

is not consistent throughout the chapters, although most of the cited references have a uniform format.

One significant problem with this book is its lack of up-to-dateness: For example, in the rapidly evolving field of proteomics, which is covered in the chapter "Advances in Protein Analysis and Sequencing by Mass Spectrometry", it is hardly acceptable that not a single reference in this chapter is more recent than 1997. The majority of the cited references originate from the first half of the 1990s. In other chapters the situation is similar. In the most extreme cases some chapters, in this book published in the year 2000, do not contain any references later than 1993. As many of the chapters are not mainly concerned with the basics but with current applications of the analytical methods, a reader who wishes to be informed about the state of the art of a particular technique would be better served by one of the readily available review articles in the scientific journals.

Who is likely to benefit from this book? Of course, specialists in the fields discussed will find this monograph useful for their work and may consider purchasing it because of the good technical quality of selected chapters. For example, V. G. Voinov has succeeded in providing a clear, well illustrated, and concise introduction to resonance electron capture mass spectrometry for analysis of organic compounds, which is currently one of the most sensitive analytical techniques available. On the other hand, the chapter by M. A. P. Martins and co-authors on NMR spectroscopy of isoxazoles is so specialized that only a very limited number of scientists worldwide will be able to make use of these more than 50 pages, three quarters of which are tables with chemical shifts. For graduate students and postdoctoral researchers, selected chapters are excellent and highly valuable tools to get acquainted with the particular analytical methods. My assumption, however, is that this book is not likely to exceed the status of a library copy, because of its indistinct profile.

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Capillary Electrochromatography. Edited by *Keith D. Bartle* and *Peter Myers*. (Series: *Chromatography Monographs*.) Royal Society of Chemistry, Cambridge 2001. xiii + 149 pp., hardcover £ 49.50.—ISBN 0-85404-530-9

Capillary electrochromatography (CEC) is a modern analytical separation technique which combines the retention principle of liquid chromatography with the principle of electroosmotic flow that drives the mobile phase in capillary electrophoresis (CE). Because of its separating capability and selectivity it has a great potential, but although it is now some 20 years since it was introduced, it has not yet become established as a routine method. Research on improvements to the separation system and instrument design, and into gaining a fuller understanding of the principles, is still continuing. This book is the second monograph on the method that has appeared, and it is an excellent introduction for anyone about to enter the field. Considering the complexity of this separation technique, it is a rather slim volume. Nevertheless, it covers the subject fully and in an understandable way, without getting lost in too much detail.

In the introductory chapter one of the editors, Keith Bartle, explains the basic principles clearly and concisely. Thus at the start all the essential features of the method, especially the respects in which it differs from HPLC, are set out. These include the high separating efficiency and peak capacity, as well as the combination of electrophoretic migration with chromatographic retention when CEC is applied to charged analytes.

Norman Smith contributes a short chapter on the instrumental requirements for CEC. In most cases these can be met by adapting commercially available CE systems, and consequently, when the latter were introduced about ten years ago, there was an upsurge of interest in CEC. Adapting CE instruments for CEC involves minor modifications, but some of these may be already incorporated by the manufacturer. There also exist instruments that have been developed especially for CEC and nano-HPLC. Smith describes the instrumental problems and the necessary modifications to CE equipment in great

detail, but gives no further information about the specially developed instruments that he mentions.

The second editor, Peter Myers, who is well known as an expert on column packing materials, provides a short discussion of stationary phases for CEC. In addition to the familiar reverse-phase materials used in HPLC, he describes strong ion-exchange phases which have a hydrophobic center and have been specially developed for CEC. The author's treatment of this topic is very clear and thoroughly competent, but one would have liked to be given more detail about some aspects, in particular the highly active ion exchangers.

Chapter 4, by Vincent Remcho and co-authors, returns in greater depth to an aspect mentioned in the introduction, with a detailed discussion of the role of electroosmosis in CEC. The chapter also contains a theoretical treatment of the separating efficiency of CEC, and in the course of that provides the reader with a complete theoretical toolkit for dealing with CEC using packed columns.

In contrast to packed-column CEC, a chapter by Rozing and Dittmann is devoted to open tubular CEC (OT-CEC). The authors begin with a very detailed discussion of band-broadening effects in OTCEC and high-pressure chromatography in open tubes, with mathematical formulas and diagrams. This section contains much fundamental information. The chapter continues by describing three important approaches to improving the phase ratio in open tubes, with examples of their use.

In a chapter devoted to the coupling of CEC with mass spectrometry, Lord and Gordon discuss the question of detection sensitivity. The chapter begins with a very informative 7-page introduction to the coupling of liquid-phase separation methods with modern mass spectrometry, including variants using a tandem mass spectrometer. Different types of interfaces, such as liquid junction, coaxial sheath flow, and on-line nanospray, are described in detail and their merits compared. Much useful advice for putting these into practice is given.

The book ends with two chapters on applications of CEC. The first, by Euerby and Gillot, deals with analysis in the pharmaceutical field, describing applications to products including steroids,

diuretics, barbiturates, analgesics, cannabinoids, and tricyclic antidepressants. The stationary phases used include ODS, SCX, and unmodified silica gel. The separations described are certainly impressive, but it is not always easy to see that CEC has a clear advantage over HPLC.

In the final chapter Dermaux and Sandra, in a refreshingly positive contribution, show how CEC excels in applications where its unique advantage of high peak capacity comes into play. The examples are mainly concerned with the analysis of extracts from natural products, including separations of triglycerides in which the peak capacity is almost reminiscent of capillary gas chromatography.

The book makes very easy reading, and the chapters complement each other very effectively, so that there is little repetition. There are a few technical shortcomings with regard to the figures. It would have been useful to provide a comprehensive, detailed, and focused treatment of the combination of ion migration and retention for charged analytes, an aspect that is only touched on in a few places, for example, in the application of OTCEC to proteins. However, this is a useful and highly informative monograph on a method that one hopes will be used with greater success in the future.

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Supported Catalysts and their Applications. Edited by David C. Sherrington and A. P. Kybett. Royal Society of Chemistry, Cambridge, 2001. 270 pp., hardcover £ 69.50,— ISBN 0-85404-880-4

The development of new selective heterogeneous catalysts is a rapidly evolving field with a large impact on the chemical industry for the production

of agrochemicals, fine chemicals, and pharmaceuticals. Especially for large- and medium-scale production processes, the task of optimizing profitability and improving the environmental acceptability of processes still remains. The recently published proceedings of the RSC conference on *Supported Catalysts and their Applications*, at the 4th International Symposium on Supported Reagents and Catalysts in Chemistry held on 2–6 July 2000 at the University of St. Andrews, UK, provides solutions to some of these challenges.

With few exceptions, most of the symposium participants and contributors to the book originate from European universities and are well-known scientists in the field. The book is divided into 31 individual chapters, which cover recent aspects of the design, synthesis, and applications of solid-supported reagents and catalysts, including supported reagents for multistep organic syntheses, selectivity in oxidation catalysis, mesoporous molecular sieve catalysts, and the use of zeolite β in organic reactions. Traditionally, heterogeneous catalysts have usually been immobilized on inorganic oxide materials where molecular precision at the metal complex center was of minor importance. However, more recently polymer-based systems with immobilized well-defined catalytic metal complexes have become a subject of intensive research. This book covers both areas of heterogeneous catalysis, inorganic oxide materials and polymer-based catalysts, and shows interesting overlaps.

While most of the contributions deal with immobilized catalysts and their applications, an excellent chapter by Steven V. Ley and Ian R. Baxendale covers supported reagents and their application to multistep organic syntheses. Examples of syntheses range from clean alcohol oxidations with a supported TPAP reagent to the convergent(!) synthesis of sildenafil (Viagra). Unfortunately, the title of the book does not even indicate that supported reagents are also included.

Although the book was published in 2001, it does not cover any parallel approaches to the search for new supported catalysts. Especially for industry, the techniques and the screening methods for the rapid identification of new catalyst candidates remain an important challenge. In this context automation and parallel approaches should definitely be mentioned. (For a recent review see: S. Dahmen, S. Bräse, *Synthesis* **2001**, 1431.)

Apart from the above-mentioned shortcomings, the two-page subject index is far too short and consists mainly of a repetition of the table of contents. For the reader who is interested in, for example, different applications of a certain catalyst, it is completely useless.

The book is clearly a recent survey, but, like the catalysts described, it is very heterogeneous in its nature: the style and quality vary from chapter to chapter. This would be acceptable for a conference proceedings but not for a scholarly monograph. Scientists who are interested in fundamentals of immobilized catalysts are better off with the book *Chiral Catalyst Immobilization and Recycling*, edited by D. E. De Vos, I. F. J. Vankelecom, and P. A. Jacobs (review: *Angew. Chem. Int. Ed.* **2001**, 40, 3480).

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