

organosilicon compounds. The final chapter, by Tsuji and Mandai discusses palladium-catalyzed reactions of propargylic compounds.

The editors have assembled here an impressive cast of authors, beyond doubt all experts in the topics they review. The choices of the chapter titles derive in many cases from their authors' expertise—they are definitely not systematic, with some based on substrate type, some on reaction type and some on organometallic nucleophile type. There is, however, not too much overlap but unfortunately one very conspicuous hole—palladium-catalyzed couplings to allyl derivatives. A few are discussed in Negishi's opening chapter, but given the level of activity in this area, I would have expected a more extended and systematic review.

Overall the book is well produced with clear legible diagrams, and each chapter is very thoroughly referenced. It is unfortunate that each chapter has its own glossary of acronyms—and these vary from one chapter to another. The index is adequate, if not particularly comprehensive. Readers will find value for money in this volume; the information density is high, the authors distinguished, and the coverage timely. At £85 this will not find its way on to many individual bookshelves, but it is a useful library purchase.

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Organofluorine Chemistry: Fluorinated Alkenes and Reactive Intermediates, Topics in Current Chemistry, Volume 192, R.D. Chambers (Ed.), Springer-Verlag, Berlin-Heidelberg, New York, 1997, pp. 244 + x, UK £84.00, ISBN 3-540-63171-2

Organofluorine Chemistry: Techniques and Synthons, Topics in Current Chemistry, Volume 193, R.D. Chambers (Ed.), Springer-Verlag, Berlin-Heidelberg, New York, 1997, pp. 252 + x, UK £84.00, ISBN 3-540-63170-4

These companion volumes, dedicated by Professor Chambers to Nobel laureate George Olah on the occasion of his 70th birthday, are recent additions to a well known series designed to provide 'critical reviews of the present position and future trends in modern chemical research'. The sheer breadth and depth of organofluorine chemistry nowadays precludes the possibility of achieving this objective in just two standard volumes of 'Topics', hence the coverage needed to be appropriately selective. This has been achieved nicely

and without serious overlap with recent major books on organofluorine chemistry or with a 'fluorine thematic' issue of *Chemical Reviews*. A fair proportion of the areas reviewed reflect the front-line editor's own long-standing research interests, as expected. Volume 192 contains four reviews, viz. Nucleophilic Reactions of Fluorinated Alkenes (R.D. Chambers and J.F.S. Vaughan), Reactions of Electrophiles with Polyfluorinated Olefins (U.A. Petrov and V.V. Bardin), Fluorinated Free Radicals (W.R. Dolbier) and Telomerisation Reactions of Fluorinated Alkenes (B. Améduri and B. Boutevin) and Volume 193 contains five: Elemental Fluorine in Organic Chemistry (J. Hutchinson and G. Sandford), Fluorinated Organometallic Compounds (D.J. Burton and L. Lu.), Enzymatically Controlled Reactions of Organofluorine Compounds (T. Kitazume and T. Yamazaki), Building Block Approaches to Aliphatic Organofluorine Compounds (J.M. Percy, UK) and Electrofluorination of Organic Compounds (F.G. Drakesmith). No doubt organometallic chemists will make a beeline for Volume 193 and the Burton/Lu review of fluorinated organometallic reagents; however, there is also much to occupy their attention in Percy's discourse in the same volume on fluoro-organic building blocks. Volume 192 is less immediately useful to organometallic chemists in general.

Burton and Lu, focusing on work reported during the past 10 years, describe in agreeable style methods of synthesis and applications of perfluoroalkyl, fluoroalkenyl, perfluoroaryl, carboalkoxydifluoromethylene, dialkoxyposphinyldifluoromethyl, α,α -difluoroallyl and α,α -difluoropropargyl derivatives of 'workhorse' metals such as lithium, magnesium, zinc, copper and tin. Percy's superbly crafted review dealing with general and significant developments in the area of building block chemistry of so called lightly-fluorinated aliphatic compounds (i.e. the molecules contain up to three F substituents) is replete with information on the use of metal-based aids for the synthesis of fluorinated target molecules. For me, his review is the high spot of this two-volume collection of reviews and deserves to be consulted widely in general organic synthesis circles, as does the review by Kitazume and Yamazaki on the biotransformations of lightly-fluorinated organic compounds.

Drakesmith's timely and authoritative review of electrofluorination methodologies in Volume 193 contains a thoughtful section on the still-uncertain mechanism of the conversion of hydrocarbon substrates to perfluorinated entities via electrolysis in anhydrous hydrogen fluoride using nickel anodes (the famous Simons Process that was discovered almost 60 years ago). This ought to attract at least passing attention from organometallic chemists. The brief section on C-F bond-making via fluorodemetalation of organic deriva-

tives of lithium, magnesium, silicon, germanium and tin with difluorine in the review by Hutchinson and Sandford in the same volume also should not be overlooked. What a pity, though, that these authors did not include any information on radiolabelling of organic substrates with [^{18}F] F_2 or further encourage the use of F_2 as a selective fluorinating agent by providing concise *practical* advice for beginners on how to procure, manipulate safely, and dispose of the element in a laboratory setting.

Overall, the reviews in both volumes are up-to-date, well written and presented, and replete with references. Inevitably typographical errors exist but 'real' chemical errors are rare and will not mislead alert readers. Obvious chances to provide cross references between reviews have not been taken.

Each volume is reasonably priced by today's standards and represents a valuable addition to *Topics in Current Chemistry*, a series which all good chemistry libraries ought to collect. Organofluorine pundits surely will strive to afford both volumes for their personal use or to persuade their institutions/companies to hold copies. Importantly, these books are a good source of information for those who teach organic chemistry at college or university level but whose lectures do not yet reflect the importance of fluoro-organic chemistry in everyday life and the wealth of scholarship involved. Consultation of the review by Hutchinson and Sandford in Volume 193 is a 'must' for those still propagating the myth that direct fluorination of organic substrates is not a synthetically useful reaction.

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Advanced Practical Inorganic and Metallorganic Chemistry, R.J. Errington, Blackie, Chapman and Hall, London, 1997, pp. 228, £24.99, ISBN 0 7514 0225 7

All supervisors of students beginning research on the synthesis and characterisation of organometallic compounds will be familiar with the questions which this book seeks to answer. Most people find that there is a gigantic step between undergraduate practical chemistry where experiments are well-tryed (and students' inexperience or incompetence can usually be blamed when they do not work) and experiments which have never been done before. Since research in inorganic and organometallic chemistry is usually undertaken by groups of students and post-doctoral assistants working together, the step between undergraduate practical work and research is usually made with the assistance

of co-workers who are more experienced. As John Errington acknowledges in his opening chapter, there is no better way of learning the many tricks that turn an unsuccessful synthesis into a successful one.

However, not all inexperienced research workers have colleagues to help them and those who do may find there is a limit to the extent to which they can pester others. Moreover, know-how is lost when experienced workers leave as is inevitable and necessary in university laboratories. These are the considerations which have led to this book. The style is informal: the reader is addressed as 'you' and the writer does not hesitate to express personal opinions, e.g. 'I think...' or 'we use...'. Abbreviations such as 'don't' or 'postdoc' are freely used. Books of this kind, for beginners in research, have been written before, but times change, new equipment, techniques and starting materials become available, and university research budgets become ever tighter. A book which takes account of present-day conditions is especially valuable.

The range of topics covered can be seen from the chapter headings: preliminaries (the laboratory, literature, keeping records, safety), bench-top techniques, glove boxes, high vacuum lines, solvents and reagents, reactions in solution, reaction work-up (isolation, purification and storage) reactions between a solid and a gas, reactions between solids, product characterisation (spectroscopic techniques, mass spectrometry, microanalysis and molecular weight determination, growing crystals for X-ray diffraction), special techniques (electrochemical techniques, thermal analysis, high pressure reactions, sonication, microwave heating, special solvents, matrix isolation, metal vapour syntheses) and preparation of starting materials. This last chapter provides references to the places in *Inorganic Syntheses* where preparations of many substances used in inorganic or organometallic chemistry are described. There are five appendices which contain valuable tabulated information on health and safety, deoxygenation columns, solvents, NMR solvents (including spectra of common impurities!) and gases. Some of what is included is common sense but it is immensely valuable to have it written down. How many students think through an experiment before they begin it, keep accurate and legible records, or lose valuable samples by careless manipulation?

This book should be read by all undergraduate project students and new graduate students working on inorganic or organometallic chemistry. Even the most experienced researchers will find tips for improving their techniques and much useful advice. There can be quibbles about what has been included and what left out but these are minor. The index could be improved. John Errington says somewhere that the successful researchers are those who enjoy making and isolating new compounds. His own enthusiasm is beyond ques-