Sensitive Electrochemical Determination Uric Acid at Pt Nanoparticles Decorated Graphene Composites in the Presence of Dopamine and Ascorbic Acid

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In this paper, the composites of Pt nanoparticles and graphene (PtNPs/GR) were prepared by one-step electrochemical reduction technique, and then were used as modified materials for electrochemical determination of uric acid (UA) in the presence of dopamine (DA) and ascorbic acid (AA). Cyclic voltammetry (CV) and differential pulse voltammetry (DPV) methods were employed to study their electrocatalytic activity toward the oxidation of UA in the presence of DA and AA. It showed PtNPs/GR modified electrode displayed good electrocatalytic activity toward UA, which can be ascribed to the synergistic effect between the high conductivity and large surface area of GR and the high catalytic activity of PtNPs. The anodic peak current was linear to the concentration of UA in the range from 0.5 μM to 180 μM , and the detection limits was 0.22 μM (S/N = 3). Moreover, the prepared electrode displayed highly selectivity, good stability and reproducibility.

Keywords: Uric acid; Pt nanoparticles; Graphene; Electrochemical determination

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