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Stoichiometry and Performance in PCDTBT:Perylene Solar Cells

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Stoichiometry and Performance in PCDTBT:Perylene Solar Cells

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Abstract

The bulk heterojunction solar cell has been developed for many decades. The electron acceptor is one of the key performance in this solar cells, typically using fullerene derivatives. However, the free fullerene solar cell has been proposed using difference acceptor molecule. Herein, the morphology in bulk heterojunction PCDTBT:Perylene thin films of varied stoichiometry (1:1, 1:2 and 1:4 PCDTBT:Perylene) and PCDTBT:PC70BM thin films is investigated and compared using Atomic Force Microscopy (AFM). PC70BM and a novel Perylene are electron acceptor and transporting molecules in polymer based solar cells. This Perylene derivative have been firstly used as electron acceptor in solar cells. The optical and energetic properties of perylene suggest that this molecule may be a good candidate for electron acceptor. The solar cell performance of varied electron acceptor and stoichiometry is reported and correlated with the morphology of thin films.

Keywords: polymer solar cells, perylene, stoichiometry, bulk heterojunction

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