Enantiocontrolled Synthesis of Fluoro-Organic Compounds: Stereochemical Challenges and Biomedical Targets. Edited by V. Soloshonok. Wiley: New York, 1997, 673 pp. ISBN 0 471 97372 6.

Since 1957, when Fried reported that various fluorinated steroids displayed enhanced biological activity compared to the corresponding parent derivatives, interest in the synthesis and biological screening of many classes of selectively fluorinated molecules, that is, compounds bearing one or a few fluorine atoms, has grown tremendously. The profound changes in chemical and physical properties as well as biological activity that can occur upon fluorine incorporation is exemplified by the growing number of pharmaceuticals and agrochemicals that contain fluorinated substituents within their structures. For example, Prozac (Eli Lilly) and Ciprofloxacin (Bayer), two of the world's most valuable drugs, owe their bioactivity to the presence of trifluoromethyl and fluorine substituents respectively. In general, the synthesis of optically pure compounds is extremely important due to regulatory requirements for the successful registration of a new pharmaceutical or agrochemical product and so, taking these factors into account, the enantiocontrolled synthesis of fluoro-organic compounds represents a new and increasingly important research goal, if, as expected, fluoro-organic molecules are to play an increasing role in new drug and agrochemical discovery programmes.

This timely volume presents, for the first time in a book that is concerned solely with the stereochemical aspects of fluoro-organic chemistry, a collection of comprehensive reviews that describes most of the major advances made within this new field. The twenty one chapters covering over 600 pages have been written by leading researchers in the area. Current synthetic methodology for the preparation of enantiopure fluorinated molecules is described in chapters devoted to asymmetric fluorination (Davis), fluoroalkylation (Iseki), dehydroxy-fluorination (Gree), fluorinated sulphoxides (Bravo), trifluoropropene oxide (Katagiri), reduction of fluorinated carbonyl compounds (Ramachandran and Brown), aldol reactions (Soloshonok), Michael addition reactions (Yamazaki), oxidation (Ono) and biocatalysis (Shimizu). In all chapters, the differences in reactivity of fluorinated molecules compared to non-fluorinated analogues are carefully compared and contrasted. Application of such methodology to the synthesis of optically pure fluorinated carbohydrates (Resnati), amino-acids (Uneyama), nucleosides (Viani) and anaesthetics (Halpern) make up the second section of the book. The widespread use of enantiopure fluorinated derivatives (e.g. Mosher's acid, ligands in lanthanide n.m.r. shift reagents) is described in the third section in chapters concerning general asymmetric synthesis (Kubota), analysis (Takeuchi) and liquid crystal design (Hiyama, Mikami). The final three chapters (Kitazume, Beguin, Schlosser) discuss the relevance of the size and co-ordinating ability of fluorine and fluorinated groups with a view to assessing the impact these substituents have upon stereochemical transformations.

In general, literature coverage is up to 1997. Over half the chapters of the book have been written by Japanese chemists, which gives some indication as to where much of the research in this area is being undertaken, and it is to their, and the other authors, great credit that all chapters are well written, organised and easy to follow. There is only little duplication. Clear contents and index sections are provided and production standards are high. I recommend this valuable text to any researchers interested in the synthesis of fluoro-organic compounds, although I am sure that most workers in this area will have a copy of this volume on their bookshelves already. Researchers involved in asymmetric synthesis and medicinal chemistry will also benefit from having access to a copy of this very useful book.

Graham Sandford, University of Durham, UK

Article Identifier:
1437-210X,E;2000,0,01,0183,0183,ftx,en;B10100SS.pdf

Targets in Heterocyclic Systems: Chemistry and Properties, Volume 2. Edited by O. Attanasi, D. Spinelli. Italian Chemical Society, 1998, 496 pp, softback. 90,000 L. ISBN 88-86208-11-1.

This second volume is part of a series which intends to present reviews and personal accounts in the field of heterocyclic chemistry. Some articles are of broad interest, others are dealing with highly specialistic topics. Eleven contributions of this volume focus on the synthesis of heterocycles, two on analysis, mainly mass spectroscopy. The first chapter gives a concise overview on synthetic pathways to modified dideoxynucleosides, which are of interest as antiviral agents. The second chapter presents applications of c-annulated furans: These o-quinonoid hetarenes are suitable for inter- and intramolecular Diels–Alder reactions and thereby are building blocks for the construction of polycyclic hydrocarbons, nanodimensional compounds and biologically active natural products such as ellipticine, anthracyclinones and steroids. The fourth rather stimulating chapter systematically describes amino acids as building blocks for chiral heterocycles, starting with three-membered rings (aziridines and epoxides) and reaching up to eight-membered rings. The fifth chapter is a very modern one explaining the construction of heterocycles by metathesis reactions with the Grubbs catalyst. After another specialized chapter about the chemistry of 5-hydroxy-4,5-dihydropyrazoles a somewhat broad review highlights the photochemical isomerization of various five-membered hetarenes. The eighth chapter is a personal account on microwave irradiation in heterocyclic chemistry. After an article about tautomers of polyhydroxypyrimidines, synthetic routes to novel heterocycles are outlined, which are important for agricultural chemistry. The eleventh chapter deals with multiple fluoro-substituted heterocycles and the final two chapters focus on mass spectroscopy of nitroazoles and of isothiazoles, respectively.

Obviously, this book presents a rather heterogenous collection of short reviews and accounts on heterocyclic chemistry. Although these articles are of high quality, even chemists specialized on heterocycles will not need a personal copy of this book, since in most cases only very few articles of this collection will be of interest for them. Of course the book can be recommended for libraries, also in respect of the reasonable price. However, high quality review journals such as "Accounts of Chemical Research" and "Chemical Reviews", which are already in danger of being withdrawn from the subscription list of many departments, are more important for a chemistry library.

Gerald Dyker, Duisburg University, Germany

Article Identifier:
1437-210X,E;2000,0,01,0184,0184,ftx,en;B20100SS.pdf