Short Communication

Synthesis and Application of Ag NPs@graphene Oxide Nanocomposite as an Electrochemical Sensor for Sweat Lactate Monitoring in Sports Medicine

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In this study, a sensitive electrochemical sensor for detection of lactate was proposed. The sensor was developed based on GCE substrate coated by Ag NPs@GO/GCE. The morphological and structural properties of Ag NPs@GO/GCE were characterized using FESEM and XRD analysis, respectively. FESEM results confirmed a uniform distributed Ag NPs in GO nanocomposites. The sensor performance of the device was examined by amperometry and cyclic voltammetry. The electrochemical sensor exhibited a linear response to the lactate in phosphate buffer solution with a linear range and sensitivity of 10 to 600 μM and $16.5 \mu\text{Acm}^{-2} \text{ mM}^{-1}$, respectively. The concentration of lactate estimated by this sensor in real sweat samples was very close to the amount of injection which can be considered as a sensor for lactate measurement in sweat samples.

Keywords: Electrochemical sensor; lactate; Ag NPs@graphene oxide nanocomposites; Cyclic voltammetry

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