The configuration of the methyl group in the 6-methyl-Δ^4-3-keto compounds has been assigned from consideration of molecular rotations and by assumption from the accepted greater stability of the equatorial (6α-methyl) substituent over the axial (6β-methyl) substituent.

These compounds were evaluated in the Department of Endocrinology of the Upjohn Research Division. By subcutaneous administration in the rat Xa was found to be four times as active as hydrocortisone in the glycogen deposition (glucocorticoid) assay, while, by the oral route, XIIIa was sixteen times as active as hydrocortisone. Neither of the compounds showed salt retaining (mineralocorticoid) activity. Similar activities were observed for the corresponding analogs of cortisone.

The authors are indebted to Dr. J. L. Johnson, Mrs. G. S. Fonken and J. E. Stafford for infrared and ultraviolet absorption data, to L. M. Reineke for papergram analyses and to W. A. Struck and associates for microanalyses.

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BOOK REVIEWS

Gmelins Handbuch der Anorganischen Chemie. By E. H. ERICH PIETSCH, Editor. Verlag Chemie, G. m. b. H., Weinheim/Bergstr., Western Germany. (American Representative, The Gmelin Institute of Inorganic Chemistry, Dimitri R. Stein, 1074 Washington Avenue, Pelham Manor, N. Y.).

Calcium: System-Nummer 28. Part B, Section 1, 1956. viii + 264 pp. 17.5 × 25.5 cm. Price, $34.99.

Kupfer: System-Nummer 60. Part A, Section 1, 1955. xvi + 710 pp. 17.5 × 25.5 cm. Price, $92.13.

Kupfer: System-Nummer 60. Part A, Section 2, 1955. xxxii + pp. 711–1465. 17.5 × 25.5 cm. Price, $101.98.

Gmelins Handbook of Inorganic Chemistry continues to live up to its well-deserved reputation as the "Bible" of the inorganic chemist with the publication of its three most recent additions to the series. It will be recalled that the current eighth edition is scheduled for completion in 1960. Supplements will be issued for volumes published prior to 1949. If any fault is to be found regarding the Handbook, it can only be that the literature coverage is not entirely up to date. The present volumes are based on a complete survey through 1949, although selected topics in the copper volumes include references through 1954. In recent years the Gmelin volumes have made a much greater use of charts, graphs, diagrams and sketches. It is gratifying to note that this policy has been continued. The volume on calcium contains 28 figures, while a total of 425 are included in the two volumes on copper.

The calcium volume is the second to appear on the element. Part one (1950) covered the historical aspects, while the present volume is concerned with the technology of calcium and its compounds. The first 20 pages review ore dressing methods for calcium fluoride, sulfate, carbonate, and phosphate. The remainder of the volume summarizes the preparation of metallic calcium and some 50 calcium compounds. Many aspects of technological importance are considered, including preparative methods, uses, analyses, transportation, storage, dangers and recommended safety precautions.

The two volumes on copper comprise the first of three parts scheduled for the element and its compounds; Part B will review copper compounds, while Part C will deal with copper alloys. Section 1 of Part A includes an historical survey (34 pp.), occurrence (143 pp.), ore dressing (21 pp.), metal preparation (484 pp.), powder metallurgy (8 pp.) and technical preparation of copper oxides, oxychlorides and sulfate (20 pp.). The extensive chapter on metal production methods is divided as follows: pyrometallurgy, wet processes, electrolytic methods, production from complex ores, from metallurgical product residues, and copper recovery processes. World production and consumption statistics are quoted for the period 1938–53.

Section 2 of Part A is devoted entirely to the preparation and properties of elemental copper. The order of presentation follows the standard Gmelin system. Preparation and purification of copper, including special forms of the element, are reviewed first (18 pp.). Next is an extensive chapter (411 pp.) on physical properties: the nucleus, the atom and the molecule, crystallographic, mechanical, thermal, optical, magnetic and electrical properties. One confusing point here is the placement of the material on crystallographic properties, working and recrystallization of copper. This appears in its proper location in the table of contents, but the text has been bound at the end of the volume. Electrochemical and chemical properties are covered in 231 pages, followed by a brief summary of physiological effects of the element. The final 93 pages are devoted to methods of detection and determination of copper.

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Gmelins Handbuch der Anorganischen Chemie. System-Number 44. Thorium und Isotope. By E. H. ERICH PIETSCH, Editor. Verlag Chemie, G. m. b. H., Weinheim/Bergstrasse, Western Germany. (American Representative, the Gmelin Institute of Inorganic Chemistry, Dimitri R. Stein, 1074 Washington Avenue, Pelham Manor, N. Y.). 1955. xv + 406 pp. 18 × 25 cm. Price, $55.22.

In the almost 30 years since the 7th edition of this reference work on the scientific literature of thorium appeared, considerable change has occurred in the scientific and technological importance of the element. The appearance of the new 8th edition of Gmelin System No. 44 has therefore been awaited with anticipation. The present volume of 406 text pages contains some 82 pages which discuss the history and occurrence of the element, general preparation of compounds and processing of ores, large-scale preparative procedures, and industrial uses. A summary of preparation, physical properties (including nuclear behavior) and mechanical properties of elemental thorium occupy about 95 pages, electrochemical and chemical properties of the metal another 15 pages, and general discussion of thorium chemistry, about a dozen pages. The detailed discussion of the literature of specific compounds, which is characteristic of the Gmelin volumes, commences on page 200, and includes some 50 pages on the naturally occurring radioactive isotopes of thorium, their nuclear properties and nuclear reactions in which they have been used.

The usefulness of an annotated bibliography, which is the essential nature of the Gmelin volumes, is closely linked

to the completeness with which it covers the literature. For the new edition of the thorium volume, coverage is stated to be complete to the end of 1949, and to cover the important literature to 1954. Caution must therefore be used in depending on the volume past 1949, and it should be kept in mind that the material released at the time of the Geneva Conference on the Peaceful Uses of Atomic Energy, August, 1955, was not available for this volume. It must also be pointed out, that material appearing in the volume is often based on abstracts, not the full original publication, and therefore introduces other limitations. This is true, for example, of a considerable portion of the work cited from U. S. Atomic Energy Commission sources. If only because of these considerations, the occasional critical judgment on conflicting data or interpretations which creeps into the work should be disregarded, without influencing the value of the volume for its main purpose, that of providing leads to relevant literature.

Like the other volumes of the series, System No. 44 will occupy a valued place on the shelves of every general chemical library, and an especially treasured one in many special-purpose laboratories. The price would seem to place it out of the reach of the ordinary chemist.

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Review of Photosynthesis and Related Processes. Volume II, Part 2. **Kinetics of Photosynthesis** (continued), Addenda to Vol. I and Vol. II, Part 1. BY EUGENE I. RABINOWITCH, Research Professor, University of Illinois, Formerly Research Associate, Solar Energy Research Project, Massachusetts Institute of Technology. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. xvi + pp. 1211–2088. 16.5 × 23.5 cm. Price, $18.50.

One always experiences a little regret in finishing the reading of any good book, whether it be fiction or a well written scientific monograph. After coming to the end of two thousand fascinating pages which have appeared over a ten year period, it comes as something of a shock to realize that Rabinowitch is not currently preparing another volume of Photosynthesis. Let us hope that he can be persuaded to bring us up to date in a few years with a general addendum to the present work.

About the first third of the present book consists of a critical discussion of induction phenomena and of the effects of temperature, intermittent illumination and the pigment factor upon the kinetics of photosynthesis *in vivo*. The remaining five hundred pages are devoted to material which has appeared since the publication of the first two volumes. The principal topics considered are, as follows: the Hill reaction and the photochemistry of chlorophyll *in vitro*—142 pages, the "path of carbon"—83 pages, and the structure of chloroplasts, the chemistry and spectroscopy of the plant pigments and the kinetics of photosynthesis—totaling 264 pages. The text concludes with an Epilogue in which the author admirably sums up the present status of our knowledge of photosynthesis: indicating, alike, major achievements and points of weakness. No reader of this book should omit the preface.

In orderliness of presentation, style of writing, editorial details and printing, the present volume is comparable to its two excellent predecessors. While the price of this book is regrettably high, no student of photosynthesis can afford to be without it.

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Synthetic Methods of Organic Chemistry. An Annual Survey. Volume 10. BY W. THEILHEIMER. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. xvi + 746 pp. 17 × 23.5 cm. Price, $25.25.

The tenth annual survey by Theilheimer includes abstracts of procedures selected from papers published from 1953 through 1955. The abstracts concern new methods and improvements in known methods for synthesis of organic compounds. They contain enough information for an appraisal of the applicability of a type of synthesis or sequence of reactions: conditions, reagents and yields. The author's purpose is to furnish selected references as a guide to the literature, but although he specifically disclaims such intent, his descriptions are usually sufficiently detailed to enable a skilled experimenter to proceed with laboratory work. The book, like its predecessors, is very useful in suggesting methods to the practical organic chemist.

The alphabetical index is cumulative, covering volumes VI through X. Cross references in the body of the work are plentiful, and like the index include not only the present volume but also four preceeding it.

For more extensive reviews of recent volumes in the series, see This JOURNAL, **76**, 317(1954); **77**, 3425, 5453 (1955).

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Experimental Thermochemistry. Measurement of Heats of Reaction. Prepared under the International Union of Pure and Applied Chemistry by the Subcommission on Experimental Thermochemistry. Edited by FREDERICK D. ROSSINI, Carnegie Institute of Technology, Pittsburgh, Pennsylvania. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. xv + 326 pp. 16 × 23.5 cm. Price, $7.80.

This book was undertaken in order to place before the scientific and technical world the best knowledge relative to experimental thermochemistry and the measurements of heats of chemical reactions. In the reviewer's opinion the objective has now been achieved remarkably well under the capable editorship of Dr. Frederick D. Rossini.

The book contains fourteen chapters. Four of these, written by Dr. Rossini himself, discuss: General Principles of Modern Thermochemistry, Units of Energy and Fundamental Constants, Calibration of Calorimeters for Reactions in a Flame at Constant Pressure, and Assignment of Uncertainties to Thermochemical Data. The remaining ten chapters represent the work of twelve other outstanding thermochemists, five Americans and seven Europeans. Eight of these chapters deal in careful detail with: Calibration of Calorimeters for Reactions in a Bomb at Constant Volume, Standard States and Corrections for Combustions in a Bomb at Constant Volume, Physicochemical Standards in Thermochemistry, and the specific problems involved in burning various compounds containing carbon, hydrogen, oxygen, nitrogen, sulfur, chlorine, bromine and iodine. There are also two chapters which discuss Thermochemistry of Reactions Other than Combustion and The Microcalorimetry of Slow Phenomena.

These contributions from thirteen authorities have been coördinated extremely well, and the treatments of the various topics are excellent. Consequently the book should become essential reading for all serious workers in the field of calorimetry. Its influence will greatly improve the quality of future experimental studies and thereby should facilitate the development of a large body of consistent, accurate thermochemical data, which is at present the most urgent need of chemical thermodynamics.

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Electromagnetically Enriched Isotopes and Mass Spectroetry. Proceedings of the Conference held in the Cockcroft Hall, Harwell, 13–16 September, 1955. Sponsored by the Atomic Energy Research Establishment, Harwell. Edited by M. L. SMITH. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, New York. xvi + 272 pp. 14.5 × 22 cm. Price, $8.00.

As indicated in its complete title, the volume under review consists of the papers, thirty in number, presented at a conference on the separation and utilization of isotopes. Participants at the conference represented the following countries: Belgium, Canada, Denmark, Egypt, France, Germany, Holland, Sweden, U. S. A., Yugoslavia and the United Kingdom. The specific subjects with which the papers are concerned are: Ion Sources (5 papers), Collector Problems (3 papers), Chemical Aspects and Target Prepara-