

The third concern raised by Chiou *et al.* (1) is the lack of a correction for the mutual miscibility of water and octanol. They show three examples that indicate an error as high as 0.3–0.5 in $\log PC$ for very nonpolar solutes. This magnitude of error is not of particular concern. It is well within the error normally encountered in determining experimental values for both $\log S_w$ and $\log PC$ for hydrophobic compounds and certainly within the limitations of Eq. 2.

The conclusion of Chiou *et al.* (1) is that experimental values for $\log PC$ should be used to improve the reliability of the $\log S_w - \log PC$ correlation in the high $\log PC$ region. While this may be true, it is somewhat impractical. The value of Eq. 2 is that it provides a simple means of estimating $\log S_w$ from nothing more than a knowledge of the melting point of the solute and a group contribution

estimate of its partition coefficient. The measurement of accurate partition coefficients greater than 10,000 ($\log PC > 4$) is far more difficult and subject to error than the measurement of $\log S_w$.

(1) C. T. Chiou, D. W. Schmedding, and J. H. Block, *J. Pharm. Sci.*, **70**, 1176 (1981).

(2) S. H. Yalkowsky and S. C. Valvani, *ibid.*, **69**, 912 (1980).

(3) S. Banerjee, S. H. Yalkowsky, and S. C. Valvani, *Environ. Sci. Technol.*, **14**, 1227 (1980).

Samuel H. Yalkowsky ^x

Shri C. Valvani

Pharmacy Research
The Upjohn Company
Kalamazoo, MI 49001

Received May 26, 1981.

Accepted for publication July 2, 1981.

BOOKS

REVIEWS

Controlled Release Technologies: Methods, Theory, and Applications. Edited by AGIS F. KYDONIEUS. CRC Press, 2000 N.W. 24th St., Boca Raton, FL 33431. 1980. Vol. I, 261 pp., and Vol. II, 273 pp. 17 × 26 cm. Price U.S. \$69.95 each (Foreign \$79.95).

Controlled Release Technologies is contained in two volumes, with a contributors list that reads like a “who’s who” in the field of controlled-release products. In the prefix, the editor indicates that “technologies described in these two volumes depend almost exclusively on the use of polymers and polymer technology” and that, although “applications, advantages and fundamental concepts of controlled release have been the subject of many symposia and several books dealing with formulations, all known delivery systems have not been assembled for consideration as they are in these volumes.” The editor is entirely correct on this point.

Volume I contains six chapters dealing with fundamental concepts of controlled release, monolithic polymer devices, monolithic elastomeric material, membrane systems, multilayered laminated structures, and controlled release from ultramicroporous triacetate. Volume II contains 13 chapters including topics on erodible matrixes and biodegradative controlled release of pesticides from polymeric substances, polymers containing pendent pesticide substituents, microencapsulation using coacervation phase separation techniques with pharmaceutical and agricultural applications, the Wurster process, microencapsulation using

physical methods, controlled-vapor release from hollow fibers, delivery of active agents by osmosis, starch and other polyols as encapsulating matrixes for pesticides, pine craft lignin as a pesticide delivery system, and other controlled-release technologies and applications.

Most chapters provide a brief description of the theory of preparing controlled-release devices but omit specific examples of formulations or preparation techniques which the “novice” could employ to make the products described. This may be because much of such information is proprietary, or it may be because the authors have assumed that the average reader will already have some knowledge in this area. Chapter 3 in Volume I is an exception in that many interesting product formulations have been presented. The volumes were published in 1980, and the editor’s introductory comments were signed and dated 1978. Thus, most chapters do not contain references more recent than 1976, but the literature prior to this time is well covered and a large number of excellent references are provided with each chapter.

In addition, Chapter 13 of Volume II, which deals with “other controlled release technologies and applications,” contains a series of tables listing U.S. patent numbers, companies holding the patents, titles of controlled-release systems, applications for the controlled-release systems, active agents involved, and the controlled-release method employed. These tables are quite informative.

The authors have done a good job of presenting polymeric controlled-release technology for drugs, insecticides, pesticides, herbicides, and antifouling formulations. Many chapters contain a brief mathematical description for active ingredient release theory followed by an

abundance of practical examples. There are many useful illustrations in graphical and tabular form as well as numerous high quality photographs. All art work is top quality. These volumes will be useful to scientists and students involved in controlled-release technologies.

Reviewed by James W. Ayres
School of Pharmacy
Oregon State University
Corvallis, OR 97331

Recent Developments in Mass Spectrometry in Biochemistry and Medicine, 6. Edited by ALBERTO FRIGERIO and MALCOLM McCAMISH. Elsevier, 52 Vanderbilt Ave., New York, NY 10017. 1980. 553 pp. 16 × 24 cm. Price \$83.00.

This volume is a compilation of the papers from the *Proceedings of the 6th International Symposium on Mass Spectrometry in Biochemistry and Medicine*, Venice, June 1979. It contains 52 papers from a variety of mass spectrometric applications. Similar to the previous series, this volume attempts to bring together the latest information on the application of mass spectrometry and research development and methodology of mass spectrometry. This objective is met in the area of the latest applications in biochemistry and medicine.

This book discusses various applicational aspects from experts in the field and is quite up-to-date. Examples of its applications in lipids, prostaglandins, protein sequencing, biogenic amines, metabolite identification, pharmacokinetics, placental drug transfer, and physiological exchange of endogenous substances are of interest to readers at intermediate to advanced levels in mass spectrometry. It is particularly useful to less sophisticated readers who want to get a glimpse of the field without purchasing the previous volumes of the proceedings. Perhaps disappointing to some experienced researchers is the deficiency in certain aspects of applications such as the use of stable isotopes in pharmacology and pharmacokinetics. This may reflect a lack of participation of certain segment of the biomedical researchers in the symposium.

In the area of latest developments in instrumentation and methodology, it has somewhat short-changed the reader. Several areas such as mass spectrometry-mass spectrometry (multiple mass spectrometry), ion-cyclotron mass spectrometry, and high-pressure liquid chromatography-mass spectrometer interface are not covered. Nonetheless, several chapters in this area are quite valuable, e.g., the description of the Kratos MS 80, the laser microprobe mass analyzer and its applications, low- and high-pressure negative chemical-ionization mass spectrometry, and the disposable surface probe.

This book is divided into six general classifications, including qualitative and quantitative studies of endogenous and exogenous compounds, instrumentation and methodology, and environmental studies. These classifications, although somewhat artificial, are quite helpful in locating quickly a particular area of interest. However, it is not understood why a paper that discusses the application of the electron-capture detector in liquid chromatography without any reference to mass spectrometry was included in this book (pp. 317-330).

This book contains an author index but not a subject index. The former does not serve much purpose because no affiliations of the authors are provided in this index and the name of the author can already be found in the table of contents. The latter, if available, is usually more useful in helping readers locate the subject of interest. However, this book is a reasonably up-to-date reference book on mass spectrometry.

Reviewed by Kenneth K. Chan
School of Pharmacy
University of Southern California
Los Angeles, CA 90033

Applied Biopharmaceutics and Pharmacokinetics. By LEON SHARGEL and ANDREW B. C. YU. Appleton-Century-Crofts, 292 Madison Ave., New York, NY 10017. 1980. 253 pp. 16 × 24 cm. Price \$18.50.

This book, intended primarily for undergraduate students in pharmacy and allied health professions, emphasizes pharmacokinetic principles rather than biopharmaceutics. The first two chapters review elementary mathematics and kinetics, and the next three chapters introduce one-compartment and multicompartment pharmacokinetic models. Chapter 6 briefly discusses biopharmaceutics, including absorption mechanisms and dosage form dissolution. Chapters 7-11 deal with absorption kinetics, bioavailability, clearance, hepatic elimination, and protein binding. Chapters 12, 13, and 14 consider intravenous infusions, multiple-dose administration, and nonlinear pharmacokinetics, Chapters 15 and 16 discuss clinical pharmacokinetics, and Chapter 17 describes the kinetics of pharmacological effects.

The book is quite readable, with numerous illustrations. Most chapters contain practice problems, along with detailed solutions. In addition, questions are included at the end of each chapter, and answers are provided in the *Appendix*. One major attribute of the book is the step-by-step illustrations given for some of the more common pharmacokinetic manipulations (e.g., method of residuals, Wagner-Nelson method, and Loo-Riegelman calculation). Only a limited number of references are provided, and they are generally in the form of a bibliography at the end of each chapter.

The text appears relatively free from errors, although several incorrect equations were found, and some generalizations were made that were not as widely applicable as the text seemed to imply. On the whole, the book provides a reasonable introduction to the material, although the somewhat superficial discussion of some topics could mislead someone utilizing the text without a thorough understanding of the limitation and pitfalls in the approaches. However, the book would be suitable as an introductory undergraduate text for a course taught by an instructor experienced in pharmacokinetics.

Reviewed by Marvin C. Meyer
Department of Pharmaceutics
College of Pharmacy
University of Tennessee
Center for the Health Sciences
Memphis, TN 38163

Progress in Drug Metabolism, Vol. 5. Edited by J. W. BRIDGES and L. F. CHASSEAUD. Wiley, 605 Third Ave., New York, NY 10016. 1980. 358 pp. 15 × 23 cm. Price \$85.00.

This volume is the fifth in a series concerned with various aspects of drug metabolism. This volume is similar to the previous four volumes in that five to six major, current, and timely topics are reviewed. These topics are not necessarily directly related other than that they are concerned with the general topic of drug metabolism.

Chapter 1 deals with the distribution and role of cytochrome P-450 in extrahepatic organs and in prostaglandin metabolism. Steroidogenic organs also are extensively reviewed. The chapter does not include recent investigations involving cytochrome P-450 in the intestine and colon, and most references are pre-1978, although the volume was published in late 1980.

Chapter 2 addresses a topic on which relatively little information exists, namely species variations in xenobiotic metabolizing enzymes. The chapter is restricted to hepatic metabolism, primarily involving microsomal monooxygenases, epoxide hydratase, and glucuronyltransferase. No information is provided on interspecies variation within hepatic and extrahepatic tissues.