



Department of Materials Science and engineering Indian Institute of Technology, Kanpur



TITLE

Electrical, mechanical and thermal properties of graphene-carbon nanotubes/PMMA hybrid nanocomposite

ABSTRACT

Carbon nanotubes (CNTs) and graphene have attracted tremendous interest in reinforcing fillers in polymer due to its unique structure and excellent physical properties. CNT or graphene-based polymer composites continue to make significant technical gains; however, there is still clear gap between theoretical expectations and experimental accomplishments. The theoretically predicted electrical, mechanical and thermal properties depends on dispersion of fillers within the matrix, interfacial interaction between filler and matrix, aspect ratio of CNTs, quality of CNTs, nature of CNTs and quality of graphene in the composite and alignment of CNTs. Therefore, to address the above-mentioned concerned problems various approach have been considered in order to enhance the physical properties (electrical, mechanical and thermal). Admixture of graphene and CNTs in polymers is emerging as new 3D hybrid structured composite materials with improved electrical, mechanical and thermal properties. This talk will focus on the investigations of electrical, mechanical and thermal properties of PMMA composites based on multi-walled CNTs (MWCNTs)-graphene oxide, reduced graphene oxide-MWCNTs and graphene (prepared by electrochemical method)-MWCNTs hybrid fillers. Moreover, the effects of functionalized MWCNTs and ionic liquid functionalized MWCNTs in the hybrid composites have also been investigated. Enhanced electrical, mechanical and thermal properties in hybrid polymer composites have been observed due to the better dispersion, effective load transfer as a result of synergistic effect of 1D MWCNTS and 2D graphene.

SPEAKER

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Dr. Kadambinee Sa is a institute post-doctoral fellow at Indian Institute of Technology Kanpur. She is working on “Characteristics of field-effect transistor based on N-doped graphene” with Prof. Anshu Gaur. She was awarded her PhD from National Institute of Technology Rourkela. Her PhD work themes on “Electrical, mechanical and thermal properties of graphene-carbon nanotubes/PMMA hybrid nanocomposite”. She obtained her Master’s degree in Physics from Sambalpur university, Odisha. Her research interest includes carbon nanomaterials, polymer nanocomposites, charge transport properties, electronic devices, energy storage devices.