

Accepted Manuscript

Title: High thermal stability of energy storage density and large strain improvement of lead-free $\text{Bi}_{0.5}(\text{Na}_{0.80}\text{K}_{0.20})_{0.5}\text{TiO}_3$ piezoelectric ceramics doped with La and Zr

Authors: Pichitchai Butnoi, Supalak Manotham, Pharatree Jaita, Chamnan Randorn, Gobwute Rujijanagul



PII: S0955-2219(18)30236-X
DOI: <https://doi.org/10.1016/j.jeurceramsoc.2018.04.024>
Reference: JECS 11834

To appear in: *Journal of the European Ceramic Society*

Received date: 22-1-2018
Revised date: 11-4-2018
Accepted date: 12-4-2018

Please cite this article as: Butnoi P, Manotham S, Jaita P, Randorn C, Rujijanagul G, High thermal stability of energy storage density and large strain improvement of lead-free $\text{Bi}_{0.5}(\text{Na}_{0.80}\text{K}_{0.20})_{0.5}\text{TiO}_3$ piezoelectric ceramics doped with La and Zr, *Journal of the European Ceramic Society* (2018), <https://doi.org/10.1016/j.jeurceramsoc.2018.04.024>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

High thermal stability of energy storage density and large strain improvement of lead-free $\text{Bi}_{0.5}(\text{Na}_{0.80}\text{K}_{0.20})_{0.5}\text{TiO}_3$ piezoelectric ceramics doped with La and Zr

**Pichitchai Butnoi^{a,b}, Supalak Manotham^a, Pharatree Jaita^a, Chamnan Randorn^c,
Gobwute Rujijanagul^{a,d,*}**

^a *Department of Physics and Materials Science, Faculty of Science, Chiang Mai University,
Chiang Mai 50200, Thailand*

^b *Graduate School, Chiang Mai University, Chiang Mai 50200, Thailand*

^c *Department of Chemistry, Faculty of Science, Chiang Mai University, Chiang Mai 50200,
Thailand*

^d *Materials Science Research Center, Faculty of Science, Chiang Mai University, Chiang Mai
50200, Thailand*

* Corresponding author: rujijanagul@yahoo.com (G. Rujijanagul)

ABSTRACT

Properties of lead-free $\text{Bi}_{0.5-x}\text{La}_x\text{Na}_{0.40}\text{K}_{0.10}\text{Ti}_{0.98}\text{Zr}_{0.02}\text{O}_3$ ($x = 0.000 - 0.040$) ceramics were investigated. All ceramics have a pure perovskite structure. A high energy storage density ($\sim 1.00 \text{ J/cm}^3$) at room temperature (RT) is noted for the $x = 0.030$ sample, while $x = 0.020$ and 0.040 samples have very high thermal stability of energy storage density of $\sim 3\%$ (at $75 - 150^\circ\text{C}$). Furthermore, the $x = 0.030$ and 0.040 samples have the highest energy storage efficiency (η) value of 94% at 125°C with high thermal stability ($\eta = 84 - 95\%$ at $25 - 150^\circ\text{C}$). The $x = 0.005$ sample has high electric field-induced strain ($S_{max} = 0.42\%$) and high normalized strain

Download English Version:

<https://daneshyari.com/en/article/7897936>

Download Persian Version:

<https://daneshyari.com/article/7897936>

[Daneshyari.com](https://daneshyari.com)