

The Effects of Thickener on the Polymerization of An Unsaturated Polyester system

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The use of unsaturated polyesters in bulk and sheet molding compounds results in composite materials that have high strength, dimensional stability, and very good surface quality. In general, they are chemically thickened compositions. This is usually achieved with group IIA metal oxides and hydroxides, especially with MgO. As known, the properties of composites very much depend on the curing process. Therefore, it is necessary to understand the fundamental principles that govern the curing when a thickener or reinforced fiber is involved.

In this paper, isothermal and dynamic DSC data were used to evaluate the curing process and kinetic parameters for an unsaturated polyester/thickener system. The heats of reaction and various kinetic parameters have been obtained. The dynamic experimental results showed two values of activation energy in accordance with the different exothermic peaks that may revealed different reaction mechanisms occurred in the curing process. The thickener can retarded the curing process, a smaller reaction rate constant and a larger activation energy were observed from both dynamic and isothermal experiments.