

Block copolymer thin films for nanopatterning applications

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Polymers in thin films (i.e. 100 nm and below) are an exciting type of materials since they can exhibit different properties compared to the bulk, due to limited amount of matter and surface interactions. Consequently, phenomenon like glass transition, crystallization, phase separation, nanostructuration arising from self-organization of block copolymers, or even swelling in solvent vapors can be greatly affected in thin films. In this presentation, we will focus on the microphase segregation observed in thin films of block copolymers that can be used to form nanopatterns similar to the elements defined in conventional lithographic processes, allowing to go beyond the characteristic length limits imposed by more conventional devices fabrication techniques. This talk will review the elaboration, characterization and applications of block copolymer thin films. We will particularly focus the presentation on the control of the morphology of the polymeric systems by exposure to solvent vapors and exemplified some specific properties arising from the thin film configuration.