

Performance evaluation of PTB7:PC₇₁BM based organic solar cells fabricated by spin and spray coating method

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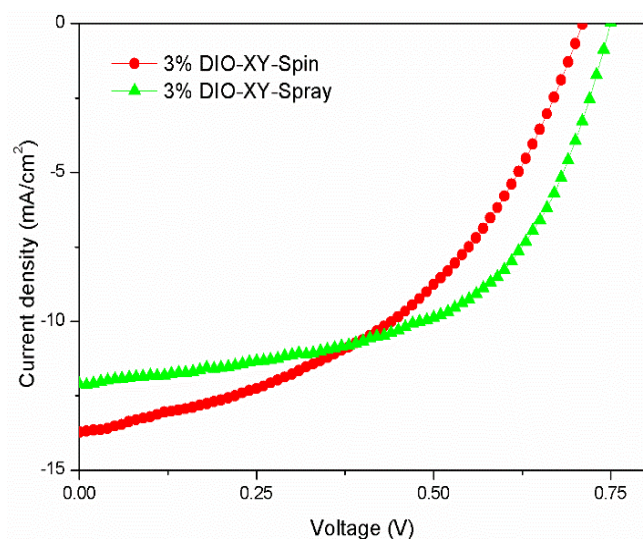


Figure J-V characteristics of PTB7:PC₇₁BM based OTFSC by spin and spray coating method.

Processing of polymer solar cells with chlorine free solvents are desirable to reduce environmental issues. In this work, we fabricate the high performance polymer solar cell of PTB7:PC₇₁BM based bulk-heterojunction device by spin and spray coating method using xylene and chlorobenzene with additive. The absorption and surface morphology of the active layers were investigated by UV-visible spectroscopy and atomic force microscopy (AFM), respectively.

Photovoltaic performance of chlorine free solvents yielding highest power conversion efficiencies (PCE= 5.07 %) by spray coating method than spin coating method (4.47%). The enhancement of performance of the polymer solar cell could be attributed to the improved the charge carrier transportation. The spray-coating device exhibit higher performance with more uniform film can be applied to the roll-to-roll and it is considered to be an alternative of conventional spin coating. The combination of chlorine-free solvents and spray-coating minimize the waste material and reduce environmental problem in large-area production of Organic Solar cell (OSC).