

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Strain Rate Dependence of Compressive Yield and Relaxation in DGEBA Epoxies GABRIEL K. ARECHEDERRA, RILEY C. REPROGLE, CAITLYN M. CLARKSON, JOHN D. MCCOY, New Mexico Tech, JAMIE M. KROPKA, KEVIN N. LONG, ROBERT S. CHAMBERS, Sandia National Laboratories — The mechanical response in uniaxial compression of two diglycidyl ether of bisphenol-A epoxies were studied. These were 828DEA (Epon 828 cured with diethanolamine (DEA)) and 828T403 (Epon 828 cured with Jeffamine T-403). Two types of uniaxial compression tests were performed: A) constant strain rate compression and B) constant strain rate compression followed by a constant strain relaxation. The peak (yield) stress was analyzed as a function of strain rate from Eyring theory for activation volume. Runs at different temperatures permitted the construction of a mastercurve, and the resulting shift factors resulted in an activation energy. Strain and hold tests were performed for a low strain rate where a peak stress was lacking and for a higher strain rate where the peak stress was apparent. Relaxation from strains at different places along the stress-strain curve was tracked and compared. 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.

Riley Reprogle
New Mexico Tech

Date submitted: 14 Nov 2014

Electronic form version 1.4