NEW BOOKS

Lou Going, Book Review Editor

ORGANIC PEROXIDES, Vol. 2, Edited by Daniel Swern (Wiley-Interscience, John Wiley and Sons, Inc., New York, 1971, x + 963 p., $39.95).

This book is a large one—in number of pages, subject matter and importance. All workers in the field of peroxides, whether inexperienced or experienced in the field, will want to be familiar with this volume as well as Volume 1. Volume 2 contains eight chapters, all by well-known authors. It is written well, with emphasis mainly on preparative aspects, and has a minimum of overlap in spite of the multiple authorship.

Chapter I, "Hydroperoxides" by R. Hiatt, is 151 pages long, contains 824 references and has 20 pages of tables of properties of hydroperoxides of simple organic compounds. The four major sections of the chapter cover: preparation; properties, separation and analysis; reactions as nucleophiles and as electrophiles (including the epoxidation of olefins by a hydroperoxide, a reaction having much current interest for industry), and homolytic reactions of hydroperoxides. Chapter II, "Chemistry of Hydroperoxides in the Presence of Metal Ions" by G. Sosnovsky and D.J. Rawlinson, has 116 pages and 294 references. The two major sections of this chapter discuss the reactions in the absence and in the presence of reactive substrates. Chapter III, "Metal-Ion-Catalyzed Reactions of Hydrogen Peroxide and Peroxydisulfate" also by G. Sosnovsky and D.J. Rawlinson, has 68 pages and 383 references. The chapter is divided into eight major sections according to type of substrate for hydrogen peroxide reactions and has a separate section for the oxidations with peroxydisulfate. Chapter IV, "The Formation of Organometallic Peroxides by Autoxidation" by Alwyn G. Davies, has 18 pages and 78 references. It discusses peroxides of Groups I, II, III and IV metals with a separate section on mechanism of autoxidation of organometallic compounds, and brings up to date Davies' chapter on the same subject in his book. Chapter V, "Organic Peroxy Acids as Oxidizing Agents-Epoxidation" by Daniel Swern, has 179 pages, 1114 references, and extensive tabulation of compounds that have been epoxidized since 1952, the compounds prior to that date having been reviewed in this author's chapter in *Organic Reactions*. Major sections include epoxidation of unsaturated compounds; laboratory epoxidations; commercial epoxidation processes—plasticizers-stabilizers; kinetics, solvent effects, stereochemistry, and mechanisms; and unusual and miscellaneous epoxidation studies. A more complete and authoritative survey cannot be found on this important reaction. Chapter 6, "Determination of Organic Peroxides by Physical, Chemical and Colorimetric Methods" by R.D. Mair and R.T. Hall, has 101 pages and 225 references. This chapter is an abridged version of a chapter by the same authors to appear in the *Treatise on Analytical Chemistry*, edited by I.M. Kolthoff and P.J. Elving. Swern cannot be criticized for duplicating information, since this critical survey is necessary to complete the overall discussion of organic peroxides in his series. Further, this chapter is a welcome one and is easily accessible. Chapter VII, "Physical Properties of Organic Peroxides" by Leonard S. Silbert, has 162 pages and 510 references. This chapter discusses molecular and crystal structures, UV and IR absorption, nuclear magnetic resonance, electron spin resonance, mass spectrometry, molecular associations, electrometry (polarography) and molar refraction. This is a thorough treatment of a subject that is highly important, but one that is sometimes neglected. A testimony to the thoroughness of the chapter is the discussion and tabulation of ozonides that have been examined by nuclear magnetic resonance. Chapter VIII, "Acyl Peroxides" by R. Hiatt, has 131 pages, 568 references, and 16 pages of tables listing the physical properties of acyl peroxides. Major sections in this chapter include synthesis, physical characteristics, chemical characteristics, analysis, thermal decomposition of aroyl peroxides, decomposition of aliphatic acyl and aroyl-acyl peroxides, peroxydicarbonates, reactions with nucleophiles, reactions with electrophiles and decomposition of acyl peroxides by metal ions of variable valence. Finally there is a comprehensive 33 page subject index but no author index. References are up to date and include 1969 publications; a few 1970 references were added in proof. Remarkably few typographical errors were found.

This book can be recommended without reservations. Even the price, although it may seem high at $39.95, is a bargain at 4.1 cents per page.

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PROGRESS IN TOTAL SYNTHESIS, Vol. 1, Sarah Etheredge Danishefsky and Samuel Danishefsky (Appelton-Century-Crofts, Meredith Corp., New York, 1971, 265 p., $12.00)

This book is the first of a series stemming from a group of weekly seminars at the University of Pittsburgh on selected recent developments in organic synthesis, especially in regard to natural products. The authors plan to continue this series on a yearly basis, with this volume covering literature appearing in 1968 and a small part of 1969.

The subject material is presented in schematic form with structural formulas, references and cross references, and the authors have included pertinent comments on each synthesis to place it in a broader context and clarify its more puzzling features.

The book is formally divided into three chapters. The first is entitled "Alkaloids and Intermediates in the Synthesis of Alkaloids," and the 52 subject compounds are presented in alphabetical order. The second chapter is entitled "Terpenes and Related Structures," and is divided into four sections: (A) Monoterpenes (5 compounds); (B) Sesquiterpenes (28); (C) Diterpenes (11); and (D) Triterpenes (2). The third chapter is entitled "Other Natural Products," and is comprised of seven sections: (A) Antibiotics and Metabolites (12 compounds); (B) Cannabinols (4); (C) Juvenile Hormones and Propylure (4); (D) Porphyrins (3); (E) Prostaglandins (4); (F) Steroids and Related Systems (5); and (G) Zearalenones (3). The emphasis throughout is on construction of rings and control over asymmetric and geometrical centers.

The rather novel method of presentation of the material in this book is refreshing and should enhance its usefulness to chemists at all levels, inasmuch as they can gain a quick visual grasp of salient features of the syntheses. This book should be valuable to the practicing organic chemist whether he is engaged in research or teaching, especially when complex molecules are under consideration. The projected future volumes of this work would be even more valuable if the time between their appearance and the appearance of the literature covered could be reduced.

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TOPICS IN STEREOCHEMISTRY, Vol. 6, Edited by N.L. Allinger and E.L. Eliel (Wiley-Interscience, John Wiley and Sons, Inc., New York, N.Y., 1971, 296 p., $19.95).

This latest volume in the *Topics in Stereochemistry* series consists of five chapters: (1) "Conformational Analysis—The Fundamental Contributions of D.H.R. Barton and O. Hassel"; (2) "Pyramidal Atomic Inversion" by J.B.

(Continued on page 140A)