

Thesis Title	A Study of Structure and Magnetic Properties of Co – Sn Substituted Barium Ferrite
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#### Abstract

This thesis involves a study of structure and magnetic properties of Co - Sn substituted barium ferrite ( $\text{BaFe}_{12-2x}\text{Co}_x\text{Sn}_x\text{O}_{19}$ ) with  $x = 0.0-0.6$ . The samples were prepared by ceramic method sintering for 12 hours at 1200, 1300 and 1350°C respectively. The structure and magnetic properties have been investigated using X- Ray diffraction (XRD), Scanning Electron Microscope (SEM), Hysteresisgraph and Mössbauer spectroscopy.

The barium ferrite structures were confirmed by XRD. The results indicated that lattice parameter  $c/a$  increased slowly with increasing  $x$ . From SEM, the average grain size increased with the sintering temperature. The specific saturation magnetization  $\sigma_s$  and coercivity  $H_c$  decreased with increasing  $x$ .  $H_c$  also decreased with increasing sintering temperature. Mössbauer parameters showed that Co and Sn preferred to enter  $4f_{1/2}$ ,  $2a$  and  $12k$  sites.

Keywords: barium ferrite / sintering / coercivity / Mössbauer spectroscopy