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

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PHYSICA B-CONDENSED MATTER

Volume: 407 Issue: 12 Pages: 2025-2031

DOI: 10.1016/j.physb.2012.01.134

Published: JUN 15 2012

[View Journal Impact](#)

Abstract

Cu²⁺ ions substituted Ni-ferrite having the general formula Ni_{1-x}Cu_xFe₂O₄ (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 magnetization (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

KeyWords Plus: SUBSTITUTED COBALT FERRITES; CATION DISTRIBUTION; X-RAY; SPINEL FERRITES; NICKEL FERRITE; NANO-PARTICLES; ZN FERRITES; GAS SENSOR; BEHAVIOR

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Publisher

ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Categories / Classification

Research Areas: Physics

Web of Science Categories: Physics, Condensed Matter

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000303803000009

ISSN: 0921-4526

eISSN: 1873-2135

Citation Network

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