

More than 1000 references, tables, and equations are supplied for an excellent introduction to the study of soft material physics and utilization in this volume. In conclusion, this book provides an interdisciplinary approach to the control and understanding of soft materials and is a unique and outstanding reference for the industrial scientist or materials engineer.

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M.E. Tuttle, editor. Structural Analysis of Polymeric Composite Materials (2004, Marcel Dekker, Inc., New York, USA) (xv + 638 pp., £109.00, ISBN 0-8247-4717-8)

Modern polymeric composite material systems are a multidisciplinary subject, involving topics drawn from polymer chemistry, fiber science, surface chemistry and adhesion, materials testing, structural analysis, and manufacturing techniques to name a few. A composite system is a material system consisting of two (or more) materials, which are distinct at a physical scale greater than about 1 μm and which are bonded together at the atomic and/or molecular levels. In the present book, an overview of modern composite materials has been provided with special reference to their structural analysis.

Structural Analysis of Polymeric Composite Materials opens with an introductory chapter on the modern composite materials. The fundamentals of force, stress and strain tensors, and various material properties required to predict the performance of composite structures are discussed in the subsequent chapters. Chapter 4 is focussed on the three-dimensional, anisotropic form of Hook's law. The uni-directional composite laminates subject to plane stress and thermomechanical behaviour of multiangle composite laminates is described in the chapter 5 and 6.

The analytical tools and/or methodologies available to accurately predict the yielding and fracture of multistage composite laminates under general thermomechanical loading conditions are described in the chapter 7. Chapter 8 is devoted to statically determinate and indeterminate composite beams. The equations that govern the behaviour of symmetric and rectangular composite plates are developed in chapter 9. The penultimate chapter presents some solutions for a special class of symmetric laminates called

'specially orthotropic' laminates. The methods of obtaining approximate numerical solutions for symmetric laminates are given in the last chapter.

The most of chapters of the book include numerical example problems that further illustrate the concepts presented. In conclusion, this book can be excellent resource for all the persons working in the area of polymeric composite materials.

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Seppo Salminen, Atte von Wright and Arthur Ouwehand, editors. Lactic Acid Bacteria: Microbiological and Functional Aspects, Third Edition, Revised and Expanded, Marcel Dekker, Inc., New York, USA, 2004 (xiii + 633pp., ISBN 0-8247-5332-1 (£130.00))

Lactic acid-producing bacteria have been used for centuries in all parts of the world for preservation and nutritional value enhancement of foods (e.g. milk, vegetables, meat). Making up a very diverse group of microorganisms, the bacteria produce lactic acid via a complex and adaptive fermentation mechanism. Because of their essential role for the food industry in general and the dairy industry in particular, their metabolism and the related technological aspects have been extensively investigated. Recently, studies have focused on determining the beneficial health effects of lactic acid bacteria, for the design of functional foods and pharmaceuticals.

Based on accurate and critical studies, *Lactic Acid Bacteria: Microbiological and Functional Aspects* reviews the impressive research developments of the past five years. Due to the rapid technical and scientific progress in the area, new chapters on vegetable fermentation, probiotics for fish, modeling of bacteria-host interactions and methods of analysis of the gut flora have been added. Many chapters have also been rewritten by a total of 37 international collaborators. The book discusses taxonomic and physiological aspects of lactic acid bacteria, their genetics, and the safety issues related to their industrial use. Special emphasis is put on their potential health benefits for humans and animals, while three chapters discuss the probiotics of Bifido- and Propionibacteria. The book also stresses the essential role of the advances in molecular biology and genetics for providing tools to understand the functioning of lactic acid bacteria.

Following a logical progression, the 22 chapters offer a comprehensive and up-to-date review of a wide range of topics, from general classification considerations to projections on the future industrial applications of lactic acid bacteria. Most chapters start with a paragraph summarizing the facts and data available on a subject, and end with concluding remarks and a list of references.

With each of the chapters contributed by different collaborators, the reader can come across redundant information. As an offset, any chapter can easily be consulted as a separate unit by readers interested in specific issues. With clear referenced information, this volume reports scientific, commercial and technological findings. It should be of interest to a wide audience ranging from academic or industrial microbiologists and food technologists, to students, regulatory agents and nutritionists. It can also be recommended to consumers desirous to find unbiased detailed information on the effects of lactic acid bacteria and related controversial issues.

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Biocatalysts and Enzyme Technology (2005, Wiley-VCH,
Weinheim, Germany) (xvii + 448 pp., £65.00, ISBN 3-527-
30497-5)

Enzymes as biocatalysts are of key importance in biotechnology and new processes have been and are being developed to manufacture both bulk and value added products using enzyme technology. Their application ranges from the production of processed foods such as bread, cheese, juice and beer, pharmaceuticals and fine chemicals, to the processing of leather and textiles as process aids in detergents and also in environmental engineering. The driving force in the development of enzyme technology has been and will continue to be

development of new and better products, processes and services to meet these needs and improvement of existing processes.

The basic fundamentals of enzymes along with historical highlights and their potential are summarised in the introductory chapters of *Biocatalysts and Enzyme Technology*. The application of enzymes in organic synthesis and an overview of enzyme production and purification are given in subsequent chapters. The applied biocatalysis with free enzymes together with suitable examples is described in chapter 5.

Immobilisation has been found to be the convenient method to make 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. The different methods and applications of enzyme immobilisation are discussed in chapter 6, while the immobilisation of microorganisms and cells is described in a separate chapter.

The study of the properties that are important for the application of immobilised biocatalysts and how these are influenced by the nano—and microenvironment around the immobilised enzymes is of great significance. Chapter 8 gives information on different aspects related to the characterisation of immobilised biocatalysts. The bioreactor represents the central part of the plant as a whole, where the reaction takes place under controlled conditions. Details of reactors and process engineering techniques in enzyme technology are discussed in chapter 9.

Biocatalysts and Enzyme Technology is an instructive and comprehensive overview of current knowledge of biocatalysts and enzyme technology. In each chapter, an introductory survey is provided together with exercises and recent references. This book will be a useful resource for all persons involved in chemistry, biochemistry, biotechnology and process engineering, and will make a real contribution to the flourishing area of enzyme technology.

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