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In-situ printing of PBDB-T-SF:IT-4F for application in high-efficiency organic solar cells

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Printing of active layers of organic solar cells is one possible way to overcome the challenge of up-scaling, which is the main drawback in the field of organic photovoltaics on their way to marketability. Thin layers of PBDB-T-SF:IT-4F, a conjugated high-efficiency polymer and a non-fullerene small molecule acceptor, which can achieve a power conversion efficiency of 13 % are printed with a meniscus-guided slot-die coater. As the solar cell performance is influenced significantly by the morphology of the active layer, it is important to understand the mechanism of structure formation during printing and drying of the active layers to enable a further optimization of the solar cell performance. Meniscus guided slot die coating of PBDB-T-SF:IT-4F is studied in situ with grazing incidence small angle X ray scattering (GISAXS), optical microscopy and UV/Vis spectroscopy to give an insight into the morphology evolution and drying kinetic of active layers.

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