Complementary multiple hydrogen bonding in Nucleobase-functionalized block copolymer blend system

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Reversible addition-fragmentation chain-transfer polymerization was employed to synthesize nucleobase-functionalized block copolymers polystyrene-b-poly(1-(4-vinylbenzyl)thymine) and polystyrene-b-poly(9-(4-vinylbenzyl)adenine). Polymers containing nucleobases have complementary multiple hydrogen bonding between nucleobases. The strong multiple hydrogen bonding is expected to has an effect on phase behavior of block copolymer blends. In addition, when we change base pair from thymine-adenine to guanine-cytosine, strength of the hydrogen bonding can be controlled. We characterized block copolymers using GPC and NMR, morphological development of the block copolymers was studied using TEM and lamellar structure of polystyrene-b-poly(1-(4-vinylbenzyl)thymine) was observed.