

Additions and Corrections

Structure and Properties of Li⁺ (Cryptand [2.1.1])e⁻, an Electride with a 1D “Spin-Ladder-like” Cavity-Channel Geometry [*J. Am. Chem. Soc.* **1997**, *119*, 3765–3772]. RUI H. HUANG, MICHAEL J. WAGNER, DEBORAH J. GILBERT, KERRY A. REIDY-CEDERGREN, DONALD L. WARD, MARGARET K. FABER, AND JAMES L. DYE*

Page 3771: The g values listed for 25 K should be $g_{||} = 2.0024$ and $g_{\perp} = 2.0020$ rather than $g_{||} = 2.01157$ and $g_{\perp} = 2.01121$ as given in the paper.

JA975408J

Molecular Dynamics Simulation Study of the B-States of Solvated Carbon Monoxymyoglobin [*J. Am. Chem. Soc.* **1997**, *119*, 2541–2551]. JIANPENG MA, SHUANGHONG HUO, AND JOHN E. STRAUB*

Values of the electric field were reported in atomic units. With the exception of Figures 6a and 7c, all reported values of the electric field should be multiplied by a factor of 6.75738 (see Figures 5 and 7b, Table 2, and the associated text). All other figures, the discussion, and all the conclusions of the paper are unaffected. We thank Philip A. Anfinrud for bringing the matter to our attention.

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Book Reviews

Inorganic Syntheses. Volume 31. Edited by Alan H. Cowley (The University of Texas at Austin). Wiley: New York. 1996. xix + 347 pp. \$60.00. ISBN 0-471-15288-9.

Inorganic chemists are very familiar with the *Inorganic Syntheses* series. Each volume contains carefully-detailed syntheses of a range of compounds, all of which are repeated by independent checkers. Volume 31 is no exception to this, and the experimental sections are distinguished by meticulous descriptions of the syntheses, detailed (and italicized) presentation of cautionary notes, ample information on the characterization of the compounds, and brief, but sufficient, introductory passages to acquaint the reader with literature reports on the use(s) of the subject compound. However, the scope of the volume (and the choice of compounds included) constitutes another important criterion for evaluation, and Volume 31 meets this test as well. It consists of four large chapters detailing syntheses in the general areas of Main Group Compounds, Ligands and Reagents, Organometallic Compounds, and Transition Metal and Actinide Complexes. The first and largest chapter contains 49 syntheses of main group compounds, including volatile complexes for MOCVD applications, molecular metal amide and alkoxide ceramic precursors, high-purity alkyls for electronics applications, and iron chalcogenides of synthetic interest. Some of the compounds are highly air- and moisture-sensitive, and several of the preparations contain detailed (and welcome) diagrams of the vacuum systems used for synthesis and/or purification. The second chapter is comprised of syntheses of a wide variety of useful compounds (35 in all), including substituted porphines, cyclic polyalkynes, chiral chelate ligands for enantioselective catalysis, encumbered chalcogenols and salts of their conjugate bases, and metal complexes of polyoxoanions. As such, the compounds described in this chapter will be of interest to researchers working in the areas of bioinorganic chemistry, metal chalcogen chemistry, and catalysis. The third chapter contains 30 syntheses of organometallic compounds. There is an emphasis on carbonyl-containing derivatives, and the chapter includes sections on phosphine and phosphite derivatives of iron pentacarbonyl, acetonitrile-containing derivatives of Rh₆(CO)₁₆, and main group element-containing transition metal carbonyl complexes and salts. However, a nice balance is struck with preparations of (C₅Me₅)Fe complexes, pyrazolate-bridged

ruthenium dimers, the preparation of tetramethyl(trifluoromethyl)cyclopentadiene (C₅Me₄(CF₃)H), and rhodium complexes of the corresponding anion [C₅Me₄(CF₃)] (Cp⁻). Finally, the fourth chapter contains 39 procedures for a wide variety of d- and f-block complexes. These include several oxorhenate derivatives, salts of metal complex cations with the weakly-nucleophilic triflate counterion, a range of interesting copper alkoxides, copper pyrazolates, and hexafluoropentanedionate (hfac) copper complexes, a volatile tris(tetramethyl-3,5-heptanedionato)yttrium derivative, and adducts of uranium(III) iodide. As this list indicates, this fourth chapter contains syntheses for a range of early, middle, and late transition metal and actinide metal complexes.

Editor Cowley notes the rapid pace at which interest in main-group chemistry is growing, and it is indeed noteworthy that this volume contains an outstanding collection for chemists interested in materials science and the preparation of molecular precursors. At the same time, the inclusion of syntheses for ligands, coordination compounds, and organometallics ensures that this will be a valuable resource of general utility. Clearly, then, Volume 31 is a thoughtful and well-executed contribution, and will be a welcome addition to the *Inorganic Syntheses* series.

Joseph W. Bruno, *Wesleyan University*

JA9658067

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Solid-Liquid Filtration and Separation Technology. By Albert Rushton, Anthony S. Ward, and Richard G. Holdich (Loughborough University of Technology). VCH: New York. 1996. xiii + 538 pp. \$185.00. ISBN 3-527-28613-6.

As the title of this book indicates, it is concerned with the separation of solids from liquids. The treatment of the subject matter emphasizes industrial scale separations as opposed to laboratory scale separations. The following list of chapter headings outlines the scope of the book's coverage: (1) Solid Liquid Separation Technology (an overview of what is to come later in more detail), (2) Filtration Fundamentals, (3)

Sedimentation Fundamentals, (4) Filter Media, (5) Pretreatment Techniques (includes coagulation, flocculation, and filter aids), (6) Clarifying Filtration, (7) Sedimentation and Thickening, (8) Centrifugal Separations (includes sedimenting centrifuges, hydrocyclones, and centrifugal filters), (9) Post Treatment Processes (includes cake washing and cake liquor expression), (10) Membrane Technology (includes microfiltration, ultrafiltration, and diafiltration), (11) Filtration Process Equipment and Calculations. There are three appendices: (A) Particle Size, Shape and Size Distributions, (B) Slurry Rheology, (C) Computer Spreadsheet Files.

If one were looking for a textbook for a course in solid-liquid separation technology, this volume would serve admirably. It would also be of great value to any engineer involved in the design, selection, or operation of solid-liquid separation equipment. Generally the book is sufficiently inclusive of information that solid-liquid separation problems can be solved without consulting further references. Nevertheless a comprehensive list of references appears at the end of each chapter.

The authors' approach is to describe the kinds of equipment available, discuss the mechanism of the particular separation operation, provide any fundamental equations with which to quantify matters, and to suggest a strategy for equipment selection and operation. In an appendix several useful spreadsheets are provided for a variety of relevant calculations (e.g., solving the filtration equations for constant pressure and compressible cake filtration). The sort of solids encountered in these kinds of separations (e.g., waste water treatment sludges) are frequently not well defined in terms of size, size distribution, shape, and compressibility. Thus, laboratory or pilot scale tests are usually a necessary part of the equipment selection process. These tests and incorporation of their results into the equipment selection process are described.

The book's coverage is very broad but not all inclusive. High flow rate filtration processes wherein inertial forces are as important as viscous forces (e.g., in paper making machines) are mentioned but not covered in any depth. Also mentioned but not discussed is the screw press, which is commonly used in waste water sludge dewatering. The appearance of the book in terms of printing, illustrations, etc. is generally excellent although there are a few errors. In summary, this is a well written, useful book.

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JA965704G

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NMR of Polymers. By Frank A. Bovey and Peter A. Mirau (AT&T Bell Labs, New Jersey). Academic Press: San Diego, 1996. x + 459 pp. \$85.00. ISBN 0-12-119765-4.

This is an excellent book that should be continuously consulted by everyone involved in studying polymers, both in academia and in industrial research labs. In the last few years, NMR spectroscopy has developed novel possibilities to gather information about polymer structure and dynamics. This book reviews the relevant work and offers an almost exhaustive overview of the old and new possibilities of using NMR to obtain information about polymers. The first chapter is entitled Fundamentals of Nuclear Magnetic Resonance and, as its title suggests, gives a background for the method. In addition, a very useful experimental part is enclosed. This will enable the polymer scientist to better communicate with the NMR spectroscopist to obtain help with solving a structural and/or dynamic problem. Although only the basic pulse sequences and experimental details are covered in the first chapter, many others are given throughout the book.

The second chapter has less to do with NMR and is an introduction to various microstructural peculiarities of polymers. Such a chapter would be better suited in a polymer chemistry/characterization book, but it is useful here, too, for defining some of the problems to be solved later, especially in Chapter 3, covering solution characterization of polymers. Novel pulse sequences offer new insight into the microstructure of polymer chains. One can say that we are now capable of knowing much more about the polymer microstructure than we could possibly need. In some cases (branching, end groups) the microstructure is very important for some use properties of the polymer, but in many others the connection between the microstructure and properties is much less obvious. One such example is the determination of fractions of

relatively long sequences, which is important only if one needs to distinguish between stereoregular and atactic polymers.

Solid-state NMR of polymers is covered in Chapter 4. This is probably the most dynamic part of NMR of polymers, with significant developments being published on a monthly basis. Here the time limitation imposed by the process of publishing a book prevented the authors from reporting the most recent findings (the literature appears to be covered up to and including 1994). Nevertheless, the book is still extremely useful as a starting point. Polymer chemists are probably unaware of at least some of the recent possibilities offered by solid-state NMR, including phase structure determination, imaging, phase transitions, and crystallinity measurements. Finally, Chapter 5 covers dynamic aspects, both in solution and in the solid state. The book has a good index, although written mainly from the spectroscopist's point of view (one can find "spin diffusion", but not "phase structure"), but including the names of the polymers analyzed.

On a less positive note, although the authors have tried to cover all "polymers", only synthetic polymers are really the subject of the book, and mentioning this in the title would have been helpful. Also, there are too many annoying typos. Overall, however, I highly recommend this as a very useful reference book, not only for the beginners in the field, but also for researchers who currently use one or another of the NMR techniques available to polymer chemists.

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Perspectives on Bioinorganic Chemistry, Volume 3. Edited by Robert W. Hay (University of St. Andrews), Jon R. Dilworth (University of Essex), and Kevin B. Nolan (Royal College of Surgeons in Ireland). JAI Press: Greenwich, 1996. xi + 286 pp. \$109.50. ISBN 1-55938-642-8.

This collection of five review articles is the third in a series planned to appear at approximately yearly intervals. However, it is apparent that the papers in this volume were contributed over approximately a three-year time span. As is typical of similar collections covering a multidisciplinary area, the contributions vary significantly in quality, depth of coverage, and perspective. There have been some minor improvements over previous volumes in the series, most notably that this is the first one to include a subject index (eight pages).

The first article, Structure and Function of Manganese-Containing Biomolecules by David C. Weatherburn (Victoria University of Wellington, New Zealand), is 84 pages long without references and is extensively referenced, containing 1041 citations through 1994 (about 60% from 1990 or later). The main article covers the literature through early 1993; there is a 14-page addendum to cover through the middle of 1994. This article takes a very biological slant and covers the extensive subject with exception of the already well-covered photo-system II. The second paper, Repertoires of Metal Ions as Lewis Acid Catalysts in Organic Reactions, written by Junghun Suh (Seoul National University, Korea), has about 30 pages of text and then 128 references (about 20% from 1990 or later, none later than 1994). The article most extensively covers metal-catalyzed hydrolysis, primarily of small-molecule complexes, although carboxypeptidase A is discussed as a sample enzyme. The third chapter, The Multicopper-Enzyme Ascorbate Oxidase, is by Albrecht Messerschmidt (Max-Planck-Institut für Biochemie, Germany) and spans about 40 pages and has 159 references (about one-quarter from 1990 or later). This article concentrates on the structural chemistry of various forms of ascorbate oxidase but contains many other comparisons with the other blue oxidases, laccase and ceruloplasmin, e.g., representative spectroscopic properties, primary structure about the active site, and redox potentials. The fourth article, The Bioinorganic Chemistry of Aluminum by Tamas Kiss (Attila József University, Hungary) and Etelka Farkas (Kossuth University, Hungary), has 43 pages of text and 280 references (40-45% from 1990 or later). First, aluminum detection and the problem of accurate quantification are discussed, and then the bulk of the article covers the coordination chemistry of Al(III) with a variety of potential biomolecules. Then topics relevant to aluminum biochemistry are discussed, including absorption, metabolism, toxic effects, and the use of aluminum in medicines. The last article, The Role of Nitric Oxide in Animal Physiology by Anthony R. Butler and Frederick W. Flitney (both from the University of St. Andrews, Scotland) and Peter Rhodes (Ninewells

Hospital, Scotland), is the shortest at 22 pages and contains just over 140 references (over 65% from or later than 1990). This is a fairly general overview of selected topics related to this very extensive research area. The review is primarily biochemically and medically oriented except for some general aqueous NO_x chemistry. The story of how the role of NO in vascular muscle relaxation was discovered is followed by discussions of the various roles of NO, including as a vasodilator, as the activator of the enzyme guanylate cyclase, in the inhibition of platelet aggregation, and in the immune, nervous, and respiratory systems.

This volume, similar to the others in the series, is certainly worthy of access, for instance in your institutional library, but is probably not worth buying for a personal library since only an occasional paper will likely be of interest to the average reader. Future volumes can be improved by making sure contributed articles are published much more quickly after being written and requiring more consistent and better quality chemical drawings.

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Advanced Series in Physical Chemistry. Volume 3. Progress and Problems in Atmospheric Chemistry. Edited by John R. Barker (The University of Michigan). World Scientific: River Edge, NJ. 1995. x + 941 pp. \$95.00. ISBN 981-02-2113-4.

The current volume in this Physical Chemistry Series consists of 19 chapters written by experts in various subdisciplines of atmospheric chemistry. This rather large volume is directed at three groups: "those not part of the atmospheric research community, but interested in progress; atmospheric scientists interested in recent advances; and experts who want to see the latest results". This is a rather ambitious mission, and the text succeeds in fulfilling some aspects of its stated purpose, but not in others. According to the editor, the authors of the individual chapters were to provide sufficient background information so that the advances described later in the chapter would be accessible to the scientist not actively involved in the field. Many of the contributors follows this pattern, and as a learning tool for those not actively involved in atmospheric chemistry research, the collection generally succeeds in providing valuable background material and insight into the application of physical chemistry techniques to atmospheric chemistry problems. It certainly could be used in a graduate course for entering students interested in pursuing a research project in this branch of chemistry. However, as a vehicle for the dissemination of recent results, the text is not as valuable. Most of the chapters provide references only through 1993. This is a rapidly advancing field, and while no volume could hope to be absolutely current, 3–4 years is a substantial length of time between compilation and use.

There are a number of excellent chapters included in this compilation; among them are the editor's own introduction which gives an excellent summary and overview of the field. The chemistry of ozone is reviewed

in both laboratory experiments and urban and rural atmospheres. Important mechanistic ozone chemistry is well covered in these sections. A chapter on the nightglow is especially informative for those not well-versed in the subject. Finally, surface chemistry in the atmosphere and the atmospheric chemistry over the poles are addressed in two well-conceived chapters.

In summary, while I believe that "experts" will probably not find the text useful, those interested in entering the field have an excellent starting point for their studies, and I recommend the text for that group.

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Spectrophotometric Reactions: Practical Spectroscopy Series, Vol. 22. By Irena Nemcova, Ludmila Cermakova, and Jiri Gasparic (Charles University). Marcel Dekker: New York. 1996. vi + 250 pp. \$135.00. ISBN 0-8247-9451-6.

This book describes and classifies reactions utilized in UV–visible spectrophotometric absorption analysis. Both analyte and reagent properties relevant to the type of reaction are discussed, and both organic and inorganic reactions are covered. A brief introductory chapter outlines the principles of absorption analysis, and discusses factors such as ionic strength, solvent–solute interactions, temperature, etc., which can affect the measurements. Static and dynamic measurements are described, as is the use of solvent extraction and of surfactants. A second chapter deals with acid–base reactions of analytes and organic reagents utilized in spectrophotometric analysis. This is followed by a chapter on complexation reactions. Metal complexes as well as molecular (primarily charge transfer) complexes are discussed. The fourth chapter deals with the formation of ion pairs, which may be determined either directly or on extraction into a suitable solvent. Chapter 5 treats redox reactions. The sixth and final chapter describes reactions of analytes to form new organic chromogens, including azo dyes, azomethines and hydrazones, quinonimines and aminoquinones, arylmethanes, nitroso and nitro compounds, and polymethines.

Each chapter begins with a brief introduction, followed by illustration with examples from the literature. A total of 938 literature citations are included, many of these being to earlier reviews. The majority of the references are to material published since 1970, with 1994 being the most recent year covered. An extensive index (20 pages) allows rapid location of references to specific analytes or reagents. In my view, the book will provide stimulating reading and serve as a valuable reference to those involved in spectrophotometric method development, or method development in liquid chromatography or flow injection analysis utilizing spectrophotometric detection. The book will also be a useful resource for instructors and students of upper level courses in instrumental analysis or analytical spectrophotometry.

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