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Structure Effect on the Crosslinking Behavior of Bismaleimides
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— The molecular structure effect on the cure characteristics of some bismaleimides (BMIs) was investigated. Four different types of BMI resins were synthesized via addition reaction of diglycidyl ether of bisphenol A with N-(3-carboxy phenyl) maleimide or N-(4-carboxy phenyl) maleimide. The change in the chemical structure was confirmed by FTIR and NMR. Kinetic parameters were determined from dynamic and isothermal differential scanning calorimetry (DSC). The maximum conversion as a function of temperature was compared with the viscosity change during cure. Both DSC and chemorheology studies show that the overall curing rate is faster for meta substituted BMIs than para substituted ones. At a fixed heating rate in the chemorheology study, viscosity started to increase at higher temperature for meta substituted BMIs, compared with para substituted BMIs. The asymptotic final viscosities were higher for shorter chains due to their resultant higher crosslinking densities. The substituent position showed much greater effect on the cure kinetics than the chain length within the experimental range of this study. The activation energies of the cure reactions were obtained from both DSC and viscosity measurements.

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