

Contents

Part I Membranes and Surfactant Systems

Adhesion and Roughness of Biological Model Membranes By W. Helfrich and B. Klösgen (With 9 Figures)	2
The Sponge State: A Striking Isotropic Liquid Phase By D. Roux and M.E. Cates (With 10 Figures)	19
Pattern Formation Processes in Binary Mixtures with Surfactants By T. Kawakatsu and K. Kawasaki (With 1 Figure)	34
Hydrodynamic Interprotein Interaction in a Biomembrane By S. Komura and T. Izuyama	36
Ordering Process Below the Pre-transition Temperature in Multilamellar Lipid Solutions By S. Ueno, T. Takeda, S. Komura, and Y. Toyoshima (With 2 Figures)	38
Anisotropic Dynamics in an Oriented Lipid Multibilayer Revealed by Vector EPR Spectroscopy By Y. Shimoyama and H. Watari (With 2 Figures)	40

Part II Gels

Swelling of Gels and Diffusion of Molecules By Yong Li and T. Tanaka (With 4 Figures)	44
Phase Transition of D.N.A. Gel and Reentrant Phenomena in Acrylamide and Gelatin Gels By E. Takushi and T. Tanaka (With 4 Figures)	55
Spongelike Domain Structure in a Two-Dimensional Model Gel Undergoing the Volume Phase Transition By K. Sekimoto, N. Suematsu, and K. Kawasaki (With 1 Figure)	57
Ordered Structures Resulting from Photo-cross-links of Binary Polymer Blends Undergoing Phase Separation By Q. Tran-Cong, T. Nagaki, M. Imura, O. Yano, and T. Soen (With 4 Figures)	59

Part III Liquid Crystals

Ordered Phases in Colloidal Suspensions of Tobacco Mosaic Virus By R.B. Meyer	62
A Model of Electro-rheological Fluid By J. Takimoto (With 1 Figure)	74
The Dynamical Structure Factor of Rodlike Polymers in the Isotropic Phase By T. Maeda	76
Pattern Formation in the Spatially Modulated Electrohydrodynamic Convection of Liquid Crystals By A. Ogawa, K. Kawasaki, W. Zimmermann, and T. Kawakatsu (With 1 Figure)	78
Theory of Shear Thinning in Liquid Crystal Polymers, for the Lower Shear Rate Regime By Y. Yamazaki, A. Holz, S.F. Edwards, and H. Fujishiro	80
Hierarchical Discommensuration Pattern and Phase Transitions in the Electrohydrodynamic Convection of Liquid Crystals with a Periodic Substrate Potential By H. Mitani (With 2 Figures)	82

Part IV Polymers

Phase Transition and Self-Assembling Structures of Polymer Mixtures Under Shear Flow By T. Hashimoto, T. Takebe, and K. Fujioka (With 11 Figures)	86
Effects of Viscoelasticity on Polymer Diffusion By M. Doi (With 2 Figures)	100
MC Study of Effects of Shear on the Phase Transition of Binary Mixtures By C.K. Chan	113
Domain Growth Under Shear Flow By T. Ohta, H. Nozaki, and M. Doi (With 2 Figures)	115
Turbulent Flow of Dilute Polymer Solutions: An Approach to the Mechanism Producing Drag Reduction By A. Hatano	117
Anomalous Phase Separation Behavior in a Binary Mixture of Poly(vinyl methyl ether) and Water Under Deep Quench Conditions By H. Tanaka and T. Nishi (With 2 Figures)	119
Study of Pattern Formation Dynamics in a Polymer Mixture Undergoing Phase Separation by Digital Image Analysis By H. Tanaka, T. Hayashi, and T. Nishi (With 1 Figure)	121

Dependence of Molecular Weight and Tacticity of Poly(methylmethacrylate) (PMMA) on Crystallization of Poly(ethyleneoxide) (PEO) in PEO/PMMA Blends By M. Takahashi, N. Harasawa, and H. Yoshida	123
Concentration-Dependent Double-Step Transition of the Diffusion Coefficient in Dilute Solutions of Styrene-Butadiene Diblock Copolymer in Selective Solvent By Y. Tsunashima (With 1 Figure)	125
Dynamic Electric Multipole Model for Colloid Particles By S. Yoshino	127

Part V Phase Transitions in Two Dimensions

Experimental Studies of Phase Transitions and Pattern Formation in Two Dimensions By C.M. Knobler, K. Stine, and B.G. Moore (With 10 Figures)	130
Geometrical Quasiparticle Condensation Model of Melting in Two Dimensions By M.A. Glaser, N.A. Clark, A.J. Armstrong, and P.D. Beale (With 3 Figures)	141
Mixed Polymer Films at the Air-Water Interface By M. Kawaguchi, R. Nishida, and K. Nagata	153

Part VI Coalescence and Domain Growth

Simple Models for Coalescence of Fluid Droplets By P. Meakin (With 17 Figures)	156
Vertex Model of Cellular Pattern Growth in Two and Three Dimensions By T. Nagai, K. Kawasaki, and S. Ohta (With 3 Figures)	179
Annihilation Kinetics of Particle-Antiparticle Systems with Long-Range Interaction By H. Toyoki (With 2 Figures)	182
A Simple Model for the Relation Between Weight and Lifetime By S. Miyazima (With 2 Figures)	184
Dynamics of Ordering Processes in a Long-Range Exchange Model By H. Hayakawa, T. Koga, and K. Kawasaki (With 2 Figures)	186

Part VII Pattern Formation

Dendrites, Viscous Fingers, and the Theory of Pattern Formation By J.S. Langer	190
---	-----

Pattern Formation in Growth of Snow Crystals: Hexagonal and Dendritic Patterns By E. Yokoyama and T. Kuroda (With 1 Figure)	194
Periodic Changes in the Structure of the Growing Crystal Surface By T. Irisawa, Y. Arima, and T. Kuroda (With 2 Figures)	196
Crystal Growth, Fractal Growth and Liquid-like Behavior in the Case of Thin Film Formation By S. Ozawa, Y. Sasajima, and T. Haseda (With 2 Figures)	198
Elongation Process of Whisker Crystals with a Solution Layer By K. Kishi, T. Yoshida, and K. Yoshioka (With 2 Figures)	200
Anisotropic Fractal Aggregation in a Finite Density Gas By M. Uwaha, Y. Saito, and S. Seki (With 1 Figure)	202
Multifractal Structure of Non-Newtonian Viscous Fingers By T. Nagatani and Y. Usami (With 2 Figures)	204
A Crossover Phenomenon in Electrochemical Deposition By Y. Usami and T. Nagatani (With 3 Figures)	206
<hr/> Part VIII Chemical Reactions and Hydrodynamic Instabilities <hr/>	
Global Mass Transport by Chemical Wave Propagation By H. Miike, H. Hashimoto, and S.C. Müller (With 2 Figures)	210
Self-Collapse of the Target Pattern due to Macroscopic Fluctuation in the Belousov-Zhabotinsky Reaction By K. Suzuki (With 2 Figures)	212
Chemical Sensing by Use of Entrainment By S. Nakata, K. Yoshikawa, and H. Kawakami (With 3 Figures)	215
Nonlinear Response of Surface Waves in a Container Under an External Parametric Forcing By M. Umeki (With 1 Figure)	217
Uphill Diffusion and Chemical Layering in a Mineral-Fluid System By T. Nishiyama (With 2 Figures)	219
Experiment on Magnetoadsorption of NO on Micropores By H. Uchiyama, S. Ozeki, K. Kaneko, Y. Natsume, and T. Suzuki (With 3 Figures)	221
Index of Contributors	223