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## Fe<sub>3</sub>O<sub>4</sub>@ CNT preparation as an efficient nanocomposite for loading and release an antiviral drug

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**Introduction:** Nanotechnology bring a lot of improvement in the engineering and biomedical field in recent years. Considering numerous applications of functionalized metal oxide nanoparticles in magnetic resonance imaging, electronics, catalysis and drug delivery; herein, in the new sciences, the nanocomposites preparation, based on nanotubes and nanoparticles, has been a noted topic in this area.

**Materials and Methods:** In this study, we have been tried to synthesized a benefit nanocomposite based on metal oxide nanoparticles. Metal oxide nanoparticles have been used for many applications such as magnetic resonance imaging, drug delivery, and treatment by neutron irradiation, electronics, catalysts, optics. In this study, iron oxide nanoparticles synthesis investigated by solvothermal synthesis method and by putting different functional groups such as SiO<sub>2</sub> and NH<sub>2</sub> on the nanoparticle surface, the properties of the particles were further improved. Furthermore, these nanoparticles prepared by green synthesis method by Bacillus sp. CKCr-7. UV-Vis spectroscopy, Scanning Electron Microscopy (SEM) and Fourier-transform infrared spectroscopy (FTIR) techniques characterized the synthesized samples.

**Results and Discussion:** As results shown, the obtained iron oxide nanoparticles were predominantly monodispersed and were stable for more than two months without significant agglomeration. After the nanoparticles synthesis, they were loaded upon carbon nanotubes, and then the nanocomposites were fully characterized. Afterward, the resulting nanocomposites and functionalized nanoparticles examined in biomedical fields for example in the delivery of active antiviral drug and in the engineering field to improve the lithium ion batteries quality. For this aim, the amount of drug loading/release was evaluated in different physiological pHs, including mouth and stomach pH values. Keywords: Fe<sub>3</sub>O<sub>4</sub>@ CNT nanocomposite, Bacillus sp. CKCr-7, Green synthesis, antiviral drug carriers

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