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Direct production of Cellulose Nanocrystals from old newspapers and recycled newsprints

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Highlights

- Viability of the direct production of CNC from recycled papers was proved.
- Similar CNC can be obtained but with different yields and purities.
- Two-step pretreatment favors purity of CNC but reduces process yield.
- Similar crystallinities and aspect ratios of all CNC were observed.

ABSTRACT

Cellulose nanocrystals (CNC) are high added value products which can be used in many applications. In this research, CNC were directly produced from two recycled papers: old newspapers (ONP) and 100% recycled newsprint (NP). CNC were also obtained from NP by previously isolating the cellulose particles by alkali and bleaching treatments. CNC yield and quality was assessed through lignin and ash determination, X-ray diffraction analysis, atomic force microscopy and thermogravimetric analysis. Not only crystallinities resulted similar (92-95%), but also aspect ratios (L/d) (each in the range of 50-120). However, different CNC purities and hydrolysis and process yields were

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