Modified Graphite Paste Electrode with Strontium Phen-Dione Complex for Simultaneous Determination of a Ternary Mixture of 4-aminophenol, Uric Acid and Tryptophan (Part I)

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doi: 10.20964/2017.11.09

Received: 31 July 2017 / Accepted: 4 September 2017 / Published: 12 October 2017

For the first time, the $[\text{Sr}(\text{OH}_2)_4(\text{phen-dione})_2](\text{Cl})_2$ complex (Sr-Phen) was synthesized and characterized by different spectroscopy techniques such as $^1\text{H-NMR}$, UV-Vis, FT-IR and conductometry as well as elemental analysis. The prepared complex was used for modification of graphite paste electrode for simultaneous determination of 4-aminophenol (AP), uric acid (UA), and tryptophan (Trp). Detailed investigations by electrochemical impedance spectroscopy and electrochemistry methods were used in order to elucidate the properties of the modified graphite paste electrode with Sr-Phen. The proposed modified electrode displays intense and indelible electrooxidation responses for simultaneous determination of AP, UA, and Trp to three well-separated peaks in potential range from 0.4 to 1.1V using cyclic and differential pulse voltammetry methods in pH 2.0. Based on the experimental results the detection limits of 3.40, 1.06 and 1.32 μM were obtained for AP, UA and Trp, respectively. Finally, the proposed modified electrode was used for simultaneous determination of AP, UA and Trp in real samples.

Keywords: Strontium Phen-dione, Modified graphite paste electrode, Simultaneous electrochemical determination, 4-Aminophenol, Uric acid, Tryptophan.

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