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A Stable Hexagonally Modulated Lamellar (HML) Structure of Asymmetric Polystyrene-b-Poly(2-vinylpyridine) in Film Geometry SUNGMIN PARK, Yonsei University, HYUNGJU AHN, Pohang Accelerator Laboratory, BYEONGDU LEE, Argonne National Laboratory, DU YEOL RYU, Yonsei University, YONSEI UNIVERSITY COLLABORATION, POHANG ACCELERATOR LABORATORY COLLABORATION, ARGONNE NATIONAL LABORATORY COLLABORATION — When a block copolymer (BCP) is confined in film geometry, the phase transitions would be different or shifted from those of the corresponding bulk. In this study, the phase transition of an asymmetric polystyrene-b-poly(2-vinylpyridine) (PS-b-P2VP) films in the presence of the strong interfacial interactions were investigated by grazing incidence small-Angle x-ray scattering (GISAXS) and transmission electron microscopy (TEM). The order-to-order transition (OOT) and order-to-disorder transition (ODT) in film geometry were influenced by the strong favorable interactions between the P2VP block and substrate, resulting in the thickness-dependent phase diagram. The phase stability of a hexagonally modulated lamellar (HML) structure was identified in film geometry, and in the films below 10Lo it was extended over the entire temperature range even above the ODT temperature of the bulk.

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