

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Functional polymer colloids stabilized by type-purified single-wall carbon nanotubes. ERIK K. HOBBIE, JEFFREY A. FAGAN, JAN OBRZUT, NIST — Emulsion polymerization of a methacrylate monomer in aqueous biological suspensions of type-purified single-wall carbon nanotubes (SWNTs) is used to synthesize polymer colloids coated by nearly pure metallic or semiconducting SWNTs. The polymer-nanocomposite spherical particles are 1-100 micrometers in diameter, are marginally stable in ethanol, and retain the color and unique optical characteristics of the purified SWNT coating in the absence of any surfactant. By assembling these functional polymer colloids on microelectronic circuits, we characterize the electronic properties of the SWNT-polymer nanocomposite microspheres and relate this to the band structure of the purified SWNT coating, demonstrating their potential use as microscopic optical and electronic components that can be easily manipulated using standard methods of colloidal self-assembly.

Erik Hobbie
NIST

Date submitted: 21 Nov 2008

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