Faculty of Science and Technology
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Development of Analytical and Separation Methods with Nano-sized Molecular Assembly

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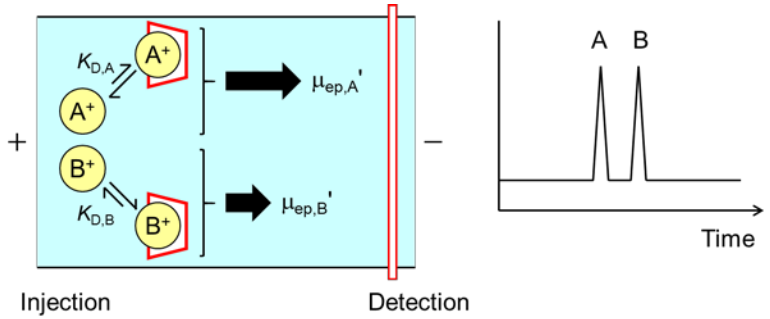

(a) Molecular recognition with affinity (b) Chromatogram

Fig. 1 Separation improvement by affinity interaction

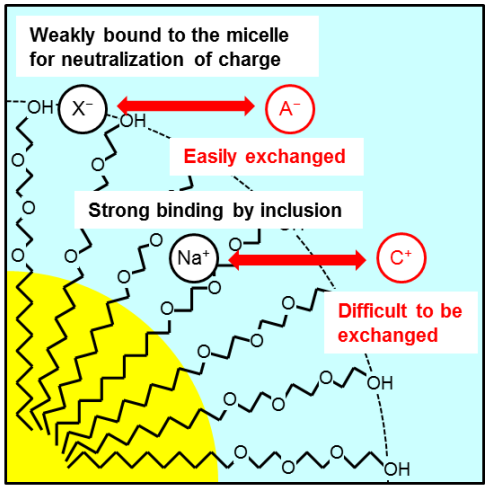

Fig. 2 Partition selectivity of ionic species toward nonionic surfactant micelle

Content:

Nano-sized molecular assemblies of surfactant micelles, vesicles, microemulsions, and polymer gels possess hydrophobic environment. Specific surface area of the molecular assemblies is greatly larger than that of bulk water-organic solvent interface. Extraction-separation with the characteristic hydrophobic environment of the molecular assemblies works in pseudo-homogeneous aqueous solution. Liquid-liquid extraction is done in the pseudo-homogeneous aqueous solution without mechanical shaking of the two phases, with fast extraction kinetics, as well as with the selectivity towards ionic substances. Functional Molecular Assembly including micelles, microemulsions, and hydrophobic matrices are to be developed.

Based on equilibria and kinetics in aqueous solution, development of affinity reagents, analysis of affinity interactions, and investigation of selectivity expression factors are studied.

Keywords : Surfactant micelle, microemulsion, hydrophobic partition, aquatic solvent, analytical separation

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