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Book reviews

Inorganic Chemistry Concepts, Vol. 6. Inorganic Stereochemistry, by D.L. Kepert, Springer-Verlag, Berlin; 227 pages, DM 154.

Inorganic molecules can adopt shapes varying widely in coordination number and detailed geometry. In attempting to explain the observed structures, Prof. Kepert starts from Nyholm and Gillespie's qualitative assumption that the stereochemical arrangement of ligands about a central atom is determined by the mutual repulsion between the valence shell electron pairs. He puts this on a quantitative basis by considering that this repulsion acts between the effective centres of the bonds, which are empirically determined positions found to be dependent not only on atom sizes but also their relative electronegativities. Multidentate ligands are considered to be rigid. The total repulsion energy can then be calculated for any given ligand arrangement.

The various idealised polyhedra and permutations of unidentate and polydentate ligand arrangements possible are reviewed. There are then separate chapters for each of the coordination numbers from 4 to 12, with detailed discussion of the molecular geometries observed by diffraction techniques for that coordination type and tabulations of the stereochemical parameters derived from them. For coordination numbers with alternative polyhedra the calculated potential energy surfaces are illustrated, giving an immediate visual estimate of the ease and nature of the possible interconversions.

Prof. Kepert has presented a detailed analysis of this simple theory of coordination geometry and shown how it can rationalise the deviations from idealised geometry seen in inorganic molecules. For anyone interested in inorganic stereochemistry this volume will provide a wealth of information.

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PETER B. HITCHCOCK

Gmelin Handbook of Inorganic Chemistry, 8th Edition, *Uranium Supplement Vol. A5 "Spectra"*. Springer-Verlag, 1982, DM 717, 269 pages.

This book has been produced by W.T. Carnall, Hannah M. Crosswhite, Henry M. Crosswhite, H.R. Hoekstra, D.J. Lam, B.W. Veal, and B. Kanellakopulos, with Dr. C. Keller supervising scientific co-ordinator for the whole of the Uranium Supplement Volumes, of which this is now the 17th.

This volume will be of only minor interest to practitioners of organometallic chemistry. The topics under discussion relate to various types of absorption and emission spectra of uranium and its compounds covering the following spectroscopic techniques: atomic, absorption and luminescence, X-ray, photoemission,

electron paramagnetic resonance, nuclear magnetic resonance, and Mössbauer. However, there is very little organometallic chemistry, for example, no NMR or PES of organometallic compounds. Nevertheless, there are short sections dealing with some IR data of tricyclopentadienyluranium compounds and a few related complexes, and a brief mention of their electronic spectra. In companion volumes, Uranium Supplement Vols. E1 and 2 (co-ordination compounds) which were published in 1979 and 1980, there is a little further information.

The book is published in English and is of the usual high standard to be expected in this series.

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