

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**A Microrheological Study of the Time Dependent Gelation of Single Wall Carbon Nanotube Suspensions.** L. A. HOUGH, M. F. ISLAM, A. G. YODH, Department of Physics and Astronomy, University of Pennsylvania 209 S. 33rd Street, Philadelphia, Pennsylvania 19104-6396 — Single wall carbon nanotubes (SWNTs) dispersed in water using an anionic surfactant, sodium dodecylbenzene sulfonate (NaDDBS) form reversible gels because of the bonding between the individual nanotubes (L.A. Hough, M.F. Islam, P.A. Janmey and A. G. Yodh Phys. Rev. Lett. **93**, 168102 (2004)). In this talk, we present a microrheology study of the time dependence of this reversible gelation. We embed fluorescent tracer particles in SWNT suspensions and use optical microscopy tracking techniques to measure the mean-squared displacement during gelation. We then apply a time-cure superposition to obtain a master curve for the viscoelasticity that extends over several decades in frequency. We compare high frequency dynamics of the SWNTs solutions to those expected for semiflexible and rigid rod polymer systems. This work has been partially supported by the NSF through Grants DMR 00-79909 (MRSEC) and DMR-0203378, and by NASA Grant NAG8-2172.

Lawrence Hough  
University of Pennsylvania

Date submitted: 01 Dec 2004

Electronic form version 1.4