

For the most part, the wording is simple and direct. Chapter 3 might well be titled "Preparation and Purification of Compounds of Zirconium" instead of "Extraction of Zirconium from the Ore." The title for Chapter 5, "Production of Zirconium Metal," specifically indicates the subject under discussion.

The author has faithfully described the two major methods now used for the production of zirconium metal. A description of apparatus and procedures for the preparation of titanium (which may not always apply to zirconium) on pages 68, 69 and 70, without specific explanations, might lead to erroneous conclusions. Another example of substituting titanium for zirconium is found on page 95. "The conclusion that titanium could not be reduced beyond the monoxide by magnesium at 1200° is contradicted by G. Meister who prepared pure zirconium, by reducing the oxide with magnesium. . . ."

The criticisms made of this book are not to be taken as too greatly detracting from its value. It is an up-to-date, exhaustive collection of information in readable form. Attention is called to the very good sections on physical properties, reactions with gases, zirconium alloys and particularly to the theoretical portions dealing with binary systems. This book should be of real value to all interested in the preparation and properties of zirconium. It is suitable for reference work or as a text for well advanced students.

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The Optical Properties of Organic Compounds, Second Edition. By ALEXANDER N. WINCHELL, Emeritus Professor of Mineralogy, University of Wisconsin. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. xviii + 487 pp. 16 × 23.5 cm. Price, \$12.00.

As in the first edition, this volume gives data on all organic compounds whose optical crystallographic properties are sufficiently well-described to permit identification. As a minimum, accurate determinations of refractive indices are essential for any system of classification; only about 2000 compounds meet this requirement.

The descriptive section is arranged according to the Beilstein classification, slightly modified to bring isomorphous salts together and to separate different hydrates. Over 600 references to the original literature are given.

Determinative tables, based on refractive indices, and two large charts are included also, with clear explanations of their use. There is a brief discussion of the microscopical methods of measuring the refractive indices of a crystal, but no attempt is made to cover the general subject of optical crystallography, well discussed in other books, including the author's.

This work is a valuable part of the literature of descriptive and analytical chemistry, and deserves to grow through many editions. It is not the fault of the author that the coverage is such a small part of the list of solid organic substances; he has contributed many original data as well as critical evaluation of those of others. But the reliable and accurate determinations of the optical properties of organic crystals grow slowly, and are not a job for the novice; experts are relatively scarce (and not drawn from the ranks of organic chemists as commonly as they should be).

The trustworthy use of such data is similarly for the few. It takes experience and judgment to resist fitting the values of an unknown to those in a table, whether it be of refractive indices or melting points, when the odds are that the table does not include it. Here the user's knowledge of the possibilities as based on the organic chemistry involved may pre-

vent such over-working of the tables, and afford valuable confirmatory or time-saving information. All of which is by way of saying that this is a good book, that more people ought to be good enough to use it, that their and its limitations should be supplemented by chemical reasoning, just as microscopy and organic chemistry can best serve jointly for difficult identifications.

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BOOKS RECEIVED

October 10, 1954—November 10, 1954

ROGER G. BATES. "Electrometric pH Determinations. Theory and Practice." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1954. 331 pp. \$7.50.

FRANK R. N. GURD (edited by). "Chemical Specificity in Biological Interactions." Academic Press, Inc., Publishers, 125 East 23 Street, New York 10, N. Y. 1954. 234 pp. \$6.00.

H. E. HUNTLEY. "Nuclear Species." St. Martin's Press, Inc., 103 Park Avenue, New York 17, N. Y. 1954. 193 pp. \$4.50.

WILLIAM S. JOHNSON (Editor-in-Chief). "Organic Syntheses." Volume 34. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1954. 121 pp. \$3.50.

The Late FRITZ LONDON. "Superfluids. Macroscopic Theory of Superfluid Helium." Volume II. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1954. 217 pp. \$8.00.

C. MARSDEN (compiled and edited by). "Solvents and Allied Substances Manual." Elsevier Press, 402 Lovett Boulevard, Houston, Texas. 1954. 429 pp. \$12.95.

SAN-ICHIRO MIZUSHIMA. "Structure of Molecules and Internal Rotation." Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. 244 pp. \$6.00.

NATIONAL BUREAU OF STANDARDS. "Table of Sine and Cosine Integrals for Arguments from 10 to 100." Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 1954. 187 pp. \$2.25.

ROBERT G. SACHS. "Nuclear Theory." Addison-Wesley Publishing Company, Inc., Cambridge 42, Massachusetts. 1953. 383 pp. \$7.50.

HENRY SEMAT. "Introduction to Atomic and Nuclear Physics." Third Edition, Revised and Enlarged, of Introduction to Atomic Physics. Rinehart and Company, Inc., 232 Madison Avenue, New York 16, N. Y. 1954. 561 pp. \$6.50.

WARD C. SUMPTER AND F. N. MILLER. "Heterocyclic Compounds with Indole and Carbazole Systems." The Chemistry of Heterocyclic Compounds. Volume VIII. Arnold Weissberger, Consulting Editor. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. 307 pp. \$10.00 single copy, \$9.00 subscription price.

L. ZECHMEISTER (edited by). "Fortschritte der Chemie organischer Naturstoffe." Eleventh Volume. Springer-Verlag, Mölkerbastei 5, Wien 1, Austria. 1954. 457 pp. \$17.20, Ganzleinen, \$18.00.