

NEW BOOKS

Handbuch der anorganischen Chemie. (Handbook of Inorganic Chemistry.) By Dr. R. ABEGG, Dr. FR. AUERBACH and Dr. I. KOPPEL. *Die Elemente der achten Gruppe des periodischen Systems. Eisen und seine Verbindungen.* (The Elements of the Eighth Group of the Periodic System. Iron and its Compounds.) Second part, B, Lieferung 1. S. Hirzel, Königstrasse 2, Leipzig, Germany 1930. xvi + 462 pp. 139 figs. 17 × 24 cm. Price, unbound, M. 45.

In a preface to this instalment Dr. Koppel, the sole surviving editor of this Treatise, states that it had been the intention to issue the volume on Iron as a complete whole, but that delays in its preparation had made it desirable to issue it in two parts, A and B. A is to deal with the iron atom, iron metal, alloys, the compounds of iron with the metalloids other than the halogens, its passivity, corrosion, technology and analysis. B is to deal with the compounds of iron.

The present volume (B 1) constituting the first part of B, discusses the compounds of di- and trivalent iron other than the complex cyanides, the compounds of hexavalent iron, the carbonyls and nitrosyls of iron and a number of substances which according to the opinion of various investigators are derived from mono-, tetra- and pentavalent iron.

This volume maintains the valuable features characteristic of the earlier volumes of this Treatise, namely, a connected, clear and critical presentation of the subject matter from a broad theoretical standpoint.

ARTHUR B. LAMB

Elementary Practical Physical Chemistry. By FRANK SHERWOOD TAYLOR, M.A., B.Sc., Chemistry Master at Gresham's School, Holt. Oxford University Press, American Branch, New York, 1928. xi + 130 pp. 51 figs. 12.5 × 18.5 cm. Price, \$1.25.

The scope of the book is indicated in the preface, in which the author says: "This book has been written for the use of the advanced classes of schools and the first-year classes of the universities. It assumes that no apparatus is available other than that found in every school laboratory, and also that the student's time is strictly limited."

The contents of the book may be summarized as follows: Part I includes the usual procedures for the determination of molecular weights, osmotic pressures and dissociation. Part II deals with ionization (the author calls it "the ionic hypothesis"), particularly with such subjects as electrolysis, solubility products, indicators, complex ions, and the e. m. f. series. In Part III, besides the usual experiments on reaction velocities, several exercises are included dealing with the effects of temperature, concentration, light and catalysis on the speed of reactions. Part IV includes three simple experiments on the distribution of a solute between two solvents. Part V deals with heterogeneous equilibria, in which certain applications of the phase rule are introduced. Part VI is an introductory treatment of colloids, consisting of easy preparation methods.

Many of the experiments are qualitative rather than quantitative, and in all cases the theoretical basis of the experiment is briefly outlined. Many teachers might find the book useful as a source of lecture table and extra laboratory experiments.

J. H. REEDY

Volumetric Glassware. By VERNEY STOTT, B.A., F.Inst.P., Senior Assistant, National Physical Laboratory; Formerly Scholar of Peterhouse, Cambridge, England. H. F. and G. Witherby, 326 High Holborn, W. C., London, England, 1928. 232 pp. 40 figs. 14 × 22 cm. Price, 20 s. net.

The units of volume, their origin and history, are discussed in Chapter I. Tables are given showing the corrections to be added to apparent weight of water at observed temperature to give volume in ml. at standard temperature. The details of construction of measuring flasks and graduated cylinders, a device for determining the internal diameter of the necks of flasks at the graduation mark, general instructions for graduating and testing, are ably discussed. The tolerances and specifications of the National Physical Laboratory are stated in detail and a comparison is made with the tolerances and specifications of the United States Bureau of Standards. The author points out that satisfactory graduations for burets and graduated cylinders require that every numbered graduated line (every tenth line) extend completely around the cylinder or buret and the remainder at least half-way around. The effect of drainage based on delivery time of pipets and burets has been carefully studied and precautions outlined so that best results may be obtained.

The machines used for placing the graduation marks on volumetric apparatus are described, especial attention being given to those used for placing the graduations on burets and graduated cylinders in conformity with the specifications of the National Physical Laboratory and the U. S. Bureau of Standards.

A series of Calibration Tables useful in calibrating and testing volumetric apparatus completes the volume.

The book gives an excellent treatise on volumetric glassware and the information contained would be very useful to manufacturers, users and those engaged in calibrating and testing such apparatus.

E. L. PEPPER

An Introduction to Organic Chemistry. By ERIC JOHN HOLMYARD, M.A., M.Sc., D.Litt., F.I.C., Head of the Science Department, Clifton College. Longmans, Green and Co., 55 Fifth Avenue, New York, 1930. xi + 282 pages. Illustrated. 12.5 × 19 cm. Price, \$1.75.

This excellent elementary textbook is based upon the author's "Outlines of Organic Chemistry" and "is intended for complete beginners—boys and girls who have just passed the School Certificate examination and are now

about to enter upon the wider field of study that lies invitingly before them." It contains clear directions for many experiments and interesting discussions of the simpler portions of organic chemistry theory, but it does not cover as wide a field as is usually covered by the most elementary courses which are given in this country. It makes no mention, for example, of the Grignard reaction, of tautomerism or of the relation between color and chemical constitution.

We cannot refrain from quoting the first paragraph of Chapter One. "Those about to begin the study of organic chemistry stand at the threshold of a new world, a world of entrancing beauty and surpassing interest. With sufficient resemblance to inorganic chemistry to render its features not completely unfamiliar, it nevertheless has characteristics of its own that excite the admiration of the simple tourist, captivate the permanent settler and stimulate the explorer to penetrate its utmost recesses. There cannot be many, and there should not be any, dull moments in the study of organic chemistry. And for the novice there is the reassuring fact that organic theory is easy, logical and almost invariably obeyed, the rare exceptions serving mainly to impart a slightly piquant effect to the whole, like a *retroussé* nose upon a profile otherwise severely Grecian."

Following shortly after this is a section entitled "A Day's Experience," in which the many contacts of a London business man with the products and materials of organic chemistry are enumerated. After he has reached his office, "feeling a little stuffy in the nose, he uses his *artificial silk* handkerchief (made of cellulose dyed with an organic dye), upon which he has taken the precaution to sprinkle a few drops of *eucalyptus oil*," etc. And in the evening he "finally arrives home to a savoury organic dinner, washed down with organic beer and followed by an organic cigar." The book has a distinctly British and a distinctly pleasing atmosphere.

Holmyard's book is too elementary for the short courses in organic chemistry which are offered at American colleges. But we are not acquainted with a better book for the uses of the exceptionally bright high-school student who wishes for an acquaintance with organic chemistry beyond the scope of the regular high-school inorganic chemistry course.

TENNEY L. DAVIS

Gesammelte Abhandlungen zur Kenntnis der Kohle. (Collected Contributions to the Knowledge of Coal.) Vol. 9. By Professor Dr. FRANZ FISCHER, Director of the Kaiser-Wilhelm-Institut für Kohlenforschung. Verlag von Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, Germany, 1930. viii + 759 pp. Illustrated. 16.5 × 25.5 cm. Price, bound, M. 70.

This volume is a collection of papers describing work done at the Kaiser Wilhelm Institute for Research on Coal chiefly during the years 1928 and 1929. The papers are for the most part reprints of papers already published elsewhere, principally in *Brennstoff-Chemie*. There are included,

however, some sixteen papers not previously published, as well as an Appendix containing a history of the Institute, a description of the new Lecture Hall erected in 1929 and an account of its dedicatory exercises.

The researches described here are in part continuations of the earlier researches of the Institute relative to the origin and constitution of coal and the coal-formers, and extend them, for instance, on the biological side. Other researches are concerned with the chemical and technological problems of fuels, particularly the production of coke. Finally, there are many researches dealing with the purification of gases, catalysis and the thermal and electrical treatment of gases, all of which point to the increasing importance of synthetic fuel.

The articles are arranged under the following heads:

- I. Bacteriological Researches
- II. Lignin, Humic Acid and Related Fields
- III. Origin and Constitution of Coal
- IV. Montanic Acid
- V. Chemical and Technological Researches on Coal
- VI. Researches on Gases. (a) Gas purification. (b) Benzene synthesis. (c) Catalytic, thermal and electrical treatment of gases
- VII. Carbides
- VIII. Miscellaneous Articles and other Publications. Appendix: History of the Institute.

The unpublished articles are particularly concerned with the bacteriological study of coal and with the synthesis of benzene.

This volume is at once a most convenient collection of related articles and a striking demonstration of the success of the Kaiser Wilhelm Institute under the leadership of Dr. Franz Fischer.

ARTHUR B. LAMB

Die Globuline. (The Globulins.) By Dr. MONA SPIEGEL-ADOLF, Assistant at the Institute of Medical Colloid Chemistry of the University of Vienna. Vol. IV, "Handbuch der Kolloidwissenschaft." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1930. xv + 452 pp. 68 figs. 15.5 × 23.5 cm. Price, unbound, RM. 33; bound, RM. 35.

The distinctive chemical properties of the globulins, and their very widespread occurrence in living tissues, mark them out as among the most important of proteins. With acids and bases they are as reactive as the albumins, while their great change in solubility with changing salt concentration sets them apart from other proteins. The study of this property offers a wide and important field of physico-chemical investigation, and will undoubtedly throw light on the biological function of the globulins.

Dr. Mona Spiegel-Adolf's book is the first comprehensive monograph devoted specifically to this class of proteins. It opens with a long chapter

on the occurrence of globulins in nature, the methods used in separating them from other substances, and their chemical composition and structure. Two chapters follow on the reactions of globulins with acids and bases, and the associated physico-chemical phenomena, which are treated in great detail. All these chapters deal with aspects of protein behavior in which the globulins do not fundamentally differ from the albumins, while Chapter IV deals with the distinctive behavior of globulins in neutral salts. Chapter V discusses their interaction with colloids and salts of heavy metals; and the final chapter treats of the globulins in biology and medicine, especially in their relation to immunity.

The author has gathered together a great amount of material from the most diverse sources, and has presented it very fully, with a wealth of tables and diagrams. The presentation of the work discussed is so full and so impartial that this monograph should be of great value as a work of reference.

The discussion is devoted almost entirely to the serum globulins and edestin; the globulins of other plant and animal tissues are scarcely more than mentioned. In our present state of ignorance concerning these substances, this is probably inevitable; but this gap indicates clearly the need for further study in this important field. Even the serum globulins remain very ill-characterized, as compared with such proteins as egg albumin or hemoglobin. Dr. Spiegel-Adolf's presentation of what has already been done makes clear the need for further exact studies in many directions: both in the preparation of pure globulin solutions, and in the analytical and physico-chemical study of their properties.

The most characteristic property of globulins, their solution and precipitation by neutral salts, might well have been treated more fully. The work of Osborne and Harris on the solubility of edestin, for instance, remains a model of investigation in this field, and deserves presentation at greater length. Moreover, the original valence rule applied by Mellanby to the solvent action of neutral salts on serum globulin is clearly a special form of the ionic strength principle later formulated by G. N. Lewis, and theoretically elucidated by Debye and Hückel. The theories of Debye and Hückel have indeed already been successfully applied to some protein systems. They deserve some discussion in such a book as this, for they promise to throw light on aspects of protein behavior which have hitherto remained perplexing and obscure.

JOHN T. EDSALL