



Stabilizing polymer-based bulk heterojunction solar cells via crosslinking

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The active layer of a polymer photovoltaic cell is mainly based on a blend of two components: a semiconducting polymer (electron donor) and a fullerene derivative (electron acceptor) to form the bulk heterojunction (BHJ). To offer optimum photovoltaic performances, the morphology of this layer has to be very carefully controlled at the nanoscale. The materials of the BHJ require specific phase segregation enabling the optimum photogenerated exciton diffusion and dissociation, and also to ensure pathways for charge carriers to electrodes. However, such a specific morphology is thermodynamically unstable over time and phase segregation occurs with thermal cycling under solar operating conditions inducing a decrease of solar cell efficiency. This review reports on the recent progress towards obtaining a stable optimized BHJ morphology and improved efficiency stability, using different chemical routes for crosslinking the organic semiconductors.

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