Abstract Submitted
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Hierarchical assembled nanostructures of hydrogen-bonded supramolecular block copolymer thin films.[1] XIAOFANG CHEN, YONGCHEN CAI, Soochow University — Controlling the microdomain orientation and long-range ordering in block copolymer thin films is very important in a number of applications, such as nanotemplate, nanoporous thin film, and data storage media. The hierarchical assemblies of block copolymers PS-*b*-P4VP with dendronized small molecules (DM) hydrogen-bonded onto P4VP blocks were investigated in thin films after solvent vapor annealing. P4VP/DM could form lamellar or hexagonal columnar structure with the periodicity around 8 nm, depending on the stoichiometry of the complex. Hierarchical assemblies of PS-*b*-P4VP(DM)x, including lamellae-within-lamellae, cylinder-within–lamellae, and cylinder-within-cylinder, were simultaneously ordered and oriented in thin films, which have been studied systematically with the help of AFM, TEM and GISAXS technologies. The orientation of supramolecular assembly depends on the P4VP(DM) fraction and can be tailored by varying the DM to P4VP ratio. Structural transitions from cylinders of (P4VP/DM), lamellae, to cylinders of PS could be achieved by simply increasing the ratio of DM to 4VP units in block copolymer systems.

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