

Production of Cellulose Nanocrystals (CNCs) from wood: overview and perspectives

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In the past two decades, Nanocellulose has raised to the front stage of wood products as a novel high value nanomaterial, which can be produced from wood and other lignocellulosics. Industrial interest in the two forms of nanocellulose, cellulose nanofibrils (CNFs) and cellulose nanocrystals (CNCs) has further amplified in the past few years leading to their commercial availability. On the one hand, the hydrolysis of cellulose into CNCs traditionally relies on the action of concentrated acid for the hydrolysis of cellulose amorphous regions and the liberation of the rod-like nanocrystals. On the other hand, CNFs are traditionally produced through mechanical peeling of cellulose microfibrils.

This presentation will provide an overview of the production methods and characteristics of CNCs. In addition, ongoing research efforts within our group on engineering environmentally-friendly routes with ionic liquids for the production of CNCs from pulp, microcrystalline cellulose and more ambitiously directly from wood will be presented. The challenges and perspectives opened by the use of ionic liquids for the direct production of CNCs from wood will be particularly outlined.