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## NEW BOOKS

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**Physical Chemistry.** By Filemon Tanchoco, A.B., Ph.C., LL.B., Professor of Chemistry, Manila College of Pharmacy. Benipayo Press, Manila, Philippine Islands. viii + 173 pp. 21 × 28 cm.

This book is the result of the author's effort to provide for his students an inexpensive, simply written and briefly descriptive text covering the salient points of modern elementary physics and theoretical chemistry. Written by one whose knowledge of the English language has been acquired, and produced by local printers with limited equipment, the book, although containing many imperfections, is a credit to its makers, and should serve well its mission of giving to Filipino students a general survey of physics and chemistry as a background for further work in chemistry, pharmacy and medical science. For improving a future edition the reviewer would suggest (1) some amplification of the sections on the Ionic Hypothesis, Cells, and Electrochemistry, (2) a slightly less extensive discussion of osmotic pressure, crystallography, and the older atomic models, and (3) the assistance (if reasonably possible) of an American chemist in minimizing minor typographical errors and avoiding occasional grammatical misconstructions.

ALLEN D. BLISS

**Smith's Inorganic Chemistry.** By JAMES KENDALL, F.R.S., Professor of Chemistry in the University of Edinburgh. Second revised edition. D. Appleton-Century Company, Inc., 35 West 32d Street, New York, N. Y., 1937. xxiv + 954 pp. 222 figs. 14.5 × 22 cm. Price, \$4.00.

This new edition of "Smith's Inorganic Chemistry" while still mainly unchanged in form and content has been somewhat enlarged and considerably enriched by Dr. Kendall's revision.

Because new material is so widely distributed throughout the text it is difficult to mention the many places where commercial processes have been brought more nearly up to date, or where theoretical explanations have been changed to conform to modern methods of thinking.

The Debye-Hückel and the Brönsted theories are presented with sufficient completeness but are not made use of to any great extent in the general portions of the text. This was probably unavoidable on account of the large amount of rewriting which would have been required.

Rather extensive use is made of thermochemical equations in the discussion of specific reactions. Considerable use has also been made of the ideas involved in the relationship between atomic structure and valence.

The questions at the ends of the chapters have been revised and extended. They form a very valuable aid to the teacher.

Dr. Kendall has complimented the *Journal of Chemical Education* by the large number of reading references he has chosen from its pages.

Adverse criticism of the book may be restricted to the suggestion that the reproduction of many of the diagrams and line drawings could be improved. Numbers on the diagrams are often not easily read.

In general the text lives up to the high standard of its predecessors and will be found a valuable addition to the library of any chemist.

P. A. BOND

**The Structure of Atomic Nuclei and Nuclear Transformations.** By G. GAMOW. Oxford University Press, 114 Fifth Ave., New York, 1937. xii + 270 pp. 70 figs. 16.5 × 24.5 cm. Price, \$6.00.

This is a second and completely revised edition of "Constitution of Atomic Nuclei and Radioactivity" by the same author. For some time the first edition has been the only authoritative book in the theory of the subject. Hence the appearance of the second edition has been expected with considerable interest. The book is divided into three parts: I, Stable Nuclei; II, Spontaneous Nuclear Transformations; III, Nuclear Transformations by Collisions; and an attempt is made in each to give a complete account of the essential developments without having the discussion exhaustive either in theory or in experiment. In some parts the book is written from a personal point of view and represents the opinions and work of the author rather strongly. Thus almost four pages are devoted to negative protons and the theory of spontaneous alpha particle disintegration is given in a more logically complete form than most of the other theories.

In a subject developing as rapidly as nuclear physics it is impossible to have a really up-to-date book and equally impossible to have all of the contents correct since so much of the subject is still in a controversial stage. The delay in printing and publishing this particular edition will probably detract somewhat from its immediate usefulness as an up-to-date summary for those actively engaged in research. Nevertheless its permanent value as a textbook will not be much affected. Some attempt at coordinating it with "An Introduction to Nuclear Physics," by N. Feather has been made, Gamow's book emphasizing the theoretical and Feather's the experimental points of view. The combined use of the two books will probably be found most effective.

On p. 39 Eqs. (56) (56') have wrong signs of  $M_n$ ,  $M_p$ . On p. 55 Eq. (3') has  $3^{1/2}$  under the integral instead of  $r^3$ . The relativistic factor which is important for heavy elements in this  $hfs$  formula apparently has been omitted. On p. 59 the author says that "recent experiments on scattering of protons in hydrogen (see Chap. IX) definitely show that the radius of the proton is of the order of magnitude  $10^{-13}$  cm." It should be noted that the experiments of Tuve, Heydenburg and Hafstad give practically no information on the range of force except for a rather large upper limit and that White's experiments gave no agreement with ordinary theories. Nevertheless, Bohr's main

thesis about the size of the proton could perhaps be defended by evidence as to the range of force from mass defects of  $H^3$ ,  $He^4$ . Gamow appears to be an optimist on p. 87 in stating that the theory of  $\alpha$ -disintegration is complete. Pedagogically pp. 88, 89 dealing with penetration through a barrier are very fine even though the problem discussed has boundary conditions differing from those needed in the physical application. On p. 98 Gamow states that the method of complex eigenvalue cannot be applied except in the simplest cases. Since there exists a general connection between solutions with real energies in the continuum and solutions with complex eigenvalue, it is possible to use the formulas of the method in all cases in which the assumptions of sharp resonance hold. The applicability of the method is thus wider than that of the WKB approximations used on p. 100. The fact is useful for light nuclei.

The speculations on p. 61 about the normal state of the deuteron being in a D or P condition appear to be rather far fetched. Most of present evidence speaks against this hypothesis. The discussion of  $\gamma$ -ray theories is somewhat superficial and so are the distinctions between substitutional reactions and reactions *en passant*. The section on nuclear excitation by  $\alpha$ -decay is particularly nice to have (pp. 110-119) since good accounts of this subject are hard to find elsewhere.

G. BREIT

**Methodik der Hormonforschung.** (Methods of Hormone Investigation. Vol. I.) By Dr. Phil. CHRISTIAN BOMSKOV. Georg Thieme Verlag, Rossplatz 12, Leipzig C 1, Germany, 1937. xxi + 716 pp. 251 figs. 17 × 25 cm. Price, M. 54; bound, M. 56.

The present-day activity of the organic chemist in the elucidation of the chemical structure of hormones involves, among other things, knowledge of the techniques employed for their isolation in chemically pure form. In order to perform this part of his work, he is often obliged to turn amateur physiologist, for the prerequisite for experiments on the isolation of a hormone is a quantitative biological test which depends upon its physiological function. When once they have been isolated, hormones may occasionally be assayed by chemical methods; these may be more precise, but are rarely as specific, and therefore constitute less reliable guides.

The volume under review is the first instalment of a comprehensive treatise for the instruction of investigators faced with the above necessity. The avowed aim of the author is to present a critical description of all methods which have proved useful, but of no others, to discuss methods of isolation and synthesis of hormones, and to describe their chemical, physical and physiological properties. The hormones are here classified according to the organ of origin, of which five—thyroid, parathyroid, adrenal cortex, adrenal medulla, pancreas—are considered in this first volume. Discussion of the hormones of the anterior and posterior lobes of the pituitary, the sex hormones, the circulatory hormones, and many others, is promised for a future volume.

The author has undertaken his task with Teutonic thoroughness. The first fifth of the space is given over to

the description of general procedures of surgical, histological, biological and chemical character. The subsequent systematic discussion of the individual hormones is carried out with elaborate devotion to detail, and consideration of every procedure which can conceivably be of practical or theoretical value appears to have been included.

This work cannot fail to be of inestimable value not only to chemists interested in hormones but to all who labor in the fields of endocrinology.

HANS T. CLARKE

**Pouvoir Rotatoire des Ions de l'Acide *d*-Glutamique.** (Rotatory Power of the Ions of *d*-Glutamic Acid.) By V. A. PERTZOFF, Institut de Chimie, Montpellier. Imprimerie de la Charite (Pierre-Rouge), Montpellier, 1937. 171 pp. Price, 25 francs.

This monograph reports a careful and valuable study of optical rotation in an amino acid which can exist in several different ionic forms. It is recommended to all who are interested in this field. The influence of concentration, temperature, and wave length has been systematically studied for all the ions concerned. There is a brief section reporting similar studies upon *l*-aspartic acid.

JOHN T. EDSALL

**Poggendorffs biographisch-literarisches Handwörterbuch für Mathematik, Astronomie, Physik mit Geophysik, Chemie, Kristallographie und verwandte Wissensgebiete.** (Poggendorff's Biographical and Bibliographic Encyclopedia for Mathematics, Astronomy, Physics, Geophysics, Chemistry, Crystallography and Related Sciences.) Vol. VI, 1923-1931, Part II, F-K. Edited by Dr. HANS STOBBE. Verlag Chemie G. m. b. H., Corneliusstrasse 3, Berlin W 35, Germany, 1937. iv + 742 pp. 17 × 25 cm. Price, RM. 63.75.

The present volume is the second instalment of this valuable encyclopedia [see *THIS JOURNAL*, 58, 1319 (1936)]. The third instalment is expected to appear in the late fall of the present year, while the fourth and concluding instalment is to appear in 1938. In the course of publication the number of biographies has grown from eight thousand to an estimated ten thousand. The publishers also announce that work on Vol. VII, covering the literature of the five years, 1932-1936, has already begun. The first instalments of it are to appear in 1939.

ARTHUR B. LAMB

**Applied Radiochemistry.** By OTTO HAHN, Director of the Kaiser Wilhelm Institute for Chemistry in Berlin-Dahlem. The George Fisher Baker Non-Resident Lectureship in Chemistry at Cornell University, Vol. XIV. Cornell University Press, 124 Roberts Place, Ithaca, N. Y., 1936. xi + 278 pp. 69 figs. 16 × 23.5 cm. Price, \$2.50.

The author has omitted that part of his Baker lectures which dealt with the chemistry of the radioactive elements in order to treat more fully the use of radioactive ele-

ments in various types of research which he designates "applied radioactivity."

An introductory lecture contains an unusually interesting account of the behavior of very minute quantities of materials with illustrations from biology, chemistry and physics.

The applied radioactivity is divided into four parts, first, investigation with unweighable amounts of radioactive atomic types in solvents, of solids in gases, in precipitation reactions and their surface exchanges. In Part III the radioactive indicator methods and their uses are discussed rather briefly on account of the attention given to this subject by Professor Paneth, one of the recent Baker visiting lecturers. Part IV deals with emanative methods including the remarkable work of the author in the high emanating power of some radium compounds distributed over gels and the study of the extent of their surfaces.

S. C. LIND

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**Organic Chemistry.** By FRANK C. WHITMORE, Research Professor of Organic Chemistry, The Pennsylvania State College. D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York, N. Y., 1937. x + 1080 pp. 14.5 × 22.5 cm. Price, \$7.50.

The author states definitely in the preface of his book his plan and purpose in writing an advanced text on organic chemistry. "The purpose and scope of this work can best be indicated by characterizing it as a one-volume 'Beilstein' designed for practising organic chemists, for others who have to take occasional cognizance of organic compounds and their reactions, and for students who have pursued organic chemistry for at least a year with the aid of the many excellent elementary and intermediate textbooks now available."

In the opinion of the reviewer the work has been done well, and excellent judgment has been used in the selection and treatment of the substances described. Since the book is for advanced students the author did not have to consider the pedagogical aspect of his presentation of the subject; he could accordingly compress the material and gain space for the consideration of many compounds not described in text-books of the usual type. Among the admirable features of the book are the following: a critical examination of the methods for the preparation of the more important compounds which leads to the indication of the best method to be used in the laboratory; the description of many compounds of biochemical interest; the attention paid to the newer products of the organic chemical industry; the use of the electronic concept of valence whenever this view is helpful in interpreting chemical behavior; and the fact that many of the more recent contributions to the literature are included.

The value of the book for reference is greatly increased by the fact that an unusually detailed index has been prepared, which covers 122 pages. The uses of typical syn-

thetic methods are fully indexed. For example, the references to the Grignard reaction cover two pages; there are about 150 references to reactions of addition, 75 to conjugated systems, 40 to the Friedel-Crafts reaction, etc.

The author states in the introduction—"Instead of giving full references in the text or in footnotes the names of investigators are included in parentheses. These can be used as clues to further details in conjunction with the ordinary indexes of the chemical literature."

The number of pages allotted to the several divisions of the subject are as follows: aliphatic compounds 614, alicyclic compounds 76, aromatic compounds 183, and heterocyclic compounds 82.

The book will be of value to advanced students who desire to broaden their knowledge of compounds and to learn more of the wide applications of the general synthetic methods used in organic chemistry.

JAMES F. NORRIS

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## BOOKS RECEIVED

July 15, 1937–August 15, 1937

- A. GRÜTZNER, G. APEL and C. GÖTZE. "Gmelins Handbuch der anorganischen Chemie. Magnesiumlegierungen: Patentsammlung geordnet nach Legierungssystemen." Verlag Chemie G. m. b. H., Corneliusstrasse 3, Berlin W 35, Germany. 192 pp. RM. 15.
- B. SMITH HOPKINS. "General Chemistry for Colleges." Revised. D. C. Heath and Company, 285 Columbus Ave., Boston, Mass. 758 pp. \$3.72.
- B. SMITH HOPKINS and M. J. COPLEY. "Laboratory Exercises and Problems in General Chemistry." Third edition. D. C. Heath and Company, 285 Columbus Ave., Boston, Mass. 234 pp. \$1.76.
- A. G. NORMAN. "The Biochemistry of Cellulose, the Polyuronides, Lignin, &c." Oxford University Press, 114 Fifth Ave., New York, N. Y. 232 pp. \$5.00.
- WILHELM PRODINGER. "Organische Fällungsmittel in der quantitativen Analyse." Ferdinand Enke Verlag, Hasenbergsteige 3, Stuttgart-W, Germany. 163 pp. RM. 15; bound, RM. 16.80.
- HANS STOBBE, Editor. "J. C. Poggendorffs biographisch-literarisches Handwörterbuch für Mathematik, Astronomie, Physik mit Geophysik, Chemie, Kristallographie und verwandte Wissensgebiete." Band VI, 1923 bis 1931, II Teil, F-K. Verlag Chemie G. m. b. H., Corneliusstrasse 3, Berlin W 35, Germany. 742 pp. RM. 63.75.
- "Gmelins Handbuch der anorganischen Chemie. System-Nummer 35, Aluminium." Teil A, Lieferung 5. Verlag Chemie G. m. b. H., Corneliusstrasse 3, Berlin W 35, Germany. 202 pp. RM. 24.75.