

Effect of modified clay on the morphological and thermal properties of PLA/PBAT nanocomposites

ABSTRACT

In this study, new biodegradable polylactic acid /poly butylene adipate-co-terephthalate nanocomposites were developed and prepared using the melt blending method. Sodium montmorillonite clay was modified using organic surfactant, octadecyl ammonium bromide, novel dimethyl dioctadecyl ammonium bromide. A commercial organomodified montmorillonite, Cloisite 20A was also used as comparison. Increased interlayer spacing, reduced free water molecule within montmorillonite clay gallery spacing and existence of alkyl group signature confirmed that organomodified montmorillonite was successfully prepared via ion exchange technique. The present work introduced 1% organomodified montmorillonite into PLA/PBAT blends. Surface morphology improved with addition of OMMT. Transition electron microscope analysis revealed exfoliated distribution between the organoclay and the matrix. The onset temperature (T_{onset}) increased after the addition of organoclay.

Keyword: Poly lactic acid (PLA), Poly butylene adipate-co-terephthalate (PBAT), Organomodified montmorillonite (OMMT), Morphological properties, Thermal properties