



Suitability of Cations Substituted M-Type (Sr-Ba) Hexaferrites for High frequency applications

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Abstract:

Effect of rare earth and Divalent (InMn) substitution on the structural electrical and dielectric properties of $Sr_{0.5-x}Ba_{0.5}In_xMn_yFe_{12-y}O_{19}$, ($x = 0.00-0.10$; $y = 0.00-1.00$) 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 Hassan Mehmood Khan has completed his PhD at the age of 30 and is working as assistant professor at the Institute of Physics The Islamia University of Bahawalpur Pakistan The fields of interest include Condensed matter Physics. Magnetic Materials, Nanomaterials. (synthesis, characterization and their application studies), nanocrystalline soft ferrites, nano-structured hard ferrites. Microwave and other high frequency applications of Ferrites.



Publication of speakers:

- Dr.Hasan M. Khan et al..M.U. Islam, Yongbing Xu, Muhammad Naeem Ashiq, Irshad Ali, M. Asif Iqbal, Muhammad Ishaque, "Structural and Magnetic Properties of Pr-Ni Substituted $Ca_{0.5}Ba_{0.5}Fe_{12}O_{19}$ hexa-ferrite Nanoparticles" *Ceramics International*, Volume 40, Issue 5, June 2014, Pages 6487-6493.
- Dr.Hasan M. Khan et al .M. Asif Iqbal, Misbah-ul-Islam, Irshad Ali, Hasan M. Khan, Ghulam Mustafa, Ihsan Ali "Study of Electrical Transport Properties of Eu Substituted MnZn-Ferrites Synthesized by Co-precipitation Technique", *Ceramics International* 39 (2013) 1539-1545.

[Webinar on Nano- Technology 2020, December 24, 2020,Dubai,UAE.](#)

Citation: Suitability of Cations Substituted M-Type (Sr-Ba) Hexaferrites for High frequency applications, Nano- Technology 2020, December 24, 2020.