Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Surfactant Assisted Orientation of PS-b-PMMA Block Copolymer Thin Films JEONG GON SON, XAVIER BULLIARD, NANO Systems Institute - Nat'l Core Research Center, Seoul Nat'l Univ., Korea, HUIMAN KANG, PAUL F. NEALEY, Dep. of Chem. & Bio. Engr., Univ. of Wisconsin-Madison, KOOKHEON CHAR, School of Chem. & Bio. Engr., Seoul Nat'l Univ., Korea —
Block copolymers are well known to spontaneously form a wide range of nanostructures. In thin films, they are additionally affected by the presence of a substrate and a free surface. This often leads to the morphology oriented in the direction parallel to the substrate. However, for the fabrication of functional nanostructures, the perpendicular orientation is preferred. In this study, we present a new route based on the use of surfactants in order to control the morphology of polystyrene-*block*-poly(methylmethacrylate) (PS-*b*-PMMA) thin films. The addition of surfactants, interacting more favorably with the PMMA domains and modifying the surface and interfacial energy of the system, induces the perpendicular orientation of block copolymer thin film microdomains regardless of the chemistry of the substrate. For the high aspect ratio and the defect-free perpendicular orientation, we combine the surfactant assisted self-assembly with the directed self-assembly on chemically nanopatterned substrates.

Jeong Gon Son
NANO Systems Institute - Nat'l Core Research Center,
Seoul Nat'l Univ., Korea

Date submitted: 01 Dec 2006 Electronic form version 1.4