

## BOOK REVIEW

John Allison,<sup>1</sup> Ph.D.

### Review of *Understanding Mass Spectra: A Basic Approach*

---

**REFERENCE:** Smith RM, *Understanding Mass Spectra: A Basic Approach*. In: KL Bush, technical editor, John Wiley & Sons, Inc., New York, 1999, 290 pp., \$64.95.

With more than 20 years of experience in the teaching of mass spectral interpretation to chemists in the health, environmental, and forensic fields, R. Martin Smith has done an excellent job (with the help of Prof. Ken Busch as technical editor) with this introductory book on mass spectrometry (MS) and spectral interpretation. Rather than attempt to cover the entire field, he focuses on electron ionization (EI), instruments that use this ionization technique, and the spectra that result. In writing a book on EI/MS, it is very difficult to not be, in some way, derivative of Fred McLafferty's *Interpretation of Mass Spectra*, historically the most important book in this field to date. Smith covers the basics, creates new "basics," and offers a text that will be competitive with the best. *Understanding Mass Spectra* contains chapters on "Isotopic Abundances," "Ionization, Fragmentation and Electron Accounting," "Neutral Losses and Ion Series," "Alpha-Cleavage," and "Important Mass Spectral Rearrangements," the key topics of this field. However, Smith's work also offers unique and important chapters such as "Writing Mass Spectral Fragmentation Mechanisms" and "Structure Determination in Complex Molecules Using Mass Spectrometry."

<sup>1</sup> Professor of Chemistry, Co-Director, MSU Mass Spectrometry Facility, Michigan State University, East Lansing, MI 48824-1322.

I found this book enjoyable to read for many reasons. First, it is scientifically clean, crisp, and precise. The words and terms of the discipline are being used by an expert. Second, the examples are related to Smith's experiences in forensic science, so there is a theme to the book. Through the mass spectra of barbiturates, stimulants, drug metabolites, and a substantial collection of interesting compounds, Smith not only guides readers through the art and science of interpretation, but makes new contributions as well.

The creation of any book is a major task, and no one expects a flawless work. There are a few points of frustration for readers, which will hopefully be taken care of in subsequent editions. In the chapter on isotopic abundances, lists of isotopic variants are difficult to read; they are imbedded in the text, rather than in tabular form. Some figures have been reduced to the point where one cannot distinguish between labels on ions indicating the charge site and the unpaired electron. However, such problems are minor.

This book is obviously important from the standpoint of forensic science, but it should also become popular in all disciplines that use MS. Certainly this would be a good book to use to teach mass spectrometry in a Chemistry or Biochemistry department—the examples discussed provide an appropriate, interesting, and important theme through which interpretation procedures are presented.

It should be pointed out that John Wiley and Sons carries more than a dozen books in the field of mass spectrometry, ranging from introductory texts to specialized applications. *Understanding Mass Spectra: A Basic Approach*, is a very nice addition to their offerings, and Dr. Smith is to be commended for his work.