

## **Physicochemical Studies on Preparation and Properties of Microemulsions with Various Surface Active Agents**

**Masahiko Abe**

*Faculty of Science and Technology, Science University of Tokyo*

Properties of the o/w type microemulsion with dimyristoylphosphatidylcholine, properties of the microemulsion with anionic/cationic mixed surfactants, phase behavior of amphoteric surfactant multi-phase microemulsion, binding constants of inorganic electrolytes and aggregation numbers of the o/w type microemulsion with an amphoteric surfactant, and molecular interactions between lipid and some steroids in a monolayer and in a bilayer (w/o/w type macroemulsion) were investigated from the point of colloid and surface chemistry. The properties of microemulsion were dependent extensively on both salinity and pH values. The middle-phase microemulsion with mixtures of anionic/cationic surfactants was independent of both temperature and salinity. The formation of the DMLL microemulsion was strongly depend both on pH and on salinity. The DMLL microemulsion near the isoelectric point was found to have some attractive features compared with other surfactants such as sulfonates and/or nonionics. The adsorption density of DMLL molecules on the surfaces of o/w type microemulsions increased as the pH approached that of the isoelectric region ; then the surfactant number on the surface of unit microemulsion was able to be obtained if we specified the diameter of the microemulsion. The interaction between hydrophobic groups of DPPC and steroids in both the monolayer and the bilayer membranes (w/o/w type macroemulsion) was found to increase with decreases in the number of side chains and double bonds in the steroid molecules involved.