Asymmetric Synthesis – The Essentials, M. Christmann and S. Bräse (Eds.), Wiley-VCH: Weinheim, **2007**, softcover, 345 pp, € 89, ISBN 3-527-31399-0

The need for chiral building blocks in chemical industries is unbroken. This accounts, at least in part, for the continuing interest in the improvement of known techniques and the development of novel methods for the stereoselective assembly of optically pure compounds.

Grasping this ever-increasing area of research, the book *Asymmetric Synthesis – The Essentials* brings together nearly sixty concise essays, generally four to six pages long, and all of them written by the protagonists of the individual topics. This approach is not only beneficial to quality, but also personalizes the overviews. The editors certainly succeeded in composing a brief compendium of the state of the art in asymmetric synthesis and, despite the large number of articles, overlaps in the content were largely prevented.

All essays are structured into a short introduction that provides useful background information, an outline of the author's contributions to the topic, and a conclusion. Future perspectives and a short vita of the author complete each contribution. This arrangement, as well as a unified glossary of abbreviations and subject index, lend the present book a consistent character. It might, however, be mentioned that its consistency is slightly compromised by a few non-uniform and rather poorly designed drawings, as well as by occasional use of incorrect stereochemical terminology; however, almost all articles are well written. Unfortunately, at least in the first edition of the book, an additional subject index not related to its contents was erroneously included. This is definitely misleading!

The book is subdivided into five parts, commencing in part one with a summary of diastereoselective carbon–carbon bond-forming processes, either substrate- or reagent-controlled reactions. The construction of stereogenic centers employing covalently bound chiral auxiliaries is covered by the pioneers – just to name a few – David A. Evans, Günter Helmchen, and Dieter Enders. Reagent-controlled transformations, for example allylation chemistry summarized by Reinhard W. Hoffmann, round off the historically oriented first part.

The following two chapters, the largest part of the book, are devoted to the ever-progressing theme of catalysis. While balancing well the transition-metal-catalyzed and organocatalyzed carbon–carbon and carbon–oxygen bond formation, the editors again won-over the major players, whose contributions to chemistry have already earned their places in modern textbooks. Catalytic asymmetric aldol-type reactions using chiral Lewis acid complexes are discussed in several articles. Along these lines, the synthetic potential of chiral Lewis acid–carbonyl complexes using C_2-symmetric ligands as well as combined acid catalysis are highlighted. Carbon–carbon bond-forming reactions by means of transition-metal-catalyzed conjugate addition, asymmetric cross-coupling, and allylic substitution reactions are included as well. Although not catalyst-controlled, the intriguing sparteine-mediated asymmetric homoaldol reaction was incorporated herein. Asymmetric oxidation chemistry such as the Bayer–Villiger reaction (Carsten Bolm) and the different accesses to asymmetric epoxidation (Varinder K. Aggarwal, Tsumoto Katsuki, Albrecht Berkessel) are presented in a series of excellent contributions.

Several articles, for example, by Benjamin List and Karl A. Jørgensen, underscore the enormous impact that organocatalysis has on current organic chemistry. Notably, part three also offers highly scholarly articles on nonlinear effects in asymmetric catalysis and asymmetric autocatalysis by Henri B. Kagan, Kenso Soai, and Donna G. Blackmond. As a part of enzyme-catalyzed transformations, Manfred T. Reetz reports on the emerging area of directed evolution of enzymes.

Putting the plethora of stereoselective transformations to the test, part four comprises stereocontrolled complex molecule synthesis. It starts with an excellent introduction by K. C. Nicolaou, focussing on those asymmetric reactions that have found broadest application in natural product synthesis. Distinguished experts highlight either an elegant total synthesis or an important methodology – for example, the metathesis reaction – used in overcoming a long-standing synthetic challenge.

Asymmetric catalysis, whether catalytic in a chiral metal complex, biocatalytic or enzymatic, has already found its way into industrial processes. Significant progress in all of these areas are the focus of the final part, which is particularly enhanced by the contributions of Nobel laureates William S. Knowles and Ryoji Noyori.

In conclusion, this topical book serves as a very valuable source of reference of the *essential* facets of asymmetric synthesis. It addresses a broad audience – ambitious undergraduates as well as graduate students will find it to be stimulating reading and a useful starting point for the preparation of seminars or even revision for exams. Experienced researchers from academia and industry will also enjoy simply dipping into it.

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