

Book reviews

Fieser and Fieser: Reagents For Organic Synthesis, Volume 16

M Fieser

Wiley, New York, 1992

£43.95 ISBN 0 471 52721 1

Volume 16 constitutes the latest in the Fieser and Fieser series, which no synthetic chemist can afford to be without. This book follows the same successful format of previous volumes in providing an up-to-date, critical and concise appraisal of reagents for organic synthesis.

The volume covers most of the useful new synthetic reagents described in the literature from 1989 through to 1991 with a noticeable emphasis on organometallic reagents. The referencing, and particularly the cross-referencing, to previous volumes and reagents is excellent. While this text is primarily designed as a desk-top rapid reference book I still find this series to be a pleasurable browsing experience; one can discover a wealth of new ideas and information in a visual fashion. Long may this invaluable series continue.

P R Jenkins Organometallic Reagents in Synthesis Oxford Chemistry Primers

Oxford University Press, Oxford, 1992

£4.99.

ISBN 0 198 55666 7

This volume constitutes a new addition to the rapidly growing family of Oxford Chemistry Primers. These texts are directed at all students of organic chemistry and are designed to provide concise introductions to various important topics—in this particular case, on the use of polar organometallic reagents for organic synthesis. Knowledge of this area is essential to the proper understanding of the subject and is at the heart of much current organic synthetic methodology. In this short primer, Paul Jenkins has covered most of the important general concepts and the topic is presented in a very readable form with excellent illustrations of relevant reactions. The mechanistic arguments are adequately discussed although I would have welcomed a more detailed discussion of single-electron transfer sequences rather than having to rely totally on the two-electron approach. Nevertheless, this is very useful text which will be of considerable use to students and is offered at a bargain price. I believe this series will develop into a highly collectable and useful introductory compilation of key areas of organic chemistry.

Advanced Organic Chemistry: Reactions, Mechanisms and Structure 4th edn

Jerry March

Wiley, New York, 1992

1512 pp. £24.95 (paperback), £45.50 (cloth).

ISBN 0471581488

This latest edition of Jerry March's *Advanced Organic Chemistry* follows the tradition set in early editions as being the single most useful general reference available to the organic chemist. The difference from previous editions lies primarily in the updating of terminology and references—about 5000 new references among a total of 15 000.

The book is divided into two parts. Part One discusses structure and bonding, acids and bases, photochemistry and the effects of structure on reactivity. This is described as an introduction to Part Two, but do not be misled—March's book is, as its title says, a text on advanced organic chemistry and it is not designed for the beginner in the field!

Part Two is concerned with organic reactions and mechanism, with each chapter concentrating on a different reaction type or basic mechanism. Each chapter is split in two, giving first details of mechanism and reactivity, then considering all the significant reactions belonging to the subject area.

By taking a mechanistic-led approach, March's book does not provide a separate chapter on organometallic reagents but these are dealt with thoroughly when they arise.

The book has two Appendices—one on literature sources and searching and the other a classification of reactions by type of compound synthesized. This latter appendix is invaluable as a method of finding how to make a particular functionality in this mechanism-based book. While very dry in tone, all in all, *Advanced Organic Chemistry* has to be highly recommended.

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Synthetic Fluorine Chemistry

G A Olah, R D Chambers and G K S Prakash (eds)

John Wiley, New York, 1992

402 pages. £75.00.

ISBN 0471543705

Synthetic Fluorine Chemistry is based on papers read in February 1990 at a research symposium dedicated to

the memory of Donald P. Loker, benefactor of the Loker Hydrocarbon Research Institute of the University of Southern California, the scientific home of George Olah, one of this century's most prolific chemists. Carefully edited by Olah and his well-known co-editors, the book comprises 17 review-type chapters, mainly of American origin and all written with the authority expected from the international standing of the senior authors concerned: 1, Lewis acid properties of fluorinated noble gas cations (G. J. Schrobilgen, Canada); 2, Controlled replacement of fluorine by oxygen in fluorides and oxyfluorides (K. O. Christie, W. W. Wilson and C. J. Schack, USA); 3, Transition metal derivatives of strong protonic acids and superacids (F. Aubke, M. S. R. Cader and F. Mistry, Canada); 4, Fluorine stabilized carbon-sulfur multiple bonding (K. Seppelt, Germany); 5, A new synthetic procedure for the preparation and manufacture of perfluoropolyethers (R. J. Lagow, T. R. Bierschenk, T. J. Juhlke and H. Kawa, USA); 6, Universal synthesis of perfluorinated organic compounds (J. L. Adcock, USA); 7, electrophilic fluorination reactions with fluorine and some reagents derived from it (S. Rozen, Israel); 8, Fluorination with onium poly(hydrogen fluorides): the taming of anhydrous hydrogen fluoride for synthesis (G. A. Olah and X.-Y. Li, USA); 9, Organometallics in synthetic organofluorine chemistry (D. J. Burton, USA); 10, Nucleophilic perfluoroalkylation of organic compounds using perfluoroalkyltrialkylsilanes (G. K. S. Prakash, USA); 11, Silicon mediated reactions in organofluorine chemistry (W. B. Farnham, USA); 12, Synthetic aspects of electrophilic *ipso* reactions of polyfluoroarenes (V. D. Shteingarts, CIS); 13, The perfluorobenzene oxide-perfluoro-oxepin system (N. E. Takenaka and D. M. Lemal, USA); 14, Perhalodioxins and perhalodihydrodioxins (C. G. Krespan and D. A.

Dixon, USA); 15, The fluoroacetamide acetal Claisen rearrangement as a tool for asymmetric synthesis (J. T. Welch, T. Yamazaki and R. Gimi, USA); 16, Unusual fluorinated alkenes and dienes, via fluoride ion induced processes (R. D. Chambers, UK) and 17, Fluorinated condensation monomers (K. Baum, USA).

Dedicated fluorine chemists clearly will find this book a useful acquisition for their personal libraries, and many others—especially organic chemists—will gain from its availability in libraries associated with their institutions or companies. For the importance of fluoro-organic synthesis in both academia and industry continues to grow apace: '... conservative estimates call for more than \$50 billion/year to be associated with this element [fluorine] in organic chemistry alone' (Chapter 7, p. 144); 'of the 10 million compounds registered in the *Chemical Abstracts* [ACS], 6.2% of them contain compounds with a C-F bond' (Preface, p. ix). Devotees of organometallic chemistry surely will be moved to consult at least Chapters 9, 10 and 11 by Burton, Prakash and Farnham, respectively. Polymer chemists will find Farnham's chapter interesting too, as well as Chapters 5 and 17. In fact, the conveners of the symposium on which *Synthetic Fluorine Chemistry* is based are to be congratulated on the good 'mix' of topics.

The book is well edited overall, nicely printed except for some lack of consistency where structural formulae are concerned, and commendably free from errors. The title is perhaps somewhat misleading, for characterization and mechanistic aspects are certainly not neglected; and the book definitely is not a *structured* advanced text on the synthesis of fluorine compounds.

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