

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Cellulose Nanocrystals as Water in Water Emulsion Stabilizers

KARTHIK REDDY PEDDIREDDY, ISABELLE CAPRON, Institut National de la Recherche Agronomique, TACO NICOLAI, LAZHAR BENYAHIA, UMR CNRS Universit du Maine — Cellulose is the most abundant polymer on the earth. Thus, it is very much desirable to find as many practical applications as possible for it. Cellulose, in its original form, contains both amorphous and crystalline parts. It is possible to separate both parts by dissolving the amorphous part in concentrated sulfuric acid. The remaining crystalline cellulose part exist in the form of rod-like particles. The dimensions of the particles depend on the source. We produce the particles from the acid hydrolysis of cotton cellulose fibers. It results in cellulose nanocrystals (CNCs) with dimensions of ~ 150 nm x 6 nm x 6 nm. It is well known that CNCs could very efficiently stabilize oil in water (O/W) emulsions by forming very dense monolayers of CNCs at O-W interfaces. However, it is not yet known whether they could also stabilize water in water (W/W) emulsions. The W/W emulsions can be produced by any two incompatible polymers. It is challenging to find effective stabilizers for W/W emulsions due to ultralow interfacial tension and large interfacial thickness. In this talk, I will show the efficiency and effectiveness of these one-dimensional rods as W/W emulsion stabilizers.

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Date submitted: 05 Nov 2015

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