A Facile Strategy for Electrochemical Analysis of Chrysophanol Based on Nitrogen-Doped Graphene Supported ZnO Nanorods/Au Multihybrid Nanoarchitecture

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doi: 10.20964/2020.04.43

Received: 13 December 2019 / Accepted: 4 February 2020 / Published: 10 March 2020

For the first time, N-doped reduced graphene oxide supported ZnO nanorods loading Au nanoparticles (N-rGO-ZnO-Au) multihybrid nanoarchitecture are successfully achieved via a simple strategy. N-rGO served as a large support material can disperse ZnO nanorods, and the abundant active sites of ZnO are benefit for growing Au NPs. The obtained multihybrid nanoarchitected materials are clearly characterized by transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS) and X-ray diffraction (XRD). The electrochemical behaviors and reaction mechanism of fabricating sensor toward chrysophanol (CHR) are investigated. The fabricated electrochemical sensor possesses excellent electrochemical characteristics for detecting of CHR. The peak current is proportional to CHR concentration in the range from 1.57 to 27.53 μM , the detection limit is 0.49 μM . Moreover, the suggested electrochemical sensor also show good reproducibility, stability and selectivity, and has been used to detect CHR in real sample.

Keywords: Gold nanoparticles; ZnO nanorods; N-doped reduced graphene oxide; electrochemical sensor; chrysophanol

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