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Abstract
This study used water clear epoxy resin (diglycidyl ether of bisphenyl-A , DGEBA) cured with clear anhydride curing agent (4-methyl hexanhydrophthalic anhydride , MHHPA)and a secondary amine catalyst (C11Z-CN). The objective of this research is to understand the curing behavior of epoxy/anhydride system , which include the effect of epoxy/anhydride/catalyst ratio , curing profile for different curing temperature and time , on the physical properties of the cured product . For the more ,we use isothermal DSC and dynamic DSC to estimated kinetic parameter and activation energy for this curing reaction .
Although this cured epoxy exhibits many desirable properties, it also has a general tendency to be brittle due to its highly cross-linked structure. The task here is to improve the toughness of the cured epoxy while keep its water clear characteristic. To achieve this target, a reactive liquid rubbers, (carboxyl- terminated butadiene-acrylonitrile), CTBN was incorporated into this cured epoxy matrix and their effects on the clearness, cured matrix morphology as well as toughness were examined in detailed.
The liquid rubber was first pre-reacted with DGEBA epoxy to improve the compatibility between rubber phase and epoxy resin. The reaction parameters such as content of CTBN, reaction temperature, reaction time, type and amount of accelerator were varied to study their effects on the dispersibility of rubber particle inside the cured matrix. Data of the acid group titration of the modified DGEBA together with SEM observation on the morphology of the final blend provided us a very interesting insight in terms of toughen mechanism for this matrix.
Keywords : epoxy resin . MHHPA . curing behavior . curing kinetic. CTBN
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