Electrochemical Detection of Diclofenac and Dibucaine in Synthetic Saliva using Liquid|Liquid Micro-Interface Modified by Silicon Nitride

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In this study, electrochemical characterization and detection of an anti-inflammatory drug diclofenac (DCF) and a local anesthetic drug dibucaine (DIC) at synthetic saliva|1,6-dichlorohexane interface were carried out for the first time using cyclic voltammetry (CV) and differential pulse voltammetry (DPV). Although the CV of synthetic saliva matrix slightly decreased the available potential window at the micro-ITIES, it has no significant effect on the ion-transfer voltammetry of DCF and DIC at liquid|liquid interface. Peak currents response by DPV were linearly increased with both DCF and DIC concentrations in the synthetic saliva matrix over the concentrations ranged 8–40 $\mu\text{mol L}^{-1}$ and 8–24 $\mu\text{mol L}^{-1}$, and the calculated detection limits were $1.8 \pm 0.2 \mu\text{mol L}^{-1}$ and $1.5 \pm 0.14 \mu\text{mol L}^{-1}$, respectively. These results demonstrated that DPV at liquid|liquid micro interfaces arrays is a feasible analytical method for ionizable drugs detection in biomimetic matrixes.

Keywords: ion transfer – diclofenac – dibucaine - synthetic saliva - voltammetric analysis

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