1. POLYMERIZED VESICLES AND BILAYER LIPID MEMBRANES (BLMs). Janos H. Fendler, Syracuse University, Department of Chemistry, Syracuse, NY 13244-1200.

Single bilayer vesicles and bilayer lipid membranes (BLMs) were prepared from \([\text{[C}_15\text{H}_3\text{iCO}_2(\text{CH}_2)_2\text{N}^+ (\text{CH}_3)\text{CH}=\text{CH}_2, \text{Cl}^-; (C_18\text{H}_37)\text{N}^+ \frac{\text{CH}_3}{}\text{CH}=\text{CH}_2, \text{Cl}^-, (C_18\text{H}_37)\text{N}=(\text{CH}_2\text{CH}=\text{CH}_2, \text{Cl}^-; (\text{CH}_2\text{CH}=\text{CH}_2, \text{Cl}^-)^2}\text{PO}_{4}^-.\] Irradiation with ultraviolet light led to the polymerization of these vesicles and BLMs. Polymerized vesicles and BLMs were found to be more stable than their unpolymerized counterparts. Properties of BLMs were measured by simultaneous electrical (capacitance, voltage-dependent capacitance, conductivity) and spectroscopic (intracavity laser absorption; steady-state, and subnanosecond time-resolved fluorescence; and reflection) techniques.


Vesicles have been synthesized from double chain surfactant molecules containing isoxazol function. These functions can be polymerized with nickel caproate. The polymerization process was followed by various techniques, including \(^1\)H-NMR, electron microscopy, differential scanning calorimetry, and fluorescence. The data indicate that on polymerization the vesicle bilayer becomes more viscous and less polar. The lower polarity is partly due to the extrusion of water molecules. The organized structure of a vesicle opens the possibility to control the course of a chemical reaction. Polymerized vesicles incorporating indoxyl functions have been prepared and studied as chiral catalysts for the enantioselective hydrolysis of \(\alpha\) and \(\beta\)-amino acid esters. Enantioselectivity ratios up to \(k^+\)/\(k^- = 15\) have been obtained.


In this work, we have prepared two micelle forming polymerizable quarternary ammonium salts bearing the double bond in the one case on the fatty head, and in the other at the end of the aliphatic chain. Furthermore, the structure of the polymerizable groups was slightly different in the two cases, i.e. \(\text{Cl}_2=\text{C}-\frac{\text{O}}{}\text{O}上下文)-\text{Cl}\) in the former and \(\text{Cl}_2=\text{C}-\frac{\text{O}}{}\text{O}上下文)-\text{Cl}\) in the latter. The polymerization was accomplished by UV-irradiation and the characterization of the products was obtained by fluorescence probing methods. It was found that the polymerization rate was very fast and practically identical in both cases. Micellar size before and after polymerization will be discussed, along with some observed special behavior of fluorescence quenching.