Biomimetic Polyene Cyclizations. A Comparison of the Phenylacetylenic and Styryl Terminators in Influencing the Stereoselectivity of Processes Leading to Steroidal Products [*J. Am. Chem. Soc.*, **101**, 1281 (1979)]. By WILLIAM S. JOHNSON,* LESLIE R. HUGHES, and JANET L. CARLSON, Department of Chemistry, Stanford University, Stanford, California 94305.

Page 1282: Reference 13 should read: The allylic alcohol $CH_2{=}C(CH_3)CH(OH)(CH_2)_2C{\equiv}CC_6H_5$ (substance **6** of ref 1a) was oxidized with Jones reagent and the resulting α,β-unsaturated ketone was then reduced with lithium aluminum deuteride. The product was converted (via the orthoacetate Claisen reaction) into deuterio-**9** of ref 1a (label at *pro* C-14) which was then employed in a sequence analogous to that shown in Scheme II of ref 1a.

Cyclization of Olefinic Tosylhydrazones under Acidic Conditions. A Facile Synthesis of Bicyclic Azo Compounds [*J. Am. Chem. Soc.*, **101**, 4005 (1979)]. By R. MARSHALL WILSON* and JOHN W. REKERS, Department of Chemistry, University of Cincinnati, Cincinnati, Ohio 45221.

Page 4007: The following paragraph should be added before "Reference and Notes".

Supplementary Material Available: Detailed experimental procedures are available for the preparations of 1,5-dimethyl-6,7-diazabicyclo[3.2.1]oct-6-ene and 1,4-dimethyl-2,3-diazobicyclo[2.2.1]hept-2-ene (2 pages). Ordering information is given on any current masthead page.

Book Reviews

General and Synthetic Methods. Volume 1. Senior Reporter: G. PATTENDEN (University of Nottingham). The Chemical Society, London. 1978. xiii + 445 pp. $60.00.

This survey of the literature of organic synthesis, covering primarily 1976, inaugurates a new series within the Specialist Periodical Reports. The material is divided into ten chapters: saturated and unsaturated acyclic hydrocarbons; aldehydes and ketones; carboxylic acids and derivatives; alcohols, halogeno compounds and ethers; amines, nitriles, and other nitrogen-containing functional groups; saturated heterocyclic ring synthesis; saturated carbocyclic ring synthesis; organometallics in synthesis; strategy and design in synthesis; phase transfer and related methods. A bibliography of reviews of general synthetic methods is also included.

Chemists acquainted with other Specialist Periodical Reports will find the format of this volume familiar. About half of the space is taken up by structural formulas, which illustrate much of the text and can be scanned easily. Careful editing has avoided errors and unnecessary duplication, and many cross references are provided. An author citation index (but no subject index) is included. The contributors have of necessity confined themselves to discussing potentially general synthetic methods, and have done an admirable job of producing a handy reference work for the busy practicing chemist.

Keith T. Buck, *Fries & Fries, Inc.*

Advances in Infrared and Raman Spectroscopy. Volume 4. Edited by R. J. H. CLARK (University College, London) and R. E. HESTER (University of York). Heyden & Son Inc., Philadelphia, Pa. 1978. xv + 353 pp. $44.00.

As readers of previous volumes in this series will realize, it has already provided a number of very interesting reviews of the techniques in infrared and Raman spectroscopy. The editors state that they intend for the series to be firmly technique-oriented, and to review areas where there has been or is expected to be recent progress. The subjects covered have been evenly divided between infrared and Raman spectroscopy, and they are written on a level that begins at the beginning and progresses to the frontiers. As such, they are often ideal sources for graduate students and teachers, and for any chemical spectroscopist who wishes to become acquainted with a new branch of his field. Although the subjects are current and exciting, the reviews are on classical chemical spectroscopy (as opposed to "physical" spectroscopy) and have not covered exotic new subjects such as laser spectroscopy. The reviews emphasize experimental aspects, but enough theory is covered to provide understanding, and the theory has in general been easy for chemists to follow. This volume is a worthy continuation of this excellent series.

The chemical nature of the series is emphasized in the first chapter of this volume, "Vibrational Spectroscopy of Free Radicals" by R. E. Hester, which discusses large, stable, organic species in solution [such as phenylenediamine radical cation, tetracyanoethylene ($TCNE^{-}\cdot$), and tetracyanoquinone ($TCNQ^{-}\cdot$) radical anions], and is not a review of laser spectroscopy of short-lived gas-phase radicals. Nevertheless, this chapter is an interesting review of spectra (characteristic frequencies and experimental techniques) from these important but less common species.

A particular highlight of this volume is the long-awaited review on the measurement of optical constants in the infrared by attenuated total reflectance by B. Crawford, Jr., T. G. Goplen, and D. Swanson. This very well-written review summarizes the theory and experimental methods, accompanied by some beautiful illustrative figures of data. Unfortunately, like most of these reviews, space does not allow for any illustrative interpretation. A short review follows on infrared emission by P. V. Huong. This review is of "classical" emission studies (no lasers) from heated materials (mostly solids and liquids) in furnaces.

A long review of J. H. R. Clarke provides an excellent introduction to the theoretical and experimental studies (infrared and Raman) of band shapes and molecular dynamics in liquids. This chapter is one of the best introductions to this subject that this reviewer has seen and is recommended before embarking on any stuly of the literature in this field.

Another long chapter by G. Vergoten, G. Fleury, and Y. Moschetto reviews low-frequency spectral data (mostly Raman but some infrared) from very large molecules of biological interest, emphasizing the "accordian-like" motions and the remarkable amount of structural information they provide. The volume closes with another excellent short review (strongly emphasizing theory) of Raman optical activity by L. D. Barron.

In summary, this volume is an excellent introduction to several interesting topics and continues in the tradition of this excellent series. It is clearly one of several such recently published books that belong in the library of every practicing chemical spectroscopist who can afford it.

Willis B. Person, *University of Florida*

Potentiometric Water Analysis. By DEREK MIDGLEY and KENNETH TORRANCE (Central Electric Research Laboratories, England). John Wiley & Sons, New York. 1978. xi + 409 pp. $42.00.

I am an analytical chemist and geochemist with a strong, practical interest in the analysis of water. I wanted to review this book to see if I could learn a bit more about the practical aspects of the electrochemical analysis of water. The design and contents of this book provided this in an excellent manner. Most instrumental analysis texts explain the theory behind the methods but do not have the space to analyze the practical aspects of applying the analysis to a real system. Consequently, there is a need for monographs which develop the

practice of a method in sufficient detail that a chemist can assess the advantages and disadvantages of that technique and be forewarned on what to expect if that method is put into practice. I have felt that the need for such information is particularly acute in the area of specific ion electrodes. Midgley and Torrance fill this need for practical information by dividing their book into two sections. Part I is 131 pages of background information in which the overview is a blend of theory and practice. Part II is 271 pages of specific methods and tables related to the methods. Further explanation of the two parts follows.

Measuring the pH of a water sample is not easy. Teachers expect some students to fail in their attempts to operate a pH meter. In the background discussion of Part I, the authors explain in simple terms, using Ohm's law, why the measurement of a cell potential is difficult in Chapter 2 on Electrochemical Principles. With this explanation in hand, they devote the succeeding chapters to electrodes, equipment, analytical principles, titrations, and analytical practice. Within this Part I, I found the section explaining the electrochemical theory of how various membrane electrodes operate to be particularly well written. The compositions of most solid-state membranes and the solutions used in many liquid ion exchange electrodes are listed. Many of the equilibria in the electrodes are explained. Of a practical nature, the design and construction of reference electrodes and flow-through cells, and the conditioning and storage of electrodes are nicely explained. Of particular interest to industrial chemists is the discussion throughout Part I of the application of potentiometric analyses to industrial situations.

In Part II, the specific methods are given. The organization is roughly by electrode function with the categories being pH by glass electrodes, cations by solid-state membranes and liquid ion-exchange electrodes, gas-sensing membrane electrodes, and anions by solid-state membranes and liquid ion-exchange electrodes. In each category, there are two or three methods completely explained so that comparable methods using similar electrodes could be compared. For example, for liquid ion-exchange electrodes complete methods are given for Ca^{2+} NO_3^-, and water hardness. For each method there is a section on apparatus, reagents, analytical procedure, sources of error, precision, accuracy, response time, electrode specifics, and comparison with other methods. In other words, the explanation is complete enough to be able to read the section and easily perform the analysis. Of special merit is the step-by-step nature of the analytical procedure and a worked example of an actual analysis. Also, the honesty of the authors is exemplary. In the Pb method, they state "the electrode is sufficiently subject to interferences, however, for atomic absorption or colorimetric methods to be generally preferred for total lead determinations." This type of objectivity is found throughout the book.

I find few faults with the book. They mostly concern omissions. A section on dissolved oxygen methods is not included; neither is a section on the measurement of oxidation potential using inert metal electrodes. These, I feel, fall within the realm of potentiometric analysis of water. The measurement of conductivity of water cannot strictly be called a potentiometric method, but it is used enough that its inclusion in the book would be useful. In the chapter on apparatus there is little discussion of how good a specific ion meter is needed for routine measurements. This would be most useful to the novice who is trying to choose an instrument from among the myriad of pH meters on the market. Most of these omissions are biases on my part and do not detract from the excellent book Midgely and Torrance wrote.

Thomas R. Wildeman, *Colorado School of Mines*

Excited States in Organic Chemistry and Biochemistry. Edited by BERNARD PULLMAN (Université Pierre et Marie Curie) and NATAN GOLDBLUM (The Hebrew University). D. Reidel Publishing Co., Dordrecht (Holland) and Boston. 1977. xiii + 448 pp. $39.50.

This is a compilation of 37 contributions from the participants of the Tenth Jerusalem Symposium on Quantum Chemistry and Biochemistry, held in Israel in March of 1977.

The contributions cover a particularly broad spectrum of subject matter, making it difficult to evaluate or describe the entire book simply. Many of the articles, though diverse in scope, were of special interest to the reviewer. One example is an excellent article by Jacques Joussot-Dubien on experimental and theoretical aspects of excited-state twisting of cycloalkenes. The chapter by Mordecai Rubin on polyketone photochemistry was interesting although brief. Franz deSchryver's article on bichromophoric dianthracene derivative photophysics is impressive. Joseph Michl's chapter dealing with upper excited state photochemistry is also superb. Lionel Salem deals nicely with the sudden polarization effect. Ernst Lippert has an excellent article on some adiabatic reactions. Urs Wild's article on upper singlet fluorescence is well done. These are typically photochemical and representative of the excellence of the compilation. The choice of these articles for special mention is somewhat arbitrary, since the remaining articles are generally of equal caliber.

In addition to papers on basic photochemistry there are contributions on the excited behavior of biologically active systems. These papers, too, seem well done.

The type seems to be of the photo-offset variety. For most papers it is excellent, but in several instances the quality of the typing is less than ideal. Almost all the drawings are professionally done; only in one instance do poorly done hand drawings and equations mar the situation.

The index also is poorly done. Any reviewer's natural inclination is to look for his name in the index. Upon doing so, this reviewer found his name cited in places in the text but not always in the index.

There is some discussion of papers included but not all papers seem to have such discussion.

This is a book which definitely is of value on library shelves. The reviewer finds having a copy for his own use worthwhile. On the other hand, a considerable portion is to be found elsewhere in the literature in separate publications as one might expect.

In summary, the book is a worthwhile contribution.

Howard E. Zimmerman, *The University of Wisconsin-Madison*

Nuclear Magnetic Resonance Spectroscopy of Boron Compounds (in **NMR 14. Basic Principles and Progress**). By HEINRICH NÖTH and BERND WRACKMEYER (Universität München). Edited by P. DIEHL, E. F. FLUCK, and R. KOSFELD. Springer-Verlag, New York. 1978. x + 461 pp. $81.00.

The authors have tried to collect all the ^{11}B NMR data for compounds having boron atoms of coordination numbers 2, 3, and 4. The literature is covered through approximately May 1977. Although it is unlikely that the literature coverage is complete, it appears to have no glaring omissions. The 200 pages of tables are preceded by 100 pages of useful and enlightening discussion of topics such as chemical shifts, coupling constants, empirical correlations, theory, and particularly illustrative compounds with two-, three-, and four-coordinate boron. The tables are conveniently organized according to structural classifications in addition to coordination number. This should allow the chemist easily to find molecules analogous to new species and/or make valuable structural correlations. The book will be a welcome addition to the practicing chemist's library.

Ralph W. Rudolph, *University of Michigan*

Inorganic Synthesis. Volume XVII. Edited by ALAN G. MACDIARMID (University of Pennsylvania). McGraw-Hill Book Co., New York. 1978. xii + 223 pp. $23.95.

Volume XVIII of "Inorganic Synthesis" continues the fine tradition of this series by providing a variety of detailed and tested syntheses. The areas emphasized in this volume include Main Group Hydrides (emphasis on hydridozincates, hydroborates, boranes, and hydridogallates) and Transition Metal Hydrides (emphasis on Mo, Re, Fe, Ru, Ni, and Pd complexes). The organometallic area includes carbonyl, phosphine, olefin, and related complexes (emphasis on Cr, Mo, W, Fe, Re, Ni, Ru, Rh, Pd, and Pt chemistry).

Iron(II) and cobalt(III) clathro chelates derived from dioximes are presented along with selected (oxalato) chromates and pentaamine(carbonato) complexes of Co, Rh, and Ir. Main group compounds include several boranes, silanes, phosphines, and an important note regarding the storage and handling of S_4N_4.

As usual, this volume will prove valuable to the synthetic inorganic chemist interested in the compounds described.

Ralph W. Rudolph, *University of Michigan*