

Book reviews

The Art of Writing Reasonable Organic Reaction Mechanisms

2nd edn, Robert B. Grossman, Springer 2003, XVI +355 pp., hardback, ISBN 0 387 95468 6, US\$49.95

Writing mechanisms for organic reactions is a useful tool for predicting likely outcomes of reactions and in discarding improbable ones. Robert Grossman discusses ideas on organic chemical reactivity, selectivity and structure in a logical way that gives the student confidence in attempting the many practice problems provided.

Chapter 1 is an introductory chapter; organic reactions are accordingly classified as 'addition', 'elimination', 'substitution' and 'rearrangement'. Throughout the book, the organic reactions are presented according to the type of mechanism that is operating. The second chapter deals with polar reaction conditions under basic conditions. The focus is on substitution and elimination reactions; base-promoted rearrangements, the Swern oxidation and the Mitsunobu reaction are also examined. The chapter summary encapsulates the major features and is good to refer to when tackling the suggested problems. The next chapter considers the mechanisms operating in polar reactions under acidic conditions. A good but not comprehensive selection of reactions is presented. In chapter 4, the pericyclic reaction mechanisms of electrocyclic reactions, cycloaddition reactions, sigmatropic rearrangements and *-ene* reactions are discussed. Thermal and photochemical reaction pathways are discussed, and examples are included of the use of Woodward and Hoffman rules to determine if pericyclic reactions occur. Chapter 5 discusses free radical reactions, with emphasis on the important reactions of atom abstraction, addition to a π bond and fragmentation. The final chapter outlines the basic principles of transition metal catalysed reactions and their involvement in organic reactions. A range of examples covering addition, substitution, rearrangement and elimination reactions is well presented.

This book provides a snapshot of examples of how to consider and approach the writing of simple and sophisticated examples of pushing electrons in and out of orbitals. Students will enormously benefit from using the principles and concepts in this book in writing their own mechanisms.

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Green Solvents for Chemistry: Perspectives and Practice

William M. Nelson, Oxford University Press, 2003, 390 pp., ISBN 0 19 515736 2, A\$360

This book covers a wide range of topics, some of which are central to the use of solvents in chemistry, while others, such as life cycle assessment, are somewhat peripheral to the topic and have been well presented elsewhere. In a number of cases the author would have been well advised to refer the reader to an authoritative text and avoid lengthy discussion, allowing more space for presentation of recent advances in the field of solvent alternatives or solvent replacement.

More importantly, for a book presumably intended for use by students as well as researchers in both industry and academia, there are an excessive number of typographical and other errors that should not have propagated beyond the stage of an early draft. Some chemical structures, such as that of $\text{Co}(\text{salen})_2$, are incorrectly represented, reaction schemes have become truncated, and some numerical values, such as the melting point of NaCl, are incorrect.

A comprehensive and well-prepared index is most important in a book intended as a reference text, yet in this book the index is distinctly lacking. A comparison of the pages listed for a topic such as supercritical CO_2 with the text reveals omissions that would have the casual reader missing some of the most relevant discussion of the subject.

As a wide-ranging introduction to solvents, including their use, origin, fate and characteristics, this text provides a good entry but the layout and indexing obviate its use as reference work for a casual reader interested in finding a greener solvent for a particular application or trying to gain an overview of recent advances in this field.

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