

Chemistry Textbook

Inorganic Chemistry. A guide to advanced study. R. B. Heslop and P. L. Robinson. Elsevier, New York, ed. 2, 1963. viii + 591 pp. Illus. \$9.

Those who are familiar with the first edition of this text will find no reason to change their opinion of the book after reading the second edition. This quotation from the preface could serve as a review:

"The original aim, which remains unchanged, was a text-book of modest size and price that did not presume to be a substitute for oral instruction or seek to deal with the special topics which give individuality to advanced courses. Extending its scope to include even a selection of these topics would have destroyed the character of the book; hence the only major additions are a description of phosphonitrilic compounds, a section on complexes in aqueous solution, and a short chapter on inorganic polymers. In other parts the treatment has been modified to bring it into line with the results of recent research."

The first 210 pages are devoted to a review of physical chemistry. With the exception of the chapters on bonding, the treatment is below the level of such physical chemistry textbooks as those by W. J. Moore and G. M. Barrow. The discussion of experimental techniques in chapter 6, of crystal symmetry in chapter 7, and of chemical kinetics in chapter 9 are extremely brief. Largely as a result of this brevity, there are several false implications and some errors of fact. The most serious of these (p. 140) is that the 230 space groups are purported to arise from the 14 Bravais lattices "when other symmetry operations are recognized (e.g., rotation of the lattice)."

In view of the fact that the authors do not give complete literature references, it is unfortunate that short, selected bibliographies were not provided at the end of chapters. Indeed, without additional sources of information, the discussion of some topics, in particular those mentioned above, are almost useless to the student.

The authors have an interesting style, and they have chosen appropriate material for inclusion in the chapters on individual elements. However, in these chapters, the application of physical chemistry remains slight.

Despite its shortcomings, Heslop and Robinson's *Inorganic Chemistry* should receive serious consideration for use as a textbook in an inorganic chemistry course offered to students with only moderately good preparation in physical chemistry.

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Industrial Electronics

Electronics in Industry. John Stewart Murphy. Oxford University Press, New York, 1963. viii + 216 pp. Illus. \$4.

Electronics in Industry is intended for those who have a fair knowledge of electronics and want to understand the operation of some of the new developments in that field, more specifically, in the areas of computers and control processes. This well-organized book covers a vast amount of material in a small space, 213 pages to be exact. The author has chosen his topics well and used the space effectively. Anyone who needs to understand the topics that are considered will find this a most useful addition to his library. The book is not intended for electronic engineers and technicians, since it does not delve into the details of design. Although some mathematical equations are used, the discussion is primarily descriptive.

In the first chapter Murphy points out the significance of the development of electronic devices and then reaches back 75 years or so to trace some of the important developments. The second and third chapters are devoted to valves (vacuum tubes) and semiconductor devices, respectively. The author's brief outline of the functions of tubes and semiconductors is excellent. This is followed by a chapter on electronic circuits. These first four chapters will help the reader understand the applications that are treated in the remaining chapters.

Chapter 5, on synchros and servomechanisms, starts with a brief explanation of the synchro system and its components and explains the transmitter, the receiver, the control transformer, and then servo systems. Measuring devices, transducers, and actuators are considered in the next chapter. In ap-

proximately 20 pages, brief descriptions are given of the control system; various types of transducers; measurements of length, thickness, and weight; counting, sorting, and batching; and measurement of light intensity. Two chapters are devoted to computers, one to digital and the other to analog computers.

The final chapter is on control and automation. Here the concept of a fully automatic factory is brought forth. This is followed by brief explanations of computer applications, machine-tool control, and finally, process control.

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Infrared Compendium

Infrared Physics and Engineering. John A. Jamieson, Raymond H. McFee, Gilbert N. Plass, Robert H. Grube, and Robert G. Richards. McGraw-Hill, New York, 1963. xiv + 673 pp. Illus. \$19.

Infrared engineering is a very recent development. Whereas devices for measuring the visible region were widely used, even in the 19th century, work on the infrared was handicapped by difficulties encountered in making measurements. Of course that most sensitive and versatile instrument, the human eye, was unavailable as an infrared detector, and the very complicated infrared absorption spectra of most materials, including the atmosphere, hindered progress. Recent interest in infrared radiation has been largely the result of military developments: the Sniperscope and the infrared-controlled missile, for example. But improved techniques now available are opening up many nonmilitary applications.

Infrared Physics and Engineering is primarily a compendium for use by designers of infrared systems, but it gives a connected account of theory and practice and, therefore, could be employed as a textbook. A large number of data, otherwise not readily available, are given in the form of tables and graphs. Included are properties of infrared sources, detectors, and transmitting materials. Consideration is given to the radiation thermocouple and the bolometer as well as to selective detec-

tors that employ lead sulfide, lead selenide, and other materials.

The part of the book that deals with materials, sources, and detectors contains 290 pages, somewhat less than half of the volume. The remainder deals with probability theory and its application to random fluctuations, electronic noise, space filtering, and information theory. In the final chapter an attempt is made to apply all this material to the general question of design of infrared systems.

The book is well-written, logically arranged, and nicely printed. It achieves unusual unity for a book written by five authors. Thus, it is a "must" for anyone interested in the theory and design of infrared systems.

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Astronomy

Space Age Astronomy. Symposium held at the California Institute of Technology, August 1961. Armin J. Deutsch and Wolfgang B. Klemperer, Eds. Academic Press, New York, 1962. xxi + 531 pp. Illus. \$16.50.

One wonders of what value a book of this sort can be. Into 526 pages are crammed a total of 56 articles, many of which are written by some of the world's most prominent astronomers. By and large, the quality of the writing is good, the illustrations are clear, and the overall format is appealing. The volume ends with an adequate index, which must have been difficult to compile. However, over and over again I found that I was left with a sense of frustration upon completing an article. The subject matter was treated superficially, and seldom was there any opportunity to learn something about the details of work described. Clearly it was not the intention of those who planned this book to go further than skin deep into any one topic.

More and more often today we see volumes of this sort: a collection of write-ups of invited talks given at a symposium sponsored by a large corporation. The Douglas Aircraft Company sponsored this symposium, which took place in August 1961 at the California Institute of Technology. Coming

just before the large meeting of the International Astronomical Union held in Berkeley, the symposium boasted a most impressive roster of participants. The book is divided into three different sections: (i) accomplishments, current projects, and proven techniques; (ii) desiderata for future astronomical observations from stations in space; and (iii) solar system problems. Recorded discussions followed some of the papers; frequently I found these interchanges more stimulating than the preceding article.

Presumably, the sponsor paid the transportation to California for many of the speakers. This is good. I would guess that the sponsor found the symposium worthwhile, too.

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Note

Organic Chemistry

Volume 3 of *Absorption Spectra in the Ultraviolet and Visible Region* (Akademiai Kiado, Budapest, 1962; Academic Press, New York, 1963. 424 pp. Illus. \$20), edited by L. Lang, presents 172 ultraviolet and visible spectra, and thus brings the total reported in the series to 521 [vols. 1 and 2 reviewed in *Science* **136**, 519 (1962)]. Results for some inorganic substances and organic complexes of inorganic ions are again included in this predominantly organic collection. The format in which the data are presented is identical with that of previous volumes, as is the information given with respect to the experimental details of the spectral determinations. Some Polish and a few Russian and British contributions are included among those of Hungarian origin, thereby meeting the editor's avowed objective of making the series an international endeavor.

Indexes to the present volume are provided. According to the preface, compilation of volume 4 is in progress; it is to be hoped that, as the series progresses, the editors will consider preparing cumulative indexes, in order to facilitate reference to this useful collection.

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New Books

Mathematics, Physical Sciences, and Engineering

Advances in Electronics and Electron Physics. vol. 17. L. Marton and Claire Marton, Eds. Academic Press, New York, 1962. 461 pp. Illus. \$14.

Advances in Mass Spectrometry. Proceedings of a conference (Oxford, England), September 1961. R. M. Elliott, Ed. Pergamon, London; Macmillan, New York, 1963. 646 pp. Illus. \$20.

Advances in Organic Chemistry. Methods and results. vol. 4. Ralph A. Raphael, Edward C. Taylor, and Hans Wynberg, Eds. Interscience (Wiley), New York, 1963. 369 pp. Illus. \$14.50.

Advances in Upper Atmosphere Research. Papers presented at the NATO Advance Study Institute (Corfu), July 1960. B. Landmark, Ed. Pergamon, London; Macmillan, New York, 1963. 348 pp. Illus. \$12.25.

Aerodynamics. A space-age survey. John E. Allen. Harper and Row, New York, 1963. 128 pp. Illus. \$2.95.

Air Chemistry and Radioactivity. Christian E. Junge. Academic Press, New York, 1963. 394 pp. Illus. \$13.50.

Alternating Current Polarography and Tensammetry. B. Breyer and H. H. Bauer. Interscience (Wiley), New York, 1963. 308 pp. Illus. \$12.

Applications of Graph Theory to Group Structure. Claude Flament. Translated from the French by Maurice Pinard, Raymond Breton, and Fernand Fontaine. Prentice-Hall, Englewood Cliffs, N.J., 1963. 136 pp. Illus. \$6.95.

Basic Astronomical Data. K. Aa. Strand, Ed. Univ. of Chicago Press, Chicago, 1963. 513 pp. Illus. \$12.50.

Basic Electronics. Royce Gerald Kloeffler, Maurice Wilson Horrell, and Lee E. Hargrave, Jr. Wiley, New York, ed. 2, 1963. 653 pp. Illus. \$11.

Basic Mathematics for the Physical Sciences. Haym Kruglak and John T. Moore. McGraw-Hill, New York, 1963. 368 pp. Illus. Paper, \$3.95.

Chemical Concepts. Jay A. Young. Prentice-Hall, Englewood Cliffs, N.J., 1963. 166 pp. Illus. Paper, \$2.95.

Chemistry: A Survey of Principles. Galen W. Ewing and E. Gerald Meyer. Wiley, New York, 1963. 249 pp. Illus. \$4.95.

The Chemistry of Wood. B. L. Browning, Ed. Interscience (Wiley), New York, 1963. 699 pp. Illus. \$25.

Chromatographic Reviews. Progress in chromatography, electrophoresis, and related methods. vol. 5. Michael Lederer, Ed. Elsevier, New York, 1963. 254 pp. Illus. \$11.

Coordination Chemistry. Seventh international conference (Stockholm and Uppsala, Sweden), June 1962. Butterworth, Washington, D.C., 1963. 129 pp. Illus. \$5.

A Course of Mathematical Analysis. pt. 2. A. F. Bermant. Translated from the Russian edition (1959) by Ian N. Sneddon. Pergamon, London; Macmillan, New York, 1963. 386 pp. Illus. \$9.