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Self-Limiting Crystal Microstructure in Poly(3-hexylthiophene) CHAD SNYDER, RYAN NIEUWENDAAL, DEAN DELONGCHAMP, JESSICA HENRY, Polymers Division, National Institute of Standards and Technology — Polymeric semiconductors, such as poly(3-hexylthiophene-2,5-diyl) (P3HT), hold great potential for a variety of technologies. These solution processable materials are promising as active layers for low cost or large area flexible electronic or optoelectronic devices that can be prepared through high-throughput deposition processes, such as inkjet or roll-to-roll printing. Of the myriad of materials currently under examination, P3HT is one of the most widely studied materials because of its electronic properties and commercial availability. However, most, if not all, commercially available P3HT is produced with some non-negligible level of regiodefects that has a predefined impact on its crystalline fraction. We examine the effect of regiodefects in P3HT on the semicrystalline microstructure, i.e., lamellar thickness and distribution, and overall crystallinity, and discuss the impact of these effects on potential device performance and bulk heterojunction morphology.

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