An Electrochemical Sensor on the Novel MgO-PEDOT:PSS Platform for Sensitive Bisphenol A Determination

Li Zheng*, Yajing Zhu

College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an, 710065, PR China

*E-mail: lzheng@xsyu.edu.cn

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A novel magnesium oxide and poly(3,4-ethylenedioxythiophene):poly(styrene-sulfonate) (PEDOT:PSS) composite modified carbon paste electrode (MgO-PP/CPE) has been fabricated for the sensitive quantification of bisphenol A (BPA). The modified electrode was characterized by scanning electron microscopy (SEM), chronocoulometry and electrochemical impedance spectroscopy (EIS). Compared with MgO/CPE, PP/CPE, and CPE, MgO-PP/CPE exhibited enhanced electrochemical activity toward the oxidation of BPA, which was due to the high surface area of MgO and facile electron transfer ability of PEDOT:PSS. Under the optimum conditions, the linear sweep voltammetric oxidation peak current of BPA was linear with its concentration in the ranges from 1.0 nM to 0.4 μ M and 0.4 to 10 μ M, with a low detection limit of 0.5 nM (3S/N). The fabricated sensor was successively applied to the quantification of BPA content in water samples.

Keywords: Bisphenol A; MgO; PEDOT:PSS; Electrochemical Sensor; Carbon Paste Electrode

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