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The chemical-free production of nanocelluloses from microcrystalline cellulose and their use as Pickering emulsion stabilizer

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Highlight

- Production of cellulose nanoparticles using microfluidization or nearcritical water
- Two environmentally-friendly, entirely water-based pathways
- GPC, WAXS and TEM characterization of the particles revealed key differences
- Both types of particles are able to stabilize oil-in-water emulsions

Abstract

This paper takes a comparative approach in characterizing two types of nano-scale cellulosic particles obtained using chemical-free pathways, either by nearcritical water treatment or by high-shear homogenization from the same microcrystalline cellulose (MCC). The nearcritical water treatment efficiently depolymerized cellulose, producing a solid precipitated fraction of low-molecular-weight material containing cellulose II, while homogenization mechanically

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