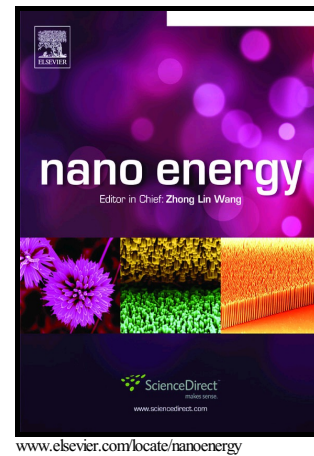


# Author's Accepted Manuscript

Flexible Transparent Tribotronic Transistor for  
Active Modulation of Conventional Electronics

Yaokun Pang, Jing Li, Tao Zhou, Zhiwei Yang,  
Jianjun Luo, Limin Zhang, Guifang Dong, Chi  
Zhang, Zhong Lin Wang



PII: S2211-2855(16)30537-7  
DOI: <http://dx.doi.org/10.1016/j.nanoen.2016.11.042>  
Reference: NANOEN1633

To appear in: *Nano Energy*

Received date: 8 October 2016  
Revised date: 18 November 2016  
Accepted date: 22 November 2016

Cite this article as: Yaokun Pang, Jing Li, Tao Zhou, Zhiwei Yang, Jianjun Luo, Limin Zhang, Guifang Dong, Chi Zhang and Zhong Lin Wang, Flexible Transparent Tribotronic Transistor for Active Modulation of Conventional Electronics, *Nano Energy*, <http://dx.doi.org/10.1016/j.nanoen.2016.11.042>

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 Transparent Tribotronic Transistor for Active Modulation of Conventional Electronics

Yaokun Pang<sup>a11</sup>, Jing Li<sup>b,1</sup>, Tao Zhou<sup>a</sup>, Zhiwei Yang<sup>a</sup>, Jianjun Luo<sup>a</sup>, Limin Zhang<sup>a</sup>, Guifang Dong<sup>b\*</sup>, Chi Zhang<sup>a\*</sup>, Zhong Lin Wang<sup>a,c\*</sup>

<sup>a</sup>Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences; National Center for Nanoscience and Technology Beijing 100083, P. R. China

<sup>b</sup>Key Laboratory of Organic Optoelectronics and Molecular Engineering of Ministry of Education, Chemistry Department, Tsinghua University Beijing 100084, China

<sup>c</sup>School of Material Science and Engineering, Georgia Institute of Technology Atlanta GA 30332, USA

donggf@mail.tsinghua.edu.cn

zlwang@gatech.edu

czhang@binn.cas.cn

\*Corresponding authors.

### Abstract

Flexible and transparent electronics have attracted wide attention for electronic skin, wearable sensors and man-machine interactive interfacing. In this paper, a novel flexible transparent tribotronic transistor (FTT) is developed by coupling an organic thin film transistor (OTFT) and a triboelectric nanogenerator (TENG) in free-standing sliding mode. The carrier transport between drain and source can be modulated by the sliding-induced electrostatic potential of the TENG instead of the conventional gate voltage. With the sliding distance increases from 0 to 7 mm, the reverse drain current is almost linearly increased from 2 to 22  $\mu\text{A}$ . The FTT has excellent performances in stability and durability in different bending modes and radius. The optical transmittance of the device is about 71.6% in the visible wavelength range from 400 to 800 nm. Moreover, the FTT is used for active modulation of conventional electronics, in which the luminance, magnetism, sound and micro-motion can be modulated by sliding a finger. This work has provided a new way to actively

---

<sup>1</sup> These authors contributed equally to this work.

Download English Version:

<https://daneshyari.com/en/article/5452481>

Download Persian Version:

<https://daneshyari.com/article/5452481>

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