

Abstract Submitted  
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**Complex Cure Kinetics of the Hydroxyl-Epoxy Reaction in DGEBA Epoxy Hardened with Diethanolamine** WINDY ANCIPINK, JOHN MCCOY, New Mexico Institute of Mining and Technology, JAMIE KROPKA, MATHIAS CELINA, Sandia National Laboratories — The curing of a diglycidyl ether of bisphenol-A Epoxy (Epon 828) with diethanolamine (DEA) involves a fast amine-epoxide reaction followed by a slower hydroxyl-epoxide reaction. At curing temperatures below 100C, the time scales of these two reactions are well separated, and the hydroxyl addition can be studied as an "isolated" reaction. The hydroxyl-epoxide reaction is of great interest due to the complex kinetics involved, which are brought about by competing reactions. The reaction kinetics are believed to be tertiary amine catalyzed and are well fit to a modified form of the Kamal-type equation. Here we study the complex long term reaction kinetics at various temperatures, by using isothermal modulated differential scanning calorimetry, micro calorimetry, and infrared spectroscopy. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Windy Ancipink  
New Mexico Institute of Mining and Technology

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