

ty. Biotechnology has also played an important role in development of newer bio-preservation techniques for food preservation. Besides the important contributions of the newer techniques in food processing, it is also important to consider any potential human health or environmental risks when foods are developed using biotechnology. The final section of the volume is focussed on the food safety, novel bioprocessing, traditional fermentations, and regulatory issues.

In conclusion, this volume is an authoritative and illustrative compilation of different issues related to food biotechnology and would be excellent source of information on food production and processing from a biotechnology perspective, not only to the academicians but also to the persons working in industry.

John F. Kennedy *
Parmjit S. Panesar
Chembiotech Laboratories,
Institute of Research and Development,
University of Birmingham Research Park,
Birmingham B15 2SQ, UK

Available online 22 May 2006

* Corresponding author.
doi: 10.1016/j.carbpol.2006.02.002

M.G. Gallego and M.A. Sierra (Eds.), Organic Reaction Mechanisms, Springer-Verlag GmbH, Heidelberg, Germany, 2004 (x+290 pp., £38.50, ISBN 3-540-00352-5)

The mechanism of a chemical reaction can be considered as a hypothetical motion picture of the behaviour of the participating atoms. The reliability of the proposed mechanism increases if it leads to quantitative predictions as to how the speed of the reaction is affected by concentrations of reactants, temperature, solvent and the presence of catalysts. The interpretation of the experimental data is a key point in any type of experimentation. The book on *Organic Reaction Mechanisms* explains the various approaches to interpret the experimental data obtained from an organic reaction and specifically how an organic reaction mechanism can be considered or rejected based on the analysis of experimental evidence.

The examples given in the book have been taken from the recent literature and deal with the formulation and experimental determination of mechanistic proposal. The information presented is generally considered necessary in the elucidation of reaction mechanisms including kinetic and thermodynamic data, isotopic labelling and organic reactivity. Every case includes brief introduction, experimental data, discussion and additional references.

The examples given have been divided into three levels. The fundamental concepts regarding the elucidation of an

organic reaction mechanism have been illustrated in level 1. Some examples are also dedicated to revising the different types of pericyclic reactions such as cycloadditions, electrocyclic ring closures and sigmatropic rearrangements. The cases with increasing order of difficulty have been placed in level 2 and 3, mixing the different techniques and data to understand the different aspects of the example under discussion.

All the cases presented in the book have been nicely illustrated that cover all the main topics of organic chemistry and this book is an innovative contribution to the subject. In conclusion, this book can be excellent source of information not only to the students but also to the academicians working in the area of organic chemistry.

John F. Kennedy *
Parmjit S. Panesar
Chembiotech Laboratories,
Institute of Research and Development,
University of Birmingham Research Park,
Birmingham B15 2SQ, UK

Available online 22 May 2006

* Corresponding author.
doi: 10.1016/j.carbpol.2006.02.001

P.M. Collins (Ed.), Dictionary of Carbohydrates with CD-ROM, Chapman & Hall/CRC Press, Boca Raton, FL, USA, 2006 (xxi+1282 pp., £182.40, ISBN 0-8493-3829-8)

Carbohydrates are essential components of all living organisms and are the most abundant group of biological molecules. These are the main source of energy supply in most cells. The metabolic breakdown of monosaccharides provides most of the energy used in biological processes. These are also principal components of nucleic acids as well as important elements of complex lipids. Oligosaccharides are often associated with proteins and lipids in which they have both structural and regulatory functions. Polysaccharides have indispensable structural functions in all types of organisms but most conspicuous in plants because of cellulose. Polysaccharides such as starch in plants and glycogen in animals serve as important nutritional reservoirs. Carbohydrates are playing very important role in the biological and pharmaceutical sciences. Therefore, carbohydrate science has become a discipline of central importance to the chemical and biological sciences.

Dictionary of Carbohydrates with CD-ROM provides a wealth of information for carbohydrate researchers. As per the editors note, this volume is a much enlarged and revised second edition of the dictionary published earlier. The number of compounds included has been substantially increased, however number of entries present in the previous compilation for antibiotic and other natural product

types in which sugar component is not central to the structure have been omitted. The total number of carbohydrate compounds in the present edition is now 24,000.

The volume covers parent monosaccharides and their important derivatives, modified monosaccharides, disaccharides, tri-, oligo-, polysaccharides, alditols, cyclitols, nucleosides, glycoside antibiotics and related compounds, and other glycosides. The dictionary is arranged alphabetically by entry name and every entry is numbered to assist ready location. The use of indexes enables the rapid location of all the compounds in the dictionary by name or compound type. In most cases the stereoisomeric and ring-form variants of a given carbohydrate are included in the same entry. The dictionary also provides information on CAS registry numbers, structural formulae, molecular formula, molecular weight, and physical data. The toxicity and hazard information is highlighted by the symbol.

The CD-ROM contains searchable indexes on 33 fields such as accurate mass, biological source, CAS registry number, chemical name, density, melting point, partition coefficient, type of compound, and UV maxima, etc. In addition to searching the above text fields, it is possible to search on structure and substructure. In conclusion, this volume constitutes a major reference book for which Peter Collins and his team are to be highly congratulated. It is an excellent source of information and is highly recommended to all the persons working in carbohydrate research, development or use.

John F. Kennedy *

Parmjit S. Panesar

Chembiotech Laboratories, Institute of Research and Development, University of Birmingham Research Park, Birmingham B15 2SQ, UK

Available online 22 May 2006

* Corresponding author.

doi: 10.1016/j.carbpol.2006.01.008

P. Coussot, Rheometry of Pastes, Suspensions, and Granular Materials: Applications in Industry and Environment, John Wiley & Sons Inc., Hoboken, NJ, USA, 2005 (xviii+291 pp., £48.95, ISBN 0-471-65369-1)

Developments in rheological science have mainly involved polymers, with many techniques routinely utilised for characterisation of polymer internal structure to determine physicochemical origins of mechanical behaviour. Natural and synthetic complex polymeric materials in liquid suspension, such as emulsions, foams and solid particle suspensions, are utilised in many applications. When the suspended element concentration is low, system behaviour is qualitatively similar to that the interstitial liquid; however at sufficiently high concentrations, suspend-

ed elements develop specific mutual interactions, which often leads to a 'paste-like' material incapable of flow when the exerted force is below a critical value. Such common products include shaving foam, mayonnaise, peanut butter, paint, concrete and also granular materials such as sand.

In contrast to polymers, these materials have extremely different internal structures, with a wide range of elements of various sizes and interaction patterns. Focussing on specific substituent components within such complex materials does not promote the development of a unifying approach for definition of the relationship between internal structure and mechanical properties. Thus, the primary objective of this book was to propose a synthetic and general approach to define the mechanical behaviour of pastes and granular materials. It is essential to apply reliable rheometrical techniques for relevant materials' characterisation. For pastes and granular materials this still constitutes a challenge, since they may exhibit strongly non-linear behaviour (behaving as either solids or liquids depending on flow conditions), several experimental problems may occur (wall slip, fracture, drying, etc.), and for some granular materials there may exist no constitutive equation intrinsic to the material. Thus, each industrial field has developed its own techniques. In this context, the second major objective of this book was to review experimental problems encountered with such materials and to examine the techniques utilised in different fields, in order to propose theoretical analyses that would enable one to extract relevant rheological parameters from such tests.

Specific chapters cover material mechanics, rheophysics of pastes and granular materials, experimental procedures and problems in paste viscometry, local rheometry, nonviscometric flows of yield stress fluids, granular flows in frictional regime, and practical rheometrical techniques. This book addresses both the foundations and theoretical principles of rheology and practical aspects and applications, including specific examples of foods, cosmetics, pharmaceuticals, paper coatings, paints and inks, ceramics and sewage sludges, making it extremely useful to both students, academics and professionals (rheologists, engineers and researchers) for the development of industrial and consumer products.

John F. Kennedy *

Charles J. Knill

*Chembiotech Laboratories,
Institute of Research and Development,
University of Birmingham Research Park,
Birmingham B15 2SQ, UK*

Available online 22 May 2006

* Corresponding author.

doi: 10.1016/j.carbpol.2006.01.007