

Dioleoyl phosphatidylethanolamine liposome stabilized with poly(ethyleneimine)/(phenylthio)acetic acid ion pair and its Temperature and Oxidation-responsive release property

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Dioleoyl phosphatidylethanolamine (DOPE) bilayers stabilized with the ion pair of poly(ethyleneimine)/(phenylthio)acetic acid (PEI/PTA) was prepared for temperature and oxidation-sensitive liposomes. An upper critical solution temperature (UCST) behavior was shown when PEI/PTA ion pair was suspended in an aqueous solution and the UCST increased in direct proportion to PTA content. Because of its amphiphilic specificity, the ion pair was self-assembled into nanospheres and it can be affirmed by TEM microscopy and dynamic light scattering. The ion pair made a salt bridge between the amino group and the carboxyl group. By FT-IR spectroscopy evidenced its PTA was readily oxidized by H₂O₂. Due to their amphiphilic specificity, the PEI/PTA ion pair act as a stabilizer for the formation of DOPE liposomes. The liposome has temperature responsive payload release specificity, it possibly because when the temperature rose, the ion pair lost its amphiphilic specificity, So ion pair can be separated from the liposomal membrane. The liposome was also oxidation-responsive in terms of release, owing to if PTA is oxidized, the amphiphilic specificity of the ion pair was lost.