

584c The Rheology and Degradation of a Series of Pha-Based Copolymers

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There is a growing interest in the development of alternatives to petroleum based polymers such as PET. Bio-derived polymers, which may be obtained from biological microorganisms or other renewable sources, may be employed in a range of commodity applications which are typically dominated by conventional polymers. These new materials are attractive from an environmental and political perspective, and increasingly offer mechanical properties comparable to traditional materials. One family of biodegradable polyesters is that of copolymers based upon polyhydroxyalkanoates (PHAs). In this work, we investigate the rheology and degradation of poly (3-hydroxybutyrate-co-3-hydrohexanoate) copolymers of varying molecular weights and comonomer concentrations. The degradation kinetics of several PHA samples are obtained from transient rheological tests and a random chain scission model. The degradation rate constant is obtained over a range of thermal histories. Our work shows that increasing the concentration of the C6 comonomer increases the rate of degradation. The implications of the rheology and degradation of PHAs on processing are discussed.