

Size Control and Registration of Nano-structured Thin Films by Cross-linkable Unit

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Polymer thin films from cross-linkable PS-*b*-PMMA copolymers containing reactive BCB functionality were prepared by thermal annealing and subsequent cross-linking at higher temperatures, leading to robust thermoset, nano-structured thin films. By controlling the extent of cross-linking, either by varying the concentration of the BCB or by limiting the extent of cross-linking, a simple route to control the feature size of the microdomains was shown. Multi-layered cross-linked thin films of the BCP were also fabricated where the microphase separation of adjacent layers were in registry, leading to a propagation of the orientation and ordering of the thin film over large distances. This opens a simple route to generate films with 3-dimensional structure with controlled placement of elements.