Electrochemical and Thermodynamic Properties of Diclofenac and Dibucaine Ions Across Water|1,6-dichlorohexane Interface

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doi: 10.20964/2021.02.26

Received: 7 October 2020 / Accepted: 23 November 2020 / Published: 31 December 2020

In this work, the electrochemical behaviour of diclofenac anion and dibucaine cation via a water|1,6-dichlorohexane liquid | liquid interface system was characterised. Both ions have been undergone voltammetry of ion transfer across the liquid-liquid interface. Analytical parameters such as the formal transfer potential, standard Gibbs energy of transfer across the interface, and the partition coefficient for both drugs were determined. The partition coefficient is of great importance for the estimation of the lipophilicity' ions, which plays a role in its distribution in living organisms and its effect on biological media. Furthermore, the different performance characteristics of the cyclic voltammetry (CV) technique were exploited to extract the values of the aqueous diffusion coefficients of both diclofenac and dibucaine, which were in a good agreement with the theoretically predicted values based on their molar mass, $4.18 \pm 0.05 \times 10^{-6} \text{ cm}^2 \text{ s}^{-1}$ and $3.43 \pm 0.04 \times 10^{-6} \text{ cm}^2 \text{ s}^{-1}$, respectively.

Keywords: Ion transfer – Diclofenac – Dibucaine – voltammetry – 1,6-dichlorohexane

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