

Comprehensive Enantioselective Organocatalysis
Edited by Peter I. Dalko.
3 Volumes. Wiley-VCH, Weinheim, 2013. 1160 pp., hardcover, € 449.00.—ISBN 978-3527332366

Comprehensive Enantioselective Organocatalysis

The field of organocatalysis has attracted a substantial number of players and has been developed in many creative dimensions. New and/or better catalysts and reactions are generated in many laboratories every day, and impressive breakthroughs occasionally appear in influential journals and scientific news media. It has become hard to keep track of the fast development of this field, even for insiders. For student beginners and for researchers outside the area, it might not be feasible to have a true picture of organocatalysis, even after an exhaustive literature search.

This three-volume handbook, *Comprehensive Enantioselective Organocatalysis*, edited by Peter Dalko with a foreword by Benjamin List, provides a convenient and comprehensive access to this field for both beginners and experienced players. For this new edition of an earlier manual on this subject, the editor has gathered over 90 authors who are experts in the field to summarize the main advances of organocatalysis, presented in 44 chapters. The editor and authors have done a marvelous job in organizing this rather complex and somewhat unstructured field in a reasonable way for readers. The catalysts, activation paths, reactions, and synthetic applications are detailed in the three volumes of the work.

In brief, Volume 1 introduces organocatalysts that are derived from amino acids and from non-amino-acid scaffolds. Readers can expect to find catalysts ranging from unmodified amino acids to designed oligopeptides and sophisticated supramolecular self-assembled structures. Volume 2 describes the activation modes of different organocatalysts, and the various methods to control catalytic reactivity and selectivity. On the basis of the interactions between the catalysts and the substrates, the editor has organized this part by a classification according to covalent and non-covalent catalysis. The discussion also introduces the tuning of reaction modes by controlling the environmental conditions (such as pressure, nano-scale cavities from porous structure, and water as reaction medium). Volume 3 focuses on reactions and synthetic applications of organocatalysis, including total synthesis. The topics covered include alkylations, nucleophilic additions to (and reduction of) carbon-carbon and carbon-heteroatom double bonds, and building of molecular complexity through ring formation, cascade catalysis, and multicatalysis. Free radical reactions, rearrangements, and kinetic resolutions are also discussed.

Given the complexity of the subject, readers should be prepared to see some unavoidable over-

laps in different chapters written by different authors. The editor has achieved the best way of organizing the contents for such a sophisticated book.

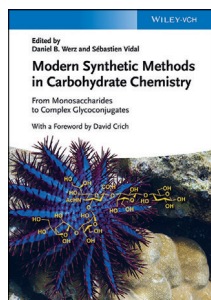
Some aspects that are not covered in the present edition, but that a reader would probably have wanted to find included are: 1) a chapter summarizing the different reaction types of organocatalysis, with attempts at drawing their fundamental connections; 2) one or two chapters of commentary views identifying challenges in possible future directions of organocatalysis; 3) one or two chapters from scientists not in the organocatalysis field who can offer constructive criticism. I guess it will be quite hard to recruit authors for such chapters, for a future edition of this book.

In short, this is a useful book that one should read to find out about this field of research, or to become a player in it.

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Modern Synthetic Methods in Carbohydrate Chemistry
From Monosaccharides to Complex Glycoconjugates.
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Modern Synthetic Methods in Carbohydrate Chemistry

Carbohydrates constitute the most abundant and functionally diverse organic compounds on the planet. Their extremely varied and elaborate structures are built on a myriad of monosaccharides, through various linkages and appendages. The chemical reactions of carbohydrates are determined largely by their functional groups and chirality, especially in terms of regio- and stereoselectivity. In fact, each type of the monosaccharides and glycosidic linkages is usually treated as a specific topic, and the synthetic chemistry of carbohydrates is a highly specialized field in the realm of synthetic organic chemistry. *Modern Synthetic Methods in Carbohydrate Chemistry*, edited by Daniel B. Werz and Sebastien Vidal, assembles a superb collection of state-of-the-art topics, which, as stated by David Crich in the foreword, “depend very heavily on the power and ingenuity of contemporary synthetic organic methodology”.

The book consists of 12 chapters, all written by established experts in their topics. Chapter 1, from the research group of George A. O'Doherty, describes “De novo approaches” to the synthesis of chiral carbohydrates. It is counter-intuitive to synthesize carbohydrates, especially glycans, using