Available online at www.sciencedirect.com
SCIENCE DIRECT
Carbohydrate Polymers 64 (2006) 603–604
Carbohydrate Polymers
www.elsevier.com/locate/carbpol

Book reviews

L. Cao, Carrier-bound Immobilized Enzymes: Principles, Applications and Design, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany: 2005, xv + 563 pp., £140.00, ISBN 3-527-31232-3

Enzymes, also called biocatalysts have wide range of potential applications in various industrial processes. These macromolecules have fascinated scientists and technologists for many decades. The driving force in the development of enzyme technology has been and will continue to be the development of new and better products with economic viability. Immobilization has been found to be the convenient method to improve the economic viability of a process through re-utilisation of biocatalysts, higher cell densities in bioreactors and easier purification of the final product. Moreover, the continuous operation is more easily and efficiently controlled while using this technology. An immobilized enzyme, by definition, must comprise two essential functions, namely the non-catalytic functions that are designed to aid separation and the catalytic functions that are designed to convert the target compounds or substrates within the time and space desired. It is usually the peculiarities of these two essential components that dictate the scope of the final application of the immobilized enzymes obtained.

Carrier-bound Immobilized Enzymes provides an overview of various immobilization procedures used in enzyme technology. The volume opens with an introductory chapter, which deals with the history, methods and prospects of immobilized enzymes. Adsorption-based immobilization, which was among the first enzyme immobilization methods, is described in the subsequent chapter. Both conventional adsorption based enzyme-immobilization methods and various new variations developed in the last few decades are presented in this chapter.

Covalently binding of enzymes to a suitable carrier is the second method developed for enzyme immobilization. In strict sense, covalently immobilized enzymes on carriers can be regarded as chemically/physically modified enzymes, whose physical and chemical nature is modified by the carrier used. Chapter 3 covers the detailed information on the different strategies employed in covalent enzyme immobilization.

Entrapment of enzymes implies to the enzyme molecules or enzyme preparations confined in a matrix formed by dispersing the catalytic component (biocatalyst) in a fluid medium (polymer solution). Different aspects of enzyme entrapment are detailed in the Chapter 4 of the book. Methods for preparation of encapsulated enzymes are discussed in the subsequent chapter. The last chapter on unconventional enzyme immobilization deals with the novel combined immobilization techniques. It provides the useful hints to design a desired immobilized enzyme, when conventional method does not fulfil the desired requirements.

In conclusion, the volume provides excellent and comprehensive review on the important field of enzyme immobilization technology covering both the history and present state of immobilization procedures. Numerous tables and figures throughout the volume provide illustrative material to support the detailed information presented in the text, and make this volume an excellent resource for biotechnologists, biochemists, biochemical engineers and enzyme technologists.

Parmjit S. Panesar
John F. Kennedy
Chembiotech Laboratories, Institute of Research & Development, University of Birmingham Research Park, Birmingham B15 2Q1, UK

Available online 20 February 2006

doi:10.1016/j.carbpol.2005.10.015

D. E. Levy, P. Fugedi (Eds.), The Organic Chemistry of Sugars, CRC Press, Taylor and Francis Group, Boca Raton, FL, USA, 2006 (xxiii + 880 pp., £115.00, ISBN 0-8247-5355-0)

Sugars have been known to humankind since prehistoric times. The chemical modification of sugars to sugar derivatives or non-sugar products has been extensively studied as a strategy to prepare products ranging from rare sugars to novel chiral substances and to complex natural products. The methods used in the initial transformations are generally drawn from the principles of mainstream organic chemistry. The unique chemical and physiological properties of sugars have propelled them into new and exciting areas of application in molecular biology, drug design, and other fields of direct impact on our quality of life. New areas relating to glycochemistry and glycobiology have emerged in conjunction with the important interface with proteins, nucleic acids, and other biological macromolecules.

The Organic Chemistry of Sugars explores the different aspects of organic chemistry that apply to sugars and sugar-like substances. The contents of the volume are divided in to four parts. Part I begins with the introductory chapters on the historical perspective of carbohydrate chemistry, and carbohydrates. Protective group strategies, glycosylation methods,