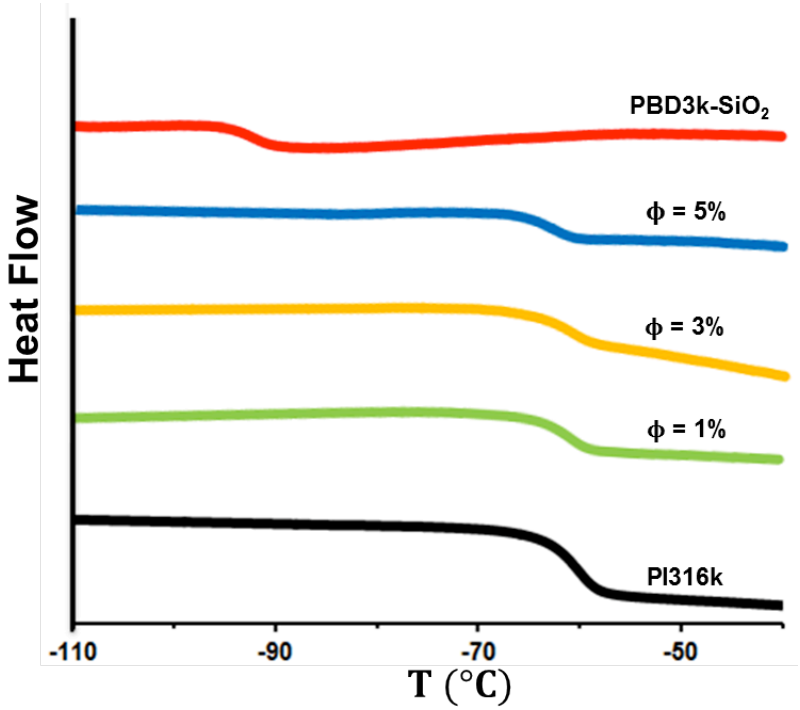
Electronic Supplementary Material (ESI) for Soft Matter

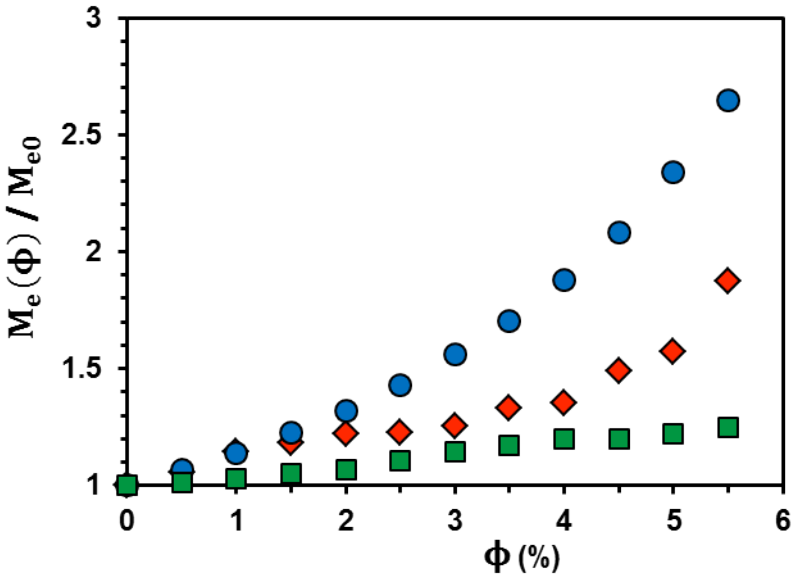
Polymer Nanocomposites: Polymer and Particle Dynamics

Daniel Kim[‡a], Samanvaya Srivastava[‡a], Suresh Narayaran[b] and Lynden A. Archer*[a]

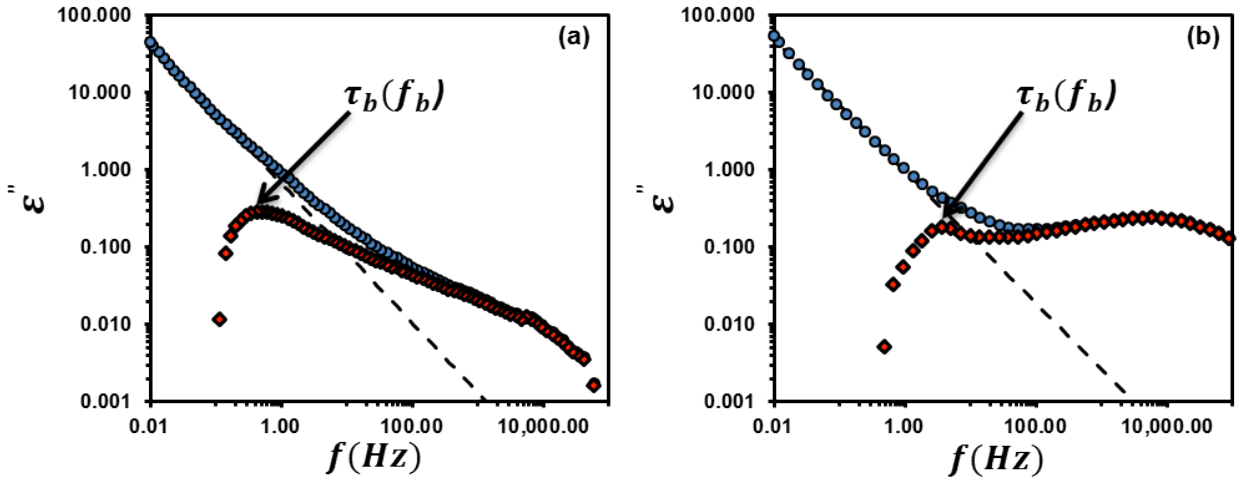
Supplementary Information



Supplementary Figure 1: DSC thermograms of SiO_2–PBD nanocomposites for PI316k, ϕ = 1%, ϕ = 3%, ϕ = 5%, and PBD3k-SiO_2. Curves are shifted along vertical axis to enhance clarity.



Supplementary Figure 2: Normalized entanglement molecular weight, $M_e(\phi)/M_{e0}$ vs. ϕ for SiO_2–PBD nanocomposites obtained from oscillatory amplitude sweep measurement (diamonds). Also, $M_e(\phi)/M_{e0}$ estimates assuming (i) all PBD chains act as plasticizer (circles) and (ii) an effective amount of PBD calculated from T_g measurement act as plasticizer (squares). M_{e0} is the entanglement molecular weight for pure PI.



Supplementary Figure 3: $\varepsilon''(f) = \varepsilon_d''(f) + \varepsilon_c''(f)$ calculation for (a) PI316k and (b) ϕ = 5% SiO_2–PBD nanocomposites. Circle symbol represents $\varepsilon''(f)$, dashed line represents $\varepsilon_c''(f)$ drawn from low frequency, and diamond symbol represents $\varepsilon_d''(f)$ which was used to find $\tau_p = (2\pi f_p)^{-1}$ where f_p corresponds to maximum in the dielectric loss spectrum, $\varepsilon_d''(f)$.