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2.4 . Block Copolymer In situ Topcoat Applications2.5 . DSA Applications; 2.6 . High chi block copolymers; 2.7 . Conclusions; Acknowledgments; References; Chapter 3: Thermal and solvent annealing of block copolymer films; 3.1 . Introduction; 3.2 . Thermal annealing of BCPs films; 3.2.1 . Fundamental consideration; 3.2.2 . Film thickness effect and temperature gradient; 3.2.3 . Crystallization behavior induced by thermal annealing; 3.3 . Solvent annealing of BCPs films; 3.3.1 . Fundamental consideration; 3.3.2 . Factors affecting the annealing process
3.3.3 . Combination of solvent annealing and thermal annealing3.4 . Summary and outlook; References; Chapter 4: Field-theoretic simulations and self-consistent field theory for studying block copolymer directed self-assembly; 4.1 Introduction; 4.2 Overview of field-theory-based simulations of block copolymer DSA; 4.3 Chemoepitaxy modeling; 4.4 Graphoepitaxy modeling; 4.4.1 Cylinders in a rectangular trench; 4.4.2 Contact hole shrink; 4.5 Summary and outlook; References; Part Two: Templates and patterning for directed self-assembly
Chapter 5: Directed self-oriented self-assembly of block copolymers using topographical surfaces5.1 . Introduction; 5.2 . Control of interfacial interactions; 5.3 . Graphoepitaxy; 5.3.1 . Fabrication of topographical surfaces; 5.3.2 . Geometry with deep patterning; 5.3.2.1 . Deep trench surfaces; 5.3.2.2 . Post surfaces; 5.3.2.3 . Other surfaces; 5.3.3 . Geometry with minimal patterning; 5.3.3.1 . Faceted surfaces; 5.3.3.2 . Shallow trench surfaces; 5.4 . Application of BCPs guided by topographical surfaces; 5.5 . Summary and outlook; References
Chapter 6: Directed self-oriented self-assembly of block copolymers using chemically modified surfaces

Sommario/riassunto

The directed self-assembly (DSA) method of patterning for microelectronics uses polymer phase-separation to generate features of less than 20nm, with the positions of self-assembling materials externally guided into the desired pattern. Directed self-assembly of Block Co-polymers for Nano-manufacturing reviews the design, production, applications and future developments needed to facilitate the widescale adoption of this promising technology. Beginning with a solid overview of the physics and chemistry of block copolymer (BCP) materials, Part 1 covers the synthesis of new materials and new