2021
Sep 13-14
Webinar

22nd International Conference on
Green Chemistry and Technology

A voltammetric sensor based on green-synthesized two-dimensional molybdenum disulfide nanosheets/nafion composite for determination of dopamine in real samples

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A simple molybdenum disulfide nanosheets (MoS2) with Nafion (NFN), has been investigated as electrochemical sensor for dopamine detection. The MoS2 nanosheets were synthesized by hydrothermal method. Cyclic voltammetry (CV), differential pulse voltammetry(DPV), and electrochemical impedance spectroscopy (EIS) were performed to characterize on screen-printed electrode (MoS2/NFN/SPE). The synthesized MoS2 nanosheets were characterized by scanning electron microscope (SEM), X-ray diffraction (XRD), and fourier transform infrared spectroscopy (FTIR). Several important parameters controlling the performance of the developed electrode were investigated and optimized. Under optimum condition, dopamine can be determined in the range of 0.1–9.0 µM and the low detection limit is 0.07 µM. Several interfering agents(100-fold) did not interfere in the determination of DA. Hence, the developed electrode having high selectivity, stability, repeatability and reproducibility was observed in this study for determination of dopamine. The obtained results of real samples analysis by dopamine sensor suggest the sensor can be used as a potential tool for the determination of dopamine in real samples.

Keywords: Dopamine sensing; differential pulse voltammetry; cyclic voltammetry; molybdenum disulfide; Nafion.

Biography

Amirhossein Mehmandost studying chemical engineering at the Urmia University Iran