Comparative study of structural, electrical and dielectric properties of Ni and Mg substituted Zn nano-ferrites

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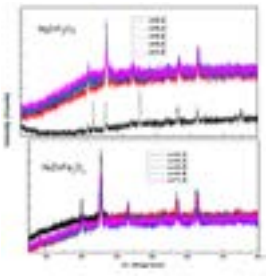
In this paper, we have reported the comparison of structural, optical and electrical properties for $Ni_xZn_{1-x}Fe_2O_4$ and $Mg_xZn_{1-x}Fe_2O_4$ nano-particles. These nano-particles (x= 0.2, 0.4, 0.6, 0.8 and 1.0) were prepared by co-precipitating aqueous solutions method using identical preparation conditions. The XRD patterns shows that both samples consisted of six peaks and related to (220), (311), (400), (422), (333), (440) planes of a cubic unit cell respectively and are in close agreement with characteristic peaks of soft ferrites. The particle size of $Mg_xZn_{1-x}Fe_2O_4$ was found to be decreasing from 31.32 to 19.55 nm by increasing magnesium content. While the particle size of NixZn1-xFe2O4 samples varied from 30.86 to 34.59 nm. The values of Lattice constant, volume, x-ray density, bulk density, particle size, porosity and dielectric constant, loss tangent and ac conductivity were also calculated for both series and results were compared. In conclusion our results suggested that $Mg_xZn_{1-x}Fe_2O_4$ can be a suitable replacement for $Ni_xZn_{1-x}Fe_2O_4$ upto 3 MHz.



Biography

Nasir completed his M.Phil and Ph.D from Quaid-e-Azam University Islamabad, Pakistan in 1992 and 2007 respectively. He did his Post-doc from University of California San Deigo, USA in 2010. He has more than 15 years of research and teaching experience. Currently he is working as Chairman, Department of Physics and Dean of Science Faculty. He has published more than 30 research papers in International Journals with impact factor. He completed 5 research projects and 12 M.Phil students completed their degree under his supervision.

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