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**Solvent-Polarity-Induced Active Layer Morphology Control in Crystalline Diketopyrrolopyrrole-Based Low Band Gap Polymer Photovoltaics** SUNZIDA FERDOUS, FENG LIU, Polymer Science and Engineering, University of Massachusetts - Amherst, DONG WANG, THOMAS RUSSELL, Polymer Science and Engineering, University of Massachusetts - Amherst. Advanced Institute for Materials Research, Tohoku University — The effects of various processing solvents on the morphology of diketopyrrolopyrrole (DPP)-based low band gap polymer (PDPPBT) and phenyl-C71-butyric acid methyl ester (PC71BM) blends are studied. The quality of the processing solvents was varied systematically using a mixture of a non-aromatic polar primary solvent with high boiling point secondary solvents of increasing polarities. An unfavorable solvent-PC71BM interaction affects the growth process of polymer crystallites inside the blend. When non-aromatic polar solvent was used, large PC71BM aggregates were formed that increase in size with the addition of non-polar secondary solvents. When polar solvents were instead used as the secondary solvents, the size scales of the aggregates decrease markedly, creating a percolated fibrillar network. Power conversion efficiencies of 0.03% to 5% are obtained, depending on the solvent system used.

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