

# The effect of different polymers on structural and magnetic properties of cobalt ferrite prepared using Sol- gel method

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## Abstract

In this study the effect of different polymers (PVA, PVP, PEG and EG) on the structural and magnetic properties of the cobalt ferrite with general formulae  $\text{CoFe}_2\text{O}_4$  was investigated. The structural, morphological and magnetic properties of the samples were studied by X- ray diffraction (XRD), Fourier transform infrared (FT-IR), Field emission scanning electron microscopy (FE- SEM) and Vibrating sample magnetometer (VSM). X-ray diffraction measurements along with Rietveld refinement confirmed the crystalline structure for all the prepared ferrites. The magnetic properties of samples indicated that maximum (71 emu/g) and minimum (50emu/g) amounts of saturation magnetization were achieved for samples prepared using PEG and PVP, respectively. Moreover, maximum (1200 Oe) and minimum (904 Oe) amounts of coercivity were achieved for samples prepared using PVA and PEG, Respectively. Our results indicate that it is possible to tune magnetic properties of ferrites by using different polymers during the preparation process.

**Keywords:** Cobalt ferrite, Polyvinyl alcohol, Polyvinyl pyrrolidone, Polyethylene glycol, Ethylene glycol, structural and magnetic properties

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