

THE RELATIONS BETWEEN STRUCTURE AND MECHANICAL PROPERTIES OF POLY(BUTYLENE SUCCINATE-CO-ADIPATE)/MONTMORILLONITE NANOCOMPOSITES

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ABSTRACT

Poly(butylene succinate-co-adipate) (PBSA)/layered silicate nanocomposites were prepared by melt mixing of PBSA and three different types of commercially available organically modified montmorillonite (OMMT). Using three types of OMMT, the effect of organic modification in nanocomposites was investigated by focusing on two major aspects: morphological study and property measurements. X-ray diffraction (XRD) patterns revealed that increasing the level of interactions (miscibility) between the organic modifier and PBSA matrix increases the tendency of the silicate layers to delaminate and distributed nicely within the PBSA matrix. Transmission electron micrographic (TEM) observations showed that the dispersion of silicate layers in PBSA matrix is well matched with the XRD patterns. Dynamic mechanical analysis and tensile property measurements revealed concurrent improvement in mechanical properties when compared to the neat PBSA and the extent of improvement is directly related to the extent of delamination of silicate layers in the PBSA matrix.

Key Words: poly(butylene succinate-co-adipate); nanocomposites; properties

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