



WoodNF

Nanofibres de bois exposé à la vapeur pour des applications d'électrofilage



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Collaborations: UDT (Conception Chili, projet Hubert Curien, Ecosud project 2019-2021)

Summary

Context — There is currently an extraordinary gain of interest for substituting oil based materials by renewable bio-based products. In this context, the wood sector has an important role to play, the forest raw materials and byproducts may be used to produce a diverse set of products. However, to have a significant impact, the forestry sector must offer innovative and cost effective solutions for the production of high-tech products which could meet the needs of specific applications.

Objectives — The objective of this project is to produce nanostructured and porous materials by electrospinning of beech wood gels that can be used for the production of high value-added materials for biotechnological and electrochemical applications.

Approaches — The beech wood gels will be produced according to a process recently developed at LERMAB using the principle of steam explosion. This process allows the production of a gelled fibrillated material with a moderate energy cost. The electrospinning of this material will be studied in the presence or not of a co-solvent and/or a biodegradable polymer.



One of the main originality of this project is to take advantage of the natural and extraction induced complexity and variability of wood fibers, the presence of residual lignin and hemicelluloses being expected to tune the surface fiber properties (compatibility, biocompatibility, surface properties, etc.).

Expected results and impacts — The potential benefits of Wood NF concern two types of applications: the immobilisation of enzymes (for biotechnological applications) and the production of carbon materials (for electrochemical studies). This project stimulates ongoing local, national (interLabex with labex TEC21, Grenoble) and international (UTC, Chile) collaborations.