

Effect of Bleaching with Potassium Hydroxide on the Properties of Egg Carton Pulp for Nitrocellulose Production

ABSTRACT

Nitrocellulose known as gun cotton and the main component of smokeless gun powder. The primary cellulose sources for nitrocellulose manufacturing are refined cotton linters and wood pulp. This research aims to look into the possibilities of egg carton pulp (ECP) as a resource in the manufacturing of nitrocellulose. The effect of different concentrations of KOH (0.6 M, 1.0 M, and 1.5 M) on ECP properties was evaluated. The ECP was characterized by chemical composition, Fourier transform infrared (FTIR), and thermogravimetric analyses (TGA). This study showed that bleaching using 1.0 M KOH reduced the lignin content by up to 1.01% and enhanced cellulose content by up to 86.94%. The presence of a 1420 cm^{-1} band in FT-IR spectra after the bleaching process reveals the existence of cellulose in the ECP. Based on the onset temperature degradation, the highest temperature measured was 294 °C for 1.0 M bleached ECP, corresponding to the cellulose degradation temperature. The presence of a high proportion of cellulose in the ECP after bleaching with 1.0 M of KOH indicates that the ECP has the potential to be used as a source of raw material in nitrocellulose production.