

NETWORK FORMATION OF GRAPHENE OXIDE IN POLY(3-HYDROXY BUTYRATE) NANOCOMPOSITES

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ABSTRACT

Polyhydroxy alkanoates (PHAs) are bio-based, biodegradable and sustainable polyesters that are produced naturally by different types of bacteria. Recently, interest in these materials has gained strongly to broaden their application range, by modifying their properties through blending and/or using nanofillers.

In this contribution we will focus on the modification of Poly[-3-hydroxybutyrate] (PHB) by Graphene Oxide (GO). Important thermal properties such as glass transition temperatures, melting temperatures, heat of fusion and thermal decomposition temperatures will be reported. Melt rheology provided substantial information about structure formation of the nanoparticles in the bionanocomposites and their influence on the thermal stability of the polymer composites. Dielectric characterization gave additional information and allows sensitive determination of glass transition temperatures. Free volume characteristics such as main free volume hole size, combined with dynamic mechanical properties in the solid state gave information about the apparent aspect ratio and dispersion of the GO fillers in PHB.

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