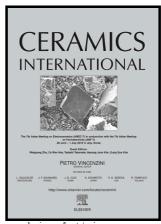
## Author's Accepted Manuscript

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## **ACCEPTED MANUSCRIPT**

Modulation of physico-chemical, magnetic, microwave and electromagnetic properties of nanocrystalline strontium hexaferrite by Co-Zr doping synthesized using citrate precursor sol-gel method

Prabhjyot Kaur<sup>a\*</sup>, S. K. Chawla<sup>a</sup>, S. S. Meena<sup>b\*</sup>, S. M. Yusuf<sup>b</sup>, Kunal Pubby<sup>c</sup>, S. Bindra Narang<sup>c</sup>

aDepartment of Chemistry, Centre for Advanced Studies-I, Guru Nanak Dev University, Amritsar

143 005, India

<sup>b</sup>Solid State Physics Division, Bhabha Atomic Research Centre, Mumbai 400 085, India

<sup>c</sup>Department of Electronics Technology, Guru Nanak Dev University, Amritsar143 005, India

Email: \*prabhjyot.2525@gmail.com; sschawla118@gmail.com; ssingh@barc.gov.in;

kunalpubby02@gmail.com; sukhleen2@yahoo.com

**Abstract**: Co-Zr doped SrCo<sub>x</sub>Zr<sub>x</sub>Fe<sub>(12-2x)</sub>O<sub>19</sub> (x = 0.0, 0.2, 0.4, 0.6, 0.8 and 1.0) have been synthesized by citrate precursor sol-gel method. We have studied the impact of coupled substitution of magnetic Co<sup>2+</sup> and non-magnetic Zr<sup>4+</sup> for Fe<sup>3+</sup> on the morphology, magnetic, microwave and electromagnetic properties of SrCo<sub>x</sub>Zr<sub>x</sub>Fe<sub>(12-2x)</sub>O<sub>19</sub>. Characterization of these materials has been done by XRD, FT-IR, EDS, TEM, VSM and Mössbauer spectroscopy techniques. Complex permeability ( $\mu$ '), complex permittivity ( $\varepsilon$ ') and reflection loss curves have also been analyzed. XRD analysis indicates the formation of single phase hexagonal ferrites at a low temperature of 800°C. Mössbauer spectra indicates that the dopant ions are located on the tetrahedral  $4f_1$  and octahedral  $4f_2$  sites up to x = 0.4, octahedral 12k site and bipyramidal 2k site for x = 0.6 and 12k site for x = 0.8-1.0. The reflection loss (R.L.) analysis shows that all the

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