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Electrical and Magnetoelectric Properties of (y)Li0.5Ni0.7Zn0.05Fe2O4 + (1-y)Ba0.5Sr0.5TiO3 Magnetoelectric Composites

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Abstract : (y) Li0.5Ni0.7Zn0.05Fe2O4 + (1-y) Ba0.5Sr0.5TiO3 magnetoelectric composites with y = 0.1, 0.3 and 0.5 were prepared by a conventional standard double sintering ceramic technique. X-ray diffraction analysis confirmed the phase formation of ferrite, ferroelectric and their composites. logρdc Vs 1/T graphs reveal that the dc resistivity decreases with increasing temperature exhibiting semiconductor behavior. The plots of logσac Vs logω2 are almost linear indicating that the conductivity increases with increase in frequency i.e, conductivity in the composites is due to small polaron hopping. Dielectric constant (έ) and dielectric loss (tan δ) were studied as a function of frequency in the range 100Hz–1MHz which reveals the normal dielectric behavior except the composite with y=0.1 and as a function of temperature at four fixed frequencies (i.e. 100Hz, 1KHz, 10KHz, 100KHz). ME voltage coefficient decreases with increase in ferrite content and was observed to be maximum of about 7.495 mV/cmOe for (0.1) Li0.5Ni0.7Zn0.05Fe2O4 + (0.9) Ba0.5Sr0.5TiO3 composite.

Keywords : XRD, dielectric constant, dielectric loss, DC and AC conductivity, ME voltage coefficient
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