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Book Reviews

Advances in Inorganic and Bioinorganic Mechanisms, Vol. 1. Editor A.G. Sykes. Academic Press, London, 1982, pp. 420, US $67.00.

The avowed aim of this new series is to provide a forum for critical and authoritative reviews in the area of inorganic mechanisms, and especially to cover the area of bioinorganic mechanisms. Certainly, this first volume provides an interesting preview of what this series might generate.

"Reactions and Reaction Mechanisms of Organochromium (III) Complexes" (J.H. Espenson, 63 pages, 153 refs.) deals with the wide variety of reactions of $L_5Cr(III)R^{2+}$ derivatives including synthesis, unimolecular homolysis of the Cr–C bond, acidolysis, accelerated *trans* substitution, reactions with electrophiles etc. "Oxidation–Reduction and Substitution Reactions of Iron–Sulphur Centres" (Fraser Armstrong, 55 pages, 167 refs.) has a much stronger bioinorganic flavour dealing primarily with the range of cluster Fe–S ferredoxins. Structural characteristics, redox reactions (electron transfer), cluster transformations and extrusions are all covered in detail. "Functional Properties of the Biological Oxygen Carriers" (A.G. Sykes, 57 pages, 169 refs.) is especially interesting, covering the range of vertebrate and invertebrate oxygen carriers. Special attention is paid to the known structural and electronic characteristics of the various carriers, and with their detailed reaction with molecular oxygen. "Substitution Reactions of Oxo–Metal Complexes" (Kazuo Saito and Yoichi Sasaki, 37 pages, 176 refs.) considered oxo species of Ti(IV), V(IV), V(V), Cr(VI), Mo(V), Mo(VI), W(VI) and U(VI). Attention is paid to ligand substitution processes, acid–base reactions, with a view to stimulating research into this rather neglected area of kinetics.

"Rates and Mechanism of Reaction for Elements in Groups I–III" (J.C. Lockhart, 51 pages, 140 refs.) considers kinetic data available for alkali and alkaline earth systems, and boron. Much of this deals with the macrocyclic ethers and with their rates of association, dissociation and transport through membranes, and emphasizes the accomplishments of recent years with the advent of faster reaction techniques. "Mechanistic Aspects of Transition Metal Complexes containing Coordinated Sulphur" (Edward Deutsch, Michael J. Root and Dennis L. Nosco, 120 pages, 296 refs.) is the longest chapter in the book and contains a wealth of information. Oxidation–reduction reactions and substitution reactions are covered and an extraordinary quantity of kinetic information is provided. These include data for making

and breaking M–S bonds, protonation at S, Lewis basicity, S-alkylation and dealkylation, etc. Although a vast number of sulphur ligands are considered, data are restricted almost entirely to Co(III) and Cr(III), but with some contributions from Ru, Fe, Ni and Cu. A useful X-ray structural section is included. The shortest review "Reexamination of the $Co(NH_3)^{3+/2+}$ Self-exchange Rate" (D. Geselowitz and Henry Taube, 16 pages, 54 refs.) reconsiders kinetic data relating to self exchange in Co(III) amines. This historical presentation and critical survey emphasizes the problems involved in obtaining unequivocal data for such a "simple" system, and indicates that problems remain to be solved.

The book is well designed with clear type. It possesses a moderate subject index, but no author index. Obviously this new series must be on the shelves of any serious inorganic kineticist.

The Editor's Desk

The Coordination Chemistry of Metalloenzymes: The Role of Metals in Reactions Involving Water, Dioxygen and Related Species, by I. Bertini, R.S. Drago, and C. Luchinat. Reidel, Dordrecht, 1983, Dfl.130/US $56.50, ISBN 90-277-1530-0.

This book contains a collection of papers delivered at the NATO Advanced Study Institute held at San Miniato, Italy, May 28 to June 8, 1982. The content of the majority of these papers concerns zinc-, copper- and iron-containing enzymes. We find an interesting variety of contributions describing a considerable array of techniques currently used to probe the chemical, electronic and structural properties of these complex biological molecules. From the work described here one obtains not only a reasonable overview of general methods in bioinorganic chemistry, but also, through several detailed examples, a grounding in the specific application of such techniques as: the use of a series of axial ligands to provide binding information; the isomorphous replacement of native metal ions with metals of greater spectroscopic utility; the extensive use of model compounds to aid in mechanistic arguments; and, finally, the use of kinetic measurements. The order within the book is such that the three main areas covered are introduced with one or more articles of a general nature, these are then followed by more detailed research papers. The result of this approach is to provide some depth where the same enzymes are discussed in two or more papers. The review articles by I. Bertini on zinc enzymes, S. Lindskog et al. on carbonic anhydrase, M. Zeppezauer on liver alcohol dehydrogenase, B. Reinhammar on blue copper-containing oxidases and S.I. Chan et al. on