Book Reviews *

Applications of Electrostatic Covalent Models in Chemistry. By Russell S. Drago (University of Florida). Surfside Scientific Publications: Gainesville, FL. 1994. iv + 308 pp. $45.00. No ISBN.

A remarkably comprehensive view of chemical bonding and complexation phenomena is provided in this work. A host of interactions that are inherently donor–acceptor in character are resolved in terms of electrostatic (E) and covalent (C) contributions. Processes of interest range from interactions as diverse as Lewis acid–base addition, substitution at metal centers, and surface wetting. The fundamental approach is the establishment of empirically based parameters to quantify contributions to bonding or complexation that will relate in a linear fashion to physical observables (bond dissociation enthalpies, heats of solution). The theory derives in part from the principles of Pauling and Mulliken, who provided early molecular orbital and valence bond models of donor–acceptor interaction and included electrostatic interaction energies explicitly.

The author illustrates the limitations of classical treatments of Lewis acids and bases, the theory of hard and soft acids and bases (HSAB), and the use of linear free energy relationships such as the Hammett equation. Correlations of observables with single parameters (e.g., with "donor–acceptor numbers") or those that depend on a single reference substrate are also viewed as deficient, since they will be inherently incapable of handling both electrostatic and covalent components of interaction, or they will show "reference dependent" behavior. The alternative E and C parameters reflect, respectively, the contributions to bond strengths associated with electrostatics involving formal charges or strong dipoles and the effectiveness of overlap of frontier molecular orbitals (soft or covalent interactions). The newer set of parameters, obtained from more than 500 measured enthalpies using least-squares fitting routines, is used to correlate other data using equations of the following type: $-\Delta H = E_A E_B + C_A C_B + W$, where E and C parameters reflect the electrostatic contributions of each acid and base in a correlated set. Within a set of data, deviation from a linear correlation signals the onset of factors other than the overlap and electrostatic components for σ bond formation between species A and B. Data that can be correlated with "ECW" parameters in an informative way include equilibrium constants, spectral shifts of all kinds (including NMR and ESR), electrode potentials, and solvation energies, indeed, any properties that depend in some systematic way on donor–acceptor interaction. The author makes a strong argument that the dual electrostatic–covalent parameter model is superior to most other structure–reactivity treatments and provides a generally stronger parallel with chemical intuition.

The book is organized in terms of establishment of the electrostatic–covalent model and the quantitative ranking of the strengths of acids and bases, followed by application of quantitative scales to reaction kinetics and spectroscopy (Chapters 1–4). Another section features further applications of the model that encompass organometallic or metal cluster reactivity and methods for obtaining additional parameters for the ECW model. The second half of the book (six chapters) is devoted to an impressive variety of topics that include new approaches to the development of Hammett-like substituent constants, models of solvation based on donor–acceptor interactions, gas-phase ion–molecule reactions, and subjects dealing with the solid state, catalysis, and materials chemistry.

Although perhaps appearing as a monograph covering a specialized topic in chemical bonding, the book is broad in scope, and the approach is pedagogical. The 12 chapters are embellished with problems and exercises for use by students. The book has considerable potential as a secondary text in physical organic/inorganic or reaction mechanisms courses. The references used for the compilation of data (or necessity) span a wide range of time but, notably, include a number of citations as late as 1994. The book has an index of moderate size and two short appendixes that deal with algorithms/programs for use of ECW parameters. For a very modest price of admission, this book offers an appealing presentation of concepts and a large variety of useful data.

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JA9450014

Phosphorus-31 NMR Spectral Properties in Compound Characterization and Structural Analysis. Edited by Louis D. Quin (University of Massachusetts) and John G. Verkade (Iowa State University). VCH: New York. 1994. xv + 455 pp. $150.00. ISBN 1-56081-637-6.

If you are interested in the synthesis of phosphorus compounds and their characterization by ^{31}P NMR, you will enjoy this book. It is written at a level that makes it useful for those who are not NMR experts, and at the same time, it provides a broad exposure to current techniques and applications.

The 33 chapters are divided into nine sections (numbers of chapters in parentheses): Chemical Shift Theory (1); Conformational Analysis of Phosphorus-Containing Ring Systems (3); Compounds with Three-, Four-, and Five-Coordinate Phosphines (Saturated) (6); Low-Coordinate Phosphorus Compounds (5); Metal Complexes of Phosphorus Ligands (4); Biological Phosphorus Systems (3); Mechanism Elucidation in Phosphorus Chemistry (3); Analytical and Interpretive Aspects (5); and NMR with Solid Phosphorus-Containing Systems (3). The authors of the chapters (about a dozen pages each) provide a somewhat personal account of work from their own laboratories (with references as late as 1993) rather than utilizing the usual review format such as that used in the 1987 Verkade/Quin book, *Phosphorus-31 NMR Spectroscopy in Stereochemical Analysis: Organic Compounds and Metal Complexes*. Those whose interests lie with compounds containing transition metals may be disappointed because only four chapters are fully devoted to that topic.

Contributions from both academic and industrial laboratories in 10 different countries provide an attractive breadth of coverage that makes it likely that most readers will discover some new thoughts for their own work. Although it is not possible in a short review to cover contributions from 33 chapters, some phenomena which caught this reviewer's eye include the following: unambiguous configuration assignments in 1,3-dithianes from T_1 values of phosphorus substituents; phosphorus–phosphorus coupling over seven or eight bonds; spectral identification of LiH_5P_8, LiH_4P_7, and LiH_8P_7 mixtures by selective population transfer experiments; synthesis, functionalization, and metal coordination of tetraphosphacubane; structure determination of low-coordinate phosphorus compounds from phosphorus–nitrogen coupling constants; identification of reactive species with bis(diisopropylamino)phosphino tags; identification of transient, electrophilic phosphorus species with solid trapping agents (CP/MAS ^{31}P NMR); stereochemical direction and activation by metals in reactions of phospholes with dienophiles; chiral inorganic [O^{16}, O^{17}, ^{18}O]-phosphate utilization for following the stereochemical course of phosphoryl transfer in biological systems, in phosphoric, phosphonic, and phosphinic acids (complete with tips on tuning, controlling temperature, and dealing with paramagnetic impurities), and for unambigously assigning 10–20 base pairs of oligonucleotides; subtleties of the Wittig reaction; applications of homonuclear (P–P) and heteronuclear (P–H) correlation experiments to systems with serious spectral overlap; advantages of using fully coupled spectra for analysis of mixtures; and quantification, automation, and robotics as employed in industry.

Most chapters begin by describing the syntheses of the compounds of interest followed by a description of how ^{31}P NMR spectroscopy was used in their characterization. In many instances standard NMR analyses are applied to rather interesting chemical systems. The reader will find many discussions of chemical shift and coupling constant trends and the results of many variable-temperature NMR studies. It is not surprising, therefore, that there is some repetition of methods, as we read about the phosphorus nucleus dressed in many different costumes, but examined in the same old way.

Although a few typographical errors (e.g., missing subscripts, inconsistency with subscripts and primes, incomplete headings, odd spacing) are present, they are not of a serious nature nor are they

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*Unsigned book reviews are by the Book Review Editor.

distracting. It might be better if P(III), P(IV), and P(V) were reserved to indicate oxidation number rather than coordination number, but overall my complaints about this book are few. It is a must for the local library and highly recommended to those who regularly stare at phosphorus spectra.

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JA945123W

Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume IV: Heterocyclic Compounds. Part C: Five-membered Heterocyclic Compounds with Two Hetero-Atoms in the Ring from Groups V and/or VI of the Periodic Table. Part D: Five-membered Heterocyclic Compounds with More than Two Hetero-Atoms in the Ring. Edited by M. F. Ansell (Queen Mary College). Elsevier: Amsterdam. 1994. xviii + 456 pp. $271.50. ISBN 0-444-89932-4.

The supplements are as follows: Chapter 16. Five-membered Heterocyclic Compounds with Two Nitrogen Atoms in the ring by S. T. Mullins; Chapter 17. Five-membered Heterocyclic Compounds with Two Different Hetero-atoms in the Ring by J. D. Hepworth and M. Wainwright; Chapter 18. Five-membered Heterocyclic Compounds with Three Hetero-atoms in the Ring by D. J. Rowe; Chapter 19. Five-membered Heterocyclic Compounds with Four Hetero-atoms in the Ring by J. H. Little.

These new Volumes of "Rodd" continue to be a major service to organic chemistry. The chapters are uniformly well written and remarkably free from errors, both in the text and in the structures. It is very pleasing to see that the text discusses structures that are usually on the same page and does so with admirable clarity. It is obvious that a great deal of common sense has gone into producing this series, which serves as a model for other lesser works. While the price of the books makes individual ownership is virtually impossible, they should be a standard component of any good organic chemical library.

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JA9448834

Advances in Electrophoresis. Volume 6. Edited by A. Charmbach (NIH), M. J. Dunn (Harefield Hospital, England), and B. J. Radola (Technische Universitat, Munchen). VCH: New York. 1994. x + 382 pp. $180.00. ISBN 3-527-30034-1.

Volume 6 of the series *Advances in Electrophoresis* contains five different chapters with a total of 382 pages. All five chapters are comprehensive reviews written by experts in the field of gel electrophoresis. They provide the reader with the fundamental, practical, and methodological aspects of gel electrophoresis.

Chapter 1 entitled Electronic Imaging of Electrophoretic Gels and Blots (J. C. Sutherland) is an in-depth treatment of the various technologies that have been applied to imaging gels and blots during the last decade. After describing the various imaging techniques and strategies, the author speculates on which of the currently available technologies may emerge as "winner". This has always been the case for developing technologies where a phase of shake out is usually entered in which a few approaches become established while others are abandoned. In this chapter, after providing a discussion pertaining to the performance of an imaging system, the author describes the physical properties that are imaged such as optical absorption/refraction, fluorescence, bio/chemiluminescence, or emissions from radionuclides. Finally, a classification of imagers is included and detailed descriptions for each imager are presented. This review has 134 references, 95% of which are from the 1980s and 1990s.

Hydrolink Gels for Electrophoresis is the title of Chapter 2 by R. J. Molinari, M. Connors, and R. G. L. Shorr. Hydrolink gels were developed by researchers at Smith Kline, Beckman Laboratories in late 1980s and are now produced by AT Biochem. The chapter discusses the various applications of the gels as well as the rationale behind developing the Hydrolink gels. Unfortunatley, since the Hydrolink gels are proprietary formulas which are patented or patent-pending, no details are provided concerning their preparation. These gels are available in various formulas to achieve different types of separations, such as Hydrolink DNA sequencing gels, mutation detection enhancement gels, custom Hydrolink gels, etc. This review lists 44 references, 42 of which are published in the 1980s and 1990s.

Chapter 3 is Electrophoresis and Direct Immunoprobing on Glyoxyl Agarose and Polyacrylamide Composites by J. R. Shainoff. Glyoxyl agarose is a unique medium "on which protein and peptides can be separated, fixed and then immunoprobed directly in place within the primary electropherogram, thereby eliminating the need for blot-transfer." The initial driving force for developing this particular gel has been the fact that there was a desperate need for "a medium that could be used for direct immunoprobing, because of need to analyze fibrinogen derivatives that were virtually resistant to blot-transfer." This chapter provides important details on the preparation of various glyoxyl agarose–polyacrylamide composite gels. There are various alternative procedures for preparing the composite gels since no single procedure accommodates all needs. In this regard, guidelines are provided for the user to aid in the selection of the procedure best suited for particular needs. In addition, the chapter is well illustrated and contains useful recipes. Seventy percent of the 69 references of this chapter are from the 1980s and 1990s.

The title of Chapte 4 is Catching Genes in the Genomic Desert with Short Synthetic Oligonucleotide Probes and is written by G. Melmer and J. T. Epplen. As the title implies, this chapter is a review on the common tools for the gene identification such as Northern and zoo blot hybridizations. It also provides a description of "new techniques such as exon trapping and mainly the use of short oligonucleotides." This review is certainly very useful for molecular biologists and specifically those involved in the genome research since it (i) compiles and discusses very useful methods and experimental protocols related to genomic research, (ii) contains useful electropherograms, tables, diagrams, and outlines pertaining to sequencing, splicing, finding genes in contiguous stretches of DNA, etc., and (iii) gives 177 references, most of which are very recent from late 1980s and early 1990s.

The last chapter on Clinical Application of High-Resolution Two Dimensional Polyacrylamide Gel Electrophoresis (2D-PAGE) is written by D. F. Hochstrasser and J.-D. Tissot. The aim of this chapter is "to demonstrate the usefulness of 2-D PAGE analysis of diverse human samples in a clinical environment and even sometimes at the bedside." This review is useful not only for the clinical analysts but also to the users of 2-D PAGE in other areas of the life science. The different sections of this chapter cover a wide range of topics including (i) the impact of 2-D PAGE on diagnosis and patient care, (ii) a review on the current literature of 2-D PAGE analysis of human samples, (iii) the methodological aspects of the technique, and (iv) the usefulness of 2-D PAGE in the analysis of body fluids and tissue biopsies. This review summarizes the research reported in 441 references, more than 55% of which were published between 1986 and 1993. The chapter has 44 illustrations and electropherograms dealing with clinical applications, e.g., patterns in tumors, protein pattern in liver biopsy, serum analysis of a pregnant women, analyses of serum samples from human fetuses, urine and serum patterns in patient with renal disease and insufficiency, pattern of polyclonal Ig production in B-hepatitis, etc.

In total, Volume 6 of the series *Advances in Electrophoresis* is a real success, as its predecessors. I recommend this book to all libraries and to all users of gel electrophoresis.

Ziad El Rassi, *Oklahoma State University*

JA944856D

Sulfur Reagents in Organic Synthesis. By Patrick Metzner and Andre Thuillier (University of Caen, France). Academic Press: London. 1994. xviii + 200 pp. $50.00. ISBN 0-12-690770-6.

This text is another in the series *Best Synthetic Methods*, which started in the mid 1980's. According to the authors, the aim of the book is to familiarize the chemical community about the widespread role sulfur reagents play in organic synthesis. Although the book is intentionally small in size, it contains a wealth of information for the practicing chemist with 100 experimental procedures and over 500 references, 30% of which are dated 1990–1993. The book provides some basic organosulfur chemistry, experimental details for the preparation and use of organosulfur reagents, mechanistic pathways for selected transformations, and brief comments on areas that require further investigation. Several examples of the use of sulfur reagents toward the synthesis of complex natural products are also provided.

There are only three chapters in this book along with an introduction. Chapter 2 deals with the preparation of organosulfur reagents at various oxidation levels such as thiols, sulfides, disulfides, thiocarbonyl derivatives, sulfoxides, and sulfones. Chapter 3 discusses the use of sulfur reagents in selected functional group transformations including the introduction of carbon–carbon double bonds, oxidations, asymmetric reductions, and the Barton reaction. Chapter 4 is the most comprehensive and it details how sulfur reagents have been used in organic synthesis. Topics include the classical 1,3-dithiane chemistry of Corey and Seebach, organometallic additions to the C=S, enethiolate chemistry, extrusion reactions, the Eschenmoser reaction, Trost's classical sulfur ylide work, and pericyclic reactions. The authors give brief discussions of the classical work in each of these areas, but more importantly, they have updated them by providing recent modifications with ample references and procedures. For example, the use of Helquist's reagent for methylene transfer, cycloadditions involving optically active sulfoxides, and the recent use of chiral sulfur molecules in asymmetric induction and in controlling the stereochemistry of pericyclic reactions are discussed.

This book is highly recommended for the practicing chemist as a source for the preparation and use of sulfur reagents in organic synthesis. Anyone with an interest in sulfur chemistry will find this book a useful addition to their library. Students and the academic community can use this book at the advanced undergraduate or graduate level as an introduction to selected topics of organosulfur chemistry.

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JA955109Z

Introduction of Open-Tubular Column Gas Chromatography. By J. V. Hinshaw (The Perkin Elmer Corp.) and L. S. Ettre (Yale University). Advanstar Communications: Cleveland, OH. 1994. x + 189 pp. $24.95 paperback, $34.95 hardcover. ISBN 0-929870-25-5.

This book is based on an introductory text written in the 1970s by one of the authors. It is intended "for the student and day-to-day user of open-tubular gas chromatography". Concepts and equations are developed from basic principles. The book is essentially devoid of applications and focuses on the fundamental processes taking place in the column. The description of hardware is kept at a minimum. Drawings and figures are of very high quality. The book is well written and essentially free of typographical errors. One of its declared goals is to make the reader understand that gas chromatography is a compromise where several variables can be adjusted to achieve the intended separation. The authors have chosen a "middle of the road approach" in their selection of topics and resisted the temptation to cover every conceivable topic in gas chromatography. As a result, some important areas of practical chromatography and instrumental development, which perhaps should have been covered, were omitted.

The book essentially consists of nine chapters and two appendixes. The introduction provides a bird's eye view of the overall process. The authors present a historical perspective and bemoan the use of the term "capillary column" which, in their opinion, should be called "open-tubular column". This has been a losing battle fought by one of the authors for more than 30 years. Terms like "splitless injection" and "methylene chloride" are equally dubious, yet it is unlikely that they ever will be substituted for more appropriate expressions. The main body of the book starts with a description of the role of the carrier gas. While this is an important subject, it is perhaps not necessary to dwell on the pressure correction factor and the use of nitrogen. Chapters 3–6 are clearly the heart and soul of the book. The separation process is nicely developed, followed by a detailed description of band broadening processes and ways to evaluate column efficiency from chromatograms. It would have been important to discuss the origin of peak distortion somewhere during the development of the theoretical concepts. Most peaks in gas chromatograms are not symmetrical, and it is important to come to an understanding of the causes of peak distortion. It is also worthwhile to point out some fundamental limitations of gas chromatography. The term peak capacity is hardly mentioned. Statistical treatment of peak overlap as explored by Giddings, Davis, Guiochon, and others is a difficult subject matter which most authors stay away from. The chapter on stationary phases covers the "classical" phases and their interactions. It falls short on some of the more recent developments, in particular on chiral phases which are a rapidly expanding area. Chapter 6 is titled The Variables of Open-Tubular GC Columns. It could also have been called Practical GC, because it brings together all variables that can be chosen or adjusted by the user. Overall optimization strategies are discussed. A description of inlets and detectors rounds out the book. These topics are not treated nearly in as much detail as the column. The discussion of detectors is certainly inadequate. Sources of noise and detector characteristics are hardly mentioned. The TCD is described as a device of 100–150 μL, and the mass spectrometer is covered on less than one page. There is also no treatment of data acquisition and the associated hardware which are standard equipment of any modern GC. The authors have added a list of references, publishers, and other useful sources at the end. Symbols are summarized and described. Page numbers are added to each symbol for quick reference.

It is always easy to criticize a book and find areas that could be improved. This paperback provides the practitioner of gas chromatography with the necessary tools to understand fundamental processes and extract the relevant information from its most important product, the chromatogram. The attractive price should be an additional incentive to keep this concise and handy book in every laboratory where gas chromatography is practiced.

Wolfgang Bertsch, *The University of Alabama*

JA955155Z

The Organic Chemistry of Drug Synthesis. Volume 5. By Daniel Lednicer (National Cancer Institute). Wiley & Sons: New York. 1995. xii + 219 pp. $69.95. ISBN 0-471-58959-4.

As with previous volumes in this series, the emphasis is the synthetic chemistry used to prepare compounds that have appeared in the annual compilation of *United States Adopted Names* (*USAN*, published by the United States Pharmacopeia). The adopted names, also called "generic names", are given to compounds by pharmaceutical companies when they have shown sufficient therapeutic potential to warrant clinical evaluation. Volume 5 covers compounds from around 1988 through USAN 1993. The syntheses, often optimized for analog preparation, along with brief sketches of therapeutic applications, are presented for about 250 compounds.

The organization of the book is similar to that of previous volumes and groups chapters according to structural classes. Volume 5 contains 11 chapters: 1, Acyclic and Alicyclic Compounds (15 references); 2, Monocyclic Aromatic Compounds (31 references); 3, Polycyclic Aromatic and Hydroaromatic Compounds (15 references); 4, Steroids (20 references); 5, Five-Membered Heterocycles (30 references); 6, Six-Membered Heterocycles (38 references); 7, Five-Membered Benzoheterocycles (20 references); 8, Six- and Seven-Membered Benzoheterocycles (35 references); 9, Bicyclic Fused Heterocycles (21 references); 10, Beta Lactams (11 references); and 11, Miscellaneous Fused Heterocycles (28 references). Given the nature of the topics, many examples are from the patent literature. In these cases, references include *Chemical Abstracts* citations. Also included at the end are a Cross Index of Drugs (a summary of compounds in Volume 5 organized by therapeutic class, which is quite useful given the structural classification of chapters), a cumulative index for Volumes 1–5, and a subject index for Volume 5.

A preparative and therapeutic discussion of roughly 250 compounds in 180 pages, including synthetic reaction schemes, necessitates a terse style. Yet the approach is successful and yields a book that should be useful to students and researchers in both organic and medicinal chemistry.

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JA945149N

The Chemistry of Natural Products. Edited by R. H. Thomson (University of Aberdeen). Blackie Academic & Professionals: London. 1993. x + 452 pp. $149.95. ISBN 0-7514-0014-9.

The range and breadth of the topic as described in the title are far too broad for a medium-sized volume. Accordingly, this edition considers the literature published since 1982 through mid-1992; the first edition appeared in 1984 and covered the literature through 1982. The chapters cover the usual natural product classes: carbohydrates, aromatics, terpenoids, steroids, alkaloids, aliphatics, and porphyrins as well as the more biologically connected amino acids, peptides, and proteins and nucleosides, nucleotides, and nucleic acids.

The approaches of the authors of the various chapters are quite different, leading to a rather disjointed overall effect. The first chapter, on carbohydrates (K. J. Hale and A. C. Richardson), contains a useful account of recent developments in the synthesis of carbohydrates (*O*- and *C*-glycosidation methodology, mostly) and in the use of carbohydrates as chiral templates, reagents for synthesis, and chiral starting materials. In contrast, chapter 2 on aromatics (J. Gill) is less comprehensive and more selective, focusing on novel structures and biosynthesis and only in a limited way on synthesis. Chapter 3, Terpenoids (R. A. Hill), takes a compromise path, presenting new structures and biosyntheses along with chemical syntheses. Chapter 4 on steroids (A. B. Turner) examines the chemistry of steroidal systems: rearrangements, photochemistry, remote functionalization, and synthesis.

J. Leonard, in the chapter on alkaloids (Chapter 6), does not attempt a comprehensive review of the topic but chooses to highlight selections from recent work in biomimetic studies and total synthesis. In a similar vein, the aliphatic chapter (Chapter 9, D. R. Kelly) presents current synthetic efforts in the areas of semiochemicals, marine natural products, polyether systems, and enyne–allene and enediyne compounds.

The chapters on amino acids, peptides and proteins (Chapter 5, C. Bladon), nucleosides, nucleotides, and nucleic acids (Chapter 7, J. B. Hobbs), and porphyrins (Chapter 8, L. R. Milgrom, F. O'Neill) deal more with their chemistry and applications of that chemistry to non-natural analogues than with the "natural products" themselves. In Chapter 8, the authors discuss the biosynthesis of the porphyrin system but then also describe non-natural porphyrins in studies of heme binding to oxygen, cytochrome P-450, DNA interactions, solar energy conversion, photosynthesis, and photodynamic therapy and as novel materials. Chapter 7 reviews recent methods in ribosidation, modified sugar nucleosides, *C*-nucleosides, nucleotide analogues, and oligonucleotide synthesis. The design of peptide-based pharmaceuticals and techniques for structure elucidation were addressed along with amino acid synthesis, novel amino acid and peptide natural products, and synthesis of glycopeptides in Chapter 5.

The production aspects of the book are also rather uneven. Occasional errors of typography and proofreading appear throughout; the majority of problems were to be found in the schemes and their captions. One common irritation is having to search through several pages to find the structure or scheme being referred to in the text. To the credit of the production staff, I felt this frustration only a handfull of times (Chapter 3) with this book.

Although the chapters are different in scope and intent, each author has provided useful references, especially to review articles. As a guide to an active decade of work in natural products, the book will be valuable resource for the nonspecialist looking for leading references and reviews in a particular area as well as to the seasoned natural products chemist.

Dee Ann Casteel, *Bucknell University*

JA945081B

Glycopeptide Antibiotics. Edited by Ramakrishnan Nagarajan (Lilly Research Laboratories, Eli Lilly and Company). Marcel Dekker, Inc: New York, NY. 1994. xiv + 423 pp with index. $165.00. ISBN 0-8247-9193-2.

In nine contributed chapters, these authors attempt a comprehensive treatment of all aspects of vancomycin and related glycopeptide antibiotics, including their discovery, isolation, purification, analysis, synthesis, mode of action, SAR, and microbial resistance, as well as the clinical application of these important compounds. While some of the chapters are somewhat brief, most of the chapters are complete, well referenced, and up-to-date.

The three weaker chapters are the ones on structure–activity relationships, mode of action, and analysis. The brevity of the chapter on SAR (22 pages/49 references) may be due to the proprietary nature of these compounds, but peptidoglycan biosynthesis could have been better presented, as well as the published D-Ala-D-Ala binding work of Dudley Williams, which was only referenced. The chapter on resistance and mode of action contained adequate citation but was still quite brief (21 pages/136 references). The chapter on analysis should have been combined with the chapter on purification. A discussion of the analysis of clinical samples was neglected, which would have been very useful to folks interested in monitoring serum levels of the drug.

The book contains two excellent chapters on synthesis which may together justify the price of the book. In a reflection of the existing social structure of synthetic chemistry, the synthesis of vancomycin is split into two chapters. Approaches to the synthesis of the aglycon portion of vancomycin is covered by David Evans and Kieth DeVries of Harvard University. This chapter (41 pages/109 references) focuses on methods for the synthesis of the novel α-amino β-hydroxy acid moieties in the vancomycins, but also includes various model studies which have been done and methods for biaryl and biaryl ether coupling. Synthesis of the unusual glycoside components was covered by Ferenc Sztaricskai and Istvàn Pelyvàs-Ferenczik of Lajos Kossuth University—one of the leading centers for carbohydrate chemistry. In an extremely comprehensive chapter (77 pages/204 references), the occurrence, isolation, and synthesis of the carbohydrate components of the various glycopeptides are described. The synthesis of the aminodeoxy sugars (vancosamine, daunosamine, ristosamine, etc.) is very well described.

The last chapter of the book (101 pages/783 references) is a clinical overview of the use of vancomycin, and analytical methods for serum analysis can probably be gleaned from the references to this chapter. There is a two-page epilog which contains references from 1992 to 1993, and the 11-page index is quite useful. In summary, this is a valuable text for anyone involved in the synthesis of these compounds and is a useful library addition.

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JA9451123

Transition Metal Chemistry. The Valence Shell in d-Block Chemistry. Edited by M. Gerloch (University Chemistry Lab, Cambridge, U.K.) and E. C. Constable (University of Basel, Switzerland). VCH: Weinheim, Germany. 1994. xi + 211 pp. DM58.00. ISBN 3-527-29219-5.

This book is an introduction to the structure of transition metal chemistry. By virtue of its nonmathematical and strongly visual approach to bonding, it provides an accessible text on the varied nature of the valence shell in d-block chemistry. Topics covered include the stability and reactivity of transition metals in their various oxidation states, spectroscopic and magnetic properties and their implications for chemical bonding in the transition metal series, and the changing roles of d electrons with respect to oxidation state. Additional details and special topics are discussed in boxed sections within the text. This book is useful for students and instructors alike with its nonmathematical account of key concepts and as a source of explanations and references to sources of further information.

JA955218D