inert matrices at low temperatures or in gas-phase beams, and the small metal particles that achieve such wonders as supported metal catalysts.

This book, a collection of review chapters by specialists in various aspects of metal cluster chemistry, will help our understanding by providing insight into such issues, and by functioning as a useful source of information on many of them, not only for the newcomer to the area (who may find rather too much background knowledge is assumed) but also for the specialist in one aspect who needs to be briefed on developments elsewhere. It begins with a frustratingly short introductory overview by the editor, followed by two chapters in which a discussion of the computational methods available to treat cluster bonding in detail (R.C. Baetzold) rather surprisingly precedes a discussion of cluster shapes (D.H. Farrar and R.J. Goudsmit) where we learn that simple bonding treatments have considerable value. (One might have expected the detailed treatment to follow the qualitative discussion.) This latter chapter and the two that follow it, by A.J. Poë on metal carbonyl cluster reaction kinetics and by J.S. Bradley on organometallic cluster chemistry (including homogeneous catalytic aspects) will be of particular interest to readers of this journal, who will find them clear, helpful and authoritative. Later chapters deal with the characterisation of gas-phase (J.L. Gole) and matrix-isolated (M. Moskovits) metal clusters (a useful complementary pair), and with supported heterogeneous catalytic systems that again provide particular interest for the organometallic chemist. P. Gallezot discusses the use of zeolites as supports for metal clusters small enough to be accommodated in their cavities, while A. Brenner and B.C. Gates, in separate chapters with apparently common objectives, provide different perspectives on other types of supported metal cluster catalysts.

Altogether, these surveys add up to a useful contribution to the development of cluster chemistry, particularly that of the later transition metals. Its value to cluster chemists in general will be limited by the topics it does not cover. Though the omission of boron clusters as explained by the editor is readily intelligible – boron is not a metal anyway – the failure to discuss the cluster chemistry of such main group metals as germanium, tin, lead, antimony and bismuth is surprising. Even more so is the absence of discussion of the metal halide clusters formed by early transition metals, an important class of compound that provides materials with useful exploitable bulk properties when the cluster units are stacked in extended columns or arrays. Another disappointing omission is that of the metal sulphide clusters that feature so prominently in biological systems and which have attracted so much attention recently. These omissions apart, this volume will prove helpful to cluster and organometallic chemists.

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Infrared and Raman Spectra of Inorganic and Coordination Compounds, by K. Nakamoto, 4th edition, Wiley–Interscience, New York, Chichester, Brisbane, Toronto, Singapore, 1986, xi + 484 pages, £52.75, ISBN 0-471-01066-9.

For over twenty years Nakamoto was undoubtedly the standard against which all

books concerning the vibrational analysis of inorganic compounds were judged. Thus, the appearance of this fourth edition (yes, it really is nine years since the third edition was published) is a welcome addition to the library shelves. Of course, all the regular features are there: the opening section remains the definitive treatment of the theory of normal vibrations, the second section describes the vibrational analysis and spectra of simple inorganic compounds of stoicheiometry XY_n ($n = 2$, 3, 4, 5, 6, 7 or 8) and X_2Y_m ($m = 4$, 6, 7, 8, 9 or 10), and the third concentrates on the vibrational spectra of complexes of a wide range of common ligands (including ammines, amines, pyridines, bipyridines, porphyrins, water, alcohols, carboxylic acids, amino acids, carbonates, 1,3-diketonates, cyanides, CO, NO, N_2, O_2, hydrides, phosphines and Group 16 donor ligands) and metal–metal bonded species. The (rather short) organometallic section (only 36 pages) is surprisingly little changed since the third edition, and contains only a handful of post-1980 references. The new and final section is devoted to bioinorganic compounds, but this again is brief (35 pages), citing only 96 references. Indeed, with the exception of this last interesting and useful section and the new cover, one could be forgiven for believing that this volume has not evolved significantly since the previous edition. There are undoubtedly new references (particularly in the section on coordination compounds), but the overall impression is of déjà vu.

I'm afraid that this edition is rather disappointing; maybe it's because one's expectations are so high. The experience of reading this book may be compared with meeting an old friend from your undergraduate days, ten years on: you look forward to the meeting, and indeed enjoy the first hour of reminiscence, but by the end of the evening you are wondering why he hasn't matured, grown and changed with the times. Nakamoto now appears decidedly old-fashioned, and some of the sparkle has gone. The new edition (with the exception of the last section) is updated rather than rethought and developed. It is still valuable, but no longer invaluable. The recent book by Weidlein, Müller and Dehnicke ("Schwingungsfrequenzen II: Nebengruppenelemente", Georg Thieme Verlag, Stuttgart, 1986) will, I am sure, become more dog-eared than the new edition of Nakamoto (albeit serving a very different purpose). Nakamoto remains very good value for money, exceptionally well written, and an excellent text for graduate students. However, Lever's recent edition of "Inorganic Electronic Spectroscopy" (Elsevier, Amsterdam, 1984) has shown the pinnacle to which follow-up editions can aspire; it was more of a companion volume than an update. I hope that the fifth edition of Nakamoto will reach similar heights but, even if the fourth edition is a little disappointing, it must still be considered as the standard book upon vibrational analysis for inorganic chemists.

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Structural Chemistry of Boron and Silicon. Springer, Berlin, Heidelberg, 1986, 195 pages. DM 118.00. ISBN 3-540-15811-1.

The main chapter (91 pages) in this monograph (Volume 131 of the series *Topics*