

Additions and Corrections

Synthesis of the 3-Repeat Region of Human Tau-2 by the Solid Phase Assembly of Backbone Amide-Protected Segments [*J. Am. Chem. Soc.* 1995, 117, 11656–11668].

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Page 11668, (4) **Assembly of Segments.** (i). Volume units should read μL not mL. The purified segments were dissolved in DMF (500 μL) with additional DMF (1500 μL).

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Book Reviews *

Capillary Electrophoresis. By Dale R. Baker (Hewlett-Packard, Boulder, CO). Wiley: New York. 1995. xx + 244 pp. \$49.95. ISBN 0-471-11763-3.

As part of the Techniques in Analytical Chemistry Series, *Capillary Electrophoresis* is intended to address fundamental instrumental and theoretical concepts of capillary electrophoresis (CE). Titles in the series target a broad audience and thus do not assume prior knowledge of the field. This particular title is designed for those who have little or no experience with CE or other separation techniques. The author also intends for this book to serve as a reference for those familiar with CE and as a reference for a CE course.

The book can be divided into three parts: background and CE theory (Chapters 1 and 2), instrumentation (Chapters 3 and 4), and methods development and applications (Chapters 5–7). The first two chapters provide background and theory of CE. The coverage in these chapters is sufficient for the reader completely unfamiliar with CE. Chapters 1 and 2 have 16 and 18 citations, respectively, as recent as 1993. Chapters 3 and 4 give an overview of the various separation modes of CE and instrumentation. The different separation mechanisms (free-zone, MEKC, size, and isotachopheresis) are presented in Chapter 3 (57 citations as current as 1994). Chapter 4 details CE instrumentation, including injection methods and a brief summary of at least eight different detection strategies. The 97 citations, as current as 1994, more than adequately cover the instrumental state-of-the-art. Chapters 5–7 handle methods development, qualitative and quantitative analysis, and selected applications. Chapter 5, *Developing a Method*, includes tips for selection of the separation mode, capillary coating and conditioning, operating buffer, and detector. Also included in Chapter 5 is a list of journals that regularly publish CE articles. Chapter 6 is a very general discussion of qualitative and quantitative aspects of separations methods. Chapter 7, probably the most useful chapter for the beginning practitioner, is an overview of applications of CE technology. An extensive table of specific applications, with appropriate literature references, is found at the beginning of this chapter, which culminates with a list of 156 citations as recent as 1994.

Throughout the text, presentation of the capabilities of CE and its limitations are well-balanced. Practical information, including experimental details is emphasized. For example, different means for introducing a sample into the separation capillary (including stacking and ITP preconcentration) are provided. A useful table summarizing various detectors, with approximate detection limits (mass and concentration), is included. The practical information outlined in the text could be a valuable tool for those first delving into the field who want to learn the rudiments of the technique. The wide range of applications covered, from routine analyses to the less common (i.e., sampling single cells), will give the reader a good sense of the capabilities of CE. In this sense, the book will make a good starting point for a person with no separations background interested in a deeper look at CE.

Overall, however, I found the book difficult to read. The assumed level of reader knowledge is too low, even for the targeted audience. At several points throughout the text there is discussion of concepts very basic to analytical chemistry. For example, the section in Chapter 4 covering UV–vis detection includes a discussion of the fundamentals

of Beer's Law. There are also schematic representations and discussions of the operating principles of a variable wavelength UV–vis detector, a photodiode array UV–vis detector, and a fluorescence detector. Definitions of precision and accuracy appear in Chapter 5, while the reader will find a discussion on the selection of an internal standard and a procedure to prepare and use an external standard calibration curve in Chapter 6. Even for those not familiar with CE, this tends to make the book tedious reading.

The most distracting feature of this book is the repetition of many details and basic concepts throughout. At points the book reads very much as a compendium of papers solicited from several authors. For example, "typical capillary dimensions" are given throughout the text. Various modes of capillary electrophoresis (separation mechanisms) are presented multiple times throughout the book. A procedure and examples of "spiking" to identify compounds is illustrated, with a figure, in Chapter 5 and then again in Chapter 6 (with another figure).

In summary, this book could see some use as a text for an introductory short course in which selected portions are utilized. The coverage on the variety of applications to which CE has been applied should be highlighted, along with the basic capabilities and limitations of CE. Also, the book is a good starting point to get a feeling for CE and compile an initial reference list to learn more about the technique.

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Insights into Specialty Inorganic Chemicals. Edited by David Thompson. The Royal Society of Chemistry: Cambridge. 1995. xxiii + 505 pp. £39.50. ISBN 0-85404-504-X.

Although this volume appears initially to be a selection of papers from a symposium, an in-depth review reveals it to be far different. A comprehensive survey of the industrial use of inorganic as well as some organometallic chemicals is presented. Most of the chapters provide insight into how scientific understanding of the reactivity of these chemicals can be transferred to their commercial development. It is exciting to find a reverse orientation in such a book wherein just enough background chemistry is provided before the "use-oriented scientific advances" are described.

The broad scope of this volume is revealed by its Table of Contents: Chapter 2—Refining Processes Relevant to the Production of Specialty Inorganic Chemicals, John Hill; Chapter 3—Medical Applications of Inorganic Chemicals, C. F. S. Barnard, S. P. Fricker, and O. J. Vaughan (an instructive overview of this diverse and often-neglected topic); Chapter 4—Inorganic Materials as Catalysts for Chemical Processing, G. C. Bond (an excellent selection of many of the extant processes in heterogeneous catalysis); Chapter 5—The Use of Inorganics in Large Scale Homogeneous Catalytic Processes, A. W. Parkins (a relatively brief overview of this topic); Chapter 7—Automobile Catalysts, M. Bewker and R. W. Joyner; Chapter 8—Fast Ion Conductors, R. C. T. Slade; Chapter 9—Inorganic Chemicals and Metals in The Electronics Industry, P. D. Gurney and R. J. Seymour; Chapter 10—Magnetic Materials, A. Harrison; Chapter 11—Superconducting

*Unsigned book reviews are by the Book Review Editor.

Materials, J. T. S. Irvine; Chapter 12—Inorganic Colours and Decoration, C. R. S. Dean (an informative chapter with many good examples to illustrate various “types” of pigments); Chapter 13—Glasses, Ceramics and Hard Metals, P. G. Harrison and C. C. Harrison; Chapter 14—Advanced Cementitious Materials, F. P. Glasser; Chapter 15—Inorganic Chemicals as Metallic Corrosion Inhibitors (a good introduction to the electrochemical nature of corrosion which includes some highly relevant Pourbaix diagrams); Chapter 16—Inorganic Chemicals for Water Purification, E. W. Hopper; Chapter 17—Inorganic Chemistry in the Nuclear Industry, A. Harper (the true complexity of irradiated fuels is well illustrated); Chapter 18—Catalysts and Photocatalysts for Solar Energy Conversion, A. Mills.

Both industrial and academic experts have been invited to contribute to this volume. Little overlap in subject matter is evident, indicating a tight editorial rein. An 18-page subject index is provided.

The subject index contains no listing of a number of topics that should have been included: the Tennessee Eastman acetic anhydride process, inorganic membranes, lithium batteries, etc., but the overall coverage of applied inorganic chemistry is excellent.

For the most part a background in structural and mechanistic inorganic (and organometallic) chemistry is assumed, although in a few chapters a brief relevant review of principles is provided. If this were to be used as a text for a senior level or first-year graduate level course in inorganic/organometallic chemistry, much more classical inorganic chemistry would have to be provided by the lecturer. This caveat aside, the book can be highly recommended for what it accomplishes, the collection of a broad scope of inorganic/organometallic chemistry application and knowledge under one cover. At the price (~\$61) the soft cover volume is a relative bargain.

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Advances in Chemistry Series 242. Foams: Fundamentals and Applications in the Petroleum Industry. Edited by Laurier L. Schramm (Petroleum Recovery Institute). ACS: Washington, DC. 1994. xii + 555 pp. \$129.95. ISBN 0-8412-2719-5.

When reading this well-developed collection of works on the challenges related to the prediction and utilization of the foaming process in the oil drilling industry, one sometimes can relate to Alice's plight regarding the “Looking Glass”. We poor mortals must develop data and theoretical understanding in our pristine laboratory environment. Then, we must step through the great temperature—pressure abyss and use our knowledge to address the riddles of “down hole” problems.

The first chapter deals with the fundamentals of surface physics, capillary suction, and rheology on formation of foams and on their bulk properties. The concepts of stability with regard to antifoaming agents and solids are also introduced. In the second chapter, the issue of foam stability is addressed in a rather complete manner. The concepts of drainage, capillary pumping, and other physics of solid inclusions are related to the drainage and stability of the foam structure. In the next chapter, the transport of foam structures through porous media is addressed from both an experimental and theoretical viewpoint. Chapter 4 deals with the effect of crude oil on the stability and transport of foams in porous media. The chapter presents a physical description of the potential interaction of the foam and oil. Two theories are presented concerning the physics, the pseudoemulsion film model and the emulsification and imbibition model. Then data are presented to compare with the model.

In Chapters 5–7 we are suspended in the looking glass and are introduced to more “real world” interactions of the foam system with media which will be encountered by the foam in the down hole reservoir and in refinery applications. Many laboratory experiments which describe the interaction of the foam at high temperatures and pressures are described in this section of the book. Hot steam foam stability, CO₂ and foams, high-pressure and -temperature surfactant dynamics are described with emphasis on laboratory experiments which can be utilized to check theoretical models. The models are in general mathematical representations of limiting case engineering approximations. This is of course due to the very complex nature of transport in porous media, a field not well understood for simple highly viscous liquids, and thus in this system, the analysis is even more complex due to the complications of a multiphase foamed fluid.

For the remainder of the book, we finish our journey through the abyss and are introduced to many accounts of the use of this foam technology in enhancing oil recovery and in oil refining. The topics covered with respect to production well applications in this third of the book include an extensive analysis of gas-blocking foams, the chemistry, composition, and rheology of foams for well stimulation, and the composition and properties of nonaqueous foam regarding their use in influencing the flow of oil—gas mixtures in deep-well applications. The final two chapters are related to the use of foam technology in froth application in refining and defoaming concepts for control of unwanted foam in the refining processes.

I found this book to be very well written, and it should provide an excellent source of information for those who work in the field of oil recovery. There are a large number of literature citations which will facilitate the readers' efforts to develop a more in-depth understanding. The whole book reads quite easily, and it has a wealth of information regarding the theory and practice for using these high-temperature foams in the petrochemical industry.

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Introduction to Biocatalysis: Using Enzymes and Microorganisms. By Stanley M. Roberts, Nicholas J. Turner, Andrew J. Willets (University of Exeter), and Michael K. Turner (University College, London). Cambridge University Press: New York. 1995. xii + 195 pp. \$19.95. ISBN 0-521-43685-0.

The goal of this book is to provide the basic groundwork for the understanding and appreciation of biotransformations in organic synthesis. The book is divided into six chapters. The first chapter is a historical introduction on the subject. The second deals with the practical aspects of biocatalysis. Chapters 3–5 describe examples of the use of microbes and enzymes to carry out different classes of organic reactions. Chapter 6 is an overview of applications of biocatalysis in the manufacture of chemicals. The coverage of materials from chapter to chapter is a bit unbalanced in its level of detail. Chapter 1 is fascinating reading, and correctly emphasizes the importance of the older biocatalysis literature, but focuses almost entirely on the transformations of carbohydrates. The chapter contains literature citations and an extensive reference list. Unfortunately, this is not the case for the remaining chapters, especially Chapters 3–6, where primary references are not cited in the text and are often not given at all. Chapter 2 goes into more detail than is needed to give a general understanding of biotransformations but is not detailed enough to be used as a lab manual. As such, it serves a useful purpose as an introduction to the methods in manuals and research papers. The chapter focuses almost entirely on microbes rather than enzymes. While the use of microbes is more complicated than enzymes, some helpful hints on the use of enzymes would also be beneficial. Chapter 2 gives a number of distracting warnings about the difficulty of some techniques and procedures and on the necessity of getting help from experts. Chapter 3 covers hydrolysis and esterification reactions. Chapter 4 covers oxidation and reduction reactions, and Chapter 5 covers various C–X bond forming reactions. These chapters are short but clearly written, with many examples. Chapter 6 describes the major industrial biotransformations, with good descriptions of processes for steroids, amino acids, and antibiotics. It also describes some current trends, such as the importance of chiral molecules and the application of metabolic engineering. This chapter is an excellent summary; however, it could be improved by the use of citations in the text, the correction of several minor errors (for example, L- not D-glycerol 3-phosphate is used in phospholipid manufacture), and the mention of several additional topics, such as catalytic antibodies, extremozymes, and catalytic RNAs.

This book is clearly written and can be read from cover to cover in less than a day. It is suitable as supplementary reading for an upper-level undergraduate or beginning graduate class in methods of organic

synthesis. It would also be useful as background reading for students pursuing independent study projects involving biocatalysis.

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Progress in Heterocyclic Chemistry, Volume 7. Edited by H. Suschitzky (University of Salford, U.K.) and E. F. V. Scriven (Reilly Industries, Indiana). Pergamon: The Netherlands. 1995. viii + 334 pp. \$150.00. ISBN 0-08-0420907.

This is an annual review series commissioned by the International Society of Heterocyclic Chemistry (ISHC). The volumes in the series contain both highlights of the previous year's literature on heterocyclic chemistry and articles on new developing topics of interest to heterocyclic chemists. The 16 highlighted accounts in Volume 7 are all written by leading researchers in their field, and these chapters constitute a systematic survey of the important original material reported in the literature on heterocyclic chemistry in 1994. The volume also contains an article on useful synthetic routes to polyfunctional pyrroles and pyrazoles and a compilation of applications of Diels–Alder cycloaddition chemistry in heterocyclic synthesis.

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Pharmacology, Biology and Clinical Applications of Androgens: Current Status and Prospects. Edited by Shalender Bhasin (Charles R. Drew University), Henry L. Gabelnick (Contraceptive Research and Development Program), Jeffrey M. Spieler (Agency for International Development), Ronald S. Swerdloff (Harbor-UCLA Medical Center), Christina Wang (Harbor-UCLA Medical Center), and Chuck Kelly (Long Beach, California). Wiley: New York. 1996. xiv + 529 pp. \$89.95. ISBN 0-471-13320-5.

This book presents contributions from leading investigators around the world, offering a focused, state-of-the-art summary of the central issues and controversies in androgen research. The book is arranged into sections covering androgen physiology, androgens and the prostate, and the neurobehavior and metabolic effects of androgens, as well as their role in disease therapy and male contraception, and the various delivery systems for each application. Every chapter in the text provides an expert opinion on a cutting-edge topic in the field while highlighting the key points of dissent and disagreement within the scientific community. This approach is intended to foster a deeper understanding of the status of androgen research and lay the groundwork for future investigations in each area.

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Disease in Evolution: Global Changes and Emergence of Infectious Diseases. Edited by Mary E. Wilson, Richard Levins, and Andrew Spielman (Harvard School of Public Health). Annals of the New York Academy of Sciences: New York. 1994. 503 pp. \$145.00. ISBN 0-89766-876-6.

This book studies the emergence of infectious diseases from various perspectives. It also reports on today's unprecedented social and ecological changes that increase the likelihood of previously unidentified diseases appearing and of previously controlled diseases emerging. The practitioners of diverse disciplines—epidemiology, evolutionary biology, environmental sciences, ecology, climatology, social and behavior sciences, entomology, microbiology, parasitology, and virology—report on recently developed techniques from many areas, including molecular biology, genetics, mathematical modeling, and remote sensing. These

techniques are exploited in an effort to understand global configurations of infectious disease emergence. Analysis of historical examples reveals patterns not apparent during a single lifetime of observation.

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The Anthropology of Lower Income Urban Enclaves: The Case of East Harlem. Edited by Judith Freidenberg (City University of New York). Annals of the New York Academy of Sciences: New York. 1995. 287 pp. \$45.00. ISBN 0-89766-891-X.

This book examines the ethnography of a lower income urban enclave, East Harlem in New York City, from a historical and comparative perspective. Ethnographers from a variety of social science disciplines, some of whom have worked in this neighborhood since the 1950s, present their findings, which are juxtaposed with the work of scholars who have researched the same or structurally similar enclaves elsewhere. The 16 papers offered here are introduced by a historical account of East Harlem, a description of the neighborhood at present, and a profile of its social environment based on current demographic, economic, and public health indicators. Topics covered included ethnomedical research, welfare and public policy, ethnic identity, and immigration and its consequences, as well as the policy implications of urban anthropological research. The result is an examination of issues that affect both residents of lower income urban enclaves and the nature of social systems that contain such enclaves.

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Combined Vaccines and Simultaneous Administration: Current Issues and Perspectives. Edited by Jim C. Williams, Karen L. Goldenthal, Drusilla L. Burns, and Benjamin P. Lewis, Jr. (USFDA). Annals of the New York Academy of Sciences: New York. 1995. 404 pp. ISBN 0-89766-863-4.

This volume is a compilation of papers delivered at the Workshop for Combined Vaccines and Simultaneous Administration: Current Issues and Perspectives held in Bethesda, MD, July 28–30, 1993. The workshop was organized to place into perspective factors that are relevant to this topic, namely, the essential elements of strong scientific rationale, research and development, manufacturing, statistical and clinical sciences, and aspects of vaccine delivery and utilization. The workshop generated substantial interest and attracted scientists from around the world who are committed to the development of safe and effective vaccines.

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Free Radicals in Organic Chemistry. Edited by Jacques Fossey, Daniel Lefort, and Janine Sorba (CNRS, France). Wiley: New York. 1995. xiv + 307 pp. \$39.95. ISBN 0-471-95496-9.

Free radicals are highly versatile reaction intermediates which allow many syntheses to be carried out under relatively mild conditions. The discovery of the first free radical, nearly 100 years ago, opened up a whole new and exciting area of organic synthesis, and free radical chemistry is still developing rapidly today. This book is an introduction to the structure, formation, and reactivity of free radicals. It gives examples of organic reaction pathways which utilize free radicals, detailed accounts of the most recent developments within the field, and an overview of the varied applications of free radicals within organic chemistry.

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