
Nanotechnology in the service of wood preservation

In order to estimate the potential of nanotechnology for wood protection, researchers in this project are systematically studying how ultra-small particles with clearly defined size and surface may affect wood. In addition, nanotoxicologists will assess to what extent wood treated with nanoparticles can be a health hazard for humans.

Background

In recent years, wood preservation research has focused on environmentally friendly wood protection agents and methods which include nanomaterials. Previous studies have shown that their effectiveness depends, on the one hand, on the size and uniformity of the particles and, on the other hand, on how well the nanomaterials can penetrate cell walls and enter into a reciprocal relationship with the wood components. However, the results of the studies are not easy to compare as the size of the particles in the analysed specimens varies strongly. Systematic tests are therefore needed to assess the potential of nanotechnology for wood preservation.

Aim

In this project, researchers systematically study the reciprocity between the defined, ultra-small particles of various sizes, on the one hand, and wood, on the other. The aim is to better understand the properties of new nanomaterials and their effects from the point of view of wood research and to evaluate any possible environmental and health risks. Experts from the areas of particle synthesis and characterisation, timber technology, microscopy and nanotoxicology will study these complex questions in the course of the project.

Significance

This project can serve as a bridge between basic research and the possible commercial use of new, nanotechnology-based wood treatments. The insights gained could contribute towards improving existing wood protection methods and accelerate the development of new nanotechnology applications in the economically important sector of buildings and construction.

Title of project: Nanotechnology: Implications for the wood (preservation) industry

Support Program/Supported by/Sponsored by: SNF

Duration: 36 months

Partner: University of Fribourg, Adolphe Merckle Institut, Bern University of Applied Sciences

Responsible for project/Project Leader/Contact: Pr. Alke Fink, Dr. Thomas Volkmer, Pr. Bernard Grobéty, Pr. Barbara Rothen-Rutishauser