

PP35. Chelating effect of carvacrol and the oregano essential oil

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Essential oils are natural products obtained from parts of plants by means of steam distillation. They are also made by expression of citrus fruit pericarp [1]. Because they are a complex mixture of chemical components, they exert innumerable biological activities, such as antimicrobial, antiparasitic, antitumor, antioxidant, among others. Because of the public demand for products of natural origin in different segments of society, essential oils have gained space, mainly in the food industries, where natural preservatives are sought that can replace or be associated with the synthetic additives used. One of the desirable properties of preservatives is their ability to interact with metal ions, such as iron, by exerting a chelating effect to inhibit lipid oxidation reactions catalyzed by these ions [2]. The objective of the present work was to evaluate the chelating effect of oregano essential oil and its major constituent, carvacrol, by cyclic voltammetry. The essential oil was extracted by hydrodistillation over a period of 2 hours using a modified Clevenger apparatus and characterized by gas chromatography coupled to mass spectrometric and flame ionization detectors. For the determination of the chelating effect, an electrochemical cell containing 0.05 mol L⁻¹ of anhydrous Na₂SO₄ was used as the supporting electrolyte, and FeSO₄·5H₂O 0.00150 mol L⁻¹ was the source of ferrous ions. Three electrodes were employed: Ag/AgCl (saturated in KCl) electrode was the reference, a platinum wire was the auxiliary, and glassy carbon was the working electrode. The determination of the chelating effect was performed by calculating the variation of the height of the ferrous oxidation peak with the increase in the concentrations of carvacrol and the essential oil. The essential oil from oregano contained terpinen-4-ol, carvacrol, *trans*-sabinene hydrate and γ -terpinene as the principal constituents. A reduction in the ferrous anodic current of 99.5 and 89% after the addition of 500 $\mu\text{g mL}^{-1}$ of carvacrol and oregano oil, respectively, was observed, thus indicating the occurrence of a chelating effect of oregano essential oil and its constituent carvacrol.

References:

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