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Book reviews

Kinetics and mechanism of reactions of transition metal complexes, Ralph G. Wilkins, VCH, Weinheim, 1991, pages XV + 465. £25.50, DM 68.00 (softcover), £56.00, DM 148.00 (hardcover). ISBN 3-527-28389-7 (softcover), 3-527-28253-X (hardcover)

New books on inorganic reaction mechanisms are few and far between so it was with some anticipation that the revised edition of Ralph Wilkins' book was awaited. The result was well worth the wait. The new edition of this text book covers all aspects of classical inorganic mechanisms together with a smattering of bioinorganic and organometallic reaction mechanisms, and much more besides. There is something in it for everyone.

For the active researcher the first two hundred pages are probably the most useful and stimulating, taking the reader through progressively more complex kinetic analyses, thence to the use of other mechanistic criteria ($\Delta S^{\#}$, $\Delta V^{\#}$ and LFER) and methods of studying reactions. All areas are well illustrated with examples from inorganic chemistry.

The remainder of the book covers the classical inorganic reaction mechanisms and is of most use to the undergraduate, covering everything from substitution, redox processes, activation of ligands and intramolecular stereochemical change. Cross-referencing to Chapter 3 gives the student a valuable insight into the techniques used to monitor the reactions: a feature often neglected in other texts. However, this is very much a kinetics-orientated book, and in places it suffers from a lack of emphasis on structural chemistry, particularly in the stereochemical aspects of substitution reactions.

An attractive feature of the text is the use of boxes to highlight features of special interest. Occasionally the choice of material to highlight seems not to be aimed at the undergraduate. For instance on page 263 more than half the page is devoted to a highlighted derivation of the equations for the work to bring two ions within bonding distance, whereas the Franck–Condon principle is dismissed in a single sentence elsewhere on the page!

The systems discussed throughout the book are almost exclusively classical Werner-type complexes. The inclusion of more organometallic systems would have added further depth to the discussion; for instance in associative pathways at six-coordinate centres. Indeed the emphasis on relatively high oxidation state complexes leads to a disproportionate emphasis on hydrolytic reactions in Chapter 6 (Modification of Ligand Reactivity), and the misleading proposition (page 317) that as a rule molecules are more acidic when coordinated than when they are free. This section certainly suffers from the lack of a discussion of more diverse metal sites.

This is a book no practising inorganic mechanist can afford to be without. It will be invaluable in adding that necessary sparkle to lecture courses (with many tutorial problems already set), and as a comprehensive bibliography to aid research.

AFRC Institute of Plant Science Research,
Nitrogen Fixation Laboratory,
University of Sussex, Brighton BN1 9RQ (UK)

Richard A. Henderson

Gmelin Handbook of Inorganic and Organometallic Chemistry, 8th edition, Br–Bromine, supplement volume B1, Compounds with Rare Gases and Hydrogen, Vol. XVIII, Springer Verlag, Berlin, 1990, pp. 550. DM 2550. ISBN 3-540-93600-9.

It is an extraordinary fact that this volume, which dissects the literature on bromine compounds with rare gases and with hydrogen from about 1930 up to the spring of 1989 should occupy 550 pages. The rare gas compounds are van der Waals complexes or exciplexes, and the discussion of these is rather physical. Thereafter comes the meat of this volume, ranging from HBr_3 and HBr_3^- through HBr_2 and HBr to H_2Br^+. This volume also covers the behaviour of Br^- in solution. As usual, the coverage is exhaustive. The physical properties of HBr require more than 160 pages, and then the discussion of chemistry starts. Very basic reactions, such as H_2–Br_2–HBr reactions, are dealt with at length. Reactions of HBr are summarised extensively. Finally, Br^- is similarly treated.

Once again, we are indebted to the Gmelin Institute for their extraordinary tenacity and thoroughness. This should be as much part of a chemistry library as Chemical Abstracts.

AFRC Nitrogen Fixation Laboratory,
University of Sussex, Brighton, BN1 9RQ (UK)

G.J. Leigh