

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Low Field Microwave Absorption Studies of Carbon Nanotubes Doped by Chemical and Ion Implantation Techniques AUSTIN HOWARD, ALEXANDER KUZNETSOV, NICHOLAS CORNELL, MYRON SALAMON, The University of Texas at Dallas, EDUARD GALSTAYAN, WEI KAN CHU, HERBERT FREYHARDT, The University of Houston, RAY BAUGHMAN, The University of Texas at Dallas, JUNJI HARUYAMA, JASON REPPERT, APPARAO RAO, Clemson University, ANVAR ZAKHIDOV, The University of Texas at Dallas — The motivation of this study is to develop a highly sensitive method of microwave absorption in low magnetic fields (LFMA), combined with SQUID magnetometry and resistivity, for searching for superconducting phases in in-situ doped nanomaterials; either chemically (by alkali metals or metalloids) or through Boron ion implantation. These methods have been applied to both MWNTs grown by CVD, as well as SWNTs which have been separated into metallic and semiconducting chiralities. Regardless of the doping technique or element, we have found a much higher rate of doping in the semiconducting SWNTs. Additionally, in the Boron doped SWNTs, we see two transitions at ~ 8 K and ~ 30 K, but the nature of the transition is not clear at the moment: it depends on the type of measurement. While SQUID and resistivity indicate a superconducting type transition, LFMA/ESR reveals that there is a clear magnetic transition at 30 K. Resolution of these differing results will be discussed.

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Date submitted: 19 Nov 2010

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