

Effects of carbon black and dispersant type on the characteristics of a styrene-based polymer/carbon black composite

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Carbon black is an important pigment because it has excellent properties such as electrical conductivity, chemical and heat resistance making it possible to use in coatings, plastics and inkjet applications. But, it easily aggregates in a polymer matrix due to its high surface energy. Besides, inhibition phenomenon is observed in the free radical polymerization procedure of vinyl monomers in the presence of carbon black. In this study, how does the pH of carbon black affect the dispersion and polymerization of a styrene-based polymer/carbon black composites was studied. Also, the effects of dispersant type (5 types) on the characteristics of the composite were investigated. Apparent carbon black dispersibility in a styrene-based monomer mixture was tested by seeing the mixture in a vial with the eye first then optical micrographs were taken to see carbon black dispersibility inside the mixture more precisely. The carbon black and dispersant type played an important role in stabilizing the carbon black dispersion. A high performance styrene-based polymer/carbon black composite could be prepared by optimizing carbon black and dispersant type.