

Ion Transfer Through Mimetic Lipid Membranes

C. M. Pereira, R. Gulaboski, E. Ferreira, D. Ribeiro, A. F. Silva

^a *LEQA – CIQ –L4, Departamento de Química, R. Campo Alegre, 687, 4169-007 Porto; cmpereir@fc.up.pt*

The properties of the interface between the water and DCE has some similarities with the interface between the biological membranes and water.[1] In order to increase the degree of similarity the water/DCE interface is modified with various lipids.[2,3] In this way, the ITIES mimics closely the bio-membranes,[4] and, without a doubt, it is possible to extract more reliable information about the processes taking place in the living organisms. Recently a particular interest has been devoted to the ion transfer across the interface of two immiscible solvents since these systems can be used to better understand the mechanisms involved in the process of drug uptake.

In this work we will present experimental results obtained in the study of the transfer of acetylcholine cations across the interface of water and 1,2-dichloroethane-modified by dioleoylacetylcholine phosphatidylcholine (DOPC) and dipalmitoylacetylcholine phosphatidylcholine (DPPC). Phosphatidylcholine were chosen since they are an important component of cellular membranes and they are also the major delivery form of the essential nutrient choline which in turn is itself a precursor in the synthesis of the neurotransmitter acetylcholine.

The experimental techniques used in this work include electrochemical techniques (voltammetry and electrochemical impedance) as well as Langmuir compression isotherms. From the experimental data it is possible to evaluate the kinetic parameters of the ion transfer and an interaction constant between the lipid and the acetylcholine cation and the results will be presented and discussed.

References:

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