

generalizations, badly executed diagrams, errors of fact. For example, Fig. 4.6, the electron density section through the (100) plane of sodium chloride, looks as if it has been drawn free-hand. Not one of the ions has anything like fourfold symmetry and the inner density of the sodium ions is elliptical. This is inexcusable when good examples are available, such as in McKie and McKie's *Crystalline Solids*. On the facing page the diagram for sodium chloride would strike the unbiased observer as monoclinic, as would that of copper, Fig. 4.8.

A complete list of such blemishes would be too long for this review but here are a few of the more blatant examples: p. 3, '... practically the whole of solid matter is crystalline', and the angle between crystal faces is called a 'solid angle'; Fig. 3.8 does not contain the points *A, B, C, D* referred to in the text; p. 78, graphite is said to be obtained 'by burning some organic material chemical'; p. 98,  $\text{ClO}_4^-$  is referred to as the chlorate ion; p. 110, a solid containing 1 p.p.m. impurity is said to contain '10<sup>23</sup> impurities per cubic meter'; the *Glossary*, p. 134, on *Unit Cell*: 'Generally the smallest is chosen'. (The student reader may wonder why this 'generalization' seems largely inapplicable to the examples given in the book itself, most of whose cells are non-primitive.)

The chapter on disorder contains 'neutron diffraction patterns' of vitreous silica and of crystalline  $\text{NH}_4\text{H}_2\text{PO}_4$ . This comparison is made obscure by the fact that no explanation is offered as to the difference in diffraction effects between single crystals on the one hand and crystal powders or amorphous materials on the other. Moreover, why compare such disparate samples? Surely a comparison of the diffraction (neutron or X-ray) from, say, amorphous silica and powdered quartz would have been far more telling?

Although this little book has some good material in it, it is a disappointment. With clearer exposition and better production it could have been very good.

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**Coordination chemistry reviews: Vol. 34. Main group chemistry review, 1979**, edited by D. B. SOWERBY, pp. viii + 467; **Vol. 35. Transition-metal chemistry review, 1979, Part A**, pp. 268 and **Vol. 37. Transition-metal chemistry review, 1979, Part B**, pp. 339, edited by C. D. GARNER & K. R. SEDDON. Elsevier, 1981. Price: Dfl 210 for Vol. 34, and Dfl 210 for Vols 35 and 37 together.

These three volumes are aimed to provide a reasonably comprehensive coverage of literature on the coordination chemistry of the main-group elements that appeared in 1979 and of *d* transition elements that appeared during late 1978 and 1979.

Vol. 34 is the second of the annual reviews of the chemistry of the main-group elements, published in *Co-*

*ordination Chemistry Reviews*. In comparison with the 1978 volume, the current volume shows greater activity during 1979 in the chemistry of the elements of Groups III and V. Topics described in detail are preparative techniques, spectroscopic and structural properties, and reaction chemistry.

Vols 35 and 37 aim to provide a complete review of the coordination chemistry of all the *d* transition elements. Of these, Vol. 35 treats the coordination chemistry of Fe, Ru, Os, Co, Rh, Ir, Pd, Pt, Cu, Ag and Au, while Vol. 37 covers Sc, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Ni, Zn, Cd and Hg. Developments in the coordination chemistry of these transition elements and current topics, inclusive of metal carbonyls, metal-to-metal bonds, metal-atom clusters, transition-metal compounds with bonds to hydrogen and carbon, and biological systems, are described in detail.

There are some inconsistencies of presentation in the three volumes, and abbreviation of the ligands is not necessarily consistent with IUPAC rules. However, these reviews will be of great value: for example, on the coordination chemistry of Mo, which has been extensively studied in recent years, the reports appear in many different journals; if researchers wish to know about the coordination chemistry of Mo, they must read a vast number of research papers appearing in many journals – a tremendously time-consuming task; fortunately, as these review volumes have been organized element by element, and a wide range of the information that appeared in the period is summarized compactly, researchers can fulfil such requirements without much labour. Consequently, these three volumes serve as an extensively useful bibliography for researchers in the fields of chemistry and materials science.

At the present time it is well known that X-ray and neutron diffraction methods have been widely utilized in the study of inorganic chemistry. Without the popularization of X-ray crystallography, inorganic chemistry would never have seen such a dramatic development in recent years. X-ray crystallography is now indispensable for the characterization of compounds and has provided a sound basis for the studies of model systems for oxygen carriers, Jahn–Teller systems for  $\text{Cu}^{II}$  complexes, metal chelates of macrocyclic compounds, crown ethers, and cryptates, etc., described in these volumes.

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**Structure and bonding. Vol. 44. Metal complexes.** Edited by M. J. CLARKE *et al.* Pp. 202. Berlin, Heidelberg, New York: Springer-Verlag, 1981. Price DM 96.00, US \$50.40.

This volume of the irregularly published series *Structure and Bonding* comprises two articles on structural aspects of metal complexes. The first is a summary of *Crystallographic Studies of Transition Metal Hydride Complexes* by Ray-