

Abstract Submitted
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Pressure Dependence of the Glass Transition Temperature in the Fragile Glass Former Cumene TIM RANSOM, WILLIAM OLIVER, University of Arkansas Department of Physics — The glass transition temperature, T_g , is one of the most important characteristics of glassy systems. While T_g has been measured for many systems at atmospheric pressure, direct measurement of the glass transition is difficult at high pressures due to small sample sizes and long time scales. $T_g(P)$ measurements to date mostly involve extrapolations of high-pressure viscosity or relaxation data to $\eta = 10^{13}$ P or $t = 100$ s, respectively. In this study we present direct measurement of T_g at pressures up to several GPa through a combination of pressure gradient tracking and observation of increases in the thermal expansion coefficient upon heating from the glass to the viscous liquid state. High pressures are attained through the use of a diamond anvil cell and precise temperatures are maintained via custom heating and cryogenic systems. By directly mapping this phase boundary, we can compare models for $T_g(P)$. In addition, high-pressure analysis requiring knowledge of T_g at pressure will be greatly aided.

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