
BOOK REVIEWS

Schmelzpunkt Tabellen Organischer Verbindungen. By DR. WALTHER UTERMAR, Diplom-Chemiker, Akademie-Verlag GMBH, Presseabteilung, Schiffbauerdamm 19, Berlin NW 7, Germany. 1951. xii + 571 pp. 18 × 26 cm. Price, unbound 60,—DM, bound 63,—DM.

The 3356 organic compounds which comprise this volume are arranged in a continuous sequence according to increasing melting point beginning at -190° and concluding at 507° . Of these the first 555 substances melt below 20° . Although a complete analysis of the scope of the compounds is impracticable, this reviewer determined that they include 1079 (32%) of compounds of Order 1 (C + H, or C,H + O), 996 (30%) of Order 2 (C,H + N, or C,H,O + H), 148 (4%) of Order 3 (C + Cl, C,H + Cl, C,H,O + Cl, or C,O + Cl) together with 1133 (34%) of compounds of other orders. The selected representatives of the first three orders comprise mainly the usual common substances but the last group includes many substances very rarely met with including a large number of organometallic compounds.

Each pair of left and right hand pages constitutes a table of thirteen vertical columns, recording very briefly for each compound the following data: (1) serial number; (2) freezing point; (3) name; (4) empirical molecular formula; (5) structural formula; (6) molecular weight to two places of decimals; (7) state of aggregation and color; (8) specific gravity; (9) boiling point; (10) Beilstein reference; (11) other physical constants; (12) solubility; and (13) selected reactions and derivatives. All of these items are given with great brevity, no references to the literature are included, and absolutely no evidence of the authenticity of the physical constants even including the melting point is supplied. The magnitude of the treatments may be referred from the fact that the average number of compounds per pair of facing pages is 12. The last 22 pages comprise a formula index of the Zentralblatt type preceded by a brief index of trivial names.

The typography and paper of this volume are of excellent quality. The author's execution of his mission seems to have been effectively accomplished. However, except in the hands of broadly trained and highly competent organic chemists the utility of such heterogeneous and fragmentary information remains to be demonstrated.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE 39, MASS. ERNEST H. HUNTRESS

The Chemistry of Hydrazine. By L. F. AUDRIETH, Professor of Chemistry, University of Illinois, Urbana, Illinois, and BETTY ACKERSON OGG, Research Associate, University of Illinois, Urbana, Illinois. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1951. xii + 244 pp. 14.5 × 22 cm. Price, \$5.00.

Not since the classical monograph of Wieland, "Die Hydrazine," in 1913 has there appeared any comparable collected material on this interesting and important hydro-nitrogen until the publication of the present work. In fact, this little book supplements the earlier one since it covers the inorganic, analytical, and physical chemistry of the parent hydrazine rather than organic derivatives. It had its origin in a report prepared for limited circulation under the sponsorship of the Office of Naval Research in 1949, since which time it has been revised and generally rounded out into book form.

Very appropriately it is dedicated to Prof. A. W. Browne of Cornell University from whose pen came for many years a continuous series of papers dealing with the compound and from whose laboratory has come a long line of chemists trained in nitrogen chemistry.

The contents are divided into twelve chapters. The first treats hydrazine as a hydronitrogen, ammonio compound and analog of hydroxylamine and hydrogen peroxide. This treatment serves as a basis for the interpretation of material in later sections on oxidation, solvation, solvolysis, etc.

Chapter Two covers in detail, with some 126 references the formation and preparation of hydrazine. In Chapter Three are given special methods for the preparation of concentrated and anhydrous hydrazine. The following chapter on the properties of the anhydrous compound contains detailed calculations of many physical and thermodynamic properties, mainly expressed in formula form. They, like much other published thermodynamic data, thus gain appearance of exactitude which they perhaps do not possess, since inextricably interwoven with exact data, are early uncertain figures or assumptions which may not hold. The authors have been quite careful to point out doubtful figures but the steps must be traced carefully.

A short Chapter Five covers properties of aqueous solutions of hydrazine and presents some important contributions of the authors' on the ternary systems alkali-hydrazine-water.

Chapter Six on the oxidation and catalytic decomposition of hydrazine is, like Chapter Four, critically written and carefully documented with 179 references, followed by Chapter Seven with the qualitative and quantitative analysis of the compound. The next three chapters cover hydrazine salts, coordination compounds, and anhydrous hydrazine as a solvent. Because of brevity, these are not as critically treated as the previous topics. Their value, which is real, will lie in the numerous references, to which the investigator should however turn in order to be certain that items of importance to him have not been omitted.

Chapter Eleven treats of the "Hydrazine system" of compounds and serves to tie together a number of complex derivatives, and the final chapter gives an interesting summary of patents on uses of hydrazine and its compounds for which the authors acknowledge indebtedness to Dr. R. L. Womer of Olin Industries.

The book represents a valuable and time-saving contribution for one who might wish to work in this field, and should provide a veritable gold mine for the researcher into the physical and inorganic chemistry of hydrazine showing, as it does, the places where important data are incomplete, inconclusive, or totally lacking.

One valuable feature of the treatise lies in the large amount of information which has been contributed from the authors' own laboratory but which till now has been available only in thesis or other unpublished form.

It is indeed unfortunate that, because of security, so much other data which must actually exist in many other laboratories cannot be made available for presentation in this book, where the authors have covered the published field in a very worthwhile manner.

DEPARTMENT OF CHEMISTRY
OREGON STATE COLLEGE
CORVALLIS, OREGON E. C. GILBERT

The Principles of Cloud-Chamber Technique. Cambridge Monographs on Physics. By J. G. WILSON, Senior Lecturer in Physics in the University of Manchester. Cambridge University Press, American Branch, 31 Madison Avenue, New York 10, N. Y., 1951. viii + 131 pp. 14.5 × 22 cm. Price, \$2.75.

The Wilson cloud-chamber is an old and important tool for the study of the trajectories of particles which ionize the gas in the chamber, and it is surprising, in view of its importance, that so little has been written about it. This monograph on the Wilson cloud-chamber succeeds in presenting, briefly and concisely, the most important characteristics and applications of the cloud-chamber, and it should be a real stimulus to the art of its use.

The presentation of the problem is well organized, and the discussion is quite complete for a book of this character. A criticism can be made of its failure to mention the large magnetic fields used at Chicago, Berkeley and Brookhaven, but the published descriptions of the chambers in the last two places may have come at too late a date to be included in the monograph.

High pressure cloud chambers are being used more extensively because of the greater abundance of nuclear events in the gas of the chamber and because of the greater stopping power and sensitive time. The lack of a specific discussion of the effect of this extension of cloud-chamber technique, while not a serious defect, is not in line with the general high excellence of the book. The book is a pleasure to read in many ways. The language is good, the exposition clear, the point of view logical and well presented.

A possible criticism could be made of the discussion of the role of slow expansions for the purpose of clearing heavy concentrations of centers of condensation out of the chamber. For one familiar with the use of cloud-chambers where the gas passes through a gauze on expanding this presents no problem in understanding because it is almost impossible to operate without slow expansions. However, those people fortunate enough to operate a piston type chamber with no gauze can do so very successfully without using slow expansions. The extensive work at Illinois on neutrons was done in this way, and on inquiring there, it appeared that they did not know what slow expansions were! My impression in reading the book was that they might be puzzled by the discussion of this subject because of the tacit assumption of familiarity on the part of the reader.

There is no doubt that the book will be extremely useful to anyone engaged in cloud-chamber work. The great improvement made by Cowan in the operation of the diffusion type chamber first described by Langsdorf is causing a mild revolution in cloud-chamber work because of the great increase in the rapidity with which data can be obtained, and the infinite sensitive time; and although this improvement is not mentioned, it is excellent to have this good summary because it is a great assistance in appraising the value of the diffusion chamber.

One cannot help admiring the British self-restraint which results in the publication of a monograph on cloud-chambers without a single half-tone reproduction of a photograph of tracks in a cloud-chamber.

RADIATION LABORATORY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

WILSON M. POWELL

Elements of Optical Mineralogy. An Introduction to Microscopic Petrography. Fourth Edition. Part II. Descriptions of Minerals. By ALEXANDER N. WINCHELL, Doct. Univ. Paris, Emeritus Professor Mineralogy and Petrology, University of Wisconsin, with collaboration of HORACE WINCHELL, Assistant Professor of Mineralogy, Yale University. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1951. xvi + 551 pp. 15.5 × 23.5 cm. Price, \$12.50.

It is unlikely that there is an optical mineralogist anywhere who is not familiar with Winchell's "Elements of Optical Mineralogy," the petrographers' *vade mecum*. The neophyte in polarized light microscopy should lose no time in becoming acquainted with Part I—"Principles and Methods"; Part II—"Descriptions of Minerals"; and Part III—"Determinative Tables." Equally valuable to him will be Winchell's "Microscopic Characters of Artificial Minerals" and his "Optical Properties of Organic Compounds." This latest edition is a rewritten and enlarged Part II in which, as in previous editions, one finds a detailed presentation of the optical properties of most minerals.

For the reader who is familiar with the earlier edition, a comparison with the new edition may be of interest. The very useful and conveniently placed list of "Abbreviations and Symbols" has been retained. A few significant changes in this listing were noted: (a) "ε," formerly used as a symbol for the refractive index of the extraordinary ray of a uniaxial crystal is now replaced by " N_E "; (b) the symbols " N_X , N_Y and N_Z ," respectively, have been introduced to represent the refractive indices of the X (fast), Y (interme-

diate), and Z (slow) rays of a biaxial crystal; these designations replace the " N_p , N_m and N_s " of Parts I and III of Winchell's work and the older " α , β , γ " symbols still used by so many authors; (c) " ρ " now becomes "r" to represent red (light) in dispersion formulas.

Further, the reader will find the sign of the extinction angle for monoclinic and triclinic minerals reversed from that given in Part III and previous editions of Part II. Thus, the rule previously governing the sign of the extinction angle for feldspars alone is now applied generally to all minerals.

Throughout the entire book major changes in arrangement and classification are to be found. A glance at the table of "Contents" reveals that while the general outline classification has not changed appreciably, within each group minerals now are arranged strictly according to type formulas. This makes for a somewhat less equivocal and more compact grouping than that used previously. In addition, the classification of silicates according to X-ray studies of their structures has been extended in this edition to all silicate minerals.

To the description of most minerals has been added a new section entitled "Structure." Here are to be found certain X-ray crystallographic data including the space group, lattice constants, the number of atoms, ions, or molecules per unit cell, and so on. Accompanying these descriptions are many new diagrams having to do largely with variations in properties with composition. In all, the authors state that some one hundred-twenty such diagrams are to be found in the new edition, over sixty more than were presented in the 1933 edition.

The reviewer is particularly impressed by the apparent care with which the authors carried out this latest revision. A rough check indicated some seventeen hundred literature references, over twice as many as appeared in the third edition. While some of these are duplicated throughout the book, it was noted that many earlier references have been deleted in favor of more up-to-date information. Arising out of this survey are many new and/or revised data, probably the most outstanding feature of the new edition. On a spot check, the reviewer could find scarcely a mineral for which some new entry had not been made. It is to be hoped that this same thoroughness may be continued in early revisions of the various Determinative Tables of the series.

Format and binding meet the usual high standards of the publisher.

UNIVERSITY OF PITTSBURGH
PITTSBURGH 13, PA.

H. W. SAFFORD

BOOKS RECEIVED

August 10, 1951—September 10, 1951

- ROBERT S. CASEY AND JAMES W. PERRY (edited by). "Punched Cards. Their Applications to Science and Industry." Reinhold Publishing Corporation, 330 West 42nd Street, New York 18, N. Y. 1951. 506 pp. \$10.00.
- BERNARD LEWIS AND GUENTHER VON ELBE. "Combustion, Flames and Explosions of Gases." Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1951. 795 pp. \$13.50.
- JAMES B. SUMNER AND KARL MYRBÄCK (edited by). "The Enzymes. Chemistry and Mechanism of Action." Volume II, Part 1. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1951. 790 pp. \$14.80.
- A. J. C. WILSON (General Editor) AND C. S. BARRETT, J. M. BIJVOET, AND J. MONTEATH ROBERTSON (Section Editors). "Structure Reports for 1947-1948." Volume 11. N.V.A. Oosthoek's Uitgevers MIJ., Domstraat 1-3, Utrecht, The Netherlands. 1951. 779 pp. 55.—guilders.