

THE EFFECT OF VACANCIES ON SOME MAGNETIC PROPERTIES OF IRON - DEFICIT (NiO)_x(ZnO)_y(Fe₂O₃)_z SYSTEM

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ABSTRACT

The effect of iron deficiency of Ni_{0.30+2X}Zn_{0.70}Fe_{2-2X}O_{4-4X} with X = 0.00, 0.01, 0.02, 0.03 and 0.04 were carefully studied. High purity (99.992%) starting oxides were used and toroidal samples were prepared by using a conventional oxide-mixing technique. X-Ray Diffraction analysis of the iron deficit samples identified single phase ferrite. Grain size of 31.8 μm and lowest theoretical porosity, 0.78%, for sample with 0.47 mole fraction of iron oxide was obtained. It is speculated that cationic and anionic vacancies are sufficiently formed for the diffusive transportation of metal ions to occur for the sample. However, sample with 0.46 mole fraction of iron oxide gave the highest saturation induction, 2757 Gauss as well as highest Curie temperature (5000C) due to stronger superexchange interaction.

<http://journal.masshp.net/wp-content/uploads/Journal/2004/Noorhana%20Yahya%2053-58.pdf>

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