SL 10.8

The Shear, Extensional and Degradation Rheology of Renewable Resource Polymers

J.P. Eickhoff, P.A. Daly and G.M. Harrison
Department of Chemical Engineering, Clemson University, Clemson, SC-29642, USA

Polymers derived from renewable resources can offer comparable mechanical properties to conventional polymers as well as potential environmental and degradation benefits. In this work, a rheological study of two poly(hydroxyalkanoate) (PHA) copolymers was conducted. The copolymers differed in molecular weight and comonomer concentration. Dynamic oscillatory, transient and extensional rheological tests were used to characterize the two materials. Steady values of the extensional viscosity were achieved. Transient experiments indicate that increasing the C6 comonomer increases the rate of degradation of the polymer. Likewise, the rate of degradation also increases with temperature for both materials tested.