Directed Self-Assembly of Block Copolymer Blends for Multiple Bend Patterning : a Monte Carlo Simulation

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Block copolymers (BCPs) or their blends have emerged as one of the ideal materials for creating nanopatterned structures. The current BCP nanotechnology has expanded to configure various nonlinear lithographic patterns (e.g. bends, jog, T-jungction) that are able to guide the BCP self-assembly into a desired pattern.

In this study, we report a simulation work on the bend patterns formed by chemo- or grapho-epitaxial assembly of block copolymer blend using a Monte Carlo simulation with 8-site bond fluctuation model. The bend-pattern formation is investigated varying various molecular or system variables associated with BCP blends and guide pattern (mixing ratio of BCP blend, pitch of guide pattern, etc). The present work provides a guiding principle to design bend guide patterns for the directed self-assembly (DSA) of block copolymers and their blends, which is useful for nanopatterning applications such as nanoelectronics.