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ELECTROCHEMICAL SENSOR OF 3-AMINOPHENOL-FORMALDEHYDE POLYMER NANOSPHERE/PHOSPHOTUNGSTIC ACID NANOCOMPOSITE MODIFIED ELECTRODE FOR NITRITE DETECTION

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Abstract

The incorporation of polymeric matrixes into producing materials is an efficient method of regulating electrochemical activity. Herein, we report the fabrication of a carbon paste electrode modified with 3-aminophenol-formaldehyde polymer nanosphere/phosphotungstic acid for nitrite sensing. The modified carbon paste electrode demonstrated high electrocatalytic activity for nitrite reduction. Amperometry and cyclic voltammetry were used to study the efficacy of a newly developed nitrite sensor at various nitrite ion concentrations, pH, scan rate, and coexisting interfering ions. The modified electrode's electrochemical behavior demonstrated high nitrite sensing selectivity in the presence of fluoride, chloride, phosphate, ammonium, acetate, and nitrate. This sensor's linear response to nitrite ions was observed in the 10-1000 μM concentration range. The limit of detection (S/N = 3) was 47.7 μM. Since nitrite can be precisely identified using this electrochemical sensor, it offers significant potential for assessing a variety of water quality issues.

Key words: 3-aminophenol-formaldehyde, electrochemistry, nitrite, phosphotungstic acid, polymer nanosphere

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