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VOLTAMMETRIC BEHAVIOUR OF EUGENOL

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Unlike isoeugenol, eugenol does not appear to have been investigated voltammetrically. This communication reports the oxidation of eugenol at the platinum and carbon paste electrodes carried out in a 3-electrode cell at 27 ± 1°C.

In 0.5 M $NaClO_4$ in CH_3CN there was a well-defined diffusion wave at the platinum electrode with a half-wave potential of 0.53V vs Ag/Ag^+. Plots of $\log \frac{i_d - i}{i}$ vs E were straight lines.

In linear sweep voltammetry E_p and i_p/v varied with sweep speed. The charge transfer step is therefore irreversible. A reduction wave was absent in cyclic voltammetry.

Phenols are known to undergo both two-electron and one-electron oxidations in acetonitrile. Since only $\alpha < n$ is obtained from the data it is not possible to decide between the two cases. One-electron oxidation is favoured since large scale electrolysis shows mixtures of products.

At the carbon paste electrode in 0.5 M NaOH eugenol gave two anodic waves with a complex concetration-dependence. Reproducibility was poor.

Controlled potential electrolysis at a Platinum wire gauze electrode at 0.75 V gave a mixture of several compounds. A demethylated product of eugenol was isolated by constant current electrolysis at 10 A m^{-2}.