عنوان مقاله:

Alumina nanoparticles modified carbon paste electrode as a new voltammetric sensor for determination of dopamine

محل انتشار:

فصلنامه ارتباطات شیمی ایران, دوره 6, شماره 4 (سال: 1397)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

The present study examines a new dopamine sensor based on Alumina nanoparticles modified carbon paste electrode (Al2O3NPsCPE). Moreover, the present study focuses on the electrochemical act of the Al2O3NPsCPE for the detection of dopamine by cyclic voltammetry (CV) and differential pulse voltammetry (DPV). There is also a focus on the specification of the prepared modified electrode by electrochemical impedance spectroscopy (EIS) and scanning electron microscopy (SEM), and there is a discussion on the influence of some experimental variables such as carbon paste composition, laboring solution pH, scan rate and possible interferences. The present study obtained a well-defined redox peak of dopamine (DA) on the Nano- Alumina/CPE at Epa=173mV and Epc=112mV, respectively. The obtained response of the sensor was linear under the optimal conditions of the catalytic peak current, in the range of 8.0-330.0 µM, and the detection limit was 2.1 µM (S/N=3) for dopamine. The proposed sensor exhibited a high sensitivity, an excellent reproducibility, good selectivity, and it was successfully used in the .determination of dopamine injection samples

کلمات کلیدی:

Alumina nanoparticles, Al2O3NPsCPE, dopamine, cyclic voltammetry, differential pulse voltammetry