

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Carbon Nanotube Networks Reinforced by Silver Nanowires with Improved Optical Transparency and Conductivity PATRICIA MARTINE¹, University of Texas, Dallas, AZIN FAKHIMI, Surrey University Guilford, UK, LING LIN², University of Texas, Dallas, IZABELA JUREWICZ, ALAN DALTON, Surrey University Guilford, UK, ANVAR A. ZAKHIDOV³, RAY H. BAUGHMAN⁴, University of Texas, Dallas — We have fabricated highly transparent and conductive free-standing nanocomposite thin film electrodes by adding silver nanowires (AgNWs) to dry-spun Multiwall Carbon Nanotube (MWNT) aerogels. This nanocomposite exhibits desirable properties such as high optical transmittance, excellent flexibility and enhanced electrical conductivity. The incorporation of the AgNWs to the MWNT aerogels was accomplished by using a spray coating method. The optical transparency and sheet resistance of the nanocomposite was tuned by adjusting the concentration of AgNWs, back pressure and nozzle distance of the spray gun to the MWNT aerogel during deposition. As the solvent evaporated, the aerogel MWNT bundles densified via surface tension which caused the MWNT bundles to collapse. This adjustable process was responsible in forming well defined apertures that increased the nanocomposite's transmittance up to 90 percent. Via AgNWs percolation and random interconnections between separate MWNT bundles in the aerogel matrix, the sheet resistance decreased from 1 K ohm/sq to less than 100 ohm/sq.

¹Alan G. MacDiarmid NanoTech Institute

²Alan G. MacDiarmid NanoTech Institute

³Alan G. MacDiarmid NanoTech Institute

⁴Alan G. MacDiarmid NanoTech Institute

Patricia Martinez
Univ of Texas, Dallas

Date submitted: 14 Nov 2014

Electronic form version 1.4