

Abstract Submitted
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The Microphase Separation of Conjugated Diblock Copolymers and their Application to Organic Photovoltaics DIAN CHEN, Polymer Science and Engineering Department, University of Massachusetts-Amherst, SERKAN YURT, DHANDAPANI VENKATARAMAN, Chemistry Department, University of Massachusetts-Amherst, THOMAS RUSSELL, Polymer Science and Engineering Department, University of Massachusetts-Amherst — Conjugated diblock copolymers with different block ratios (P3HT-b-PrT) were synthesized via GRIM polymerization. The PrT block is amorphous due to the substitution of the hexyl group in P3HT with an alkyl silane group, which drives the microphase separation of the polythiophenes-based block copolymer and the variation in the crystallinity between the two blocks. Thermal and solvent annealing were used to control the self-assembly of the BCPs and the orientation of the P3HT crystals, while the domain size was controlled by the block molecular weights. The BCPs were blended with n-type semiconductors, like phenyl-C61-butyric acid methyl ester (PCBM), which segregated to the amorphous domains by solvent and heat treatment. Such heterojunction structure could lead to high-performance organic photovoltaics.

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