

Abstract Submitted
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Control of Nanoparticle Distribution with Directed Assembly of Block Copolymer Films HUIMAN KANG, FRANCOIS DETCHEVERRY, Dep. of Chem. and Bio. Engr., University of Wisconsin, Madison, USA., ANDREW MANGHAM, Dep. of Chem., University of Wisconsin, Madison, USA., MARK STOYKOVICH, Dep. of Chem. and Bio. Engr., University of Wisconsin, Madison, USA., ROBERT HAMERS, Dep. of Chem., University of Wisconsin, Madison, USA., JUAN DE PABLO, PAUL NEALEY, Dep. of Chem. and Bio. Engr., University of Wisconsin, Madison, USA. — Model CdSe nanoparticles, functionalized with tetradecyl phosphonic acid, were synthesized so as to preferentially segregate into the polystyrene domains of polystyrene-*block*-poly(methylmethacrylate) (PS-*b*-PMMA). Nanocomposites, composed with ternary blends (PS-*b*-PMMA/PS/PMMA) and CdSe, could be directed to assemble into defect-free and registered periodic and non-regular structures on chemically patterned substrates. CdSe nanoparticle arrays, replicating the block copolymer patterns, were obtained by removing the polymer using oxygen plasma. The location and distribution of nanoparticles in the PS domains controls depending on the blend composition, molecular weights of homopolymers and the commensurability between the chemical surface pattern and the bulk lamellar period of the composite and the experimental results are compared to prediction of single chain mean field (SCMF) theory extended to model nanocomposites.

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