

Influence of Physical Pressing Processes on the Performance of Organic Solar Cells

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Organic solar cells with polymeric bulk heterojunction (BHJ) layers, of which electron-accepting molecules are either fullerenes or nonfullerenes, have been extensively studied because of their feasible futures for ultrathin and flexible solar modules that can be manufactured without vacuum system by applying wet-coating fabrication processes such as spin-coating, ink-jet printing, spray coating, slot-die coating, etc. The power conversion efficiency of such BHJ polymer solar cells has recently reached 13~14% due to new organic materials and sophisticated device architectures, but the stability (lifetime) is still one of the big issues to overcome for commercialization. Apart from the efficiency competition, our group has devoted to develop viable fabrication processes by introducing physical pressing technology that can mechanically strengthen the BHJ layers and may make micro/nano-structures on the surface of the BHJ layers. This presentation will shortly introduce a couple of our studies on the physical pressing technology and discuss its influence on the performance of polymer solar cells.