High Sensitive Electrochemical Luminescence Sensor for the Determination of Cd²⁺ in Spirulina

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The determination of cadmium ions in Spirulina is very important in food safety. In this work, stable CdTe quantum dots (QDs) were synthesized in the aqueous phase with thioglycolic acid as a protective agent. Based on the enhancement effect of cadmium ions on the electrochemiluminescence (ECL) signal of the TGA-modified CdTe QDs, a signal-enhanced ECL sensor was constructed to detect cadmium ions under the optimal experimental conditions. The linear range was 2 nM-0.5 μM, and the detection limit was 1.1 nM. In addition, the system can also be used to determine the pH. In the pH range of 4.5-7.4, the electrochemiluminescence intensity increased linearly with increasing pH. This method can be used not only to detect cadmium ions but also to determine the pH of the solution. It can be applied to the detection of cadmium ions in Spirulina samples.

Keywords: Electrochemiluminescence; Electrochemistry; Cadmium ions; Thioglycolic acid; Spirulina

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