

Phase Transition Behavior of Asymmetric Polystyrene-*b*-Poly(2-vinylpyridine) in Thin Film Geometry: A Stable Hexagonally Modulated Layer Structure

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In present 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 layer (HML) structure was identified in film geometry, and in the films below  $10L_o$ , it was extended over the entire temperature range even above the ODT temperature of the bulk.