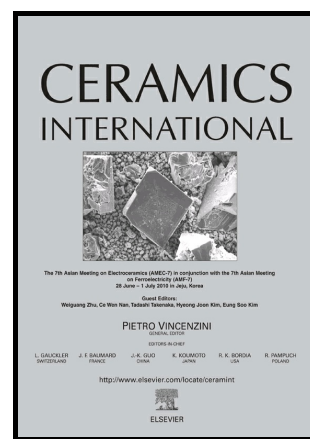


Structural of BCTZ nanowires and high performance BCTZ-based nanogenerator for biomechanical energy harvesting

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PII: S0272-8842(17)30069-X
DOI: <http://dx.doi.org/10.1016/j.ceramint.2017.01.057>
Reference: CERI14519

To appear in: *Ceramics International*

Received date: 6 January 2017
Revised date: 10 January 2017
Accepted date: 10 January 2017

Cite this article as: H.H. Fan, C.C. Jin, Y. Wang, H.L. Hwang and Y.F. Zhang, Structural of BCTZ nanowires and high performance BCTZ-based nanogenerator for biomechanical energy harvesting, *Ceramics International*, <http://dx.doi.org/10.1016/j.ceramint.2017.01.057>

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Structural of BCTZ nanowires and high performance BCTZ-based nanogenerator for biomechanical energy harvesting

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ABSTRACT

Owing to its excellent piezoelectric and ferroelectric properties, (Ba,Ca)(Ti,Zr)O₃ (BCTZ) family is considered as one of the most promising piezoelectric materials to replace the lead-based piezoelectrics, such as Pb(Zr,Ti)O₃ et al.. In this study, a BCTZ nanowires (NWs) based piezoelectric nanogenerator (NG) was fabricated. BCTZ NWs were prepared by an electrospinning technique. The NG achieved an excellent piezoelectric performance with a maximum open-circuit voltage of 0.65 V and short-circuit current of 2.2 nA by bending periodically. Furthermore, the NG obtained a maximum voltage of 2.2 V and current of 90 nA by tapping it. Results indicate that the lead-free BCTZ has a huge application potential in biomechanical energy harvesting.

Keywords: BCTZ NWs; Nanogenerator; Lead-free; Wearable; dielectrophoresis.

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