

Quantitative and qualitative analysis of lignocellulosic fibre from pineapple (Ananas Comosus) leaves extraction

ABSTRACT

Pineapples (*Ananas Comosus*) are vastly cultivated in Malaysia for their fruits. But the other parts of the plants especially the leaves are usually turned into waste. This research is aimed to exploit the wastes by extracting the cellulose from the pineapple leaves (PALF) by using alkali and bleaching treatment. Consequently, the TAPPI method was employed to determine the chemical composition of PALF biomass followed by physicochemical characterization via X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR), and Thermogravimetric analysis (TGA & DTG). The dried pineapple leaves were cut, ground and sieved. The pre-treated sample was hydrolysed with 4% NaOH, rinsed, dried, and then heated with a mixture of sodium chlorite, NaClO₃, and acetic acid, CH₃COOH. Besides, the dried sample also employed acid-insoluble lignin treatment to measure lignin content. The yield was calculated based on differential mass in every stage of treatment. XRD diffractograms showed a significant increase in % Cr, and C.I. was shown after alkali treatment and bleaching. FTIR spectrums showed that existence of OH (3342 cm⁻¹), stretching -CH (2984 cm⁻¹), -CH₂ (1429 cm⁻¹), -CH (1339 cm⁻¹), -OH (1638 cm⁻¹) and C-O (896 cm⁻¹) functional group in prepared cellulose. TGA and DTG analysis show three stages of decomposition via hydration, decarboxylation, and chain cutting process. Therefore, extraction of α-cellulose (74%) from PALF biomass was successfully produced using alkali and bleaching treatments followed by the TAPPI method.