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Photo-induced improvement of Bulk Heterojunction Polymeric Solar Cells KAMIL MIELCZAREK, ALEXANDER COOK, ANVAR ZAKHIDOV, University of Texas at Dallas, NANOTECH INSTITUTE TEAM — The effectiveness of BHJ polymeric solar cells depends highly on the formation of continuous three dimensional interconnecting networks of electron donor (typically RR P3HT) and acceptor (typically PCBM) materials. This process is controlled by post-processing heat treatment to induce phase separation of the materials. We demonstrate in this presentation, that in-situ photo-excitation of the BHJ structure during the annealing process controls both the maximal photocurrent and filling factor of the BHJ solar cell. We have found that variations in intensity and spectral composition of the photo excitation affect the resulting morphology of BHJ. The increased diffusivity of constituents and photo-modulation of the carrier recombination upon annealing is discussed as one of the causes of the observed morphology improvement.

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