

Isolation and characterization of macerated cellulose from pineapple leaf

ABSTRACT

Diverse renewable resources, especially those obtained from residual agricultural wastes, are being exploited to reduce the impact of environmental damage. This study presents a method to produce purified cellulose extracted from locally planted pineapple leaves (*Ananas comosus*). The cellulose was extracted by maceration pretreatment. The heating times were varied. This method is a simpler and more effective approach to delignify the pineapple leaf fibers compared with conventional chemical pulping and bleaching processes. The chemical composition of the cellulose was investigated according to TAPPI standards and by structural analyses, namely Fourier transform infrared (FTIR) spectroscopy and X-ray diffraction (XRD). The results indicated that the hemicellulose and lignin were partially removed from the cellulose. Chemical analysis confirmed that the cellulose content increased from 25.8% (pineapple leaf fibers) to 70.9% (macerated cellulose). The optimum heating time was 3 h. However, XRD showed that the extracted cellulose had a higher crystallinity index than the initial pineapple leaf fibers. These results indicated that pretreatment via maceration has good potential applications in the production of macerated cellulose.

Keyword: Pineapple leaf; Macerated cellulose; Pretreatment