



Contribution ID: 12

Type: Poster Presentation

## Synthesis, Electron Spin Resonance and Photoluminescence properties of Sm<sup>3+</sup> ion doped Zn-Mn nanoferrites synthesized by glycol-thermal method

Nano-crystalline  $Zn_{0.5}Mn_{0.5}Sm_xFe_{2-x}O_4$  ( $0 \leq x \leq 0.05$ ) with average crystallite sizes varying between 12 and 17 nm were synthesized by the glycol-thermal process. XRD analysis confirmed a single-phase cubic spinel structure in all the compounds. Substituting a smaller Fe<sup>3+</sup> ion with a larger rare-earth Sm<sup>3+</sup> ion has affected the distribution of metal ions on tetrahedral (A) and octahedral (B) sites. A scanning electron microscope has been used to study the morphology of nanoparticles and it revealed spherical shaped nanoparticles. EDX confirmed the phase purity and the elemental composition. Crystallite sizes affect ESR signal intensity and the line width. The *g*-values fluctuated ranging from 2.31 to 2.51 due to fluctuating crystallite sizes. The broad visible emission band is observed at 318 nm and 380 nm in the entire PL spectroscopy results for all compositions with an excitation wavelength of 340 nm. The emission intensity was found to be dependent on Sm<sup>3+</sup> ion concentration and crystallite sizes of the compounds and the spin number.

**Apply to be considered for a student ; award (Yes / No)?**

No

**Level for award;(Hons, MSc, PhD, N/A)?**

N/A

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**Session Classification:** Poster Session

**Track Classification:** Track A - Physics of Condensed Matter and Materials