

Novel Block Copolymer Morphologies Studied by GISAXS

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This talk will present emerging strategies for constructing three-dimensional nanostructures whose shapes and symmetries go beyond those of the bulk equilibrium diblock copolymer phase diagram. Photo-thermal methods are used to direct the order and orientation of block copolymer ordering; ordered layers can be stacked to yield new lattice symmetries. This multi-layered ordering strategy can also be performed in a responsive mode, where each self-assembled layer templates the ones that follow. The responsiveness of self-assembling materials is further highlighted by studying the pathway-dependence of ordering. Grazing-incidence x-ray scattering (GISAXS/GTSAXS) is used to probe the three-dimensional order in these multi-layered nanostructures. Taken together, these new motifs represent a toolbox for constructing 3D nanostructures with symmetries and complexity beyond conventional self-assembled morphologies.

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