Ultrasensitive Electrochemiluminescence Sensor for Specific Detection of Rutin Based on CdS Modified Pencil Graphite Electrode

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In this paper, A CdS modified pencil graphite electrode(CdS/PGE) was fabricated using solvothermal route through simple procedure. The CdS/PGE showed unexpectedly electrochemiluminescent behaviour with potassium persulfate ($K_2S_2O_8$) as a coreactant. Based on this principle that ECL was quenched when rutin was present in this system, an ECL sensor for detecting rutin had been developed. The effects of buffer solution and pH were studied in detail. Under the optimum conditions, a possible mechanism of ECL quenching was also clearly discussed. The linear correlation between the quenched ECL intensity and the logarithm of rutin concentration was observed over the range of $4 \times 10^{-9} \sim 8 \times 10^{-7}$ mol/L with the limit of detection (LOD) of 2×10^{-9} mol/L. This proposed method was applied in the analysis of rutin in compound rutin tablets, with recoveries of 98%~105%. The experimental results demonstrated that the ECL sensor showed good stability and reproducibility.

Keywords: Electrochemiluminescence, CdS nanorods, pencil graphite electrode, rutin,

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