

Abstract Submitted  
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**Face-on and Edge-on Orientation Transition and Self-epitaxial Crystallization of All-conjugated Diblock Copolymer<sup>1</sup>** HUA YANG, YANCHUN HAN, Chinese Academy of Sci (CAS) — The orientation transition and self-epitaxial crystallization of all-conjugated diblock copolymers poly(p-phenylene)-block-(3-hexylthiophene) (PPP-*b*-P3HT, BmTn) were systematically investigated by in-situ temperature-resolved two-dimensional grazing incidence X-ray diffraction (2D GIXD) in step-by-step heating and cooling process. B39T18 was selected, the results of 2D GIXD showed that the PPP block crystal adopted a face-on orientation while the crystallization of P3HT block was hindered in as-casted films. Three different molecular orientations transition were obtained in self-epitaxial crystallization circles. First, P3HT crystallize with edge-on during the heating process and induced the PPP blocks crystallized with edge-on during the cooling process. Then, the as-casted film was heated in the melting temperature region of PPP blocks and isothermally crystallized. The partial melting of PPP blocks promoted the P3HT blocks crystallize in a face-on due to the steric limitation effect, PPP blocks crystallized with a face-on via the self-epitaxy during cooling. Furthermore, the face-on transformed to thermodynamically stable edge-on in the melt annealing process.

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