

totally comprehensive with respect to its topic coverage. However, this is an informative volume that provides readers with a readily accessible overview of polymer science and technology and is, therefore, recommended to all individuals with interests in this area.

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Starch: Basic Science to Biotechnology. Advances in Food and Nutrition Research, Vol. 41

M.N. Sivak, J. Preiss (Eds.) Academic Press, San Diego, 1998, xiv + 199 pages, ISBN 0-12-016441-8, £59.95

The majority of starch is utilised as food, however approximately one third of produced starch is employed in a variety of industrial processes that take advantage of its unique properties. Research into the biosynthesis of starch, whilst aiming to answer fundamental questions, can also be used to increase the starch content in plants and/or to manipulate its quality (e.g. altering the amylose:amylopectin ratio). Starch content has been increased in tomatoes and potatoes using recombinant DNA and molecular biology techniques.

The overall aim of *Starch: Basic Science to Biotechnology* is to provide an up-to-date account of the biochemistry and molecular biology of starch by discussing the chemistry of the starch granule and the biochemistry, molecular biology, plant physiology, and genetics of plant starch synthesis. The volume commences with an introductory chapter on the occurrence of starch, discussing starch in seeds, storage roots, tubers, stems, leaves, and algae. The second chapter details the structure of the starch granule, covering the nature of amylose and amylopectin, a comparison of the composition of different commercial starches, and molecular orientation in the granule.

The biosynthetic reactions of starch synthesis are discussed in chapter 3. The metabolic routes leading to polyglucan synthesis were elucidated in the 1950s after the discovery of nucleoside-diphosphate sugars. Topics covered include the ADPglucose pathway, the rate of starch synthesis, and the activity of starch biosynthetic enzymes. ADPglucose is formed via a reaction catalysed by ADPglucose pyrophosphorylase (ADPGlc Ppase). Synthesis of ADPGlc Ppase, its regulatory properties, subunit structure,

structure–function relationships, substrate-binding sites, and cloning of ADPGlc Ppase genes, is presented in the fourth chapter. After the synthesis of ADPGlc the next stage involves the transfer of the glucosyl moiety of the sugar nucleotide to a maltosaccharide or starch, by a starch synthase. Starch synthases are covered in chapter 5, whilst the following chapter discusses branching enzymes.

The next four chapters discuss questions and hypotheses in starch biosynthesis, starch synthesis in non-photosynthetic plant tissues, regulation of the starch synthesis pathway, and starch accumulation in photosynthetic cells, respectively. The penultimate chapter details starch degradation and discusses amylases, debranching enzymes, degradation pathways, starch digestion in humans, and mechanisms of action. The industrial applications of starch and its chemical and physical processing are summarily discussed in the final chapter. Topics covered include starch production, physical analysis of starch and starch derivatives, chemical modification, sweetener production, and biodegradable polymers. For many of the important discoveries the authors' names and dates are included so that the reader is introduced to leading researchers in the field. In conclusion, this is an extremely informative volume that is of benefit to individuals with research interests in starch science.

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Named Organic Reactions

T. Laue, A. Plagens; Wiley, Chichester, 1999, x + 288 pages, ISBN 0-471-97142-1, £34.00

Named reactions serve several useful purposes with respect to organic chemistry. They allow individuals to discuss reactions with greater ease, both verbally and in written communications. Furthermore, they are an extremely useful aid for teaching/learning the principles of organic chemistry, since the scientific content behind the name is of great importance. Therefore, knowledge of such reactions is essential for the organic chemist. This volume does not attempt to be a replacement for a general organic chemistry textbook, but aims to be a comprehensive reference work on named reactions, which is suitable for general reference/reading, learning and revision purposes.

Named Organic Reactions deals with 134 of the most

important reactions in organic chemistry; the included reactions having been selected based upon their importance with respect to modern synthetic organic chemistry, as well as their relevance to a modern organic chemistry course. The reactions included in this volume are arranged in alphabetical order, and each entry is incorporated in a consistent form. The name of the reaction serves as a heading and is followed by a very short description of the reaction and a reaction scheme depicting the overall reaction. This information is then followed by a paragraph that provides an introductory description of the reaction. The major part of each entry deals with the mechanistic aspects of the reaction. Side-reactions, variations and modified procedures with respect to product distribution and yields are described. Recent as well as older examples of the application of a particular reaction or method are given.

A list of references is provided at the end of each entry. In addition to the original literature, this list also includes review articles and selected references to recent publications. These serve to show the origins of the name of the reaction and how the reaction has been subsequently explored or developed. The examples detailed or cited for each reaction are by no means intended as a complete treatment, but serve to indicate the scope of reaction application. In conclusion, this volume contains a wealth of useful information and is a valuable reference source for advanced undergraduate studies and all individuals with research interests in synthetic organic chemistry.

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New Aspects in Bioorganic Chemistry

U. Diederichsen, T.K. Lindhorst, B. Westermann, L.A. Wessjohann (Eds.); Wiley-VCH Verlag GmbH, 1999, xvii + 439 pages, ISBN 3-527-29665-4 (£45.00)

The understanding of (patho) physiological processes, such as the biosynthesis of enzymes, nucleic acids, and secondary metabolites, the pathways of signal-transduction or the function of pharmaceutical agents, is of increasing importance not only in drug research, but also for the development of new synthetic methods in organic chemistry and biochemistry. Bioorganic chemistry is a typical new branch of modern science, overlapping the traditional fields of chemistry and biology, and giving a better understanding of complex interactions on a molecular level.

“New Aspects in Bioorganic Chemistry” has been contributed to by over 60 scientists, providing a topical overview of the recent advances in drug development based on natural products; the biosynthesis, activity and application of enzymes; carbohydrates; peptides; nucleic acids, and analytical methods in bioorganic chemistry.

This book unites some of the central questions of biochemistry, medicinal chemistry and organic chemistry. It contains over 50 articles, written by academic and industrial researchers. The topics covered are chosen from typical bioorganic fields, including analytical methods, biochemistry, biosynthesis, biotransformation, carbohydrates, drug research, enzymes, enzyme synthesis, glycobiology, immunology, medicinal chemistry and QSAR, molecular biology, natural products, nucleic acid chemistry, organic and combinatorial synthesis of model drugs, peptide chemistry and spectroscopic methods. Each chapter end also contains extensive referencing.

“New Aspects in Bioorganic Chemistry” gives a very thorough, yet fully comprehensible introduction into this new field of chemistry. It is a very informative guidance book, suitable for both advanced students and researchers. The text contains numerous, very well shown illustrations, figures and tables, and also a detailed subject index.

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