

Abstract Submitted
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Process-directed self-assembly of copolymers MARCUS MULLER, Georg-August University, Goettingen, Germany, JIUZHOU TANG, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China — Using computer simulation and numerical self-consistent field theory of an unentangled diblock copolymer melt, we study the interplay between relaxation of molecular conformations from a highly stretched, non-equilibrium state and structure formation of the local, conserved density during self-assembly from a disordered state. In agreement with experiments, we observe that the planar elongation of molecular conformations in the initial, disordered state results in an alignment of lamella normals perpendicular to the stretch direction during the subsequent self-assembly. Although thermodynamically the parallel orientation is favored by the non-Gaussian conformations, the alignment of the lamella normal perpendicular to the stretch direction is characterized by the larger growth rate of composition fluctuations during the spinodal ordering process. Theoretical approaches to account for the transient, non-Gaussian conformations are discussed.

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