

Abstract Submitted
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The Effect of a Self Assembled Monolayer in Small Molecule Organic Solar Cells ALEXANDER COOK, KAMIL MIELCZAREK, ANVAR ZAKHIDOV, The University of Texas at Dallas Physics Department — We have previously found that a Self Assembled Monolayer (SAM) of Fluoroalkyl TrichloroSilane (FTS) molecules on Single-Walled and Multi-Walled Carbon Nanotubes (SWCNT & MWCNT) can greatly improve the conductivity [1]. In present work we have studied the effect of SAM modified carbon nanotubes in Small molecule organic photovoltaic cells. (OPV) We have fabricated and characterized OPV of the general structure: CNT(FTS)/CuPC/C60/BCP/Al. We observed improvement of the performance of the OPV with CNT anodes with FTS SAM both for SW and MW CNT. The major effect is an improvement of the open circuit voltage and also small improvements in both short circuit current and filling factor. The increase in open circuit voltage is likely due to modifications of the carbon nanotube work function by the strong dipole moments of the FTS molecules. The improvements in short circuit current and filling factor is probably due to improved active layer morphology and removal of absorbed water from the substrate.

[1] Cook, Alexander; Lee, Bumsu; Kuznetsov, Alexander; Podzorov, Vitaly; Zakhidov, Anvar. Self Assembled Dipole Monolayers on CNTs: Effect on Transport and Charge Collectio. Oral Presentation APS March Meeting 2010

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