Determination of Epinephrine using a Novel Sensitive Electrochemiluminescence Sensor based on ZnO Nanoparticles Modified Pencil Graphite Electrode

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The accurate determination of epinephrine is important for medical application. In the paper, a novel electrochemiluminescence (ECL) sensor, ZnO nanoparticles modified pencil graphite electrode (ZnO/PGE) was fabricated by self-prepared ZnO and low-cost 2B pencil graphite. The ZnO/PGEs showed excellent electrochemiluminescence performances and the possible electrochemiluminescence mechanism of ZnO/PGEs was also discussed. The effects of experimental parameters such as scanning rate, pH, concentrations of persulfate and reproducibility on ECL intensity have been investigated. Under the optimum condition, the ECL intensity of ZnO/PGE decreased linearly with concentrations of epinephrine over the wide range from 8×10^{-10} to 2×10^{-7} mol L⁻¹, with detection limit of 1×10^{-10} mol L⁻¹ (S/N=3). The results showed that this novel sensor was successfully applied for the analysis of epinephrine in drug samples with satisfactory results.

Keywords: Pencil graphite electrode, ZnO, Electrochemiluminescence, Epinephrine

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