

Biobased plastic film from cogon grass cellulose

ABSTRACT

The study of using natural resources such as cellulose as an alternative to synthetic polymers for manufacturing biobased plastic packaging is currently on going amongst numerous researchers to achieve sustainable goals as well as the need to replace petroleum feedstock that are getting depleted by years. Cogon grass is one of the most problematic grasses globally, and it has been observed that cogon grass grows abundantly along the roadside and open areas in Malaysia. Since the said grass is high in cellulose content (64%) it is a suitable candidate for raw material in manufacturing biobased plastics. Hence, the objective of this study was to produce a thin biobased film from cogon grass cellulose. In this study, cogon grass cellulose was extracted using sodium hydroxide before being acetylated to yield cellulose acetate (CA). Solvent casting with dichloromethane (DCM) was performed on the synthesized CA to produce a biobased thin film with different CA concentrations (1%–5%) to study the properties of the thin films. The film with 5% CA had the highest tensile strength (10 MPa). The surface morphology of the thin film was smooth, even and homogenous indicating that the acetylation process during cellulose acetate formation successfully occurred and that the DCM used can penetrate the cellulosic fibre very well.