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Phase behavior of PNiPAM-PEG microgel suspensions JOAQUIM CLARA-RAHOLA, BENJAMIN SIERRA-MARTIN, ANDREW LYON, ALBERTO FERNANDEZ-NIEVES, Georgia Institute of Technology — Cross-linked Poly(*N*-isopropylacrylamide) (PNiPAM) microgels have been a focus of research in the last decade, with particular interest in the swelling and de-swelling response of particles with temperature, ionic strength and pH. In this work we investigate the phase behavior of PNiPAM microgels cross-linked with Poly(ethylene glycol) (PEG) in aqueous suspensions. We characterize this class of microgels at low concentrations employing light scattering techniques and find that in contrast with other cross-linkers, the properties of PEG at different temperatures result in an unusual intra-particle configuration that guarantees a repulsive interaction between particles throughout the spanned temperature range. We study the dynamic and mechanical properties of PNiPAM-PEG microgel suspensions as a function of temperature at a generalized volume fraction of $\zeta = n_p V_0 = 1.5$, with n_p the particle number density and V_0 the volume of a particle at low concentrations. Interestingly, despite we keep ζ constant, we find dramatic changes in behavior with temperature. As a result, the phase behavior of these systems also changes; it exhibits analogies and mark differences with hard sphere behavior.

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