

Contents

Part I	Mono- and Bilayers	
<hr/>		
Molecular Theory for Amphiphile Packing and Elastic Properties of Monolayers and Bilayers		
By A. Ben-Shaul, L. Szleifer, and W.M. Gelbart (With 3 Figures) . .		2
Chain Packing and the Compressional Elasticity of Surfactant Films		
By W.M. Gelbart and A. Ben-Shaul		9
Dynamics of Phase Transitions in Langmuir Monolayers of Polar Molecules		
By F. Brochard, J.F. Joanny, and D. Andelman (With 3 Figures) . .		13
Investigation of Phase Transitions in Fatty Acid Monolayers by Fluorescence Microscopy. By F. Rondelez (With 2 Figures)		
		20
Polymorphism of Monolayers of Monomeric and Macromolecular Lipids: On the Defect Structure of Crystalline Phases and the Possibility of Hexatic Order Formation		
By E. Sackmann, A. Fischer, and W. Frey (With 6 Figures)		25
Surface-Density Transitions, Surface Elasticity and Rigidity, and Rupture Strength of Lipid Bilayer Membranes		
By E. Evans and D. Needham (With 16 Figures)		38
Equilibrium Configurations of Fluid Membranes		
By W. Helfrich and W. Harbich (With 1 Figure)		58
Dynamics of Drying and Film-Thinning		
By P.G. de Gennes (With 6 Figures)		64
Part II	Surface Thermal Fluctuations	
<hr/>		
Curvature and Fluctuations of Amphiphilic Membranes		
By S. Leibler, R. Lipowsky, and L. Peliti		74
Fluctuations and Interactions Between Membranes. By D. Sornette .		
		80
Tangential Flows in Fluid Membranes and Their Effect on the Softening of Curvature Rigidity with Scale. By D. Foerster		
		97

Unbinding of Membranes. By R. Lipowsky and S. Leibler	98
Elasticity of Crystalline and Hexatic Membranes By L. Peliti and D.R. Nelson	106
Fluctuations on Crystal Surfaces. By S. Balibar	113
Surface Tension and Rigidity: Role of the Fluctuations and Optical Measurements. By J. Meunier (With 1 Figure)	118

Part III	Ordered Phases
-----------------	-----------------------

Geometrical Basis of Cubic Structures By J. Charvolin and J.F. Sadoc (With 7 Figures)	126
Periodic Surfaces of Prescribed Mean Curvature By D.M. Anderson, H.T. Davis, J.C.C. Nitsche, and L.E. Scriven . .	130
The Cubic Phases of Liquid-Containing Systems: Physical Structure and Biological Implications By V. Luzzati, P. Mariani, and T. Gulik-Krzywicki (With 3 Figures)	131
Interactions in Lyotropic Lamellar Phases: A High Resolution X-Ray Study. By D. Roux and C.R. Safinya (With 5 Figures)	138
Stability of Brine Swollen Lamellar Phases. By G. Porte, P. Bassereau, J. Marignan, and R. May (With 10 Figures)	145
Phase Diagram of Lamellar Phases: Rigidity and Curvature By J.-M. di Meglio (With 7 Figures)	153
Edge Dislocations and Elasticity in Swollen Lamellar Phases By J. Prost and F. Nallet (With 2 Figures)	159
Lamellar Lyotropic Phases: Rheology, Defects By M. Kléman (With 7 Figures)	164
On the Coexistence of Two Lamellar Phases By H. Wennerström (With 5 Figures)	171

Part IV	Vesicles
----------------	-----------------

Long Range Interactions Between Lipid Bilayers in Salt Solutions and Solutions of Non-Adsorbant Polymers: Comparison of Mean-Field Theory with Direct Measurements By E. Evans and D. Needham (With 9 Figures)	178
Niosomes: A Case in the Design of Lipid Vesicles By G. Vanlerberghe (With 1 Figure)	199

Direct Visualization of Amphiphilic Phases by Video Enhanced Microscopy and Cryo-Transmission Electron Microscopy By D.D. Miller, J.R. Bellare, D.F. Evans, Y. Talmon, and B.W. Ninham (With 5 Figures)	202
Spontaneous Formation of Vesicular Structures from a Swollen Lamellar Phase by Dilution and Control of Surface Charge Density By W.J. Benton (With 1 Figure)	207

Part V	Micelles
---------------	-----------------

Scattering of Concentrated Dispersions of Colloidal Particles: Microemulsion Droplets, Polydisperse Hard Spheres and Charged Hard Spheres. By A. Vrij	212
Self-diffusion of Globules By R. Klein, U. Genz, and J.K.G. Dhont (With 1 Figure)	213
Dynamics of Charged Systems. By L. Belloni	220
Counterion Complexation. Ion Specificity in the Diffuse Double Layer of Surfactant and Classical Colloids By D.F. Evans, J.B. Evans, R. Sen, and G.G. Warr (With 1 Figure)	224
Light Scattering Experiments on Interacting Micelles By M. Corti, V. Degiorgio, and L. Cantu (With 4 Figures)	229
Nonionic Micelles By B. Lindman and M. Jonströmer (With 2 Figures)	235
SANS Study of Structure, Growth, and Polydispersity of Short-Chain Lecithin Micellar Systems. A Ladder Model Analysis By S.H. Chen, T.L. Lin, and C.F. Wu (With 9 Figures)	241
Theory of Thermodynamic Properties and Phase Separation of Micellar Solutions with Upper and Lower Consolute Points By D. Blankschtein, G.M. Thurston, and G.B. Benedek (With 1 Figure)	253
Electric Birefringence of Nonionic Micellar Solutions Near the Cloud Point. By V. Degiorgio and R. Piazza (With 2 Figures)	259
Aspects of the Statistical Thermodynamics of Amphiphilic Solutions By R.E. Goldstein	261
Rheological Properties of Semi-Dilute Micellar Systems By S.J. Candau, E. Hirsch, R. Zana, and M. Adam (With 2 Figures)	268
Shear Induced Micellar Structures By H. Hoffmann, H. Rehage, and I. Wunderlich (With 4 Figures)	272

Dynamics of Intermicellar Exchanges By R. Zana and J. Lang (With 2 Figures)	278
--	-----

Part VI	Microemulsions
----------------	-----------------------

A Statistical Mechanical Model for Microemulsions By J.C. Wheeler and T.P. Stockfisch (With 2 Figures)	286
Middle-Phase Microemulsions and Random Surfaces By S.A. Safran, D. Roux, S.T. Milner, M.E. Cates, and D. Andelman (With 2 Figures)	291
Intimations of Bicontinuity in Microemulsion Theory By L.A. Turkevich (With 6 Figures)	298
Microemulsions and Their Precursors. By H.T. Davis, J.F. Bodet, L.E. Scriven, and W.G. Miller (With 16 Figures)	310
Three-Component Microemulsion Structure: Curvature and Geometric Constraints. By V. Chen, G.G. Warr, D.F. Evans, and F.G. Prendergast (With 3 Figures)	328
Transition of Rodlike to Globular Micelles by the Solubilization of Additives. By H. Hoffmann and W. Ulbricht (With 7 Figures)	334
A Study of Dynamics of Microemulsion Droplets by Neutron Spin Echo Spectroscopy. By J.S. Huang, S.T. Milner, B. Farago, and D. Richter (With 4 Figures)	346
Images of Bicontinuous Microemulsions by Freeze Fracture Electron Microscopy. By W. Jahn and R. Strey (With 3 Figures)	353
Molecular Self-Diffusion and Microemulsion Bicontinuity By B. Lindman (With 5 Figures)	357
Scattering Probes of Microemulsion Structure By E.W. Kaler (With 3 Figures)	364
Small-Angle Scattering on Microemulsion Systems. Evidence for an Ordered Bicontinuous Structure By A. de Geyer and J. Tabony (With 11 Figures)	372
Relation Between Elasticity of Surfactant Layers and Characteristic Sizes in Microemulsions By O. Abillon and D. Langevin (With 1 Figure)	383
Phase Behavior of Quinary Systems: The X Surface By M. Kahlweit and R. Strey (With 2 Figures)	388

Part VII **Porous Media**

Fractal Flow Patterns in Porous Media. By A. Soucemarianadin,
R. Lenormand, G. Daccord, E. Touboul, and C. Zarcone
(With 7 Figures) 392

Index of Contributors 399