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# Production of Nanocellulose from Lime Residues Using Chemical-free Technology

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The feasibility of using lime residues after juice extraction as a raw material to produce nanocellulose was determined in this study. Different processing schemes were applied by varying the pretreatment and defibrillation methods and conditions. Autoclaving at 110-130 ⁰C was performed as a pretreatment to remove hemicellulose and pectin from the native fiber. The fiber images obtained from transmission electron microscopy (TEM) technique revealed that the multiple homogenizing steps could effectively disintegrate the pretreated fiber into nanometer scale. X-ray diffraction (XRD) results showed that the prepared nanocellulose possessed much higher crystallinity index (CI) comparing to that of the native fiber; it was noted that the degree of CI was dependent on the processing conditions. The results suggested that there is a potential to produce nanocellulose from citrus by-products via the application of the developed chemical-free technology, which is safely to be used for food applications.

Keywords: Lime residues; Nanocellulose; Hydrothermal

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