Electrodeposition of Poly(sodium 4-Styrenesulfonate)-Silver Nanocomposites for Electrochemical Detection of H₂O₂

Qingbin Guo*, Meixia Li

Hebei University of Engineering, Handan, Hebei, 056038, P.R. China

*E-mail: qingbinguo_hun@yeah.net

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A polystyrene sulphonic acid-silver nanocomposite (PSS-Ag NPs) using AgNO₃-PSS solution as precursor was successfully deposited on the glassy carbon electrode (GCE) via electrodeposition. The prepared PSS-Ag NPs/GCE was then applied as active electrode material of non-enzymatic electrochemical sensors for H₂O₂ detection. The performance of PSS-Ag NPs/GCE for electrocatalytic reduction of H₂O₂ was better than that of Ag NPs/GCE and PSS/GCE electrode. The linear response ranging of the sensor with PSS-Ag NPs modified electrode was from 1.5 µM to 2.0 mM. And the detection limit was 0.7 µM (*S/N* = 3). Owing to the outstanding electrocatalytic activity and rapidly electron transport property of PSS-Ag NPs composite, the non-enzymatic H₂O₂ sensor constructed with PSS-Ag NPs/GCE was highly stable and sensitive.

Keywords: Polystyrene sulphonic acid; Silver nanoparticles; H₂O₂; Electrodeposition; Sensor

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