Journal of Organometallic Chemistry, 286 (1985) C51—C52
Elsevier Sequoia S.A., Lausanne — Printed in The Netherlands

Book review

Dictionary of Organometallic Compounds (J. Buckingham, Executive Editor), Chapman and Hall, London, New York, and Toronto, 1984, 3232 pages (in three volumes), £575. ISBN 0-412-24710-0.

Organometallic chemistry is currently being well served by publishers, and the appearance of this three-volume dictionary represents another important event in the development of the subject. A good number of well regarded organometallic chemists have contributed to the compilation, to make it a work of high quality. Annual supplements will keep it up to date.

The dictionary lists almost 16 000 compounds, the numbers of entries for each element being: Ag, 39; Al, 727; Am, 1; As, 451; Au, 100; B, 1398; Ba, 12; Be, 23; Bi, 68; Bk, 1; Ca, 13; Cd, 66; Ce, 9; Cf, 1; Cm, 1; Co, 370; Cr, 178; Cs, 5; Cu, 69; Dy, 6; Er, 18; Eu, 5; Fe, 2222; Ga, 157; Gd, 8; Ge, 299; Hf, 53; Hg, 873; Ho, 6; In, 90; Ir, 242; K, 14; La, 7; Li, 189; Lu, 26; Mg, 148; Mn, 145 Mo, 146; Na, 20; Nb, 51; Nd, 12; Ni, 381; Os, 449; Pa, 2; Pb, 216; Pd, 346; Pm, 1; Pr, 6; Pt, 477; Pu, 4; Rb, 3; Re, 93; Rh, 463; Ru, 870; Sb, 154; Sc, 14; Si, 1867; Sm, 18; Sn, 479; Sr, 11; Ta, 40; Tb, 5; Tc, 13; Th, 39; Ti, 153; Tl, 601; Tm, 4; U, 81; V, 119; W, 156; Y, 15; Yb, 36; Zn, 169; Zr, 116.

The elements appear in alphabetical order by element symbol (i.e. Ag first and Zr last). The section for each element begins with a short but useful introduction giving useful general information about the element; e.g. the valencies, common coordination numbers, toxicity, availability of common starting materials, analytical methods, NMR properties etc. For each compound the entry gives, when the relevant information is available, information such as the molecular formula, preferred name, synonyms, structure diagram, details of stereoisomers and important derivatives, CAS Registry Number, physical description, stability, solvent for recrystallization, solubility, melting point, freezing point, density, refractive index, magnetic properties, use and importance, hazardous and toxic properties; selected references (with the main contents indicated). Although most readers will no doubt have their own views on additional compounds which might be included, the contributors seem to have made sound choices of compounds, and the whole work has been compiled in a scholarly way on which the editors are to be congratulated. I myself would have given more space to organolithium compounds (only 189 entries) in view of their usefulness as starting materials for so many other organometallic compounds, but the balance otherwise seems appropriate.

The third volume of the set consists of a name index, a molecular formula index, and a CAS Registry Number index. Much more valuable than these to my mind is the 'structure index' given for each element (except where the number of entries is very small) at the beginning of the section on that element. These display the structural formulae or actual structures of all the compounds

listed for the relevant element; e.g. for iron the formulae of the 2222 compounds listed are clearly set out in 39 pages, and it is possible to glance through all of them quite quickly to see which compounds and which types of compounds are included. Just looking through these lists can be very interesting and informative, and can stimulate ideas for new work. This novel index greatly adds to the usefulness of the volumes.

Much thought has been given to the conventions used. Sadly, the editors decided, presumably to match the Chemical Abstracts practice, to use American spellings for all chemical names, and this leads to adoption of the absurd form aluminum. It is very annoying that the great power of Chemical Abstracts, wielded so insensitively in such matters, can bring about use of this ugly and illogical form outside the U.S.A., in direct rejection of the I.U.P.A.C. recommendation. In my view the editors were wrong to give in to Chemical Abstracts in this particular case, since no significant problems would have arisen from use of the civilized form aluminium. Use of the American spellings sulfur and cesium, while regrettable, is less objectionable, since the logical or historical arguments for the British form are rather weaker in these cases, and, indeed, I.U.P.A.C., in deference to American practice, has adopted the spelling sulfur (though not cesium).

In future, if I wish to know whether a certain organometallic compound or type of compound has been made, or to form an impression of the properties of certain types of compound, I will turn first to this dictionary. There is no doubt that it will be of great value to organometallic chemists, and perhaps in the long run will be even more useful in total to the large numbers of organic chemists who occasionally need to use organometallic compounds. The material is very clearly presented and the volumes very well produced, and at today's prices it represents unusually good value. Every chemical library should have a copy — not only those associated with organometallic laboratories.

COLIN EABORN

School of Chemistry and Molecular Sciences,
University of Sussex, Brighton BN1 9QJ (Great Britain)