquids or deep eutectic solvents as solvents. Generally, the cation that has been most studied in order to dissolve lignin is imidazolium modified by methyl, ethyl, allyl, butyl, hexyl or benzyl groups.[3] However, these petroleum-based ionic liquids are very cyto- and eco-toxic,[4,5] so other biobased and less ecotoxic ionic liquids have been used for lignin dissolution.[6] For example, choline ester-based ionic liquids are used to dissolve lignin from Kraft pulp at 100 °C for 1 hour.[7]

In this context we want to develop new biobased bolaform ionic liquids based on choline ester with levulinate or lactate anions as associated anions (Scheme 1).



Scheme 1: Synthetic pathway used for the bolaform biosourced ILs

The presentation will be dedicated to the description of the syntheses and the characterization of the new bolaform ILs. The further work which will be realized in Prague will be also presented and discussed in relation to the lignin depolymerisation purpose.

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