

## Preparation of Fe<sub>2</sub>O<sub>3</sub> / Graphene Composite for IR Shielding

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Inorganic nanocrystals attract great interest due to their unique physical properties and immense potential for applications. In particular, magnetic nanocrystals offer exciting opportunities for technologies on the interfaces between chemistry, physics, biology, and medicine. The aim of our research was investigation of the influence of preparation conditions on the magnetic properties of iron oxide/graphene composites. Graphene oxide (GO) were prepared via modified Hummer's method. Iron oxide nanoparticles deposited on the graphene surface were prepared by sol-gel method under different conditions e.g. pH, temperature, time. The obtained composites were characterized by: i) X-ray diffraction (XRD) – to determine the average size of crystallites and the phase composition, ii) electron microscopy (SEM/STEM) – for imaging the metal oxide distribution on the surface of graphene flakes, iii) thermo-gravimetric analysis (TGA) – for determining the thermal stability and percentage content of graphene and metal oxides. Absorption of IR radiation were measured using FT-IR spectrometer in the range of 400 – 7000 cm<sup>-1</sup>.

**Keywords:** graphene oxide, nanocomposites, metal oxide, IR shielding