

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Enhanced Mechanical Properties in PVA/SWNT Composite Fibers** WILLIAM SAMPSON, JOSELITO RAZAL, STEVE COLLINS, RAY BAUGHMAN, NanoTech Institute, University of Texas at Dallas, ALAN DALTON, Department of Physics and UniS Material Institute, University of Surrey, WILLIAM SAMPSON TEAM — Composite fibers of polyvinyl alcohol (PVA) and HiPco Single Walled Carbon Nanotubes (SWNT) have been developed at The University of Texas at Dallas that show greatly enhanced mechanical properties, with typical strengths of 1.8GPa and toughness in excess of that of spider silk, making these the toughest known fibers to date. However, the exact interactions leading to the enhanced mechanical properties are not as yet fully understood. We have used a series of Raman and DSC experiments to discover the nature of the strength-enhancing interactions in these composite materials. The results lead to the conclusion that the bulk of the improvements are due to SWNT-nucleated PVA crystallinity, with the SWNTs playing less of a direct role than we originally thought.

William Sampson  
University of Texas at Dallas

Date submitted: 10 Nov 2004

Electronic form version 1.4