

Electrochemical Sensor based on Carbon Paste Electrode Modified by TiO₂ nano-particles for the Voltammetric Determination of Resorcinol

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doi: 10.20964/2018.04.04

Received: 13 November 2018 / Accepted: 8 January 2018 / Published: 6 March 2018

TiO₂ nano-particles were prepared and characterized by transmission electron microscope (TEM) and scanning electron microscope (SEM). A new carbon paste electrode modified by TiO₂ nano-particles was manufactured and characterized. The modified electrode was prepared by mixing TiO₂ nano-particles with graphite powder in presence of paraffin wax. The electrochemical activity of resorcinol (RS) was studied in Britton–Robinson (BR) buffer at different pH values using cyclic voltammetry (CV) and linear sweep (LSV). The results illustrated that the carbon paste modified electrode gave a good response for an electrocatalytic activity towards the electrochemical oxidation of RS. The electrochemical oxidation of RS at carbon paste electrode modified by TiO₂ nano-particles was diffusion-controlled and irreversible. By applying the optimum conditions for the determination of RS, a lower detection limit of 1x10⁻⁹ M was obtained. This method was applied for the determination of RS in tap water samples, and the recovery for RS from this study was 94% to 101.1%.

Keywords: Electrochemical Sensor; TiO₂ nano-particles; Voltammetry; Resorcinol

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