

Effect of cogon grass fibre on the thermal, mechanical and biodegradation properties of thermoplastic cassava starch biocomposite

ABSTRACT

Thermoplastic cassava starch (TPCS) is a promising alternative material to replace the non-biodegradable petroleum based polymer due to its good environmental-friendly aspect i.e. abundant, sustainable, recyclable and biodegradable in nature. However, TPCS have some limitation such as poor mechanical properties. Therefore, in the present study, cogon grass fibre (CGF) were incorporated into TPCS using compression molding. Then the fundamental properties of CFG/TPCS biopolymer composites were carried out in order to evaluate their potential as a biodegradable reinforcement. From the study it was found that, the incorporation of CFG has improved the tensile and flexural properties of the TPCS composites, while the impact strength and elongation were reduced. The thermal properties of the biocomposite were reduced as the cogon grass fibres increase from 0 to 5%. In term of morphological, SEM shows good fibre adhesion between CGF and TPCS. Soil burial test shows that incorporation of CGF into TPCS has slow down the biodegradation process of the composites. Thus, CGF/TPCS biopolymer composites can be classified as composites with great potential as environmental-friendly material that biodegradable and renewable.

Keyword: Thermoplastic starch; Thermoplastic cassava starch; Cogon grass fibre; Biocomposite