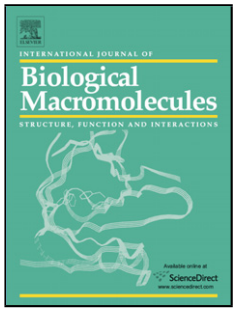

Title: Sono-chemical synthesis of cellulose nanocrystals from wood sawdust using Acid hydrolysis

Authors: Th. I. Shaheen, Hossam E. Emam

PII: S0141-8130(17)33050-7
DOI: https://doi.org/10.1016/j.ijbiomac.2017.10.028
Reference: BIOMAC 8323

To appear in: *International Journal of Biological Macromolecules*

Received date: 15-8-2017
Revised date: 19-9-2017
Accepted date: 5-10-2017

Please cite this article as: Th.I.Shaheen, Hossam E.Emam, Sono-chemical synthesis of cellulose nanocrystals from wood sawdust using Acid hydrolysis, International Journal of Biological Macromolecules https://doi.org/10.1016/j.ijbiomac.2017.10.028

Sono-chemical synthesis of cellulose nanocrystals from wood sawdust using Acid hydrolysis

*Th. I. Shaheen**, *Hossam E. Emam*[*]

Pretreatment and Finishing of Cellulosic Fibers, Textile Research Division, National Research Centre, Scopus affiliation ID 60014618, 33 EL Buhouth St., Dokki, Giza 12622, Egypt

[*]Corresponding authors.

E-mail address: Shaheen_chem@yahoo.com, ti.shahin@nrc.sci.eg, Tel:+20201155137913 (Tharwat Shaheen)

E-mail address: hossamelemam@yahoo.com, Tel:+20201008002487 (Hossam E. Emam)

Highlights

- Extraction of cellulose nanocrystals from sawdust.
- Utilization of sono-chemical technique for extraction by dint of sulfuric acid.
- Crystallinity index of the obtained CNC was 90%, with size does not exceed than 50nm in diameter.

Abstract

Cellulose nanocrystal (CNC) is a unique material obtained from naturally occurring cellulose fibers. Owing to their mechanical, optical, chemical, and rheological properties, CNC gained significant interest. Herein, we investigate the potential of commercially non-recyclable wood waste, in particular, sawdust as a new resource for CNC. Isolation of CNC from sawdust was conducted as per acid hydrolysis which induced by ultrasonication technique. Thus, sawdust after being alkali delignified prior sodium chlorite bleaching, was subjected to sulfuric acid with concentration of 65% (w/w) at 60 ^{0}C for 60 min. After complete reaction, CNC were collected by centrifugation followed by dialyzing against water and finally dried via using lyophilization