the development of genomics or the discovery of quantum mechanics.

Curiously and perhaps sensibly, the book is also generally not about 2030 it is about 2010. Predicting 20 years into the future requires that authors enjoy being wrong, and there is more than enough interest in extrapolating what already exists, without adding the complexities of inventing hypothetical new technologies. The focus of *2030* is very much the "now" of 2010, and how technologies that already exist might be used; but, of course, unexpected, radical new sciences and technologies will emerge between 2010 and 2030, and they may make all the difference. Twenty years is a long distance along the timeline of technology.

One last good features to this book (of many): a student coming away from reading it should have the feeling that almost no really important problem has been solved, and the future of technology and society is up to him or her. The book does not fall into the trap of trumpeting solutions—it emphasizes problems remaining to be solved. Since there are far more "unsolved problems" than "satisfactory solutions", it should be a very encouraging read for a young scientist or engineer. There is lots remaining for him or her to do!

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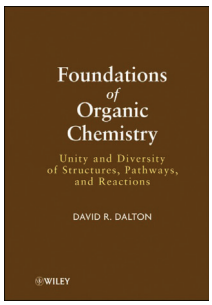

Foundations of Organic Chemistry
Unity and Diversity of Structures, Pathways, and Reactions. By David R. Dalton. John Wiley & Sons, Hoboken 2011. 1440 pp., hardcover, € 129.00.—ISBN 978-0470479087

Foundations of Organic Chemistry

Foundations of Organic Chemistry is a textbook designed for introductory classes in organic chemistry. It is divided into three parts—background, middleground, and foreground—and 14 chapters.

The background chapters provide a well balanced introduction to the principles of analytical, physical, and theoretical chemistry related to the study of organic chemistry; it includes the spectroscopic analysis of organic compounds and the kinetics of reactions, as well as valence bond theory and molecular orbital theory. The presentation continues with an outline of the general principles of the nomenclature of organic compounds, the basics of reaction thermodynamics, isomerism, acid–base chemistry, and solvents in organic chemistry.

In the five middleground chapters the reader is guided through the major classes of organic compounds. The focus of these chapters is on the description of typical reactivity patterns and an in-depth discussion of the reaction mechanisms underlying them. The coverage and depth of presentation in most chapters goes far beyond that of other common textbooks. As well as modern aspects of organic chemistry, such as cross-coupling reactions and metathesis, topics such as photochemistry and the chemistry of phosphorus and silicon compounds are well fitted into the contents.

The foreground part of the book provides the student with a detailed overview, in four chapters, of the chemistry, biochemistry, and bioorganic chemistry of the main classes of natural products. Carbohydrates and their biosynthesis, oligo- and polysaccharides, acetogenins, fatty acids, and terpenes are covered first. Amino acids, peptides, and the most common coenzymes, as well as alkaloid chemistry, are presented and their significance is outlined. Nucleotides and the derived DNA and RNA are treated next. The book finishes with a description of the biosynthesis and functions of the pigments of life—the tetrapyrrolic cofactors, such as heme, chlorophyll, and vitamin B_{12}.

What can the student expect from this textbook? The language of the book is mostly adjusted to the audience for which it is written. The author talks to the reader, and ignites interest by clever comparisons and quotations at the beginnings of the chapters. The text is criss-crossed with problems for recapitulation and improvement of knowledge, and every chapter ends with a set of problems concerned with the topic covered. A very nice feature of the book, which places it next to more advanced textbooks, is that references to the primary literature are provided. The book contains a 42-page index that is very useful for finding specific topics quickly.

The book certainly covers much more material than most of the other common basic organic chemistry textbooks, such as "Vollhardt", "Clayden", or "Bruice", on approximately the same number of pages for a similar price. However, studying with this textbook is somewhat more demanding. The treatment of certain topics is elaborate enough to serve as an introduction to individual courses of physical organic or theoretical chemistry, and may not be suitable for study without professional guidance. The inclusion of additional material succeeds by using a very dense style of presentation, which is unlike the above-mentioned textbooks. This may make it difficult for students who begin their first organic chemistry course with only a little background to distinguish the essentials from more specialized content. Here a clearer visual differentiation would have been valuable.

Although the content is up-to-date, a major shortcoming of the book is its style of visual presentation—the book is entirely black-and-white, including the graphic material. This might make it unattractive in comparison to many competitors on the market. Although the book uses the generally useful arrow-pushing depiction, its value is often diminished because the curved arrows overlay structures, and thus are often more confusing than clarifying. Also the alignment of bonds and atoms in structures is sometimes unsatisfactory. While these details may not be so important for advanced students, a clear style of presentation is mandatory to aid understanding for beginners. Another disadvantage is that no solutions to the problems are given, and consequently there is no feedback.

We did not notice many mistakes in the book. A few more serious ones concern the naming of reactions. The term "Claisen condensation" is used incorrectly on pages 824–827. The "real" Claisen condensation is described correctly later (p. 911), but the index fails to direct one to it. On the same page, the intramolecular version is incorrectly termed "acyloin condensation" instead of "Dieckmann cyclization", although both transformations are treated correctly on pages 867–868. The electron flow and metal oxidation states in a reduction using zinc and acetic acid are not correctly depicted on page 869. Thus, studying with the book requires a critical mind, and a look into another textbook is useful from time to time.

To whom can this book be recommended? It may be overwhelming for those students who do not intend to pursue organic chemistry later. However, in comparing the contents of this textbook with others that are available, one should recognize that it is not only intended for learning the basic organic principles and reactivity patterns. It will lead a wider range of chemistry students, and also practitioners who wish to refresh their knowledge, to a deeper understanding of organic chemistry, and it is also a source of additional information. It provides the reader with the necessary support to learn and properly understand organic chemistry, and with a good overview of this interdisciplinary field and its relationship to other branches of chemistry and natural sciences.

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