Abstract Submitted
for the 4CF06 Meeting of
The American Physical Society

Functionalization and Metalization of Carbon Nanotube Mats
JACOB FLUCKIGER, DUSTIN LLOYD, LEI PEI, ROBERT DAVIS, Brigham Young University — An intriguing mechanical material would be an aluminum / carbon nanotube composite. It could combine the ultra high strength of carbon nanotubes with the ductility and manufacturability of aluminum. We are studying the formation of this metal matrix composite by electroplating aluminum on preformed carbon nanotube structures. In order to induce aluminum growth on the nanotubes, chemical modification of the nanotube surface is required. Surface chemical functionalization was performed by suspension and immersion in a succinic acid bath for the loose nanotubes and nanotube mats respectively. The active surfaces consisting of carboxyl groups should form a stable chemical bonds with the aluminum. Characterization of the chemically functionalized buckypaper by water contact angle and x-ray photo electron spectroscopy (XPS) measurements will be presented. Initial metallization studies will also be presented.

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Date submitted: 11 Sep 2006 Electronic form version 1.4