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Functionalized Carbon Nanotubes in Modified Plant Oil Composites. IAN M. MCANINCH, RICHARD P. WOOL, Department of Chemical Engineering, University of Delaware — Carbon nanotubes (CNTs) with their impressive mechanical properties are ideal reinforcement material. Acrylated epoxidized soy oil (AESO) has been previously shown to have favorable interactions with carbon nanotubes; however a mixture of aggregates and dispersed tubes were found even at low CNT concentrations. In order to prevent re-aggregation, the CNTs were functionalized with a 10 carbon long aliphatic chain. These aliphatic chains are similar to the fatty acids that make up soy oil. Functionalization was verified using XPS and IR spectroscopy. These functionalized CNTs were dispersed by mechanical shear mixing into AESO both with and without styrene as a comonomer. No large aggregates were observed in the liquid, uncured, samples or in the final cured composites. Dispersion in the solid composites was verified using optical and electron microscopy. Better dispersion also resulted in improved mechanical properties.

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