Processing and Characterization of (Pb0.55Ca0.45) (Fe0.5Nb0.5)O3 and (Pb0.45Ca0.55) (Fe0.5Nb0.5) O3 Dielectric Ceramics

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Abstract : Ceramic samples of (Pb0.55Ca0.45) (Fe0.5Nb0.5)O3 and (Pb0.45Ca0.55)(Fe0.5Nb0.5)O3 were synthesized by columbite precursor method and characterized for structural and dielectric properties. Both the synthesized samples have perovskite structure with tetragonal symmetry. The variations in relative permittivity and loss tangent were measured as a function of frequency at room temperature. Both the relative permittivity and loss tangent decreased with increase in frequency. A reasonably high value of relative permittivity of 63.46, loss tangent of 0.0067 at 15 MHz and temperature coefficient of relative permittivity of -82 ppm/˚C was obtained for (Pb0.45Ca0.55) (Fe0.5Nb0.5) O3.

Keywords : loss tangent, perovskite, relative permittivity, X-ray diffraction
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