

Effect of different curing agent on the physical properties of an epoxidized soybean oil modified DGEBA system

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To replace a petroleum-based material to a sustainable bio-based material partially and modify the physical properties of a typical diglycidyl ether of bisphenol A (DGEBA) epoxy resin system epoxidized soybean oil (ESO) was added to the DGEBA resin system. Two kinds of curing agents, ethylene diamine and 1-methylimidazol, were used respectively to cure the epoxy system and the effect of different curing agent on the physical properties of the ESO modified DGEBA epoxy resin system was investigated. The physical properties of the epoxy resin system were investigated by UTM, impact tester, DSC and TGA. In the DGEBA/amine system, tensile properties and impact strength increased with ESO content. However, the DGEBA/imidazole system showed a maximum in tensile strength, tensile modulus and impact strength at ESO 15 wt%. At ESO 15 wt%, the DGEBA/amine system showed lower impact strength but higher tensile strength, lower heat of reaction but faster reaction, and higher thermal stability than the DGEBA/imidazole system.