

Accepted Manuscript

Title: Ultrathin Zinc Oxide Nanofilm on Zinc Substrate for High Performance Electrochemical Sensors

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PII: S0013-4686(14)01334-6
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2014.06.132>
Reference: EA 22994

To appear in: *Electrochimica Acta*

Received date: 3-3-2014
Revised date: 25-6-2014
Accepted date: 26-6-2014

Please cite this article as: X. Zhang, W. Ma, H. Nan, G. Wang, Ultrathin Zinc Oxide Nanofilm on Zinc Substrate for High Performance Electrochemical Sensors, *Electrochimica Acta* (2014), <http://dx.doi.org/10.1016/j.electacta.2014.06.132>

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Ultrathin Zinc Oxide Nanofilm on Zinc Substrate for High Performance Electrochemical Sensors

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Abstract:

Ultrathin ZnO nanofilms based on Zn substrate were synthesized through a facile one-pot hydrothermal method. Then this prepared Zn-ZnO integrated electrode was directly used as work electrode to detect glucose and hydrazine in the solution, respectively. Exhilaratingly, the results show that the prepared Zn-ZnO integrated electrode has significant electrocatalytic activity toward the oxidation of glucose and reduction of hydrazine. As a result, Zn-ZnO integrated electrode exhibits a wide linear range from 1 μM to 19.2 mM for the detection of glucose with a low detection limit of 1 μM (S/N=3) and a wide linear range from 0.5 μM to 14.2 mM for the detection of hydrazine with a linear range from with a low detection limit of 0.5 μM (S/N=3). What's more, the proposed sensor displays excellent selectivity, good stability, and satisfying repeatability.

Keywords: Zinc oxide; Integrated electrode; Electrochemical sensors; Glucose; Hydrazine

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