Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Investigation of Fluorinated and Hydrogenated Carbon Nanotubes by STM DHARMPAL TAKHAR, Z. GU, A. A. PEERA, W. E. BILLUPS, J. L. MARGRAVE, K. F. KELLY, Department of Electrical and Computer Engineering, Rice University, Houston, Texas — There is a great deal of interest in the functionalization, in particular fluorination, of carbon nanotubes for the purposes of solvation and subsequent chemical reaction. Towards this end, we report the investigation of fluorinated nanotubes by variable-temperature STM. The atomic-scale fluorine coverage on the fluorotubes with composition was observed as a function of annealing temperature. Upon heating of the fluorotubes, we observe the subsequent desorption of the fluorine initiated around 240 ^{o}C and proceeding up to 650 ^{o}C. At higher temperatures, all the fluorine desorbs revealing a number of small defects. Further heating leads to cutting of the fluorotubes which is initiated at these defect locations. We compare these results to our recent investigation of dihydrogen functionalized carbon nanotubes.

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Date submitted: 30 Nov 2005 Electronic form version 1.4