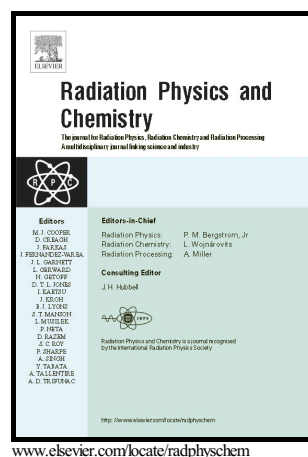


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Exceptional Electromagnetic Radiation Shielding Performance and Dielectric Properties of surfactant assisted Polypyrrole-Carbon Allotropes Composites

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Abstract

The present work reports the development of composites of surfactant assisted Polypyrrole incorporated with three different carbon allotropes that are Amine Functionalized Multiwalled Carbon Nanotubes, Graphene and Hybrid Carbon Assemblage by in-situ emulsion polymerization of Pyrrole monomer with Sodium Lauryl sulphate as dopant. The prepared composites were characterized by different techniques. Spectroscopic analysis demonstrates that the presence of Graphene, Amine Functionalized Multiwalled Carbon Nanotubes and Hybrid carbon structures facilitates strong polarization due to the formation of a solid-state charge-transfer complex between Polypyrrole and Carbon Allotropes. This provides appropriate impedance matching and superior dipole interaction, which leads to the high microwave absorption properties. Exceptional Electromagnetic Radiation shielding measurement of the composites in Ku-band shows a shielding attenuation from -28.8 dB to -79.9 dB. Based on obtained results, polypyrrole-carbon allotropes composites can be utilized as effective shield materials for electromagnetic noise signals and electronic packaging of high tech equipments. Furthermore, the obtained high values of dielectric properties suggest that the prepared composites can be used for stealth technology.

Keywords

Hybrid Carbon Assemblage, Graphene, Polypyrrole, Radiation shielding

1. Introduction

In the present time, there is quick improvement in science and technology with generation of extensive number of hardware gadgets, printers, microwave broilers, cell phones and so on assuming a critical part in our day by day life yet they have risky impact on human body. Along these lines there is need of improved light weight, thin, erosion safe and very

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