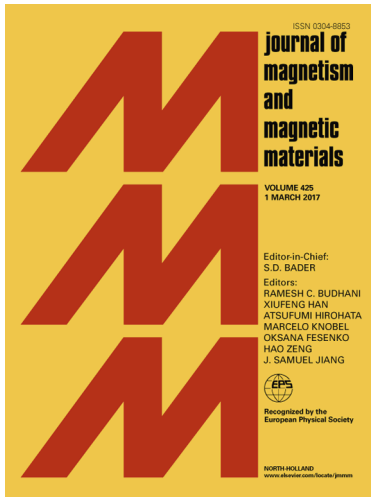

Correlation of the atomic structure, magnetic properties and microwave characteristics in substituted hexagonal ferrites

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PII: S0304-8853(18)30322-6
DOI: https://doi.org/10.1016/j.jmmm.2018.05.006
Reference: MAGMA 63918

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 4 February 2018
Revised Date: 27 April 2018
Accepted Date: 3 May 2018

Please cite this article as: A.V. Trukhanov, S.V. Trukhanov, V.G. Kostishyn, L.V. Panina, V.V. Korovushkin, V.A Turchenko, D.A. Vinnik, E.S. Yakovenko, V.V. Zagorodnii, V.L. Launetz, V.V.Oliynyk, T.I. Zubar, D.I. Tishkevich, E.L. Trukhanova, Correlation of the atomic structure, magnetic properties and microwave characteristics in substituted hexagonal ferrites, *Journal of Magnetism and Magnetic Materials* (2018), doi: https://doi.org/10.1016/j.jmmm.2018.05.006

CORRELATION OF THE ATOMIC STRUCTURE, MAGNETIC PROPERTIES AND MICROWAVE CHARACTERISTICS IN SUBSTITUTED HEXAGONAL FERRITES

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Present paper describes variation of structure and magnetic properties in diamagnetically doped barium hexaferrites. $Al^{3+}$and In^{3+} diamagnetic ions were chosen for investigation of the correlation between the chemical composition, crystal structure, magnetic properties and microwave characteristics in $BaFe_{12-x}DI_xO_{19}$ solid solutions. The changes of structure and electronic properties were investigated using neutron powder diffraction and Mossbauer spectroscopy. These data were used for discussion of the electromagnetic properties changes. It was demonstrated possibility of electromagnetic properties control in the samples. It was shown that all samples demonstrate correlation between electromagnetic properties and the level of chemical substitution. The transmission spectra of all the samples demonstrated a deep minimum in the frequency range 20-65 GHz which was associated with the natural ferromagnetic resonance (NFMR). Calculated data for electromagnetic absorption correlates well with experimental transmission spectra. External magnetic field leads to shift of the NFMR peak due to increase of magnetic anisotropy. It was concluded that the intrasublattice interactions were responsible for tailoring the magneto crystalline anisotropy and resonance parameters.

Key worlds: atomic structure, neutron powder diffraction, Mossbauer spectroscopy, microwave characteristics

PACs: 81.40.Vw, 61.05.C-, 77.80.B-