

BOOK REVIEWS

A Text-book of Practical Organic Chemistry Including Qualitative Organic Analysis. By ARTHUR I. VOGEL, D. Sc. (Lond.), D.I.C., F.R.I.C., Head of Chemistry Department, Woolwich Polytechnic; sometime Beit Scientific Research Fellow of the Imperial College, London. Longmans, Green and Co., 55 Fifth Avenue, New York 3, N. Y. 1956. xxvii + 1188 pp. 17 × 25.5 cm. Price, 60/—.

In format and external appearance the third edition of this well known text is similar to the second. However, there has been a careful revision, and the volume has been expanded by 155 pages. Only a general description of the numerous changes and additions which have been made is possible in a brief review. New preparative procedures illustrating more recent developments in organic synthetic methods have been inserted, the number of heterocyclic and alicyclic preparations has been more than doubled, and the chapter on miscellaneous reactions has been greatly enlarged to include examples of many of the "name" reactions discussed at length in *Organic Reactions* (John Wiley and Sons). Directions are given for the preparation of some additional types of derivatives useful in the identification of organic compounds, and the melting points of such derivatives from selected compounds are assembled in tabular form. An account of the electronic mechanisms of numerous reactions is now contained in the short theoretical discussions which precede the detailed synthetic procedures involving these reactions. Other additions are a chapter on semimicro technique (previously incorporated in the 1954 impression of the second edition) and a section in the appendix giving an introduction to the application of infrared and ultraviolet spectra to organic chemistry.

This text, which "is intended to meet the requirements of the student throughout the whole of his training," contains a wealth of material. It is, therefore, the more surprising that it contains no discussion of paper chromatography. The author regrets "that the size of the volume has rendered the insertion of literature references impossible." Since selected references, particularly to recent work, would have greatly enhanced the value of the text by introducing the elementary student to the literature and guiding the more advanced student in his further study, it is the reviewer's opinion that some of the less instructive cognate preparations could well have been sacrificed to permit the addition of such references. With the ideal text in mind, he wishes also that there could have been included in the theoretical portion some discussion of reaction rates, chemical equilibria, and energy changes in chemical reactions to emphasize to the student that intelligent laboratory practice calls for an understanding and application of such fundamental principles and not solely a laboratory know-how and a familiarity with the equations for the reactions which he is carrying out. The inclusion of the above-mentioned features would have made this very useful text a humdinger.

Even so, it can be said of the third edition, as it could of the text when it was originally published, that if a student could have only one reference book available in the organic laboratory, he would make no mistake in choosing Vogel's "Practical Organic Chemistry." Furthermore, at its moderate price he can be certain that he is getting full value for his money.

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R. W. HELMKAMP

L'Hydroxycarbonylation. Vol. LVI. Colloques Internationaux du Centre National de la Recherche Scientifique. Centre National de la Recherche Scientifique, 13 Quai Anatole-France, Paris 7, France. 1955. 101 pp. 21 × 27 cm. Price, Frs. 1.000.

The CNRS published this report on the meeting held in Paris from May 31 to June 5, 1954, under the presidency of M. H. Gault. It contains a transcript of each one of the 26 papers presented, with a brief summary of the discussion that followed. Seven countries (Belgium, England, France,

Germany, Holland, Saar and the United States of America) sent a total of 45 representatives.

The colloquium was devoted to the study of "hydroxycarbonylation," that is, of reactions which lead to α - or β -hydroxycarbonyl compounds.

The papers can be divided into two groups, those dealing in general with the physical chemistry of hydroxycarbonylation, and those considering some of its most important applications in organic chemistry. The first group includes the study of mechanism and kinetics of various reactions: equilibrium in the hydration of aldehydes, aldolization of acetaldehyde, phenol-formaldehyde, and formaldehyde-benzamide condensations, deketolization, catalytic influence of ionic interchangers on the condensation of carbonyl compounds, orientation in the ketone-ester condensations, tautomerism of the α -hydroxycarbonyl compounds with enediols, etc. The second group contains numerous applications: determination of active hydrogens by a spectrographic method, solution of β -hydroxycarbonylation problems through ultraviolet spectrophotometry, synthesis of cyclic ketones, synthesis of polycyclic cyclenones, and other compounds containing fused rings, etc.

The purely synthetic organic work indicated a variety of technical and scientific applications such as: the building of the polycyclic system of the steroids and of aureomycin, the development of an industrial method for the synthesis of chloromycetin, the opening of a new road to the preparation of polynuclear compounds, and of a new series of dyes derived from naphthacene.

From a physicochemical point of view, the most important achievement was the substitution of the old empirical rules by the modern ionic and electronic concepts. The latter were applied successfully in many cases to establish the appropriate experimental conditions, to predict the course of hydroxycarbonylation reactions, and even to determine whether a given process was possible.

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M. BARON

Temperature—Its Measurement and Control in Science and Industry, Vol. II. Edited by HUGH S. WOLF for the American Institute of Physics, Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1955. x + 467 pp. 16 × 23.5 cm. Price, \$12.00.

The volume is a collection of twenty-four papers arranged in five sections covering General Concepts, Standards and Scales, Transient Phenomena, Experimental Measurements and Miscellaneous Topics. The contributions were presented at the Third Symposium on Temperature in October of 1954 in Washington, D. C. The companion volume I published 15 years ago will remain a fundamental work while the new volume contains material relating to both high and low temperatures that could not have been treated in the earlier volume with the definiteness now possible. New techniques and improvements in methods of temperature measurement together with the relevant theory is lucidly presented.

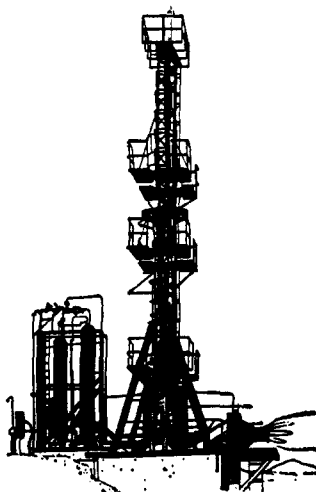
Since the Second Symposium in 1939 an appreciation of the importance of an accurate knowledge of the relation of the international scale of temperature to the thermodynamic or Kelvin scale has increased greatly. The comparisons by gas thermometry in the interval from the ice-point to the normal sulfur boiling point are concisely stated, and much needed similar effort from the ice-point downward is represented by several papers out of the nine devoted to Standards and Scales. There is a renewed approach to the high temperature region after more than forty years since Day and Sosman's gas thermometry investigations in the U. S. A. followed the pioneer efforts of Carl Barus and the continental investigators.

The Comité Consultatif de Thermométrie labored valiantly with the question of assignment of T_0 . About 100 years ago Kelvin noted that a sufficient definition of the thermodynamic scale was met by assigning one fixed point.

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Some seventeen years ago a similar suggestion was made by W. F. Giauque stressing the suitability of the triple point of water as the reference temperature. The C. C. T. in 1948 accepted the single fixed point suggestion in principle with the value 273.16° for the triple point, thus requiring 273.15°K . for the normal ice-point. There remains, however, something of a dilemma regarding the size of the degree and J. H. Hall's paper presents the situation briefly yet completely. H. F. Stimson's paper is a logical sequence of E. F. Mueller's paper on resistance thermometry appearing in the first volume. H. F. S. appears to have come close to the ultimate in precision and apparatus in the case of the triple point of water, the oxygen and sulfur points.

The remarkable progress in heat resistance alloys has been accompanied by the concomitant development of rockets, jets and gas turbines. Indeed, last December one of the greatest quality manufacturers ceased the production of piston airplane engines to construct exclusively turbo props, and gas turbine vehicles are not many years away. The significance of accurate temperature measurements of flames and the hot gases involved in the study and control of combustion in the foregoing engines has given rise to diversified methods based on radiation and related temperature indicating devices. The critical survey of the methods by H. P. Broida includes a selected bibliography. Much additional work in this important field of temperature measurements remains to be carried out. Section IV containing six papers (132 pages) dealing with experimental measurements is a valuable summary. The section preceding Section IV contains two papers dealing with non-equilibrium states and fluctuations, material fundamental in unraveling the tangle of effects inherent in spectral methods of temperature measurement.

The concluding section of three papers deals with the temperatures in atomic explosions, ionization measurements at elevated temperatures and high altitude temperatures. Volume II "Temperature" is very timely and provides a scholarly review of the varied and ingenious methods developed to meet the indispensable temperature measuring needs of science and technology.

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FREDERICK G. KEYES

BOOKS RECEIVED

September 10, 1956–October 10, 1956

- R. C. L. BOSWORTH. "Transport Processes in Applied Chemistry. The Flow of Physical Properties in Chemical Reactors." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1956. 387 pp. \$12.00.
- F. R. BRUCE, J. M. FLETCHER, H. H. HYMAN, AND J. J. KATZ, Editors. "Progress in Nuclear Energy." Volume I. Series III. "Process Chemistry." McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1956. 407 pp. \$12.00.
- B. D. CULLITY. "Elements of X-Ray Diffraction." Addison-Wesley Publishing Company, Inc., Reading, Massachusetts. 1956. 514 pp. \$10.00.
- H. EYRING, Editor, C. J. CHRISTENSEN, AND H. S. JOHNSTON, Associate Editors. "Annual Review of Physical Chemistry." Volume 7. Annual Reviews, Inc., Palo Alto, Stanford, California. 1956. 503 pp. \$7.00.
- W. G. FRANKENBURG, V. I. KOMAREWSKY, AND E. K. RIDEAL (edited by). "Advances in Catalysis and Related Subjects." Volume VIII. Academic Press, Inc., Publishers, 111 Fifth Avenue, New York 3, N. Y. 1956. 353 pp. \$10.00.
- L. HOLLAND. "Vacuum Deposition of Thin Films." With a Foreword by Professor S. Tolansky. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1956. 541 pp. + 25 Plates. \$10.00.
- MELVIN S. NEWMAN (edited by). "Steric Effects in Organic Chemistry." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1956. 710 pp. \$12.50.
- K. A. STACEY. "Light-Scattering in Physical Chemistry." Academic Press, Inc., Publishers, 111 Fifth Avenue, New York 3, N. Y. 1956. 230 pp. \$6.75.