

ABSTRAK

PEMBUATAN NANOSELULOSA DARI KAYU LUNAK PINUS (*Pinus merkusii*) MENGGUNAKAN METODE HIDROLISIS ASAM

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Telah dilakukan pembuatan nanoselulosa berbasis kayu lunak pinus (*Pinus merkusii*) menggunakan metode hidrolisis asam. Pada penelitian ini dibuat 4 sampel dengan variasi konsentrasi H₂SO₄. Sampel yang telah dibuat dilakukan uji X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) dan Fourier Transformed Infrared (FTIR). Hasil uji XRD dianalisis secara kualitatif dan kuantitatif. Analisis XRD merujuk bahwa semakin besar konsentrasi H₂SO₄ yang digunakan maka persentase kemurnian dari masing-masing sampel meningkat. Hasil identifikasi fasa diperoleh bahwa sampel dengan penambahan H₂SO₄ 19, 29, dan 39% terbentuk fasa I_α , I_β dan lignin. Sementara, pada sampel dengan penambahan H₂SO₄ 45% hanya terbentuk fasa I_α , dan I_β . Identifikasi gambar hasil uji SEM diperoleh bahwa pola gambar memiliki struktur bentuk distribusi menyerupai susunan lempengan batu yang rapat dan saling tumpang tindih. Analisis FTIR menunjukkan gugus fungsi yang terbentuk yaitu O-H, C-H, C≡C, C=C, H-C-H, C-O dan C-O-C yang menunjukkan kehadiran selulosa.

Kata Kunci: Nanoselulosa, Pinus, hidrolisis asam, H₂SO₄.

ABSTRACT

EXTRACTION OF NANOCELLULOSE FROM SOFTWOOD PINE (*Pinus merkusii*) USING ACID HYDROLYSIS METHOD

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*Research has been conducted on nanocellulose from the main material of soft pine wood (*Pinus merkusii*) by acid hydrolysis method. In this study, 4 study samples were made using variations in the concentration of H_2SO_4 . The prepared samples were tested by X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and Fourier Transformed Infrared (FTIR). XRD test results were analyzed qualitatively and quantitatively. XRD analysis indicated that the greater the concentration of H_2SO_4 used, the percentage of purity of each sample increased. Phase identification results obtained that the sample with the addition of H_2SO_4 19, 29, and 39% formed phases I_a , I_β and lignin. While in the sample with the addition of 45% H_2SO_4 only I_a and I_β phases are formed. The addition of H_2SO_4 affects the molar percent of each phase. The higher the concentration of H_2SO_4 the greater the value of the molar percentage of phases I_a and I_β . Image identification from SEM test results shows that the image pattern has a distribution structure resembling a compact and overlapping arrangement of stone slabs. FTIR analysis shows the functional groups formed are O-H, C-H, $C\equiv C$, $C=C$, H-C-H, C-O and C-O-C which indicate the presence of cellulose.*

Keywords: nanocellulose, pine, hydrolysis method, H_2SO_4 .