

Abstract Submitted
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Effect of Polymer Compression on Demixing of Colloid-Polymer Mixtures: Gibbs Ensemble Monte Carlo Simulation¹ SHRIKANT SHENOY, ALAN R. DENTON, Department of Physics, North Dakota State University — Phase separation of a stable colloidal dispersion can be induced by adding nonadsorbing polymers. Depletion of polymers around the colloidal particles induces an effective attraction, leading to demixing at sufficient polymer concentration. The most widely studied model of colloid-polymer mixtures is the Asakura-Oosawa (AO) model², which treats the colloids as hard spheres and the polymers as effective spheres, of fixed size, that have hard interactions with the colloids but are mutually noninteracting. To study the influence of colloid-induced polymer compression on equilibrium demixing, we incorporate size variation of polymers into the AO model. Within this extended model, we perform Gibbs ensemble Monte Carlo simulations, including size variation of polymers as a new Monte Carlo move. We compare our results with recent predictions of density-functional theory³.

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