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Au/graphene hybrid nanostructure ultrasensitive probe for the detection of glucose

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This work presents the synthesis of Graphene Oxide (GO) for the development of highly efficient, reliable and stable glucose biosensor. Au/Graphene hybrid nanostructures have been synthesized by using Hummer method. X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscopy (FESEM) and Raman spectroscopy have been used to characterize hybrid nanostructures. A Glassy Carbon Electrode (GCE) has been modified by the hybrid structures for the determination of glucose. The electrochemical behavior of the modified electrode exhibits remarkable catalytic performance towards glucose detection. The biosensor could detect glucose in the linear range from 0.0025 mM to 0.1 mM. The biosensor shows high and reproducible sensitivity of $84.53 \text{ mA cm}^{-2} \text{ mM}^{-1}$ with in a response time less than 4 seconds, which is much higher than that of bare and GO based modified electrodes. In addition, the biosensor exhibits a good anti-interference ability and a good response towards glucose detection from fresh juices. All the results show that GO based hybrid nanostructures not only enhance the sensitivity towards glucose detection but also provide a novel platform for the design of other biosensors.

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