

2. Preparation of Cellulose Nanocrystal Aerogel from Wastepaper through Freeze-Drying Technique

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Abstract

Cellulose nanomaterials processing for aerogel preparation has received considerable attention among the scientific community due to its fascinating properties. In this work, we report on the preparation of cellulose nanocrystals (CNCs) aerogel from wastepaper using a freeze-drying technique. Structure analysis of the cellulosic particles extracted was investigated by Fourier Transform Infrared Spectroscopy (FTIR). Morphological analysis of the extracted cellulose and CNCs were carried out by Scanning electron microscopy (SEM) and Transmission electron microscopy (TEM) respectively. We achieved density of aerogel down to 0.012 g/cm³ which is comparable with typical values of cellulosic aerogels. The preparation of the CNCs aerogel might offers a wide range of aerogel applications through an environmentally friendly conversion of wastepaper material.

Keywords: Aerogel; Cellulose; Cellulose Nanocrystal; Wastepaper; Nanomaterials

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