

wine institutes in the world, The Institut d'Oenologie de l'Université de Bordeaux — Pascal Ribéreau-Gayon.

Handbook of Enology Volume 1: "The Microbiology of Wine and Vinifications" describes microbial fundamentals of winemaking combining a scientific knowledge with its application during harvest, from grape-picking to the end of the fermentation processes in the cellar.

Handbook of Enology Volume 2: "The Chemistry of Wine Stabilization and Treatments" uniquely combines chemical theory with the description of day-to-day work in latter stages of winemaking from clarification and stabilization treatments to ageing processes. The second volume of the Handbook discusses methods such as sedimentation, centrifugation and precipitation and their use in ensuring an end product of top quality.

The goal of these two books was to choose the most relevant and significant publications in the particular field of research. A large number of references to French enological research have been included in order to make this information available to a larger English speaking audience.

Volume 1 describes the first phase of winemaking or "vinification" (as has been used in this book). It comprises all technical aspects from grape maturity and harvest to the end of alcoholic and malolactic fermentation. The second phase of winemaking is described in *Volume 2* "maturation, stabilization and treatment", which refers to wine aging. Since the first stage concerns microbiology, and the second chemistry, the individual operations could be linked to their particular sciences.

The description of the different steps of enology does not always obey logic as precise as the title of these books may lead to believe. Microbial contamination during ageing and storage are covered in *Volume 1*. Ageing of white wines and the resulting chemical transformations cannot be separated from vinification and are therefore covered in *Volume 1*.

Our understanding of phenolic compounds in red wine is based on complex chemistry. All aspects related to the nature of the corresponding substances, their properties and their evolution during grape maturation, vinification and ageing are therefore covered in *Volume 2*.

Handbook of Enology is an interdisciplinary resource for winemakers, students of ecology, and chemists interested in winemaking. Theoretical interpretations as well as solutions are presented to resolve the problems encountered most often in wineries.

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Microreactors

Wolfgang Ehrfeld, Volker Hessel, Holger Löwe Wiley-VCH Verlag GmbH, Weinheim, 2000, xi + 288 pages, ISBN 3-527-29590-9, £80.00

Microreaction technology is an extremely interesting and rapidly developing interdisciplinary field. New concepts of chemical synthesis have resulted in increasing the demand for miniaturization and more complex systems. Microreaction technology completely opens new possibilities for chemical engineering, combinatorial chemistry and biotechnology. Small, inexpensive, independent and versatile devices ensure many reactions achieve maximum selectivity, minimum waste, minimum investment, better control of the process, safe manufacture and production on command, to create a more efficient process. This book outlines fabrication techniques of microfluidic components, unit operations of micro chemical engineering and current worldwide activities. It also includes requirements with respect to the needs of the chemical industry.

Microreactors comprises eleven chapters and the contents of the book are divided into two major parts, with the beginning of each chapter aimed to present general aspects of a specific class of microdevices, while the details are discussed in separate sections. Initial chapters cover state of the art microreaction technologies, modern micro-fabrication techniques for microreactors, micromixers, and micro heat exchangers. Later chapters discuss microseparation systems and specific analytical modules for microreactors, microsystems for liquid phase reactions and for gas phase reactions, and gas/liquid microreactors. Finally, microsystems for energy generation and for catalyst and material screening, and methodologies for distributed production are covered.

Microreactors is written for both newcomers and experts interested in this exciting field, as well as for researchers from industry and research institutions. The book contains numerous illustrations and detailed references are included at the end of each chapter. It is a well presented and well structured state of the art review, which may be of great interest to chemists, chemical engineers, biotechnologists, process engineers, and microsystem technicians in the

chemical and pharmaceutical industry and academia, as well as for manufacturers of analytical instruments.

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Carbohydrates

Paul Finch (Ed.); Kluwer Academic, Dordrecht, 1999, xii + 334 pp., ISBN 0-751-40235-4, £104.00

Increasing awareness of the roles of carbohydrates in biological recognition and regulation has brought about a resurgence of interest in carbohydrate chemistry. The advancements made in recent years in theoretical, physical and synthetic methods have enabled scientists to research further into the properties of carbohydrates and their potential for exploitation. In *Carbohydrates*, a contemporary view of our knowledge of the structures and syntheses of monosaccharides, oligosaccharides and glycopeptide units is presented, as well as the properties of some important examples and derivatives including sulphates and polysaccharides.

The book contains 9 chapters, each containing an introduction as well as detailed referencing. The chapters cover: the geometry and dynamics of monosaccharides and oligosaccharides; the chemical synthesis of monosaccharides; the conjugation of monosaccharides — synthesis of glycosidic linkages in glycosides, oligosaccharides and polysaccharides; the chemistry of glycopeptides; the shapes and interactions of polysaccharide chains; and the chemistry of polysaccharide modification and degradation. A chapter examining carbohydrate sulphates is also included, given that although the structural and mechanical role of sulphates is pre-eminent, several more subtle functions are beginning to emerge. The final chapter discusses carbohydrate–protein interactions. This is a subject of intense contemporary study because of its key importance in the regulatory roles of carbohydrates.

In *Carbohydrates*, an authoritative overview of the current status of some particular areas of structural and synthetic carbohydrate chemistry is presented, with the

aim of underpinning the steady increase in the perception and understanding of the roles of carbohydrates in nature. This very detailed and comprehensive book is written by established experts in the field of carbohydrate chemistry, and provides an informed perspective on key areas of carbohydrate chemistry.

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Novel Macromolecules in Food Systems

G. Doxastakis, V. Kiosseoglou (Eds.); Elsevier, Amsterdam, 2000, 468 pages, ISBN 0-444-82932-6, £127.00

Polysaccharides and proteins are essential ingredients in both natural and processed foods: they perform key roles that include thickening, stabilisation, gelation and encapsulation. To a large extent, they determine shelf-life, texture and nutritional quality. Advances are continually being sought by developing new macromolecules that perform better than their traditional competitors. Using recent innovations in biological and physical sciences, scientists have created novel food ingredients chemically, microbiologically and enzymatically. As research and technological information in this field is increasing rapidly, it is becoming increasingly difficult to keep track, both of innovations in the field of novel macromolecules and of developments of novel uses for traditional ones.

Novel Macromolecules in Food Systems provides a fundamental understanding of novel uses of traditional biopolymers as well as establishing the nature of structure/physiochemical relationships of novel macromolecules in applications where they replace or complement their existing counterparts. The book comprises seventeen chapters that cover the latest information on preparative methods, chemistry, structure and functionality of novel biopolymers or novel applications of more traditional macromolecules. A number of chapters are grouped into those dealing with novel proteins and novel polysaccharides: two chapters cover the interface between these