

Electropolymerized Eugenol-MWNT-Based Electrode for Voltammetric Evaluation of Wine Antioxidant Capacity

Ziyatdinova G., Kozlova E., Budnikov H.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. Eugenol electropolymerization conditions on multiwalled carbon nanotube based glassy carbon electrode (MWNT/GCE) have been found. The polyeugenol/MWNT/GCE shows reversible redox steps of o-quinone fragment in acidic media. Natural phenolic antioxidants are oxidized on polyeugenol/MWNT/GCE at 0.52V excluding resveratrol (0.62V). Differential pulse voltammetry on polyeugenol/MWNT/GCE was applied for the evaluation of wine antioxidant capacity (AOC). The AOC was expressed in catechin equivalents per 1L of wine. The linear dynamic range is 1.00-250 μ M with LOD and LOQ of 0.21 and 0.71 μ M of catechin, respectively. Positive correlations for AOC with antioxidant activity ($r=0.9840$) and total phenolics content ($r=0.9944$) were observed.

<http://dx.doi.org/10.1002/elan.201400712>

Keywords

Antioxidants, Electropolymerization, Food analysis, Nanotubes, Polyeugenol, Voltammetry