

Abstract Submitted  
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**Electrorheology and field-induced percolation of carbon nanotube suspensions under AC fields** JERRY SHAN, CHEN LIN, Rutgers University — Dilute ( $\sim 0.003\%$  by volume fraction) suspensions of SWNTs in oil exhibit large variations in viscosity under electric fields. We report on an experimental investigation of the characteristics and mechanisms of electrorheology in SWNTs suspended in silicone oil. Shear thinning is observed in which the apparent viscosity at fixed field strength decreases with higher shear rates. The apparent viscosity increases with higher field strengths, until a threshold field strength is reached. Above that critical electric field, the apparent viscosity makes a large, sudden jump. This phenomena is associated with the formation of gap-spanning chains (percolation networks) of SWNTs under dipole-dipole interactions. The role of individual nanotubes versus bundles of nanotubes is assessed by comparing the electrorheology of centrifuged and un-centrifuged suspensions.

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