Book Reviews

Chemical Aspects of Drug Delivery Systems. Edited by D. R. Karsa and R. A. Stephenson. The Royal Society of Chemistry, London. 1996. viii + 162 pp. 15 × 23 cm. ISBN 0-85404-706-9. $89.00.

This book is the proceedings of a symposium held on April 17−18, 1996, on some advances in chemical aspects of drug delivery systems. The title is somewhat misleading, as the main focus of the symposium was clearly the use of various materials primarily in solid drug formulations. These are more topics in pharmaceutics rather than chemistry. Nevertheless, as a book on the recent advances in specific areas of pharmaceutics, the papers address the most advanced aspects of the respective subject matters. There are 15 papers in the book, starting with a general review of materials, excipients used in formulation of a variety of drugs. The various routes of administration and the various classes of general ingredients are nicely summarized. The following papers describe some approaches for localized drug delivery formulations. Thus, mucoadhesive polymers are briefly summarized in the second chapter, and the mechanism of the interaction of the polymers and mucous as well as the effect of incorporation of the drugs into the polymers is described. This is a well-written, comprehensive, and up-to-date chapter on the subject matter. Chapter 3 describes briefly some-novel aspects of transdermal drug delivery, primarily addressing penetration enhancers. Chapter 4 addresses use of hydrogels based on poly(ethylene glycols) for controlled release of drugs. It is a well-written chapter and addresses novel aspects, in particular, potential use of microgels for controlled delivery of proteins. Another class of nonionic surfactants and a computer-aided method for the design of them are described in Chapter 5. While the chemistry involved is rather simple, the studies on the effect of conformation of the surfactant on the monolayers is interesting. Poloxamer-type nonionic surfactants are described in Chapter 6. Studies on conformational changes in relation to their impact on absorption properties and toxicity are presented. Chapter 7 describes the use of poly(ethylene glycol) for derivatizing some drugs for delivery purposes. Chapters 8−10 deal with lactose, an important and natural product used in many pharmaceutical preparations. The influence of particle size, functional differences, and the use of lactose in direct compression tablets are described, respectively. Chapter 11 addresses the use of cellulose in microcrystalline form in making tablets with reduced porosity and with increased flow rates. Chapter 12 describes use of starch for solid drug formulations and the potential increased use of starch for improved bioavailability. Chapter 13 addresses the use of freeze-dried trehalose and related compounds in stabilizing and delivery of drugs. The application of aqueous shellac solutions for enteric and other pharmaceutical coatings with improved mechanical properties is addressed in Chapter 14. The last chapter, entitled Information Requirements for Drug Delivery Systems, is only a short abstract; thus, it is impossible to judge what it would contain.

This small volume should be of interest to people involved in drug formulation. It is up-to-date; however, it is rather narrowly focused, and contrary to the title, there is virtually no discussion about the chemical drug delivery systems and related issues.

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Annual Review of Pharmacology and Toxicology, Volume 36. Edited by A. K. Cho. Annual Review, Inc., Palo Alto, CA. 1996. vii + 719 pp. 16 × 23 cm. ISBN 0-8243-0436-5. $52.00.

This volume is the latest in a long series of reviews on general topics within the broad disciplines of pharmacology and toxicology. The 24 reviews included are reasonably comprehensive, ranging from 20 to 40 pages, and are well referenced. In keeping with the series title, some chapters address toxicological mechanisms, such as the role of second messengers in toxicant-induced immunosuppression (M. P. Holsapple et al.), the molecular basis for estrogen carcinogenicity (J. D. Yager and J. G. Liehr), the cardiac toxicity of the antihistamines (R. L. Woosley), and the assessment of follicle destruction in chemical-induced ovarian toxicity (P. B. Hoyer and I. G. Sipes), while others are directed toward pharmacological topics such as classification of opioid (P. A. Zaki et al.), imidazoline (S. Regunathan and D. J. Reis), and angiotensin (K. G. Griendling et al.) receptors. Basic physiological mechanisms are also covered, such as cyclic nucleotide phosphodiesterases in vascular smooth muscle (J. B. Polson and S. J. Strada), receptor−G protein interactions (T. Gudermann et al.), adenylyl cyclases (Sunahara et al.), phosphoinositide phospholipases (J. H. Exton), insulin receptor signal transduction (M. G. Myers and M. F. White), and control of exocytosis (G. J. Augustine et al.). The drug discovery and development process is also targeted in chapters on progress in antisense oligonucleotide therapeutics (S. T. Crooke and C. F. Bennett) and new strategies for pain relief (A. Dray and L. Urban) as well as discussions of mechanisms for the development of drug resistance in antitumor (W. T. Bellamy) and antiviral (J. W. Erickson and S. K. Burt) therapy. In addition to these and other reviews, the personal experiences of an eminent pharmacologist (Sir James Black) and toxicologist (Robert A. Neal) are included. The former is noteworthy for showing what can still be accomplished using classical receptor characterization in isolated tissue preparations.

Because of the diversity of the topics covered, it is unlikely that one will have an interest in all the detail presented in every chapter. Nevertheless, most of the chapters are well written and provide a useful back-

ground in areas outside of the readers area of expertise. This particular volume may be especially useful to those interested in second messengers and signal transduction as a consequence of several excellent reviews directed toward various aspects of these processes.

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Methods of Organic Chemistry. (Houben-Weyl). Additional and Supplementary Volumes to the 4th Edition. Stereoselective Synthesis. Volume E21a. Nomenclature, Principles, Analytic, Axially Chiral Compounds, Bond Disconnection, Alkylation Reactions, and Insertion into C−H Bonds. Volume E21b. C−C Bond Formation by Addition to =O, =N, =−−X, =−=O, =−=N, =−N=X, and =−S=X. Volume E21c. C−C Bond Formation by Addition to C=C, Cycloaddition Reactions, and Ene Reaction. Volume E21d. C−C Bond Formation by Sigmatropic Rearrangements, Electrocyclic Reactions, C−H, and C−Hal Bond Formation. Volume E21e. Bond Formation: C−N, C−O, C−P, C−S, C−Se, C−Si, C−Sn, and C−Te. Volume E21f. Survey of Chiral Auxiliaries, Solvents, Reagents, and Catalysts. Edited by Gunter Helmchen, Reinhard W. Hoffmann, Johann Mulzer, and Ernst Schumann. Georg Thieme Verlag, Stuttgart, Germany. Volume E21a: 1995. xix + 1168 pp. 17.5 × 25.5 cm. ISBN 3-13-219504-9. DM 2840.00. Volume E21b: 1995. xviii + 1051 pp. 17.5 × 25.5 cm. ISBN 3-13-219504-9. DM 2480.00. Volume E21c: 1995. xv + 1096 pp. 17.5 × 25.5 cm. ISBN 3-13-798004-6. DM 2550.00. Volume E21d: 1995. xiv + 1020 pp. 17.5 × 25.5 cm. ISBN 3-13-100114-3. DM 2770. Volume E21e: 1995. xxi + 1261 pp. 17.5 × 25.5 cm. ISBN 3-13-100124-0. DM 2980.00. Volume E21f: 1996. xlii + 1230 pp. 17.5 × 25.5 cm. ISBN 3-13-102794-0. DM 1930.00. Volume Set: approximately DM 13900.00. **Workbench Edition** (10 Volume Set). ISBN 3-13-106124-3. DM 3600.

During the last 20 years, stereoselective synthesis has grown in importance in organic chemistry as it has become a reliable methodology. As the demand for enantiomerically pure drugs and pesticides has dramatically increased, methods of asymmetric synthesis have become of major importance to almost all practicing chemists, especially medicinal chemists. These observations led to the present volume set of the Houben-Weyl series *Methods of Organic Chemistry*. The enormous amount of material available on this topic forced the editors to publish *Stereoselective Synthesis* in a multivolume set of more than 7000 pages. The set provides a comprehensive and critical treatment of chemical transformations in which a new stereocenter is created, i.e., all enantioselective and diastereoisomer-differentiating reactions which allow the absolute and relative configuration of a new stereogenic unit to be controlled. It does not, however, cover mechanism-controlled reactions (e.g., S_N2 displacements), "ex-chiral-pool" syntheses which do not lead to new stereogenic units, and *E*/*Z*-selective formation of alkenes.

Following the general introductory chapters, i.e., Nomenclature and Vocabulary of Organic Stereochemistry, Basic Principles of EPC Synthesis, Determination of Enantiomeric Purity, and Determination of Absolute and Relative Configuration, in the first volume, chapters on individual synthetic methods in this and remaining volumes are organized by the type of bond that is broken or formed. Only the starting material and products, and not reaction mechanism, are considered as a basis for classification. The scope of the most important methods is illustrated with tables of selected examples. Experimental procedures enable insight into the practical application of the methods. Access to and properties of the common chiral auxiliaries, solvents, reagents, and catalysts employed in the various reactions are comprehensively treated in the final volume (E21f). All chapters in all volumes are thoroughly referenced. Indexes for the entire set are provided in Volume E21f. The author index is exhaustive and is 200 pages in length. The compound index (787 pages) lists all reaction products described in the set that contain at least one newly established stereocenter; achiral compounds are not included. In contrast to more traditional compound indexes, the one here is based only on chemical formula of open-chain compounds, cyclic compounds, and natural products and does not present full systematic names. The method of preparation, total number of newly created asymmetric centers, and preparative procedures are also cited in this compound index. Use of this unique index requires initial familiarization, but once the rules are mastered the described reaction products can be readily located.

The editors and 119 authors responsible for this superb compilation have provided a timely, complete, and critical survey of the methods of stereoselective synthesis. Clearly, this set of volumes represents a standard reference work which will be appreciated by all chemists engaged in organic synthesis. Institutional library access is recommended.

A *Workbench Edition* of this *Houben-Weyl's Stereoselective Synthesis, Volume E21* is available in a 10-volume paperback set at a greatly reduced price.

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