

Abstract Submitted
for the SES07 Meeting of
The American Physical Society

Novel Optoelectronic Transport Studies of Supramolecular Nanotube Assemblies HARSH CHATURVEDI, JORDAN POLER, University of North Carolina at Charlotte — Single Walled Carbon Nanotubes (SWNT) are important materials for future devices and sensors.. Ruthenium complexes have very strong absorbance in the visible spectrum. SWNTs have exceptional electron accepting and charge transfer properties. We have shown specific binding of these complexes with the end of SWNTs. Properties of these supramolecular nano-assemblies are being investigated to develop applications like sensors and photovoltaic cells. Photon enhanced aggregation properties of SWNT due to these ruthenium complexes are demonstrated. These organometallic based molecular adsorbates onto the nanotubes affect the field effect transistor response of SWNTs. Ruthenium centered phenanthroline complexes exhibit a strong metal to ligand charge transfer. We believe that the nanotube quenches charge from the ligand after the complex has been optically excited. This results in optically altering the carrier density, and therefore the transport properties of the nanotubes. We believe this is due to charge transfer from the metal center through the ligand and finally onto the nanotubes. Photon induced affects on the charge transport are shown. Advancements towards realizing real-time optoelectronic sensors and nano devices are demonstrated.

Harsh Chaturvedi
University of North Carolina at charlotte

Date submitted: 17 Aug 2007

Electronic form version 1.4