

Abstract Submitted
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Interfacial activity of acid functionalized single-walled carbon nanotubes (SWCNTs) at the fluid-fluid interface TAO FENG, THOMAS RUSSELL¹, DAVID HOAGLAND², University of Massachusetts at Amherst — Interfacial assembly of acid-functionalized single-walled carbon nanotubes at the oil/water interface is achieved by the addition of low molecular weight (MW) amino-terminated polystyrene in the oil phase. The surface activity of carboxylated SWCNTs is strongly influenced by the end-group chemistry and molecular weight of the polystyrene component, the concentrations of this component and the SWCNTs, along with the degree of functionalization of the SWCNTs. The prerequisites for interfacial trapping are amino termini on chains with MW less than 5K and 6 hours or longer incubation of pristine SWCNTs to achieve their carboxylation. Plummetts in interfacial tension resembling those for surfactants were observed at critical bulk concentrations of both SWCNTs and PS-NH₂. In dried droplets, SWCNTs densely packed with associated PS-NH₂ form a bird nest-like interfacial structure, with the SWCNTs preferentially oriented perpendicular to the original interface.

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