

Macromolecular Symposia: NMR Studies of Polymeric Materials

Hüthig & Wepf-Verlag, Zug-Heidelberg-Oxford, CT 309 pp. softcover. DM 127.-, US\$ 89.-

Macromolecular Symposia Vol. 86 contains 20 of 25 lectures held at the NMR Symposia of the Federation of Analytical Chemistry and Spectroscopy Societies in Detroit, MI, October 18–19, 1993. Today, NMR spectroscopy is a powerful tool of polymer research. The lectures of these symposia deal with liquid and solid state NMR as well as NMR imaging for polymer analysis. One purpose of the NMR symposia was to bring together scientists from universities, government laboratories and industry. Therefore the lectures are mainly devoted to the application of these NMR methods. In the first lectures, liquid state NMR studies on polymerization, chemical structure, polymer interactions and reactions are reported. The solid state NMR part also deals with chemical microstructure, with polymer morphology, interaction and dynamics. In the last part, in four lectures about NMR imaging the curing of elastomers, the improvements in the information available by line narrowing and chemical shift resolving and the detection of flow in suspensions is reported. The lectures in this book represent the state of the art in these rapidly developing fields of NMR. This book gives a good overview of the current trends for all polymer scientists who are interested in the application of NMR for polymer research.

G. Fleischer (Leipzig)

Macromolecular Symposia–Vol. 87/Polymers–Progress in Chemistry and Physics
193 Seiten. Hüthig & Wepf Verlag Zug, Heidelberg, Oxford, CT/USA.
Preis: DM 84.--, SFr. 76.--, öS 660.--, US\$ 59.--

The Macromolecular Symposia reflects the results which were shown at the international symposia on polymer science, held in Mainz, Germany on May 1994.

M. Leclerc investigates the relations between structure and property of two categories of polythiophene derivatives, which are classified by the nature and the position of the substituents. A.D. Schlüter describes the synthesis of fully unsaturated double-stranded polymers by processes of dehydration and dehydrogenation. The article of G. Wenz deals with the inclusion

process of monomeric α , ω -diamines and related polymers by cyclodextrin rings which are influenced by the degree of protonation of the amino group. X. Coqueret scrutinises the polymerization rate which is influenced by different modifications of polysiloxane. In doing so the polymeric chromophores induce an increase of the polymerisation rate. A.M. Ritcey reports on transferred monolayers of a new cellulose derivate, which possess a molecular orientation in which the polymer backbone is lying flat on the substrate with the side chains extending perpendicular to the surface. M.D. Foster studies the microstructure and thermal stability of Langmuir–Blodgett–Kuhn multilayers containing rod-like polyglutamate copolymers having flexible aliphatic side chains. S. Isoda gives a review of structure formation of organic multilayers, analyzed by high resolution electron microscopy. B. Chu reports on supramolecular structures which can be formed by triblock copolymers in either polar or nonpolar solvents at appropriate concentration and temperature or in the presence of additives. The article of A.R. Khokhlov deals with supramolecular structures and conformational transitions in polyelectrolyte gels. Three reasons for microsegregation are discussed. An overview is given by M. Ballauff on recent studies of lattices by small-angle x-ray scattering. J. Blackwell compares supramolecular structures formed by a polymethacrylate with highly tapered side chains with its monomeric precursor. The transient rheological behaviour of textured and untextured rod-like polymers under shear flow are investigated by a new Brownian dynamics simulation algorithm, which is developed in the paper of Y. Yang. R. Borsali discusses in his article the dynamic scattering properties of ternary polymer mixtures in solution and determines the value of the single chain diffusion coefficient D_s and the interaction parameter χ_F as a function of the total polymer concentration. G. Fytas presents different mechanisms of composition and orientation relaxations near order-disorder transitions, using dynamic light scattering from diblock copolymers in melt and solution in a non-selective solvent. C.H. Wang reports on quasielastic light scattering to study semidilute solutions of polystyrene in benzene and benzene/diethyl phthalate mixtures. The paper of M. Brereton deals with the diversity of structural properties which can be imposed on a melt of polymer loops by controlling the linking number between each pair of loops. D.N. Batchelder analyzes in his work the resonance raman

spectrum of crystalline poly[bis(p-toluene sulfonate) of 2,4-hexadiene-1,6-diol] as a function of applied high pressure.

B. Blümich and P. Blümer give a review on the rise of nuclear magnetic resonance in material research.

The Macromolecular Symposia Vol. 87 thus gives a broad overview on the chemistry and physics of polymers.

A. Fahrwald (Leipzig)

Macromolecular Symposia: Frontiers in Polymerization

244 Seiten. Hüthig & Wepf Verlag Zur, Heidelberg, Oxford, CT/USA. Preis: DM 102.--, SFr. 92.--, öS 800.--, US \$ 71.--

Macromolecular Symposia Vol. 88 reports on the invited lectures at the international conference “Frontiers in polymerization” held in Liège, Belgium at October 1993. The conference was organized in honour of Prof. Ph. Theyssié on his formal retirement from his chair at Liège University. This issue summarizes 16 invited lectures. The article of Ph. Teyssié reviews the application of coordination chemistry in polymerisation processes, which is not already depleted by the Ziegler–Natta mechanism. Two contributions deal with GTP (group transfer polymerization), R.P. Quirk reports on chain transfer and living functionalization of polymethacrylates and W.R. Hertler deals with the catalysis of GTP of MMA with nucleophilic anions on crosslinked polystyrene supports. The influence of cation size on the meso-selectivity of anionic vinyl polymerization is discussed in an article of T.E. Hogen-Esch. The paper of C. Pichot is a brief survey on the preparation of latexes bearing covalently bounded functional groups using various routes. M.K. Georges gives a review of free radical propagating in which the radical propagating chain is reversibly terminated, permitting controlled molecular weights and resins of complex architecture. M. Sawamoto analysed the growing species in living cationic polymerization of vinyl ethers by in-situ “multinuclear” NMR spectroscopy. S. Inoue reports on the acceleration of alkylene oxide living polymerization by combination of aluminium Schiff base and tetraazaanulene complexes. A conceptual approach to nanoscopic chemistry and architecture is given by D.A. Tomalia. D.Y. Sogah reports on the design and synthesis of polytripeptide (LeuGlnPro)_n based upon the matrix protein amelogenin. In the paper of A. Laschewsky

the preparation of amorphous homogeneous blends of zwitterionic polymers and transition metal salts is discussed. The advantages of Trimethylsilylmethylolithium as an initiator not only for the ring opening polymerisation of cyclosiloxanes but also for the anionic polymerization of vinyl monomers is discussed by S. Boileau. The article of T. Hamaide deals with new heterogeneous catalysts for ring opening oligomerization obtained by grafting alkyl aluminium moieties on silica. Mechanisms and kinetics in different living polymerization systems are compared in an article of B. Iván. J. Jedlinski presents new results concerning the mechanistic aspects of β -lactones anionic polymerization with different initiators.

H. Groothues (Leipzig)

Polyelectrolytes: Formation, Characterization and Application

H. Dautzenberg, W. Jaeger, J. Kötze, B. Philipp, Ch. Seidel and D. Stscherbina, XIV, 343 pages, 116 figures, 36 tables, 947 references. Hanser Publishers, Munich, Vienna, New York, 1994. Hardcover DM 168,-ISBN 3-446-17127-3

The present book has been written by a team of six German authors working in Teltow and Potsdam, mainly in the Max Planck Institute for Colloid and Interphase Research. Teltow and surroundings are renowned by high quality research in the field of polyelectrolytes. For some time, there has been a need to cover this important area of polymer science by a modern monograph and Dautzenberg et al. have undertaken this commendable task.

The book treats the subject in its entire width, from chemistry of polyelectrolytes, over physical chemistry and physics to their application. After a general introduction, the individual chapters deal with the synthesis of polyelectrolytes, polyelectrolyte models and theoretical predictions, electrochemical and spectroscopic characterization of polyelectrolytes, characterization of macromolecular parameters in polyelectrolyte solutions, structure formation in polyelectrolyte systems, and application of polyelectrolytes. All chapters have rich lists of up-to-date references.

The book is intended as a textbook. Thus, the reasoning always starts from the basic principles and tries to avoid large mental leaps. In this connection, it should be observed that some chemists may find it difficult to read the chapter on models and theoretical predictions. The chapter on structure formation in polyelectrolyte systems reviews among others the important

contribution of the authors to this topical problem.

In conclusion it is to be said that Polyelectrolytes is a successful work and can be recommended to all those whose professional activities include polyelectrolytes.

P. Kratochvíl (Praha)

Detergents and Cleaners, a Handbook for Formulators

K. Robert Lange (ed.), XVIII, 276 pages, 91 figures, 50 tables, 261 references. Hanser Publishers, Munich, Vienna, New York (1994) Hardcover DM 118,-ISBN 3-446-17307-2

The present volume has been intended as a concise guide for formulators of detergents and cleaners, including everything from the elements of surface science to applications, regulatory matters and practical suggestions for everyday formulating problems. The book has been written by eleven authors, including the editor. The practical sections of the book are oriented on American readers.

The chapters of the book deal with the following subjects: Basic surfactant concepts, mechanisms of soil removal, individual types of surfactants, bleaches and optical brighteners, polymers in cleaners, laundry products, hard-surface cleaners, the detergent regulatory and environmental situation, and hints for the formulator. The appendix lists the suppliers of raw materials, and the glossary defines the basic terms.

The book is very well written and reads smoothly. The chapters on chemistry and physical chemistry of detergents could serve as an introductory textbook on the subject. It is to be appreciated that the editor managed to maintain a uniform style of presentation throughout the volume in spite of the large number of contributing authors. The intended audience for this book, i.e., bench chemists and senior technicians working in laboratories of detergent and cleaner manufacturing companies will find it most helpful for daily reference.

P. Kratochvíl (Praha)

The Science of Heterogeneous Polymers

(Structure and Thermophysical Properties) V.P. Privalko, V.V. Novikov. 235 pages, 71 figures, 18 tables, 673 references. John Wiley & Sons, Chichester, New York, Brisbane, Toronto, Singapore, 1995. Hardcover 49, 95£. ISBN 0471 94167 0.

While the problem of structure-property relationship has already been treated in

several comprehensive books the presented publication deals with the effect of heterogeneity in a systematic manner. The criterion of heterogeneity discussed here is the incompatibility of the components as the basis for the identification of the phase state of polymers. In this context filled polymers, blends of incompatible polymers and phase-separated block copolymers are regarded as structural similar systems. The two phases may be separated by an interphase, one phase being continuous (matrix phase) and the other existing as discrete inclusions within the former.

Part I is a review of the most important aspects of formation and characterisation of a boundary interface in different "micro-heterogeneous materials" (MHM) whilst Part II is devoted to an analysis of the applicability of current pragmatic and physical approaches and to a theoretical description of the composition-dependant properties of MHM. The reader will be provided with an adequate presentation of the experimental evidence for the existence of a boundary interface in polymer MHM of whatever composition and the theoretical tool to account for its contribution to the thermal conductivity and the thermoelastic properties of such materials.

The appendix contains chapters on partition function and the probability theory as well as modelling of the effective properties of a MHM with anisotropic inclusions.

The book will be an appreciated source for chemists, physicists, chemical physicists and graduate students in research and development of polymers.

H. Domininghaus (Dreieich)

Surface and Interface Analysis ECASIA'93

(Proceedings of the European Conference on Applications of Surface and Interface Analysis) D. Briggs, J.T. Grant, S. Pignataro (eds.) 4-8 October 1993, Catania/Sicily, Vol. 22, John Wiley & Sons, Chichester, 1994. Hardcover: 145, -£ SIANDO 22 (1-12) 1-632, ISSN 0142-2421.

Almost 450 delegates representing 29 countries from five continents attended this conference. Altogether 455 papers were presented 128 of which are published in this Vol. 22 whilst 28 preceded already in Vol. 21. The lectures under consideration here are subdivided in totally 19 sections such as: Depth profiling, Data interpretation and quantification. Thin films and coatings, Adhesion, Ceramics and glasses, Imaging, Metallurgy, Microelectronics, Optoelectronics, Sensors, Superconductors, Tribology and wear, Catalysis, Corrosion, Environmental studies, Polymers, Radiation effect,

Technique developments, Work of art. 420 well-known authors from universities, research centers and companies contributed to this comprehensive and very recent survey of the state-of-the-art.

Here some topics dealt with-in the sequence of the sections stated above: Laser etching of silicon: Dopant desorption, diffusion and segregation during laser induced melting, Computer programs for surface analysis by SIMS and SNMS, An XPS study of diamond films grown on differently pretreated silicon substrates. The chemical environment of nitrogen in the surface of carbon fibers, Interface analysis of ceramic matrix composites by XPS, AES, SEM and XRD, STM characterization of InP gratings for DFB laser fabrication. An

interfacial study of sigma fiber/Ti-6Al-4V composite using scanner Auger/EDX microscopy, Low energy field emission Auger electron spectroscopy, XPS investigations of electrochemically modified porous silicon layers, ESCA investigation of SnOx films used as gas sensors. Interfacial depth profiling of superconducting High-Tc mono-and multilayer structures by Auger electron spectroscopy, Tribological behaviour of heat treated thin films of electro polymerized polyacrylonitrile, XPS investigation of titanium modified MFI-type zeolites, Surface analytical investigations of Al and (Ti, Al) nitrides formed by ion implantation and their corrosion properties, Ion beam analysis of ceramics and glasses in nuclear energy, XPS analysis of poly-

propylene grafted with acrylic monomers, Comparison between pulsed laser and ion irradiation of hydrogenated amorphous carbon films, Surface acoustic wave resonance spectroscopy (SAWRS) as a novel technique to study surface phenomena, Small area XPS and XAES study of iron ore smelting process.

The proceedings are a basic help to analysts from both industries and universities, theoreticians needed for making a meaningful analysis, inventors and vendors of analytical equipment and technological engineers from industry.

H. Domininghaus (Dreieich)