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Book Reviews

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BOOK REVIEWS

Paul Caubère, *Utilisation des dérivés du soufre en chimie organique*, Masson, Paris, etc., 1984, 184 p.

It is a well documented fact that organic sulfur compounds frequently play important parts in the synthesis of essential organic compounds. However, books and reviews surveying solutions to synthetic problems usually focus on the synthetic route and the final outcome of a reaction sequence rather than paying attention to the possible wider synthetic perspectives intimated by the frequent involvement of intermediate or precursory sulfur compounds. This situation represents a challenge, recognized and accepted by the author. There is a gap to be filled between the very comprehensive, specialized original literature reporting on synthetic utility of organic sulfur compounds and the usually very concise descriptions delivered by textbooks. The author's answer is "Use of sulfur derivatives in organic chemistry" (title translated into English). However, perhaps the title may give rise to expectations of a somewhat broader coverage of the subject than what is apparent from the table of contents. Whatsoever, rather than delivering a comprehensive, systematic treatment, the author clearly has preferred to document the synthetic utility of organic sulfur compounds by exemplifications. However, exemplifications imply selections. Based upon the selection of only a few types of sulfur compounds, although in this connection doubtless the more important ones, the selection of examples of their use in organic synthesis is in turn comprehensive, affording excellent illustrations of synthetic versatility and topicality.

The book is divided into two parts. The first and major part (139 pages) is dedicated to the very subject as announced by the title. An introductory chapter reviews structural characteristics, binding properties, stereochemistry, and thermostability of sulfonium salts, sulfoxides, sulfones, and the anions derived from such compounds. Five consecutive chapters deal with the synthetic utility of sulfoxides, sulfones, thioethers and sulfonium compounds, dithioacetals and -ketals, and thioesters, respectively. With the exception of the last chapter, which is a short one, all other chapters are expediently divided into subchapters referring to particular topics. The topics frequently build on reactivity owing to some structural peculiarity, e.g., multiple functionality, but may alternatively focus on a principle of reactivity (i.e. a mechanism or a method) or the nature of the product obtained. Although concise, the text is always adequate, and exemplifications and explanations are throughout supported by detailed reaction schemes, accounting excellently for perhaps not immediately palpable reaction mechanisms.

Juggling sulfur compounds in organic synthesis is one matter, procuring the sulfur compounds is another. In acknowledgement of the fact that the sulfur compounds dealt with seldom are stock chemicals, the author has subjoined the shorter second part (30 pages), which is devoted to a concise and adequate going through of current synthetic routes to the indispensable sulfur compounds.

Rounding off this profiling, it might be noted that the book is supplied with a

well-arranged table of contents, a table of the applied abbreviations, a subject index, and 148 references.

The book addresses itself to graduate students and research workers looking for a suitable introduction to the subject. It is written in French. However, interested readers having little acquaintance with the French language should not be deterred by this fact. The numerous and detailed reaction schemes are quite informative, and with the help of a dictionary the message contained in the accompanying concise text should become easily intelligible. Since the book is available paperbacked and laid out as a photo-reproduced typescript, the initial cost can hardly be prohibitive.

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Houben-Weyl, Methoden der Organischen Chemie, Erweiterungs- und Ergänzungsbände. D. Klamann (Ed.), E11, Organische Schwefelverbindungen, Thieme, Stuttgart, 1985. LXXIV + 1821 pp. (in 2 parts). DM 1950 (subscription price DM 1755). ISBN 3 13 218104 8.

The title of this important volume notwithstanding many important classes of organic sulfur compounds have been placed in other volumes of this supplement of the legendary *Houben-Weyl* (for instance thio- and dithiocarboxylic acids and derivatives in Vol. E5). The subjects remaining in Vol. E11 are

Sulfoxyl Cations (by G. Fengler)
Sulfoxyl Derivatives (by G. Fengler)
Sulfenic Acids and Derivatives (by R. Schubart)
Di- and Polysulfanes (by K.-D. Gundermann and K. Hümke)
Sulfanes (by K.-D. Gundermann and K. Hümke)
Thioaldehydes and Thioketones (by J. Voss)
Thioketenes and Derivatives (by E. Schaumann)
Sulfonium Salts with Coordination Number 3 (by E. Vilsmaier and H. Heydt)
Organic Derivatives of Sulfurous Acid (by E. Fischer)
N-Sulfinyl Compounds (by R. Beckert and R. Mayer)
N-Thiosulfinyl Compounds (by S. Bleisch and R. Mayer)
Sulfur Diimides (by S. Bleisch and R. Mayer)
Sulfenic Acids and Derivatives (by E. Krauthausen)
Sulfoxide Acetals (by K.-D. Gundermann and K. Hümke)
Sulfoxides (by G. Kresze)
Sulfimides (by M. Haake)
Heterotriorgano and Tetraorgano Sulfuranes (by K.-D. Gundermann and K. Hümke)
Sulfines and Derivatives (by B. Zwanenburg and B. G. Lenz)
Sulfonium(IV) Salts (by P. K. Claus)
Organic Derivatives of Sulfuric Acid (by B. Unterhalt, S. Bleisch, and R. Mayer)

Sulfonic Acids and Derivatives (by G. Schilling, S. Pawlenko, and H. Jäger)
 Sulfones and Derivatives (by K. Schank and M. Haake)
 Sulfenes and Derivatives (by B. G. Lenz and B. Zwanenburg)
 Sulfur Ylides (by P. K. Claus)
 Sulfur Stabilized Carbenium Salts (by P. K. Claus)
 Sulfonium(VI) Salts (anonymous)
 Three-Membered Rings with at least One Sulfur Atom (by H. Meier)
 Four-Membered Rings with at least One Sulfur Atom (by H. Meier and N. Hanold)
 Protective Groups for Sulfur Compounds (by K.-D. Gundermann)

As usual a most distinguished author panel has been assembled for this monumental task. However, it is surprising to note that one of the foremost authorities on *N*-sulfinyl compounds and sulfur diimides, G. Kresze, though on the panel, did not take part in the compilation of the respective chapters. The entry "IV. Triorgano-, Tetraorgano-, Pentaorgano- und Hexaorgano-sulfurane(VI)" in the table of contents is missing on the designated p. 1326.

The literature coverage, extending all the way to a substantial number of 1985 papers, is impressive. One might call it overzealous, however, to include (on p. 1639) a reference to the non-existing book D. H. Reid and D. R. Hogg, *Specialist Periodical Reports, Organic Compounds of Sulphur, Selenium, and Tellurium, Vol. 7*, The Chemical Society, London, 1983. The important reference 133, mentioned three times on p. 209, is nowhere to be found.

The coverage of the subject matter is, not unexpectedly, superb, but somewhat uneven in depth. The chapters on, for instance, sulfoxides, sulfones, sulfines, and sulfur ylides, respectively, are most detailed in their description of the reactions of the compounds in question while the thiol and the sulfide chapter are content with zero coverage of the respective reactions. The *N*-sulfonylsulfimides have defied the editor's systematics and appear in two independent chapters (on p. 887 and p. 1008) without cross reference. The same is true of *N*-sulfonylsulfoximides (on p. 1109 and p. 1299). Some of the book's nomenclature veers between the strange and the weird, the former represented by the book's "Diorgano-disulfane" for disulfides (why then not call "Thiole" "Organosulfane"?), the latter by "S-Nitro-sulfensäuren" for thionitric acid *S*-esters. Come to think of it the analogous thionitrous acid *S*-esters R-S-NO seem to have been overlooked altogether.

The organization of the extensive tables of contents and indexes makes it virtually impossible to use the two parts of this volume independently as might well be desirable in a busy departmental library.

The lively and uncrowded typography, the liberal use of structural formulas and tables, and the frequent direct presentation of synthetic procedures vouch for easy and convenient use, both by the casual reader and the detail-seeking specialist. The present volume is an indispensable source of inspiration and information for synthetic chemists which even readers with a limited knowledge of German will find easy to use.

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M. E. Vol'pin (Ed.), Soviet Scientific Reviews, Supplement Series *Chemistry*, Vol. 1, D. N. Kursanov, Z. N. Parnes, M. I. Kalinkin, and N. M. Loim, *Ionic Hydrogenation and Related Reactions*, Harwood Academic Publishers, New York, 1985, xvi + 252 pp., \$112.00, ISBN 3-7186-0145-1, ISSN 0275-780X.

The present volume, an updated English translation of the corresponding 1979 Russian edition, contains the following chapters:

Ionic Hydrogenation of Unsaturated Hydrocarbons. Ionic Hydrogenolysis.

Ionic Hydrogenation of Heterocyclic Compounds.

Investigation of the Mechanism of the Ionic Hydrogenation of Compounds Containing an Ethylenic Bond. Synthesis of Organic Compounds Labeled with Deuterium.

Ionic Hydrogenation of Compounds with a C=O Bond.

Ionic Hydrogenation of Compounds Containing Other Types of Multiple Bonds.

The Hydride Mobility of Hydrogen Bonded to Different Elements. Ionic Dehydrogenation and Disproportionation Reactions.

Catalytic Ionic Hydrogenation.

Ionic Hydroalkylation and Alkylation.

An appendix contains 30 examples of actual synthetic procedures. No indexes are provided. The paucity of post-1980 references, the latest from 1982, indicates an excessive production time for this volume. The artwork, though uneven, is acceptable.

Sulfur chemists will be most interested in the book's treatment of the reduction of thiophenes (and selenoxanthenes) with trifluoroacetic acid and organosilanes. The special attraction of ionic hydrogenation in this case lies in the fact that most sulfur compounds act as poisons of the more common catalytic hydrogenation.

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