Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Brillouin light scattering measurements of high modulus glasses produced by physical vapor deposition KENNETH L. KEARNS, Department of Chemistry, University of Wisconsin-Madison, TIM STILL, Max Planck Institute for Polymer Research, GEORGE FYTAS, Max Planck Institute for Polymer Research and F.O.R.T.H. Institute for Electronic Structure and Laser Technology, M. D. EDIGER, Department of Chemistry, University of Wisconsin-Madison — Physical vapor deposition was used to create low enthalpy, high density glasses of indomethacin (IMC). Brillouin light scattering was employed to measure the longitudinal and transverse sound velocities of the stable vapor-deposited glass, supercooled liquid, and the ordinary glass formed from cooling the liquid. Both Young and shear high frequency moduli were approximately 20% greater for the vapor-deposited sample as compared to the ordinary glass. The isothermal transformation of the high modulus glass to the supercooled liquid was 10,000 times slower than the structural relaxation time of the supercooled liquid at T_g+10 K. Additionally, the spectrum for both phonon polarizations broadens during the isothermal transformation, which suggests that the stable vapor-deposited glass and supercooled liquid coexist for long periods of time at a single temperature.

Kenneth L. Kearns
Department of Chemistry, University of Wisconsin-Madison

Date submitted: 21 Nov 2008 Electronic form version 1.4