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**Raman Spectroscopy Studies of Oxygen and Hydrogen RF-Plasma Treated Single Wall Carbon Nanotubes** CHAMINDA JAYASINGHE, DAVID B. MAST, Department of Physics, University of Cincinnati — We present results from resonant Raman spectroscopy, x-ray photoelectron spectroscopy (XPS) and thermoelectric power (TEP) measurements on hydrogen and oxygen plasma treated single-wall carbon nanotubes (SWNTs). For oxygen treated SWNTs, Raman spectroscopy of the BWF band (∼1522cm-1) show a dramatic up shift for both the ∼1522cm-1 band and the ∼1578cm-1 band by nearly 20 cm-1. In addition, there is a considerable change in the appearance of the D' mode (∼1620cm-1) with oxygen plasma treated SWNTs. These results show that oxygen plasma treatment affects the metallic nanotubes in our sample more than semiconducting ones. The Raman spectra of hydrogen treated SWNTs show a much smaller D band peak than the oxygen treated SWNTs. The G bands of the hydrogen treated SWNTs are also up shifted compared to untreated nanotubes. The surface of the oxygen plasma treated SWNTs was also analyzed by XPS. These results show that the O1s to C1s intensity ratio is considerably higher in oxygen treated SWNTs compared to untreated nanotubes. The TEP measurements confirm that these plasma treatments induce defects as well as add side wall functionalization to the SWNTs.

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