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Placement Control of Nanomaterial Arrays on Surface-Reconstructed Block Copolymer Thin Films JEONG GON SON, WAN KI BAE, Seoul National University, HUIMAN KANG, PAUL F. NEALEY, University of Winconsin-Madison, KOOKHEON CHAR, Seoul National University — Nanomaterials such as nanoparticles, quantum dots and nanorods/wires have recently attracted considerable attention not only because of their unique electronic, optical, and magnetic properties depending on their size and chemical structure but also due to their possible applications to optoelectronic devices, next-generation memory devices, and biological sensors. In order to take full advantage of these useful properties for highly integrated fabrication, precise control of such nanomaterials on patterned substrates is inevitably required. In this presentation, we demonstrate a straightforward and reproducible method for the placement of nanomaterials such as nanoparticles and nanorods on patterned PS-*b*-PMMA block copolymer (BCP) thin films. This concept is based on the properties of surface-reconstructed BCP thin films, which could induce topographical nanopatterns induced by selective solvent vapor treatment without any etching process. The deposition conditions for high density nanomaterial patterns in the grooves of BCP nanopatterns were optimized. By treating the surface under electron beam irradiation, the pattern inversion of nanomaterial-containing BCP nanopatterns was also observed, which can be further processed to realize the dual nanomaterial patterning.

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