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Long-Range Ordering of Block Copolymers on Well-Controlled Patterned Substrates DONG-EUN LEE, NAM-KYUN KIM, JINA PARK, DONGHYUN LEE, Dankook University — In this study, we achieved long-range ordering of block copolymers (BCPs) by combining solvent-annealing process and well-controlled patterned substrates. Nano-lines of poly(tetrafluoro ethylene) (PTFE) were firstly fabricated in large area as a PTFE bar was rubbed on Si substrates at 340 °C. The amplitude and pitch distance of PTFE nanolines were around 17 nm and 150 nm, respectively. Then, asymmetric polystyrene-*block*-poly(2-vinylpyridine) copolymers (PS-*b*-P2VP) were subsequently spin-coated on the patterned substrates after a thin layer of poly(vinyl alcohol) (PVA) was prepared on the PTFE patterned substrates to enhance the wettability of BCP thin films. As BCP thin films were solvent-annealed in vapor of organic solvents, highly ordered BCP nanostructures oriented either parallel or perpendicular to the surface were generated in large area. In addition, the nanopatterns were successfully transferred to the underlying PVA layer or Si substrate by dry etching. Thus, the resulting nanopatterns were utilized as templates to synthesize inorganic nanofeatures. The ordering behavior of BCP thin films on the patterned substrates was characterized by using AFM, SEM and GI-SAXS.

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