Application of poly(3,4-ethylenedioxythiophene)/manganese Dioxide Composite-Modified Electrode for Sensitive Electrochemical Detection of Luteolin

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doi: 10.20964/110378

Received: 17 January 2016 / Accepted: 25 February 2016 / Published: 1 April 2016

In this work, the electrochemical determination of luteolin using poly(3,4-ethylenedioxythiophene)/manganese dioxide nanocomposite modified glassy carbon electrode (PEDOT/MnO₂/GCE) is reported. PEDOT/MnO₂ nanocomposite has been proposed via a simple two-step deposition approach. Electrochemical results revealed that PEDOT/MnO₂ showed enhanced electrocatalytic performance toward luteolin, which might be attributed to good conductivity and accelerated electron transfer of PEDOT and good catalytic effect of MnO₂. Experimental conditions, including pH values and scan rates were optimized. In optimal conditions, a good linear relationship was found between oxidation peak currents and the concentration of luteolin in 5.0 nM-7.0 μM range. The detection limit was calculated to be 1.8 nM at a signal-to-noise ratio of 3. Finally, the applicability for luteolin determination in real samples was successfully demonstrated.

Keywords: Poly(3,4-ethylenedioxythiophene); Manganese dioxide; Two-step deposition ; Luteolin

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