

Sensor and Nanocomposite Applications of Carbon Nanotubes

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Sensor and nanocomposite applications of carbon nanotubes are addressed in my talk. First, biological and chemical sensor applications of carbon nanotubes are investigated. We report the synthesis and successful testing of solution phase, near-infrared sensors using single-walled carbon nanotubes(SWNT) that modulate their emission in response to the adsorption of specific biomolecules. As for nano-bio marker applications, sensitive Raman features of SWNT are used to tag DNA and live myoblast stem cells. Gas sensors have also been developed using field effect transistor characteristics of semiconducting SWNT. Second, nanocomposite applications of carbon nanotubes are introduced. Carbon nanotubes have received considerable attention as nano-sized reinforcements of composite materials. Here, we report uniform mixing and significantly improved interfacial bonding by the incorporation of nickel-coated SWNT as reinforcements for copper matrix composites. Carbon nanotube applications as conductive fillers in polymer matrix composites are also discussed.