

Characterization of PTB7-Th:PC71BM bulk heterojunction solar cells: influence of blend ratio

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Organic photovoltaic devices are a promising source of green energy. In such cells the generated excitons are separated by the electric field built up by the difference in work functions at the interfaces between the polymer (PTB7-Th) and the fullerene (PC71BM). Thus, a crucial parameter for solar cell performance is the morphology of the polymer-rich (or fullerene-rich) domains.

The ratio between the two materials has been varied and the optical properties of resulting films have been characterized via UV-Vis absorption and photoluminescence. The surface morphology has been investigated with AFM and optical microscope. The inner film morphology has been examined by GISAXS. Additionally, the vertical material composition has been inspected via X-rays reflectivity and a deeper sight into the crystalline structure via GIWAXS. Finally, the solar cells performances have been tested via current-voltage characterization and external quantum efficiency (EQE).

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