

Abstract Submitted
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Polymer and Nanoparticle Interactions Determining Nanocomposite Physical Properties KATHERINE BEST, UMass Amherst, CAROLINE MIESCH, JAMES WATKINS, TODD EMRICK, ALFRED CROSBY — Tailored nanoparticles provide a powerful strategy for tuning the physical properties of polymer matrices, largely due to their high surface area to volume ratio. Although this increase in interfacial area is a dominating parameter, the physical interaction between polymer chains and similarly-sized nanoparticles is not fully understood. This interaction is often mitigated with the presence of tailored polymer ligands that can be physically or chemically attached to the nanoparticle surface. Here, we focus on the effect of nanoparticle core material and associated ligand density on the physical properties of a polymer matrix. Specifically, Au and CdSe nanoparticles are surface modified with low molecular weight polystyrene (PS) and blended with a linear PS matrix. The physical properties of the tailored nanoparticles as well as the elastic moduli and glass transition temperatures of blended nanocomposites are presented.

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