

Author's Accepted Manuscript

Flexible thermoelectric foil for wearable energy harvesting

Chunlei Wan, Ruoming Tian, Azrina Binti Azizi, Yujia Huang, Qingshuo Wei, Ryo Sasai, Soontornchaiyakul Wasusate, Takao Ishida, Kunihito Koumoto



PII: S2211-2855(16)30374-3
DOI: <http://dx.doi.org/10.1016/j.nanoen.2016.09.011>
Reference: NANOEN1490

To appear in: *Nano Energy*

Received date: 5 July 2016
Revised date: 26 August 2016
Accepted date: 7 September 2016

Cite this article as: Chunlei Wan, Ruoming Tian, Azrina Binti Azizi, Yujia Huang, Qingshuo Wei, Ryo Sasai, Soontornchaiyakul Wasusate, Takao Ishida and Kunihito Koumoto, Flexible thermoelectric foil for wearable energy harvesting, *Nano Energy*, <http://dx.doi.org/10.1016/j.nanoen.2016.09.011>

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.

Flexible thermoelectric foil for wearable energy harvesting

Chunlei Wan^{1,*}, Ruoming Tian², Azrina Binti Azizi³, Yujia Huang¹, Qingshuo Wei⁴, Ryo Sasai⁵, Soontornchaiyakul Wasusate⁵, Takao Ishida⁴, Kunihiro Koumoto^{2,*}

¹*State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, China*

²*Toyota Physical and Chemical Research Institute, Nagakute 480-1192, Japan*

³*Graduate School of Engineering, Nagoya University, Nagoya 464-8603, Japan*

⁴*Nanosystem Research Institute, National Institute of Advanced Industrial Science and Technology, 1-2-1 Namiki, Tsukuba, Ibaraki 305-8564, Japan*

⁵*Interdisciplinary Graduate School of Science and Engineering, Shimane University, 1060 Nishikawatsu-cho, Matsue 690-8504, Japan*

wancl@mail.tsinghua.edu.cn

koumoto@toyotariken.jp

*Corresponding authors.

Abstract

Flexible thermoelectric (TE) devices have been of rapidly growing interest for long-lasting and maintenance-free wearable power source that makes use of the temperature difference between human skin and ambient environment. Despite the high TE performance, conventional inorganic TE semiconductors, such as Bi₂Te₃, skutterudites, are restricted for this application due to their non-flexibility structure and non-scalable manufacturing techniques. In this paper, we report large-area free-standing TE foil with several centimeters in size through a scalable, cost-effective and solution-based approach for flexible thermoelectric devices. The foil is made by self-assembling two-dimensional hybrid superlattices of TiS₂ layers and hexylamine molecules. Through a Lewis base-acid reaction, electrons are transferred from the hexylamine molecules into the TiS₂ layers, making the material

Download English Version:

<https://daneshyari.com/en/article/5452280>

Download Persian Version:

<https://daneshyari.com/article/5452280>

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