

Microcalorimetric Investigation of the Interaction of Polysorbate Sufactants with Unilamellar Phosphatidylcholines Liposomes

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摘要

The physical stability of liposome was discussed by the zeta potential and isothermal titration calorimetry (ITC) measurements. In our system, the liposomes containing egg-PC, α -tocopherol and various quantities of polysorbate surfactants (Tween 20 and Tween 80) were prepared herein by the probe sonication method. The stability of these liposomes were also monitored and discussed by examining the size change with incubation time and the permeability of hydrophilic fluorescence (5(6)-carboxyfluorescein) probe. The experimental results demonstrated that adding Tween surfactants accelerated the change in liposomal size. Although adding 4 wt.% Tween surfactants had no effect on the permeability at 298 K, the permeability was promoted both at 298 and 310 K as the additional Tween surfactants increased to 8 wt.%. The zeta potential of liposome and the interaction potential between the liposomes were obtained by photon correlation spectroscopy (PCS) and by ITC. The experimental results demonstrated that adding the Tween surfactants increased the attractive interaction potential between the liposomes, whereas, the zeta potential of liposomes with the Tween surfactants was not varied from liposomes without surfactants at 298 K. The increase attractive interaction potential can be attributed to the increase in hydrophobic interactions between the $(\text{CH}_2\text{-CH}_2\text{-O})_n$ groups on the Tween surfactant's headgroup.