

عنوان مقاله:

Electrochemical Investigation for Sensitive Determination of Metoclopramide Based on Ytterbium Oxide Nanoparticles Supported on Graphene

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خلاصه مقاله:

A novel modified glassy carbon electrode (GCE) was successfully fabricated with ۱-(E)-۴-((۲-(۲,۴-dinitrophenyl)hydrazono)methyl)benzene-۱,۲-diol (DDH) and reduced graphene oxide-ytterbium nanoparticles (rGO-Yb₂O₃ NP) for the determination of metoclopramide (MC). The electrochemical behavior of the modified electrode (rGO-Yb₂O₃-DDH/GCE) was investigated by common and practical methods including differential pulse voltammetry, chronoamperometry and cyclic voltammetry. It was found that the rGO-Yb₂O₃-DDH composite has a coherent electrocatalytic role in the oxidation of metoclopramide with relatively high stability, lifetime and sensitivity. The characterization of the nanocomposite was done by X-ray diffraction, Fourier transform infrared spectroscopy and field emission scanning electron microscopy. The MC oxidation took place at the optimum pH of ۷.۰ and a potential that was about ۸۱۰ mV more negative than that of an unmodified glassy carbon electrode. Under optimized conditions, the corresponding linear calibration curves were found to be in the linear dynamic range of ۲۵.۰-۳۰۰۰.۰ μM with the detection limit of ۷.۱۴ μM. Finally, the proposed electrode was successfully used to measure MC in blood serum samples.

کلمات کلیدی:

Ytterbium oxide, Reduced grapheme oxide, Electrochemical sensor, Metoclopramide

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