An Amperometric Sensitive Hydrogen Peroxide Sensor Based on a Silver Nanoparticle-Doped Polyimide-Modified Glassy Carbon Electrode

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We report a novel non-enzymatic sensor for the detection of hydrogen peroxide based on a polyimide and silver nanoparticle composite-modified glassy carbon electrode. The structure and morphology of the modified electrode surface were characterized by scanning electron microscopy and atomic force microscopy. The electrochemical performance of the present sensor was evaluated by cyclic voltammetry and amperometry. Under optimal conditions, the calibration plots are linear in the range of 0.01-1 mM, with a detection limit (S/N=3) of 8.6 μ M. The electrode exhibited high stability, great sensitivity, stable reproducibility and fast response times (< 5 s). These results show that polyimide can be used as a reliable and long-life sensor for hydrogen peroxide detection, revealing a new application for polyimide.

Keywords: polyimide, silver nanoparticle, hydrogen peroxide, electrochemical determination

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