

Abstract Submitted
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Systematic Study of the Effect of Incorporation of Carbon Nanotubes into $\text{Ge}_x\text{Se}_{1-x}$ Glass System ¹ CHARI RAMKUMAR, JOHN RADEMACHER, MEHDI MILLOT, DAVID HELLMAN, JAKE ANDERSON, WAYNE BRESSER, Department of Physics, Geology and Engineering Technology, Northern Kentucky University — We successfully synthesized $\text{Ge}_x\text{Se}_{1-x}$ ($x = 0.225$) glass samples and doped the samples with commercially produced (Protein Mods) carbon nanotubes (CNTs). We investigated the glass transition temperature (T_g) using Modulated Differential Scanning Calorimetry (MDSC). The glass samples without the CNTs have a T_g of $\sim 220^\circ\text{C}$ and the T_g was found to be independent of starting materials from different suppliers as well as water-bath temperature (Fig. 1). CNTs, being a very hygroscopic material as well as oxygen absorbing material, needed to be cleaned under vacuum with the hot water-bath. We found that the T_g decreases when 5% and 10 % CNTs by mass is added to the glass samples as compared to the base $\text{Ge}_x\text{Se}_{1-x}$ glass. The decrease in T_g indicates the occurrence of an intermediate phase (reduced-stress glass phase) at lower temperature, which could be potentially useful in material science applications.

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