

**Macromolecular Symposia, Volume 94, Polymer Spectroscopy**

11th European Symposium on Polymer Spectroscopy (ESOPS-11) in Valladolid, Spain, July 20–22, 1994. Symposium Editor: Jose M. Pastor. 1995. IX, 282 pages, Soft cover DM 120,- sFr 108,- ÖS 948,- US\$ 90,- Hüthig & Wepf Verlag, Zug, Heidelberg, Oxford, CT/USA; ISBN 3-85739-291-6

The understanding of special polymer properties often is based on spectroscopical work. The possibilities of investigating polymers with spectroscopical methods as well as the increased availability of commercial high quality equipment has lead to a great importance of spectroscopy in polymer science.

The book is divided in 23 contributions. They describe the use of different spectroscopical methods as vibrational spectroscopy, NMR, atomic force microscopy, neutron scattering, fluorescence spectroscopy, Raman and infrared spectroscopy, which is the main part of the book. The reader should be familiar with the fundamental principles of the different spectroscopical methods, because the main focus of the articles is the presentation of new scientific results, but not to describe the basics of the used methods. The contributions cover more fundamental applications like the role of vibrational spectroscopy-microscopy techniques in polymer characterization, but it is also figured out how spectroscopy can help to solve very specific problems like the influence of substituents on the orientational behaviour of novel azobenzene side-chain polyesters.

The book gives an interesting insight into special areas of spectroscopical work, but it is too special for scientists who want to get an overview of polymer spectroscopy.

A. Schönfeld, Hoechst AG

**Polymers from Agricultural Coproducts**

(ACS Symposium Series 575) M.L. Fishman, R.B. Friedman, S.J. Huang (eds), VIII, 247 pages. American Chemical Society, Washington, DC, 1994. Hardcover \$ 69.95. ISBN 0-8412-3041-2

The present volume has been developed from a symposium sponsored by the Division of Agricultural and Food Chemistry at the 206th National Meeting of the American Chemical Society, Chicago, Illinois, August 22–27, 1993. For the last several years, much attention has been paid to the possibility of producing raw materials,

including polymers, from sustainable and renewable resources, thus reducing the depletion of finite petroleum resources. The revival of interest in polymers from agriculture is also due to the desire to produce more environmentally friendly plastics. The above symposium gathered together leading scientists and technologists, mostly but not only from the USA, working in the field of polymers derived from agricultural materials.

The diversity of polymers based on agricultural products is large and is reflected in the diversity of the contents of the book. The first section contains two overview chapters, which deal with rationales and economic prospects for producing various polymers from agricultural materials, as well as the status of the technology to produce degradable polymers. The following sections of the book detail in original communications the characterization, synthesis, modification, and isolation of specific groups of polymers and polymeric materials, including starches, starch blends and composites, other polysaccharides, oligosaccharides, monosaccharides, polyamides, proteins, polyesters, and rubbers.

The volume is an up-to-date review of a topical field of polymer science. It is an extremely useful source of information for specialists working in this area, but also a generally interested reader will enjoy skimming through it.

P. Kratochvil (Praha)

**Polymer Powder Technology**

M. Narkis, N. Rosenzweig (ed) 633 pages, 249 figures, 58 tables, 1068 references. John Wiley & Sons, Chichester, New York, Brisbane, Toronto, Singapore (1995) Hardcover 95,- ISBN 0-471-93872-6

Components based on polymer powder technology, albeit not always identifiable as such, play an important role in many industrial and consumer applications. Twenty-seven authors have contributed to the book from their extensive experience in their respective fields of experience.

Polymer powder processing techniques, i.e., powder sintering, rotational molding, powder coating, ram extrusion and compression molding, different as they may appear at first glance, are all diverse implementations of the polymer powder technology field. These powder processing methods share scientific and engineering fundamentals that relate to powder mechanics, mixing and structuring, heat transfer

and a particle coalescence process undisturbed by external shear.

This book treats first the fundamental scientific and engineering aspects of polymer powder technology, which are shared by its processing techniques, and later by an extensive review of those processing techniques. This technology holds the potential for new and interesting applications, especially in multicomponent powder mixing, structuring, alloying, three dimensional network formation, and controlled release, which would function in the fields of agriculture and medicine.

The book is intended for materials science and plastic scientists, engineers, technologists and students who wish to initiate an R&D program in this field, or who are already active in powder technology and wish to widen their knowledge and in-depth understanding.

H. Domininghaus (Dreieich)

**Modern Infrared Spectroscopy**

Barbara Stuart, 180 pages, 100 figures, 22 tables, 12 references. John Wiley & Sons Inc. (1996), Chichester, New York, Brisbane, Toronto, Singapore. Paperback £1795 ISBN 0-471-95916-2 (cloth); ISBN 0-471-95917-0 (paper)

Infrared spectroscopy is one of the most important analytical techniques available to today's chemists. One of the great advantages of infrared spectroscopy is, that virtually any sample in virtually any state can be studied. Liquids, solutions, pastes, powders, films, fibres, gases and surfaces can all be examined by a judicious choice of sampling techniques.

The first chapter gives a general introduction, the fundamentals of electromagnetic radiation and the vibrations of molecules, followed by the chapter on instrumentation such as dispersion and Fourier-transform infrared spectrometers. The third chapter deals with sampling according transmission reflectance and photoacoustic spectroscopy, the use of temperature cells and micro-sampling. The following two chapters cover spectrum interpretation and quantitative analysis. Chapter six gives practical samples of organic and inorganic compounds, polymers, biological systems, drug analysis, pollution monitoring, coal, minerals and catalysts, not to forget the identification of unknown samples.

The author introduced self-assessment questions (SAQs) at appropriate places of the text. The responses are given at the end

of the book. At intervals a summary and list of objections are given. This Open Learning book is a convenient and flexible way of studying for people who for a variety of reasons cannot use conventional educational courses. The aim of it is to give a full understanding of the analytical techniques described.

H. Dominghaus (Dreieich)

**Fundamentals of General, Organic, and Biological Chemistry, Fifth Edition**

John R. Holm, 892 pages, 210 figures, 73 tables.

John Wiley & Sons Inc. (1994), New York, Chichester, Brisbane, Toronto, Singapore, Hardcover £22,50 ISBN 0-471-57949-1

The overarching, organizing theme of this book is that life in both health and disease has a molecular basis. No other text remains so consciously faithful to a consistent theme. The molecular basis of life cannot be studied without learning about molecules as well as the fundamental concepts concerning the structure and properties of matter in general. Chapters 1–11 deal with the traditional general chemistry topics, followed by the topics of chemistry essential to the study of biochemistry (chapters 12–18). In chapters 19–29 illustrations of the molecular basis of life are given. Carbohydrates, lipids, and proteins, followed by enzymes, hormones, neurotransmitters, and extracellular fluids of the body. A study of nucleic acids completes the survey of the chief kinds of substances in the body and their particular settings.

The citric acid cycle and the respiratory chain serve the metabolism of all types of chemicals, so the pathways are studied next, followed by treatments of metabolism of carbohydrates, lipids, and proteins. Finally after the developing a knowledge of the structures, properties and uses of substances in cells, nutrition and the sources of nutrients close this chapter.

H. Dominghaus (Dreieich)

**Mathematical Survival Guide. Tips for Science Students**

Jeffrey, R. Appling, 127 pages, 13 figures, 2 tables.

John Wiley & Sons Inc. (1994), New York, Chichester, Brisbane, Toronto, Singapore. Paperback £12,- ISBN 0-471-031038

Doing math, even simple math it seems, is like speaking a foreign language. Students sometimes need to brush up math skills in preparation for a first year science course. This book is meant as a review to help those students who need a quick reference to basic math techniques. Sometimes the discussion is brief and efficient, sometimes it has more depth in order to get across important concepts. It includes study tips and insights that could help in all science courses.

This book starts with the basic numbers and their manipulations, including ratios, powers, roots, logarithms, scientific notations and significant figures. The reader can advance into the territory of equations, units, and graphing. He is introduced to helpful methods (estimation techniques, for example) that also enhance understanding; he gets familiar with a great deal of study tips e.g. what two studying techniques have dramatically improved student grades (30 points)? Your calculator is it a friend or foe?

H. Dominghaus (Dreieich)

**Chemistry and the Living Organism, Sixth Edition**

Molly M. Bloomfield, 672 pages, 306 figures, 61 tables.

John Wiley & Sons Inc. (1996), New York, Chichester, Brisbane, Toronto, Singapore. Hardcover: £23,95. ISBN 0-471-10777-8 (cloth: alk. paper)

Chemistry affects each of our lives. Chemicals control our physical appearance; hormones help determining our height, weight, build, and sexual characteristics. Our health depends on chemicals that preserve our food, protect us from disease and chemicals supply our body with nutrients needed to function properly. Chemicals influence our behaviour and our emotions; thoughts and experience may be stored in our brain in the form of chemical compounds. That's why a basic knowledge can help to become more aware of all our total self and the way in which we interact with our environment. This textbook will help us to require the basic knowledge of principles of chemistry.

Section 1 covers in its eleven chapters the topic: the living organism – a background. In Section 2 (three chapters) are presented the elements necessary for life and in Section 3 the compounds of life (seven chapters). The

appendix covers: numbers in exponential form, the use of significant figures and selected answers to text problems.

Each chapter opens with a story vividly demonstrating the application of that chapter's concepts to issues that directly concern students. They bring further a number of perspectives emphasizing the relevance of chemical principles to the student's personal and professional lives.

H. Dominghaus (Dreieich)

**Dynamics of Adsorption at Liquid Interfaces**

Elsevier Science Inc. P.O. box 211, 1000 AE Amsterdam, The Netherlands or Elsevier Science Inc. P.O. box 945, Madison Square Station, New York, NY 10160-0757, USA

Dynamics of Adsorption at Liquid Interfaces is a textbook providing a valuable introduction for scientists and engineers interested in liquid/fluid interfaces and disperse systems to the rapidly developing area of adsorption dynamics. It is an extensive review on the subject of dynamics of adsorption and gives a general summary of the current state of adsorption kinetics theory and experiments. Recent progress in currently designed set-ups and improved and generalized known methods for studying interfacial relaxations is reviewed. In addition, the role of the electric charge of surfactants in the adsorption process is discussed in terms of a non-equilibrium distribution of adsorbing ions in the diffuse layer.

Present theories of the effect of dynamic adsorption layers on mobile surfaces, such as moving drops and bubbles, based on both diffusion and kinetic controlled adsorption models are described and efficient approximate analytical methods to solve the mathematical problem of coupling surfactant transport and hydrodynamics are introduced. The role of a dynamic adsorption layer in bubble rising, film drainage and film stabilization and in complex processes such as flotation and microflotation is discussed.

Containing more than 1100 references, the book is essential reading for industrial scientists and graduate and post-graduate students in physical, surface and colloid chemistry, physico-chemical hydrodynamics, water purification and mineral processing.

Dr. Th. Fischer (Leipzig)