Abstract Submitted
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Viscosity of Polymer Nanocomposite with Athermal Hairy Nanoparticles[1] FEI CHEN, OPHELIA TSUI, Boston Univ — We studied the zero shear viscosity of polymer nanocomposites (PNC) containing silica nanoparticles grafted with polystyrene ligands blended with polystyrene homopolymer. As the ratio of the molecular weight of the homopolymer, P, to that of the ligands, N was increased from about 0.01, we observed a transition from viscosity enforcement to viscosity reduction near P/N = 1. Interestingly, many of the samples exhibiting viscosity reduction have the dry diameter of the particles exceeding the radius of gyration of the homopolymer (i.e., $2r > R_g$), making them exceptional cases according to the viscosity phase diagram published by Kalathi et al. (Phys. Rev. Lett. 109, 198301 (2012)). We discuss whether hydrodynamic effect and plasticizer effect might have caused our observations.

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