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RHEOLOGICAL CHARACTERIZATION OF CLAY-POLYESTER COMPOSITES

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Polymer-clay composites, which consist of clay particles dispersed in a polymeric matrix, have been used in different applications. Clay fillers are widely used in polymers as ways to produce cost-effective, strong, and energy efficient materials. The compounding and inclusion of particulate fillers in the polymers to get a homogenous material is a rather complex process. The processing of these materials, like mixing and molding is strongly dependent on the particle-particle and particle-polymer interactions. Therefore, the fundamental understanding of the rheological properties of the polymer-clay composites is very important in the design of their processing. In this study, the rheological behavior of bentonite clay dispersed in unsaturated polyester was investigated. Herschel-Bulkley model and Structural Kinetic model were used to describe the dependence of the apparent viscosity of the composite on shear rate and shearing time, respectively. The effects of the filler/polyester ratio and filler size on the rheological properties of the composite were studied.