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The Book Corner

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THE BOOK CORNER

PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS OF LIQUID CHROMATOGRAPHY, Edited by C. M. Riley, W. J. Lough and I. W. Wainer, Elsevier Science Ltd, Oxford, England, 1994, x + 379 pp., £ 85.00 (\$ 136.00); ISBN: 008041009 X

This book represents Volume 1 in the new series entitled "*Progress in Pharmaceutical and Biomedical Analysis*," which is edited by distinguished scientists in the field. The book provides an update on recent developments in liquid chromatography, with topics that quickly progressed in the last decades such as chirality, biotechnical substances and the need for more rigorous documentation and validation of analytical procedures.

The book consists of four parts:

Part one deals with the application of new technology to pharmaceutical and biomedical analysis and consists of three chapters, discussing the pharmaceutical and biomedical applications of capillary electrophoresis, novel approaches for the analysis of primary amines, amino acids and peptides by liquid chromatography, while chapter 3 deals with analysis of enantiomers.

Part two describes the recent advances in the area of solid phase extraction, restricted access media for direct injection, microdialysis and coupled column chromatography. This part consists of 4 chapters.

Part three contains two chapters concerned with liquid chromatographic methods for the isolation of drug substances on preparative scale and purification of peptides and proteins.

Part four describes the development of validation of analytical methods in pharmaceutical and biomedical research, with a chapter devoted to validation of liquid chromatography methods of pharmaceuticals in bulk form, formulations and biological fluids. The final chapter describes the strategy for method validation for bioanalytical applications in the pharmaceutical industry.

Each chapter ends with a list of references related to the topic discussed, with citations as recent as 1993. This book is highly recommended for analytical chemists, pharmaceutical chemists, biochemists in both industrial and academic affiliations, and also drug regulatory centers.

This book is the start of a new series, with two more volumes to be published in the near future; I anticipate their place as valuable references in the areas of pharmaceutical and biomedical analysis.

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GAS CHROMATOGRAPHY, Edited by Ian A. Fowles, second edition, in Analytical Chemistry by Open Learning Series, John Wiley & Sons Inc., New York, 1995, 258 pages.

In the second edition of Gas Chromatography, the author expanded the treatment of column systems into packed column systems (chapter three) and capillary column systems (chapter four) while, in the first edition, they were discussed together. Also, the detector systems are discussed independently (chapter six). Furthermore, this second edition includes two new topics: injection systems for high resolution gas chromatography, HRGC (chapter five), and environmental analysis systems (chapter ten).

Other subjects in the first edition were expanded and revised in the second edition and are discussed in greater depth and detail; these include: the fundamental chromatograph (chapter two), data handling systems and quantitative analysis (chapter seven), qualitative analysis (chapter eight), and analysis of less volatile samples (chapter nine).

This book is divided into ten chapters. Chapter one is an introduction. Chapter two includes the topics of gas supply systems, columns, oven, injection systems, detectors, data systems, and starting up the complete system. Chapter three covers packed column dimensions, column packing and preparation, solid supports, stationary phases, column performance, carrier gases, the injection systems, system optimization and evaluation of chromatography. Chapter four discusses the structures and dimensions of capillary columns, handling of capillary columns, fittings and connectors, optimization and separation, and column maintenance, while chapter five deals with injection systems such as, the split/splitless injectors, on-column injector, automatic injection in HRGC, and large volume injection in HRGC. In chapter six, the emphasis is on the types of detectors used in GC. Chapter seven discusses the chromatography and the data systems, injection and quantitation, integration methods, and method validation. Chapter eight is an interesting one which discusses retention times and multidimensional systems, such as, HRGC-MS, HRGC-IR, HRGC-IR-MS

and HPLC-HRGC-MS. Chapter nine discusses the use of high temperature stationary phases, derivatization and pyrolysis gas chromatography. Chapter ten covers solvent extraction, on-line focusing, headspace analysis in HRGC, and purge and trap systems.

The book is well written and illustrated. It is recommended for students, technicians, and chemists who want to gain fundamental working and practical knowledge in gas chromatography.

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2. The fundamental chromatograph. (12)
3. Packed column systems. (23)
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EXPLOITING BIOTECHNOLOGY, edited by Vivian and Sheila Moses, Harwood Academic Publishers, London, UK, 1995, 332 pages, \$28.00.

This book is written in a way that is easy to understand and with some business orientation. It is suitable for both biotechnology students as well as those whom in their education and training does not include the science and engineering on which the technology is based. The book is divided into thirteen chapters. Chapter one is an introduction, which briefly describes the definition, prospects, applications, and industrial products of biotechnology. Chapters two through four deal with the basis of biotechnology in sciences, engineering, and feedstocks. In the science, they discuss the basic concepts of biochemistry, genetics, DNA, genetic codes, replication of DNA, and genetic engineering; in engineering, the book focusses on choice of organisms, growth of genetically engineered organisms, production, packaging and marketing; and in feedstocks, deals with the role of feedstocks in biotechnology. Chapter five discusses the patenting of products from biotechnology and the protection of intellectual

property. Chapter six emphasizes the management aspects of a biotechnology company, including research, strategy, product development, human resources, finance, marketing and decision making. Chapter seven discusses the applications and products of biotechnology in human health care, which includes production of vaccines, monoclonal antibodies, diagnostic products, therapeutic drugs, and gene therapy. Chapter eight focuses on the use of biotechnology for the production of antibiotics, vitamins, drugs, amino acids, organic acids, proteins, enzymes, starches, sugars, methanol and ethanol. Chapter nine emphasizes the manipulation of plant genetics results in improvement of crop quality, plants' resistance to insects, herbicides and plant pathogens; production of new ornamental plants; plants which produce pharmaceutical compounds, chemicals for agriculture, perfumes components, pigments, and food additives. Introduction of nitrogen fixation genes into rice, corn, wheat, and other cereal crops to reduce the use of nitrogen fertilizers. Chapter ten deals with the exploitation of biotechnology for improvement of techniques in mining and recovery of crude oil. Chapter eleven discusses the application of genetically engineered micro-organisms for removal of pollutants in water, soil, air, oil spills, disposal of sewage sludges, solid wastes, toxic organics, heavy metals and hazardous wastes. Chapter twelve describes the use of biosensors in immunoassay for screening of bacteria, pathogens, pesticides, or pollutants in meats, fishes, waters, and human blood. Chapter thirteen is an overview of future applications of biotechnology.

The authors stated that "while mainly scientific and technical in its approach and in the material it covers, the book hopes to satisfy both scientific and business interests. Primarily, the book seeks to explain to people with no special knowledge of chemistry, and with no more than a layman's appreciation of biology, both the promise and the limitations of using living organisms and their products in industry."

I think they have accomplished not only their objective, but the purpose of the book, which is to make accessible a general understanding of the technical base on which biotechnology rests. It also offers a broad view of the commercial and industrial applications which have already been made or are likely to be developed before too long. A few things that I liked about the book: it is easy to read, well written and costs only \$28.00. I also liked the honesty of the authors who stated, "In no sense is this book a comprehensive catalogue of all that is going on." To satisfy that objective would have required a volume many times longer and would have demanded of its readers an extensive knowledge of the underlying sciences. Moreover, the subject is moving so fast that, however hard the authors might have tried to include every last bit of news, publication delays would inevitably have led to the omission of many interesting items. "We have tried, instead, to offer a balanced presentation of current activity and, where it might lead in the short- and medium-term." The book is recommended to all those interested in the biotechnology field.

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NEW METHODS IN PEPTIDE MAPPING FOR THE CHARACTERIZATION OF PROTEINS, edited by William S. Hancock, CRC Series in Analytical Biotechnology, CEC Press, Boca Raton, FL, 1995, 246 pages.

This book is devoted to the characterization of recombinant DNA-derived proteins by peptide mapping. It describes new technological procedures, including capillary electrophoresis, analysis of glycopeptides, and the use of electrospray- and matrix-assisted laser desorption mass spectrometry. The book presents practical procedures for preparing a protein sample, enzyme digestion, choice of separation method, and procedures for the structural analysis of the separated species.

The book, which is written by experts in this field, and edited by William S. Hancock, is divided into eight chapters. Chapter one describes the use of tryptic mapping of peptides as the key method for characterization of biotechnological protein products. Chapter two gives a useful discussion of approaches for the use of computer simulation for the rapid optimization of the peptide map. Chapter three demonstrates the power of spectra in the interpretation of peptide maps. Chapter four gives an account of the application of HPCE to peptide mapping and gives practical tips on developing the most effective conditions. Chapters five through seven discuss the power of combined

LC/MS techniques for analysis of complex proteins such as glycosylated samples. The extra dimension of mass spectrometry may be required to fully characterize a peptide map. With LC/MS, the mass spectrometer allows on-line identification of peptides and coelutions are readily detected. Chapter five gives an excellent description of the power of electrospray mass spectrometry (ESI-MS) as an on-line HPLC detector. Chapter six describes how ESI-MS can be successfully coupled to capillary electrophoresis. Chapter seven describes the application of ESI-MS to analyze complex glycoproteins via on-line analysis of HPLC-tryptic maps. Matrix-assisted laser desorption mass spectrometry, combined with time of flight MS (MALDI-TOF), a promising new approach to characterize polypeptides, is discussed in chapter eight.

In general, the book is well written and edited. It is informative, to the point and free from errors. Each chapter is rich with illustrations and references. The book is recommended to all those interested in peptide and protein separation and characterization.

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