

Abstract Submitted
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Size Independent Glass Transition of Polystyrene Nanospheres

NICOLE SIKES, Columbus State University — The effect of confinement on the glass transition temperature (T_g) has been studied in thin films, nanocomposites, and nanoparticles. Keddie et al studied T_g as a function of film thickness and found that while T_g decreased with decreasing film thickness when the film was on a gold substrate, there was an increase in T_g with decreasing film thickness when the film was on silicon substrate. Thin films are a popular system to study; however understanding other systems is crucial to understanding the fundamental effects of confinement. Polymer nanoparticles are an attractive system due to their potential as drug delivery agents, however the studies on them are limited and the results are in poor agreement. However most researchers have claimed to find that T_g is dependent on the size of the nanoparticles. Here temperature-varied fluorescence spectroscopy was used to study the glass transition temperature of polystyrene nanospheres of varying sizes (including sizes far below what has been actively investigated in the literature) and anomalous size independent T_g for particles below a certain size was found.

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