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Voltammetric Determination of Thymol in Oregano Using CeO2-Modified Electrode in Brij® 35 Micellar Medium

Ziyatdinova G., Ziganshina E., Cong P., Budnikov H.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Springer Science+Business Media New York.Glassy carbon electrode (GCE) modified with CeO2 nanoparticles dispersed in 0.01 M Brij® 35 (CeO2-Brij® 35/GCE) has been developed for the determination of thymol in micellar medium. Scanning electron microscopy (SEM) data confirm immobilization of the nanomaterial on the electrode surface. The electrooxidation of thymol on CeO2-Brij® 35/GCE is an irreversible diffusion-controlled process with participation of two electrons and two protons. Differential pulse voltammetry has been used for the quantification of thymol. The linear dynamic range of the thymol determination is 0.700–10.1 and 10.1–606 μM with the limits of detection and quantification 0.20 and 0.65 μM, respectively. The approach developed has been applied for the quantification of thymol in oregano spices using preliminary micellar extraction with Brij® 35. The results of voltammetric determination are in good agreement with the data of standard spectrophotometric method.

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Keywords

Chemically modified electrodes, Differential pulse voltammetry, Food analysis, Micellar media, Nanoparticles, Thymol

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