

研究论文

聚乙烯吡咯烷酮/硫化镉量子点修饰电极的制备及其对血红蛋白的测定研究

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摘要 制备了聚乙烯吡咯烷酮(PVP)表面修饰的硫化镉(CdS)半导体纳米晶体(量子点), 并将其修饰玻碳电极, 用于血红蛋白(Hemoglobin, Hb)的电化学行为的研究. 实验结果表明, 血红蛋白在该修饰电极上有良好的电流响应, 流动注射分析结果进一步表明该修饰电极具有好的稳定性和重现性. 在 $1.0 \times 10^{-8} \sim 2.0 \times 10^{-5}$ mol/L浓度范围内, 血红蛋白的浓度与其响应电流呈良好的线性关系, 线性相关系数为0.9986, 检出限为 5.0×10^{-9} mol/L.

将该方法用于全血中血红蛋白的测定, 也获得了良好的结果.

关键词 [硫化镉](#) [聚乙烯吡咯烷酮](#) [量子点](#) [血红蛋白](#)

分类号

Preparation of PVP-capped CdS Quantum Dot Modified Electrode and Its Application to the Determination of Hemoglobin

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Abstract Polyvinylpyrrolidone (PVP)-capped CdS semiconductor nanocrystals (quantum dots, QDs) were prepared and used to modified glass carbon electrode. The electrochemical behaviors of hemoglobin on PVP/CdS QD modified electrode were studied. The results showed that hemoglobin exhibited good current responses to the electrode. In addition, the results of flow injection analysis further suggested high stability and reproducibility of PVP/CdS QD modified electrode. The peak currents were linear to the concentrations of hemoglobin ranging from 1.0×10^{-8} to 2.0×10^{-5} mol/L with the correlation coefficient of 0.9986 and the detection limit of 5.0×10^{-9} mol/L. The method was applied to the determination of hemoglobin of whole blood and satisfied results were also achieved.

Key words [cadmium sulfide](#) [polyvinylpyrrolidone](#) [quantum dot](#) [hemoglobin](#)

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