Book Reviews

Introductory Textbooks Received

Chemical Principles: An Introductory Programmed Text. Second Edition. By O. A. RUNQUIST, C. J. CRESWELL, and J. T. HEAD. Burgess Publishing Co., Minneapolis, Minn. 1974. viii + 719 pp. $13.95.

Solving Problems in Chemistry. By ROD O'CONNOR and CHARLES MICKEY. Harper & Row Publishers, New York, N.Y. 1974. x + 402 pp. $4.95.

Fundamentals of Chemistry in the Laboratory. By KURT IRGOLIC and ROD O'CONNOR. Harper & Row Publishers, New York, N.Y. 1974. viii + 360 pp. $4.95.

Chemical Principles in the Laboratory with Qualitative Analysis. First Edition. By EMIL J. SLOWINSKI, WAYNE C. WOLSEY, and WILLIAM L. MASTERTON. W. B. Saunders Co., Philadelphia, Pa. 1974. x + 351 pp. $6.25.

Chemistry. By LEONARD W. FINE. Prentice-Hall, Englewood Cliffs, N.J. 1973. xv + 910 pp. $13.95.

Instructors' Guide for Chemical Principles in the Laboratory. Second Edition. By EMIL J. SLOWINSKI WILLIAM L. MASTERTON, and WAYNE C. WOLSEY. W. B. Saunders Co., Philadelphia, Pa., iv + 136 pp.

Chemical Principles in the Laboratory. Second Edition. By EMIL J. SLOWINSKI, WILLIAM L. MASTERTON, and WAYNE C. WOLSEY. W. B. Saunders Co., Philadelphia, Pa. 1973. xi + 319 pp. $5.95.

A Study Guide to Chemical Principles. Second Edition. By WILBERT HUTTON. W. A. Benjamin, Inc., Menlo Park, Calif. 1974. x + 326 pp.

Introductory Chemistry Laboratory Manual. By HAROLD R. HUNT. Macmillan Publishing Co., New York, N.Y. 1974. viii + 223 pp. $5.50.

Modern Quantitative Analysis Experiments for Non-Chemistry Majors. By GEORGE G. GUILBAULT. Marcel Dekker, Inc., New York, N.Y. 1974. ix + 243 pp. $7.75.

Chemical Problem-Solving by Dimensional Analysis. By ARNOLD B. LOEBEL. Houghton Mifflin Co., Boston, Mass. 1974. xii + 367 pp.

Chemistry Problems. Second Edition. By M. J. SIENKO. W. A. Benjamin, Inc., Menlo Park, Calif. 1972. x + 382 pp. $3.95.

Physical Science with Environmental Applications. By ARTHUR W. WIGGINS. Houghton Mifflin Co. Boston, Mass. 1974. xiii + 305 pp. $10.95.

Programmed Reviews of Chemical Principles. By J. D. LASSILA, F. M. BARROW M. E. KENNEY, R. L. LITLE and W. E. THOMPSON. W. A. Benjamin, Inc., Menlo Park, Calif. 1974. viii + 743 pp. $4.95.

Relevant Problems For Chemical Principles. Second Edition. By I. S. BUTLER and A. E. GROSSER. W. A. Benjamin, Inc., Menlo Park, Calif. 1974. 523 pp. $4.95.

Problems in Chemistry, Revised and Expanded. By H. O. DALEY, JR., and R. F. O'MALLEY. Marcel Dekker, Inc., New York, N.Y. 1974. xvii + 490 pp. $7.95.

General Chemistry. By R. A. DAY, JR., and R. C. JOHNSON. Prentice-Hall, Inc., Englewood Cliffs, N.J. 1974. xiii + 609 pp. $12.95.

Instructors Manual for Essentials of General, Organic and Biochemistry. Second Edition. By J. I. ROUTH, D. P. EYMAN, and D. J. BURTON. W. B. Saunders Co., Philadelphia, Pa. 127 pp.

Basic Equilibrium Calculations. By COOPER H. LANGFORD. Addison-Wesley Publishing Co., Reading, Mass. 1973. xiii + 76 pp. $2.95.

Laboratory Chemistry. Volumes I and II. By the Staff of the University of Maryland. Burgess Publishing Co., Minneapolis, Minn. 1973. ix + 92 pp and v + 82 pp, respectively. $3.50 each.

Exercises in General, Organic, and Biological Chemistry. Third Edition. By A. N. LANGSJOEN. Burgess Publishing Co., Minneapolis, Minn. 1973. xii + 146 pp. $4.50.

A Practical Laboratory Manual for College Chemistry. By S. Y. SHEN. Harper & Row, New York, N.Y. 1973. x + 210 pp.

Chemical Experimentation: An Integrated Course in Inorganic, Analytical, and Physical Chemistry. By U. A. HOFACKER. W. H. Freeman and Co. San Francisco, Calif. 1972. x + 226. $6.95.

Laboratory Techniques for High Schools: A Work Text of Bio-Medical Methods. By G. I. EDWARDS and M. CIMMINO. Barron's Education Series, Inc., New York, N.Y. 1974. 219 pp. $4.95.

Instructor's Manual to accompany Chemistry: Principles and Applications. By P. A. ROCK and G. GERHOLD. W. B. Saunders Co., Philadelphia, Pa. 271 pp.

Chemistry Principles and Applications. By P. A. ROCK and G. GERHOLD. W. B. Saunders Co., Philadelphia, Pa. 1974. xvi + 716 pp. $14.95.

An Index to Biographical Fragments in Unspecialized Scientific Journals. By E. SCOTT BARR (University of Alabama). Academic Press, New York, N.Y. 1974. vii + 294 pp. $12.50.

This is an alphabetical list of scientists of all sorts about whom biographical information was published before 1920 in seven English-language journals devoted to science in general, such as Science, Philosophical Magazine, etc. The compilation includes many chemists. Its value lies in the fact that these biographical notices (and the portraits that often accompany them) are frequently omitted from the indexes of the journals, and are thus very difficult to find.

Liquid-Phase Reaction Rate Constants. By E. T. DENISOV (Institute of Chemical Physics, Moscow). Plenum Press, New York, N.Y. 1974. xxi + 771 pp. $50.00.

This book consists almost entirely of tables and references thereto, and is a compilation of data for more than 8000 reactions. It is translated from the Russian edition published in 1971. There is no index, but the material is subdivided into twelve chapters according to type of reaction. There are short sections of text, such as eight pages on "Effect of Solvent on Free-radical Reactions" and "Oxidation-Reduction Reactions of Ions with Molecules," in which general observations about particular species and about methods are made. All rate constants have been expressed using units of seconds for consistency, and the methods used to determine them are specified. It must have been a laborious task to compile this immense amount of information, and the result should be found widely useful, notwithstanding the fact that the coverage ceased in 1970.

Survey of Progress in Chemistry. Volume 6. Edited by ARTHUR F. SCOTT (Reed College). Academic Press, New York, N.Y. 1973. xii + 340 pp. $29.50.

This volume contains five essays that cover a broad range of chemistry: Ruthenium-II Ammines (H. Taube), Prebiotic Chemistry (R. M. Lemmon), Rates of Ionization of Carbon Acids (J. R. Jones), Pericyclic Reactions and Orbital Symmetry (K. N. Houk), and Conformation—Function Relationships in Peptides and Proteins (H. R. Wyssbrod and W. A. Gibbons). This series is stated to be "an attempt to improve the transmission of new material to the

college chemistry teacher." The chapters may profitably be compared to articles in *Accounts of Chemical Research;* they are considerably longer, and somewhat broader in scope, and are concerned more with the subject itself rather than the particular author's contribution to it. They are useful chapters for references as well as for orientation, for they contain many tables and substantial bibliographies. An extensive author index and a limited subject index conclude the book.

Formation of C-C Bonds. Volume 1. Introduction of a Functional Carbon Atom. By J. MATHIEU and J. WEILL-RAYNAL (l'Ecole Superieure de Techniques Avancees Roussel Uclaf). Georg Thieme Verlag, Stuttgart. 1973. xxiv + 459 pp. DM 128.

This is the first volume of a projected three-part work designed to facilitate the work of organic chemists concerned with synthesis. It is a book of tables arranged according to types of structural transformation (*e.g.,* halomethylation, formylation, carboxylation, etc.) of reactions useful in synthesis for attaching a carbon-containing functional group. The organization is set out in detail in the table of contents, so that one can locate a particular subject quickly. What one finds in the tables themselves is a general equation, such as $\geqslant C\text{-}OH \rightarrow \geqslant C\text{-}CO_2H$, beneath which equations for a representation of examples specific as to compound and method are listed. The equations generally include both conditions and yields. Beside each reaction are found concise notes giving information on scope. References to all reactions are cited on the same page. The result is an extremely usable and useful work, which has already shown a pronounced susceptibility to being borrowed. The large amount of material contained in it may be judged from the publisher's statement that there are 1900 "formula schemes" and 150 tables.

There are two obvious works with which this book will be compared: "Survey of Organic Syntheses" by Buehler and Pearson, and "Compendium of Organic Synthetic Methods" by Harrison and Harrison. The former is largely discursive in nature, and the latter consists entirely of equations. The Mathieu and Weill-Raynal book stands in between and to a considerable extent combines the advantages of each, but only the experience of continued use can reveal how successful this combination really is.

In the Introduction, Professor D. H. R. Barton recommends this work for personal libraries. This is a sound recommendation, although it might have been tempered had he been aware of the intended price (over $50.00) when he wrote it. The format is awkward for shelving—it is 9½ inches wide and only 7 inches tall—but it is likely to be in use on the desk much of the time.

The Alkaloids. Volume 4. Edited by J. E. SAXTON (University of Leeds). The Chemical Society, London. 1973. xii + 433 pp. 14.00.

This volume of the Specialist Periodical Reports reviews the literature from July, 1972, to June, 1973, over the whole field of alkaloid chemistry. The longest of the seventeen chapters is devoted to aporphine alkaloids, the developments about which are covered from 1967, so as to bring the chapter on this subject in Manske's "The Alkaloids" (Vol. 9, 1967) up to date. The first chapter is on biosynthesis generally; the other chapters are concerned with particular classes of alkaloids. The tremendous amount of activity in the field of alkaloids is emphasized by the size of the author index to this volume; it is fourteen pages long, with three columns to the page.

The Determination of Nitro and Related Functions. By Y. A. GARVARGIOUS (National Research Centre, Cairo). Academic Press, London. 1974. 154 pp. £3.50.

This book reviews rather uncritically the published methods for analytical determination of a variety of inorganic and organic compounds. The scope is broader than the title suggests and includes nearly all groups derived by reduction of the nitro group, as well as some that are related only very distantly (*e.g.,* azides). In some instances, laboratory directions for recommended methods are given.

The collection of this information is certainly useful. On the other hand, the way it is presented is often confusing, particularly where the author does not clearly distinguish between inorganic ions and covalently attached functional groups. The influence of structure on the very nature of an analytical method is too often ignored, and such misleading statements as "Organic azides undergo a Curtius rearrangement on heating . . ." occur too often. The structures shown suffer from rather more than the usual number of typographical errors, and there are some inconsistencies, such as the use of various formulations for the nitro group, including pentacovalent structures. An appendix brings the literature coverage up to 1971.

Advances in Heterocyclic Chemistry. Volume 17. Edited by A. R. KATRITZKY and A. J. BOULTON. Academic Press, New York, N.Y. 1974. ix + 360 pp. $39.50.

Three of the six chapters in this volume deal with nitrogenous seven-membered rings: benzazepines (by S. Kasperek), 1,5-benzodiazepines (by D. M. G. Lloyd and H. P. Cleghorn), and 2,3-dihydro-1,4-diazepines (by D.M.G.L., H.P.C., and D. R. Marshall). These are essentially descriptive chapters, in which the authors have attempted to organize the sometimes confusing, sometimes conflicting, reports in the literature into a rational whole. A chapter on advances in oxazole chemistry (by R. Lakhan and B. Ternai) brings this timely subject up to date, by building on the earlier reviews that covered the subject up to 1955. Heterocyclic *N*-imides, the isosteres of *N*-oxides, are the subject of a short chapter by H. J. Limpe. Finally, the controversial subject of aromaticity of heterocycles is bravely confronted by M. J. Cook, A. R. Katritzky, and P. Linda. They cover the subject broadly enough to include not only the more familiar systems, but also such exotic ones as the recently prepared arsenic and antimony analogs of pyridine, boron heterocycles, and a variety of postulated three-membered rings. In their conclusion, they point out how little is known, even semiquantitatively, about aromaticity of rings of size other than five- or six-membered, and they make the intriguing statement that ". . . three- or four-membered rings which could possess considerable aromaticity are often unknown or of doubtful existence."

The period of coverage of the literature is stated in each chapter and generally extends into 1972.

Spectroscopy in Biology and Chemistry/Neutron, X-Ray, Laser. Edited by SOW—HSIN CHEN and SIDNEY YIP (Massachusetts Institute of Technology). Academic Press, New York, N.Y. 1974. xi + 410 pp. $15.00.

This book contains direct reproductions of manuscripts based on lectures given at an AEC Summer Institute (MIT, August 1973) on "the use of thermal neutron diffraction and inelastic scattering, and the related techniques of X-ray diffraction, Raman and Rayleigh scattering, in investigating biological macromolecules and chemical systems." Although the unifying theme is nominally neutron scattering as a methodology, three of the twelve contributions (on protein X-ray diffraction, laser Raman spectroscopy, and intensity correlation spectroscopy) make no explicit mention of it. The many applications and results discussed range from determining the distribution of swimming speeds of bacteria, to the structure of nerve myelin as a model membrane system, to a synopsis of work done on calculation of potential functions for alkanes. The average number of references per chapter is a respectable 40.

This is not a book for the myopic super-specialist. It would make good reading at the graduate or postdoctoral level for persons engaged in molecular structure and/or vibrational analysis, and who are interested in broadening their grasp of the field. The editors are to be commended for their holistic approach to their task: they have provided an index (an enormous aid to the nonspecialist) and two lengthy introductory chapters on radiation scattering spectroscopy and quasielastic scattering. Another example of the apparent care for detail is that in Chapter 10 there is a footnote explaining the difference in the author's definition of the structure factor from that used in Chapter 1. With the proliferation of scientific publications, frequently it is the little things that make a book a better investment of $15.00 than, say, a good Italian dinner. This book probably is.

Jesse W. Schilling, *Trinity University (Texas)*