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The Control of Electron Transport Related Defects in *In situ* Fabricated Single Wall Carbon Nanotube Devices ZHIXIAN ZHOU, Department of Physics and Astronomy, Wayne State University, ALASKA SUBEDI, GYULARES, RONGYING JIN, DAVID MANDRUS, Materials Science and Technology Division, Oak Ridge National Laboratory — Metallic single wall carbon nanotube (SWNT) devices were characterized using low temperature transport measurements to study how the growth conditions affect defect formation in carbon nanotubes. Suspended carbon nanotube devices were grown *in situ* by a molecular beam growth method on a pair of catalyst islands located on opposing Au electrodes fabricated by electron beam lithography. We present experimental evidence that transport related defect formation in carbon nanotubes, in addition to the well known growth temperature dependence, is also affected by the nature and the composition of the carbon growth gases. [Zhou *et al.*, Appl. Phys. Lett. 89, 133124 (2006)] We have also investigated how the transport related defects affect the performance of SWNT field-effect-transistors, revealing significantly different impacts of the defects on semiconducting SWNT devices with Schottky and Ohmic contacts. [Zhou *et al.*, unpublished]

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