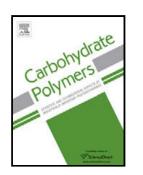
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ACCEPTED MANUSCRIPT

1	Nanoporous membranes with cellulose nanocrystals as
2	functional entity in chitosan: Removal of dyes from water
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11	Abstract
12	Fully biobased composite membranes for water purification were
13	fabricated with cellulose nanocrystals (CNCs) as functional entities in chitosan
14	matrix via freeze drying process followed by compacting. The chitosan (10 wt
15	%) bound the CNCs in a stable and nanoporous membrane structure with
16	thickness of 250 -270 $\mu\text{m},$ which was further stabilized by crosslinking with
17	gluteraldehyde vapors. Scanning electron microscopy (SEM) studies revealed
18	well-individualized CNCs embedded in a matrix of chitosan. Brunauer,
19	Emmett and Teller (BET) measurements showed that the membranes were
20	nanoporous with pores in range of 13-10 nm. In spite of the low water flux
21	(64Lm ⁻² h ⁻¹), the membranes successfully removed 98%, 84% and 70%
22	respectively of positively charged dyes like Victoria Blue 2B, Methyl Violet 2B
23	and Rhodamine 6G, after a contact time of 24 hrs. The removal of dyes was
24	expected to be driven by the electrostatic attraction between negatively
25	charged CNCs and the positively charged dyes.
26	Key words: cellulose nanocrystals, chitosan, nanoenabled membranes, dye
27	removal, water purification, adsorption
28	
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