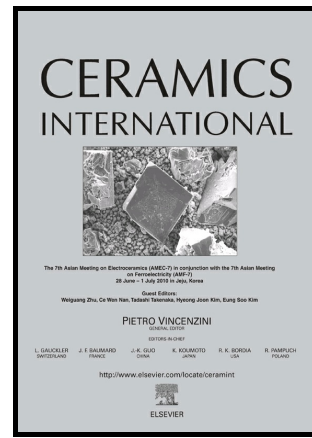


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Impedance Spectroscopy Study of  
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 $\text{Ba}(\text{Zr}_{0.05}\text{Ti}_{0.95})\text{O}_3$  Ceramics Prepared via  
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# Impedance Spectroscopy Study of $\text{Bi}_{0.5}(\text{Na}_{0.74}\text{K}_{0.16}\text{Li}_{0.10})_{0.5}\text{TiO}_3\text{-Ba}(\text{Zr}_{0.05}\text{Ti}_{0.95})\text{O}_3$ Ceramics Prepared via Combustion Technique

Sasiporn Prasertpalichat<sup>1,2</sup>, Buratsakorn Phongthippithak<sup>1</sup>, Nitish Kumar<sup>3</sup>,  
David P. Cann<sup>3</sup>, Theerachai Bongkarn<sup>1,2\*</sup>

<sup>1</sup>Department of Physics, Faculty of Science, Naresuan University, Phitsanulok, Thailand 65000

<sup>2</sup>Research Center for Academic Excellent in Applied Physics, Faculty of Science, Naresuan University, Phitsanulok, Thailand 65000

<sup>3</sup>Materials Science, School of Mechanical Industrial and Manufacturing Engineering Oregon State University, Corvallis, OR 97331, USA

## Abstract

Lead free  $(1-x)\text{Bi}_{0.5}(\text{Na}_{0.74}\text{K}_{0.16}\text{Li}_{0.10})_{0.5}\text{TiO}_3\text{-}x\text{Ba}(\text{Zr}_{0.05}\text{Ti}_{0.95})\text{O}_3$  or BNKLT-100xBZT,  $0.025 \leq x \leq 0.125$ , ceramics with single-phase perovskite structure were prepared via a combustion technique. Impedance spectroscopy was conducted over a wide temperature and frequency range in order to investigate the influences of BZT on electrical properties and conduction mechanisms. Analysis using impedance complex plane plots combined with spectroscopic plots of the imaginary component of the impedance and electric modulus revealed an electrically homogeneous microstructure with increasing BZT content. With the increase in BZT content, the resistivity increased from  $\sim 10^6 \Omega\text{-cm}$  at  $x = 0.025$  to  $\sim 10^7 \Omega\text{-cm}$  at  $x = 0.125$ . The activation energy determined from an Arrhenius-type plot of conductivity was also found to increase from 0.97 eV ( $x = 0.025$ ) to 1.62 eV ( $x = 0.125$ ), which is close to half of the optical bandgap, suggesting a change in conduction mechanism towards an intrinsic electronic conduction mechanism. IS measurement under different oxygen partial pressure was also performed on selected sample. The possible

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