



Thin film electronics from solution processed single walled carbon nanotube thin films

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Carnegie 315, Time 11am [Note Time/Room change]

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Low-density random networks of SWNTs have received significant attention for applications such as transparent electrodes for solar cells and active layers in field-effect transistors. We will briefly review the optoelectronic properties of individual carbon SWNTs and networks. Secondly, we will show how the degree of bundling of SWNTs suspended in water can be determined as a function of the sedimentation time by monitoring their optical transmittance at different depth levels of the vessel. We discuss how the formation and aggregation of nanotube bundles in suspension typically occurs on time scales of 0-10 hours and can be understood in the framework of the Mie theory of light scattering. Finally, morphology, optical properties and the electronic performance of solution-processed SWNT networks will be correlated to the type and age of the starting suspensions by means of spectroscopic ellipsometry and Raman spectroscopy combined with electrical transport measurements.

Professor Manish Chhowalla is an Associate Professor in the Department of Materials Science and Engineering at Rutgers University. Professor Chhowalla received his B.S. in Ceramic Engineering from Rutgers University in 1992. After working as a Research Scientist with Multi-Arc Inc. (now Ion Bond Inc) from 1992 – 1994, he went to the University of Cambridge in the UK where he received his Ph.D in 1998 and was post-doctoral researcher from 1998 – 2001. He then received the Royal Academy of Engineering Research Fellowship (2001 – 2003), after which he joined Rutgers as an Assistant Professor, where since 2006 he has been an Associate Professor in the Materials Science and Engineering Department. His primary research interests are related to transport through disordered systems such as carbon nanotube networks, amorphous and organic thin films. He has over 90 publications and 2000 citations.