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Directed Self-assembly of High-Molecular-Weight Block Copolymer Films DU YEOL RYU, EUNHYE KIM, HYUNGJU AHN, SUNGMIN PARK, JUNE HUH, Yonsei University, JOONA BANG, Korea University, BYEONGDU LEE, Argonne National Lab., DEPARTMENT OF CHEMICAL & BIOMOLECULAR ENGINEERING, YONSEI UNIVERSITY COLLABORATION, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, YONSEI UNIVERSITY COLLABORATION, DEPARTMENT OF CHEMICAL AND BIOLOGICAL ENGINEERING, KOREA UNIVERSITY COLLABORATION, X-RAY SCIENCES DIVISION, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LAB. COLLABORATION — The solvent-vapor annealing of block copolymer (BCP) films facilitates the mobility of highly entangled polymer chains, or the path-way barriers to the formation of well-ordered structures. In this study, the microdomain orientation of BCP films has been studied by in-situ grazing incidence small angle x-ray scattering (GISAXS), atomic force microscopy (AFM), and scanning electron microscopy (SEM). We demonstrate the rapid evolution of a perpendicularly oriented lamellar morphology in high-molecular-weight (up to 1,000,000 g/mol) block copolymer films, to achieve topographically patterned BCP substrates.

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