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Phase behavior of the blend of rod-coil block copolymer with the corresponding coil homopolymer CHIA-SHENG LAI, National Tsing Hua University, CHUN-CHIH HO, WEI-FANG SU, National Taiwan University, HSIN-LUNG CHEN, National Tsing Hua University — We investigated the self-assembly behavior of the blends of a rod-coil block copolymer DEH-PPV-*b*-PMMA with the PMMA homopolymers (h-PMMA) with various molecular weights to clarify how the rigidity and self-organization of the rod block would affect the morphologies and the phase behavior comparing with those of coil-coil block copolymer blending. SAXS/WAXS along with TEM were used to reveal the nanostructure in detail. In the case of the blends with h-PMMA with lower molecular weight, the morphology was strongly dependent on the interplay between microphase separation and nematic interaction. The h-PMMA tended to localize into the middle of PMMA nanodomain and formed a lamellar structure irrespective of the volume fraction of h-PMMA. At high volume fraction of h-PMMA, a sponge phase was found to coexist with the lamellar structure. The interdomain spacing increased with the overall PMMA content. Macrophase separations became dominate in the blends with h-PMMA of high molecular weight. WAXS studies of the blends indicated the amorphous h-PMMA reduced the correlation of the rod-rod ordered packing. Upon heating, the lamellar structure transformed into a disordered state, and the T_{ODT} was found to be reduced by adding h-PMMA with lower molecular weight.

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