

Theme of Session: Chemical science

Comparative Kinetic analysis on Thermal degradation of Phenolic resin and Phenolic Triazine Cyanate Ester resin

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Abstract

This study covers thermal degradation of phenolic resin and phenolic triazine cyanate ester resin by using thermogravimetric analysis (TGA). The thermal degradation data of the cured phenolic resin and cured phenolic triazine cyanate ester resin were carried out by thermogravimetric analysis at four different heating rates from 30°C to 900°C under nitrogen atmosphere. TGA curves showed that the thermal degradation of the phenolic resin occurred at three different steps and whereas thermal degradation of the phenolic triazine cyanate ester resin occurred at single step. From TGA data, it was found that phenolic triazine cyanate ester resin has higher thermal stability and char yield than the phenolic resin. The kinetics parameters, such as activation energy and pre exponential factor of phenolic resin and phenolic triazine cyanate ester resin were determined by Flynn-Wall-Ozawa (FWO) kinetic model as per ASMT E1641. The kinetic parameters of two resins were compared. It was observed that activation energy for 10 % degree of decomposition for phenolic triazine cyanate Ester resin is higher than that of phenolic resin and this indicates that phenolic triazine cyanate ester resin has higher thermal stability than the phenolic resin.

Keywords: Thermogravimetric analysis (TGA). Phenolic resin, Phenolic triazine Cyanate ester, Ozawa equation, activation energy.