

Book reviews

Advances in Metal Carbene Chemistry

U Schubert (ed)

NATO ASI Series, Series C: Mathematical and Physical Sciences, Volume 269.

Kluwer Academic Publishers, Dordrecht/Boston/London, 1989.

xiv + 407 pages. \$114.00 (USA), £64.00 (UK), Dfl 200.00.
ISBN 0 7923 0156 0

This interesting book, the proceedings of the NATO Advanced Research Workshop on Transition-Metal Carbene Complexes held in 1988, contains a wealth of information on carbene complexes presented by leaders in the field.

It opens with a brief review of the area which is followed by an account by E. O. Fischer of the early days of transition metal-carbene complexes. Some 41 papers are then presented which include data on carbene to carbene conversions at dimetal centres, methylene complexes of ruthenium, osmium and iridium, cyclizations of alkynes and carbenes, electron-rich alkenes as sources of carbenes, carbenes from isocyanides, hydrocarbenes, carbene complexes in the development of polymer-supported coordination chemistry and many other interesting topics. A good proportion of the book is concerned with the uses of metal carbene complexes in organic synthesis.

The volume is produced from camera-ready manuscripts and the result is of a good standard.

This is an excellent treatise of an important topic; all libraries and workers in the field should have a copy.

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Environmental analysis using chromatography interfaces with atomic spectroscopy

Roy M Harrison and Spyridon Rapsomanikis (eds)

Ellis Horwood Series in Analytical Chemistry, Ellis Horwood, Chichester, 1989

£59.50. ISBN 0 853129797.

The subject material described by the title might suggest a rather specialized work of deep interest to a few but of little relevance to many. In fact this is not the case. Analytical chemistry has recognized that a calcu-

lation of the concentration of a compound in terms of the metal concentrations alone is not enough. It is necessary to know the *chemical* identity of the metal in addition to its gross concentration, e.g. whether the known amount of mercury present exists as inorganic mercury(II), mercury metal or methylmercury. This further refinement of analysis is known as speciation. In environmental terms it is particularly important; some arsenic compounds are very toxic, but some have very little toxicity. We do really need to know *what* is there, as well as *how much*.

In order to speciate, chemical derivatives of the same element need to be separated, e.g. Bu_3Sn^+ from Bu_2Sn^+ , etc. In addition to this, many of the chemical species of environmental interest are present in intractable, non-volatile forms. Often they need to be released from strong binding to environmental material (e.g. algae, sediment, biota, etc.), derivatized to a more stable form (e.g. by conversion to hydrides) without loss of original chemical structure, and then separated from each other prior to detection. This very often involves liquid and gas chromatography and atomic spectroscopy. Hence the origin of this book.

It can be briefly said that the subject material is covered widely, clearly and authoritatively. Sufficient technical detail is included to enable the interested reader to construct the required systems in his own laboratory. The various drawbacks, alternatives and methodologies are described very competently. There is no doubt that workers already in the field will need to obtain a copy of this book.

The task of this review is more to convey the necessity of the speciation approach to a wider audience, and hence to encourage them to purchase this work. It can be repeated that it is now insufficient to detect only a single elemental concentration in a compound. Wide ranges in toxicity and other properties exist for the same element in different oxidation states or with different ligands. In order to assess the importance of an element in a given situation we need to know its full chemical identity. This is the message towards which this book is moving. For full identification, coupling of chromatography with mass spectrometry is required, but linkage of chromatography with atomic absorption usually speciates beyond much doubt. The book is useful and important and would be valuable to very many analytical chemists. It is not unreasonably priced.

Chapter details are as follows (some titles are abbreviated): Basic principles (S. J. De Mora), Atomic absorption (C. N. Newitt), Flame photometry (S. Kapila, D. O. Duebelbeis, S. E. Manahan and T. E.