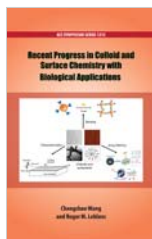


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Chapter 1

Langmuir Monolayer Properties of Fluorinated Fatty Alcohols and Dipalmitoylphosphatidylcholine (DPPC)

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The authors have newly synthesized fluorinated amphiphiles with relatively short perfluorocarbon chains to understand their interaction with biomembranes. This chapter describes the monolayer miscibility of perfluorobutylated (*F4H11OH*) or perfluorohexylated long-chain alcohols (*F6H9OH* and *F6H11OH*) with DPPC, which is a major component of native pulmonary surfactants in a mammal. The two-component monolayer has been elucidated from the thermodynamic and morphological aspects. The surface pressure (Π)–molecular area (A) and surface potential (ΔV)– A isotherms for the systems were measured on 0.15 M NaCl at 298.2 K. From the isotherm data, a plot of an excess Gibbs free energy change of mixing *versus* mole fraction and a two-dimensional phase diagram were constructed to elucidate the miscibility between the two components. The miscibility is also supported by the *in situ* fluorescence microscopy (FM) and *ex situ* atomic force microscopy (AFM) after transfer on a mica substrate. Herein, the fluidization of DPPC monolayers containing a small amount of *F4H11OH* and *F6H9OH* is induced by increasing surface pressures. On the other hand, the incorporation of *F6H11OH* undergoes the solidification of DPPC monolayers. The control