**Abstract**

Spinel ferrites are commercially important materials because of their excellent magnetic and electrical properties. Nano-structured materials are now being studied intensively due to their novel physicochemical properties. Magnesium ferrites are considered as the most versatile ferrite due to its high resistivity and low eddy currents for high frequency applications. Microstructure and magnetic properties of magnesium ferrites are highly sensitive to composition, sintering conditions, grain size, impurities and the preparation methodology. It is a partially inverse spinel and its degree of inversion is sensitive to the thermal history of the sample, microstructure and preparative parameters. These nanoparticles are successfully prepared by co-precipitation method. Magnesium chloride [MgCl2.6H2O], anhydrous Ferric chloride [Fecl3] and sodium hydroxide are used as raw materials. Magnesium ferrite sample sintered at 600○C are subjected to X-ray diffraction to calculate the average nano-crystalline size using Debye – Scherrer formula. The FT-IR spectra of the sample are recorded to ensure the presence of the metallic compounds. The morphological analysis of the sample is studied using Scanning Electron Microscope (SEM). The magnetic properties of the sample are studied using Vibrating Sample Magnetometer.