

عنوان مقاله:

Impact, thermal and biodegradation properties of high impact polystyrene/corn starch blends processed via melt extrusion

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خلاصه مقاله:

High impact polystyrene (HIPS)/corn starch blends were prepared in presence of glycerol as a plasticizer via melt extrusion process by a twin-screw extruder. The novelty of this work is first, because of the use of pre-gelatinized corn starch as modified one and second, the procedure of making blends by extruder which makes it ease of access and also industrially possible. The blends were then characterized by scanning electron microscopy (SEM) to visualize morphology of blends and dispersion of starch in HIPS matrix, soil burial test (SBT) to investigate of blend biodegradability by measuring weight loss of samples, Izod impact strength test to evaluate of impact properties, melt flow index (MFI), thermo-gravimetric analysis (TGA) and Vicat softening point (VSP) tests to evaluate their thermal properties of prepared blend samples. Results indicated that these properties were affected by the amount of starch and glycerol used for preparation of blends in a way that addition of starch and glycerol led to a faster degradation rate especially in first two weeks, more decomposition stages through TGA, decrease in values of Izod impact strength and VSP. Measurements also showed that higher amount of starch led to decrease in the value of melt flow .rate (MFR), although it was increased by addition of glycerol

کلمات کلیدی:

High Impact Polystyrene, Corn Starch, Glycerol, Melt Extrusion, Biodegradation

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