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Self-Assembly of Polymer-Decorated Nanoparticles in the Bulk and in a Nanometric Confinement DAMIEN MAILLARD, SANAT KUMAR, Department of Chemical Engineering, Columbia University, New York, NY, PINAR AKCORA, Department of Chemical Engineering, University of Missouri, Columbia, MO — As shown previously by simulation and TEM studies in the bulk, PS grafted nanoparticles when mixed a PS matrix self-assemble into a range of superstructures. These self-assembled structures can be regrouped into a phase diagram in which the leading parameters are the particles grafting density and the molecular weight ratio of the grafted and free matrix chains. Depending on those parameters the particles can be well dispersed or aggregated in one (strings), two (interconnected sheets) or three (spherical aggregates) dimensions. Here we consider the corresponding behavior in thin films (100 nm thick) using in-situ phase contrast AFM. In addition to yielding the morphologies, this protocol allows us directly visualize the aggregation process of the particles.

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