

Book reviews

Clusters. Structure and Bonding 62, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1985, v + 161 pages, DM98. ISBN 3-540-15731-X.

In a series in which the title of a volume is frequently a poor reflection of its contents, this book comes as close as any to bearing an accurate label. The volume contains three reviews, each quite excellent; they describe, respectively, metal–metal multiple bonds, recent developments in transition metal cluster chemistry, and the spectroscopic properties of the quasi one-dimensional tetracyanoplatinate(II) compounds. The first review (F.A. Cotton and R.A. Walton, 49 pages, 188 refs.) is a welcome update of the authors' recent book ("Multiple Bonds between Metal Atoms". Wiley, 1982); it deals comprehensively with ditechneium, dirhenium, ditungsten, diruthenium and diosmium chemistry, and more briefly with other related areas. Particularly fascinating are the latest advances in the understanding of the electronic structure of the diatomic $[M_2]$ ($M = V, Cr, Mo$ or Ru) molecules. Although one might quarrel with the concept of a dinuclear cluster (can two people form a crowd?), this review is of the high quality that one expects from these authors, revealing their flair and insight, and should be on the private bookshelves of all workers in the field.

The second review (G. Schmid, 35 pages, 132 refs.), subtitled "The Way to Large Clusters", is a rather personal view of the subject, with much attention being focused on $[Au_{55}(PPh_3)_{12}Cl_6]$, and its rhodium, ruthenium and platinum analogues, $[M_{55}(ER_3)_{12}Cl_{20}]$ ($E = P$ or As), compounds currently under active investigation in Schmid's laboratories. Indeed, the high resolution transmission electron microscopy images of $[Au_{55}(PPh_3)_{12}Cl_6]$, previously unpublished, are really quite superb. The review is not comprehensive, but neither is it meant to be. It will be most helpful to established workers in the field, but should probably be avoided by novices.

The final review (G. Gliemann and H. Yersin, 67 pages, 181 refs.) deals exclusively with the spectroscopic properties of the quasi one-dimensional tetracyanoplatinate(II) compounds, $M_x[Pt(CN)_4] \cdot nH_2O$ ($M = Na, K, Ba, Mg, Eu, etc.$). In addition to the discussion of their crystal and electronic structures, and the variable temperature polarized spectroscopic studies, the effects of high pressures and magnetic fields are also considered in some detail. This review is timely, well written and profusely illustrated, but could have been improved by the addition of a general conclusion and overview at the end of this otherwise excellent article.

In conclusion, then, this volume shows the series of "Structure and Bonding" in its best light. This book is professionally produced (type-set and justified) with high quality illustrations, contains lucidly written and definitive reviews on related subjects, and is reasonably priced (despite the current exchange rate). It should be in all chemistry libraries and on many private bookshelves.