Contribution ID: **274** Type: **Poster Presentation**

Structural and magnetic characterization of Sm3+ ion substituted Zn-Mn nanoferrites synthesized by glycol-thermal method

Thursday, 11 July 2019 15:00 (2 hours)

Zn0.5Mn0.5SmxFe2-xO4 (0 ≤ x ≤ 0.05) fine powders with average crystallite size in the range 12-17 nm were synthesized by glycol-thermal reaction. The as synthesized compounds were subjected to the annealing process of 1100 ⁰C, after which the crystallite size increased to about 60 nm. XRD analysis confirmed a single phase cubic spinel structure in all the compounds investigated. TEM images showed nearly spherical particles with uniform particle size distributions. The Mössbauer spectrum of Zn0.5Mn0.5Fe2O4 (x = 0) oxide could be resolved into two quadrupole doublets indicative of paramagnetic spin state. Sm3+ substituted Zn0.5Mn0.5SmxFe2-xO4 (0.01≤ x ≤ 0.05) fine powders show weak sextets in addition to broad doublets attributed to some particles magnetic moments in ordered magnetic phase. The Mössbauer spectra of the compounds annealed at 1100 ⁰C exhibit magnetic split sextets indicative of ordered magnetic phase. The compounds have small coercive fields and high saturation magnetization (40 emu/g to 60 emu/g) which reduces with increasing Sm3+ content due to the paramagnetic nature of Sm3+ ions.

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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