

Microwave Assisted Organic Synthesis, edited by J. P. Thierney and P. Lidström; Blackwell Publishing Ltd., 2005, 296 pp, hardcover, £ 89.50, ISBN 1-405-11560-2

The use of microwaves in organic synthesis has increased dramatically in the last years, receiving widespread acceptance and becoming an indispensable tool. Several quite recent books and reviews are available on the subject, and perhaps for this reason, and probably also due to its multi-author structure, this book focuses on selected topics rather than attempting a coherent treatment of the whole subject.

Following a brief preface by the editors, Chapter 1, written by D. M. P. Mingos, is devoted to a discussion of the theoretical aspects of microwave dielectric heating, and provides a readable and concise introduction to the physics involved in the processes discussed later in the book. The comparison between microwave and conventional heating in Section 1.4 is particularly interesting, although a more thorough discussion of the subject of specific microwave effects would have been desirable. Chapter 2, by K. Olofsson and M. Larhed, deals with microwave-accelerated reactions catalyzed by organometallic species. Due to the existence of two reviews of this field by the same authors published in 2002, one of them also a book chapter, they concentrate on recent findings, a decision that allows a more detailed discussion. However, a more balanced treatment would have been advantageous for the readers of the present work, who are forced to peruse the earlier sources for a wider perspective. The contribution of T. Besson and C. T. Brain in Chapter 3, on the other hand, contains a systematic review of the progress of microwave-enhanced heterocyclic chemistry from 2000 onwards. In spite of a few mistakes in the schemes (e.g. in Cchemes 3.46, 3.49 and 3.50), this chapter provides a very useful update of the topic, with a particularly interesting final conclusion section. Chapter 4, by T. N. Danks and G. Wagner, deals with microwave-assisted reductions, the only functional group transformation covered in the book. This chapter does a good job in conveying to the reader the advances made in the use of solid hydrogen transfer compounds and other reduction reagents under micro-

wave irradiation conditions, while pointing at the high potential of this area for further development.

The next three chapters of the book are devoted to particular aspects of synthetic methodology with special current interest. Chapter 5, by J. Westman, is an excellent review of multi-component reactions under microwave irradiation. This is a particularly important topic due to the current relevance of the multi-component strategy in the development of fast, efficient and less-wasteful routes to structurally complex molecules. Similarly, Chapter 6 (I. R. Baxendale, A.-L. Lee and S. V. Ley) and Chapter 7 (A. Stadler and C. O. Kappe), provide excellent introductions to topics related to the application of microwave irradiation to solid-phase synthesis. The first of these chapters, from the group that has led the development of solid-supported reagents, naturally concentrates on this subject, while the second has a more general character, and spans the whole field of microwave-assisted solid-phase synthesis. Chapter 8, by C. R. Sarko, is much more specialized than the other chapters in the book, and deals with the quantitative measurement of time-savings associated with microwave-assisted synthesis. The final chapter, by B. A. Roberts and C. R. Strauss, discusses the crucial subject of the scale-up of microwave-assisted reactions for intermediate-scale industrial applications.

Overall, the chapters are of high quality in terms of content and they are well-written. The presentation of the book is excellent, and chemical structures are remarkably homogeneous in appearance for a multi-authored volume, with the notorious exception of Chapter 4, and are almost completely error-free. There is very little overlap between the chapters, which is a problem sometimes found in other multi-authored works. In conclusion, this book is highly recommended to synthetic chemists interested in applying microwave irradiation to problems related to their work.

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