

Abstract Submitted
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Hierachically Ordered Structures Enabled by Evaporative Self-Assembly of Confined Comb Block Copolymer MYUNGHWAN BYUN, NED B. BOWDEN, ZHIQUN LIN, FUNCTIONAL POLYMERIC NANOCOMPOSITES TEAM — We demonstrate the controlled evaporative self-assembly of an asymmetric comb block copolymer toluene solution in a wedge-on-flat geometry for generating the microscopic gradient surface patterns of comb block copolymer. These periodic hierarchically ordered structures (i.e., straight lines and punch-hole like mesh) are dictated by the height of the upper wedge lens that determines the height of capillary bridge. Upon subsequent solvent vapor treatment, morphological changes via the interplay of surface tension-driven destabilization at the micrometer scale and solvent vapor-induced microphase separation of comb block copolymer at nanometer scale are observed. As such, this facile approach offers a new platform for patterning the block copolymer thin film with various domain structures in a simple, robust, and cost-effective manner.

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