tration, polynuclear formation and paramagnetic broadening which should be considered. Also, in relation to ESR, the question of dielectric loss in aqueous studies is not discussed. On the other hand, details of calorimetric studies and the technical difficulties in the evaluation of K using specific ion electrodes are well defined. An important omission is the increased use of rapid reaction kinetic systems (including flow ESR and NMR) in the study of the formation of ligated species. There is some discussion of reactions of coordinated ligands, but no mention of techniques which can provide equilibrium data on complexes in the sub-second lifetime range.

Equilibrium conditions of outer-sphere complexes are described with little discussion of the reactivity of inner-sphere systems. There is also the curious statement (p. 366) that the decline in publications over the past decade in the area of outer-sphere complex formation is probably due to the fact that the "fundamental questions were solved in the 1960s while the theoretical knowledge for a detailed analysis is still not available". One has to wonder at the work over the last ten years by Hush, Sutin and others on the Marcus Model of electron transfer where the whole question of precursor complex formation has been so prominent. The nature of photochemical charge transfer processes occurring in outer-sphere systems is also an area which appears to be omitted. It may not have been the intention of the authors to examine such topics. However, after a glimpse of the interesting overview provided by detailed knowledge of equilibrium data in, for example, the analysis of the chelate effect, the very short "prospects" chapter while pointing to future study areas fails to convey a sense of excitement or curiosity. Let us hope that the challenges ahead in this area of chemistry are not subsumed in other wider investigations. There is a need for analytical treatment of equilibria. This volume certainly provides details on the acquisition and data handling in evaluating constants. It is unfortunate that the account could not have been more contemporary.

A. McAuley

Bonding Energies in Organometallic Compounds, ACS Symposium Series No. 428, edited by Tobin J. Marks, American Chemical Society, Washington, DC, 1990.

This book is a series of 18 presentations following an introductory overview by the editor. It is based on the September 1989 symposium at the 198th National Meeting of the American Chemical Society, and is aimed at a wide audience, including surface and catalysis chemists and biochemists. Each presentation (chapter) is self-contained with references up to the first part of 1989. There are also overall author, affiliation and subject indexes.

Periodic trends of bond energies are dealt with at the beginning (Chapter 2) with experimental correlations, and again at the end (Chapter 19) with a discussion of density functional theory. Ionization energy–bond energy relationships are investigated in Chapter 6. Homolytic bond dissociation and kinetics are surveyed by Halpern (Chapter 7), donor–acceptor correlations by Drago (Chapter 12), and hard–soft concepts and absolute electronegativities are used to predict enthalpies of exchange reactions by Pearson (Chapter 17). Bond enthalpies of the organolanthanides are reviewed (Chapter 11), and experimental methods of determination of metal–metal and metal–ligand bond energies are detailed for FT mass spectroscopy (Chapter 4) and calorimetric methods (Chapters 13 and 14). Reaction energetics and activation parameters are discussed in Chapters 3 and 8. Surface chemistry is given an in-depth overview by Somorjai (Chapter 15) and Stair (Chapter 16), including the catalytic properties of surfaces. Gas-phase chemistry of metal–ligand systems is examined in Chapters 5 and 18. Nitrogen and hydrogen binding on chromium, molybdenum and tungsten complexes (Chapter 9), and hydrogenation and reductive coupling of carbon monoxide by rhodium(II) porphyrins (Chapter 10) are studies of interest to biochemists and catalysis chemists. The written material is adequately supported by figures and tables.

This volume meets its objectives, bringing together the diverse communities of activity in the field of organometallics. It provides a broad yet in-depth overview of reactivity and bonding energetics in metal–ligand chemistry.

C.E. Holloway

Thermodynamic Properties of Inorganic Materials, A Literature Database covering the Period 1970–1987, *Parts A and B*, by Bertrand Cheynet, Elsevier, Amsterdam, 1989, Part A 1630 pp., Part B 771 pp., US $683.00/Dfl. 1400.00. ISBN 0–444–88036–4.

This is Volume 38 in the Physical Science Data Series, and is a literature database of thermodynamic properties of inorganic solids, gases, solutions, metals and alloys. Part A contains a key-word list of some 13 400 systems appearing in 25 846 references. Part B contains those references.

The book is an awesome collection of references of considerable value to those seeking data for an extensive range of inorganic systems. It will be of considerable value until such a time as similar computer databases become easily and inexpensively available to anyone.

The Editor's Desk