

Biopolymer Blends Based on Polylactic Acid and Polyhydroxy Butyrate-co-Valerate: Effect of Clay on Mechanical and Thermal Properties

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Abstract

Biodegradable polymer blends consisting of polylactic acid (PLA) and polyhydroxy butyrate-co-valerate (PHBV) have been prepared by melt mixing in a twin screw extruder and followed by injection molding technique. Cereplast PLA containing starch as an additive was used to make the blends. The effects of three different types of clay (montmorillonite, bentonite, and chemically modified bentonite) on the mechanical and thermal properties of the blends were studied. The ratio of PLA and PHBV (w/w) was maintained at 70:30 while the weight of clay was fixed at 1%. The addition of clay was found to result in a slight increase in tensile strength and modulus. Viscoelastic studies revealed that the damping property of the blends decreased with the addition of clay. This was attributed to the decreased segmental motion in the molecular chains. The morphology of the blends has been investigated by environmental scanning electron microscopy and a homogenous surface was observed for the blend containing montmorillonite.