The Development of Biobased Paper from Pineapple Leaf Fibre

ABSTRACT

The usage of non-wood fiber sourced from agricultural waste for papermaking has attracted the interest of many researchers. In this study, paper made from pineapple leaf fiber (PALF) was developed using environmentally friendly approaches. This study aimed to prepare PALF papers using organosolv pulping with acetic acid (AcOH) and 0.1% hydrochloric acid as catalyst. The PALF were treated with varying AcOH concentrations (16, 20, 24, 28, and 32 %) for 9 hours to study the effectiveness of delignification to produce fine quality pulp. Then, the morphological and mechanical properties of the PALF paper was also conducted to analyze their potential in paper making. From the study, it was discovered that the organosolv pulping could produce fiber that can be made into paper of comparable properties to that of other conventional method. Based on the Fourier Transform Infra-Red (FTIR), the emergence of cellulose-associated peaks (3300 cm-1) and the reduced intensities of the peaks attributed to lignin (1600 cm-1) and hemicellulose were observed which suggests effective delignification. The Scanning Electron Microscope (SEM) analysis revealed that the treated PALF consists of cellulosic microfibrils that are well separated. Meanwhile, the mechanical analysis using the Universal Testing Machine (UTM) revealed that the tensile strength of the papers varies between 0.20- 0.25 N/mm2 while the tearing resistance showed increasing trend (2.07, 5.15, 6.86, 10.03, and 11.1 mN.m2 /g) with increasing AcOH concentration.