

SPEAKER



NAME

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BIOGRAPHY

Martin Gericke obtained his Ph.D. in 2011 from the Friedrich-Schiller-University of Jena (FSU). After a one-year Post-Doc stay at the Åbo Akademi Turku, followed by two years at a private research institute in Germany (FZMB GmbH) he returned to Jena in 2014 as an academic researcher. He is coordinating the FSU activities within the presented joint project. His current research is focused on the development of novel functional polysaccharide nanomaterials, gels, and composites. Moreover, he is working on modular synthesis approaches for the chemical modification of polysaccharides.

LECTURE

Novel analytical NMR-techniques for the advanced characterization of commercial cellulose ethers

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Cellulose ethers are used as commercial additives, e.g., in paints, construction materials, food, healthcare, and pharmaceutical products. The application performance of technical cellulose ethers is dictated by a complex interplay of various structural features, including molecular weight, total degree of substitution, and distribution of ether moieties within the repeating unit / along the polymer chain. Aim of the presented industry-academia collaboration is to adapt new analytical tools for the characterization of commercial cellulose ethers beyond the current-state-of-technology. For this purpose, well-defined model compounds with either (i) methyl, (ii) hydroxypropyl, or (iii) both substituents were prepared using regioselective protecting group strategies. Dynamic nuclear polarization NMR (DNP-NMR) was used as a new spectroscopic technique for the comprehensive structure characterization of the cellulose derivatives and suitable experimental parameters were established. Ultimately, it was possible to monitor batch-to-batch variations of commercial cellulose ethers using DNP-NMR.