

**Thermal Decomposition Activation Energy of Epoxy System
Modified with CTBN**

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To modify the brittleness of epoxy resin, carboxyl terminated butadiene acrylonitrile rubber(CTBN) was introduced to diglycidyl ether of bisphenol A(DGEBA)/4,4'-methylene dianiline(MDA) system. To curing epoxy resin, DGEBA, MDA and CTBN were well-mixed at 80°C and they were cured at 150°C for 1 hr after curing at 80°C for 1.5 hr. Cured epoxy resin was analyzed by thermogravimetry(TG) at various heating rates and the TG data was interpreted by Freeman & Carroll equation. The equation is like this.

$$-\frac{\Delta \ln(dw/dt)}{\Delta \ln W_r} = \frac{E_{ad}}{R} \frac{\Delta \ln T^{-1}}{\Delta \ln W_r} - n \quad ; \text{ Freeman \& Carroll eq'n}$$

where, dw/dt : weight loss rate(mg/min), W_r : total weight loss(mg),
 E_{ad} : thermal decomposition activation energy(cal/mol), R : gas constant,
 T : absolute temperature(K), n : reaction order.

References

1. E. S. Freeman and B. Carroll, *J. Phys. Chem.*, **62**, 394(1958)
2. J. Y. Lee, S. H. Lee, J. H. Park, M. J. Shim and S. W. Kim, Proceeding of HHNTI'96-Dandong, China, 568(1996)