Volume 100 (1996)

Trends in Colloid and Interface Science X

Guest Editors:
C. Solans, M. R. Infante
and M. J. García-Celma (Barcelona)
The IXth European Colloid and Interface Society (ECIS) Conference was held in Barcelona, 17 – 22 September, 1995. It was attended by over 320 participants from 30 different countries. The scientific program was composed of 301 contributions (70 lectures and 231 poster communications). It covered the theoretical, experimental and technical aspects of almost all fields of modern Colloid and Interface Science.

This volume contains a selection of the contributions presented at the Conference. It is divided into the following sections:
- Surfactant aggregates: Micelles, vesicles and liquid crystals
- Colloidal particles: Interaction, structure and aggregation
- Emulsions and concentrated systems
- Microemulsions
- Mixed colloidal systems
- Rheology
- Biocolloids
- Interfaces, films and membranes.

On behalf of the Organizing Committee, we would like to thank all participants for their scientific contributions which resulted in a successful Conference. We are especially grateful to the members of the Scientific Committee, M. Corti, H. Hoffmann, D. Langevin, H. Lekkerkerker, B. Lindman, M. A. López Quintela, C. Mans, P. Schurtenberger and Th. F. Tadros. They helped us in the difficult task of selecting the contributions for oral presentations from a rather large number of high quality Abstracts.

We gratefully acknowledge the support of the Faculty of Chemistry of the University of Barcelona. They kindly allowed us to use their facilities in which to hold the Conference.

We also gratefully acknowledge the financial support from the European Colloid and Interface Society and from the following Spanish Organizations: Generalitat de Catalunya, Ministerio de Educación y Ciencia (MEC), Universitat de Barcelona (UB), Real Sociedad Española de Química (RSEQ), Consejo Superior de Investigaciones Científicas (CSIC), Mettler Toledo S.A.E., Petróquimica Española S.A., ICI Española S.A. and Optilas Ibérica S.A.

We sincerely thank the staff of the “Department de Tecnologia de Tensioactius” (CSIC) and the “Department d’Enginyeria Química i Metallurgia” (UB) for their enthusiastic and efficient collaboration in the organization of the Conference. We are also indebted to Mr. and Mrs. Guruswamy for their valuable and generous help.

On behalf of the Organizing Committee,

C. Solans, M. R. Infante, M. J. García-Celma
Surfactant aggregates: Micelles, vesicles and liquid crystals

- H. Kunieda, K. Shigeta, K. Nakamura, T. Imae: Formation and structure of reverse vesicles .......................................................... 1
- H. Edlund, M. Bydén, B. Lindström, A. Kahn: Phase diagram of the 1-dodecyl pyridinium bromide-dodecane-water surfactant system ......................................................... 6
- K. Berger, K. Hiltrop: Characterization of structural transitions in the SLS/n-alcohol/water system ......................................................... 9
- V. Babić-Ivančić, D. Škrtic, N. Filipović-Vinceković: Phase behavior in sodium cholate/calcium chloride mixtures ......................................................... 24
- J. R. Chantres, M. A. Elorza, B. Elorza, P. Rodado: The effect of sub-solubilizing concentrations of sodium deoxycholate on the order of acyl chains in dipalmitoylphosphatidylcholine (DPPC). Study of the fluorescence anisotropy of 1,6-diphenyl-1,3,5-hexatriene (DPH) ......................................................... 29
- D. Težak, M. Martinis, S. Punčec, I. Fischer-Paković, S. Popović: Multifractality of lyotropic liquid crystal formation ......................................................... 36
- V. Babic-Ivanovic, D. Skrtic, N. Filipovic-Vincekovic: Surfactant aggregation and response of ion-selective electrode ......................................................... 39
- Y. A. Shchipunov, E. V. Shumilina: 3-deoxy-s-alkyl-d-glucose derivative micelle formation, CMC and thermodynamics ......................................................... 43
- R. Bikanga, P. Bault, P. Godé, G. Ronco, P. Villa: Computer simulation studies of surfactant systems ......................................................... 48

Colloidal particles: Interaction, structure and aggregation

- V. Reus, L. Belloni, T. Zemb, N. Lutterbach, H. Versmold: Equation of state of a colloidal crystal: An USAXS and osmotic pressure study ......................................................... 54
- R. H. Ottewill, A. R. Rennie: Interaction behaviour in a binary mixture of polymer particles ......................................................... 60
- V. Peikov, Ts. Radeva, S. P. Stoylov, H. Hoffmann: Electric light scattering from polytetrafluorethylene suspensions. II. Influence of dialysis ......................................................... 64
- M. Pailette, S. Brassete, I. Ledoux, J. Zyss: Two photon Rayleigh scattering in micellar and microemulsion systems ......................................................... 68
- H. Verduin, J. K. G. Dhont: Effects of shear flow on a critical colloidal dispersion: a light scattering study ......................................................... 81
- R. M. Santos, J. Forcada: Synthesis and characterization of latex particles with acetal functionality ......................................................... 87
- B. Gerharz, H. J. Butt, B. Momper: Morphology of heterogenous latex particles investigated by atomic force microscopy ......................................................... 91
- M. C. Miguel, J. M. Rubi: Dynamic properties of magnetic colloidal particles: Theory and experiments ......................................................... 96
VIII Contents

A. Cebers: Two-dimensional concentration domain patterns in magnetic suspensions: Energetical and kinetic approach ........................................... 101


P. Verbeiren, F. Dumont, C. Buess-Herman: Determination of the complex refractive index of bulk tellurium and its use in particle size determination ........................................... 112


J. Müller, T. Palberg: Emulsions and concentrated systems Probing slow fluctuations in nonergodic systems: Interleaved sampling technique ........................................... 121


G. Marion, K. Benabdelljalil, J. Lachaise: Quantifying the concept of physico-chemical formulation in surfactant-oil-water systems – State of the art ........................................... 137

Yu. V. Shulepov, S. Yu. Shulepov: Interbubble gas transfer in persistent foams resulting from surfactant mixtures ........................................... 143

A. Kasper, S. Kirsch, F. Renth, E. Bartsch, H. Sîllescu: Equilibrium states and structure factor of concentrated colloidal dispersions in optimized random phase approximation ........................................... 148

M. Olteanu, S. Pertz, V. Raicu, O. Cinteza, V. D. Branda: Development of core-shell colloids to study self-diffusion in highly concentrated dispersions ........................................... 151

M. Gradzielski, D. Langevin, B. Farago: Concentrated graphite suspensions in aqueous polymer solutions ........................................... 156

M. Gradzielski, D. Langevin, B. Farago: Microemulsions Experimental investigation of the structure of nonionic microemulsions and their relation to the bending elasticity of the amphiphilic film ........................................... 162

F. Bordi, C. Cametti, P. Codastefano, F. Sciortino, P. Tartaglia, J. Rouch: Effect of salinity on the electrical conductivity of a water-in-oil microemulsion ........................................... 170

M. Camardo, M. D'Angelo, D. Fioretto, G. Onori, L. Palmieri, A. Santucci: Dielectric relaxation of microemulsions ........................................... 177

M. G. Giri, M. Carlà, C. M. C. Gambi, D. Senatra, A. Chittofrati, A. Sanguineti: Percolation in fluorinated microemulsions: A dielectric study ........................................... 182

S. Amokrane, P. Bobola, C. Regnaut: Adhesive spheres mixture model of water-in-oil microemulsions ........................................... 186

C. Vázquez-Vázquez, J. Mahía, M. A. López-Quintela, J. Mira, J. Rivas: Preparation of Gd₂CuO₄ via sol-gel in microemulsions ........................................... 191

S. M. Andrade, S. M. B. Costa: Fluorescence studies of the drug Piroxicam in reverse micelles of AOT and microemulsions of Triton X-100 ........................................... 195
Mixed colloidal systems

Depletion interaction and phase separation in mixtures of colloidal particles and nonionic micelles ........................................ 201

The effect of monovalent and divalent cations on sterically stabilized phospholipid vesicles (liposomes) ........................................ 206

Adsorption of gluconic and citric acids on maghemite particles in aqueous medium ......................................................... 212

Influence of heat treatment on the surface properties of functionalized polymer colloids ......................................................... 217

Kinetics of crystal growth of α-PbF₂ and micellization of non-ionic surfactant Triton X-100 at steady-state condition .................... 221

Selective solubilization of the stratum corneum components using surfactants ................................................................. 230

Influence of surfactant-gelatin interaction on microcapsule characteristics ................................................................. 235

Rheology

Microscopic mechanisms of non-linear rheology of crystalline colloidal dispersions ......................................................... 241

Linear viscoelasticity of O/W sucrose-palmitate emulsions ................................................................. 246

Structural models to describe thixotropic behavior ........................................................................................................ 252

The effect of surface friction on the rheology of hard-sphere colloids ........................................................................ 259

Rheological properties of concentrated lateritic suspensions ......................................................................................... 266

Biocolloids

Surface charge characterization and protein adsorption at biomaterials surfaces ............................................................. 271

Cyclodextrins as molecular tools to investigate the surface properties of potato 5-lipoxygenase ........................................ 276

Microemulsions as reaction medium for a substitution reaction ..................................................................................... 281

Lecithin W/O microemulsions as a host for trypsin. Enzyme activity and luminescence decay studies .............................. 286

Synthesis and properties of bioactive surfactants containing β-lactam ring ................................................................. 290

Two alternatives: Lipase and/or microcapsule engineering to improve the activity and stability of Pseudomonas sp. and Candida rugosa lipases in anionic micelles ......................................................... 296

A study of the interaction of adrenocorticotropic-(1-24)-tetracosapeptide with BLM and liposomes .............................. 301

Impact of the surface charge of magnetoproteoliposomes on the enzymatic oxidation of cytochrome c .............................. 306
Interfaces, films and membranes

The direct measurement of the interfacial composition of surfactant/polymer mixed layers at the air-water interface using neutron reflection .......................... 311

Dynamics of soluble adsorption layer studied by a maximum bubble pressure method in the μs and ms range of time .................................................. 316

Skin formation on liquid surfaces under non-equilibrium conditions ........................................ 321

Dynamic surface properties of aqueous solutions ................................................................. 328

Electric potential differences across lipid mono- and bilayers ........................................ 330

Evidence of entropic contribution to “hydration” forces between membranes ...................... 338

Pore kinetics of mastoparan peptides in large unilamellar liquid vesicles ............................. 345

Head-group variations and monolayer structures of diol derivatives ................................ 351

Macromolecules in ordered media III. A fluorescence study on the association of poly-2-vinylpyridine with a phospholipid bilayer ........................................ 356

Lysozyme separation by colloidal gas apheres ................................................................. 362

Author Index .................................................................................................................. 368

Subject Index .................................................................................................................. 370