Abstract Submitted
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Investigation of the Thermal Behavior of Single-Walled Carbon Nanotubes and Tungsten Oxide Nanostructures Using Raman Spectroscopy[1] PRABHAKAR MISRA, DANIEL CASIMIR, RAUL F. SANCHEZ, Howard Univ, CHRISTINA CRAIG, University of Dallas, Irving, SARAH BARTLEY, Agnes Scott College, SHANKAR BALIGA, General Monitors, Inc — Thermal conductivity measurements of a variety of Single-Walled Carbon Nanotube (SWCNT) samples via Raman shifts of the G^+ band frequency around 1592 cm^{-1} recorded with a 780 nm laser as a function of laser power (0 – 25 mW) have allowed quantitative estimates of the purity levels of the SWCNTs. In addition, Raman spectra of a variety of tungsten oxide (WO_3) nanomaterial samples, namely WO_3 on silicon substrate, as well as nanopowder and nanowires, exhibited clear variation in O-H band features around 1550 cm^{-1} due to effects of ambient humidity, as well as other spectral features due to gas (NO_x) exposure have been documented, as a function of varying temperature (in the range 27 – 200C). Thermal characteristics of SWCNTs and WO_3 samples, along with the associated Molecular Dynamics simulations performed, will prove useful for thermal energy storage and gas sensing applications.

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