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Directed Assembly of Asymmetric Ternary Block Copolymer-Homopolymer Blends Thin Films on Checkerboard Trimming Chemical Pattern HUIMAN KANG, PAUL F. NEALEY, Department of Chemical and Biological Engineering, University of Wisconsin, Madison, WI 53706 USA — Typical 2-dimensional projections of ordered block copolymer morphologies in thin films include periodic lines or hexagonal arrays of spots and therefore may not be suitable for patterning even strictly periodic device-oriented arrays, such as checkerboard trimming patterns (alternating lines and dashed lines) used in the fabrication of dynamic random access memory (DRAM). Here we direct the assembly of asymmetric ternary polystyrene-block-poly(methylmethacrylate) (PS-b-PMMA)/homopolymer PS/homopolymer PMMA blends on checkerboard trimming chemical patterns. The degree of perfection and domain uniformity of the assembled films was quantified as a function of overall composition of PS or PMMA and total homopolymer fraction in the blends. By matching polymer volume fractions and pattern area fractions, blends composed of lamellae-forming block copolymer and substantially asymmetric fractions of the two homopolymers could be assembled into equilibrated line and dash morphologies.

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