

Abstract Submitted  
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**Dispersion Behavior of Au Nanorods in Polymer Thin Films Mediated by Brush-Matrix Interactions** MICHAEL J.A. HORE, RUSSELL J. COMPOSTO, Department of Materials Science and Engineering, University of Pennsylvania — Moderate volume fractions ( $\sim 5$  v%) of poly(ethylene glycol) or polystyrene-functionalized Au nanorods are incorporated into poly(ethylene oxide), poly(methyl methacrylate), or polystyrene thin films (thickness  $\sim 30$  nm). Their dispersion is characterized via TEM, AFM, and x-ray reflectivity. When the chemical species of the brush is identical to that of the matrix, nanorod dispersion is dominated primarily by entropy and controlled by the ratio of the chain lengths of the brush and matrix. When there is a favorable enthalpic interaction between the brush and matrix, the dispersion is independent of the molecular weights of the brush and matrix. These experimental data are compared to Monte Carlo simulations.

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