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Professor



B.S. Chemical Engineering, National Taiwan University 1990

Ph.D. Chemical Engineering, Rice University, Houston, Texas, USA 1998

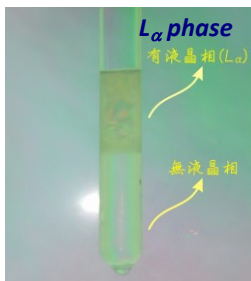
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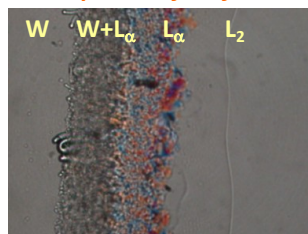
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Our research interests are mainly focused on various applications and properties of surfactants, colloid science, as well as electroless plating techniques.

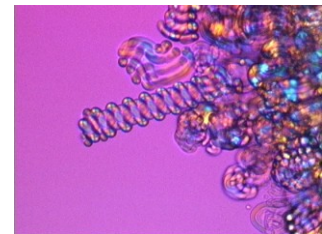
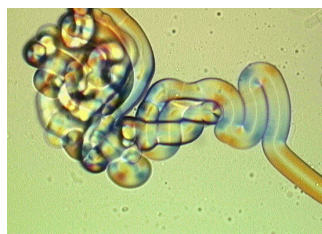
● Phase Behavior of Surfactants and Its Associated Applications



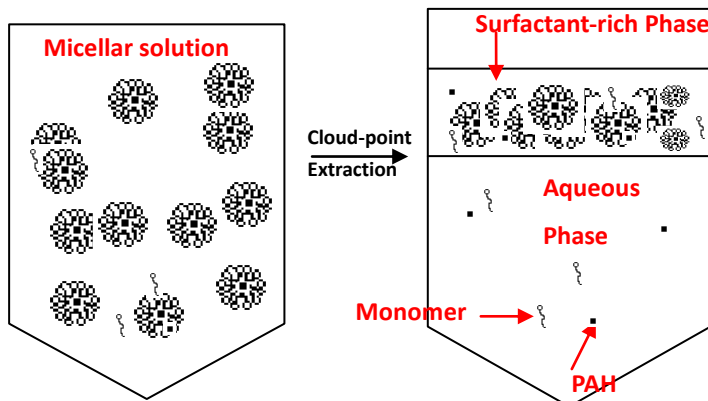
Typical Aqueous Phase Sequence of Surfactant



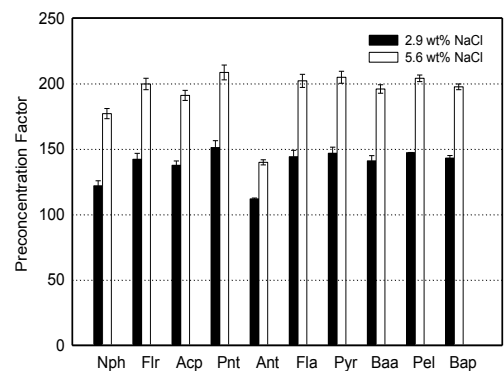
Liquid Crystalline L_alpha Phase (Myelins)



✓ Application in Microanalysis and Preconcentration

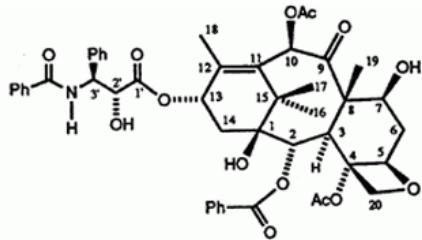


Cloud-point Extraction (CPE)

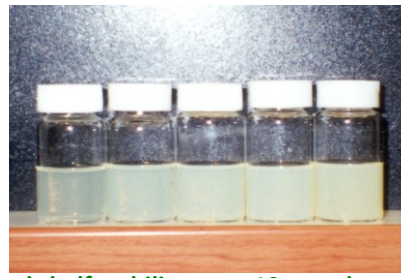


Performance of the L₃-phase extraction on hydrophobic solutes such as polycyclic aromatic hydrocarbons (PAHs).

✓ **Applications in Enhanced Drug Delivery using Emulsion Formulations**

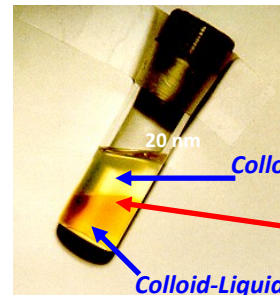
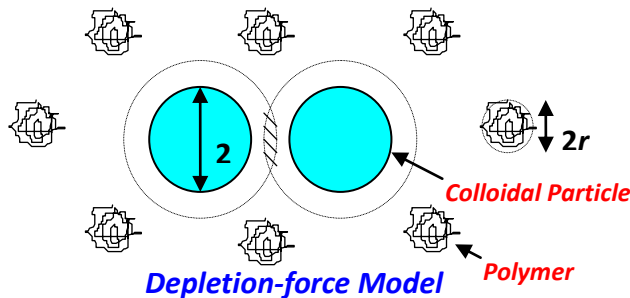


Paclitaxel as the model drug



Good shelf stability, over 10 months, containing 1000 ppm Taxol in O/W emulsions, was obtained using food-grade surfactants and lipids.

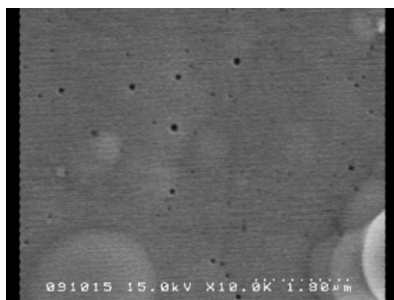
● **Critical Phenomena in Colloidal System**



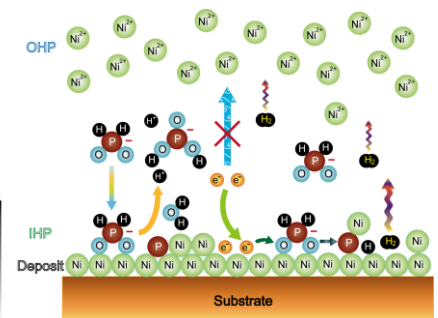
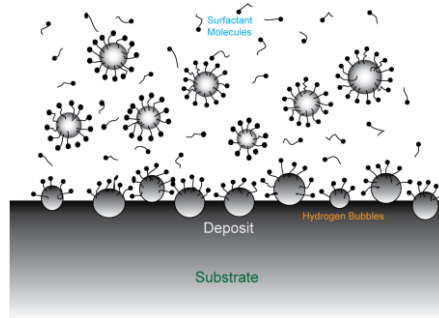
Ultralow IFT $\approx 1 \mu\text{N/m}$

34.40 wt% $\text{C}_{18}\text{-g-SiO}_2$ (20nm)+ 1.1wt% PDMS (MW=96000 g/mol) in Cyclohexane

● **Electroless Plating Techniques**



Surfactant can reduce void (pit) formation on electroless Ni thin films.



Schematic of electroless plating technique

Selected Publications:

- (1) K.-C. Hung, **B.-H. Chen**, "Application of L_3 Sponge Phase in Extraction of Polycyclic Aromatic Hydrocarbons", *AIChE Journal*, **53**(6), 1450–1459 (2007).
- (2) K.-C. Hung, **B.-H. Chen**, Liya E. Yu, "Cloud-Point Extraction of Selected Polycyclic Aromatic Hydrocarbons by Nonionic Surfactants", *Separation & Purification Tech.*, **57**(1), 1–10 (2007).
- (3) D. Carr, P.R. Garrett, D. Giles, G. Pierre-Louis, E. Staples, C. A. Miller, **B-H Chen**, "Solubilization of Triolein by Microemulsions Containing C_{12}E_4 /Hexadecane/Water; Equilibrium and Dynamics", *Journal of Colloid and Interface Science*, **325**(2), 508–515 (2008).
- (4) M.-K. Chang, C.-H. Chen, **B.-H. Chen**, "Characteristics of Magnetic Nanoparticles Fabricated by Electroless Nickel Deposition", *Ind. & Eng. Chem. Res.*, **47**(9), 3021–3029 (2008)
- (5) J.-L. Li, **B.-H. Chen**, "Effect of Nonionic Surfactants on Biodegradation of Phenanthrene by a Marine Bacteria of *Neptunomonas naphthovorans*", *J. Hazardous Materials*, (in press).