

Solvatochromic Effect of Dipolar and Common Additives on PCDTBT:PC₇₀BM Organic Photovoltaic Cells

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Polymer solar cells (PSCs) having donor-acceptor bulk heterojunction (BHJ) is one of the convenient solution for the world energy demand. Herein, bulk heterojunction solar cells were fabricated using the blend of PCDTBT and PC₇₀BM in 1,2-dichlorobenzene with the device structure of ITO / PEDOT:PSS / PCDTBT:PC₇₀BM / BCP / Al. Effect of dipolar dopants such as dimethylsulfoxide (DMSO) and dimethylformamide (DMF) and common dopants such as 1,8-diiodooctane (DIO) and 1,8-octanedithiol (OT) as processing additives on the performance of PCDTBT:PC₇₀BM based BHJ solar cells were studied and compared in terms of current density, open-circuit voltage and power conversion efficiency. In order to study the effect of additives on the morphology of the devices AFM and SEM were investigated. The addition of additives, donor/acceptor ratio and the solvent have a large influence on the morphology of PCDTBT:PC₇₀BM devices, thereby increasing the performance than the pristine devices.