Abstract Submitted
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Structural Transitions of Polymer Grafted Magnetic Nanoparticles[1] YANG JIAO, PINAR AKCORA, Stevens Institute of Technology — We decorate iron oxide nanoparticles with polymers to investigate the various interactions between particles and particle-polymer on the formation of different morphologies. We show that very low to intermediate grafting densities (2-20 chains/particle) can be achieved by controlling the concentration of free polymer chains in solution by grafting-to method. Nanostructural transitions of poly(styrene) grafted Fe3O4 nanoparticles are investigated upon varying the grafting densities and brush lengths. The roles of these parameters as well as dipolar force in the formation of various aggregates, such as star-like shape and chains, are discussed. This morphological transition is found to be sensitive to small grafting density change in very low to intermediate regime (0.01-0.04 chains/nm2). Interestingly, the matrix shows reverse effects on nanostructures with increment of brush lengths.

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