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H-bonding tuned phase transitions of a strong microphase-separated polydimethylsiloxane-*b*-poly(2-vinylpyridine) block copolymer

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ABSTRACT: The phase behaviors of a polydimethylsiloxane-*b*-poly(2-vinylpyridine) block copolymer (PDMS-*b*-P2VP, DV) tuned by the supramolecular self-assembly approach with the 1-pyrenebutyric acid (PBA) as additive were investigated. The PDMS-*b*-P2VP block copolymer (D_{10k}V_{12.5k}, the molecular weight of the PDMS and P2VP were 10000 and 12500 g mol⁻¹, respectively) with volume fraction of P2VP (f_{P2VP}) of 52% exhibited hexagonally perforated layer (HPL) morphology after dried from the solution, and the nanostructure transformed to gyroid structure after thermal annealing above 140 °C, which were indicated by the small-angle X-ray diffraction (SAXS) and transmission electron microscopy (TEM) results. Through solution

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