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Pretreatment of wood using ionic liquids

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In the pretreatment of wood it is essential to apply mild conditions for extracting oligomeric cellulose and possibly lignin that can be used for a variety of environmentally friendly products such as polymers. For this, ionic liquids are ideal due to their mixture of polar and non-polar character, which makes them swelling the wood until it bursts to a rather fluffy material. Using small angle neutron scattering in operando studies, the different states of the pretreatment are identified. After impregnation with the liquid, the cellulose is restructured and forms nano-scale voids. At late stages the cellulose is rather amorphous and quite dilutes. This opens possibilities for enzymatic chain scission in a second step of treatment. The findings are complemented by other techniques, which allows for an optimization of the pretreatment process.

Primary authors: FRIELINGHAUS, Henrich (JCNS); MANGIAPIA, Gaetano (German Engineering Materials Science Centre (GEMS) am Heinz Maier-Leibnitz Zentrum (MLZ)); Dr VIELL, Jörn (RWTH Aachen); Dr MARKS, Caroline (RWTH Aachen)

Presenter: FRIELINGHAUS, Henrich (JCNS)

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