Application of Fe₃O₄@SiO₂/MWCNT Film on Glassy Carbon Electrode for the Sensitive Electroanalysis of Levodopa

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A Fe₃O₄@SiO₂/MWCNT (FSCNT) film was coated on a glassy carbon electrode, and then electrochemical oxidation behavior of levodopa was considered in PBS (pH 7.0) by cyclic and differential pulse voltammetry (CV and DPV). The obtained results showed that the new electrode has an electrocatalytic activity in oxidation of levodopa which causes a remarkable enhancement in its oxidation current. In the optimum conditions, the anodic peak current indicated a linear relation versus levodopa concentration in the range of 1.0 × 10⁻⁵ to 6.0 × 10⁻⁴ M with detection limits of 2.0 × 10⁻⁶ M (signal-to-noise = 3). This method was used to the measurement of levodopa in urine samples.

Keywords: Levodopa; Fe₃O₄@SiO₂/MWCNT nanocomposite; Glassy carbon electrode; Voltammetry

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