

Abstract Submitted
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Perpendicular Orientation of Nanodomains on Versatile Substrates through Self-Neutralization Induced by Star-Shaped Block Copolymers MOOSEONG KIM, SANGSHIN JANG, KYU SEONG LEE, HONG CHUL MOON, JONGHEON KWAK, JICHEOL PARK, GUMHYE JEON, JIN KON KIM, POSTECH — A novel self-neutralization concept is introduced by designing molecular architecture of a block copolymer. Star-shaped 18 arm poly(methyl methacrylate)-block-polystyrene copolymers ((PMMA-b-PS)₁₈) exhibiting lamellar and PMMA cylindrical nanodomains are synthesized. When a thin film of (PMMA-b-PS)₁₈ is spin-coated on a substrate, vertically aligned lamellar and cylindrical nanodomains are obtained without any pre- or post-treatment, although thermal annealing for a short time (less than 30 min) is required to improve the spatial array of vertically aligned nanodomains. This result is attributed to the star-shaped molecular architecture that overcomes the difference in the surface affinity between PS and PMMA chains. Moreover, vertical orientations are observed on versatile substrates, for instance, semiconductor (Si, SiOx), metal (Au), PS or PMMA-brushed substrate, and a flexible polymer sheet of polyethylene naphthalate.

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