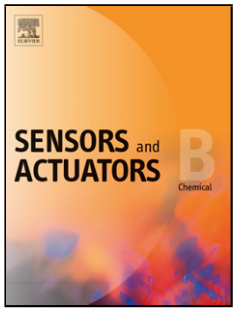

Title: Sensitive Fiber Microelectrode Made of Nickel Hydroxide Nanosheets Embedded in Highly-Aligned Carbon Nanotube Scaffold for Nonenzymatic Glucose Determination

Authors: Qianqian Qian, Qiong Hu, Li Li, Peipei Shi, Jinyuan Zhou, Jinming Kong, Xueji Zhang, Gengzhi Sun, Wei Huang

PII: S0925-4005(17)32012-9
DOI: https://doi.org/10.1016/j.snb.2017.10.110
Reference: SNB 23414

To appear in: *Sensors and Actuators B*

Received date: 14-8-2017
Revised date: 5-10-2017
Accepted date: 18-10-2017

Please cite this article as: Qianqian Qian, Qiong Hu, Li Li, Peipei Shi, Jinyuan Zhou, Jinming Kong, Xueji Zhang, Gengzhi Sun, Wei Huang, Sensitive Fiber Microelectrode Made of Nickel Hydroxide Nanosheets Embedded in Highly-Aligned Carbon Nanotube Scaffold for Nonenzymatic Glucose Determination, Sensors and Actuators B: Chemical https://doi.org/10.1016/j.snb.2017.10.110

Sensitive Fiber Microelectrode Made of Nickel Hydroxide Nanosheets Embedded in Highly-Aligned Carbon Nanotube Scaffold for Nonenzymatic Glucose Determination

Qianqian Qian,[a†] Qiong Hu,[b†] Li Li,[a] Peipei Shi,[a] Jinyuan Zhou,[c] Jinming Kong,[b*] Xueji Zhang,[d] Gengzhi Sun,[a*] Wei Huang[ae*]

[†] These authors contributed equally to this work.

[a] Key Laboratory of Flexible Electronics (KLOFE) & Institute of Advanced Materials (IAM), Jiangsu National Synergetic Innovation Center for Advanced Materials (SICAM), Nanjing Tech University (NanjingTech), 30 South Puzhu Road, Nanjing 211816, China. Email: iamgzsun@njtech.edu.cn; iamwhuang@njtech.edu.cn

[b] School of Environmental and Biological Engineering, Nanjing University of Science and Technology, Nanjing 210094, China. Email: j.kong@mail.njust.edu.cn

[c] School of Physical Science and Technology, Lanzhou University, 222 South Tianshui road, Lanzhou 730000, China.

[d] Chemistry Department, College of Arts and Sciences, University of South Florida, East Fowler Ave, Tampa, Florida 33620-4202, United States.

[e] Shaanxi Institute of Flexible Electronics (SIFE), Northwestern Polytechnical University (NPU), 127 West Youyi Road, Xi'an 710072, Shaanxi, China.

Abstract

A sensitive fiber microelectrode for nonenzymatic glucose determination was fabricated by incorporating nickel hydroxide nanosheets into highly-aligned carbon nanotube scaffold. The as-prepared microelectrode featured a detection limit of 0.645 μM, high sensitivity of 12.2 mA cm^{-2} mM^{-1}, wide linear-detection range from 20 μM to 10.5 mM, as well as an excellent anti-interference ability and repeatability.

Keywords: microelectrode; fiber; nickel hydroxide nanosheet; carbon nanotube; glucose sensor.

1. Introduction