

THE KINETICS OF CHANGE IN THE FLUIDITY OF LIPOSOMES ADMIXTURED WITH ORGANIC TIN COMPOUNDS: AN ESR STUDY

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The kinetics of change in the fluidity of liposome membranes admixed with organic tin compounds was investigated. The liposomes were obtained in the process of sonication of egg yolk lecithin (EYL). Five compounds were chosen for the investigation: three differing in the length of hydrocarbon chains ($(\text{CH}_3)_4\text{Sn}$, $(\text{C}_2\text{H}_5)_4\text{Sn}$, $(\text{C}_3\text{H}_7)_3\text{SnCl}$) and two differing in the number of rings ($(\text{C}_6\text{H}_5)_2\text{SnCl}_2$, $(\text{C}_6\text{H}_5)_3\text{SnCl}$). The concentrations of the investigated compounds in relation to EYL amounted to 1% for the first measurement series and 3% for the second one. The technique of electron paramagnetic resonance (ESR) was used in the research, with two spin probes differing in location of the nitroxyl group in the membrane. TEMPO probe dissolves both in the hydrophobic part of membranes and in water environment, while 16-DOXYL-stearic acid one locates itself deep in the hydrophobic membrane. The spectroscopic spectra were registered from the moment of introducing the admixture into liposomes during the successive 120 hours. Upon an analysis of the obtained results one can draw the following conclusions: all the tin compounds investigated for the purpose of the present work, made the liposome membranes to grow stiffer with time. Admixtures of 1% concentration changed the spectroscopic parameters of the membranes only to an insignificant extent; however, the changes in the parameters in the case of 3% admixture were substantially greater. It was also found out that the dynamics of the change in the spectroscopic parameters differs for ring compounds and chain ones. The latter displayed lower dynamics of parameters in time than the former ones. The weakest influence was observed for the compound of the shortest chain $(\text{CH}_3)_4\text{Sn}$, whereas the strongest – for the $(\text{C}_6\text{H}_5)_2\text{SnCl}_2$ compound.

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