Short Communication

Electrochemical Sensor Based on Glassy Carbon Electrode Modified by Palladium Doped ZnO Nanostructures for Glucose Detection

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An electrochemical glucose sensor based on a glassy carbon electrode (GCE) decorated by palladium (Pd) doped ZnO nanorods (NRs) was developed. The Pd-doped ZnO NRs was prepared by a facile chemical bath deposition technique, and the characterizations of the samples were studied by X-ray diffraction and scanning electron microscopy analysis. Electrochemical behaviors of the Pd-doped ZnO NRs/GCE electrode to glucose were determined by electrochemical impedance spectroscopy, cyclic voltammetry and differential pulse voltammetry. The electrochemical results indicated that the Pd-doped ZnO NRs/GCE revealed an excellent response to glucose with a detection limit of 0.3 μM and a sensitivity of 0.64 $\mu\text{A}/\mu\text{Mcm}^2$. This sensor was applied satisfactorily to glucose determination in blood serum samples. With remarkable electrochemical performance, Pd-doped ZnO NRs / GCE can provide a suitable platform in the manufacture of a variety of electrochemical sensors and have a great promise for sensing applications.

Keywords: Electrochemical glucose sensor; Doped ZnO nanostructures; Cyclic voltammetry; Differential pulse voltammetry

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