

Additions and Corrections

Spontaneous Multilayering of Calix-4-resorcinarenes

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Table 1: Propane should read propanone.

JA9550384

Book Reviews

Analyses of Hazardous Substances in Biological Materials. Volume 4. Edited by J. Angerer and K. H. Schaller (Universitat Erlangen-Nurnberg). VCH: Weinheim. 1994. xxii + 267 pp. \$80.00. ISBN 3-527-27027-2.

This book is the fourth in a continuing series on methods development for contaminant analysis in human biological fluids by the German Department of Health. It covers analysis of metals, organometallics, and organics in biological fluids such as urine and serum. The assays are performed using graphite furnace atomic absorption spectrometry, voltametry, and gas chromatography. The book very carefully states that the concentration of contaminants measured by these techniques are usually found in occupationally exposed individuals rather than the general population. Most of the references in this book are dated (older than 5 years) and most of the techniques used are far from cutting edge, but the book is still relevant because many of the local health departments and contract labs that perform these analyses still use this instrumentation. Specifically two of the newer, more commonly used techniques for doing elemental analysis in biological fluids are not mentioned in this book. Microwave sample extraction/digestion and inductively coupled plasma mass spectrometry analysis for trace metals are not utilized in the methods.

There is a glossary of frequently utilized terms such as MAK, maximum concentration value at the workplace. It should be noted that most of the terms are similar to those used in the U.S. but some such as BAT (biological tolerance value for a working material) are significantly different. The book contains an excellent introduction to graphite furnace atomic absorption spectrometry at a level that is understandable to most who would have interest in this text.

The first section of the book discusses how methods are developed in this system and how they are approved and subsequently utilized by the group in the GDR. It should be noted that the proposal and certification process of the methods in this book are entirely internal within the health department in the German republic.

The subsequent chapters of this book are the sample preparation and analysis methods themselves. The methods in this book are very thoroughly written and are easy to understand. Each method has two sections. The first is background, including a through explanation of potential sources of the contaminant within an occupational setting and how exposure may occur. The authors also discuss the potential health risks associated with high exposures to the contaminant. The limits of detection and expected sensitivity and repeatability values are all reported for each method. The authors discuss appropriate blanks and potential problems or interferences with the methods as well as any corrections which may be necessary to account for deviations in the method. This section is also the cookbook portion of the method.

The metals methods include antimony, platinum, tin, and organotin compounds (except methyltin) and vanadium. Antimony and organotins are determined by electrothermal vaporization the others by voltametry.

Organic methods are for aromatic amines in urine, plasma, or erythrocytes by GC with ECD as well as benzene and alkylbenzenes in blood, butoxyacetic acid in urine, and hexane in urine by GC-FID. There is also an HPLC method for TTCA in urine. All of these methods require extensive sample preparation including derivitization of the analytes for some methods.

Most of the laboratory controls are made in house, and although general references are made to standard reference agencies, very few are employed in the methods listed here. The difficulty in the sample preparation described in this book demonstrates the need for more updated techniques. Some laboratories that carry out this type of

analysis may require this type of protocol because of the age of their equipment. This text is relevant to laboratories which still employ graphite furnaces, voltametry, and GC as their primary means for analysis of biological samples for metal and organic contaminants. This book is recommended for laboratory managers and supervisors who carry out these types of analyses on a routine basis and who would like to keep a reference text on some of these methods.

Brian T. Buckley, *Rutgers University*

JA955138+

Excited States in Photochemistry of Organic Molecules. Edited by Martin Klessinger (University of Munster) and Josef Michl (University of Colorado). VCH: New York. 1995. xxiv + 537 pp. \$89.95. ISBN 1-56081-588-4.

In my opinion, this is quite simply the best graduate textbook available for a course focusing on organic spectroscopy and excited state surfaces. It incorporates the most illustrative sections of previous texts authored or coauthored by Michl and Klessinger including *Elektronenstruktur Organischer Moleküle* by Klessinger, *Electronic Aspects of Organic Photochemistry* by Michl and Bonačić-Koutecký, and *Spectroscopy with Polarized Light* by Michl and Thulstrup. Although a purist may quibble with the claim in the preface that this book is nonmathematical, the mathematics employed is kept to an absolute minimum and that which is included is amply justified as a means by which the excited state surfaces can be more easily understood. The coverage is sufficiently detailed to justify its inclusion as the text of choice in a graduate level class on theory for organic chemists. It is an excellent introduction to the photochemistry of small molecules and will provide a good footing for students who wish to investigate in their research the more practical applications of photochemistry (polymer photochemistry, optics, electronic devices, heterogeneous photocatalysis, etc.) that are not covered in detail here.

While emphasizing qualitative aspects of photochemical theory, the book excels in presenting clear views of electronic states, particularly those that involve pericyclic interactions or those than can be understood from the classic perimeter model or through simple perturbation theory. Two of the chapters (Chapter 5, dealing with photophysical processes of radiative and radiationless deactivation, and Chapter 7, dealing with examples of phototransformations of organic molecules) are quite similar to what is available in other texts. These two chapters cover this material concisely and coherently but do not provide the breadth or structural variation that would be needed by a synthetic organic chemist or a physical organic chemist who was interested in structure-activity relationships. These chapters, however, while valuable, pale in comparison with the delightful chapters dealing with electronic spectroscopy, excited state surfaces, biradicals and biradicaloids, and surface funnels for how photochemical reactions in condensed media can be perturbed by excited state surface perturbations. Its description of magnetic circular dichroism is particularly useful and made me feel that I understood the phenomenon well for the first time. The references cited in the text provide both an historical perspective and sufficient coverage to date to have included the major areas of organic photochemistry. Each of the chapters ends with a well-chosen selection of review articles that can expose the student to more detailed discussions of the topics considered, and the book is well-indexed.

Although the presentations include details sufficiently sophisticated to bring joy to a practitioner, they are sufficiently clear and cogent to similarly inspire the beginning graduate student. The book abounds

with specifically relevant spectra that expose the reader to both the fundamentals and subtleties of organic spectroscopy. The carefully described examples guide the student through rather sophisticated spectroscopy problems in an apparently effortless way. In reading this text one experiences the joy of pedagogical discovery that many of us may have forgotten since our student days.

This is a text that should not be restricted to the graduate classroom. It should be widely read by practitioners in the field, who, I will wager, will experience the same delight that I did in working through the clearly-presented examples described in each chapter. For a practicing professional, this is a book that can be easily read on one Dallas–Washington round trip as I did, even in seasons without tornado delays in Dallas. Those who use a trip that way will be well rewarded.

Marye Anne Fox, *University of Texas, Austin*

JA955368O

Biodegradation of Nitroaromatic Compounds. Edited by Jim C. Spain (Armstrong Laboratory, Tyndall Air Force Base, FL). Plenum Press: New York. 1995. xiii + 232 pp. \$79.50. ISBN 0-306-45014-3.

This book is based on a 1994 International Symposium on the Biodegradation of Nitroaromatic Compounds held in Las Vegas, NV. The symposium brought together a group of highly regarded scientists working at the forefront of research in the area of biodegradation of nitroaromatic compounds. The invited speakers were asked to summarize their work in a comprehensive fashion to be put in the form of the book presently under review.

The book has been divided into five sections containing a total of 12 chapters. The first section consisting of only one chapter provides a comprehensive review of the field. The second and third sections each containing three chapters describe the biodegradation by aerobic and anaerobic bacteria, respectively. In section four, two chapters are devoted to the use of Fungi for the treatment of the nitroaromatic contaminants in soils and water, and the final section describes (in three chapters) the related biochemistry.

The depth of each chapter attests to the qualifications of its authors. In general, each author has done a wonderful job of presenting their work. There are plenty of references, and the presentation format is excellent. Overall, this is an excellent book for anybody interested in the subject. However, the most important feature is the timeliness of this book. The subject of remediation of nitroaromatic contaminants is very important as well as very "hot." Not only will the biodegradation of nitroaromatics continue to grow rapidly but progressively other competing methods will be investigated. The book is excellent, but it could be even better if a short discussion of other relevant methods could be included.

Alka Shukla, *Southeast College*

JA9552454

Electrochromism: Fundamentals and Applications. Edited by Paul S. Monk (Manchester Metropolitan University, U.K.), Roger J. Mortimer (Loughborough University of Technology, U.K.), and David R. Rosseinsky (University of Exeter, U.K.). VCH: New York. 1995. xxiii + 216 pp. \$98.00. ISBN 3-527-29063-X.

The volume is divided into 12 chapters, each covering various aspects of electrochromic technology. Part I (Chapters 1–3) is clearly aimed at the student reader, while the remainder of the book serves as an excellent source of detailed information for workers at all levels. The first three chapters provide a good introduction for those unfamiliar with the phenomenon; however, in several places (such as in the brief section on classification of electronic transitions), oversimplification may cause some confusion. By contrast, Chapter 2 suffers from striving for a complete treatment of electrochemistry from the Nernst equation to AC impedance techniques within the span of a few short pages. Moreover, much of the discussion here is largely irrelevant to the understanding of subsequent material.

Part II (Chapters 4–10) represents the "meat" of the book, and it is here that the most useful and complete information is provided. As with any such review, the authors draw heavily on the areas of their own research in the field; in this case, the breadth of the authors' experience allows for excellent coverage of many diverse types of chemistry. In particular, the chapters on metal oxide, Prussian Blue, and bipyridilium electrochromes are exceptionally well-written and

instructive. Chapters on phthalocyanines and conductive polymer electrochromes are perhaps less complete but still very effective.

Finally, polyelectrochromism and photoelectrochromism are briefly discussed in the last two chapters. The focus of these sections on more elaborate technologies is especially thought-provoking, and they furnish a stimulating conclusion to the volume.

Overall, this book should provide an invaluable resource to any scientist interested in the phenomenon of electrochromism. Although written for a chemistry audience, the authors do successfully build important bridges to the literature and terminology of physicists. References, though not exhaustive, are quite extensive and afford coverage through 1993, with some citations from 1994.

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JA955309A

Nuclear Magnetic Resonance Probes of Molecular Dynamics.

Edited by Robert Tycko (AT&T Bell Lab, New Jersey). Kluwer Academic: The Netherlands. 1994. xi + 550 pp. \$252.00. ISBN 0-7923-2795-0.

This book contains a fairly comprehensive selection of the various NMR methods for the study of molecular dynamics in a variety of systems of current scientific interest. The authors of the various chapters are well selected, being leading investigators in their respective fields. The topics covered are up to date as are the references. The book thus serves as a very useful source for researchers both established and in graduate studies who wish to review the current applications of NMR in this regard. There is really no other single source containing this particular emphasis and encompassing all the material covered here, making this a very useful and appropriate publication.

The specific topics covered in some detail include: (i) 1D deuterium solid state spectroscopy with all the variants; (ii) multidimensional solid state and liquid state methods for quadrupolar and spin $1/2$ nuclei, including detailed theoretical treatments; (iii) dynamic magic angle spinning spectroscopy; (iv) magnetization and coherence transfer methods; (v) high-pressure NMR studies; (vi) use of gradients to measure diffusion and flow; (vii) NMR on catalytic surfaces.

As a text the book lacks sufficient introductory material; the introductory chapter is well written but too brief and lacks a survey of the ideas behind the methodologies which are employed in the succeeding chapters. Thus the reader would require a reasonably detailed background knowledge of NMR prior to reading to get the optimum benefit. There are few omissions in the areas covered. Though the area of internal dynamics of biomolecules in solution has only two chapters devoted to its, this is an extremely large and diverse field. There is also no appreciable discussion of the use of NMR to characterize morphology based on dynamic contrast in materials.

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JA955252S

Waterborne Coatings and Additives. Edited by D. R. Karsa and W. D. Davies (Akcros Chemicals). Royal Society of Chemistry: Cambridge, U.K. 1995. viii + 259 pp. £49.50. ISBN 0-85404-740-9.

The book entitled *Waterborne Coatings and Additives* describes Applications and Performance, Crosslinkers, Coatings and Pollution Legislation, and Additives. Generally speaking this is a useful book for the people who produce and utilize the waterborne coatings and additives which are growing rapidly in the paint industry because of environmental safety. The book discusses alkyl, epoxy, and polyurethane waterborne coatings and their applications as well as some additives used in the waterborne coatings. The book does fulfill its objectives. However, there are a limited number of errors: (1) There is no chapter regarding the waterborne acrylic coatings which are the very common and extensive utilizing commercial products in the waterborne coating industry. The performance and cost effectiveness of the waterborne acrylic coatings are very attractive in today's market. (2) There are a great number of waterborne polyurethane dispersions for coating applications; anionic, cationic and nonionic types. These types should be discussed. (3) Both aziridine and carbodiimide are important cross-linking agents in waterborne coatings, and they should be discussed. (4) The literature after 1991 should be utilized.

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