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Hard-Surface Effects in Diblock Copolymer Systems DONG MENG, YUHUA YIN, JACQUELINE ACRES, QIANG WANG, Colorado State University — Polymer chains near a hard (impenetrable) surface have different conformations from those in the bulk. For diblock copolymers (DBC), a hard surface has both energetic and entropic effects. The decrease of polymer segmental density near a hard surface reduces A-B repulsion and favors self-assembled morphologies with more A-B interfaces near the surface, while the enrichment of chain ends and depletion of middle segments near the surface favor parallel morphologies where chains orient mainly perpendicular to the surface. Using parallel self-consistent field calculations with high accuracy, we have studied in detail the hard-surface effects in three DBC systems: DBC thin films confined between two flat homogeneous surfaces, DBC in nanopores, and DBC nanocomposites.

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