

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**The Impact of Sample Preparation on Polymer Carbon Nanotube Nanocomposites.** CHANG-UK LEE, University of Tennessee, Knoxville, MARK DADMUN, University of Tennessee, Knoxville — The dispersion of multi-walled carbon nanotubes (MWNTs) in a polymer matrix is a critical parameter that impacts the ability of that MWNT to improve the properties of the polymer matrix. In this study, the impact of the sample preparation process on the dispersion and properties of the resultant nanocomposite is discussed. Additionally, the impact of intermolecular interactions between the MWNT and polymer matrix on the mechanical properties of the polymer nanocomposites was investigated. Polymer nanocomposites composed of 1 wt% MWNT and poly(styrene-co-4-vinyl phenol) (PS-co-VPh) random copolymers were prepared by three different methods, including melt-mixing and solution casting. The MWNT are either oxidized to incorporate oxygenated defects or utilized as received. DMA results suggest that solution casting allows the formation of more intermolecular hydrogen bonding between MWNT and polymers than melt mixing. DMA data also suggests that more intermolecular hydrogen bonding results in improved mechanical properties of the resultant polymer nanocomposites.

Chang-Uk Lee  
University of Tennessee, Knoxville

Date submitted: 30 Nov 2005

Electronic form version 1.4