Development of Electrochemical Sensor Based on Graphene Oxide Electrode Modified by Silver-Doped ZnO Nanorods for Detection of Carbamate Pesticide in Food

Chunyan Wang^{1,2,*}, Qiong Song^{1,2}, Xiaoqiu Liu¹, Xiaowei Zhu¹

¹ College of Food Engineering, Jilin Engineering Normal University, Changchun 130052, China

² Measurement Biotechnique Research Center, Jilin Engineering Normal University, Changchun, 130052, China.

*E-mail: wangchunyan@jlnu.edu.cn

doi: 10.20964/2020.06.74

Received: 6 February 2020 / Accepted: 30 March 2020 / Published: 10 May 2020

A facile approach was used to develop a novel electrochemical sensor based on graphene oxide (GO)/glassy carbon electrode (GCE) modified by silver (Ag)-doped ZnO nanorods for the determination of carbamate pesticides (CP). The electrochemical deposition technique was used to fabricate the proposed electrode, and scanning electron microscopy and energy dispersive X-ray spectroscopy were carried out to characterize the electrode surface morphology and determine the elements present in the sample, which confirmed the successful formation of Ag-doped ZnO nanorods. The electrochemical properties were considered by differential pulse voltammetry (DPV) and cyclic voltammetry. Due to the good conductivity and strong catalytic activity of Ag-doped ZnO nanorods, the developed sensor revealed a limit of detection as low as 0.34 nML^{-1} by DPV, indicating a good stability, acceptable reproducibility and selectivity and great potential in determination of CP compounds in foodstuffs.

Keywords: Graphene oxide electrode; Ag-doped ZnO nanorods; Differential pulse voltammetry; Carbamate pesticide; Cyclic voltammetry

[FULL TEXT](#)

© 2020 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).