

Abstract Submitted
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Effects of nanoparticles on chain dynamics and glass transition in athermal polymer nanocomposites¹ HYUN JOON OH, PETER GREEN, University of Michigan, Ann Arbor — Chain relaxation dynamics and the glass transition of mixtures of polystyrene (PS) homopolymer with PS-grafted gold nanoparticles were examined using broadband dielectric spectroscopy, differential scanning calorimetry and capacitive scanning dilatometry. Through changes in the nanoparticle core size, D , grafting density, σ , degree of polymerization of grafted chains, N , and the nanoparticle concentration, ϕ , both the chain relaxation time, τ , and the T_g could be induced to undergo significant changes, increases or decreases, in magnitude. These results will be discussed in light of dynamics in other polymer/nanoparticle systems. In addition, the role of particle size and the role of the melt/brush interfacial interactions on the dynamics will be discussed.

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