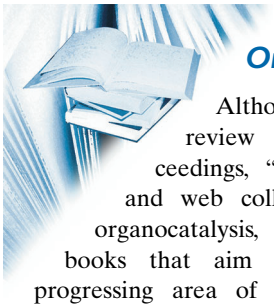


Asymmetric Organocatalysis

Although there are countless review papers, chapters, proceedings, "special topics" articles, and web collections on asymmetric organocatalysis, there are only a few books that aim to cover this rapidly progressing area of organic synthesis in a conceptual manner, concentrating on the methodological approach. *Asymmetric Organocatalysis—Workbench Edition* is one of the few major works that provide well-structured coverage, allowing the non-specialist reader to learn about this exciting field, and also providing a dependable reference source for synthetic chemists in general.

The manual is one of the new Workbench Editions in Thieme's *Science of Synthesis* (SOS) series, and aims to give full-text descriptions of organic transformations and synthetic methods, including experimental procedures. *Asymmetric Organocatalysis—Workbench Edition* is a high-profile multi-author book with 37 critically written chapters, concluding with an "all that is still left to do" visionary list by the editors. The manual consists of two volumes: 1. *Lewis Base and Acid Catalysts* (Editor: Benjamin List), and 2. *Brønsted Base and Acid Catalysts, and Additional Topics* (Editor: Keiji Maruoka), and surveys the most significant developments of the last decade, covering the literature up to the beginning of 2011. Each volume is introduced by a preface and a set of abstracts, with a summary and keywords for each chapter. The contents of the chapters are organized according to catalytic activation types (i.e., Lewis base/acid and Brønsted base/acid activation). This classification is not always strictly followed, but is replaced, where appropriate, by a more intuitive treatment based on mechanisms or reaction types.

In the first part of Volume 1 (*Lewis Base and Acid Catalysts*), the conceptually central aminocatalytic reactions (enamine and iminium activations) are discussed. The enamine part covers intra- and intermolecular aldol, Mannich, and Michael reactions, α-functionalizations and alkylations of aldehydes and ketones, as well as SOMO and free-radical organocatalytic transformations. The iminium part covers activations by MacMillan catalysts, diaryl prolinol derivatives, and primary amines. The aminocatalysis part is completed by descriptions of some applications in target-oriented syntheses.

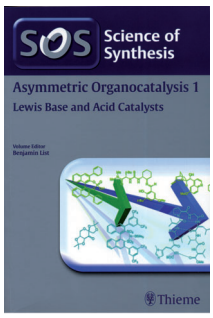
The rest of the part on Lewis base activation is less homogenous, and consists of groups of related chapters. In addition to a detailed analysis of acyl-transfer and carbene-catalyzed reactions, reactions catalyzed by tertiary amines and phosphines are discussed, as well as (aza-)Morita–Baylis–Hillman reactions.

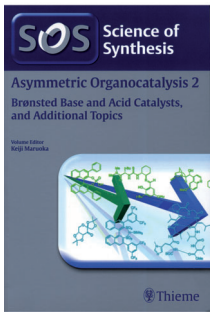
Although Lewis acid catalysts are among the types most widely used in organic chemistry, applications in asymmetric organocatalysis are limited to the few examples of carbenium, silyl, or phosphonium cations having a vacant orbital. Asymmetric epoxidations catalyzed by ketones and iminium salts are also discussed in the Lewis acids part of the book.

Volume 2 (*Brønsted Base and Acid Catalysts, and Additional Topics*) begins with the challenging topic of Brønsted base activation, using chiral guanidine and amidine organocatalysts, and finishes with the important group of chapters on cinchona-derived organocatalytic transformations. The largest part of Volume 2 is devoted to the centrally important topic of Brønsted acid activation in asymmetric organocatalysis. Among the moderate to strong acid catalysts, chiral phosphoric acids are highlighted, along with carboxylic acids, binols, and sulfonamide catalysts; the large group of chapters on (thio)urea hydrogen-bonding catalysts (weak acids) is followed by taddol and ionic hydrogen-bonding catalysts.

The "Additional Topics" section includes phase-transfer catalysis and theoretical studies, with supported organocatalysts, multi-catalyst systems, peptide catalysis, and organocatalytic cascade reactions. The volume is completed by industrial applications of all types of asymmetric organocatalytic reactions, followed by the editors' concluding remarks.

The work offers a condensed and highly practical view of a very broad area. The chapters are written by high-profile authors, and provide detailed explanations of reaction mechanisms, possible transition states, and the scope of the reactions, and the information is presented in well-organized tables. The selected experimental procedures can be implemented quickly and easily in the laboratory. Although the book does not claim to cover all parts of this fast-growing field, it is unfortunate that some important topics such as photocatalysis are absent, and that squaramide-based catalysts, for example, are not discussed in more detail. Some overlapping between chapters is unavoidable in a manual of this scope and size, and that may also contribute to providing the reader with a more balanced view. While the arrangement of the material according to catalytic functions is a natural approach for those who are developing asymmetric organocatalytic transformations, this treatment fits less naturally to a reader who wishes to apply these reactions in syntheses. The detailed keyword index (47+81 pages) provides a partial solution for this problem. Also, SOS will soon provide a web-based browser interface (*Science of Synthesis*, 4.0) allowing easy access to the methods





Asymmetric Organocatalysis Workbench Edition. 2 Volumes, Science of Synthesis Series. Edited by Benjamin List and Keiji Maruoka. Thieme, Stuttgart, 2012. 1928 pp., softcover, € 449.00.—ISBN 978-3131705914

and experimental procedures of all volumes of the series, with editable browser functions and options for filtering according to reactant, catalyst, product (for structural searching), title, content, and references (for textual searching).

In summary, the two-volume work *Asymmetric Organocatalysis—Workbench Edition* is a rich source for all academic or industrial researchers who are already working in this field, or wish to gain a deep insight into this fast-progressing area. It can be used as an advanced textbook, as a collection of experimental procedures, or as an encyclopedia.

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