



Publications

Inductively Coupled Plasma Mass Spectrometry. Edited by Akbar Montaser (George Washington University, Washington DC). Wiley-VCH: New York, 1998. xxix + 964 pp. \$149. ISBN 0-471-18620-1.

Finally, a comprehensive monograph on inductively coupled plasma mass spectrometry (ICP-MS) has arrived. Edited by Akbar Montaser, this book follows in the tradition of his earlier work *Inductively Coupled Plasma in Analytical Atomic Spectrometry*, and it should find a place next to it in personal, academic and corporate libraries.

In the Forward Jim Winefordner surveyed the contents: "It is gratifying to see a single book devoted to this extremely important topic. This book encompasses 11 chapters, primarily involving the instrumentation, the fundamentals, and the methodologies of ICPMS, written by a group of 27 world-class scientists from seven countries. Considerable experimental and fundamental emphasis is placed on sample preparation and sample introduction in ICP spectrometry as well as the experimental and fundamental aspects of plasma generation. Instrumentation for both low- and high-resolution ICPMS and the significance of mixed-gas and helium plasmas are stressed. Of course, analytical characteristics and novel applications of ICPMS are a major part of this book. Finally, microwave-induced plasmas are reviewed as ion sources for mass spectrometry."

In the preface Montaser summarized the contents and Table 1 summarizes the titles, contributing authors, and the number of pages and references in each:

Chapter 1 outlines the generation and operation of ICP discharges.... Chapter 2 addresses the art and science of microwave sample preparation.... Chapters 3 and 5, respectively, focus on the various techniques used for transporting samples into the plasma and the fundamental aspects of sample introduction.... Chapters 4 and 6 are concerned with ICPMS instrumentation....

Analytical characteristics of ICPMS ... are treated in Chapter 7.... Chapter 8 considers parameters that affect ion transmission through the instrument Chapter 9 ... is devoted to the applications of ICPMS for a wide variety of sample types.... Chapter 10 considers plasma sources other than the commonly used Ar ICP.... Other alternative plasma sources, such as microwave-induced plasmas operated at atmospheric or reduced pressure with various gases, are discussed in Chapter 11.

In Chapter 4 Turner and Montaser integrate more than 30 years experience with ICP generation techniques and torch development. With emphasis on plasma generation, they provide an excellent summary of accumulated experience in rf design and coupling. Chapter 5 features fundamental aspects, definitions and basic descriptions of particle distributions, measurement equipment, and transport efficiency that complement sample introduction topics in chapter 3. Montaser et al. conclude the chapter with significant research goals that could occupy researchers for sometime. In Chapter 6 Turner et al. outline basic principles of ICP mass spectrometers, their operation, limitations and advantages. They provide a concise, relatively current primer on ICP-MS and commercial and research systems. The chapter lacks reference to some very recent developments (e.g., commercial time-of-flight MS instruments), and some topics are without literature citations (e.g., Fig. 6.36). Chapters 7 and 8 are welcome updates of important ICP-MS chapters published in 1992. In the novel applications chapter (Chapter 9) by Taylor et al. devote half to analyses grouped by technique and half featuring applications by general type (*i.e.*, biological, geological, environmental, industrial, semiconductor, forensic). Both approaches are useful.

To summarize this is a well written, well expressed, well integrated, and well-edited volume. It more than a book on

Table 1. Chapters, Authors, and Pages

Chapter	Title	Authors	Pages and References
1	An Introduction to ICP Spectrometries for Elemental Analysis	Montaser, McLean, Liu, Mermert	1-31 (31) 54
2	The Art and Science of Microwave Sample Preparation for Trace and Ultratrace Elemental Analysis	Kingston and Walter	33-81 (50) 55
3	Sample Introduction in ICPMS	Montaser, Minnich, McLean, Liu, Caruso, McLeod	83-264 (182) 601
4	Plasma Generation in ICPMS	Turner and Montaser	265-334 (69) 141
5	Fundamental Aspects of Sample Introduction in ICP Spectrometry	Montaser, Minnich, Liu, Gustavsson, Browner	335-420 (86) 202
6	Instrumentation for Low- and High-Resolution ICPMS	Turner, Mills, Schröder, Lapitajs, Jung, Iacone, Haydar, Montaser	421-501 (81) 125
7	Analytical Characteristics of ICPMS	Horlick and Montaser	503-613 (111) 363
8	Fundamental Considerations in ICPMS	Douglas and Tanner	615-679 (65) 133
9	Novel Applications of ICPMS	Taylor, Huff, Montaser	681-807 (126) 516
10	Mass Spectrometry with Mixed-Gas and Helium ICPs	Montaser and Zhang	809-890 (82) 231
11	Mass Spectrometry with Microwave-Induced Plasmas	Zhang, Montaser, Zimmer, Vela, Caruso	891-939 (49) 91

ICP-MS, it's a basic book on current spectrochemical analysis, since many of the early chapters examine background topics including sample preparation and sample introduction. Fundamentals of the plasma and MS instrumentation are also current. The contents are contemporary at the time of preparation, but some specific instrument descriptions will be soon dated in the rapidly developing instrument environment. Owing to the extensive coverage and numerous authors, some material is duplicated and cross references among some section is missing. Furthermore, a few inescapably omissions are significant. For example, the work of Moino et al. [1], who apply an atmospheric pressure microwave induced plasma ionization source for molecular analysis, is missing from Chapter 11. This highly recommended volume should be added to Date and Gray's *Introduction to ICP-MS* and Jarvis, Gray, and Houk's *Handbook of Inductively Coupled Plasma Mass Spectrometry* in every professional ICP-MS library collection. It's a remarkably good value for the price.

[1] M. Moino, M. Xia, J.B. Stewart, and B. Hormann, Atmospheric Pressure Microwave Induced Plasma Ionization Source for Molecular Mass Spectrometry, *J. Am Soc. Mass Spectrom.*, 9, 42-49 (1998).

Stable Isotopes in Human Nutrition. Edited by Fred Mellon (Norwich Laboratory, Norwich, UK) and Brittmari Sandström (Royal Veterinary and Agricultural University, Frederikberg, Denmark). Academic Press: San Diego, 1996. xiv + 156 pp. \$56. ISBN 0-12-490540-4.

This concise volume serves as a handbook on stable isotope methods for studying inorganic nutrient metabolism in humans. Comprising 13 brief chapters in 5 parts (i.e., Nutrition Techniques, 4 chapters; Sample Handling and Preparation, 2 chapters; Quantification of stable isotopes, 6 chapters, and Future developments, 1 chapter), this edited volume provides a introductory background for stable isotope measurements in human nutrition. It should be read by all chemists, biologists and nutritionists involved or interested in stable isotope research and planning stable isotope studies. The dominant inorganic nutrients (Ca, Mg, Fe, Zn, Cu, Se, Cr,

and Mo) are targeted. Topics include isotope methods and nutrient metabolism overview (chapter 1), methods for studying inorganic nutrient absorption and metabolism (chapter 2), inorganic nutrient labeling (chapter 3), study techniques (chapter 4), sample storage and safe handling (chapter 5), sample collection and preparation (chapter 6), stable isotope quantification by neutron activation analysis (chapter 6), mass spectrometry (Chapter 8), EIMS (chapter 9), FABMS (chapter 10), TIMS (chapter 11), ICP-MS (chapter 12 written by H. Crews et al.), and future prospects (chapter 13). Considering the "recent shift towards conducting nutritional research at the molecular level," the authors address approaches and techniques of an earlier decade. The prospect for hyphenated separation with ICP and ES MS approaches in extending isotope methods is recognized, however. In summary this is a useful volume for all who are undertaking nutritional studies.

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been regarded as cancer chemopreventive agents. The potential utility of selenium supplementation in the diet, however, is limited by its toxicity. More recent reports have suggested that selenomethionine should be better than selenite for nutrition supplements because it is less toxic. On the other hand, while L-amino acids are the only ones of biological origin, D- and L- enantiomers are usually produced and they display different absorption, kinetics and metabolic pathways in living organisms. Therefore, analytical resolution of selenomethionine into their D- and L- enantiomers for nutritional purposes and Se metabolism studies is of great interest these days.

In recent years chiral liquid chromatography using β -CD columns has been shown to allow direct optical resolution of a number of N-derivatives of amino acids, particularly OPA and NDA fluorescent derivatives [1,2].

In this paper OPA and NDA amino acid derivatives are investigated comparatively for Selenomethionine and DL quiral discriminations on a β -CD bonded phase using

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