Fabrication and processing of polymer solar cells: A review of printing and coating techniques

Polymer solar cells are reviewed in the context of the processing techniques leading to complete devices. A distinction is made between the film-forming techniques that are used currently such as spincoating, doctor blading and casting and the, from a processing point of view, more desirable film-forming techniques such as slot-die coating, gravure coating, knife-over-edge coating, off-set coating, spray coating and printing techniques such as ink jet printing, pad printing and screen printing. The former are used almost exclusively and are not suited for high-volume production whereas the latter are highly suited, but little explored in the context of polymer solar cells. A further distinction is made between printing and coating when a film is formed. The entire process leading to polymer solar cells is broken down into the individual steps and the available techniques and materials for each step are described with focus on the particular advantages and disadvantages associated with each case.

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