

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Electro-Mechanical Actuation of Carbon Nanotube Yarns, Sheets, Composites JIYOUNG OH, MIKHAIL KOZLOV, The Alan G. MacDiarmid NanoTech Institute, University of Texas at Dallas, MEI ZHANG, Florida State University, SHAOLI FANG, RAY BAUGHMAN, The Alan G. MacDiarmid NanoTech Institute, University of Texas at Dallas — We report preparation of highly conductive carbon nanotube yarns and sheets. The materials aim at such applications as electronic textiles, electro-mechanical actuators, and conductive coatings. The electro-mechanical response of the specimens was measured using custom made force transducer operating in an isometric mode. The measurements were carried out at room temperature in aqueous and organic electrolytes; square-wave potential of variable amplitude was applied with a potentiostat. It was found that the maximum isometric stress generated by nanotube actuators could be as large as 12 MPa. This approaches the stress generation capability of commercial ferroelectrics and is significantly larger than that of natural muscles. A variety of applications of the materials is discussed.

Jiyoung Oh
The Alan G. MacDiarmid NanoTech Institute, University of Texas at Dallas

Date submitted: 29 Dec 2010

Electronic form version 1.4