Mechanical and thermal properties of a DGEBA/imidazole epoxy resin system modified with epoxidized soybean oil

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Epoxidized soybean oil (ESO) was used as a reactive impact modifier for a diglycidyl ether of bisphenol A(DGEBA)/1-methyl imidazol epoxy resin system. ESO/DGEBA mixing weight ratios were 15/85, 30/70 and 45/55. 20 phr of 1-methyl imidazole was used to cure the epoxy resin system. The mechanical and thermal properties of the epoxy resin system were investigated by UTM, impact tester and DSC. With increasing ESO content, the impact strength and elongation at break of the epoxy resin system increased but tensile strength and modulus decreased. The curing mechanism and behavior of the epoxy resin system were studied. The curing rate and heat of reaction of the epoxy resin system decreased with ESO content.