

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Synthesis and Characterization of Polyamide Nanocomposites Using Functionalized Carbon Nanotubes MOHAMMAD MONIRUZZAMAN, KAREN WINEY, University of Pennsylvania, JAYANTA CHATTOPADHYAY, W. EDWARD BILLUPS, Rice University — We have synthesized nylon 6,10 nanocomposites using functionalized single-walled carbon nanotubes using our interfacial *in situ* polycondensation method. The specific functional groups $-(\text{CH}_2)_n\text{COCl}$ [$n = 4,9$] on the sidewalls of SWNT were designed to covalently link the nanotubes to the nylon matrix *via* alkyl segments. The composites show significant improvements in tensile modulus, strength and toughness. The alkyl linkages at the SWNT/nylon 6,10 interface contribute significantly to improving the toughness of the composites. Two extensions of this work will be presented. First, our method will be altered to synthesize nylon 6 via ring opening polymerization in the presence of functionalized nanocomposites. Second, we will adapt our method to other functionalized nanoparticles, possibly graphite. We expect to achieve similar improvements in mechanical properties in these composites.

Mohammad Moniruzzaman
University of Pennsylvania

Date submitted: 03 Dec 2007

Electronic form version 1.4