

IRON OXIDE NANOPARTICLES: SYNTHESIS, CHARACTERIZATION AND APPLICATION

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Abstract

In this work, we present a brief review of the simple synthesis of iron(III)-oxide nanoparticles (Fe_2O_3 NPs), their characterization and potential application as nanosorbents and voltammetric sensors. Fe_2O_3 NPs were obtained from Fe^{2+} and Fe^{3+} salts by the solid-state method and characterized by transmission electron microscopy (TEM), energy dispersive spectroscopy (EDS), Ultraviolet-visible spectroscopy (UV-Vis) and Fourier-transform infrared spectroscopy (FTIR). The morphology and average size of Fe_2O_3 NPs estimated by TEM show that Fe_2O_3 NPs are spherical in shape with an average diameter of 3 nm. EDS qualitative analysis confirms the presence of Fe and O in NPs chemical composition. The potential application of Fe_2O_3 NPs was proposed as nanosorbents of heavy metal ions Pb^{2+} and Cd^{2+} . Further, Fe_2O_3 NPs can be applied as voltammetric sensors due to significant selective electroanalytical signal amplification in determining Pb^{2+} and Cd^{2+} ions.

Keywords: Iron-oxide nanoparticles, nanosorbents, voltammetric sensor.