Anodic Oxidation of Phenoxyethanol in Nonaqueous Media

Magdalena Jakubczyk*, Sławomir Michalkiewicz

Institute of Chemistry, Jan Kochanowski University, Świetokrzyska St. 15G, PL-25406 Kielce, Poland

*E-mail: magdalenajakubczyk2@gmail.com

doi: 10.20964/2019.07.69

Received: 10 March 2019 / Accepted: 7 May 2019 / Published: 10 June 2019

The unknown electrochemical properties of phenoxyethanol (PE) - the most commonly used preservative in cosmetics were studied. The measurements were performed on platinum micro- and macroelectrodes by linear sweep (LSV), cyclic (CV) and differential pulse voltammetry (DPV) in mixed solvent acetic acid-acetonitrile (20%, v/v) containing NaClO₄ as a supporting electrolyte. The anodic oxidation process has proved to be quasireversible, diffusion-controlled and proceeding with exchange of one electron giving the unstable cation radical as a primary product (E_qC_i mechanism). Very good reproducibility of the DPV curves and the wide linearity range up to 1 mmol L⁻¹ indicate that the proposed medium can be successfully applied to develop the first voltammetric method of this preservative determination in pharmaceutical and cosmetic products.

Keywords: Phenoxyethanol, Oxidation, Voltammetry, Acetic Acid, Acetonitrile

[FULL TEXT](#)

© 2019 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/>).