

Effect of seaweed on mechanical, thermal, and biodegradation properties of thermoplastic sugar palm starch/agar composites

ABSTRACT

The aim of this paper is to investigate the characteristics of thermoplastic sugar palm starch/agar (TPSA) blend containing *Eucheuma cottonii* seaweed waste as biofiller. The composites were prepared by melt-mixing and hot pressing at 140 °C for 10 min. The TPSA/seaweed composites were characterized for their mechanical, thermal and biodegradation properties. Incorporation of seaweed from 0 to 40 wt.% has significantly improved the tensile, flexural, and impact properties of the TPSA/seaweed composites. Scanning electron micrograph of the tensile fracture showed homogeneous surface with formation of cleavage plane. It is also evident from TGA results that thermal stability of the composites were enhanced with addition of seaweed. After soil burial for 2 and 4 weeks, the biodegradation of the composites was enhanced with addition of seaweed. Overall, the incorporation of seaweed into TPSA enhances the properties of TPSA for short-life product application such as tray, plate, etc.

Keyword: Composites; Thermoplastic starch; Seaweed