

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Effect of depletant dispersity on clustering and gelation of model charged colloids¹ NA PARK, JACINTA CONRAD, Univ of Houston — Depletion interactions are commonly used to induce well-controlled attractions between colloids. The range and strength of this attraction are controlled by the size and concentration of the depletant, respectively. In earlier theoretical studies, both the range and strength of attraction could change dramatically when the depletant was not uniform in size, resulting in shifts in phase boundaries. Nonetheless, the role of dispersity on the phase behavior of colloidal suspensions remains poorly understood, with previous studies showing conflicting results. Here, we experimentally explore the effect of depletant dispersity on clustering and gelation of charged poly(methyl methacrylate) particles using unary and binary mixtures of polystyrene. When the concentration of polymer in mixtures was represented as a sum of the normalized concentrations of each polymer species, the non-equilibrium phase behavior was largely independent of polymer size and dispersity for short-ranged attractions. Disparities between sample sets with unary or binary mixtures of depletant were found near the transition from a fluid of clusters to a gel, and in a region of reentrant melting of repulsively caged particles due to short-ranged attractions.

¹NSF (CBET-1438204) and the Welch Foundation (E-1869)

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Date submitted: 11 Nov 2016

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