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High Efficiency Regio-Regular-P3HT/PCBM Flexible Solar Cells KANZAN INOUE, PALLAVI MADAKASIRA, ROSS ULBRICHT, The University of Texas at Dallas, Nanotech Institute, MIAOXIN ZHOU, The University of Texas at Dallas, Department of Chemistry, XIAOMEI JIANG, SERGEY LEE, The University of Texas at Dallas, Nanotech Institute, JOHN FERRARIS, The University of Texas at Dallas, Department of Chemistry, Nanotech Institute, ANVAR ZAKHI-DOV, The University of Texas at Dallas, Department of Physics, Nanotech Institute, POLYMER SOLAR CELL TEAM — Solar cells (SCs) employing freshly synthesized home-made regio-regular poly(3-hexylthiophene) (RR-P3HT) and PCBM yielded nearly two fold increase of short circuit current, compared with the devices consisting of commercial RR-P3HT. The filling factor (FF) on the other hand decreased significantly resulting in the overall efficiency of 4% for the device with commercial PHT from ADS. However, improving the serial resistance of the device can lead to much higher efficiency. The ideal homogenization of P3HT/PCBM solution and the optimal device heat-treatment [1] were used with the fresh home-made polymer to achieve the good phase separation of PCBM and RR-P3HT into a bi-continuous network structure. The best concentration of PCBM was found rather low; only 54 wt% with respect to RR-P3HT in Toluene contrary to reported high 400 wt% to

PPV in 1,2 Dichlorobenzene.

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