

presents the basic principles, as well as many results from published research. The material that is presented is more comprehensive than in previous books, and also deals with recent new developments, such as size-quantized photoelectrochemical systems and porous dye-sensitized photoelectrochemical solar cells.

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**Principles and Applications of Asymmetric Synthesis.** By *Guo-Qiang Lin, Yue-Ming Li and Albert S. C. Chan*. John Wiley & Sons Ltd., Chichester 2001. xvii + 515 pp., hardcover £ 64.50.—ISBN 0-471-40027-0

It is fair to describe asymmetric synthesis as one of the most important and wide-ranging topics of organic chemistry. An enormous variety of methods has been developed during the last 30 to 40 years, at first mainly stoichiometric reactions, then in the last two decades with an increasing emphasis on catalytic methods. Although a number of books on aspects of asymmetric synthesis, some of them very substantial, have recently appeared, for the last few years there has not been a concise, quickly assimilable, survey of the state of the art in this extensive area of research. The authors of this book have set themselves the demanding task of filling that gap. The material included covers the situation up to September 1999, and thus, notwithstanding the rapid pace of development, it offers an up-to-date view of the field.

The book is intended especially for synthetic chemists and students who use

asymmetric synthesis as one of the main methods of their work, and who want an overview of the available techniques. Each chapter contains an exhaustive compilation of literature references, making it very easy to go into topics in more depth.

The first chapter is an introduction, and touches on a wide variety of topics. There is a short discussion of the different types of chirality and their nomenclature, so condensed that the meaning is not always very clear. In contrast, methods for determining enantiomeric excess (*ee*) and absolute configuration, which are of more practical importance in relation to synthesis, are treated in lucid detail. Unfortunately, however, the last part discussing strategies for asymmetric synthesis is less convincing.

The following chapters are arranged rationally according to reaction types:  $\alpha$ -alkylations and 1,2-additions to carbonyl compounds, aldol and related reactions, oxidations, Diels–Alder and related reactions, and reductions. These topics are treated in thorough detail, covering not only stoichiometric and auxiliary-based methods but also catalytic methods. The emphasis is not so much on describing a specific reaction with all its variations and finer details, but rather on giving a comprehensive picture of the whole range of possibilities. The individual methods are described briefly but precisely, and numerous literature references are provided for the reader who wishes to go into more depth. Each chapter is written in the style of a review article on the topic concerned. At the end of each chapter there is a very useful table summarizing the most important and effective ligand systems for catalytic reactions, together with relevant literature references. However, the long chap-

ter that follows these descriptions, devoted to the use of asymmetric reactions in natural products syntheses, is rather out of place in a book such as this, which is intended as a work of reference. It consists of over 50 pages describing total syntheses of natural products, including for example rifamycin S and taxol, but without much information on retrosynthetic approaches or on general strategies. The descriptions are limited to the actual reactions used, which is of little use to the synthetic chemist who wishes to learn about general methods. The final chapter is also unsatisfactory and badly structured. It contains brief and inadequate treatments of a very inhomogeneous collection of different topics, ranging through enzymatic reactions, nonlinear effects, autocatalysis, and a variety of reactions, including some important ones that were already very thoroughly studied before 1999, such as asymmetric 1,4-additions. Unfortunately the brief subject index that follows also leaves much to be desired. For example, such important keywords as “Oppolzer sultam”, “Oxazolidinones”, and “BINAP” are missing.

To summarize, this book provides a concise and fairly comprehensive overview of the most important aspects of asymmetric synthesis, offering the chemist a quick survey of the available methods. However, the content and structure of the last two chapters is not very appropriate for a work of reference. Also the book lacks a thorough and detailed index, which is essential if it is to fulfill its aims effectively.

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