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Synthesis, Characterization and Mass Attenuation Coefficient of Green Graphene Sand Composite using Sr⁹⁰ Beta Source

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Abstract: Graphene is a flat monolayer of carbon atoms tightly packed into a two-dimensional honeycomb lattice and has completely conjugated sp^2 hybridized planar structure. Graphene and its derivatives havetremendous application potential. This paper consists of the synthesis of graphene sand composite (GSC)by a non-hazardous route. Samples of different thicknesses in disc shape were prepared and characterized by x-ray diffraction (XRD), infra-red (IR) spectroscopy, scanning electron microscopy (SEM)and Raman spectroscopy. Further the radioactive parameters such as linear attenuation coefficient (LAC), mass attenuation coefficient (MAC), half layer value (HLV) and mean free path (MFP) have been evaluated from the experimental data by using Sr^{90} beta Source having energy of 2.27 MeV. Obtained results suggests that synthesised GSC can find applications in radioactive waste management, radiation attenuation/shielding and protective garments manufacturing.

Keywords: Graphene sand composite, LAC, MAC, HLV, MFP, Raman spectroscopy



