

SUPPLEMENTARY MATERIAL

Application of Voltammetry in Biomedicine – Recent Achievements in Enzymatic Voltammetry

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Abstract

This Supplementary Material contains figures related to the work published in R. Gulaboski, V. Mirceski, *Macedonian Journal of Chemistry and Chemical Engineering* 39 (2) (2020) 1-14 DOI: <http://dx.doi.org/10.20450/mjcce.2020.2152>

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Alongside to the figures related to surface EEC and surface EEC' mechanisms, all relevant references related to this work are also incorporated in this Supplementary Material.

The entire work is a broad overview of the recent achievements in enzymatic voltammetry, while providing large set of data about theoretical and experimental achievements in the last 6 years, related to the electrochemical and voltammetric features of so-called "redox enzymes". In addition, several novel methodological concepts, evaluated from square-wave voltammetry, which are seen as promising tools to achieve better sensitivity in evaluating kinetic and thermodynamic parameters in various enzymatic systems.

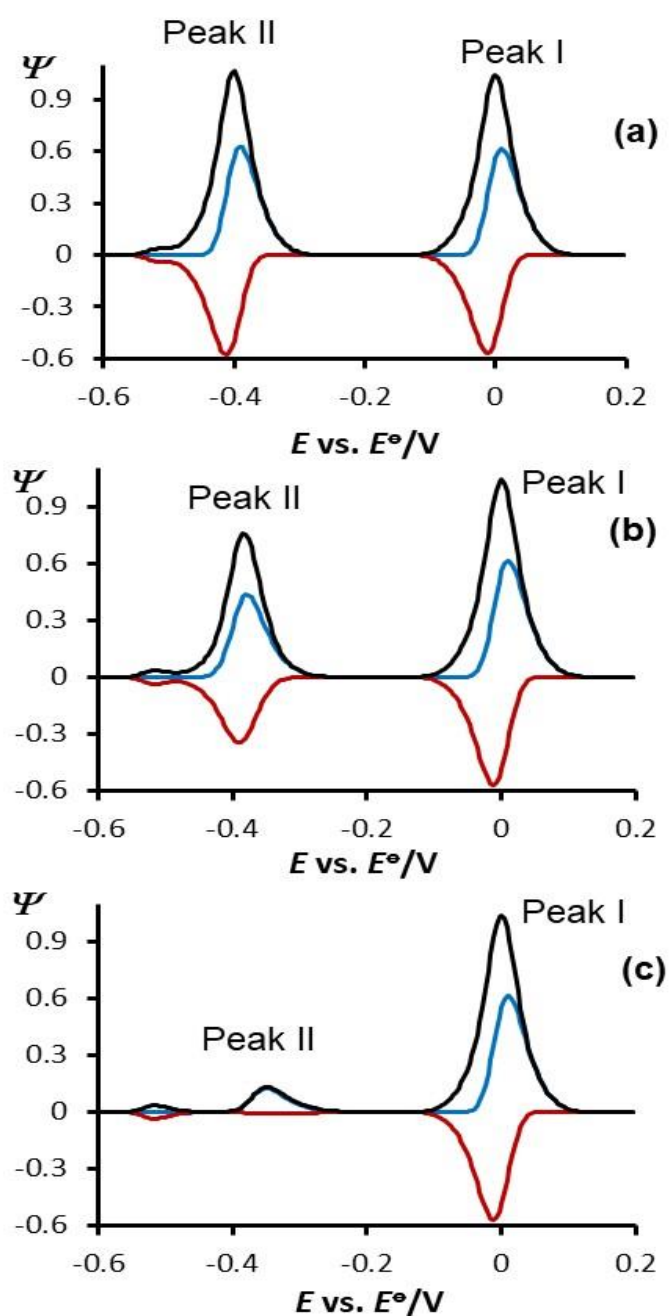


Figure S1. Surface EEC mechanism $A(\text{ads}) + n_1e^- \leftrightarrow B(\text{ads}) + n_2e^- \leftrightarrow C(\text{ads}) + S \leftrightarrow D(\text{ads})$ in protein-film voltammetry: effect of the substrate concentration $c(S)$ to the features of theoretical SW voltammograms. Voltammograms are simulated at potential separation of $|400 \text{ mV}|$ between both electrode steps: The values of $c(S)/\text{molL}^{-1}$ are set to: 0.0001 (a); 0.01 (b); and 0.05 (c). The value of chemical rate constant was set to $k_{\text{chem}} = 10 \text{ mol}^{-1}\text{Ls}^{-1}$. Equilibrium constant of follow-up chemical reaction was $K_{\text{eq}} = 1000$. All other simulation parameters were same as those in figure 3.

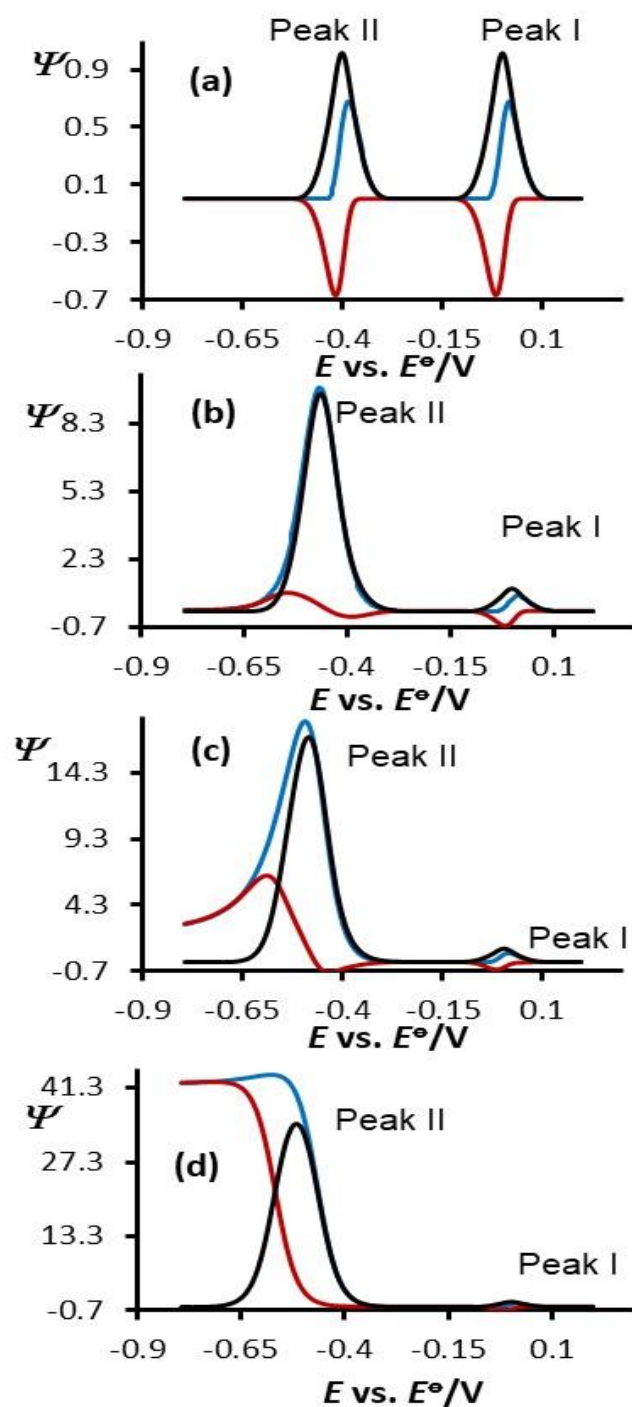


Figure S2. Surface EEC' regenerative mechanism $A(\text{ads}) + n_1e^- \leftrightarrow B(\text{ads}) + n_2e^- \leftrightarrow C(\text{ads}) + S \rightarrow B(\text{ads})$ in protein-film voltammetry: effect of the substrate concentration $c(S)$ to the features of theoretical SW voltammograms. Values of $c(S)/\text{molL}^{-1}$ are set to: 0.0001 (a); 0.03 (b); 0.035 (c) and 0.05 (d). The value of catalytic rate constant was set to $k_c = 10 \text{ mol}^{-1}\text{Ls}^{-1}$. All other simulation parameters were same as those in figure 3.

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