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Book Reviews

Immobilized Biocatalysts — an Introduction. By Winfried Hartmein, Springer-Verlag, Berlin, Heidelberg, 1988. ix + 242 pp. ISBN 3-540-18808-8. Price: DM39.

This book is the English translation of the original German edition of *Immobilisierte Biokatalysatonen* published by Springer-Verlag in 1986. The aim of this book, which is comprised of theoretical and practical sections, is to introduce the students to the subject of the immobilization of biocatalysts. The theoretical section deals with the techniques of biocatalyst immobilization, characterization of immobilized biocatalysts, immobilized biocatalyst reactors, and applications, which are described in nine chapters.

The general principles of biocatalysts, enzyme structure and nomenclature, and the definition and classification of immobilized biocatalysts are described very briefly in the first chapter. The most important and frequently used methods of immobilization such as adsorption, ionic and covalent binding, crosslinking, entrapment and membrane confinement, are outlined. The effect of temperature and pH on the properties of immobilized biocatalysts are summarized and the mass transfer effects systematically presented in a very easy and understandable way.

The chapter on reactors for immobilized biocatalysts is well written but is too quantitative. After the mathematical description of diffusion effects, it would have been appropriate to write a section on the design of ideal and real immobilized biocatalyst reactors, presenting the basic equations and their modifications due to diffusion and dispersion (fluidized bed reactors) effects. The following four chapters present the broad applications of immobilized biocatalysts on the industrial and analytical areas, and their use in medicine (intra- and extra-corporeal enzyme therapy and artificial organs) and basic research.

Although the overall subject of this book is the immobilization of biocatalysts, it deals mainly with the immobilization of enzymes and microbial cells, plant cells, mammalian cells and organelles. The co-immobilization of enzymes and cells are only described very briefly at an

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introductory level in the last chapter of the theoretical section. The book would perhaps have been improved by the addition of a chapter on the use of biocatalysts in organic media.

A very important and easily understandable section is the experimental section. This is particularly useful for its description of the immobilization methods of enzymes and yeast cells by different techniques, in the form of ten laboratory exercises, and so introduces the subject of biocatalyst immobilization at a laboratory level.

This book should be essential reading for those recently introduced to biocatalyst immobilization technology, but is particularly recommended for students and teachers of enzyme technology.

Joaquim M. S. Cabral
John F. Kennedy

The Structure of Cellulose. Edited by Rajai H. Atalla, American Chemical Society, Washington, DC, 1987. x+315 pp. ISBN 0-8412-1032-2. Price: £83.95 Hardback; £47.92 Paperback.

Cellulose is the most abundant biopolymer and represents a major renewable resource material. This linear polymer, composed of 1,4-β-D-glycosidic bonds, forms the principal constituent of plant cell walls where it occurs as microfibrils. The study of cellulose has always been controversial since it began in the middle of the past century, during the expansion of industrial use of cellulosic raw materials, and with advances in plant biology.

The structure of cellulose has therefore been studied intensively for a better understanding of its behaviour, with a view to its development, improvement and use in the production of new products in the textile finishing and paper making industries.

This volume, developed from a symposium sponsored by the Cellulose, Paper and Textile Division of the American Chemical Society, provides a historical perspective on various debates in cellulose research and presents information on recent structural studies on the forms and complexes of cellulose. Topics include X-ray diffraction studies of raman cellulose, two crystalline forms in native celluloses, irreversibility between cellulose I and II, raman spectra of cellulose, aspects of recrystallized cellulose and fractional analysis of cotton cellulose.