Accepted Manuscript

A highly sensitive nonenzymatic H_2O_2 sensor based on platinum, $ZnFe_2O_4$ functionalized reduced graphene oxide

Lingyun Ning, Xinglong Guan, Jingwen Ma, Min Wang, Xiaobin Fan, Guoliang Zhang, Fengbao Zhang, Wenchao Peng, Yang Li

PII: S0925-8388(17)34357-8

DOI: 10.1016/j.jallcom.2017.12.161

Reference: JALCOM 44247

To appear in: *Journal of Alloys and Compounds*

Received Date: 6 June 2017

Revised Date: 6 December 2017

Accepted Date: 15 December 2017

Please cite this article as: L. Ning, X. Guan, J. Ma, M. Wang, X. Fan, G. Zhang, F. Zhang, W. Peng, Y. Li, A highly sensitive nonenzymatic H_2O_2 sensor based on platinum, $ZnFe_2O_4$ functionalized reduced graphene oxide, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2017.12.161.

A Highly Sensitive Nonenzymatic H_2O_2 Sensor Based on Platinum, $ZnFe_2O_4$ Functionalized Reduced Graphene Oxide

Lingyun Ning,‡ Xinglong Guan,‡ Jingwen Ma, Min Wang, Xiaobin Fan, Guoliang Zhang, Fengbao Zhang, Wenchao Peng, Yang Li*

Lab of Advanced Nano-structures & Transfer Processes, Department of Chemical Engineering, Tianjin University, Tianjin 300354, China

ABSTRACT: We report a simple method for the preparation of a hydrogen peroxide (H_2O_2) sensor based on reduced graphene oxide (rGO). $ZnFe_2O_4$ and Pt nanoparticles were supported on graphene sheets (Pt/$ZnFe_2O_4$/rGO) to modify the glassy carbon electrode, which were used to detect H_2O_2. The morphology and structure of Pt/$ZnFe_2O_4$/rGO were characterized by scanning electron microscopy, transmission electron microscopy, X-ray powder diffraction and X-ray photoelectron spectroscopy. The property of the H_2O_2 sensor was evaluated by cyclic voltammetry and amperometry. The prepared H_2O_2 sensor showed a wide linear range from 0.5 μm to 10.2 mM with a low detection limit of 0.1 μM.

KEYWORDS: Zinc ferrite; Graphene; Pt nanoparticles; Electrodeposition; Nonenzyme sensor; Hydrogen peroxide detection