Electrochemical Detection of Daphnetin Based on a Glassy Carbon Electrode Modified with Nafion and RGO-TEPA

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doi: 10.20964/2021.04.46

Received: 2 December 2020 / Accepted: 25 January 2021 / Published: 28 February 2021

A sensitive electrochemical sensor composed of Nafion, tetraethylene pentamine-functionalized reduced graphene oxide (RGO-TEPA), and a glassy carbon electrode (GCE) was developed to analyze daphnetin (DAHP). The electrochemical behavior of DAHP on Nafion/RGO-TEPA/GCE was studied by cyclic voltammetry. The electroanalytical method for DAHP detection was established using differential pulse voltammetry. A detection limit of 0.5 nM ($S/N = 3$) and a linear calibration range of 0.1 to 10 μ M were obtained. The reproducibility and repeatability of the method were calculated to be 1.6% and 4.8%, respectively. The sensor showed good selectivity for DAHP and was successfully applied to detect DAHP in Zushima tablets. The content of DAHP in Zushima tablets detected by our sensor agreed well with that detected by HPLC.

Keywords: Daphnetin; electrochemical sensor; Nafion; reduced graphene oxide-tetraethylene pentamine (RGO-TEPA)

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