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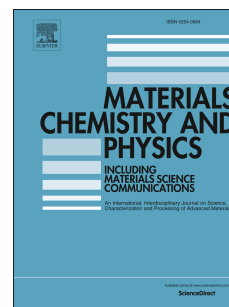
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Fabrication and Characterization of LaFeO₃-BaTiO₃ Electroceramics

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Abstract

The structural, electrical and multiferroic characteristics of (Ba_{1-x}La_x)(Ti_{1-x}Fe_x)O₃ (i.e., (1-x) BaTiO₃-xLaFeO₃) with (x=0.0-0.5) were investigated. The samples prepared through a chemico-thermal route were found to crystallize in a tetragonal structure similar to that of its parent BaTiO₃. Elemental content, surface morphology and vibrational characteristics (from Raman spectra) of the samples were also analyzed. The temperature dependence of dielectric characteristics of all the materials has been studied using a multi-peak Gaussian model. The dielectric peaks are attributed to the magnetic transitions of LaFeO₃ and the ferroelectric-paraelectric transition of BaTiO₃. The existence of multiple transitions in (Ba_{1-x}La_x)(Ti_{1-x}Fe_x)O₃ compounds leads to higher values of dielectric constant in a wide range of temperature. Due to the high dielectric or tangent loss of the materials with higher x content, these materials might be suitable for use as microwave absorber. The relaxation and conduction mechanism of all the materials have been investigated. The multiferroic characteristics of the samples have been analyzed with room temperature P-E, M-H and M-E plot.

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