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Abstract
In this study , we try to mix the different ratios of DGEBA、Novolac and Resin A by Mixture Design method . After that , the MHHPA was used to play the role of crosslinking agent and a cured resin with good thermal and flexibility properties, was therefore obtained.

First , the cure conditions of epoxy was determined by DSC. Curing kinetics for each resin was analyzed according to Ozawa’s method. Order of the reaction, n, is about 1.2 . By using a titration method, the epoxy equivalent weight (EEW) of DGEBA and Novolac were determined to be 183.7 and 170.6 g/equivalent, respectively. The change of functional groups during curing can be obtained by FTIR. DMA and IPC-TM 650 method were used to measure the thermal property and flexibility property. Then, an empirical model was fitted and plotted as contour diagram, which revealed the Tg and flexibility effects among mixed epoxy resins. The results indicate that the optimum region of thermal and flexibility properties is within DGEBA(0~0.25)、Novolac(0~0.25)、Resin A(0.67~1), and the glass transition temperature of this region ranges from 121 to 126℃.

In addition, we try to synthesize polyurethane prepolymer with polyol (1,4-butanediol+adipicacid) and 4,4-Diphenylmethane diisocyanate. After that, the prepolymer was added to modifide DGEBA while empolying MHHPA as a crosslinking agent. Use FTIR、DMA、IPC-TM 650 method to measure the functional groups change、thermal property and flexibility property. The morphology was observed by SEM and the thermal stability was measured by TGA. The results exhibit that when the content of PU in PU-1000 and PU-2000 is 10%、5%, respectively. The PU/DGEBAmixtures give a cured resin with good thermal and flexibility properties.
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