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Comparative Raman spectroscopy study of Single-Wall and Double-Wall carbon nanotube systems doped with H_2SO_4 EDUARDO BARROS, ANTONIO G. SOUZA FILHO, Universidade Federal do Ceara, YOONG-AHM KIM, HIROYUKI MURAMATSU, TAKUYA HAYASHI, MORINOBU ENDO, Shinshu University, MILDRED DRESSELHAUS, Massachusetts Institute of Technology — In this work, we performed Raman experiments on a mixture of Single-wall and Double-wall carbon nanotubes for different relative concentrations and using different laser energies. Two sets of samples were analyzed, one which was exposed to H_2SO_4 for 5s and one which is pristine. The H_2SO_4 is known to act as an acceptor for the electrons of graphitic materials. The effect of the hole doping on the vibrational and electronic properties of the double and single-wall carbon nanotubes is probed using Resonant Raman scattering with different excitation energies probing different nanotubes. The inner and outer walls of double-wall nanotubes can also be studied at the same time for selected excitation energies. A detailed analysis of the charge transfer in single wall and double wall nanotubes and its effects on the nanotube properties is obtained.

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