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Parallel Tandems of Dye Sensitized Solar Cells with CNT Collector JOSEF VELTEN, CHAO-CHEN YUAN, ANVAR ZAKHIDOV, University of Texas, at Dallas — In this presentation, we demonstrate the fabrication of monolithic parallel tandem dye sensitized solar cells using a semitransparent layer of carbon nanotubes. Each DSC sub-cell has titania photoelectrode with two different dyes: N 719 and N 749, which absorb light in different parts of solar spectrum. This layer of carbon nanotubes laminated on highly porous polymeric Millipore filter acts as both the collector of charge carrier and as the catalyst of the I/I_3^- redox reaction that completes the function of the cell, overall allowing easier fabrication for tandem solar cell devices, with a potential for creating flexible devices in the future. The parallel tandem shows the total photocurrent which is nearly the sum of two I_{sc} currents of constituent cells, and total Voc, which is average of two Voc, while conventional in-series DSC tandems show the lowest V_{oc} and slightly increased I_{sc}[1]. Thus the higher efficiency can be achieved in parallel DSC tandems, and we discuss the physical reasons for this effect. [1] Yanagida, et.al. J. of Photochemistry and Photobiology A: Chemistry Volume 164, Issues 1-3, 1 June 2004, Pages 33-39

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