

Abstract Submitted
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Phase Behavior of Charged Colloid-Polymer Mixtures: A Simulation Study¹ BEN LU, ALAN R. DENTON, Department of Physics, North Dakota State University — We present a Monte Carlo simulation study of mixtures of charged colloids and nonadsorbing polymers. The multicomponent mixture of colloidal macroions, microions (counterions and salt ions), polymers, and solvent is modeled as an effective two-component mixture of pseudomacroions and neutral polymers. The pseudomacroions are assumed to interact via effective electrostatic interactions² (screened-Coulomb pair potential and one-body volume energy) and the polymers are treated as effective spheres that have hard interactions with the colloids but are mutually ideal. Previous studies have identified the volume energy as the driving force for phase separation of deionized colloidal suspensions³ and polymer depletion-induced attraction as the origin of colloid-polymer demixing. Here we apply the Gibbs ensemble Monte Carlo method to the effective binary mixture to examine the combined influences of electrostatic and depletion-induced interactions on phase behavior.

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²A. R. Denton, *Phys. Rev. E* **62**, 3855 (2000).

³R. van Roij, M. Dijkstra, and J.-P. Hansen, *Phys. Rev. E* **59**, 2010 (1999); P. B. Warren, *J. Chem. Phys.* **112**, 4683 (2000).

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