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Stabilization of nanorods in polymer melts by end-adsorbed chains AMALIE L. FRISCHKNECHT[1], Sandia National Laboratories — Adsorbed or grafted polymers are often used to provide steric stabilization of colloidal particles. When the particle size approaches the nanoscale, the curvature of the particles becomes relevant, and rules of thumb based on the behavior of polymers attached to flat surfaces may no longer apply. To investigate this effect for the case of cylindrical symmetry, I use a classical density functional theory applied to a coarse-grained model to study the polymer-mediated interactions between two nanorods. The rods are immersed in a polymer melt consisting of two kinds of chains: 1) a small fraction of chains of length N with ends that are attracted to the rods so that they form a polymer brush on the rods; and 2) a matrix of chains of length P which have no interactions with the rods. Calculations of the density profiles and potential of mean force reveal the effects of curvature compared to similar calculations for chains adsorbed to flat planar surfaces.

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