

MRSEC SEMINAR SERIES

Directed Assembly and Electron Transport Properties of Chemically Functionalized Graphene

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Abstract:

Reduced graphene oxide (RGO), a chemically functionalized atomically thin carbon sheet, provides a convenient pathway for producing large quantities of graphene via solution processing. The easy processibility of RGO and compatibility with various substrates including plastics makes them an attractive candidate for high yield manufacturing of graphene based electronic and optoelectronic devices. However, a clear understanding of electron transport properties of RGO sheet is still lacking which is of great significance for determining the potential of RGO in electronic and optoelectronic applications. Here, we will present our recent development of a high yield bottom-up approach for the fabrication of RGO field effect transistor (FET) via dielectricphoresis (DEP) and its new understanding of low temperature electron transport mechanism such as space charge limited conduction (SCLC) with exponential trap distribution, Coulomb blockade and Efros-Shklovskii variable range hopping conduction. In addition, the application of RGO such as Schottky diode, photodetector, and composite materials will also be given.
