

Book reviews

A Multilingual Glossary of Biotechnological Terms. Edited by H.G.W. Leuenburg, B. Nagel and H. Kölbl. Verlag Helvetica Chimica, Basel, 1995. 251 pp. Price £31.00. ISBN 3-906390-13-6.

Biotechnology is the integration of natural sciences and engineering sciences in order to achieve the application of organisms, cells, parts thereof and molecular analogues for products and services. This is the definition of biotechnology that was adopted by the General Assembly of the European Federation of Biotechnology in 1989. The definition reveals that biotechnology covers a wide range of specialised disciplines of science, including chemistry, biochemistry and chemical engineering.

A Multilingual Glossary of Biotechnological Terms contains IUPAC approved definitions of over two hundred and thirty terms frequently used in relevant literature, together with their translation into six languages, namely French, German, Japanese, Portuguese, Russian and Spanish. The terms are presented in dictionary format for ease of location, and are listed again in the index, without the definition, for ease of translation.

The aim of this book has been to facilitate communication between chemists, chemical engineers, biologists, and bioengineers, and to this extent this volume must be seen as a success. The terms detailed in the book form an extensive vocabulary which scientists can draw from. Translations of the different terms into the six other languages listed are easily accessible, even to those scientists who have no understanding of the other languages.

A Multilingual Glossary of Biotechnological Terms will prove to be a valuable reference source for workers with multilingual requirements in the fields of microbiology, genetic engineering, biochemistry, molecular biology, biochemical engineering, bioprocessing and anyone interested in the general concepts of biotechnology, and is thus highly recommended.

Tracey A. Norris
John F. Kennedy

Carbohydrate Building Blocks. By M. Bols, J. Wiley and Sons Chichester, 1996. ix + 182 pp. ISBN 0-471-13339-6.

Stereoselectivity in organic synthesis has become increasingly important as the usefulness of racemic products in the pharmaceutical industry decreases. Many routes have been devised for the synthesis of

complex asymmetric structures in an enantimerically pure form. The most fruitful of these takes advantage of readily available optically pure starting materials of known absolute configuration. The readily available carbohydrates and their numerous easily obtainable derivatives make unequaled sources of such enantio-merically pure starting materials.

Carbohydrate Building Blocks aims to make available a collection of building blocks from which the synthetic chemist can easily locate chiral starting materials that he or she would find useful.

The book begins with an overview of carbohydrates as starting materials in chiral synthesis. The main advantage when choosing a carbohydrate building block is one of cost, the price of these starting materials being so low that synthesis can be carried out on any scale without difficulty.

Traditionally, the most extensively employed method of selectively manipulating monosaccharides is the formation of acetal/ketal derivatives (Chapter 2). Besides the use of acetals, there exists a number of possibilities for the selective functional group conversion of the different hydroxyl groups in a monosaccharide (Chapter 3)

Oxidation or reduction of monosaccharides can lead to the formation of lactones or polyols respectively, which are useful building blocks for stereoselective synthesis (Chapters 4 and 5). 1,6-Anhydro sugars are a group of compounds of increasing potential use as building blocks due to their rigid structure and stability in the presence of many reagents. Also, their high crystallinity makes them easy to work with (Chapter 6).

Monosaccharides containing unsaturation are valuable synthons, particularly for making branched chain compounds. The most readily available unsaturated sugars are the 1,2-glycols, which serve both as useful building blocks in their own right and as precursors to many other unsaturated sugar derivatives (Chapter 7).

Reducing sugars undergo complicated reactions when treated with strong base or acid, however exceptions to this are D-fructose and lactose when treated with base (Chapter 8), and glucal when treated with acid (Chapter 9).

Some of the least expensive available carbohydrates are a number of disaccharides, which have in the past found little synthetic use. Chapter 10 gives an insight into how they can be made useful.

This book is well written and produced to a high scientific standard, with clear and precise reaction schemes. It is also well indexed with all of the chiral building blocks detailed in the book listed in a stereo-

chemical index. It will appeal to all synthetic organic chemists, whether academics or students. This book stands as a indispensable guide, excellent synthetic reference manual and an extensive source of ideas for further research.

John F. Kennedy
Tracey A. Norris

Biotechnology in the Feed Industry—1994 & 1995.

Edited by T.P. Lyons and K.A. Jacques, Nottingham University Press, Nottingham, 1994 & 1995 (2 Vols). viii + 344 & xi + 496 pp. Price £50.00 each. ISBN 1-897676-514 & 1-897676-565.

From its humble beginnings back in the late 1970s, the biotechnology industry has thrived over the last decade and has become an extremely important branch of scientific research and development. Whilst the biotechnology industry has been dominated by the design, development and production of therapeutics, the large scale application of biotechnological methodologies to the agricultural sector has resulted in a number of significant, if not glamorous, advancements.

These volumes present the proceedings from Alltech's tenth and eleventh annual symposiums, respectively, on the application of biotechnology in the feed industry, held in Kentucky, USA. The main emphasis of the tenth symposium was the interaction of nutrition, immunity and gastrointestinal function, focusing on proteinated trace minerals, oligosaccharides and yeast cultures, in this context. Topics involving carbohydrates include the physicochemical properties and nutritional roles of plant polysaccharides in monogastric animals, manipulation of fibre degradation, and the impact of mannan-oligosaccharides on the gastrointestinal microflora and the immune system. The practical application of enzymes in animal nutrition is also discussed in some detail.

The eleventh volume has a slightly more biochemical feel to it with emphasis on mycotoxins, immune modulators and mineral metabolism. However, one chapter is devoted to a showcase on agriculture around the world, with contributions from experts from Europe, Asia, North and South America, and the final section of the book, which comprises just under half of its contents, presents a round-table discussion of an extremely broad range of topics, including additional investigations into a number of the themes developed in the earlier volume, such as the use of mannanoligosaccharides in turkey farming, various biotechnological enzyme applications, and the numerous and varied applications of the yucca plant in agro-biotechnology.

As the global population increases, and consequently agricultural land decreases, the agricultural industry will require an even greater contribution from the biotech-

nology industry to help solve arising problems through the development and application of natural solutions that are environmentally acceptable to an increasingly aware consumer population.

These volumes thus represent a detailed and extremely important contribution to the development and successful application of biotechnological processes in the feed industry, and will be of value to researchers in industry and academia with interests in the biotechnology of minerals, carbohydrates, proteins and enzymes.

Charles J. Knill
John F. Kennedy

Edible Coatings and Films to Improve Food Quality.

Edited by J.M. Krochta, E.A. Baldwin and M.O. Nisperos-Carriedo, Technomic, Lancaster, USA, 1994. x + 379 pp. Price \$125.00. ISBN 1-56676-113-1.

The continued increase in the awareness and interest of consumers in areas such as health, food quality, convenience, and safety have presented food manufacturers and processors with numerous challenges, some of which have potential solutions in edible coating and film concepts. By acting as barriers to moisture and oxygen, such edible coatings can feasibly reduce the complexity and thus improve the recyclability of packaging materials, compared with more traditional non-environmentally friendly packaging, and may be able to replace such synthetic films.

New materials are continuing to be isolated and characterised by food scientists and engineers, many from abundant natural sources that have traditionally been regarded as waste materials. In some cases such materials are being combined/modified in creative ways resulting in the development of novel materials with unusual previously unavailable coating and film properties.

This volume aims to provide a detailed, yet comprehensible introduction for newcomers to the field of edible coatings and films by providing descriptions of suitable materials, summarising their properties, reviewing methods for their application, and discussing their present and potential uses. The volume begins with a general introductory chapter which outlines the characteristics, formation, definitions, and testing methods associated with edible films and coatings. This is followed by three linked chapters which focus on edible coatings for vegetables, minimally processed fruit and vegetables, and processed foods, respectively.

A number of chapters deal with the important area of encapsulation, focusing on flavour encapsulation and the carrying/delivery of food additives, fungicides and natural antagonists. The latter half of the book is essentially devoted to specific classes of edible coatings and films. A general chapter on applications is followed