Abstract Submitted for the MAR06 Meeting of The American Physical Society

Boron-doped SWNTs for Electromagnetic Interference Shielding P. EKLUND, D. NAREHOOD, Dept. of Physics, The Pennsylvania State University, N. DITROLIO, N. ANDREWS, CarboLex, Inc., 500 Parkway Ave, Broomall, PA 19008, U.J. KIM, X.M. LIU, H.R. GUTIERREZ, Dept. of Physics, The Pennsylvania State University — SWNTs have been proposed for electromagnetic interference shielding as an additive in polymers. However, 2/3 of the SWNTs are expected to be semiconducting and only 1/3 are metallic. B-doping of graphite is known to lead to strongly p-doped material. In SWNTs, doping is therefore expected to lead to degenerately-doped semiconducting tubes and then a shielding benefit can be derived from all tubes in the sample. We find that 1-2 at% B-doping is possible at 25-50 gr/hr production. The quality of the HCl-purified product has been investigated by Raman scattering (RS), optical adsorption, transmission electron microscopy and temperature programmed oxidation. RS spectra were found to exhibit sharp G,R bands and a very weak D-band component is also observed. We note that after B-doping the 2^{nd} order RS cross section is enhanced, as reported previously for pulsed laser produced B-doped SWNTs by Rao et al. All band positions are very close to that observed for undoped SWNTs, indicating a reasonably good molecular structure of the B-SWNTs and consistent with the small size of atomic boron (i.e., substitutional dopant). OA show that the interband absorption peaks associated with semiconducting and metallic tubes upshift by 20-50 meV, indicating p-doping.

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Date submitted: 05 Dec 2005

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