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## Structural and Magnetic Properties of $\text{Mg}_x\text{Sr}_x\text{Mn}_x\text{Co}_{1-3x}\text{Fe}_2\text{O}_4$ Nanoparticle ferrites

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### Abstract content <br> &nbsp; (Max 300 words)

A series of nanoferrites (with  $x = 0, 0.1, 0.2, 0.3, 1/3$ ) were synthesized by glycol-thermal technique. X-ray diffraction (XRD) patterns of the as-prepared samples show single-phase cubic spinel structure. The average crystallite sizes, lattice parameters, XRD densities and porosities were estimated from XRD data. The average crystallite sizes were found in range of 7 to 9 nm. Mössbauer spectroscopy measurements were performed in order to investigate the magnetic order of the materials and the distribution of  $\text{Fe}^{3+}$  ions in the tetrahedral and octahedral sites. Room temperature magnetic measurements of the series were studied using a vibrating sample magnetometer. The results show that the values of the coercive fields and saturation magnetizations which increase with increase in Co content from 15 Oe and 56.51 emu/g for  $x=0.3$  to 114 Oe and 76.61 emu/g for  $x=0.1$  respectively. Significant correlations between magnetizations and coercive fields are observed. A significant change in properties is observed for the compound. These results are contrasted with low temperature measurements from 2 K to 300 K and magnetic fields to 5 Tesla.

### Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?

Yes

### Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?

PhD

### Main supervisor (name and email)<br>and his / her institution

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### Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

yes

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