Ultrasensitive and Indirect Electrochemical Detection of Sulfamethoxazole Using Ag₂O @ MWCNTs Nanocomposites Modified Glassy Carbon Electrode

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The Ag₂O @ MWCNTs nanocomposites material was prepared via simple, one-step *situ precipitation* method using conventional reagent. The obtained Ag₂O @ MWCNTs was structurally characterized by scanning electron microscopy (SEM), fourier transform infrared spectroscopy (FTIR) and ultraviolet and visible spectrophotometry (UV–Vis). The functional GCE with Ag₂O @ MWCNTs exhibits good electrochemical performances with a pair of quasi-reversible redox peak. While sulfamethoxazole (SMX) can interact with Ag(I) to form Ag-SMX complex, which makes the concentrations of silver ion involved in the redox reaction decreased, thus reducing the redox peak of Ag₂O @ MWCNTs composites. The decreased oxidation peak current is found to be linear with the SMX concentrations from 0.02–100 nM and the detection limit was 4.06×10^{-12} M (S/N=3) by using DPV method. Furthermore, the proposed method demonstrated excellent selectivity, repeatability and reproducibility, and can be successfully applied for the SMX analysis in human serum.

Keywords: Sulfamethoxazole; Ag₂O@MWCNTs nanocomposites; Differential pulse voltammetry; Ultrasensitive and indirect detection

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