

New Modified-Multiwall Carbon Nanotubes Paste Electrode for Electrocatalytic Oxidation and Determination of Hydrazine Using Square Wave Voltammetry

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摘要 The application of *p*-aminophenol as a suitable mediator, as a sensitive and selective voltammetric sensor for the determination of hydrazine using square wave voltammetric method were described. The modified multiwall carbon nanotubes paste electrode exhibited a good electrocatalytic activity for the oxidation of hydrazine at pH = 7.0. The catalytic oxidation peak currents showed a linear dependence of the peaks current to the hydrazine concentrations in the range of 0.5 - 175 $\mu\text{mol/L}$ with a correlation coefficient of 0.9975. The detection limit (S/N = 3) was estimated to be 0.3 $\mu\text{mol/L}$ of hydrazine. The relative standard deviations for 0.7 and 5.0 $\mu\text{mol/L}$ hydrazine were 1.7 and 1.1%, respectively. The modified electrode showed good sensitivity and selectivity. The diffusion coefficient ($D = 9.5 \times 10^{-4} \text{ cm}^2/\text{s}$) and the kinetic parameters such as the electron transfer coefficient ($\alpha = 0.7$) of hydrazine at the surface of the modified electrode were determined using electrochemical approaches. The electrode was successfully applied for the determination of hydrazine in real samples with satisfactory results.

关键词: [hydrazine determination](#) [modified carbon nanotubes paste electrode](#) [electrocatalytic measurement](#) [voltammetry](#)

Abstract: The application of *p*-aminophenol as a suitable mediator, as a sensitive and selective voltammetric sensor for the determination of hydrazine using square wave voltammetric method were described. The modified multiwall carbon nanotubes paste electrode exhibited a good electrocatalytic activity for the oxidation of hydrazine at pH = 7.0. The catalytic oxidation peak currents showed a linear dependence of the peaks current to the hydrazine concentrations in the range of 0.5 - 175 $\mu\text{mol/L}$ with a correlation coefficient of 0.9975. The detection limit (S/N = 3) was estimated to be 0.3 $\mu\text{mol/L}$ of hydrazine. The relative standard deviations for 0.7 and 5.0 $\mu\text{mol/L}$ hydrazine were 1.7 and 1.1%, respectively. The modified electrode showed good sensitivity and selectivity. The diffusion coefficient ($D = 9.5 \times 10^{-4} \text{ cm}^2/\text{s}$) and the kinetic parameters such as the electron transfer coefficient ($\alpha = 0.7$) of hydrazine at the surface of the modified electrode were determined using electrochemical approaches. The electrode was successfully applied for the determination of hydrazine in real samples with satisfactory results.

Keywords: [hydrazine determination](#), [modified carbon nanotubes paste electrode](#), [electrocatalytic measurement](#), [voltammetry](#)

收稿日期: 2011-08-30; 出版日期: 2012-02-08





引用本文:

Ali A. ENSAFI, Mahsa LOTFI, Hassan KARIMI -MALEH .New Modified-Multiwall Carbon Nanotubes Paste Electrode for Electrocatalytic Oxidation and Determination of Hydrazine Using Square Wave Voltammetry[J] 催化学报, 2012,V33(3): 487-493

Ali A. ENSAFI, Mahsa LOTFI, Hassan KARIMI -MALEH .New Modified-Multiwall Carbon Nanotubes Paste Electrode for Electrocatalytic Oxidation and Determination of Hydrazine Using Square Wave Voltammetry[J] Chinese Journal of Catalysis, 2012,V33(3): 487-493

链接本文:

[http://www.chxb.cn/CN/10.1016/S1872-2067\(11\)60349-5](http://www.chxb.cn/CN/10.1016/S1872-2067(11)60349-5) 或 <http://www.chxb.cn/CN/Y2012/V33/I3/487>

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