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Enhancing commensurability using cylinder-forming block copolymer-homopolymer ternary blends on spotted chemical patterns HUIMAN KANG, PAUL F. NEALEY, Department of Chemical and Biological Engineering, University of Wisconsin, Madison WI 53706 — Self-assembly of block copolymers can be directed by underlying chemical patterns to create well-defined nanostructures with registration and a high degree of order, and is extremely useful for multiplying feature density from the pattern, if the pattern spacing and surface chemistry are carefully selected. Best hexagonal order of cylinder-forming pure polystyrene-*block*-poly(methyl methacrylate) (bulk inter-cylinder spacing L_0) on spotted chemical pattern (inter-spot spacing L_S) is typically achieved within the range of $0.96L_0 \leq L_S \leq 1.06L_0$ of the pattern and even narrower range for the density multiplication technique. Using ternary blends of block copolymer and low molecular weight homopolymers increase the range of L_S for which direct hexagonal cylinders with registration on the spot patterns, up to $\pm$ 10% from L_0, although the blends have similar L_0 with pure block copolymer. Additionally, inclusion of homopolymers relaxes the commensurability requirements for multiplying the cylinder density on the spot patterns.

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