A Glucose Biosensor Based on Glucose Oxidase enzyme and ZnO Nanoparticles Modified Carbon Paste Electrode

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In this study, modified carbon paste electrode (CPE) with zinc oxide (ZnO) nanoparticles used for designing a glucose oxidase enzymatic biosensor to investigation of its electrochemical behavior, and determination of glucose concentration. The size and morphology of synthesized ZnO metal oxide nanoparticles evaluated via chemistry technique like scanning electron microscopy (SEM) and X-ray diffraction (XRD). A pair of clear and stable peaks in PBS (0.1 M, pH = 7) obtained for the direct transfer of electrons from GOD to modified electrode with -340 mV and -385 mV respectively as oxidation and reduction potentials. The enzymatic biosensor exhibited a linear response to the β -D (+) glucose concentration range from 40 μ M to 380 μ M with limit of detection equal to 8 μ M in a signal to noise ratio of 3. Here, the designed GOD/ZnO/CPE electrochemical biosensor showed high stability and efficiency for glucose sensing.

Keywords: Biosensor, Glucose Oxidase, Zinc Oxide nanoparticles, Carbon Paste electrode

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