

Simultaneous Determination of Dihydroxybenzene Isomers by MWCNTs-NTiO₂ Modified Glassy Carbon Electrode

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doi: 10.20964/2017.02.54

Received: 2 November 2016 / Accepted: 26 December 2016 / Published: 30 December 2016

In this paper, multi-wall carbon nanotubes and nano-titanium dioxide (MWCNTs-NTiO₂) modified electrode is easily prepared by one-step coating. The nano-TiO₂ colloid is prepared by sol-gel method at room temperature to improve the dispersion and electrical conductivity of original MWCNTs on glass carbon electrode (GCE). The electrochemical behaviors of dihydroxybenzene isomers are investigated by cyclic voltammetry (CV) and differential pulse voltammetry (DPV) at MWCNTs-NTiO₂/GCE. Hydroquinone (HQ), catechol (CC) and resorcinol (RC) all exhibit sensitive responses at original MWCNTs modified electrode. However, the peak currents of HQ, CC and RC present much enhanced signals at MWCNTs-NTiO₂ modified electrode, proving a good synergetic effect of NTiO₂ and MWCNTs. The individual and simultaneous determination of HQ, CC and RC at MWCNTs-NTiO₂/GCE are studied, and obtains good liner relations in a wide range. The limits of detection for HQ, CC and RC are 93 nmol L⁻¹, 210 nmol L⁻¹ and 32 nmol L⁻¹ (S/N = 3), respectively. This kind of sensor has been applied for simultaneous determination of HQ, CC and RC in artificial wastewater and obtained good results.

Keywords: dihydroxybenzene; electrochemical sensor; MWCNTs; NTiO₂; isomer

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