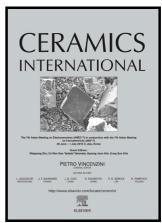
### Author's Accepted Manuscript

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### **ACCEPTED MANUSCRIPT**

## Electrical and nonlinear current-voltage characteristics of

### La-doped BiFeO<sub>3</sub> ceramics

Benjaporn Yotburut<sup>1</sup>, Prasit Thongbai<sup>2</sup>, Teerapon Yamwong<sup>3</sup>, and Santi Maensiri<sup>1,4\*</sup>

<sup>1</sup>School of Physics, Institute of Science, Suranaree University of Technology, Nakhon

Ratchasima, 30000 Thailand

<sup>2</sup>Department of Physics, Faculty of Science, Khon Kaen University, Khon Kaen 40002,

#### Thailand

<sup>3</sup>National Metals and Materials Technology Center (MTEC), Thailand Science Park,
Pathumthani 12120, Thailand

<sup>4</sup>SUT Center of Excellence on Advanced Functional Materials, Suranaree University of Technology, Nakhon Ratchasima, 30000, Thailand.

\*Corresponding Author: Professor Dr. Santi Maensiri, Tel: +66 (0)-4422-4188, fax: +66 (0)-4422-4185, santimaensiri@g.sut.ac.th; santimaensiri@gmail.com

Abstract

Multiferroic  $Bi_{1.x}La_xFeO_3(x=0, 0.05, 0.1, 0.2, and 0.3)$  ceramics with particle sizes of ~67-19 nm were prepared by a simple co-precipitation method. The effects of La dopant on the microstructure, giant dielectric response, and electrical properties were investigated. The grain size of  $Bi_{1.x}La_xFeO_3$  ceramics significantly decreased with increasing La doping ions. The  $Bi_{0.95}La_{0.05}FeO_3$  ceramic exhibited the highest leakage current density value. Interestingly, it strongly decreased as the concentration of La increased. The nonlinear coefficient of La doped BFO slightly decreased with increasing La. This shows a space-charge-limited conduction mechanism, which is involved in low electric field regions for all samples investigated. La substitution significantly enhanced the breakdown field. It was found that the potential barrier height at the grain boundary was slightly reduced from 0.3 to 0.16 eV by substitution of La ions. Using impedance spectroscopy analysis, except for the  $Bi_{0.7}La_{0.3}FeO_3$  ceramic, the grain

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