

REVIEWS

Pharmaceutical Chemistry. Vol. 1: Theory and Application. Edited by L. G. CHATTEN. Marcel Dekker, Inc., 95 Madison Avenue, New York, N. Y. 10016, 1966. xii + 504 pp. Price \$14.50.

This text is a contributive volume with 13 chapters by 13 different authors. The purpose of the volume, according to the preface, is "to provide a broad basis on which the senior undergraduate and graduate student can build." The editor writes that "Although it is anticipated that the student has a fundamental knowledge of chemistry, each of the chapters deals with some basic principles which will serve as a review." If the advanced student is to use this book and it is assumed that he has studied quantitative analysis and organic chemistry, in the reviewer's opinion, the text has not met these objectives.

A detailed examination of the book supports this contention. The introductory chapter introduces the concept of quality control and sampling; in addition, the subjects of mass and volume determination and laboratory techniques which are usually treated in a first course in analysis are reviewed. Although the calculation of titration curve points and titration of mixtures is treated very well, some twenty pages are used to review equilibria topics which should be familiar to students at this level (or at least they can review on their own). The chapter dealing with precipitation, complex formation, and oxidation-reduction methods is an extensive consideration of the very numerous analyses of this type with some theoretical comment. Similarly, the chapter on acidimetry and alkalimetry deals with rudimentary analytical topics, *e.g.*, methods of expressing solution concentrations, and then treats many different acid-base analyses. This type of material would be better presented in a reference rather than a textbook. Nonaqueous titrimetry is presented at too practical a level without use of topics such as glacial acetic acid equilibria. The chapter on complexometry is good, but rigorous calculations involving complex equilibria are not adequately developed. Although the chapter on alkaloidal assay is interesting, it fails, *e.g.*, to use structures and calculations to point out acid-base behavior and to employ the concept of partition coefficients to explain solvent distribution behavior. However, the use of tables to summarize the many analytical methods is excellent. The miscellaneous methods chapter is very good in its treatment of topics such as the Karl Fischer titration, gas analysis, and nitrosation. Likewise, the section on ion-exchange separations is very well done. Enough theory is presented to permit the student to make simple calculations describing column behavior. Column, thin-layer, and paper chromatography are treated well in a single chapter but certain organizational lapses are disturbing, *viz.*, partition column chromatography and two-dimensional thin-layer chromatography are introduced in sections discussing detection methods. The experiments at the end of this chapter are good. The last two chapters deal with

the analysis of (a) fixed oils, fats and waxes, and (b) volatile oils. It is assumed that since the substances are complex mixtures whose analysis necessitates the use of many methods, they are used as examples. Both chapters are disappointing in that they are listings of physical and chemical procedures with some explanatory comment. The chemical methods are not adequately explained with equations and the calculations are represented by formulas which do not invite reasoning. The section on functional group analysis is not done well.

The following observations may be made in summary. The treatment in several of the chapters is too elementary. No use or mention is made of statistics, nor is enough use made of organic reaction mechanisms. Instrumental topics are introduced with little or no background (thereby requiring another book and additional expense). Not all chapters have problems and questions. If this text is to be used by advanced students, in spite of several good chapters, some good experiments, and an admirable use of literature references, it falls short.

Reviewed by Thomas Medwick
College of Pharmacy
Rutgers—The State University
Newark, N. J.

Sulfur Dioxide. Applications in Foods, Beverages and Pharmaceuticals. By LOUIS C. SCHROETER. Pergamon Press, Inc. 44-01 21st St., Long Island City, N. Y. 11101, 1966. xiv + 342 pp. 14 × 22 cm. Price \$11.

"Sulfur Dioxide" is an excellent monograph containing both the applications of this commercially important compound in pharmaceuticals, foods, and beverages and theoretical reference material useful to medicinal, inorganic, analytical, and pharmaceutical chemists.

The first chapter contains a complete review of the preparation and properties of sulfur dioxide. The properties of this compound are described in a sophisticated physicochemical manner and are well referenced. An outstanding characteristic of the book is the number of references (over 1100) that are cited.

The second chapter, dealing with the oxidation of sulfur dioxide, is particularly good. Sulfite oxidation in aqueous systems is discussed in detail from a kinetic-mechanistic standpoint reflecting the author's expertness in this area. Many of the key references are to the published work of Dr. Schroeter.

Chapter three contains the inorganic reactions, complexes and clathrates of sulfurous acid species. The reactions are limited to those typical of aqueous sulfurous acid systems. The complexes and clathrates are considered in a quantitative manner.

Chapter four, dealing with the organic reactions of sulfites is another particularly complete and good

chapter. Of the many reactions covered, the discussions on the reactivity of sulfite with aromatic nitro compounds and with benzyl alcohols are especially thorough.

In the fifth chapter, standard quantitative and qualitative methods of detection for sulfurous acid salts are presented together with the special methods needed for sulfite estimation in foods and beverages.

In the next chapter, the food and beverage applications are discussed. The importance of understanding the chemical reactivity of sulfurous acid salts with sugars, proteins, vitamins, and the like is effectively stressed, and the use of sulfurous acid in specific food preservation is extensively covered.

"Pharmaceutical Applications" comprises chapter seven. There are essentially three major topics in this chapter: (a) practical aspects, (b) theoretical considerations, and (c) an extensive listing of specific applications to various drugs.

The monograph ends with a chapter on the toxicity of sulfur dioxide. Plant, human, and animal toxicity is reported.

As T. Higuchi states in the foreword, this simple compound touches us all—from the preparation of dried apricots to free radical chemistry. Under one cover, Dr. Schroeter has provided us with a reference covering all aspects of sulfur dioxide—from utility to chemical reactivity.

*Reviewed by Theodore Sokoloski
College of Pharmacy
Ohio State University
Columbus*

Clinical Pharmacy: A Text for Dispensing Pharmacy. By GLENN L. JENKINS, GLEN J. SPERANDIO, and CLIFTON J. LATIOLAIS. McGraw-Hill Book Co., 330 West 42nd St., New York, N.Y., 1966. viii + 379 pp. 15 × 22.5 cm. Price \$11.95.

In their preface, the authors state that their text is to be a departure from the conventional text of compounding and dispensing. The use of the term "clinical" in the title implies the intent of the authors to create a text for a course in dispensing pharmacy given immediately before graduation. It indicates a modern text which will help prepare the student to practice his profession not only as a capable pharmacist today, but also as an informed pharmacist tomorrow.

It is the opinion of this reviewer, however, that "Clinical Pharmacy" falls far short of its worthy goal. Indeed, instead of being a text for advanced students, it more appropriately belongs to that textbook class suitable for the beginning pharmacy student.

In addition to the topics normally covered in a dispensing text of pharmacy, it is heartening to note the chapters on allergenic extracts, investigational drugs, clinical research, the pharmacy as a drug information center, and pharmacy service in small hospitals and nursing homes. A chapter on the ethical and moral aspects of the profession and the relationship between a pharmacist and his patron, should have been added to complete the text. While the material covered in these chapters is necessary, more emphasis could have been placed on the relationship of the community pharmacist with the activities described.

The balance of the text is a shallow treatment of the subjects normally discussed in other dispensing

texts. The depth to which a senior student ought to be taken in these subjects is never achieved.

As an example, the chapter on controlled release dosage forms never gets into the problem of evaluating these products from the published literature, and the difficulties which have been encountered with these products in terms of proper release rates and clinical effectiveness. The student must be made aware of these factors if he is going to adequately advise physicians and patrons in this area.

The chapter on calculated solutions is unduly elementary for a senior student. The material in this chapter properly belongs in the arithmetic course given in the first years of the pharmacy curriculum. Similarly, in the chapter on radioactive pharmaceuticals, senior students don't need to be told that an atom is composed of a nucleus of protons and neutrons surrounded by orbiting electrons. Certainly the reader should be informed of the activities of pharmacists in handling radioactive pharmaceuticals, the necessary equipment, and how the agents are used. Problems of storage and assay are also important, as are the mathematics of radioactive decay.

Although the authors attempt to excuse the lack of references, such an omission is a serious drawback in any text. The purpose of references is not only to aid in the instruction of the student, but also to credit the investigator whose works are used in the text.

Pharmaceutical education is in dire need of a text in dispensing pharmacy which clearly demonstrates the application of basic disciplines to community and hospital practice. Many of these disciplines are being adequately taught, but their application is not. This text does not fulfill the expectations embodied in its title.

*Reviewed by Richard P. Penna
Academy of General Practice
American Pharmaceutical Association
Washington, D. C.*

Methods of Vitamin Assay. 3rd ed. Edited by The Association of Vitamin Chemists, Inc., Methods Committee. John Wiley & Sons, Inc., 605 Third Ave., New York, N. Y. 10016, 1966. xvii + 424 pp. 15.5 × 23.5 cm. Price \$14.00.

Probably the technology of vitamin assay has grown too complex in the last 15 years to get it all into a single book. Thus, the Third Edition of "Methods of Vitamin Assay" tries to cover so much ground in food and feed applications that it is not likely to be very useful as a laboratory manual to analysts in the pharmaceutical field. The style and quality of the work varies from one chapter to another because of the multiple authorship. The chapters on sampling and biological assays are good, although not particularly slanted to pharmaceutical analysts. The one on vitamin D is excellent.

My confidence was shaken somewhat by the repetition in the vitamin A chapter of statements from the Second Edition that are no longer applicable today. The authors seem unaware that changes have been made in the U.S.P. Reference Standard, monograph, and assay method since 1951. The only serious defect in the chapter though is that the calculation for the ultraviolet absorption method