Book Reviews

Organometallics 1,
M. Bochmann, Complexes with Transition Metal–
Carbon σ-Bonds, pp. 92, Oxford University Press, Ox-
ford, 1994, £4.99
ISBN 0-19-855750-7;
Organometallics 2,
M. Bochmann, Complexes with Transition Metal–
Carbon π-Bonds, pp. 91, Oxford University Press, Ox-
ford, 1994, £4.99
ISBN 0-19-855813-9.

These two paperbacks (they are also available in
hardback) are volumes 12 and 13 in the Oxford Chem-
istry Primers series. They are intended to provide a
more comprehensive account at an undergraduate (UK)
level of material which is probably not available in a
more comprehensive chemistry text. The prices, sub-
sidised in this case by ZENECA Ltd., should make
them accessible to most students.

Volume 1 starts with a chapter on a few basics, such
as the 18-electron rule, electron-counting, and the clas-
sification of carbon ligands in terms of the number of
electrons they provide for bonding to metals. The next
three chapters deal with metal carbonyls, metal alkyls,
and alkylidene and alkylidyne complexes. The patterns
of all the chapters are similar, with a brief but very
pertinent discussion of theory (stability, spectroscopy,
structure, etc.), an account of preparative methods,
and a presentation of general reactions. The margins
contain occasional advisory remarks, and the chapters
conclude with a few general references.

The first volume seems to be an admirable produc-
tion for the stated purpose, excellently presented. It is
therefore a pity that the title is misleading. In the
introduction the η-designator is introduced, and the
ligands described in this volume are binding as η^1.
Alkylidene is then classified as a π-ligand and alkyli-
dyne as a 3-electron ligand. Of course, σ and π are
quantum numbers and should never be used as struc-
tural designators. This may create problems, but in the
long term would create less confusion for students.

Volume 2 starts with a brief recapitulation of the
introductory information in volume 1, and then dis-
cusses alkene complexes, alkyne complexes, cyclopen-
tadienyl complexes, allyl and dienyl complexes, and
arene complexes. The pattern is the same as that of

volume 1. The treatment is straightforward, easy to
read, but not patronising. It should be a useful re-
source for many undergraduate courses.

These two little volumes fulfil a need that has not
yet been met by other books. Students, at least in the
UK, often no longer have the funds to buy as many text
books as one might desire, and these books appear to
achieve comprehensiveness and cheapness at the same
time. They are to be welcomed.

Transition Metal Chemistry,
M. Gerloch and E.C. Constable, pp. 211 + xi, VCH
Weinheim, 1994, DM58
ISBN 3-527-29219-5

This small volume (which is also available in hard
cover) is an introduction to transition-metal chemistry.
It covers at least the basic transition metal chemistry
that a student at the University of Sussex, if not else-
where, might be expected to know at graduation, but in
the non-mathematical format that students prefer, and
which few of them, or their teachers, ever need to
elaborate.

The authors state their belief that their approach
differs from others in that they focus on the changes in
chemistry observed when oxidation states change. It is
reasonable therefore to judge the book in the light of
this aim. Other comments made by the authors suggest
to me that they are hinting at issues that the average
undergraduate would not be interested in.

Chapter 1 contains a description of the main charac-
teristics of complex compounds, closing with a list of
observed oxidation states, but no rationalisations.
Chapter 2 is entitled "Focus on the d^n Configuration".
This is a description of typical transition-metal proper-
ties, such as colour and the formation of Werner-type
complexes. Chapter 3 concerns crystal-field splittings,
and covers the usual range of material in a clear and
comprehensive fashion, including term symbols and
Tanabe–Sugano and Orgel diagrams. The treatment is
non-mathematical.

Chapter 4 carries this analysis further, by discussing
the intensities of "d–d" spectra, and Chapter 5 intro-
duces spin and magnetism. This is again very clear,
though the authors make heavy weather of showing
that μ_{eff} is a pure number. Chapter 6 moves on to