

Microstructure Study of NanoCrystalline Cellulose Obtained from Cotton Linter

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Abstract : Problems and disadvantages of using conventional plastics are more apparent in recent years and have attracted researchers' attention. Polymers from natural resources or bio polymers represent a suitable replacement to overcome to the disadvantages of plastics. But due to the some flaws of bio polymers, using suitable filler almost seems necessary. Nanocrystalline cellulose with low cost and availability can be applied as appropriate filler. In this study nanocrystalline cellulose was produced from cotton Linter and was characterized. The cotton Linter was hydrolyzed in sulfuric acid then neutralized by the two different concentrations of NaOH. The resulted suspension was treated by ultrasound waves. Process efficiency was determined as 90%. The final product was studied using scanning electron microscopy and x-ray diffraction technique. The obtained diagram of XRD experiment confirmed that the produced material was nanocrystalline cellulose. Also percentage of crystallinity was calculated as 84% in the obtained material as well as the size of crystals. It can be said that the applied method is a rapid and easy method for the production of nanocrystalline cellulose.

Keywords : nanocrystalline cellulose, crystallinity, XRD, cotton linter

Conference Title : ICBB 2015 : International Conference on Bioengineering and Bionanotechnology

Conference Location : Barcelona, Spain

Conference Dates : August 17-18, 2015