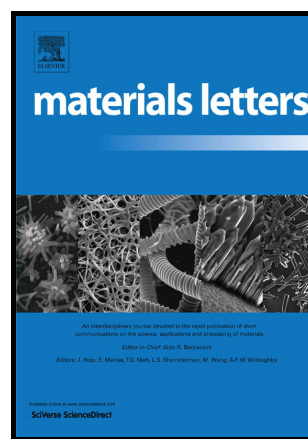


Higher wavenumber shift of Pb (Al_{1/2}Nb_{1/2})O₃ substitution in relaxor ferroelectric Pb(Zr_{0.52}Ti_{0.48})O₃-Pb(Zn_{1/3}Nb_{2/3})O₃ ceramics

Jiajun Zhu, Chuanqing Li, Kai Jiang, Peng Zhang, Wen-Yi Tong, Aiyun Liu, Wangzhou Shi, Yu Liu, Yi-Ping Huang, Wenwu Li, Zhigao Hu



PII: S0167-577X(16)31706-2
DOI: <http://dx.doi.org/10.1016/j.matlet.2016.10.110>
Reference: MLBLUE21680

To appear in: *Materials Letters*

Received date: 2 October 2016
Accepted date: 26 October 2016

Cite this article as: Jiajun Zhu, Chuanqing Li, Kai Jiang, Peng Zhang, Wen-Y Tong, Aiyun Liu, Wangzhou Shi, Yu Liu, Yi-Ping Huang, Wenwu Li and Zhigao Hu, **Higher wavenumber shift of Pb (Al_{1/2}Nb_{1/2})O₃ substitution in relaxor ferroelectric Pb(Zr_{0.52}Ti_{0.48})O₃-Pb(Zn_{1/3}Nb_{2/3})O₃ ceramics** *Materials Letters*, <http://dx.doi.org/10.1016/j.matlet.2016.10.110>

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 galley proof before it is published in its final citable 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.

Higher wavenumber shift of $\text{Pb}(\text{Al}_{1/2}\text{Nb}_{1/2})\text{O}_3$ substitution in relaxor ferroelectric $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$ - $\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3$ ceramics

Jiajun Zhu,^{a,b} Chuanqing Li,^{a,b} Kai Jiang,^{a,b} Peng Zhang,^a Wen-Yi Tong,^{a,*} Aiyun Liu,^c

Wangzhou Shi,^c Yu Liu,^d Yi-Ping Huang,^{e,*} Wenwu Li,^{a,*} and Zhigao Hu^a

^a Key Laboratory of Polar Materials and Devices, Ministry of Education,

Department of Electronic Engineering, East China Normal University, Shanghai 200241, China

^b National Laboratory for Infrared Physics, Shanghai Institute of Technical Physics,

Chinese Academy of Sciences, Shanghai 200083, China

^c Department of Physics, Shanghai Normal University, Shanghai 200234, China

^d Helmholtz-Zentrum Dresden Rossendorf, Institute of Ion Beam Physics and Materials Research,

Bautzner Landstrasse 400, D-01328 Dresden, Germany

^e Department of Physics, Soochow University, Taipei 11102, Taiwan

(Dated: Tuesday 1st November, 2016)

ABSTRACT

We report the lattice dynamics of $0.8\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$ -($0.2-x$) $\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $x\text{Pb}(\text{Al}_{1/2}\text{Nb}_{1/2})\text{O}_3$ (0.8PZT -($0.2-x$) PZN - $x\text{PAN}$, $0.02 \leq x \leq 0.08$) ceramics around morphotropic phase boundary (MPB) by infrared and Raman spectra. The dielectric functions in the wavenumbers range between 50 and 1000 cm^{-1} were extracted from the factorized oscillator model. The addition of PAN to PZT-PZN system introduces Al^{3+} ions to the B-site and all of these Raman-active modes in the measured range are related to B-site atoms vibration. The effect of PAN addition leads to infrared and Raman modes shifting to higher wavenumbers, because the atomic weight of Al is smaller than that of Zn. Therefore, the substitution of B-site atom in PZT-PZN system is the dominant reason to influence the frequency shift of infrared and Raman modes.

Keywords: PZT-based ceramics, Morphotropic phase boundary, Dispersion relation, Lattice vibrations, Raman spectroscopy.

*Corresponding authors. E-mail addresses: twy891137ssyy@163.com (W.-Y. Tong), yphuang@scu.edu.tw (Y.-P. Huang), wwli@ee.ecnu.edu.cn (W.W. Li).

Download English Version:

<https://daneshyari.com/en/article/5463551>

Download Persian Version:

<https://daneshyari.com/article/5463551>

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