

glasses, glazes and frits, reduced materials (carbides, nitrides and elements) and, finally, unknown materials. These are supported by a number of appendices which list specific techniques for the determination of the loss on ignition and for the fusion of a large number of substances ranging from raw materials to products. Problem elements are also listed here, as are certified reference materials. A final appendix briefly discusses the desirability of various accreditation schemes.

It is obvious that a great deal of thought has been put into the content of the book and the way the material is set out in order to make it readily accessible. At first I thought that in some subject areas there was far more detail than was really necessary, for example, there is even a description of the best way to label specimens. But that was before I have encountered some of the sillier aspects of BS5750. This book is intended as a manual of procedures for use in laboratories which wish to achieve accreditation under this standard. If you follow the methods given here you will not only go a long way towards complying with the bureaucratic strictures of BS5750, but you will also produce analyses of the highest attainable quality, which is not necessarily the same thing.

E. LACHOWSKI

HPLC Detection—Newer Methods: G. PATONAY (editor), VCH, New York, 1992. Pages xii + 336, DM158.00. ISBN 3-527-28219-X.

This is an interesting book because, as explained in the preface, its purpose is to cover aspects of less well known detection methods in HPLC without discussion of detection methods in general use. The content is consistent with the title and the book is an in depth series of reviews on the newer and correspondingly lesser used detection methodologies. Given the number and scope of existing texts on generally used detection principles and equipment, it thus provides a unique and valuable addition to the literature of HPLC. It will provide stimulating reading for many practising chromatographers by showing the range and potential of what some may term more esoteric HPLC detection techniques. Methods covered are long lived luminescence, chemiluminescence, photothermal, electrochemical and near infrared absorption. The various applications of lasers in a range of optical detection methods are reviewed, particularly in the context of microcolumn technology. In reviewing most of these detection methods a good balance has been struck by the various contributors between background theory, which may be new to some of us, and applications. In the chapter dealing with laser applications to microseparation systems a more general analytical approach is taken and includes sections on analytical figures of merit and concentration and mass sensitivity. The last three chapters each provide substantial coverage of what have come to be called hyphenated techniques in which additional, usually spectroscopic, information is obtained about the analyte on-line with the separation process. The chapter on HPLC/FT-IR reviews principles and equipment design and compares analytical and microbore chromatography in the context of interfaces needed. The chapter on detection by mass spectrometry outlines the various types of chromatography—spectrometer interfaces that have been developed and gives a selective overview of applications of HPLC/MS, concentrating particularly on natural products. The last chapter, which in the preface is described as “a peek into the future”, outlines progress in the coupling of HPLC with nuclear magnetic resonance. The use of both stopped and continuous flow are described and a number of applications are cited. Overall the book is well produced and its usefulness is considerably enhanced by the extensive references on each topic.

R. B. TAYLOR

Silica Gel and Bonded Phases—Their Production, Properties and Use in LC: R. P. W. SCOTT, Wiley, Chichester, 1993. Pages xii + 261. £35.00. ISBN 0-471-93985-4.

This book provides an appropriate companion volume to *Liquid Chromatography Column Theory* by the same author. As previously, the present volume provides an individual assessment of current knowledge and theory and draws extensively on research by the author and co-workers. The major part of the book describes silica as a material for chromatography and traces the development of modified silicas. The last few chapters focus more closely on the silica in chromatography and explore ideas on molecular interactions between bonded reverse phase silicas and components of the mobile phase.

The book starts with a review of the structure, preparation and size classification of silica gel as a material. This provides useful background information about the ubiquitous chromatographic material although it is, perhaps, of minimal direct use to most chromatographers. Chapter 3 combines coverage of methods for determining porosity, surface area and particle size distribution with a review of current methods for packing silica gel into chromatography columns including dry and slurry packing and also radial compression methods. The next two chapters deal with the chemical nature of the silica surface including the techniques used in its study and also the properties of silica gel as a size exclusion material. This leads logically to a discussion of the interactions of solvents and solutes with the silica gel surface. In Chapters 7 and 8 there is excellent coverage of the history and classification of bonded phase silica based materials including the technology for their production.

The last three chapters are devoted to aspects of reverse phase bonded silicas. Properties such as wetting and stability of bulk and brush phases are described along with a discussion of solute and solvent interactions with such materials. Adsorption isotherms of various mobile phase components are described including what are referred to as ion exchange reagents, a sensible change from pairing ions. The book concludes with a thermodynamic treatment of solute retention which it is suggested can help in identifying molecular interactions while pointing out the lack of predictive capability.

This book comprises a very comprehensive account of the main chromatographic material currently in use. As such, it should provide informative background reading for practising chromatographers and perhaps encourage some re-evaluation of current thinking. It is interesting that the later chapters indicate the incomplete current understanding of the chromatographic process in spite of the detailed knowledge of the primary separation material.

R. B. TAYLOR

Spectroscopic Methods and Analyses—NMR, Mass Spectrometry, and Metalloprotein Techniques: C. JONES, B. MULLOY and A. H. THOMAS (editors), Humana, Totowa, 1993. Pages: x + 395. US\$59.50, (softback). ISBN 0-89603-215-9.

This book is the latest (17th) volume in the series "Methods in Molecular Biology" and describes the use of complex physical methods in the characterization of biological macromolecules. The application of three groups of technique are covered namely, (i) the use of nuclear magnetic resonance (NMR) techniques with respect to proteins, peptides, nucleic acids and carbohydrates, (ii) mass spectrometry (MS) and associated soft ionization techniques and (iii) a variety of physical methods which lend themselves to the characterization of the metal centre in metalloproteins including Mössbauer, Raman and Electron Paramagnetic Resonance Spectroscopy and X-Ray Absorption Spectroscopy. In the first two sections there is a chapter describing the fundamental principles underlying either NMR or MS followed by more descriptive chapters describing and illustrating their potential application to molecular characterization. In the third section theoretical considerations are dealt with in individual chapters which also include various examples and illustrations of potential uses.

Each chapter, produced by well known experts and in many cases eminent workers, is a well written work of reference but by necessity contains complex scientific and mathematical material and consequently this cannot be considered a beginners' guide to the use of these physical techniques in molecular biology as a knowledge of the underlying mathematical, physical and chemical concepts is required. Indeed, more time spent by the reader on the introductory chapters will yield significant benefits in this regard. However, there are good illustrative examples of the various applications, many excellent practical hints, lists of "dos" and "don'ts", good considerations of the technology required and methods of data interpretation and a comprehensive reference list. In essence, the material covered by this in many ways excellent volume whets the appetite for this subject area, stimulates thought and will certainly expand the horizons of many biochemists and molecular biologists with respect to the molecular characterization of macromolecules. However, the complexity of both subject, technology required and most importantly, correct experimental design and data interpretation, requires collaboration and cooperation with specialist centres, a message clearly stated in many places within the book.

P. H. WHITING