Effect of Trivalent and Divalent Cations (rare earth) on the Properties of M – Type (Sr – Ba) Hexaferrites

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Abstract:

Effect of rare earth and Divalent (InMn) substitution on the structural electrical and dielectric properties of Sr0.5-x Ba0.5InxMnyFe12-yO19,(x = 0.00–0.10; y= 0.00–1.00) Hexaferrites prepared by sol–gel auto combustion is reported. The synthesized samples were characterized by Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscopy electrical and dielectric properties (resistivity and conductivity). The X-ray diffraction analysis confirmed single phase M-type hexa-ferrite structure. The lattice parameters were found to increase as In Mn contents increases, which is attributed to the ionic sizes of the implicated cations. The InMn seems to be completely soluble in the lattice. The results of scanning electron microscopy shows that the grain size decreases with increase of In Mn substitution. The increased anisotropy and fine particle size are useful for many applications, such as improving signal noise ratio of recording devices.

Biography:

Dr Hasan Mehmood Khan, Assistant Professor, Department of Physics, The Islamia University of Bahawalpur. 2003-2007 Lecturer , 2007-2009 (M.Phil Physics) 2010-2016 (PhD Physics under Indigenous HEC batch 4th Scholarship from B.Z.U, Multan), Assistant Professor (South Punjab Institute of Science and Technology, w.e.f July 2015 to February 2017) , Assistant Professor (Ghazi University, D.G.Khan from 03-03-2017-23 Oct. 2017), Assistant Professor (Physics), The Islamia University of Bahawalpur 24th, October 2017 onwards.

Publication of speakers:

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2. Hasan M. Khan, M.U. Islam, Yongbing Xu, M. Asif Iqbal, Irshad Ali, "Structural and Magnetic Properties of TbZn-Substituted Calcium Barium M-type Nano-structured Hexa-ferrites", Journal of Alloys and Compounds, Volume 589, 15 March 2014, Pages 258–262.
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