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# Structural, Morphological and Temperature Dependent Dielectri<mark>c</mark> S<mark>tudies of Sr-Cu Nano Sized Hexa Ferrite</mark>s

Vandana Badwaik <sup>a</sup>, <mark>Dilip Badwaik</mark> <sup>c</sup>, Kishor Rewatkar <sup>b</sup>  $\stackrel{>}{\sim}$   $\stackrel{>}{\simeq}$  , Vivek Nanoti <sup>a</sup>

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### Abstract

A series of polycrystalline SrCu nano ferrites substituted with Sn-Co having generic formula  $Sr_2Cu_2Fe_{12-X}(SnCo)_{X/2}O_{22}$  (where x changes from 0 to 2.5 in equal steps of 0.5) have been synthesized by novel microwave assisted sol gel process using urea as fuel. Structural characterization of the prepared compounds have been performed using X-ray powder diffraction pattern, which shows

formation of single Y-type hexagonal phase and belonging to space group R3m (*no.* 166). The lattice parameters, X-ray density (D<sub>x</sub>), measured density (D<sub>m</sub>), and porosity (P) of samples are calculeted from XRD data. We observed that the lattice parameters "a" and "c"

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increasewith content of SnCo. The crystallite size is in the range 13- 47nm, shows nanometer size of prepared compounds. The microstructure is studied by transmission electron microscopy (TEM). The ac electrical conductivity ( $\sigma_{ac}$ ) dielectric constant ( $\epsilon$ '), and dielectric loss (tan  $\delta$ ) are studied a function of temperature. The plot of conductivity verses 1/T shows semiconducting nature of the compounds. The results of dielectric constant and dielectric loss are explained on the basis of the assumption that the mechanism of dielectric polarization is similar to that of conduction process.

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