ELSEVIER

Carbohydrate Polymers 39 (1999) 289–292

Carbohydrate Polymers

# Book reviews

***Understanding Organic Reaction Mechanisms*, A. Jacobs, Cambridge University Press, Cambridge, 1997, pp xv + 304, Price £17-95, ISBN 0-521-46776-4**

Organic reaction mechanisms are a fundamental part of organic chemistry, and the ability to understand how they work and appreciate the principles that govern chemical reactivity is extremely important. An understanding of these principles assists individuals in making intelligent predictions about the mechanisms and outcomes of specific chemical reactions.

Molecular orbital theory is used to provide logical explanations of chemical reactivity, and the first chapter introduces the principles of chemical bonding, specifically discussing atomic orbitals, hybridization, resonance structures, curly arrows, frontier orbitals and aromaticity. The next two chapters describe more of the background to understanding reaction mechanisms. Firstly, the nature of ionic species, which are found in the vast majority of chemical reactions, e.g. acids and bases, nucleophiles, electrophiles and leaving groups, and secondly the driving forces behind such reactions, such as thermodynamic and kinetic effects.

The next two chapters take a closer look at the specific molecules that take part in the chemical reactions, the chapter focuses on reactive carbon species, e.g. carbanions, carbocations, carbon radicals, and carbines, and chapter five deals with the effect of heteroatoms such as oxygen, nitrogen, sulphur, phosphorus, halogens, group I and II metals, and silicon. Most of the principles behind the reasons why chemical reactions takes place have been discussed in the first five chapters of the book, so the sixth chapter details some of the types of reactions themselves, such as additions, eliminations, substitutions, rearrangements, and pericyclic reactions.

Chapter seven examines some of the experimental techniques utilised for establishing mechanisms, as not all mechanisms can be theoretically ascertained with certainty. The penultimate chapter is devoted to exploring the thought processes involved in predicting the mechanisms of unfamiliar reactions, and draws together all of the material presented in previous sections of the book. The final section examines the reaction mechanism case histories of four specific reactions with interesting mechanisms.

Overall 'Understanding Organic Reaction Mechanisms' is an extremely well constructed volume that logically flows in sequence from chapter to chapter, with each chapter concluding with a summary of the important points and a selection of problems to help the reader to apply the knowledge gained from assimilating the data in each section. We are therefore pleased to highly recommend this volume as a main stream undergraduate chemistry textbook, which is also useful as a general mechanistic reference guide for researchers in both academic and industrial organic chemistry.

Charles J. Knill, John F. Kennedy
*Birmingham Carbohydrate and Protein Technology Group, School of Chemistry, The University of Birmingham, Edgbaston, Birmingham B15 2TT, UK*

0144-8617/99/$ - see front matter 
PII: S0144-8617(98)00148-9

***Forest Products Biotechnology*, A Bruce J W Palfreyman (Eds.) pp. ix + 326, ISBN 0-7484-0415-5**

Industries are developing radical, new biotechnological processes to expand and develop their range of products that originate from the worlds forests. As a result, biotechnology is helping to reduce any adverse impact on the environment.

Forest Products Biotechnology presents a comprehensive review of specialist research directed towards efficient and environmentally friendly use of the forests. It begins with a brief introduction into wood as a material. It then moves on to examine wood decay. Biopulping is defined as the pretreatment of wood by delignifying fungi. It leads to energy reduction and a lower lignin content after cooking (Chapter 4). Next, two chapters follow which consider environmental alternatives to the two main problems associated with pulp, namely that of bleaching and treatment of effluents.

Bioremediation is the process by which hazardous organic materials are biologically degraded. The bioremediation of contaminated soils and woods is discussed in Chapters 7 and 8, respectively. Next follows a discussion of wood composites. Secondary metabolites in wood processing are defined as those compounds that are not structural polysaccharides or lignin. A review of their chemistry can be found in Chapter 10. There are two main types of wood derived adhesive, which are based on tannin and lignin (Chapter 11).

Chapters 12 and 13 examine products derived from forest waste substances, namley ethanol and mushrooms. In the