

Abstract Submitted
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The effect of chain architecture and additive processing on the performance of BHJ solar cells JAMES T. ROGERS, KRISTIN SCHMIDT, JEFF PEET, ROBERT COFFIN, GUILLERMO C. BAZAN, EDWARD J. KRAMER, UC Santa Barbara — The bulk heterojunction morphology (BHJ) of certain polymer-fullerene blends has enabled the development of solution processable plastic solar cells which promise to make solar energy a more economically viable renewable energy source. To study the morphological changes induced by additive processing of these devices, a novel class of donor-acceptor type polymers has been developed whose performance is greatly improved upon the incorporation of an additive. Synthetic control over three highly analogous polymers has enabled a systematic and quantifiable comparison of the influence of several important polymer structural perturbations on the morphology of additive processed films. The distribution of components and interfacial structure of these additive processed devices was investigated using resonant soft x-ray reflectivity (RSoXR) and near edge x-ray absorption fine structure (NEXAFS) techniques. These techniques reveal how the changes in chain architecture affect chain orientation relative to each interface and how additives influence the depth distribution of components.

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