

## **Simple synthesis and characterization of cobalt ferrite nanoparticles by a thermal treatment method**

### **ABSTRACT**

Crystalline, magnetic, cobalt ferrite nanoparticles were synthesized from an aqueous solution containing metal nitrates and polyvinyl pyrrolidone (PVP) as a capping agent by a thermal treatment followed by calcination at various temperatures from 673 to 923?K. The structural characteristics of the calcined samples were determined by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), and transmission electron microscopy (TEM). A completed crystallization occurred at 823 and 923?K, as shown by the absence of organic absorption bands in the FT-IR spectrum. Magnetization measurements were obtained at room temperature by using a vibrating sample magnetometer (VSM), which showed that the calcined samples exhibited typical magnetic behaviors.

**Keyword:** Simple synthesis; Cobalt ferrite nanoparticles; Thermal treatment method