Abstract Submitted
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Test for superconductivity in individual end-bonded MWNTs Y. SUN, S. CHEN, J.Y. HUANG, Z.F. REN, J.I. OH, M.J. NAUGHTON, M. VAZIRI, U. Mich.-Flint — Takesue *et al.* [1] recently reported 12K superconductivity in templated arrays of $\sim 10^4$ "end-bonded" multi-walled carbon nanotubes (MWNTs). They attributed the occurrence of superconductivity to intershell (interlayer) effects within each MWNT. We have tested this by preparing and measuring *individual* end-bonded MWNTs, which were grown by arc-discharge without catalyst. High resolution TEM showed they had typical outer (inner) diameters of 10 - 15 nm (1-2 nm), with no visible defects, values verified by AFM and electrical measurements. We also verified by TEM that, as grown, the nanotube ends were closed. We then used a novel nanolithographic approach to facilitate end-bonding (*i.e.* contacting all layers), which was subsequently verified in $I - V$ tests. Four-probe resistivity was measured for several such individual end-bonded MWNTs, to 1.4 K, including the use of current densities smaller than those used in Ref. 1. No evidence for superconductivity was found.

[1] I. Takesue *et al.*, Phys. Rev. Lett. **96**, 057001 (2006)

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