

Abstract Submitted
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Synthesis and Self-Assembly of Rod₂Coil Miktoarm Star Copolymers of Poly(3-dodecylthiophene) and Poly(methyl methacrylate) with high rod fractions JICHEOL PARK, Pohang Univ of Sci & Tech, HONG CHUL MOON, University of Minnesota, CHUNG-ROYNG CHOI, JIN KON KIM, Pohang Univ of Sci & Tech — Poly(3-dodecylthiophene)-*b*-poly(methyl methacrylate) diblock copolymer (P3DDT-*b*-PMMA) can self-assembled into various microdomains such as spheres, cylinders, and lamellae depending on weight fraction of P3DDT. However, only fibril morphology was formed when weight fraction of P3DDT (w_{P3DDT}) was major ($w_{\text{P3DDT}} \sim 0.76$). Here, we introduce a new approach to obtain microdomain structures even at high w_{P3DDT} by using well-defined A₂B miktoarm star copolymer composed of P3DDT and PMMA ((P3DDT)₂PMMA). We found via small angle X-ray scattering and transmission electron microscopy that (P3DDT)₂PMMA showed PMMA cylinder packed hexagonally in the matrix of P3DDT and body-centered-cubic spheres of PMMA for w_{P3DDT} of 0.66 and 0.75, respectively. This because of much reduction of the rod-rod interaction in (P3DDT)₂PMMA compared with P3DDT-*b*-PMMA diblock copolymers.

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