

Abstract Submitted  
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**Spontaneous Evolution of Nanostructure in Composite Films  
Consisting of Mixtures of Two Different Block Copolymer Micelles**

SE-HEE KIM, Interdisciplinary Program in Nanoscience and Technology, Seoul National University, KOOKHEON CHAR, School of Chemical and Biological Engineering, Seoul National University, BYEONG-HYEOK SOHN, Department of Chemistry, Seoul National University — Diblock copolymers consisting of two immiscible polymer blocks covalently bonded together form various self-assembled nanostructures such as spheres, cylinders, and lamellae in bulk phase. In a selective solvent, however, they assemble into micelles with soluble corona brushes and immiscible cores. Both polystyrene-poly(4-vinylpyridine) (PS-*b*-P4VP) and polystyrene-poly(2-vinylpyridine) (PS-*b*-P2VP) diblock copolymers form micelles with PS coronas and P4VP or P2VP cores in a PS selective solvent (toluene). By varying the mixture ratio between PS-*b*-P4VP and PS-*b*-P2VP, composite films based on the micellar mixtures of PS-*b*-P4VP and PS-*b*-P2VP were obtained by spin-coating, followed by the solvent annealing with tetrahydrofuran (THF) vapor. Since THF is a solvent for both PS and P2VP blocks and, at the same time, a non-solvent for the P4VP block, PS-*b*-P2VP micelles transformed to lamellar multilayers while PS-*b*-P4VP micelles remained intact during the THF annealing. The spontaneous evolution of nanostructure in composite films consisting of lamellae layers with BCP micelles were investigated in detail by cross-sectional TEM and AFM.

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