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BOOK REVIEWS

Fundamentals of Asymmetric Catalysis. By Patrick J. Walsh and Marisa C. Kozlowski (University of Pennsylvania, Philadelphia). University Science Books: Sausalito, CA. 2008. xiv + 674 pp. $88.50. ISBN 978-1-891389-54-2.

With this book, the authors have the ambitious goal of summarizing the entire field of asymmetric catalysis in a single, manageable volume. The book differs from other recent monographs and edited series by its organization as a textbook and its focus on concepts rather than types of reactions. Practicing synthetic chemists working with asymmetric synthesis might find the text helpful as a source of definitions of specific modes of asymmetric induction and references about these modes. Further, it might find use as a supplementary text, most likely reference, for an introductory course on reactions.

The focus on concepts rather than types of reactions makes this book much more useful as a textbook in an advanced topics course, specifically on asymmetric catalysis, than as a source of reactions for a synthetic chemist. As the title suggests, the authors review the current literature in asymmetric catalysis and provide a balanced examination of the importance of various contributions to the field. However, the organization around modes of induction sometimes forces the authors to limit themselves to examples that best demonstrate the concept, rather than the most useful ways to carry out a transformation. The examples given are generally timely, but again, the focus on examples that demonstrate concepts sometimes leads to outdated references.

In general, the authors have organized and covered the concepts appropriately. Although the stated subject of the book is asymmetric catalysis, the authors necessarily begin by covering basic concepts of achiral catalysis. The bulk of the book then covers different ways for chiral catalysts to yield nonracemic products. The authors also deal with topics at the edge of the subject, such as double diastereoselection and supported asymmetric catalysts. Unfortunately, maintaining a reasonable length for the book requires a rather hurried explanation of diastereocontrol.

In summary, this book meets the goal of providing definitions and examples of the concepts involved in asymmetric catalysis. As such, it will be a useful resource for courses on special topics in the field but will be of less value to researchers in asymmetric catalysis.

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Corrosion Handbook: Corrosive Agents and Their Interactions with Materials. Second, Completely Revised and Extended Edition. Volume 11: Sulfuric Acid. Edited by Gerhard Kreysa and Michael Schütze (Karl Winnacker Institute of the DECHAMA, Frankfurt, Germany). DECHEMA e.V.: Frankfurt and WILEY-VCH Verlag GmbH & Co. KGaA: Weinheim. 2008. xiv + 574 pp. $575. ISBN 978-3-527-31127-9.

This handbook provides information on the influence of sulfuric acid on approximately 1200 materials. The materials are categorized into the following groups—metallic materials, nonmetallic inorganic materials, organic materials/plastics, and materials with special properties—and these are further subdivided according to their chemical formulas and alloys. The book concludes with a bibliography, a "Key to materials compositions", a material index, and a subject index.

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Highlights in Colloid Science. Edited by Dimo Platikanov (University of Sofia, Bulgaria) and Dotchi Exerowa (Bulgarian Academy of Sciences, Sofia). Wiley-VCH Verlag GmbH & Co. KGaA: Weinheim. 2009. xxii + 306 pp. $190. ISBN 978-3-527-32037-0.

This book consists of 16 rather brief review articles on various topics with no central theme. They are arranged simply in the order of receipt by the editors. It is dedicated to Dr. Tharwat Tadros on the occasion of his 70th birthday, and it also commemorates the 200th anniversary of the establishment of the Wiley Publishing House in New York, both worthy objectives, but the papers may have been published more reasonably as a special issue of a journal of review papers rather than as a hard-cover book. The articles are authored by investigators well-known in the subject matter of their respective reviews and in most cases primarily cover work from their own laboratories. The subject matter is so diverse that it defies categorization of any kind and perhaps reflects the unwieldy breadth toward which the subject of "colloid science" itself has evolved. One difficulty that the reader will have in navigating the material is that none of the papers has an abstract, and only some of them have summary statements or separate conclusions. One must therefore rely on the title and author(s) alone to decide whether or not to delve further.

Despite the above shortcomings, there are a number of highlights in this book. van de Ven leads the book with his chapter, "Orthokinetic Heteroflocculation in Papermaking", in which he reviews the diverse possibilities for the shear-induced deposition of colloids on fibers using polymers or polyelectrolytes. Although the implied application is papermaking, the article is pertinent to the broader subjects of flocculation-based separations, such as the collection of the products from bioreactors, to the bottom-up structure building critical to the design of a variety of composite materials. In the article "Uptake and Release of Active Species into and from Microgel Particles", Bradley, Davies, and Vincent discuss the absorption and release of nanoparticles (quantum dots) that have a range of exciting new applications. In "Particle Characterization Using Electro-Acoustic Spectroscopy", O'Brien, Beattie, and Hunter provide

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a timely review of this now somewhat routine technology in which they point out that significantly more information than particle size and zeta potential may be extracted from it. In particular, one may use it to investigate the thickness of adsorbed polymer layers and surface electrical conductance. Lyklema, Jóar-Reyes, and Leermakers demonstrate in their article, "Modelling the Structure and Stability of Charged Hemi-Micelles at the Air-Water Interface", the current power of molecular modeling by using the Scheutjens−Fleer self-consistent field (SCF) theory to investigate a topic that is so far barely accessible to experiment. The existence of "hemi-micellar" structures at the surface of solutions of soluble surfactants has been postulated but has so far eluded unambiguous detection. One of the most comprehensive reviews is "Manipulation of DNA by Surfactants" by Lindman et al. They focus on DNA−surfactant phase behavior and provide the basis for examining construction of both passive and active new DNA-based materials.

Although the organization of the chapters in this book could have been improved, many useful insights can be obtained from the uniformly good quality articles of this compilation.

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Fragment-Based Drug Discovery: A Practical Approach. Edited by Edward R. Zartler (Merck & Co., Inc., West Point, PA) and Michael J. Shapiro (University of Maryland, Baltimore). John Wiley & Sons, Ltd: Chichester. 2008. x + 286 pp. $220. ISBN 978-0-470-05813-8.

The aim of this monograph is to provide a snapshot of the current state of fragment-based drug discovery. As mentioned in the Introduction, the concept of using fragments as anchor points for drug discovery arose in the 1980s when it was theorized that the total affinity of a ligand for a protein is a function of the affinity of its constituent parts. However, it was not until the mid-1990s that the technologies necessary for measuring weakly binding ligands were developed. In the decade since, fragment-based methods have become a complementary and, in many cases, an alternative approach to standard high-throughput screening methods.

This book comprises 11 chapters written by researchers from both the pharmaceutical industry and academia. Each chapter is meant to be a practical guide to some aspect of fragment-based drug discovery or to some particular technique. Overall, it is well organized and the chapters flow together very smoothly despite the fact that they are written by different authors.

Chapter 1 gives a broad overview of fragment-based drug discovery aimed especially at answering two main questions: What is a fragment? and why use fragments? Chapter 2 builds upon this and presents an overview of the workflow involved in designing and executing a fragment-based screening strategy. The next chapter presents a very detailed discussion of assembling fragment libraries, addressing the sizes and physical properties of fragments, sources for fragments, diversity, and synthetic aspects. Each of the next seven chapters (4−11) presents a particular method used either for screening or linking of fragments or for generating a structural hypothesis to guide subsequent synthetic chemistry. These topics include the uses of NMR spectroscopy (Chapters 4−6), *in situ* chemistry and mass spectrometry (Chapter 7), computational approaches and virtual fragment scanning (Chapters 8 and 9), and chemical capture methods (Chapter 10). Finally, a case study in fragment-based lead generation using β-secretase as the target is presented in Chapter 11.

Overall, this book provides an excellent resource for those in pharmaceutical research who are interested in fragment-based drug discovery. Most of the topics are covered in enough detail that this book could be used as a guide for those initiating a program in fragment-based discovery. The only topic missing from the book is the use of crystallographic methods for generating fragment leads. Although there is a paragraph in Chapter 3 covering X-ray methods, which are mentioned in the introductory chapters, it would have been nice to have an entire chapter dedicated to these methods as several groups in industry have applied them successfully.

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