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Directed Nanorod Assembly Using Block Copolymer-Based Supramolecules KARI THORKELSSON, ALEXANDER MASTROIANNI, Materials Science and Engineering, University of California, Berkeley, PETER ERCIUS, National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, TING XU, Materials Science and Engineering, Chemistry University of California, Berkeley; Materials Sciences Division, Lawrence Berkeley National Laboratory — Nanorods display many unique electrical, mechanical, and optical properties unavailable in traditional bulk materials, and are attractive building blocks toward functional materials. The collective properties of anisotropic building blocks often depend strongly on their spatial arrangements, interparticle ordering, and macroscopic alignment. We have systematically investigated the phase behavior of nanocomposites composed of nanorods and block copolymer (BCP)-based supramolecules forming spherical, cylindrical and lamellar morphologies. Initial exploration showed that the nanorods can be readily dispersed in polymeric matrix and the overall morphology of nanorod-containing supramolecular nanocomposite depends on the nanorod-polymer interactions, inter-rod interactions and entropy associated with polymer chain deformation. The energetic contributions from the components of the system can be tailored to disperse nanorods with control over inter-rod ordering and the alignment of nanorods within BCP microdomains.[1] By varying the supramolecular morphology and composition, arrays, sheets, and interconnected networks of nanorods are demonstrated that may prove useful for fabrication of optically and electrically active nanodevices. 1. Thorkelsson, K. et al. Nano letters 2012, 12, 498

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