

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Kinetics and physical properties of photolabile base catalyzed thiol-epoxy resins CHRISTOPHER COMER, OLIVIA MCNAIR, CHARLES HOYLE, DANIEL SAVIN, University of Southern Mississippi, School of Polymers and High Performance Materials — Typical epoxy resin systems based on multifunctional epoxides and multifunctional amines yield polymeric materials with unrivaled chemical resistance, toughness, and adhesion. Unfortunately amine cured epoxy resins must be mixed immediately prior to application because reactivity of the amine and epoxy is too high. Thiol-epoxy resins offer a less reactive alternative to these traditional epoxy resins and are catalyzed by the addition of a tertiary amine, such as DBN. In this study a combination of a diepoxide with multifunctional thiols based on mercaptoacetate (MA) and mercaptopropionate (MP) were polymerized using a photolabile base catalyst or DBN. The reactivity of the MA and MP based thiols were characterized using Real-time FT-IR. Mechanical and thermal properties of the resins were characterized using DMA, DSC, MTS, pencil hardness, and impact resistance. Thiol-cured epoxy systems have uniform network structures, as indicated by sharp $\tan \delta$ peaks and distinct glass transition region shown by DMA and DSC respectively.

Daniel Savin
University of Southern Mississippi

Date submitted: 19 Nov 2009

Electronic form version 1.4