Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Mechanical and Electrical Properties of Organogels with Multi-wall Carbon Nanotubes MOHAMMAD MONIRUZZAMAN, KAREN WINEY, University of Pennsylvania — Organogels are fascinating thermally reversible viscoelastic materials that are comprised of an organic liquid and low concentrations (typically <2 wt %) of low molecular mass organic gelators. We have fabricated the first organogel/carbon nanotube composites using 12-hydroxystearic acid (HSA) as the gelator molecule and pristine and carboxylated multi-wall carbon nanotubes as the nanofillers and 1,2-dichlorobenzene as the organic solvent. We have achieved significant improvements in the mechanical and electrical properties of organogels by incorporating these carbon nanotubes. For example, the linear viscoelastic regime of the HSA organogel, an indicator of the strength of the gel, extends by a factor of 4 with the incorporation of 0.2 wt% of the carboxylated nanotubes. Also, the carbon nanotubes (specially the pristine tubes) improve the electrical conductivity of the organogels, e.g. six orders of magnitude enhancement in electrical conductivity with 0.2 wt% of pristine tubes. Differential scanning calorimetry experiments indicate that the nanotubes do not affect the thermoreversibility of the organogels.

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Date submitted: 27 Nov 2007 Electronic form version 1.4