

Abstract Submitted
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Particle-Directed Assembly of Semiflexible Polymer Chains

MICHAEL MCGOVERN, KEVIN DORFMAN, DAVID MORSE, University of Minnesota — We use molecular dynamics simulations to investigate several models of semiflexible polymers that exhibit an attractive interaction with spherical particles. The organization of semiflexible polymer chains through attractive interactions with spherical particles occurs in several important processes in nature, such as the winding of DNA around histones and counter-ion condensation of charged polymers. The process is also of technological interest in the packaging of DNA for delivery to cells. In this presentation, we will present data on both the phase behavior and the kinetics of self-assembly as a function of the stiffness of the polymers, the attractive potential between the monomers and the particles, and the relative size of the monomers and particles. Our simulations suggest a transition between globular and rod-like aggregates that changes from a gradual to a sudden transition depending on particle size, and that rod formation is a slow, nucleation dependent process.

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