

Preparation and Characterization of Nanocrystalline Cellulose from Acacia mangium

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Abstract : Nanocrystalline cellulose (NCC) were prepared by acid hydrolysis and ultrasound treatment of bleached Acacia mangium fibers. The obtained rod-shaped nanocrystals showed a uniform size. The results showed that NCC with high crystallinity can be obtained using 64 wt% sulfuric acid. The effect of synthesis condition was investigated. Different reaction times were examined to produce the NCC and the results revealed that an optimum reaction time has to be used for preparing the NCC. Morphological investigation was performed using the transmission electron microscopy (TEM). Fourier transform infrared (FTIR) spectroscopy and thermogravimetric analysis (TGA) were performed. X-ray diffraction (XRD) analysis revealed that the crystallinity increased with successive treatments. The NCC suspension was homogeneous and stable and no sedimentation was observed for a long time.

Keywords : acid hydrolysis, nanocrystalline cellulose, nano material, reaction time

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