Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Hypergolic fuel detection using Single Walled Nanotube Networks
SHARVIL DESAI, Dept. of Physics and Electrical and Computer Engg.,
University of Louisville, Louisville, KY, KAPILA HEWAPARAKRAMA, Dept. of
Physics, University of Louisville, Louisville, KY, GAMINI SUMANASEKERA,
Dept. of Physics and Electrical and Computer Engg., University of Louisville,
Louisville, KY — Reliable and accurate detection of hypergolic fuels is vital to
U. S. Missile Defense Agency. In this research a simple and highly sensitive SWNT
network sensor was developed for real time monitoring of hydrazine leaks to ppm
level concentrations. Upon exposure to hydrazine vapor, the resistance of n-type (af-
fter degassing) nanotubes is observed to decrease rapidly. The response time exhibits
a linear dependence on the concentrations of the vapor. It was also found that the
resistance of the sample can be recovered by pumping on the sample and exposing
to UV light. The experimental results support chemical adsorption of hydrazine on
SWNTs. Theoretical results of hydrazine-SWNT interaction [1] are compared with
the experimental observations. Results of similar study on ammonia, dimethyl hy-
drazine, and naphthalene will also be presented. [1] Min Yu, C. S. Jayanthi, Shi-Yu
Wu, APS 2008

Sharvil Desai
Dept. of Physics and Electrical and Computer Engg.,
University of Louisville, Louisville, KY

Date submitted: 01 Dec 2007

Electronic form version 1.4