

will give results about 6% higher than the one adopted by the U.S.P. in 1958. While this could be an isolated oversight, it casts doubt on the thoroughness of the preparation of the Third Edition and on the authenticity that the book might be assumed to have—particularly for pharmaceutical analysts.

The chapter on vitamin E fails to mention any official method, and the one given for pharmaceuticals differs from those in the N.F. and U.S.P. The chapter concerns itself mostly with food and feed applications. Even so, it covers so many methods in so many applications that it is lacking in detail.

The chapters on the other vitamins are about equally divided as to whether they take cognizance of an official method.

This edition could be of value to pharmaceutical analysts as a guide to the many modifications that are possible for specific problems. However, it should be supported by reference to official methods, where they are applicable, and to the original literature, where more complete detail is usually given.

*Reviewed by Robert W. Lehman
Distillation Products Industries
Rochester, N. Y.*

Chemical Principles in Calculations of Ionic Equilibria. By EMIL J. MARGOLIS. The Macmillan Co., 866 Third Ave., New York, N. Y. 10022, 1966. xi + 482 pp. 15.5 × 24 cm. Price \$7.95 cloth-bound; \$3.95 paperbound.

Although teachers of physical pharmacy and pharmaceutical analysis can assume that their students have been exposed to the principles and calculations of ionic equilibria, review and expansion of the subject matter are usually desirable and necessary. This book can be recommended for that purpose as either a source of self study assignments or for class room use.

The first chapter reviews in a classical fashion simple mathematical operations. Chapter 2 defines components and units of concentration. Each of the remaining six chapters is divided into three sections: a discussion of theoretical principles; a collection of appropriate interpretative problems with solutions; an extensive collection of supplementary problems. Chapter 3 deals with protolytic equilibria and complex-ion formation. Included are treatments of the hydrolysis of salts, buffers, ionization of polyprotic acids, titration curves, and indicator selection. Brønsted-Lowry concepts are used in the discussion of hydrolysis and ionization. Approximate equations, used for the calculation of species distribution and concentration are derived. Although exact equations are not presented, limitations of the approximate equations are discussed. Here, as with the remaining chapters, interpretative exercises are presented to cover a wide range of situations. Step-wise solutions of the problems are given with extensive helpful commentary on both the chemical and mathematical aspects of the situation. Solid-liquid precipitations and solubilizations are the topics of chapter 4. Emphasis here is placed on the application of K_{sp} principles to inorganic qualitative analysis. Of particular interest is the treatment of simultaneously occurring equilibria as for example the solubilization of weak acids, bases, and ampholytes by pH adjustment or complex formation.

Liquid-liquid partitioning behavior and extraction are briefly reviewed in chapter 5. Chapter 6 covers, in an elementary manner, activities, activity coefficients, ionic strength, and the Debye-Hückel equation. The interpretative problems provide useful and illuminating practical illustrations of activity considerations. Principles and applications of electrochemistry are reviewed in chapters 7 and 8. Voltaic and electrolytic cells are discussed and illustrated, standard electrodes are defined and explained. A descriptive elementary treatment of free energy, enthalpy, and entropy is presented as a prelude to the introduction of the Nernst equation. Potential diagrams, redox titrations, and redox indicators are also covered.

In general, the book covers principles and calculations at a level somewhat higher than the usual general chemistry treatment. The author's long experience as a teacher in the area is reflected by his anticipating and emphasizing aspects of ionic equilibria which are usually poorly understood by the average student.

*Reviewed by David E. Guttman
School of Pharmacy
State University of New York at Buffalo*

Applied Infrared Spectroscopy. Edited by DAVID N. KENDALL. Reinhold Publishing Corp., New York, N. Y. 10022, 1966. xv + 560 pp. 15.5 × 23.5 cm. Price \$23.

The 18 chapters of this volume provide a survey of the state of the art of infrared spectroscopy. Applications are described in eight of the chapters. These include descriptions of the use of infrared spectrometry by organic chemists at the bench and for studies on polymers, inorganics, the structure of coal, and essential oils and related products. Expositions on the use of infrared in the industrial laboratory, in pharmaceutical research and development, and in government regulatory agencies are provided. Techniques are covered in the remaining chapters, which include an introduction to infrared theory, practical hints on technique, a description of instrumentation, general and microsample handling techniques, microtechniques using miniaturized diamond optics, a scheme for qualitative interpretation of spectra, and chapters on attenuated total reflectance and the use of computers in spectroscopy.

Since the book is the product of a collaboration among 21 authors and co-authors, it is not unexpected that the chapters are uneven in quality and that there is considerable overlap in material covered. Detailed descriptions of the use of Beer's law in quantitative analysis are given in chapter 2, "Survey of Practical Information," chapter 6, "Infrared on the Chemist's Bench," and chapter 8, "Application of Infrared Spectroscopy to Polymers." Similarly, a description of the literature and spectra collections available is provided in three of the chapters. The relative lack of cross-referencing among the chapters is wasteful of space; however, there is a didactic advantage in having each chapter complete in itself.

Chapters on "Infrared in the Regulatory Agencies" by Carol and Hayden of FDA and "Pharmaceutical Applications of Infrared Spectroscopy" by Johnson, Rinehart, and Graham are of most immediate interest to pharmaceutical scientists, but notable also are the fascinating chapter on "The Use of Computers in Spectroscopy" by Savitzky and

the several chapters on the "common-sense" aspects of infrared by the editor. This book is not over-all a practical manual on infrared spectroscopy nor is it an effective introductory textbook; it is instead a valuable collection of authoritative information on the practice and use of infrared spectroscopy for the non-specialist in infrared. The book is recommended as an addition to the collection of volumes on infrared spectra which should be available in the laboratory.

*Reviewed by Lester Chafetz
Pharmaceutical Research and Development
Laboratories
Warner-Lambert Research Institute
Morris Plains, N. J.*

Food Chemicals Codex. First Edition. Prepared by the Committee on Specifications of the Food Chemicals Codex of the Food Protection Committee. National Academy of Sciences-National Research Council. National Academy of Sciences-National Research Council, 2101 Constitution Ave., N. W., Washington, D. C. 20418, 1966. xv + 846 pp. 15.5 × 23 cm. Price \$25.

The "Food Chemicals Codex" promises to develop an importance comparable to the "U. S. Pharmacopeia" and the "National Formulary" as a compendium of chemical identity and specifications.

As an activity of the Food Protection Committee, the First Edition was prepared under the direction of Dr. Justin L. Powers, assisted by various expert committees. Originally published as a series of loose-leaf parts, the present first edition appears in bound form. It is the result of approximately five years of organization and development.

The "Food Chemicals Codex" is designed to provide standards for food grade chemicals, and its status in this respect is established by an endorsement appearing in each book indicating that the Food and Drug Administration will regard the specifications in the "Food Chemicals Codex" as defining an "appropriate food grade" within the meaning of the Food Additives Amendment and regulations. The "Food Chemicals Codex" will, therefore, in the future serve the food industry and its various activities in the same way that the "U. S. Pharmacopeia" and the "National Formulary" have served the drug and pharmaceutical industries.

The first edition consists of over 800 pages of text embracing 518 food chemicals. As would be expected, the makeup is analogous to that of its comparable compendia for drugs. Following the specific monographs there is a section of general tests and apparatus which the quality control chemist will find extremely useful. The policy of the "Food Chemicals Codex" is that other analytical methods with equal or greater accuracy may be used, but that only the assays and tests described therein are authoritative.

The first edition recognizes that in order to keep pace with the use of chemicals in food continuing revision will be necessary. The Governing Board of the National Academy of Sciences has approved a plan for sponsoring the Codex through its next revision, scheduled for publication in 1971. During the interim there will be revision supplements whenever necessary.

The "Food Chemicals Codex" should be available

to every chemist who has responsibility for the manufacture, distribution, and quality control of chemicals which fall under the general category of food additive chemicals. It will serve as a valuable reference and text in schools and libraries.

*Reviewed by L. W. Hazleton
Hazleton Laboratories, Inc.
Falls Church, Va.*

British National Formulary 1966. Published jointly by the British Medical Association and the Pharmaceutical Society of Great Britain. The Pharmaceutical Press, 17 Bloomsbury Square, London W.C.1, England, 1966. 356 pp. 11 × 17.5 cm. Price \$1.75.

The "British National Formulary" now is published in only one edition which combines the essential features of the former Standard and Alternative editions in order to retain the information required by both prescribers and pharmacists. Monographs which formerly followed the Notes for Prescribers are replaced with a listing of preparations and page references to the Classified Formulary section of the book.

Monographs in the Classified Formulary, the second half of the book, now have only English titles; synonyms and subheadings have been eliminated. Group headings also are in English. For example, the heading "Unguenta" has been changed to "Ointments," "Ear drops" replaces "Auristillae."

The "Infants Section" has been completely eliminated since so many preparations for children are those prescribed for adults but with a modified dosage schedule.

More conversion to the metric system is in evidence. Many minim dose preparations have been reformulated to a 5-ml. unit dose. Those preparations still using the Imperial system are now being converted for the complete adoption of the metric system which will be in 1968.

Staff review

The Condensed Chemical Dictionary. 7th ed. Edited by ARTHUR and ELIZABETH ROSE. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y. 10022, 1966. xxi + 1044 pp. 17 × 24.5 cm. Price \$17.50.

This is a newly up-dated version of this valuable reference and is vastly expanded over the previous (6th) edition. A great deal of information about a great variety of items has been so condensed to make a book both easily handled and extremely useful. This is an alphabetical listing of chemicals, drugs, materials, trademark names, and terminology with description or definition. A typical chemical entry provides a brief description of the compound, its properties, derivation, uses, grades available, containers, warnings, and shipping regulations. Items which are described in the "National Formulary," "United States Pharmacopeia," or "Food Chemicals Codex" are identified. Trademark names are listed with chemical identification, grades available, uses, manufacturer's name and address, and shipping instructions.

Staff review