Table II. Secondary Amides, RCONHR′

R	R′	Yield of RCOSH	Yield of R′N=C=S
C_6H_5	C_6H_5	85	93[c]
C_6H_5	1-Naphthyl	91	95[d]
$C_6H_5CH_2$	*p*-$CH_3C_6H_4$	61	65[e]
$C_6H_5CH_2$	CH_3CH_2	70	*f*
CH_3	C_6H_5	85[a]	90[c]
CH_3	1-Naphthyl	85[a]	71
$CH_3(CH_2)_{10}$	CH_3	40	*f*
5-Norbornene-2-carboxylic acid 5-Norbornenyl (?)	1-Naphthyl	60[b]	65

[a] Isolated diacetyl disulfide, bp 110° (20 mm). [b] The thiol acid polymerizes rapidly in air presumably by addition of the –SH group to the double bond. [c] Isolated as thiocarbanilide, mp 154°. [d] Isolated after hydrolysis with hydrochloric acid as 1-naphthylamine hydrochloride. [e] Isolated as *N*-phenyl-*N*′-*p*-tolylthiourea, mp 141°. [f] Not isolated.

of the amide is added. After the evolution of hydrogen is finished, the mixture is cooled in ice and water, and with stirring 5.9 g (75 mmol, 50% excess) of carbon disulfide is added slowly. The mixture is stirred at room temperature for 20 min (if the isothiocyanate is to be trapped as a thiourea the excess of carbon disulfide has to be removed by evaporation *in vacuo* at this stage). The reaction is decomposed by addition of 40 ml of ice water followed by 40 ml of concentrated hydrochloric acid, the benzene is separated and the aqueous phase extracted with benzene. From the benzene the thiol acid is extracted by 5% sodium hydroxide.

For the primary amide a double amount of sodium hydride is employed. Thiocyanate anion was shown to be present in the aqueous solution. From all the new compounds adequate analyses were obtained. Experiments on the application of this reaction to the breaking of the amide bond in amino acid derivatives and peptides are in progress.

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*Book Reviews**

Determination of Organic Structures by Physical Methods. Volumes 3 and 4. Edited by F. C. NACHOD (Sterling-Winthrop Research Institute) and J. J. ZUCKERMAN (SUNY Albany). Academic Press, New York, N. Y. 1971. Volume 3: xv + 472 pp. $22.50. Volume 4: xiii + 381 pp. $19.50.

The editors refer to the first two volumes of this series, which appeared earlier, as dealing with methods that "are now considered classic." These two volumes, and another yet to appear, are intended to bring the coverage up to date by including newer methods.

Volume 3 contains chapters on Photoelectron Spectroscopy (Brundle and Robin), X-Ray Diffraction (Stewart and Hall), Optical Rotatory Dispersion and Circular Dichroism (Crabbé), Thermochemistry (Wiberg), Mass Spectrometry (Williams), Electron-Spin Resonance (Russel), and Configuration and Conformation by NMR (Anet and Anet). Volume 4 covers Applications of High-Field NMR (Naegele), Pulsed NMR Methods (Boden), Nuclear Magnetic Double Resonance (McFarlane), ^{15}N NMR (Lichter), NMR Spectra of the Heavier Elements (Wells), ^{13}C NMR (Pregosin and Randall), and ^{31}P NMR (Van Wazer). Each chapter is a good review and includes introduction, theory, methods, and applications, plus extensive references. The contributing authors are obviously well chosen. Each volume has its own author and subject indexes.

Organic Functional Group Preparations. Volume III. By S. R. SANDLER (The Borden Chemical Co.) and W. KARO. Academic Press, New York, N. Y. 1972. xiii + 496 pp. $24.50.

Thirteen functional groups are covered in this volume: acetals and ketals; anhydrides; monoalkyl sulfates; sulfenic acids and derivatives; isocyanides; amidines; imides; imidates; nitrones; hydroxylamines; oximes; hydroxamic acids; and thiohydroxamic acids. As in earlier volumes, each chapter contains succinct procedures for a large number of representative examples. The selection of preparative reactions to discuss and exemplify is conservative, in that only well-established methods have been chosen. Other methods are then simply listed. Everything is well documented, and each chapter has about a hundred references. One can always differ with the selections made by the authors, but mistakes seem to be few. One minor one occurs in the chapter on hydroxylamines, wherein the reaction of Grignard reagents, RMgX, with alkyl nitrates, $RONO_2$, is stated to give the mixed compound, RR′NOH, instead of that derived only from the alkyl of the Grignard reagent: R_2NOH. The coverage extends through 1971.

The Purines—Theory and Experiment. Volume IV of the Jerusalem Symposia on Quantum Chemistry and Biochemistry. Edited by E. D. BERGMANN (The Hebrew University) and B. PULLMAN (Université de Paris). Academic Press, New York, N. Y. The Israel Academy of Sciences, Jerusalem. 1972. iv + 614 pp. $29.00.

The proceedings of an international symposium, held in April 1971, are collected in this volume. They consist of the texts of the papers, averaging about ten pages each, and including tables, figures, references, and the discussions on the floor (mercifully edited). The entire text is in English.

New Journals

Synthesis. International Journal of Methods in Synthetic Organic Chemistry. Edited by G. SCHILL, G. SOSNOVSKY, and H. J. ZIEGLER. Academic Press, New York, N. Y. Vol. 1, No. 1, Jan 1972. $42.00 plus postage per year.

Includes reviews, communications, and abstracts.

Bibliographies of Chemists. Edited by H. B. LEWIS and N. KHARASCH. Gordon and Breach, Science Publishers, Inc., New York, N. Y. Vol. 1, No. 1, 1971. $36.00 per volume.

Contains chronological lists of publications, including titles of articles, of selected leading chemists from universities and industry.

Polymeric Materials, International Journal of. Edited by H. S. KAUFMAN. Gordon and Breach, Science Publishers, Inc., New York, N. Y. Vol. 1, No. 1, 1971. $47.00 per volume to libraries; $17.00 per volume to individuals.

Devoted to papers concerned with the relation of chemical structure, origin, and properties to engineering properties.

Environmental Analytical Chemistry. Edited by R. W. FREI. Gordon and Breach, Science Publishers, Inc., New York, N. Y. Vol. 1, No. 1, 1972. $41.50 per volume to libraries; $14.50 per volume to individuals.

Separation and Purification Methods. Edited by E. S. PERRY

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* Unsigned book reviews are by the Book Review Editor.

and C. J. VAN OSS. Marcel Dekker, Inc., New York, N. Y. Vol. 1, No. 1, 1972. $19.50 per volume (two issues).

A continuation of the series Progress in Separation and Purification (1968–1971).

Biological Applications of Electron Spin Resonance. Edited by H. M. SWARTZ, J. R. BOLTON, and D. C. BORG. John Wiley & Sons, Inc., New York, N. Y. 1972. x + 569 pp. $27.50.

This text consists of eleven chapters contributed by the editors and six other authors. The authors stated purpose is to present both problems and possibilities with respect to the applications of electron spin resonance (esr) to problems in the biological sciences. In this reviewer's opinion, they have succeeded beyond their expectations, as this text not only fills a missing gap but does it in an outstanding manner as well.

The first three chapters deal with the theoretical introduction to esr and the experimental expertise necessary for the appropriate experiments. These chapters are quite lucid in their presentation and are a pleasure to read after one is used to extensive literature searches. The theoretical section is well done, and the reader is properly recommended to other texts for a more exhaustive treatment, if necessary. Chapters 2 and 3 contain much useful information previously buried in the literature, and this alone makes the text quite valuable.

Chapters 4 and 5 are concerned with cell and tissue studies. As is the case throughout the text, the authors of these chapters pay much attention to detail and the various artifacts that arise.

Chapter 6 is an interesting account of the esr contributions to photosynthesis, while Chapter 7 deals with free radicals from enzymes, quinones, vitamins, drugs, and various other biological agents. Chapter 8 is Beinert's coverage of flavins and flavoproteins including iron sulfur proteins. This latter area is one in which esr is best coupled with other types of spectroscopic techniques, as is indicated by the author.

Chapter 9 deals with copper proteins and contains an excellent discussion of the interaction of the copper(II) ion with its environment. Enzymes of particular interest include the amine oxidases and cytochrome oxidase.

Chapter 10 discusses esr studies in radiation biology in terms of what can be studied. As is indicated therein, the reader is provided only with an introduction to this broad subject and would do well to read elsewhere for both details and general literature coverage.

Chapter 11 provides an introduction to the spin label technique devised by McConnell and his coworkers. This technique has many uses such as in the study of membranes, enzymes, and antibody–antigen reactions, and thus promises to be an extremely valuable tool in the years to come. Finally, the book is provided with an author and subject index.

In summary, this book is highly recommended to those biological scientists interested in physical methods, as well as to those esr investigators interested in pursuing biological problems.

W. R. Carper, *Wichita State University*

Techniques of Electrochemistry. Volume 1. Edited by E. YEAGER (Case Western Reserve University) and A. J. SALKIND (Rutgers Medical School). John Wiley & Sons, Inc., New York, N. Y. 1972. ix + 581 pp. $27.95.

The five chapters of this book, each a separate contribution by one or two experts, are arranged and organized to give the work an excellent overall coherence. The book starts with the basic principles of electrode potentials and cell emf and ends with more or less detailed discussion of some of the more advanced and highly sophisticated special techniques used in the study of electrode processes and electrosorption. The broad scope of well-established experimental electrochemical procedures is covered to include developments up to about 1969. This book can be unreservedly recommended for the practicing specialist looking for a review of basic techniques. Also, noting the authors' claim that the book has been written "at a level that non-specialists can understand," much of it can be recommended as reference material in a teaching curriculum, particularly at the graduate level, providing the term "non-specialist" is not too freely interpreted. The content of the first chapter, and to some extent the second, can be recommended as well for the senior undergraduate student with the necessary background in thermodynamics and electrochemical theory. Each chapter ends with an extensive list of references to original papers, most of fairly recent date. Only a few relatively minor typographical errors were noted.

Chapter 1 is a lucid and very readable account under the title "Measurement of Reversible Electrode Potentials." It is concerned generally with the basic theory of electrode potentials and electrochemical cells as well as with the techniques of measurement. A brief discussion of nonaqueous media is included. Chapter 2, equally lucid and readable, is entitled "The Study of the Ionic Double Layer and Adsorption Phenomena." It deals with basic double-layer theory and with electrocapillary and other experimental methods applicable to double-layer studies, and also with the effects of adsorption of various substances from solution, especially on the mercury electrode. The three remaining chapters, all well written but far from light bedside reading for the "nonspecialist," take up about 75% of the book. The discussion concentrates on the power and scope of modern experimental techniques appropriate to the field. Chapter 3, on "Overpotential Measurements," begins with a section on electrode kinetics and then concentrates on various experimental measurements relating to electrode overpotential under steady-state and nonsteady-state conditions. Chapter 4 on "The Measurement of Surface Area and Porosity" deals essentially with adsorption on solid surfaces, much of the discussion being concerned necessarily with the adsorption of gases. Chapter 5 on "Special Techniques in the Study of Electrode Processes and Electrochemical Adsorption" deals with the principles of some special techniques including ellipsometry, X-ray diffraction, and radiotracer and other methods for the study of adsorption.

The section in Chapter 1 on "Conventions for Electromotive Force and Electrode Potentials" is a small and relatively minor part of this book, but it brings up a question that should have a place in the open forum of published opinion. Is it necessary for authors of books to perpetuate the IUPAC definitions and sign conventions adopted in Stockholm in 1953? The beginning student, particularly, should be spared the interminable difficulty with the highly arbitrary "left" and "right" electrodes, and the corresponding awkwardness of an electrode potential "defined as the emf of a cell in which the electrode on the left is a standard hydrogen electrode and that on the right is the electrode in question." To begin with, a potential is not an emf. Therefore, why not stick to the highly appropriate concepts of oxidation and reduction potentials, and why not define electrode potential simply as a tendency of the electrode to oxidize (oxidation potential) or to reduce (reduction potential), relative of course to some convenient reference because the absolute value of such a potential cannot be defined? The greater this tendency, the more positive or less negative the potential. Moreover, since the equation relating a cell emf to the electrical work done by the cell, and to the change in free energy of the system, is usually written as $nFE = w = -\Delta G$, then why not state, simply, that the emf is positive if the cell reaction is spontaneous (galvanic) and negative if the reaction is driven (electrolytic)? The question of right and left electrodes does not arise, and it will make no difference how one writes the cell schematic. The point here is that these two sign conventions, one for electrode potential and the other for cell emf, arise from two basically different and unrelated sources, one from a natural tendency to consider the terms *greater* and *more positive* to be synonymous and the other from customary thermodynamic usage. (A third sign convention applies to electrode polarity in a cell. It arises from still another distinct source unrelated to the first two, *viz.* the arbitrary convention that assigns a negative charge to the electron, *i.e.*, that amber rubbed with cat's fur becomes negatively charged.)

Another point. Why do authors continue to call the potential difference across a liquid–liquid phase boundary a liquid-junction potential? Would not the term liquid-junction emf be more appropriate?

One significant error and possible source of confusion in Chapter 1 should be noted. In equation 11 (p 10), E is the cell emf corresponding to the overall cell reaction given in equation 7. It is not an electrode potential as stated in the next paragraph.

A. J. Sukava, *University of Western Ontario*

Molecular Reactions and Photochemistry. By C. H. DEPUY (University of Colorado) and O. L. CHAPMAN (Iowa State University). Prentice-Hall, Inc., Englewood Cliffs, N. J. 1972. x + 150 pp. $10.95 (cloth), $5.95 (paper).

This nice little book is one of the latest in Prentice-Hall's "Foundations of Modern Organic Chemistry Series." In seven chapters it succinctly differentiates thermal and photochemical activation; describes the most important concerted thermal rearrangement and elimination reactions; outlines photophysics; describes the most common photochemical reactions; exemplifies the methods unique to photochemistry of determining reaction mechanisms; and presents (in 64 pages) explanations of orbital symmetry control in electrocyclic, sigmatropic, and cycloaddition reactions. Enough experimental variation is presented for most of the reactions discussed so that the basis for each currently accepted mechanism is clear. The book is gratifyingly free of errors and of ideosyncratic quirks. (The only error I noticed which might confuse a student is on p 67, where Table 4.2 lists pK_a values for naphthylamine instead of for naphthylammonium ion.)

This book was designed to be a supplement to an undergraduate organic chemistry course and meets that goal admirably. The writing is simple and lucid throughout and is keyed to the assumption that the reader understands the basic concepts and facts of organic chemistry.

In my (probably slightly prejudiced) opinion, studies of photochemical and concerted reactions have become so important to organic chemistry in the past decade that they should be covered in an undergraduate organic course on the same intellectual level traditionally reserved for "older" reactions. Since none of the most widely used textbooks currently cover these topics adequately, I certainly can recommend that teachers who share my opinion adopt this book as required supplemental reading. Those many teachers who, in choosing among topics, decide not to formally present these topics certainly should consider suggesting this book as supplemental reading. Undergraduate and beginning graduate students who have not been formally exposed to these topics will find this book to be a most useful introduction.

Peter J. Wagner, *Michigan State University*

Residue Reviews. By F. A. Gunther (University of California, Riverside). Springer-Verlag, New York–Heidelberg–Berlin. 1972. Volume 42: vii + 182 pp. $14.80. Volume 43: vii + 149 pp. $14.20.

Volumes 42 and 43 of "Residue Reviews" represent the continued successful efforts of the editor to "provide concise, critical reviews of timely advances, philosophy, and significant areas of accomplished or needed endeavor in the total field of residues." These two volumes, as all previous volumes, contain invited papers and specially commissioned reviews.

Volume 42 covers a variety of subjects. Carbamate pesticides and their metabolism is covered by A. Schlagbauer and B. Schlagbauer with a two-part literature survey listing over 300 references through 1971. A timely and informative review by J. G. Saha reports on the "Significance of Mercury in the Environment." Additional papers report on the status of pesticide use and legislation in Norway and Egypt. This reviewer must inject a note of caution to the reader where articles on pesticide legislation are concerned. Pesticide legislation and regulatory requirements are undergoing major changes throughout many countries of the world. Publication delays of one or two years may create out-dated information by press time.

Two of the four articles in Volume 43 relate to the herbicides chlorthiamid and dichlobenil. These papers review the work reported on residues in crops, soils, and animals with special emphasis on the fate of dichlobenil in plants and soil. An up-dated review by D. Bull on the metabolism of organophosphorus insecticides notes the need for continued effort in defining different metabolic reactions involved with this class of pesticides. The review covers a 20-year period.

The extension of enzyme inhibition techniques to the detection of enzyme-inhibiting pesticides on thin layer chromatograms was reviewed by C. Mendoza. The author reviews the principles and specifies merits and limitations in the application of the technique. The procedures described are best suited for residue screening and for confirmation of more specific quantitative methods.

Robert A. Conkin, *Monsanto Commercial Products Company*

Air Pollution. By W. L. Faith and Arthur A. Atkisson, Jr (University of Texas). Wiley-Interscience Publishers, New York–London–Sydney–Toronto. 1972. viii + 393 pp.

The authors have done a service to the study of environmental matters by bringing up to date their valuable first edition. Environmental topics have become so popular that the number of publications in this field has proliferated so rapidly that it is practically impossible to keep up with developments in the field. The nonexpert is bombarded with contradictory statements in the press, and other highly colored and emotional publications which contain more zeal than facts, and no wonder he is confused.

The book by Faith and Atkisson serves the students, the experts, and the interested laymen in sorting out the knowledge in the air pollution field, and a carefully chosen literature survey will direct the reader to further detailed accounts. In addition to extensions in the chapters on the chemistry and physics of the atmosphere, we find up-to-date accounts on photochemical smog and its control. The chapter on control of stationary and mobile sources (mostly automobiles) gives a well-rounded picture of the progress in control and some of the difficulties which are to be expected in the future. The chapter on ambient air quality standards and the derived emission standards should be quite useful to the average reader who in the past has often been confused by government edicts.

The new edition has been enriched by a discussion on social, economic, and legal aspects of environmental management. Recent years have brought home the fact that the environmental problems associated with the increased population in our urban areas cannot be solved by technology alone. The material presented in the chapters on "Social Origins of Air Pollution," "Air Quality Management," and "Organization and Operation of Air Pollution Agencies" will prove quite useful for anyone who has to cope with the modern air pollution syndrome. These chapters, written by old hands in these fields, offer interesting study material to the environmental engineering student as well as the professional in the field.

The text is clearly the result of many years of experience of the authors in problems of research, engineering, and administration and can be highly recommended as a textbook in the study of environmental engineering subjects as well as a ready reference book for the practioner.

A. J. Haagen-Smit, *California Institute of Technology*

Boranes in Organic Chemistry. By H. C. Brown (Purdue University). Cornell University Press, Ithaca, N. Y. 1972. x + 459 pp. $24.50

The content of Professor Brown's published Baker Lectures is much more important and far reaching than the simple title of the volume implies. While Professor Brown has previously reviewed, at length, the usefulness of the hydroboration reaction, the present volume presents the most recent review of the subject and stands as a novel exposition of chemical sociology and research strategy.

During the past few years we have observed a general degradation of research funding and the onset of an intellectual malaise which deemphasizes the importance of chemistry. While this reviewer does not wish to editorialize on the subject, Professor Brown has illustrated by way of example the fact that a perceptive and ambitious young chemist can prosper if he applies sufficient dedication and adaptibility to chemistry. Professor Brown's career is clearly delineated in this volume beginning with his early days as a student (during the Great Depression) and his achievements as we know them today. While this close examination of one successful career alone is not enough to instill total confidence in the future of chemistry in so-called "hard times," it should be remembered that Professor Brown's early problems were not unique to him in the 1930's and 1940's.

The chemical topics discussed in the book are clearly presented in essentially chronological order beginning with the author's early studies of free radical chemistry, steric strains, the polemical nonclassical ion problem, selective reductions, hydroboration, and finally organoboranes themselves. Each subject is embellished by a myriad of personal events which served to motivate and channel Professor Brown's chemical career to its present status. This is solid chemical reading enhanced with humor and, above all, the strategy employed in accomplishing important chemical research. This reviewer heartily recommends this book as therapy for the many disenchanted students, teachers, and professionals, alike. Indeed, "Tall oaks from little acorns grow" or, when all else fails, innovate!

M. Frederick Hawthorne, *University of California—Los Angeles*

Organometallic Reactions. Volumes 3 and 4. Edited by E. I. Becker (University of Massachusetts—Boston) and M. Tsutsui (Texas A&M). Wiley-Interscience, New York, N. Y. 1972. Volume 3: xii + 434 pp. $26.00. Volume 4: xii + 460 pp. $27.50.

These two volumes offer six surveys of topics in organometallic chemistry, with commendably comprehensive tables, lists of references, and experimental procedures. The scope of the chapters varies from clearly defined single reaction types to vaguely defined broad areas of chemistry. Volume III begins with a chapter entitled "Olefin Oxidation and Related Reactions with Group VIII Noble Metal Compounds" (R. Jira and W. Freiesleben) which is, in fact, largely devoted to organopalladium chemistry, discussed in considerable mechanistic detail. The second chapter, "Cleavage Reactions of the Carbon-Silicon Bond" (V. Chvalovsky), is a practical guide to a precisely defined reaction but does not include any references past 1968. The third chapter, "Oxymetalation" (W. Kitching), is a slightly expanded and updated version of a previous review by the same author. It is of admittedly great generality and overlaps somewhat with the first chapter on olefin oxidation.

Volume IV begins with a brief chapter on "σ-π Rearrangements of Organotransition Metals" (M. Hancock, M. N. Levy, and M. Tsutsui), a topic broad enough to include almost all transition-metal organometallic chemistry. Brief mention is made of such diverse topics as the Wacker reaction (its third discussion in four chapters) and nmr studies of fluxional ring complexes. The second chapter, "Onium Compounds in the Synthesis of Organometallic Compounds" (O. A. Reutov and O. A. Ptitsyna), returns to the orginal concept of a complete survey of a clearly defined reaction. The last chapter, while departing completely from the single-reaction-type concept, is a thorough and well-organized review of bis(π-cyclopentadienyl) transition-metal compounds (E. G. Perevalova and T. V. Nikitina).

Clearly synchronization of the chapters and literature coverage has been a problem, as shown by the number of adenda (and lack thereof in some cases). Better timing and greater attention to the breadth of the topics selected would improve future volumes of the series.

Jack R. Norton, *Princeton University*

Seven-Membered Heterocyclic Compounds Containing Oxygen and Sulfur. By A. Rosowsky (Children's Cancer Research Foundation). John Wiley & Sons, Inc., New York, N. Y. 1972. xxvii + 949 pp. $75.00.

This volume (Number 26) extends the Wiley-Interscience series on "The Chemistry of Heterocyclic Compounds" and fills a major void in the review literature. The coverage meets the exacting standards which these monographs have set. The contents include mono- and polycyclic oxepins in fused, spiran, and bridged systems (by A. Rosowsky), excluding caprolactones and adipic anhydrides (for which a survey has been deferred); di- and trioxepins (C. E. Pawloski); and oxepins in terpenes (A. N. Starratt), steroids (J. A. Zderic), sugars (T. R. Hollands), and alkaloids (P. J. Scheuer). Under thiepin coverage are found monocyclic systems containing up to seven sulfur atoms (L. Field and D. L. Tuleen) plus polycyclic rings (J. V. Traynelis). References appear to extend into 1969 or 1970 for most chapters.

William L. Mock, *University of Illinois at Chicago*

The Mechanism of Protein Synthesis and Its Regulation. Edited by L. Bosch (State University of Leiden). North-Holland Publishing Co., Amsterdam–London. American Elsevier Publishing Co., New York, N. Y. 1972. vi + 590 pp. $38.00.

The understanding of protein biosynthesis at the molecular level continues to advance at such a rapid pace that a current review of all aspects of this problem is indeed useful. The complexity of the cellular process in which over 200 distinct macromolecules are utilized in the assembly of specific proteins is described in a series of twelve chapters, each dealing with a particular phase of the biosynthetic process. For example, there are individual chapters on polypeptide chain initiation, elongation, and termination as well as chapters on the detailed structure of the individual components used in cellular protein synthesis such as transfer RNA, messenger RNA, ribosomes, and ribosomal RNA. Other chapters discuss the molecular events involved in the translation of viral RNA and the stability of messenger RNA. Each chapter has been authored by someone who is actively working in the area being discussed.

An attractive feature of this book is the comment by each contributor reflecting his assessment of the present status of the topic being discussed, a projection of future areas of progress, and frequently the identification of major problems which remain to be solved. Each chapter contains an interesting chronological account describing advances which have led to the present level of understanding and individual contributions are cast in the framework of the overall progress made in this area. The discussion of data is thoroughly documented by literature references, generally through early summer, 1971. Unfortunately this field is advancing so rapidly it was not possible to include extensive discussion on recent advances on the structure of poly A-containing RNA molecules, and there was only brief discussion on the synthesis and processing of ribosomal RNA.

This book should be very useful both to those who are actively working in some phase of protein biosynthesis as well as the graduate student or research worker who wants a thorough overview of the field. It is well-written and represents an exceptionally fine single-volume documentation of the many molecular events occurring in protein biosynthesis.

Fritz M. Rottman, *Michigan State University*

Chemical Structure and Reactivity. By B. R. Eggins (University of Warwick). Barnes and Noble Books (a division of Harper and Row Publishers, Inc.), New York, N. Y. 1972. xii + 190 pp. $13.50.

This book contains topics generally covered in the "theory" or "principles" part of an inorganic course, with focus on the solid state. Being small in size (just under 6″ × 9″) and containing only 180 pages, it is apparent that this book offers no presentation in depth. Topics are introduced in a concise, factual, and noncritical way.

There are eleven chapters which are divided as follows: (1) the nature of the solid state (deals mostly with the kinds of models used to construct crystal and molecular structures); (2) factors affecting crystal structures and types of bonding (includes topics of ionization potential, electron affinity, shapes of molecules, electronegativity, oxidation number); (3) the nature of the electron (Heisenberg uncertainty principle, Schrödinger equation, H-atom wave functions, hybrid orbitals); (4) determination of crystal and molecular structure (crystal systems, lattice types, Miller indices, diffraction studies, dipole moments, magnetic moments, spectroscopic methods); (5) metallic character (metallic bond, metallic radii, close packing of spheres); (6) ionic and covalent compounds (ionic radii, radius ratios and crystal structure, examples of crystal structures, partial ionic character); (7) molecular and hydrogen-bonded compounds (nonbonded interactions, van der Waals radii, steric interactions, shapes and properties of molecules, H-bonding); (8) bond and crystal energetics (covalent bond, bond energies and bond lengths, Born–Haber cycle, electronegativity scales), (9) atomic size and chemical reactivity (solubility, redox potentials, acids and bases—including "hard" and "soft," stability of oxidation states, thermal and hydrolytic stability); (10) polyatomic ions and coordination compounds (structures of complex ions, Pauling's rules, solvent of crystallization); (11) nonstoichiometry and defect structures (dislocations, lattice point defects, physical effects of defect structures, interstitial compounds).

This book may have a special place in the British curriculum since students entering the University generally are better prepared in math and science. The author assumes a background in basic thermodynamics. It would be more difficult to find a place for it in the American curriculum. It is too advanced for first year students but not detailed enough for a junior–senior class in inorganic chemistry. Reading references to commonly used inorganic texts are often cited at the end of each chapter.

Milton Tamres, *University of Michigan*