

Abstract Submitted
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Long-time dynamics of chains in polymer nanocomposites PETER GREEN, University of Michigan — In polymer nanocomposites (PNCs), the presence of the nanoparticles has a marked effect on the dynamics and the T_g . In one limit, the chains become strongly attached to the particles, and two glass transitions, and bimodal dynamics, may be observed. In the other, where the chain/particle interactions are weak, the chain friction factor, $z(T)$ can undergo significant changes, manifested in the translational diffusion and viscosity. In the polymethyl methacrylate (PMMA)/ C_{60} system, the dynamics slow down, accompanied by an increase in the glass transition. At the same time, the temperature dependence of the relaxations remains the same as pure PMMA. In polystyrene (PS)/Au-thiol capped PS ligands, the dynamics and the glass transition could be induced to increase or decrease, through manipulation of molecular parameters in the system. In this presentation, we propose a mechanism to describe translational diffusion and T_g in PNC systems in which the polymer chain/nanoparticle interactions are weak.

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