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Raman Spectroscopy in Single-Wall and Double-Wall Carbon Nanotube Systems Doped with H_2SO_4 EDUARDO BARROS, Tohoku University, ANTONIO SOUZA FILHO, Universidade Federal do Ceara, YOONG-AHM KIM, HIROYUKI MURAMATSU, TAKUYA HAYASHI, Shinshu University, RIICHIRO SAITO, Tohoku University, MORIBONU 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 5 s 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 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. For selected excitation energies, it is possible to probe, at the same time, the inner and outer walls of double-wall nanotubes. The lineshape of the G' band double-wall nanotubes is discussed in terms of the interlayer interaction and the effect of single-wall nanotube contaminants and the H_2SO_4 doping to the G' band is studied.

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