**Abstract**

Nano-sized Cobalt ferrites doped with copper as an additive element CoxCu(1-x)Fe2O4 (where x =0,0.2,0.4,0.6,0.8,1) are synthesized using co-precipitation method. Cobalt-Copper ferrite samples sintered at 600○C are subjected to X-ray diffraction to calculate the average particle size and lattice parameters using Debye – Scherrer formula. The FT-IR spectra of these samples are recorded to ensure the presence of the metallic compounds. The variations of dielectric constant and dielectric loss for all the samples are studied as a function of frequency. The crystalline structure of composite nano particles are characterized by Transmission Electron Microscope (TEM).