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Controlling Lateral Ordering of Block Copolymer Micelles on Nano-patterned Surface DONG-EUN LEE, DONG HYUN LEE, Dankook Univ — For nano-patterning based on self-assembly of block copolymers (BCPs), it is one of key issues to control both size and separation distance of BCP nanodomains. In this study, we demonstrate a unique method to control spatial arrays of BCP nanodomains by using nano-patterned surface produced from ordered BCP thin film. Firstly, thin films of an asymmetric polystyrene-block-poly(2-vinlypyridine) copolymer (S2VP) were prepared on water-soluble poly(vinyl alcohol) (PVA) films. After solvent-annealing to obtain either parallel or perpendicular orientation of P2VA cylinders on the PVA surface, BCP ordered structures were transferred to underlying PVA layer by oxygen RIE. Then resulting nanoporous PVA films were directly used as templates to control lateral spacing of BCP micelles. Secondly, the micelles of polystyrene-block-poly(4-vinlypyridine) copolymer (S4VP) were deposited on the PVA film and spontaneously placed in its nano-pores. Consequently, well-defined micelle arrays of S4VP with the lateral ordering of S2VP were achieved. In addition, as PVA films were completely removed by washing with water and BCP micelles were just remained. We utilized these BCP micelles as templates to fabricate nanoparticle arrays.

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