

Synthesis and characterization of graphene oxide functionalized with magnetic nanoparticle via simple emulsion method

ABSTRACT

Current research focusing on the loading of Iron (III) oxide (IO) onto graphene oxide (GO) via simple emulsion technique. GO specialty such as big surface to volume ratio combined with magnetic nanoparticle superparamagnetic properties produce interesting nanocomposite material for biomedical application. Proper modification was carried out by simply varying the ratios of GO to IO ranging from 1:1 to 1:3 to discover the best amount of IO suitable to be loaded on GO. In addition, the prepared nanocomposites crystallinity, chemical interaction, structure, surface morphology and magnetic behaviour were investigated using various equipment such as X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy (RAMAN), Vibrating Sample Magnetization (VSM), and Atomic force microscopy (AFM). The magnetic nanoparticle synthesized via co-precipitation method found to be Iron (iii) oxide. IO loaded with GO were validated to be superparamagnetic with maximum magnetic saturation measured at the ratio of GO to IO of 1:2.

Keyword: Magnetic nanoparticle; Graphine oxide; Emulsion technique