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Orientation Control of Block Copolymer Films on Rough Substrates Prepared by E-beam Lithography YOUNGWOO CHOO, HYO SEON SUH, HYUN-MI KIM, MYUNG RAE CHO, YUN DANIEL PARK, KI-BUM KIM, Seoul National University, KOOKHEON CHAR — Several researches on the perpendicularly oriented BCP thin films induced from the underlying substrates with surface roughness have been reported. In the present study, we investigated the effect of each roughness factor, such as period or depth of the roughness, on the orientation of BCP thin films. In order to control such roughness factors systematically, we introduced various lithographic techniques. The hydrogen silsesquioxane (HSQ) patterns with controlled period and depth were prepared by the Atomic Image Projection E-beam Lithography (AIPEL), which were realized by adjusting lithographic parameters of AIPEL. In addition, we also prepared silicon oxide patterns using ordinary e-beam lithography. The line width and period of patterns were finely tuned during the E-beam writing while the depth of the patterns was modified by the reactive ion etching on the patterned substrates. On the substrates with specified roughness, we deposited symmetric PS-*b*-PMMA diblock copolymers and observed the effect of individual roughness factors on the orientation of BCP thin films.

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