

Abstract Submitted
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Self-assembly of Polymer-Grafted Magnetic Nanoparticles in Solutions and at Interfaces¹ SIQI LIU, TSENGMING CHOU, PINAR AKCORA, Stevens Institute of Technology — We will present the effect of increasing dipolar interactions on the morphology diagram of polystyrene-grafted iron oxide nanoparticles. Uniformity in grafting (attaching chains symmetrically on spherical particles) has important consequences on the aggregation state of large nanoparticles in solution. We will discuss the stability of polymer-grafted magnetic nanoparticles in solution prepared by grafting-to and -from methods, and compare the aggregation states (i.e. lattice framework, well-dispersed) of particles in solvent-cast films. Our results suggest that polymer-grafted particles prepared by grafting-to method aggregate and form a lattice framework. Non-aggregated and stable colloidal solutions are observed with the particles prepared by grafting-from method, which is attributed to the non-uniform distribution of tethered chains on particle surfaces. Moreover, the organization of grafted particles at liquid-air interfaces, and their spatial arrangement and packing with the application of oscillating magnetic fields will be discussed.

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