

REVIEWS

Plastic Containers for Pharmaceuticals—Testing and Control. By JACK COOPER. World Health Organization, Geneva 27, Switzerland (WHO Offset Publication No. 4), 1974. 204 pp. 22 × 28 cm. Price SW. fr. 32, \$12.80.

Packaging of pharmaceuticals in plastic containers has increased at an unprecedented rate. Testing and control procedures are needed for the pharmaceutical industry. During revision of the second edition of the *International Pharmacopoeia*, the World Health Organization recognized the importance of general monographs on this subject and it was at their request that Mr. Cooper prepared this comprehensive report. Mr. Cooper's experiences with the sorption of preservatives by rubber closures are well documented. As Chairman of a Commission for the Standardization of Regulatory Requirements for Plastic Containers set up by Fédération Internationale Pharmaceutique, he is cognizant of the potential problems in the use of plastics in pharmacy. He has done an excellent job of compiling his information.

In Sections I to V, physical-chemical properties of the most important plastics (polyethylene, polypropylene, polyvinyl chloride, and celluloids) used in packaging drugs are considered. Possible difficulties in the use of plastic containers for drugs are loss of product ingredients to the plastic (sorption), loss of plastic ingredients to the product (desorption), transport of water vapor or gases across the plastic wall (permeation), drug loss through radiation (photodegradation), and change in physical properties of the container by contact with the product (polymer modification). The nature and the means of dealing with these issues are succinctly described and illustrated with published work. The author points out that most of the materials causing drug-plastic interactions are preservatives, and that any significant drug loss is adequately identified by the comprehensive stability programs used by the pharmaceutical industry. Section VI describes the implications of these problems in some of the main dosage forms such as parenterals, ophthalmics, topical preparations, solid dosage forms, and oral liquids.

Sections VII and VIII cover pharmacopoeial regulatory requirements from seven countries, and standards issued by institutions or industries from four countries. The greater part of the book consists of 24 attachments that enlarge on the material found in these chapters. Mr. Cooper also discusses the possibility of establishing international standards.

The report is highly recommended as an addition to industrial quality control and stability laboratories and libraries.

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Comparative Pharmacology, Vol. 1. Edited by M. J. MICHELSON. Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, 1973. 517 pp. 24 × 16 cm.

Dr. Michelson has performed an excellent job in editing the book *Comparative Pharmacology, Vol. 1*, and the choice of international authors for the preparation of this book is excellent. The comparative pharmacology of acetylcholine in various phyla is well presented and represents one of the best comparative treatises that I have seen. The chapter on the structure and mutual disposition of cholinergic receptors and changes in their disposition in the course of evolution, by Dr. Michelson, is exceptionally well presented.

In addition, Chapter 3, on the comparative pharmacology of catecholamines, by Dr. Goteborg and Dr. Malmo, provides a readily usable review and compilation of the comparative pharmacology of the catecholamines in both invertebrates and vertebrates. Each of

the contributors to this book has provided excellent bibliographies to allow the reader to obtain an in-depth knowledge of the comparative pharmacology of the neurotransmitters acetylcholine and catecholamines.

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Terpenoids and Steroids, Vol. 4. Senior Reporter, K. H. OVERTON. Specialist Periodical Reports, The Chemical Society, Burlington House, London W1V 0BN, England, 1974. 608 pp. 15 × 22 cm. Price £18.50. (Orders should be addressed to The Publication Sales Officer, The Chemical Society, Blackhorse Road, Letchworth, Herts., SG6 1HN, England)

This is the fourth volume on terpenoids and steroids in a valuable series first published 4 years ago. The aim of the various series of Specialist Periodical Reports is to provide systematic, comprehensive, and critical review coverage of progress in the major areas of chemical research. The various series are being published annually or biennially on such topics as Foreign Compound Metabolism in Mammals; Biosynthesis; The Alkaloids; Carbohydrate Chemistry; Amino-acids, Peptides and Proteins; and Photochemistry.

This volume does not contain a subject index but is organized in a systematic manner which facilitates finding any information being sought. The six pages in the Table of Contents outline this volume in detail. The chapters are divided into many sections which are identified in boldface type in the text as well as in the Table of Contents. These sections are further divided into subsections. Chapter titles are found at the top of every second page of the text. There is an author index which is helpful to those following the research of a given individual.

This review is illustrated with drawings of over 2400 chemical structures. It is documented with 2100 references which are listed at the bottom of the first page of each chapter where used.

Part I, which covers the terpenoids, is divided into chapters which include Monoterpenoids; Sesquiterpenoids; Diterpenoids; Sesterterpenoids; Triterpenoids; Carotenoids and Polyterpenoids; and Biosynthesis of Terpenoids and Steroids. Of special interest is the identification and referencing of over 150 recent reviews covering 1968–1973. The chapter on sesterterpenoids deserves special attention since it contains an excellent review of the literature published on this class of terpenoids beginning with the first report published in 1965.

Part II, which covers steroids, includes three large chapters. The chapter on steroid properties and reactions is divided into sections based upon more common functional groups, a section on compounds of nitrogen and sulfur, and sections on such important subjects as molecular rearrangements, functionalization at nonactivated positions, and photochemical reactions.

The chapter on microbiological reactions with steroids provides a comprehensive account of research published since this subject was last reviewed in this series in 1967. Subject matter in this chapter is organized according to types of transformations and presented under headings which include hydroxylation reactions; hydroxy-steroid-oxo-steroid interconversions; dehydrogenation and the reductions of carbon-carbon double bonds; olefinic bond isomerization; esterase, amidase and hydrolase reactions; reactions involving heteroatoms; and steroid degradation reactions.

In this reviewer's opinion, the "frosting on the cake" is the last chapter entitled "Steroid Conformations from X-Ray Analysis Data." The authors have utilized data from their laboratory at Rijksuniversiteit, Leiden as well as from research literature, part of which they recalculated. The authors were thus able to recalculate equilibrium geometries and analyze the effects of functional groups and configurations upon these geometries of steroids. The