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Book Reviews

Organic Reaction Mechanisms: 40 Solved Cases

Mar Gomez Callego, Miguel A. Sierra (Ed.); Springer-Verlag, Berlin, Germany, 2004, $x + 290$ pages, ISBN 3-540-00352-5 (£38.50)

Organic chemistry, which covers the study and the understanding of organic reactions, is taught in most universities at undergraduate and postgraduate levels. The teaching of organic chemistry requires the formal representation of organic reactions on the blackboard or a computer screen in order to simplify the understanding of the reaction processes. Controversially, the formal representation of organic reactions does not always represent reality since organic chemistry is an experimental science where only the results are observed. Moreover, there is no 'theorem of stereocontrol' to ensure that processes occur in a very specific way.

Organic Reaction Mechanisms: 40 Solved Cases presents cases of organic reaction mechanisms using formal representation (432 figures) of the processes including the alternative mechanisms to achieve a reaction. The 40 cases are taken from original works of other authors and classified into three different levels. Level 1 presents 16 cases of study to illustrate basic concepts of organic chemistry reactions such as crossover experiments, neighbouring groups participation, carbocation formation, Hammett constants, kinetic constants and activation parameters. Those concepts are explained in illustrated cases, for example the nucleophilic versus basic catalysis. Levels 2 and 3 present 15 and 9 cases, respectively, from medium to difficult levels that involve the use of the basic concepts covered in level 1. The examples are treated in detail with an introduction, experimental data, discussion, key points and additional references. Levels 2 and 3 cases are for example, the chelate-controlled carbonyl reaction, the tandem cycloadditions with nitronates, the Baylis–Hillman reaction, and the solvolysis of vinyl iodonium salts.

This volume clearly explains these 40 cases with good formal representations of the processes. The approach of the authors is original since they do not approach the reaction mechanisms with general theories illustrated by examples, as it is done in most of the textbook, but they focus instead on very specific examples. This volume will be useful to advanced undergraduate students and researchers interested in understanding the mechanism of organic reactions.

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Fundamentals of food reaction technology

R. Earle, M. Earle; Royal Society of Chemistry, Cambridge, UK, and Leatherhead International Ltd, Leatherhead, UK, 2003, x + 188 pages, ISBN 1-904007-53-8, £39.50

Most of the food products available on the market today result from food processing technologies carried out on agriculture and fish raw materials. Food processing is aimed to make optimum food products that manage to satisfy both consumers and producers concerns. Consumers concerns include nutrition, safety, shelf life, sensory qualities, physiological benefits, as well as the social and environment aspects, whereas producers concerns include feasibility and profitability as well as satisfying consumer requirements since those translate directly into buying specifications.

Fundamentals of Food Reaction Technology introduces food processing technologies in five chapters organised in stages from the definition and description of the existing processes to the current trends of food reaction technologies. The first chapter introduces broad concepts relating particular food situations to the general framework of reaction technology by defining the important problems encountered in food processing such as consumers concerns and processes limits. The next chapter presents product changes occurring during processing and parameters such as concentration and temperature affecting these changes. Chapter 3 presents processing outcomes and variation. This sometimes refers to the use of equations to describe the kinetic of reactions such as bacterial growth and death. The penultimate presents the means to achieve better food products by using multiple rather than single reaction processes. The final chapter introduces reaction processes other than heat processing. For example, using processing agents or alternative energy sources such as very high pressure. The latter part of this chapter presents examples of the success of some applied reaction technologies such as

canning, meat freezing and packaging, followed by a brief description of the technology trends.

Fundamentals of Food Reaction Technology provides a good introduction to food reaction technologies and contains a well-structured index and contains numerous references providing easy access to further reading material. It is particularly recommended to industrial technologists working in process design, organisation and control of food processing.

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Water-Soluble Polymer Application in Foods
A. Nussinovitch; Blackwell Publishers, Oxford, 2003, vii + 240 pages, ISBN 0-632-05429-8, £69-50

Water-soluble polymers are commonly used for many traditional applications in the food and other industries. They can be used as thickening and gelling agents for the stabilisation of emulsions and for syneresis control, or as suspending agents for coatings and binders. *Water-Soluble Application in Foods* provides a theoretical, up-to-date, and comprehensive approach to hydrocolloids as adhesives, special gum coatings, and dry macro- and liquid-core hydrocolloid capsules. Some other hydrocolloid products and the applications of water-soluble polymers are also covered.

The first chapter describes the adhesive properties of hydrocolloids. Synthetic hydrocolloids used to create multi-layered foods, hydrocolloid adhesion tests, hydrocolloids as wet glues and their dependence on layer thickness, moisture content and molecular weight, are discussed. The second chapter deals with hydrocolloid coatings. Coatings created by drying hydrocolloid gels, solutions, blends and wax–hydrocolloid mixtures are presented. In addition, methods of testing coatings and how to design a hydrocolloid coating are included. The liquid-core hydrocolloid capsules and hydrocolloid macrocapsules are focused upon in Chapter 3, which contains information on applications, mechanical properties of liquid-core capsules and dry macro-capsules.

Multi-layered hydrocolloid products, which are important for their ability to convey the sensation of eating many textures at once, are discussed in the next chapter. The following chapter deals with the processes for flavour encapsulation and hydrocolloids as suitable matrix-builders in flavour encapsulation. Chapter 6 details hydrocolloids used in immobilisation for food purposes, and includes many examples. The role of hydrocolloids in preparing gum-based foods, how their properties determine the properties of texturised fruits and information about the uses and trends of such products are discussed in Chapter 7. The penultimate chapter emphasises the food uses of hydrocolloid cellular matrices. Examples of the unique nature and different production methods for hydrocolloid cellular solids are also provided in this chapter. The final chapter covers the uses of hydrocolloids for producing special textures in foods and other products.

This volume provides a clearly written and presented compendium, equally of value as a textbook or as an essential reference tool. It is especially suitable for scientists and students in all branches of biochemistry and food science, and will also be of value to workers in the related areas of adhesives and coatings.

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Performance Functional Foods
D.H. Watson (Ed.); Woodhead Publishing Ltd, Cambridge, UK, 2003, xi + 200 pages, ISBN 1-85573-671-3, £115.00

In the last few decades, the food market in Europe and the US has seen the emergence of new type of foods that are thought to play a physiological functional role. These so-called 'functional foods' claim to improve consumer life by having a beneficial effect on mood, health, and mental and physical performances. As the market is growing quickly, it appears that the selling arguments are rarely based on scientific evidence, which has led people to question the reliability and safety of functional foods. This collection of reviews provides information on the principles of existing functional foods.

The first chapter of *Performance Functional Foods* provides an introduction to the market trends in the US and Europe. The next three chapters provide detailed information