

7<sup>th</sup> World Congress on**BIOPOLYMERS AND POLYMER CHEMISTRY**

June 04-06, 2018 Osaka, Japan

**Nanocellulose-modified oil-based wood coatings****Stefan Veigel<sup>1</sup>, Eva-Marieke Lems<sup>1</sup>, Wolfgang Gindl-Altmutter<sup>1</sup>, Gerhard Grull<sup>2</sup>, Andreas Illy<sup>2</sup>, Christian Hansmann<sup>3</sup> and Thomas Rosenau<sup>1</sup>**<sup>1</sup>BOKU-University of Natural Resources and Life Sciences Vienna, Austria<sup>2</sup>Holzforschung Austria, Austria<sup>3</sup>Kompetenzzentrum Holz GmbH, Austria

**D**ue to their bio-based character, oil-based coatings are prevailing more and more in wood surface finishing. These coatings impart appealing optical and haptic properties to the wood surface but lack sufficient protection against water and mechanical influences. The aim of the present study is therefore to modify oil-based coating formulations by the addition of hydrophobized Cellulose Nanofibrils (CNF) which are thought to form an ultra-thin protective layer on the wood surface without affecting its pleasant optics and haptics. Hydrophobization of CNF was performed by an esterification with different carboxylic acids as well as a modification using the paper sizing agent alkyl ketene dimer. Modified nanofibrils were added to an oil-based coating material either by a solvent exchange approach or spray drying and subsequent addition of the dry cellulose powder. Oil formulations containing 1 wt% CNF modified with (2-Dodecen-1-yl) succinic anhydride showed almost no sedimentation after 48 hours. An enhanced abrasion resistance along with a slightly higher resistance to chemicals was found for oak wood surfaces coated with cellulose-modified oil formulations. The increased surface resistance might be attributed to the loose network structure of CNF which effectively prevents the oil from penetration into the wood surface, thus forming a protective CNF/oil composite layer on the wood surface.

stefan.veigel@boku.ac.at