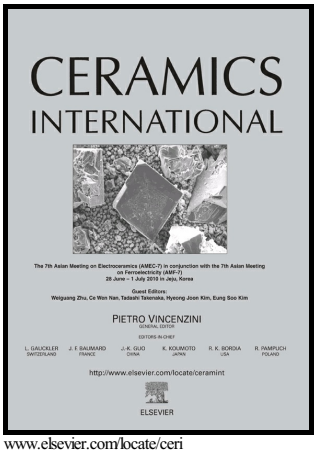

www.elsevier.com/locate/ceri

Electrical and photoluminescence properties of Sm^{3+} doped $Na_{0.5}La_{0.5}Bi_{8-x}Sm_xTi_7O_{27}$ ceramics

Pengbin Wang, Xiangping Jiang, Chao Chen, Xiang Xia, Yalin Jiang, Xiaohong Li, Yunjing Chen, Gang Fan

PII: S0272-8842(17)32218-6
DOI: https://doi.org/10.1016/j.ceramint.2017.10.030
Reference: CERI16449

To appear in: *Ceramics International*

Received date: 11 August 2017
Revised date: 1 October 2017
Accepted date: 7 October 2017

Cite this article as: Pengbin Wang, Xiangping Jiang, Chao Chen, Xiang Xia, Yalin Jiang, Xiaohong Li, Yunjing Chen and Gang Fan, Electrical and photoluminescence properties of Sm^{3+} doped $Na_{0.5}La_{0.5}Bi_{8-x}Sm_xTi_7O_{27}$ ceramics, *Ceramics International,* https://doi.org/10.1016/j.ceramint.2017.10.030

Electrical and photoluminescence properties of Sm^{3+} doped $Na_{0.5}La_{0.5}Bi_{8-x}Sm_xTi_7O_{27}$ ceramics

Pengbin Wang, Xiangping Jiang*, Chao Chen, Xiang Xia, Yalin Jiang, Xiaohong Li, Yunjing Chen, Gang Fan

Jiangxi Key Laboratory of Advanced Ceramic Materials, School of Material Science and Engineering, Jingdezhen Ceramic Institute, Jingdezhen, 333403, China.

Abstract

In this study, Sm^{3+} doped $Na_{0.5}La_{0.5}Bi_{8-x}Sm_xTi_7O_{27}$ (NBT-BITL-*x*Sm, x = 0, 0.01, 0.015, 0.02, and 0.03) ceramics were synthesized via a conventional solid-state reaction process. The structural, electrical, and photoluminescence properties of NBT-BITL-*x*Sm ceramics were systematically investigated. The crystal structure of NBT-BITL-*x*Sm was refined using XRD Rietveld refinement and found to possess a single orthorhombic structure at room temperature. Raman spectroscopy revealed that Sm^{3+} ions preferred to substitute for Bi^{3+} located in the A-sites of pseudo-perovskite layers, inducing a slight decrease in orthorhombic distortion. Strong characteristic emission peaks of Sm^{3+} ions were observed in orange-red regions under a 407 nm laser source, and the sample with x = 0.015 achieved the optimal photoluminescent property. Dielectric measurements showed double anomaly permittivity peaks at the temperature of 589 and 600°C (T_m and T_c, respectively). The complex impedance spectrum indicated that the electrical conductivities mainly originated from crystal grains at high temperature. The activation energy was calculated to be 1.37–1.44 *e*V from Arrhenius fitting results. After Sm^{3+}

* Corresponding author. Tel: +86-13979827680; fax: +86-798-8499328
E-mail addresses: jiangxp64@163.com (X. Jiang).