

Effect of organo-modified montmorillonite on poly (butylene succinate)/poly (butylene adipate-co-terephthalate) nanocomposites

ABSTRACT

The composite material based on poly (butylene succinate) (PBS), poly (butylene adipate-co-terephthalate) (PBAT) and organo-modified montmorillonite (OMMT) were prepared by melt blending technique and characterized. Sodium montmorillonite (Na-MMT) was successfully modified by octadecylammonium (ODA) and dimethyldioctadecylammonium (DDOA) salts to become OMMT through cation exchange technique which is shown by the increase of basal spacing of clay by XRD. The addition of the OMMT to the PBS/PBAT blends produced nanocomposites which is proved by XRD and TEM. Tensile tests showed increase in tensile strength and modulus which is attributed to the existence of strong interactions between PBS/PBAT and clay, particularly with OMMT. Highest tensile strength of nanocomposite was observed at 1 wt% of OMMT incorporated. TGA study showed that the thermal stability of the blend increased after the addition of clays. SEM micrographs of the fracture surfaces show that the morphology of the blend becomes homogeneous and smoother with presence of OMMT.

Keyword: Nanocomposites; Biodegradable; OMMT