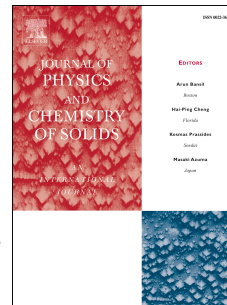


Accepted Manuscript

Effect of gallium doping on electromagnetic properties of barium hexaferrite

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ACCEPTED MANUSCRIPT

EFFECT OF GALLIUM DOPING ON ELECTROMAGNETIC PROPERTIES OF BARIUM HEXAFERRITE

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The BaFe_{12-x}Ga_xO₁₉ ($x \leq 1.2$) hexaferrites were synthesized by the usual ceramic technology. It was been established that with the x increase the unit cell and magnetic parameters monotonically decrease. The frequency of natural ferromagnetic resonance firstly decreases from 49.6 GHz down to 49.1 GHz when $x = 0.6$ and then it increases up to 50.5 GHz. The line width monotonically increases from 3.5 GHz up to 5 GHz. The peak amplitude of resonant curve changes slightly with the exception for the $x = 0.9$ when it reaches -16 dB. The 1.3 GHz/kOe frequency shift in bias field is more intensive for small $x = 0.3$. The decreasing of the magnetic parameters is a result of the dilution of the Fe³⁺ - O²⁻ - Fe³⁺ superexchange interactions. The behavior of the amplitude-frequency characteristics is largely determined by the reduction of the uniaxial exchange anisotropy. The prospects of the Ga-substituted hexaferrites as a material effectively absorbing the high-frequency electromagnetic radiation are shown.

Key words: solid state reactions, crystal structure, magnetic and absorption measurements, doped hexaferrites.

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