

Organoselenium Chemistry I: Functional Group Transformations; by Alain Krief and László Hevesi, Frankfurt, Springer-Verlag, 1988, xi + 221 pages, DM186, ISBN 3-540-18629-8

The last twenty years or so have seen what one might describe as the "element revolution" in organic synthetic methodology. Organic chemists have discovered the rest of the periodic table, and there has been a path to fame by taking an element and exploring its uses in synthetic chemistry. Selenium has been one of the elements "discovered" in this way, and the examples of silicon, palladium, titanium and tin also spring readily to mind. Synthetic methodology has been greatly enriched by these studies, but they have generated equally interesting results for the organometallic chemist. Selenium has not been quite as successful as some other elements, perhaps because many chemists are suspicious of its toxicity and the reputedly unpleasant smell of selenium reagents. Such fears are not in fact particularly well grounded; most related sulphur compounds are appreciably more volatile, and hence in practice more noxious. The present authors do an excellent sales job for selenium.

This is intended to be the first and two volumes detailing organoselenium chemistry, and its aim is to give an account of the most frequently used selenium containing reagents generally available to chemists, mentioning both the scope and the limitations of the reactions. This volume is restricted to reactions in which there is no isolable organoselenium intermediate, and which are operationally one-step processes. The second volume will review the preparations of the organoselenium reagents, and the isolation of stable organoselenium intermediates.

The book opens with an introduction containing a general review of selenium chemistry with particular reference to toxicology and environmental studies. Thereafter the book is organised by oxidation level, starting with hydrogen selenide and selenols. These compounds may be the least attractive from the point of view of toxicity and odour, but they have found uses in dealkylation of esters and ammonium salts, deoxygenation of epoxides and the preparation of alkylselenocuprates. Chapter three deals with the uses of elemental selenium, including alkene isomerisation, oxidation and aromatisation of hydrocarbons, and oxidation of formates, hydrazine and carbon monoxide. The selenoxides, considered next, have generally found their applications as mild oxidising agents. Chapter five discusses selenyl halides, ArSeCl , and diaryl diselenides, ArSeSeAr , whilst the lengthier Chapter six deals with benzeneseleninic anhydride. This latter has proved an extremely versatile mild oxidising agent, including phenols, ketones and esters (which are dehydrogenated), alcohols, thiols, amines and hydrocarbons among its substrates. Benzeneseleninyl chloride, reviewed in Chapter 7, has been used to oxidise amines and aldoximes, and to dehydrogenate carbonyl compounds. Perseleninic acids have found applications in epoxidation, the Baeyer Villiger reaction and sulphide oxidation. Chapter nine is much the longest in the book, devoted to the reactions of selenium dioxide. This is hardly surprising, since its first applications in organic synthesis date back to the 1930s. There are excellent discussions of the mechanism of the reactions reported. The final chapter details reactions involving selenium oxychloride and selenium tetrahalides.

As is usual from this publisher this is a very well produced book, with clear diagrams in bold type. There are some 600 references, running into 1985, with

unpublished data from 1986 in the authors' own laboratory. The index is clear and well-presented. From the point of view of the organic chemist interested in achieving a specific synthetic transformation this book has the weakness that the uses of selenium reagents are not in general compared with alternative strategies for the same transformation. This is not to blame the authors, since such comparisons are notoriously difficult, and would greatly have expanded the size of the volume. As a book for the organometallic or organic chemist who wishes to learn about organoselenium chemistry in order to improve his acquaintance with the modern synthetic armoury, it is very good. The price is high for a relatively slim volume and will probably exclude most individual purchasers, but it should be available in all serious chemistry libraries.

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Organometallic Chemistry, Volume 16; Specialist Periodical Report of the Royal Society of Chemistry, edited by E.W. Abel and F.G.A. Stone, Royal Society of Chemistry, 1987, xviii + 526 pages, £120, \$236, ISBN 0-85186-641-7.

This volume of the Specialist Periodical Reports in Organometallic Chemistry surveys the literature for the calendar year 1986. The format of the book follows that of previous volumes, with a left to right traverse of the Periodic Table for compounds of the main group elements, and compounds organised primarily by ligand types for derivatives of the transition metals.

As the years and the volumes in this series have passed one may observe that the presentation has become steadily more condensed and laconic, as the literature has expanded. Early volumes showed some efforts at critical reviews, but sadly neither time nor space allow for this today. Both the editors and the reviewers should be congratulated on the speedy appearance of the volume. The reviews seem to be comprehensive, and they largely seek only to record the work published in the field. It is clear that some of the reviewers faced a Herculean task, with several chapters running to well in excess of 300 references, and that on diffraction studies to 1382. This is an extremely valuable compilation of material, and certainly one of the first of my own ports of call in seeking information about recent publications.

The volume has been produced from camera ready manuscripts, and the quality of presentation is somewhat variable. Most is good with clear diagrams, but Chapter 4 was close to illegible in parts, at least in my copy. Author and editors please take note, for next year. There is no index, but the book is well organised and the chapter contents lists make it relatively easy to find the material you want quickly.

This is clearly a book that every serious chemistry library must purchase, in spite of its price. In terms of information content it is fact reasonable value for money, but I look back with great regret to the days when I could afford to buy a copy for myself, even as a relatively humble post-doc.

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