

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Carbon Nanotubes as Counter Electrodes for Gratzel Solar Cells

HASAN SHODIVE, ALI ALIEV, MEI ZHANG, SERGEY LEE, RAY BAUGHMAN, ANVAR ZAKHIDOV, The University of Texas at Dallas, NanoTech Institute, BE 26, P.O. Box 830688, Richardson, TX 75083 — The role of interfaces is very critical for solar cell devices which use nanostructured materials. Dye Sensitized Solar Cells (DSSC) are devices which parts are interfacial in character and physico-chemical processes occur at the interface of two distinct media. DSSC are of great interest due to combination of their high efficiency and relatively low cost. An effective counterelectrode with high electrochemical activity is an important component of DSSC to enhance its practical utility. Presently used Pt coated ITO counterelectrode can not be applied in flexible DSSC architectures, while there is a growing need for flexible anodes which are transparent and have desired interface characteristics. In this work in order to search for such materials for counter electrode in dye sensitized solar cells, newly developed strong and transparent and modified carbon nanotube sheets [1] are used in interfacial counter electrode. To increase the electrochemical activity of the anode the CNT sheets are coated with highly conductive SWCNT and compared with pure multiwall CNT sheets. We show that the transparent sheets of SWCNT/MWCNT perform as a flexible anode and as electrochemical catalyst and also can be used in tandems of dye sensitized solar cells as transparent charge recombination or interconnect layers. [1] M. Zhang, S.Fang, A.Zakhidov, S.B.Lee, A.Aliev et.al., Science, 309,(2005) 1215

Hasan Shodiev
The University of Texas at Dallas, Nanotech Institute

Date submitted: 30 Nov 2005

Electronic form version 1.4