

Accepted Manuscript

Enhanced mechanical and piezoelectric properties of BCZT-CuY/rGO-based nanogenerator for tiny energy harvesting

Yinghong Wu, Fei Ma, Jingkui Qu, Tao Qi

PII: S0167-577X(18)31143-1

DOI: <https://doi.org/10.1016/j.matlet.2018.07.102>

Reference: MLBLUE 24668

To appear in: *Materials Letters*

Received Date: 25 May 2018

Revised Date: 13 July 2018

Accepted Date: 24 July 2018

Please cite this article as: Y. Wu, F. Ma, J. Qu, T. Qi, Enhanced mechanical and piezoelectric properties of BCZT-CuY/rGO-based nanogenerator for tiny energy harvesting, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.07.102>

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.



Enhanced mechanical and piezoelectric properties of BCZT-CuY/rGO-based nanogenerator for tiny energy harvesting

Yinghong Wu^{a,b}, Fei Ma^{a,b}, Jingkui Qu^{a,*}, Tao Qi^a

^aNational Engineering Laboratory for Hydrometallurgical Cleaner Production Technology, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, PR China.

^bUniversity of Chinese Academy of Sciences, Beijing 100190, PR China.

*Corresponding author. E-mail: jkqu@ipe.ac.cn, Tel: +86-10-82544848.

Abstract

BCZT-CuY/rGO/PDMS composites with excellent elasticity and flexibility, and their nanogenerators (NGs) with favorable electrical properties, were fabricated. The impact of rGO on the dispersion of BCZT-CuY, the mechanical properties of BCZT-CuY/rGO/PDMS, and electrical performance of BCZT-CuY/rGO-based NGs were systematically investigated. The results indicated that the distribution of BCZT-CuY in PDMS with added rGO was much more uniform than that without rGO. Moreover, its elastic modulus and elongation at the break increased to 4.6 MPa and 250%, respectively, with the introduction of rGO. Apart from a high d_{33} at the percolation threshold, the average V_{OC} (1.36 V) and I_{SC} (35 nA) achieved by finger tapping BCZT-CuY/rGO-based NGs suggested their considerable potential in harvesting tiny energy.

Keywords: rGO, piezoelectric nanogenerator, electrical properties, energy storage and conversion.

1. Introduction

Owing to its ability to convert negligible mechanical energy into electrical energy, the piezoelectric nanogenerator (NG) is considered one of the most promising devices for tiny energy harvesting [1, 2]. Among various piezoelectrics, poly-vinylidene fluoride

Download English Version:

<https://daneshyari.com/en/article/8012292>

Download Persian Version:

<https://daneshyari.com/article/8012292>

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