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Book Review

Inductively Coupled Plasma Spectrometry and Its Applications, Sheffield Analytical Chemistry, Vol. 1, Steve J. Hill (Ed.), Sheffield Academic Press, Sheffield, UK, 1999, 370 pp. ISBN: 1-85075-936-7. Price: £89.00 (cloth)

The inductively coupled plasma (ICP) is arguably the most important spectroscopic source for elemental analysis developed over the past three decades. After considerable development and application as an emission source, it was then modified to take advantage of the high level of ionization in the hot plasma, and the hugely successful ICP mass spectrometry came into prominence. While ICP-MS has numerous advantages over ICP-AE, the simplicity and lower cost of the latter method has sustained its popularity even while ICP-MS was becoming the more glamorous of the two, based on ultratrace detection limits, isotopic capability, and complete elemental coverage. Still, ICP-AE occupies an important echelon in elemental analysis.

Stephen Hill, a professor of analytical chemistry at the University of Plymouth, has assembled an impressive lineup of authors to review the current status of ICP techniques. The ten chapters of this book show all the advantages and limitations of edited works. Each of the authors is indeed an expert in some aspect of ICP spectroscopy and has produced a chapter that takes advantage of the specialized learning of the author(s). The curse of edited volumes, apparent here to a less than flagrant level, is that all pieces of the book do not converge to form an integrated, harmonious monograph. But, it is a worthy effort, and a book that analytical spectroscopists will want to be sure is available in their library.

The intention of the editor is that his writers assume “no prior knowledge of subject areas,” a noble and semisuccessful initiative. For the most part, clear

introductions and coherent descriptions of the various ICP topics are found. Many of the sections will be sufficiently qualitative that the reader will wish to consult the references or more in-depth treatment of the topic, but this is more expected than not, given the range and depth of explication required for a comfortable understanding.

A sparkling introduction chapter by A. Greenfield and M. Foulkes takes advantage of the former's experience with ICPs going back over 35 years. Some of the anecdotes and spectroscopic war stories make this required reading. Next, J.M. Mermet provides an in-depth discussion of ICP fundamentals, drawing upon a rich and detailed literature of complementary and sometime conflicting measurements. His sorting and summarizing of an often overwhelming body of literature is quite successful. A. Fisher and S.J. Hill take on the task of reviewing ICP-AES instrumentation in 24 pages of text, a considerable challenge. R. Browner draws upon his extensive experience in sample production studies to analyze the many approaches investigators have pursued to convert a solution sample into a satisfactory aerosol.

Moving next to the ICP as an ion source, G. O'Connor and E.H. Evans produce a somewhat spare chapter that bills itself as embracing fundamentals, but devotes most of its coverage to the important area of mass spectrometric instrumentation. Next, F. Vanhaecke, L. Moens, and P. Taylor devote 62 pages to convincing readers that ICP-MS really can be competitive for isotope ratio measurements, which increasingly appears to be the case. The next chapter by S. Hill et al. discusses the use of alternative ICP plasmas, which have been of more theoretical than practical interest, and they also very briefly review alternative sample introduction systems. The final

three chapters of the book treat ICP applications, including environmental by K. Sutton and J. Caruso, geological by D. Miles, and food sciences by P. Robb et al. The last of these serves as a fine example of why so many ICP systems are being sold. The techniques are simply reliable, workhorse methods that do things no others can match.

The volume is a must-read for anyone starting off in ICP spectroscopy, and it would not hurt more

experienced analysts to have this book readily available close to their instruments. The editor and the authors have a right to be pleased with themselves.

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