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Coordination Chemistry Reviews
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COORDINATION CHEMISTRY REVIEWS

Book Reviews

Braving the Elements, by Harry B. Gray, John D. Simon and William C. Trogler, University Science Books, Sausalito, CA, 1995, ISBN 0-935702-34-2 (paperback)

A literally charming book that is hard to put down. Full of useful and fascinating information about the role of chemistry in our lives. It contains everything you have ever wanted to know and more besides! The innumerable topics include vision, chemotherapy, insecticides, detergents, vaccines, acid rain and the lakes, explosives and chemical weaponry, rubber and textiles, atmospheric chemistry, smog and global warming, nuclear chemistry and Three Mile Island, and much more — all written in an engaging style with a strong historical emphasis. An ideal book for chemists, for families with inquisitive children, and everyone else who just wishes to know how chemistry affects their lives.

Stereochemistry of Coordination Compounds, by Alex von Zelewsky, John Wiley and Sons, New York, 1996, 254 pp, US$24.95, ISBN 0-471-95057-2 (cloth), 0-471-95599-X (paperback)

Stereochemistry is a fundamental concept in coordination chemistry. This book answers every conceivable question/problem that you might have in this field. The author has a relaxed, easy to read style and introduces the topic in a historical sense by discussing the contributions of the father of stereochemistry/coordination chemistry, Alfred Werner. Examples of some of his contributions are presented in the original German. The book then goes through a wide range of topics from the various theoretical models of Sidgwick and Powell, Nyholm and Gillespie, Kepert, Burdett, etc. to Red Book nomenclature, through problems of classifying and naming chiral species, topography and the stereochemical course of chemical reactions. The book ranges from simple octahedra to helices, molecular chains and knots. Many examples are presented, e.g. the tridentate ligand $[(O_2C)–CH_2–NH–CH_2PO_3]_{3-}$ (PMG) forms complexes of the type $[Co(PMG)_2]^{3-}$ which, depending on the stereochemical orientation of the two ligands, display seven pairs of enantiomers and one achiral isomer. In another example, depending on its denticity, a chelate ligand can occupy one or more edges of an octahedron. von Zelewsky demonstrates that, considering all denticities from zero to six (and assuming that sites not occupied by the chelate ligand have equivalent ligands), there are 144 possible structures. These are sketched out and descriptors given for the chiral examples. A very useful book to refer students to, and a pleasure to browse through.

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Electron Transfer Reactions, ACS Advances in Chemistry Series, vol. 253, edited by Stephen S. Isied, 1997, 439 pp, ISBN 0-8412-3456-6

This collection of chapters was based upon a symposium entitled "Taube Insights: From Electron Transfer Reactions to Modern Inorganic Chemistry" which was held at Stanford in March 1995, and organized by the editor of this monograph. Henry Taube is truly a giant of inorganic chemistry. This book is dedicated to his life contributions to the field. It begins with two dedication articles highlighting Taube's work and insight, and then there follows a chapter by Henry Taube giving a quasi-historical view of the chemistry of ruthenium ammines and the early discovery of dinitrogen complexes thereof. 23 further articles, written by Taube's students and collaborators, friends and colleagues, are sub-divided into organometallic chemistry, mechanistic inorganic chemistry, and metals in biology. A must-read book for connoisseurs of electron transfer inorganic chemistry.

Metal Ions in Biological Systems, vols. 31–35, edited by Astrid and Helmut Sigel, Marcel Dekker, Monticello, NY

This series of books is extremely well known to the bioinorganic community and most certainly to related biomedical and biochemical communities, maintaining an extremely high standard in publishing reviews over a wide range of bioinorganic and biomedical topics. The recent volumes are no exception, and deserve a prominent place in both private (albeit a rather well endowed one) and institutional libraries.

Vol. 31: *Vanadium and its Role in Life*, 1995, 800 pp, US$225, ISBN 0-8247-9383-1. While the biochemical behavior of iron is well known to the chemical community, as is the toxicity of certain elements such as copper and mercury, the average inorganic chemist may only know that vanadium is incorporated into the oxygen carrying "blood" of ascidians and in a nitrogenase enzyme from a mutant *Azotobacter*. This book will rectify this situation. 20 chapters cover a wide range of topics from the purely spectroscopic (UV/vis/CD, vibrational, EXAFS, EPR, ENDOR, 51V NMR, ESEEM, etc.), to transport, physiology and nutrition, to anti-tumor activity, to its role in ascidians, fan worms and related species, to the peroxidases and nitrogenases, etc. There is no excuse now not to know about biological vanadium, though even with all this work, its role in animal systems remains elusive.

Vol. 32: *Interactions of Metal Ions with Nucleotides, Nucleic Acids, and their Constituents*, 1996, 848 pp, US$225, ISBN 0-8247-9549-0. As the Preface points out, "enzymes that utilize nucleotides as substrates and enzymes that synthesize or cleave nucleic acids, i.e. RNA and DNA, invariably require metal ions", prompting the collection of a vast volume of data relevant to the title and summarized here in 21 chapters. 10 chapters deal with low molecular weight species concerning phosphate interactions, purines, sugars, mononucleotides, hydrolysis of nucleosides, etc. The later chapters deal with high molecular weight species including oligonucleotides, RNA and DNA including ternary metal ion–nucleic acid base–protein complexes. Anti-cancer drugs and pharmaceuticals are covered in the final chapters.

Vol. 33: *Probing of Nucleic Acids by Metal Ion Complexes of Small Molecules*, 1996, 712 pp, US$195, ISBN 0-8247-9688-8. The interaction of metal ions with DNA is an area of intense topical interest. 21 chapters in this book cover an extremely wide range of topics within the purview of the title, including molecular modeling, metallocene interactions, platinum complex intercalation and interactions, photolytic covalent binding and electrochemical activation, cleavage and interactions of DNA with many metal ions including zinc, copper, iron, platinum, manganese and nickel, etc.

Vol. 34: *Mercury and its Effects on Environment and Biology*, 1997, 648 pp, US$250, ISBN 0-8247-9828-7. The toxicity of mercury is well known, spills of the metal and the release of organomercurials, such as methylmercury, are justly feared. This book features 19 chapters covering the appearance of mercury throughout the globe in lake, river, marine, soil, air and microbial environments and in the food chain. Its toxicity is discussed with relevance to the brain, the immune system and in the fetus, etc. Mercury responsive gene regulation and bacterial mercury resistant genes are also covered.

Vol. 35: *Iron Transport and Storage in Microorganisms, Plants and Animals*, 1998, 775 pp, QP535.F41765. As noted in the Preface, ''iron must be constantly disciplined, monitored and appropriately shielded when stored''. The way in which iron originally available freely as Fe(II) in an anaerobic atmosphere aeons ago comes today to be transported, controlled, distributed, etc. in an oxygen rich environment, makes a fascinating story enunciated through the various chapters of this book. The first 15 chapters deal with topics ranging from biological cycling in the oceans to microbial and bacterial iron transport, to iron chemistry in fungi and higher plants, to the siderophores and ferritins, and transferrin, etc. Three remaining chapters deal with iron homeostasis, the role of other metals in iron transport and iron chelators for clinical use.

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