Structure, analysis and some magnetic properties for low temperature fired Ni-Cu ferrite

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Abstract

Cu2+ ions substituted Ni-ferrite having the general formula Ni1-xCuxFe2O4 (where x=0.0, 0.2, 0.4 and 0.6) were prepared by the sintering ceramic method. X-ray diffraction, infrared spectra and magnetization of the above ferrite were carried out to investigate structural and magnetic characterization of this ferrite. Crystallite size, lattice parameters, positional oxygen parameter was found to vary between 8.3856 and 8.3865 angstrom. The infrared spectra were measured in the frequency range 650-150 cm(-1). Two prominent bands were observed, high frequency band nu(1) and low frequency band nu(2) were assigned to tetrahedral and octahedral sites. Bond length and force constant were also calculated for both tetrahedral and octahedral sites. The effect of Cu concentration on, saturation magnetization, coercivity ratio and magnetic moment were investigated using vibrating sample magnetometer (VSM). It was found that both saturation magentization (M-S) and coercivity (H-C) decreases with increasing in Cu content. (C) 2012 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: X-ray; Infrared; Lattice parameter; Magnetic properties

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