

Self-Assembled Nanostructure of Binary Blends of Diblock Copolymer

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Block copolymers spontaneously microphase separate to form ordered structures including spheres, cylinders, and lamellae with lattice periods on the order of 10–50 nm. The morphology, size and lattice period formed microphase separation depends on the volume fraction of the two blocks and the overall molecular weight of the block copolymer chain. In thin films block copolymer can be used as templates for nanofabrication. Block copolymer lithography has been used to fabricate the semiconductor quantum dots, magnetic storage media and photovoltaics. Here we investigate self-assembly of binary of diblock copolymer to shift the lattice period of the block copolymer domains. Lamellar period of the blend of diblock copolymer is tuned between the bulk lamellar periods of two block copolymers. Binary blends of diblock copolymers serve as an effective template to achieve multiple length scales in the self-assembly of block copolymer thin films.