

THE INFLUENCE OF COMPOUNDS OF TIN ON THE DYNAMIC PROPERTIES OF LIPOSOME MEMBRANES

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The influence of organic and inorganic compounds of tin on the dynamic properties of liposome membranes obtained in the process of dipalmitoylphosphatidylcholine (DPPC) sonication in water was investigated. The investigation was carried out by means of EPR spin probes with the use of TEMPO probe. Four compounds of tin were chosen: three organic ones ($(\text{CH}_3)_4\text{Sn}$, $(\text{C}_2\text{H}_5)_4\text{Sn}$ and $(\text{C}_3\text{H}_7)_3\text{SnCl}$ and one inorganic - SnCl_2 . The organic compounds differed as to their length of hydrocarbon chains and, moreover, the last of them contained chlorine in its structure, like the inorganic compound. The investigated compounds were added to liposome dispersion, which was prepared prior to that, until reaching a concentration of 10%-mole in proportion to DPPC. From the experiments conducted in this work it follows that the greatest changes in division coefficient (F) were induced by tin chloride (both organic and inorganic). Since the compounds of tin in water solution are of ionized character, the obtained result can prove that there exists a relation between the activity of the admixture and its ionic character. Also the character of the changes in F which were induced by admixtures of organic and inorganic chlorides is similar. The coefficient F in both cases increases rapidly along with a rise in the concentration of admixture and stabilizes at a concentration of about 1.5% for SnCl_2 and 3% for $(\text{C}_3\text{H}_7)_3\text{SnCl}$. Admixtures $(\text{CH}_3)_4\text{Sn}$ and $(\text{C}_2\text{H}_5)_4\text{Sn}$ were able to change the coefficient to a much weaker extent, which can testify to their much weaker activity in their interaction with membranes. At the initial stage of introducing admixtures of these compounds there followed a slight decrease in coefficient F: it reached its minimal value at a concentration of admixture of about 1% in the case of $(\text{CH}_3)_4\text{Sn}$ and 1.5% in that of $(\text{C}_2\text{H}_5)_4\text{Sn}$. A further increase in the concentration of admixtures resulted in a rise in the value of coefficient F and then in its stabilizing at a concentration of about 3%. Furthermore, a slightly stronger influence of $(\text{C}_2\text{H}_5)_4\text{Sn}$ on the changes in coefficient F was observed in comparison with $(\text{CH}_3)_4\text{Sn}$, which can be related to its slightly longer hydrocarbon chain.