Abstract Submitted
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$\pi-$Conjugated Copolymers of Thiophene: Effect of Chain Architecture on the Physical and Optoelectronic Properties for Photovoltaic Applications JOJO AMONOO, EMMANOUIL GLYNOS, CHELSEA CHEN, ANTON LI, JONAS LOCKE, ANNE MCNEIL, PETER GREEN, University of Michigan, Ann Arbor, JOJO AMONOO, EMMANOUIL GLYNOS, CHELSEA CHEN, ANTON LI COLLABORATION, JONAS R. LOCKE COLLABORATION — We found that polymer chain architecture strongly influences phase separation capabilities of the donor-acceptor blend in bulk heterojunction organic photovoltaic devices. Ni-catalyzed controlled polymerization was utilized to access new conjugated copolymers of 3-hexylthiophene and 3-(hexyloxy)methylthiophene, two donor polymers. Monomer sequence was controlled along the copolymer chain by the rate of addition of the comonomers, to achieve diblock, random and gradient copolymer chain architectures. This allowed us to study the effect of copolymer sequence of polythiophene based copolymer/[6,6]-phenyl-C61-butyric acid methyl ester (PCBM) blend on the structure, nanoscale morphology and local charge transport properties using conductive and photoconductive atomic force microscopy. The gradient configuration showed the largest phase separation behavior with PCBM.

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