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Nano-structures of block copolymers under confinement JIE FENG, Department of Polymer Engineering, University of Akron, ELI RUCKENSTEIN, Chemical and Biological Engineering Department, State University of New York at Buffalo — By employing a bond fluctuation lattice Monte Carlo simulation, block copolymers confined in nano-cylindrical cavities are studied. The effects of preference of the surface for segments and incompatibility between different blocks as well as the symmetry of the chains and the ratio of cavity diameters to the lamellae period of copolymers in the bulk (D/L_0) are investigated in detail. Numerous novel morphologies such as complicated helical structures, plate morphologies with fins and dendrites etc are presented in this work. Some phase diagrams regarding above parameters are provided in order to understand the transitions between structures. Additionally, the orientation parameters indicating the alignments of the polymer chains were calculated and correlated with the morphologies. The simulation results are compared with experimental results qualitatively.

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