



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.12 No.02, pp 299-309, 2019

Structural, Dielectric and magneto-electric properties of La and Co Co-Substituted BiFeO₃ Ceramics

Senbeto Kena Etana*, P.Vijarya Bhaskar Rao

Department of Physics, Wollega University, Ethiopia

Abstract : Bi_{1-x}La_xFe_{0.85}Co_{0.15}O₃ (x = 0.1,0.15)Ceramics have been prepared by sol-gel technique. X-ray diffraction data indicated a phase transition from rhombohedra with space group R3c to orthorhombic structure and decreasing in crystallite size from 26.27nm to 21.05nm for x=0.1, 0.15, respectively. The activation energy for electrical conduction has been calculated from the Arrhenius plot using impedance measurement. The activation energy for the grain conduction was found to be increased from 0.286 eV to 0.38eV for x=0.1, 0.15, respectively measured in the temperature ranges (300°C, 350°C, 400°C, 450°C, 500°C). The vibrating sample magnetometer (VSM) results showed that the saturation magnetization (Ms) increased from 13.24emu/g for x=0.1 to 39.59 emu/g for x=0.15, due to the collapse of spin cycloid structure. The remnant magnetization (Mr) is also correspondingly enhanced from 3.43 emu/g to 11.88emu/g.

Keywords : nano-particle, multi-ferroics, dielectric constant, dielectric loss, bismuth ferrites, magnetization.

Senbeto Kena Etana *et al* //International Journal of ChemTech Research, 2019,12(2): 299-309.

DOI= <http://dx.doi.org/10.20902/IJCTR.2019.120239>
