

Effect of Source on the Properties and Behavior of Cellulose Nanocrystal Suspensions

Christina Schütz^{1, †}, Jonas Van Rie¹, Samuel Eyley¹, Alican Gençer¹, Hans van Gorp⁴, Sabine Rosenfeldt², Kyongok Kang³, Wim Thielemans¹

¹ Renewable Materials and Nanotechnology Research Group, Department of Chemical Engineering, KU Leuven, Campus Kulak Kortrijk, Etienne Sabbelaan 53, 8500 Kortrijk, Belgium

² Physical Chemistry I and Bavarian Polymer Institute, University Bayreuth, Universitätsstrasse 30, 95440 Bayreuth, Germany

³ Forschungszentrum Jülich, Institute of Complex Systems (ICS-3) 52425 Jülich, Germany

⁴ Division of Molecular Imaging and Photonics, Department of Chemistry, KU Leuven Celestijnenlaan, 200 F, 3001 Leuven, Belgium

[†] Physics and Materials Research Unit, University of Luxembourg, 162 A Avenue de la Faïencerie, 1511 Luxembourg, Luxembourg

Cellulose being the most versatile and abundant biopolymer in nature and due to its properties that arise from the hierarchical structure, it has been used for millennia by mankind in the form of microfibrils, mainly in the paper and pulp industry. However, many efforts are being directed towards retrieving even smaller cellulose constituents such as nanofibrils and nanocrystals (i.e., nanocellulose), which can be used in high performance materials.¹ In order to do so, a better understanding of the behavior and interactions between these novel nanomaterials are required.^{1,2}

We have investigated the effect of cellulose source on the suspension properties of cellulose nanocrystals extracted from cotton and wood sources using the exactly same preparation strategy. The structural properties revealed to be similar within the given standard deviation and prevalent polydispersity whereas other properties such as liquid crystalline phase behavior, viscosity, diffusion coefficients, and surface tension were found to differ significantly. This study shows that professedly similar cellulose nanocrystals exhibit rather differing behaviors and this presentation attempts to interpret this phenomenon.

[1] Moon et al., *Chem Soc. Rev.* **40** (2011), 3941.

[2] Lagerwall et al., *NPG Asia Mater.* **6** (2014), e80.

[3] Schütz et al., (2018), submitted.

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