

Book Reviews

Writing Reaction Mechanisms in Organic Chemistry, Second Edition. By Audrey Miller and Philippa H. Solomon. Harcourt Academic Press, New York. 2000. xiv + 471 pp. 19 x 23.5 cm. ISBN 0-12-496712-4. \$48.50.

The ability to write and understand organic reaction mechanisms is fundamental to the understanding of organic chemistry. Through a knowledge of organic mechanisms, it is possible to rationalize synthetic product formation, to develop new synthetic reactions, and to predict products for known reactions utilizing novel substrates. For the medicinal chemist, organic mechanisms also play a role in understanding biological phenomena such as enzyme reactions and the interaction of drug entities with biomolecules. Although the subject of organic mechanisms is covered in many textbooks currently used for advanced organic courses, few of these textbooks take a problem-based approach to teaching this subject. For this reason, *Writing Reaction Mechanisms in Organic Chemistry* represents a valuable tool for teaching mechanistic chemistry. The text has undergone significant revision since the previous edition, in order to make it more "user friendly", and additional topics have been added.

This textbook covers the entire gamut of organic mechanisms in six well-written chapters, beginning with a chapter on Lewis structure, formal charge, resonance, aromaticity and organic bonding, and progressing through a discussion of HOMO, LUMO, and the frontier orbital theory. Interspersed within each chapter is an ample number of problems, and complete solutions for these problems appear at the end of each chapter. Chapters dealing with general principles, nucleophiles and bases, electrophiles and acids, radical chemistry, and pericyclic reactions are also included. Chapter 7 is a compendium of additional problems, some of which require the reader to access the primary organic chemistry literature. Three appendices are also included, dealing with common Lewis structures, symbols and abbreviations, and relative acidity. There are few references to the primary literature in the chapters, although this does not seem to be a shortcoming.

This textbook could be used as a supplement to a sophomore course in organic chemistry, but the book is written with the assumption that the reader has taken a two-semester organic series. However, this book would be an excellent adjunct to any advanced organic course, either as a required or as a recommended text. The wide variety of practice problems, combined with the well-written text and generous structural depictions, make this text a valuable tool for teaching organic mechanisms to first-year graduate students. This book should be purchased by anyone who is responsible for teaching

organic mechanisms and should be made available to advanced undergraduates and first-year graduate students taking a didactic advanced organic chemistry sequence.

Patrick M. Woster

*Department of Pharmaceutical Sciences
College of Pharmacy and Allied Health Professions
Wayne State University
Detroit, Michigan 48202*

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The Organic Chemistry of Enzyme-Catalyzed Reactions. By Richard B. Silverman. Academic Press, San Diego, CA. 2000. xvii + 717 pp. ISBN 0-12-643745-9. \$89.95.

Medicinal chemists who live at the interface of organic chemistry and biology will appreciate this book. As Silverman states in his Preface, "...it is an enzymology text for organic chemists and an organic chemistry text for enzymologists." Ultimately this is an organic chemistry book. Enzymes are treated on the basis of the class of organic reaction that is catalyzed, and electron-pushing mechanisms abound. The book is not consistent with respect to the breadth and depth of coverage of individual enzymes (serine proteases cover 16 pages and metalloproteases get 4 pages, while aspartic proteases and cysteine proteases share 2 pages), but in every case the material is a good exposition of step-by-step catalysis. Silverman has thoroughly covered both old and new literature, to present both the mechanisms by which enzymes work and the kinds of experiments that were done to elucidate those mechanisms. This approach makes the book ideal for teaching enzyme structure and function to graduate students. Each chapter has extensive references to relevant literature. Appendix I is a lucid presentation of enzyme kinetics and inhibition. Appendix II provides problems and detailed solutions for each chapter in the book. Whether you are teaching, learning, or trying to inhibit an enzyme, you will find this book invaluable.

D. Eric Walters

*Department of Biochemistry and Molecular Biology
Finch University of Health Sciences/
The Chicago Medical School
3333 Green Bay Road
North Chicago, Illinois 60064*

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