Simple and Sensitive Electrochemical Sensor for Tyramine Determination Based on Overoxidized Poly(*o*-aminophenol) Film Modified Electrode

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A simple electrochemical sensing method was proposed for fast detection of tyramine in rice vinegar. *o*-Aminophenol (OAP) was electropolymerized on the surface of glassy carbon electrode (GCE) to form the poly(*o*-aminophenol) (POAP) film. Then the overoxidized poly(*o*-aminophenol) film modified GCE (OPOAP/GCE) was obtained by electrochemical treatment of POAP film in the alkaline solution. The modification method of GCE and detection conditions of tyramine were optimized. Electrochemical impedance spectroscopy and scanning electron microscopy were used to characterize the preparation process of OPOAP/GCE and binding ability of tyramine onto the OPOAP film. Furthermore, the electrochemical properties of OPOAP/GCE was investigated by square wave voltammetry. OPOAP/GCE, which was fabricated via cyclic voltammetry in 0.3 M perchloric acid solution with 0.01 M OAP and overoxidized in 0.09 M NaOH solution, showed good electrochemical response on tyramine. The oxidation current and the concentration of tyramine had good linear relationship in the ranges of 0.1-10 μ M and 10-200 μ M, respectively. The detection limit was 0.054 μ M, based on the signal to noise ratio of 3. The recovery rates of tyramine in rice vinegar sample were from 95.6% to 117.2%. The sensor was simple, inexpensive, rapid, and suitable to detect tyramine in rice vinegar sample.

Keywords: poly(*o*-aminophenol), conducting polymer, electrochemical sensor, tyramine, rice vinegar

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