

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Conductivity, Rheology and Processing of Carbon Nanotube Composites KALMAN MIGLER, NIST, SAM KHARCHENKO, JAN OBRZUT, JACK DOUGLAS, PAUL START — The primary application for CNT composites is the enhancement of their electrical properties relative to pure polymers. The conductivity is controlled by the alignment and the dispersion of the nanotubes in the polymer matrix during processing. Understanding the interplay between conductivity, processing, alignment and rheology is key their efficient use. We present simultaneous measurements of the Rheology and conductivity of molten polymer nanotube composites over a range of concentrations near the percolation threshold. We find that simple shear fields can change the conductivity by orders of magnitude. Surprisingly, upon cessation of shear, the conductivity returns to its quiescent value.

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Date submitted: 30 Nov 2005

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