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Transformation of the Boundary Conditions for Density Multiplication by Directed Assembly of Block Copolymer-Homopolymer Blends and Molecular Transfer Printing GUOLIANG LIU, SHENGXIANG JI, PAUL NEALEY, University of Wisconsin-Madison — Previously we determined the phase behavior of lamellae-forming poly(styrene-*block*-methyl methacrylate) (PS-*b*-PMMA) on interpolated chemical patterns in thin films. The stripe density of the chemical pattern was half of the block copolymer domain density. We observed morphologies such as parallel lamellae, vertical lamellae, mixed lamellae, PS-dots, and PMMA-dots depending on the boundary conditions: the pattern stripe width and the interfacial energies between the blocks and the pattern stripes. Here we found that the block copolymer domain width of vertical lamellae exhibited a bimodal behavior. By directed assembly of block copolymer-homopolymer ternary blends and subsequent molecular transfer printing, the boundary conditions of the chemical patterns were transformed. The printed chemical patterns had a stripe density and a stripe width matching with block copolymer domains. The interfacial energies of the stripes were favorable to the block copolymer domains. Directed assembly of block copolymer on this new chemical pattern removed the domain bimodal behavior and improved the three dimensional block copolymer domain profiles.

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