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Tetragonal Ordering in Block Copolymer-Homopolymer Blend Films Laterally Confined in a Square Well SU-MI HUR, CARLOS GARCÍA-CERVERA, ED KRAMER, GLENN FREDRICKSON, UCSB — Self-consistent field theory (SCFT) simulations are presented for a melt blend of AB diblock copolymers and A homopolymers in a thin film confined to a square well. The work aims to guide self-assembly towards tetragonal ordering, which is a pattern of technological interest in block copolymer lithography. By using suitable A homopolymer additives, we have succeeded in achieving square lattices of cylinders not observed in the confined or bulk pure diblock system. A phase diagram is presented that shows the region of stability of the tetragonal phase as a function of chain length and volume fraction of the homopolymer additive, in addition to several other interesting phases that result from a competition between surface and bulk contributions to the free energy. Results are also presented on the effect of line edge roughness in the square confinement well on the achievement of robust and defect free tetragonal order.

Su-Mi Hur
UCSB

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