Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Spectroscopic Study of Chromophore/Single-Walled Carbon Nanotubes Hybrid Structures RANDY WANG, PADMA GOPALAN, MARK ERIKSSON, University of Wisconsin-Madison — Chromophores have been used to functionalize individual single-walled carbon nanotubes (SWNTs) for potential applications in optoelectronic devices. In such a system, the molecular photoabsorption can be synthetically tuned independently of the the nanotube structure. Recently, we have developed a nanotube-based transistor in which azobenzene-based chromophores were attached to SWNTs by means of an anthracene tether. UV light induces isomerization of the chromophore, changing the molecular dipole and photogating the SWNTs, shifting the threshold voltage and increasing the conductivity of the nanotube transistor. Here we report the results of spectroscopic analysis of chromophore functionalized SWNTs in orthodichlorobenzene. We examine the effect of changing the tether to pyrene on both the absorption and fluorescence emission spectrum. We will outline our studies on the cis-trans isomerization and creation of charge separated state in the attached chromophore in both solution and FET architecture. Research supported by the U.S. Department of Energy, Office of Basic Energy Science, Division of Materials Sciences and Engineering under Award #ER46590.

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Date submitted: 08 Dec 2009 Electronic form version 1.4