عنوان مقاله:

Thermoplastic starch-filled polypropylene nanocomposite: Evaluation of mechanical, thermal and morphological characteristics

محل انتشار:

کنفرانس بین المللی فرآورش پلیمرها (سال: 1390)

تعداد صفحات اصل مقاله: 4

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خلاصه مقاله:

Polypropylene/thermoplastic starch (PP/TPS)/organoclay (Cloisite 30B) nanocomposites with different compositions of TPS (100/0, 90/10, 70/30, 50/50) with and without 3 wt% organoclay were prepared using melt intercalation technique in presence of 6 wt% Ethylene Vinyl Acetate (EVA) copolymer as a coupling agent,using a co-rotating twin screw extruder. The effect of organoclay content on the mechanical and thermal properties of the nanocomposite blends has been investigated. The morphological properties were examined using Small-angle X-ray scattering (SAXS) technique and transmission electron microscopy (TEM). Mechanical tests indicated that the tensile strength and modulus of PP/TPScomposites improved with the incorporation of the nanoclaybut elongation at break decreased, noticeably.Thermogravimetric analysis (TGA) confirmed that the thermal stability of PP/TPS (50:50)/organoclay nanocompositeimproved significantly as compared with PP/TPS (50:50) blend.SAXS patterns of nanocomposites confirmed exfoliation of the organoclay galleries within the blend matrix. The silicate layers of organoclay were dispersed at the nanometer level in the PP/TPS blend nanocomposites, as revealed from the TEM micrographs.

کلمات کلیدی:

PP, TPS, SAXS, TGA, TEM, Closite 30B