

The next review covers mixed-metal clusters, but there then follows a discussion of ligand-metal surface interactions. This is surface chemistry. The diversity of topic characterises the whole collection, with conventional coordination and organometallic chemistry mixed with discussions of metal particles, metal clusters, oxide surfaces, and theoretical analyses.

I cannot comment on the quality of such a diverse set of reviews, 18 in all, neither would I suggest that they did not make a good Advanced Studies Institute. From the editors' comments it was clearly enjoyable, but I do feel that the material is so diverse as not to be suitable for publication between the same covers. The NATO Science Committee should consider the contents and potential audience of such a book before deciding whether to publish. Although many might well wish to read some of the contents, few would wish to read them all, and only a very few would be prepared to pay so much for the privilege.

G.J. Leigh
School of Chemistry, Physics
and Environmental Science
University of Sussex
Brighton BN1 9QJ
UK

PH S0022-328X(96)06789-7

Deciphering the Chemical Code, Nicolaos D. Epiotis, VCH, New York, 1996, xvii + 933 pp., \$89.95, ISBN 1-56081-946-4

This book represents a massive effort to reinterpret ideas of chemical bonding based on modern computational methods as well as experimental information during the past several decades on a variety of chemical substances. The familiar trichotomy of covalent, ionic, and metallic (delocalized) bonding appears in considerably modified form as T bonds, E bonds, and I bonds, and the ideas are developed from non-orthogonal valence bond theory without using any of the basic ideas of molecular orbital theory.

This mammoth book, containing no less than 43 chapters, is very reasonably priced for its size. It is divided into the following five major parts: *I. The Valence Bond Theory of Chemical Bonding* (52 pages); *II. The T Bond* (154 pages); *III. The Molecular T Bond* (484 pages); *IV. The Cluster I Bond* (160 pages); *V. Chemoelectricity, Chemomagnetism, and Beyond* (72 pages). Organometallic compounds play a prominent role in much of the theoretical development in this book, e.g.:

(1) Chapter 21, with the title *The Relay I Bond and the Foundation of Organometallic Bonding* (12 pages), discusses allyl and cyclopentadienyl derivatives of main group metals;

(2) Chapter 24, with the title *The Chemical Code Cracks in the p-Block*, includes a discussion on ligand attraction in square pyramidal $\text{Bi}(\text{C}_6\text{H}_5)_5$;

(3) The relatively long Chapter 26, with the rather cryptic title *...and It Shatters in the d Block* (40 pages), includes metal carbonyls, metallocenes, and platinum-olefin complexes in its discussion.

In the development of this new theoretical approach the author has clearly assimilated a vast amount of experimental information on essentially all of the exciting types of substance discovered during the past decades. This includes not only the organometallic compounds mentioned above but other currently significant areas, including fullerenes (Section 16.6) and high critical temperature superconductors (Chapter 41). Chapter 42, with the intriguing title *Is There Hyperbonding and Hyperchemistry*, even includes a brief discussion of 'cold fusion'. The theory underlying the effort in this book to reinterpret chemical bonding is clearly a work of unusual creativity. Many of the ideas in this book are likely to stimulate chemical thought for the next several decades, so that by the year 2050 this book has the potential to become a real classic similar to Pauling's book *The Nature of the Chemical Bond*. Unfortunately, however, assimilation of Epiotis' book by the chemical community is likely to be very slow because of the variety of new concepts involved. Thus the "Pictorial Glossary" at the beginning of this book explaining the most critical concepts needed to understand this book is 17 pages long. Also, many of the new ideas are presented in rather unfamiliar and unusual terminology, apparently in order to avoid confusion with established ideas. For this reason, deciphering the interesting ideas presented in this book and truly understanding them is likely to take the chemical community many years. This book may well be a preview of chemical bonding theory in the 21st, and possibly even the 22nd, century.

R.B. King
Department of Chemistry
University of Georgia
Athens, GA 30602
USA

PH S0022-328X(96)06785-X

Metals and Ligand Reactivity, E.C. Constable, VCH, Weinheim, 1996, pp. 312 + xiv, ISBN 3-527-29278-0 (hardcover), ISBN 3-527-29277-2 (softcover), DM128 (hardcover), DM68 (softcover)

This text is the second, revised, and expanded edition of a book that is an introduction to the organic chemistry of metal complexes. It aims to provide a general readership with sufficient background knowledge to understand the bases of this rather recent subject, and