Additions and Corrections

Synthesis and Characterization of the First Transition-Metal η^2-Disilene Complexes [*J. Am. Chem. Soc.* **1989**, *111*, 7667−7668]. ERIC K. PHAM AND ROBERT WEST*

On p 7668, column 1, line 9 should read "...24.32 ppm for **3a**...", line 15 should read "...1315 Hz for **3a**...", and line 17 should read "...149 Hz for **3a**...". In ref 10, the $^{31}P\{^1H\}$ and $^{29}Si\{^1H\}$ data for **3a** should be as follows: 59.36 ppm (s, $^1J_{Pt,P}$ = 1213 Hz) and 24.32 ppm (dd, $^2J_{P(cis),Si}$ = 13.6 Hz, $^2J_{P(trans),Si}$ = 149 Hz, $^1J_{Pt,Si}$ = 1315 Hz).

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Cross-Linkage by "Intact" Bizelesin and Bisalkylation by the "Separated Halves" of the Bizelesin Dimer: Contrasting Drug Manipulation of DNA Conformation (5′-TAATTA-3′) Directs Alkylation toward Different Adenine Targets [*J. Am. Chem. Soc.* **1996**, *118*, 5383−5395]. FREDERICK C. SEAMAN,* JIANXIONG CHU, AND LAURENCE HURLEY*

Page 5389: The following caption should have appeared with the color figure.

Figure 5. Stereoview and cross-connectivity diagram of the 10-mer bisadduct showing CPI-I cross-connectivity with duplex adenine H2 and deoxyribose H1′, H4′, H5′, and H5″ substituents for (A) the duplex region surrounding 5A-attached CPI-I and (B) the duplex region surrounding 8A-attached CPI-I. Colors are yellow (5-CPI-I and 8-CPI-I), green (adenine), red (thymine), magenta (deoxyribose and phosphate backbone), and white (selected hydrogens).

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Book Reviews *

Phosphorus: An Outline of Its Chemistry, Biochemistry and Technology, Fifth Edition, Studies in Inorganic Chemistry, #20. By D. E. C. Corbridge (University of Leeds). Elsevier: Amsterdam. 1995. 1220 pp. $514.75. ISBN 0-444-89307-5.

This book is a compendium of all known chemistry of the element phosphorus. The previous edition appeared in 1990. The chemistry of phosphorus is so vast that it is extremely difficult to compress the important material into a single volume. Nonetheless Corbridge has managed to do this while at the same time making the material quite readable. The scope of the book is very broad, ranging from the extraction of phosphate rock, to the role of palindromic sequences in DNA transcription, to metal complexes of P_x rings. The presentation includes a historical review, which is useful and not belabored, but emphasizes fundamental synthetic transformations, structures, properties, and applications.

The book is subdivided into 14 chapters based on the types of bonding (P−C, P−S, P−N, P−O, ...) and families of compounds (biopolymers, metalophosphorus compounds, ...). Each chapter is subdivided into sections which facilitate the use of the references. The previous edition provided references only to reviews and monographs, while this edition has numerous references to the primary literature. The references are to both recent and older literature; the author appears to be selective for the most prominent work, whatever its date of publication. The book consists of a typed, not type-set, manuscript with hand drawn figures and typed chemical formulas. While this primitive style of presentation is usually unappealing, it comes off well in this case and lends a little informality to the otherwise imposing tome. The crystallographic drawings are adequately reproduced. A few of the chemical formulas, especially of metal complexes, are incorrect, but the errors are simple typos and are not misleading.

The coverage appears complete, although it does not correlate with prevailing fashions. For example, asymmetric catalysis using chiral phosphines is covered in one page, far less than is dedicated to Graham's salt, $[NaPO_3]_n$, an ionomer whose chemistry is much less studied by academic scientists. Books like this are stimulating because they suggest research topics, often ones that were pursued many years ago, that merit renewed scrutiny.

This book would be useful to all researchers and technologists whose interests include the element phosphorus.

Thomas B. Rauchfuss, *The University of Illinois*

JA965522M

S0002-7863(96)05522-9

More than one mystery—Explorations in Quantum Interference. By M. P. Silverman (Trinity College, CT). Springer-Verlag: New York. 1995. xiv + 212 pp. $49.95. ISBN 0-387-94340-4.

Current theories and experiments in photochemistry and chemical physics are emphasizing the importance of coherence phenomena for controlling chemical reactions (see, for example, *Molecules in Laser Fields* Bandrauk, A. D., Ed.; M. Dekker Pub.: New York, 1993). Coherences are created by superpositions of quantum states, and these are therefore highly sensitive to the preparation from the initial state, the phase of the excitation mechanism, e.g., from a laser field, etc. As a chemical system evolves from an initial reactant state to a final product state, interferences develop whenever coherences exist. Controlling such interferences through manipulation of the coherences has been recognized as an important subject of scientific research in order to

*Unsigned book reviews are by the Book Review Editor.

achieve control of chemical reactions. Thus a good understanding of quantum intereference is an essential prerequisite for initiating any research project in this new area of chemical physics.

This book is an excellent pedagogical introduction to this subtle aspect of quantum mechanics. It can be followed easily by any graduate student with rudimentary knowledge of time-dependent quantum mechanics, as distinct from time-independent quantum chemistry. As the author is a physicist, chemistry appears only occasionally with superficial examples of molecules such as benzene. More time, in fact half the book which has six short chapters, is spent on fundamental physical problems such as the Bohm-Ahronov effect and gauge invariance. The second half of the book deals with subjects which should be of interest to the photochemical and chemical physics community, i.e., the physically measurable consequence of coherence in simple systems. The two-level system is treated completely, for example, in the rotating wave approximation and beyond. It is rightly emphasized that the application of an oscillating field to states already prepared in a coherent linear superposition permits one to determine the relative phase of different components of the initial state. This is not a complete measurement of the wave function, an issue which has raised recent controversy (see Unruh, W. G. *Phys. Rev.* **1994**, *A50*, 882). There is also an interesting section on interferences created by different fields of well-defined relative phase. This subject which is at the core of the Brumer−Shapiro scheme of coherent control of photochemical processes (see first reference above) seems to have been considered in atomic spectroscopy by N. Ramsey (1989 Physics Nobel Prize) as early as 1949. Again, Silverman emphasizes possible use of field-phase dependence of interferences in order to test gauge invariance.

The final chapter, The Quantum Physics of Handedness promises to enlighten one's understanding of chirality, an important subject in chemistry. A simple derivation is given of optical rotation as a mathematical rotation of an initially polarized photon by a field-induced perturbation, so that the final state is again a coherent superposition of photon quantum states. I would consider this chapter the weakest part of the book, as the mathematical complexity is raised quite a bit. Thus one is faced all of a sudden with creation−annihilation photon operators to explain optical rotation. There is no definition of the quantum electric and magnetic field states as coherent superpositions of photon states, and the relation of these to actual experimental fields. Again a physicist's viewpoint predominates. As an example the interesting statement is made that the eigenstates of enantiomers are not parity eigenstates. And yet optical activity is a parity conserving process. It follows therefore that any state prepared as a mixture of different parities, i.e., nonsymmetric states, will be optically active. Such nonparity states are readily prepared by current intense short pulses.

In the final analysis, this is a very pedagogical exposition of simple models and examples of quantum interferences. It can be recommended for advanced undergraduate and graduate students in chemistry who would like to know more about physicists' ideas of quantum interferences. However, such reading should be supplemented by an advanced quantum optics or nonlinear optics book in order to be able to follow the current chemical physics literature in the area of coherent control of chemical reactions.

André D. Bandrauk, *Université de Sherbrooke, Canada*

JA955246W

S0002-7863(95)05246-2

Modern Conformational Analysis. By Helena Dodziuk (Polish Academy of Sciences, Poland). VCH: New York. 1995. xii + 264 pp. $99.95. ISBN 1-56081-689-9.

This book, a volume in the series *Methods in Stereochemical Analysis* (edited by Alan P. Marchand), is devoted to novel trends in the conformational analysis of organic molecules. The book consists of 12 chapters, each of which contains an up-to-date reference list. In the first six chapters the basic concepts, definitions, experimental and theoretical methods, symmetry, chirality, and standard structures are presented with clarity. The coverage on physical methods (especially the three sections on nuclear magnetic resonance) is comprehensive and instructive. Where applicable, the complementarity of different physical methods is shown. In the next four chapters, new frontiers in organic chemistry involving unusual hydrocarbon structures (saturated compounds with strongly distorted bonds, atypical alkenes, cyclic cumulenes, nonlinear alkynes, cyclophanes, fullerenes, etc.), topological molecules (catenanes, dendrimers, etc.), and supramolecules (complexes from cyclodextrins, etc.) are reviewed. Bonding patterns in these molecules are discussed in sufficient detail. The chapters represent well-organized expositions on the formation, properties, and applications of these novel systems. The last two chapters touch upon molecular modeling and perspectives for future pharmaceutical, agricultural, and electronics applications. Overall the book is a concise overview on recent developments and is highly recommended to scientists in this field.

The unique feature of this book lies in the abundant use of novel structures as examples in every chapter. Most of these structures are symmetric and shown in kaleidoscopic splendor. The fascination of the author, a physicist, with the beauty and shape of molecules spills over onto the written page. Adding interest to the reading are lively comments, historical facts, and personal insights. Without a doubt this modern treatise on conformational analysis will inspire and excite undergraduate and graduate students of organic chemistry.

Alice Chung-Phillips, *Miami University*

JA955383T

S0002-7863(95)05383-2

Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds, Vol. IV. Heterocyclic Compounds. Edited by M. F. Ansell (Queen Mary College). Elsevier: Amsterdam. 1995. xviii + 302 pp. $218.75. ISBN 0-444-82260-7.

Part I, Six-Membered Heterocyclic Compounds with Two Hetero-Atoms from Group V of the Periodic Table: the Pyridazine and Pyrimidine Groups. Part J, Six-Membered Heterocyclic Compounds with Two Hetero-Atoms from Group V of the Periodic Table: the Pyrazine Group, Phenoxazine, Phenothiazine, Phenazine and Sulphur Dyes, Six-Membered Heterocyclic Compounds with Three or more Hetero-Atoms. Chapter 42. Pyridazines, Cinnolines, Benzocinnolines and Phthalazines by J. Parrick, C. J. Granvill Shaw, and L. K. Mehta. Chapter 43. Pyrimidines and Quinazolines by D. T. Hurst. Chapter 44. Pyrazines and Related Strutures by K. J. McCullough. Chapter 45. Phenazine, Oxazine, Thiazine and Sulphur Dyes by G. Hallas and A. D. Towns. Chapter 46. Quinazoline Alkaloids by S. Johne. Chapter 47. Six-Membered Rings with Three or More Hetero-Atoms by R. N. Butler and D. F. O'Shea.

This new volume of "Rodd" continues to be a major service to organic chemistry, since it collects very specialized aromatic and heteroaromatic chemistry into a single and palatable formate. 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 virtually impossible, they should be a standard component of any good organic chemical library.

Philip D. Magnus, *The University of Texas at Austin*

JA9655350

S0002-7863(96)05535-7

Biosensor and Chemical Sensor Technology: Process Monitoring and Control. Edited by Kim R. Rogers (US-EPA), Ashok Mulchandani (University of California−Riverside), and Weichang Zhou (Merck Research Laboratory). ACS: Washington, DC. 1995. xii + 197 pp. $52.95. ISBN 0-8412-3330-6.

This book was developed from two symposia sponsored by the Division of Biochemical Technology and the Biochemical Secretariat at the 209th National Meeting of the American Chemical Society, Anaheim, CA, April 2−6, 1995. The scope of the book is the discussion of the use of chemical sensors and biosensors for process and environmental monitoring and for medical applications. The information presents advances in enzyme- and antibody-based biosensors, including enzyme electrodes and optical immunosensors. There is a discussion of the advances in acoustic, optical, and electrochemical biosensors. A description of on-line and off-line monitoring techniques for the fermentation process is also included. There are 16 chapters and author, affiliation, and subject indexes.

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