Book reviews

Element Speciation in Bioinorganic Chemistry

S. Caroli (ed.)
John Wiley and Sons, Chichester, 1996
474 pages: £75.00
ISBN 0-471-57641-7

Elemental speciation is now not only considered vital in many areas of chemistry, but is the subject of more and more research papers both at conferences and in the literature. It is therefore not surprising that an increasing number of books have been published on this topic recently. This particular volume, I feel, is one of the better of those I have seen, although somewhat ambitious in terms of content given that it attempts to cover more than the title suggests.

This is Volume 135 in a series of monographs on analytical chemistry and its applications. Like many other books in this series it is an edited collection of contributions, in this case from a group of no less than 29 authors largely chosen from workers in Italy and Spain. The book is structured into 13 chapters covering both instrumental developments and applications of speciation. The first five chapters discuss both the importance of speciation studies and the various methods that have been developed to determine individual species. Thus, for example, methods of separation (e.g. selection extractions, derivitization procedures, selective volatilization and the more common chromatographic approaches) are covered. Detection methods are also discussed in some detail, with a particular emphasis on electrochemical methods such as anodic stripping voltammetry, neutron activation analysis, radiotracer methods and coupled chromatography with ICP–AES. Surprisingly, however, the role of ICP–MS—although mentioned briefly in various parts of the book—is not particularly prominent. The sixth chapter deals with quality control in speciation analysis. The inclusion of this topic is most welcome since, whilst few would doubt its importance, it is often overlooked or poorly presented in published text. The authors of this section are well-known authorities with much experience of working within the EC Standards, Measurement, and Testing programme. The section is well written and reviews the principles of quality assurance, potential sources of error and a number of specific examples of method validation in speciation studies. The final chapters are more element-specific and discuss aluminium and silicon speciation in biological materials, organotin compounds in both marine organisms and coastal environments, chromium and selenium in natural waters, and arsenic speciation and health. There are also chapters on trace-metal complexation in seawater and the speciation of trace elements in milk.

Overall the book is well presented with many useful tables and figures. Although I would recommend it to anybody with an interest in elemental speciation, it does have some negative features. For example, there is a degree of repetition, with some information being given in more than one chapter. In addition, although the book is well referenced, most of the references are now a little dated. An example is the chapter on new methods of speciation analysis, where only eight of the 113 references cited are post-1988. Thus many recent and important advances are omitted. There is also a general tendency for the authors to look back rather than offer an insight to the potential of speciation studies in the field of bioinorganic chemistry in the future. However, that said, the material that is included is informative, with details of both the advantages and disadvantages of the various techniques and applications described. Perhaps any book that claims to be 'a complete reference for the analytical and instrumental aspects of speciation' is going to fall short of its aims, since the subject area is now so vast. However, this is still one of the best books around on this topic and one which I am sure will find its way onto the book shelves of both established workers in elemental speciation and those who are venturing into this area for the first time.

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Industrial Organic Chemicals

Harold A. Wittcoff and Bryan G. Reuben
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This book provides a comprehensive, well-organized and up-to-date picture of how organic chemicals and polymers are produced. It also indicates the major uses for these substances. The first chapter explains the importance of the chemical industry to the economies of the developed nations with particular reference to the USA, where it provides the greatest added value in manufacturing with the third largest annual revenue after food and transportation equipment. Key international characteristics of the industry, including maturity, capital intensity and the growing importance of competition from developing countries such as Saudi Arabia and Canada are discussed. Much informative numerical data are provided in this chapter, including a table of the world's top 30 chemical companies, listing sales and profitability in 1993.

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