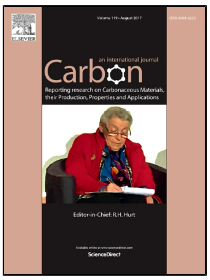
Accepted Manuscript



Low-dimensional Carbon Based Sensors and Sensing Network for Wearable Health and Environmental Monitoring

Fei Wang, Su Liu, Lin Shu, Xiao-Ming Tao

PII:	S0008-6223(17)30573-0
DOI:	10.1016/j.carbon.2017.06.006
Reference:	CARBON 12083
To appear in:	*Carbon*
Received Date:	21 February 2017
Revised Date:	01 June 2017
Accepted Date:	02 June 2017

Please cite this article as: Fei Wang, Su Liu, Lin Shu, Xiao-Ming Tao, Low-dimensional Carbon Based Sensors and Sensing Network for Wearable Health and Environmental Monitoring, *Carbon* (2017), doi: 10.1016/j.carbon.2017.06.006

Low-dimensional Carbon Based Sensors and Sensing Network for Wearable Health and Environmental Monitoring

Fei Wang[a], Su Liu[a], Lin Shu[b] and Xiao-Ming Tao[a,c]*

[a] *Institute of Textiles and Clothing, The Hong Kong Polytechnic University, Hong Kong, China*
[b]*School of Electronic and Information Engineering, South China University of Technology, China*
[c]*Interdisciplinary Division of Biomechanical Engineering, The Hong Kong Polytechnic University, Hong Kong, China*

ABSTRACT

With the advent of the era of big data and Internet of Things, wearable electronics are becoming more imperative than ever before, which prompts the continuous and fruitful research on wearable sensors and sensing network for health and environmental monitoring. This article presents an in-depth overview and review of this fertile area, focusing on sensors and sensing networks for strain, pressure, surface bio-potential, gas and temperature, which are made from low-dimensional carbon nano-materials and their composites. It covers materials, device structures, fabrication, performance and applications. It's evident that the appropriate and deliberate selection of low-dimensional carbon materials, matrix and substrate materials, and their interactions, as well as effective structural designs, are essential for highly sensitive and stable performance. Finally, the current status of industrial application is presented, possible hindrances for the adaptation of the technology are discussed, and future directions of development are indicated.

*Corresponding author. Email: xiao-ming.tao@polyu.edu.hk, Tel: 852-27666470.