shows marks of such a duality: it is very strict in certain aspects; in others, the formulas are merely taken over without any attempts being made to derive them rationally (e.g. Stokes' law of sedimentation, the Debye-Hückel limiting laws, and the whole chapter on the chemical bond and resonance).

The 30 chapters cover the following topics: limiting laws; review of certain indispensable conventions; the standard chemical balance; measurements of volume; density and some of its clinical uses; sedimentation in gravitational and centrifugal fields; limiting laws of gases; colligative properties of solutions; distribution between phases; diffusion; impressionistic sketches of phenomena associated with semipermeable membranes; mass action law; rates of reaction; equilibrium in systems containing hemoglobin; conductance; proton exchange, pH; certain properties of protein solutions; equilibrium of blood electrolytes; thermochemistry; free energy; oxidation-reduction; glass electrode; polarography; a picture of atomic structure; isotopes; refraction and polarization of light; stereoisomerism; emission and absorption spectra; luminescence; and a few topics of colloid chemistry. There are several appendices. Each of the 30 chapters is seasoned by a motto, a quotation from authors ranging from an ancient emperor of Hindustan to the heroes of modern science.

It will indeed be a good investment of leisure hours for a medical student, not only while at medical school but even more so thereafter, to study this book chapter by chapter—for study, he must; it is no easy reading matter. He will learn something both from those chapters which try to inculcate the fundamentals and from those representing just impressionistic sketches, and he will find the satisfaction, from his standpoint as a medical man, that at all times the application of the particular topic to physiological and clinical problems is emphasized.

L. MICHAELIS

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Selected values of properties of hydrocarbons. Frederick D. Rossini, *et al.* (Circular of the National Bureau of Standards C461; prepared as part of the work of the American Petroleum Institute Research Project 44.) Washington, D. C.: U. S. Government Printing Office, 1947. Pp. xiii + 483. $2.75.

Twenty years ago no one was particularly concerned with the physical properties of hydrocarbons. At that time, with the exception of aromatics, the hydrocarbons were used mainly as a convenient starting basis for the study of organic chemistry. Since then, the widespread use of hydrocarbons in production of high-octane motor fuel, synthetic rubber, and chemicals has necessitated a critical evaluation of their physical properties. This book is therefore extremely appropriate and timely, representing, as it does, a fundamental study of this fundamental subject.

This volume is the result of a special project sponsored by the government and enthusiastically supported by the American Petroleum Institute and the petroleum industry as a whole. A special staff, under the expert direction of noted specialists, devoted their entire work of at least *six* years to collection, selection, critical evaluation, and calculation of numerous properties of hydrocarbons. With such an approach to the subject, naturally the most valuable and successful results were obtained.

To illustrate the completeness and thoroughness of this project, it is sufficient to enumerate the basic properties presented in the volume: boiling point and its relation to pressure, refractive index, density, freezing point, molecular volume, molecular refraction, specific refraction, refractivity intercept, specific dispersion, viscosity (absolute and kinematic), heat of vaporization, entropy of vaporization, heat of combustion, heat of formation, free energy of formation, entropy, heat content, heat capacity, and heat of fusion.

Most of the properties are given for all classes of hydrocarbons up to compounds containing 10 carbon atoms in the molecule. Viscosity and thermodynamic data are prescribed for hydrocarbons up to compounds containing 20 carbon atoms in the molecule.

Every worker in the field of hydrocarbons, chemist and engineer alike, will be elated to have at last these valuable data collected in one volume.

Some criticism can be made on the appearance of the book and particularly on the cumbersome method employed in indexing the table of contents. Such a valuable book merits also a better paper and print.

V. I. KOMAREWSKY

Illinois Institute of Technology

The systematic identification of organic compounds: a laboratory manual. (3rd ed.) Ralph L. Shriner and Reynold C. Fuson. New York: John Wiley; London: Chapman & Hall, 1948. Pp. ix + 370. (Illustrated.) $4.00.

"In this edition," according to the author, "recognition is given to the fact that the primary feature of the student's assignment and the wellspring of his interest is the identification of unknown compounds. He is no longer directed to perform numerous practice experiments on solubility and in the use of classification reagents but is advised to carry out such control and practice experiments as are needed, in view of his previous training."

Additional classification reagents are introduced as well as additional procedures for the preparation of derivatives. The melting points of solids and the boiling points of liquid have been included, in parenthesis, in the index, thus saving a considerable amount of time on the part of the student.

The chapter headings are: "Introduction," "The Identification of Unknowns," "Preliminary Examination," "The Determination of Physical Properties," "Qualitative Analysis for the Elements," "The Solubility Classes," "Application of Classification Tests," "The Preparation of Derivatives," "Tables of Derivatives," "The Separation of Mixtures," "The Interpretation of Experimental Data," and "Problems."

The chapters have been both enlarged and rearranged

to improve the teaching value. This book may be considered both as a valuable text and as "one of the indispensable reference books of organic chemistry."

ED. F. DEGERING

Purdue University

Encyclopedia of chemical technology. Vol. I: ***A to Anthrimides.*** Raymond E. Kirk and Donald F. Othmer. (Eds.) New York: Interscience, 1947. Pp. xxiv + 982. (Illustrated.) $20.00.

This is the first volume of a 10-volume encyclopedia dealing with the practice and principles of modern chemical technology. When completed, it will fill a long-felt need for a comprehensive treatise to which professional chemists and chemical engineers may turn for information on the methods used in the American process industries. It is intended for those in universities and other research institutions, as well as for those who are working in industry.

The work is organized as a specialized encyclopedia and is by no means a handbook or series of monographs. The entire field of chemical technology is covered. The first volume contains nearly 100 articles on industrial chemicals and materials, on unit operations and processes of chemical engineering, and on chemical principles. Of these, 35 titles are of major length, including Absorption, Acetic Acid, Acetylene, Acid-Base Systems, Adhesives, Adsorption, Alcohol (Industrial), Alkali and Chlorine Industries, Alkali Metals and Alkali Metal Alloys, Alkaloids, Alkyd Resins, Alloys, Amination by Reduction, Amino Resins and Plastics, Ammonia, Analytical Chemistry, Anthraquinone and Related Quinonoid Dyes, and others.

The arrangement of the subject matter follows a general plan of grouping together topics that are technologically related. Important chemicals are frequently dealt with in articles under their own name, but those which have similar uses are described under a single heading—for example, Abrasives, and Anesthetics. Others may be grouped because of similarity in processing, or as products of an integrated industry (e.g. chlorine, sodium carbonate, and sodium hydroxide). At times this results in some duplication; the manufacture of aniline is described under Amination by Reduction as well as under Aniline. Numerous cross references are provided in the articles, and the individual name of each substance in alphabetical order directs the reader to the proper group title.

The articles on industrial chemicals and materials include sections on physical and chemical properties, methods of manufacture, uses and applications, specifications and standards, and health and safety factors in handling. There are articles on the chemical engineering unit operations, as well as background articles on physical and organic chemistry, metallurgy, and other subjects which serve as important references in process principles.

The format of the book is pleasing. Subject headings and subheadings are clear, and the quality of the paper and printing are excellent. The volume is strongly bound. These qualities are especially important in an encyclopedia which will have hard usage in libraries. The editors have been fortunate in selecting outstanding authorities to write the articles in this volume. The remaining volumes, which are to be published at the rate of two to three each year, will be anticipated by a host of users.

H. F. JOHNSTONE

University of Illinois, Urbana

The sulfonamides and allied compounds. Elmore H. Northey. (American Chemical Society Monograph Series.) New York: Reinhold, 1948. Pp. xxvii + 660. $15.00.

Dr. Northey's book is an outgrowth of a review prepared and presented at the Symposium on Chemotherapy held at Gibson Island, Maryland, in 1939, under the sponsorship of the Section on Chemistry of the AAAS. "The original review was enlarged and revised under the sponsorship of the Division of Medicinal Chemistry of the American Chemical Society and was published in Chemical Reviews, 27, 85–196 (1940)." Since then, the revolutionary achievements of the sulfonamides in the treatment and control of human and animal diseases have been recognized by everyone. However, the extent of the contributions of the chemists and experimental scientists in the development of this field may not be fully appreciated. Dr. Northey has revised and amplified his previous publication into the present monograph, which emphasizes the "chemical side of the new chemotherapy."

The book opens with a chapter on the "History of Bacterial Chemotherapy," which reviews the development of antibacterial agents, including the discovery of the active azo dyes by the German investigators and the establishment of the role of sulfanilamide in their therapeutic activity by the French. A chapter on "Nomenclature, Classification and Synthesis of Sulfonamide Derivatives" follows. Three chapters are devoted to the classification of the chemical structure and chemotherapeutic activities of sulfanilamide derivatives, one to sulfones and one to compounds related to the sulfones. These chapters, covering over 5,000 compounds, include a brief review of the chemistry and pharmacology of each series, while the tables provide data on structure, melting range, activities, and references to information on other important properties of the drugs. This compilation of data on the sulfonamides and related compounds is of immeasurable value as a reference source for those interested in keeping up with the developments in this field.

A series of 5 chapters on the evaluation of chemotherapeutic activity, relationship of structure to activity, pharmacology, mechanism of action, and evaluation cover the biological phase of the problem. Harold J. White, bacteriologist at the Stamford Research Laboratories of the American Cyanamid Company, wrote the chapter on the "Experimental Evaluation of Chemotherapeutic Activity," and in this he describes *in vitro* and *in vivo* methods for the testing of new chemotherapeutic agents and summarizes in tabular form the experimental results as reported by different investigators on 23 of the better-