

Abstract Submitted
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Electrical conducting and breakdown behaviors of multiwall carbon nanotubes under different contact modes SHUO CHEN, J.Y. HUANG, S.H. JO, Z.Q. WANG, D.X. HAN, Boston College, G. CHEN, M. DRESSELHAUS, MIT, Z.F. REN, Boston College — We have carried out electrical transport property studies of individual multiwall carbon nanotubes while viewing the structural changes in-situ inside a high resolution transmission electron microscope. Two types of contact have been tested: end-contact with all layers contacted with the electrodes, and side-contact with only the outmost layer contacted with the electrodes. We found that in some cases electrical breakdown takes place in the innermost layer under both contact modes with a simultaneous current drop, which indicates that under high bias voltage, each layer carries a current even there is no direct contact with the electrodes. Experimental evidence shows that the temperature can reach around 3000 °C during breakdown, so the inter-layer conducting could be induced by strong electric field or by thermal excitation.

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