Influence of Er^{+3} on the morphology, structure and electrical properties of $Bi_{3.25}La_{0.75}Ti_3O_{12}$ ceramics

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$Bi_{4-x}La_xTi_3O_{12}$ (BLT) ceramics has attracted considerable attention of many researchers due to their potential applications in nonvolatile ferroelectric random access memories (FRAMs). Ceramics samples of $Bi_{3.25}La_{0.75}Ti_3O_{12}$.(BLT075) are attracting a particular interest because shows a better ferroelectric property. Recently, ferroelectric properties were improved by ion doping on Bi and Ti-sites. In this work, Er-doped BLT075 (BLTEr) ceramics were prepared by substituting Er^{+3} on the Bi or Ti-sites. The effect of Er^{+3} substitution on the phase formation, microstructure as well as the electrical properties of BLT075 ceramics was investigated. To our knowledge, this is the first work in which erbium has been used as doping element in this ceramic system. Ferroelectric ceramics of BLTEr were prepared using the solid state reaction method. X-ray diffraction patterns of calcined and ceramic samples exhibit the characteristic Bragg reflections corresponding to the $Bi_4Ti_3O_{12}$ (BIT) and a little amount secondary phase. The density of the sintered ceramic samples was over 95% of their theoretical value. The influence of Er substitution on the BLT075 microstructure and electrical properties will discussed in detail.

Keywords: Ferroelectric material, BLT-based compound, Sintering, Microstructure, Electrical properties
Work supported by CNPq

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