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Gas Absorbtion and Interaction Inside Carbon Nanotubes WILLIAM BLACKMORE, AUSTIN BUDDY DAVIS, T. RANDALL DILLING-HAM, Northern Arizona University — Since the discovery of carbon nanotubes in 1991 by S. Iijima the field of Nanoscience has grown in leaps and bounds. Potential applications include nanowires for quantum computers, hydrogen storage devices in fuel cells, biosensors and bioreactors, and much more. The focus of this research has been to improve upon existing etching techniques to "unzip" the nanotubes allowing improved absorption of introduced gaseous species and, once introduced, to prompt chemical interaction between multiple gaseous species in the nanotubes using XPS. Implications of this research could extend to safe transportation of volatile gasses, increased efficiency filtration, and more. To date, a mixture of HNO_3/H_2O_2 and H_2SO_4/H_2O_2 and an etching time of 1 week to a month has provided the best oxidation results while maintaining the structure of the carbon nanotubes. Initial spectra of trapped CO_2 have been completed and further experiments including multiple species are planned.

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