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Book Review

Reagents for Transition Metal Complex and Organometallic Syntheses, Inorganic Syntheses, Vol. 28; edited by R.J. Angelici (Department of Chemistry, Iowa State University), Wiley Interscience, New York, 1990, 463 pages, £43.65. ISBN 0-471-52619-3

This volume of *Inorganic Syntheses* brings together in one book a range of syntheses which the editor considers to be of "basic starting materials". There are nine totally new contributions and 81 others taken from earlier volumes of *Inorganic Syntheses*. As usual a contribution consists of a critical survey of possible synthetic methods and detailed procedures for several related compounds. For the contributions from earlier volumes the original authors were asked to update their entries, make modifications where necessary, and add safety notes. If the modifications were substantial the new experimental procedures were independently checked, as were all the new syntheses.

The contributions are grouped into chapters as follows: compounds with weakly coordinated ligands (tetrafluoroborate, triflate, nitriles, dinitrogen and dienes); low-valent complexes of Rh, Ir, Ni, Pd, and Pt; substituted metal carbonyl anion complexes; metal cluster compounds (of Ru and Os); cyclopentadienyl complexes (of early transition metals, Co, and Rh); lanthanide and actinide complexes; ligands and other transition metal complexes. This last chapter contains entries not easily fitted in elsewhere, e.g. PMe_3, PF_3, C_5H_5Tl, C_5Me_5H, anhydrous metal chlorides, tungsten chloro phosphine complexes, $[Ru(bipy)_3]Cl_2 \cdot 6H_2O$, π-allyl and COD complexes of Pt and Pd, and Zeise's salt.

Almost anyone who wishes to break new ground in the coordination or organometallic chemistry of transition metals will have to make compounds described in this book, which is thus likely to be widely acquired for use in research laboratories. The procedures are already known to be reliable and authoritative and this collection will be a standard reference work for many years.

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Erratum

Re: Manganese carbonyl and organometallic compounds: analysis and classification of crystallographic and structural data; by C.E. Holloway and M. Melnik (*J. Organomet. Chem.*, 396 (1990) 129).

We regret that Table 6 is missing from this paper as printed; the table is reproduced below.

Table 6 Crystallographic and structural data for hetero-binuclear carbonyl compounds[a]

Compound	Crystal Class	Space Group	Z	a[pm] b[pm] c[pm]	α[°] β[°] [°]	Chromophore	M-L [pm]	L-Mn-L L-Mn-L' [°]	Ref
$(OC)_5MnHg\{N_3(2\text{-}ClC_6H_4)_2\}$	tr	$P\bar{1}$	2	723(1) 1048(1) 1375(1)	103.4(1) 92.0(1) 101.1(1)	MnC_5Hg	OC[b] not given Hg 255.7(1)		96
$(OC)_5MnSiH_3$[c]						MnC_5Si	OC 184.7(2) Si 240.7(5)	94.5(2)	97
$(OC)_5MnGeH_3$[c]						MnC_5Ge	OC 184.9(2) Ge 248.7(2)	97(2)	97
$(OC)_5MnGeBr$[c]						MnC_5Ge	OC 183.4(5) Ge 243(1)	95 84.5(5)	98
$(OC)_5MnGe(CF_3)_3$	m	$P2_1/n$	4	1450.9(3) 1274.9(2) 825.25(8)	92.128(8)	MnC_5Ge	OC 186.3(6,2) Ge 241.32(9)	90.7(2,1.7),176.8(2,7) 88.6(2,2.1),176.9(2)	99
$\{Me_2As(CH_2)_3AsMe_2\}(OC)_3Mn.GeCl_3$	m	$P2_1/n$	4	821.5(3) 1427.9(7) 1678.7(8)	90.46(1)	MnC_3As_2Ge	OC 178(2,1) As 241.5(3,1) Ge 238.1(3)	91.3(7,7)[d]	100
$(OC)_5MnSnCl_3$[e]	m	$P2_1/c$	8	1410(1) 1338(5) 1327(2)	97.39(21)	MnC_5Sn	OC 187.8(44,97) Sn 257.5(5)	90.7(20,3.2),177.3(18,1.1) 88.7(14,1.7),179.0(14)	101
						MnC_5Sn	OC 187.1(33,42) Sn 260.4(5)	91.4(15,3.8),174.3(15,1.3) 86.8(11,2.2),178.2(12)	
$(OC)_5Mn(dmp)_2PdBr$[f]	m	Cc	4	1831.7(2) 1341.2(2) 2101.3(4)	117.5(1)	MnC_3P_2Pd	OC 179(1,17) P 226.5(3,11) PD 281.0(2)	not given	102
$a\text{-}Br(CO)_3Mn'(triphos)Cr(CO)_5$	or	Pbcn	8	2126.0(6) 1445.1(3) 2833.8(9)		MnC_3P_2Br	OC 165(4,5) P 231.5(13,14) Br 253.7(8)	90(2,2)[g],	103

Table 6, cont. (2)

Compound	Crystal Class	Space Group	Z	a[pm] b[pm] c[pm]	α[°] ß[°] [°]	Chromophore	M-L [pm]	[pm]	L-Mn-L L-Mn-L [°]	Ref
ß-Br(CO)$_3$Mn^I(tripbos)Cr^0(CO)$_5$. .CH$_2$Cl$_2$	m	Cc	4	2443(3) 1076(1) 1742(2)	89.11(3)	MnC_3P_2Br	OC 182(2,9) P 235.8(7,12) Br 253.4(4)	90(1,3)[g]		103
(OC)$_4$Mn(PPh$_2$)Fe(CO)$_4$	or	Pbcn	8	1676.8(9) 1702.0(9) 1535.9(8)		MnC_4PFe	OC not given P not given Fe 282.5(5)			104
(Ph$_3$P)(CO)$_4$Mn(AsMe$_2$). .Fe(CO)$_4$	or	Pbca	8	1535.1(10) 1508.6(2) 1690.3(3)		MnC_4PAs	OC 184(1,3) P 234.5(3) As 251.0(2)	91.8(5,6.0),170.4(5)[h$_1$]		105
(Ph$_3$P)(CO)$_4$Mn(AsMe$_2$). .Fe(CO)$_4$	or	Pca2$_1$	4	1537.0(1) 1019.0(2) 1331.8(3)		MnC_4PAs	OC 186(1,2) P 228.3(4) As 246.2(2)	90.0(6,1.2),177.6(6,1.4)[h$_2$]		105
[(OC)$_4$Mn(AsMe$_2$)$_2$Fe(CO)$_4$] .[Cl(CO)$_4$Mn(AsMe$_2$)Fe(CO)$_4$]	m	P2$_1$	2	896.4(5) 1343.9(2) 1501.5(4)	99.40(4)	MnC_4As_2	OC 177-184(3) As 241-244(2)	i		106
						MnC_4AsCl	OC 178-187(3) As 248(1) Cl 241(2)	j		
(OC)$_3$Mn(μ-H)(μ,μ^1-dtal) .Fe(CO)$_2$	m	P2$_1$/a	4	2199.6(2) 685.8(1) 1554.6(5)	110.20(1)	MnC_3N_2HFe	OC 180.1(6,1) N 202.9(5,0) H 170(6) Fe 253.93(9)	89.4(3,1.6)[k]		107
(OC)$_5$MnRe(CO)$_5$	m	I2/a	4	1440(4) 714(1) 1478(1)	105.4(1)	MnC_5Re	OC not given Re 296			108a

Table 6, cont. (3)

Compound	Crystal Class	Space Group	Z	a[pm] b[pm] c[pm]	α[°] β[°] [°]	Chromophore	M-L [pm]	[pm]	L-Mn-L L-Mn-L [°]	Ref
$(OC)_5MnRe(CO)_5$	m	I2/a	4	1439.0(4) 711.2(2) 1473.6(3)	105.54(2)	MnC_5Re	OC 191.7(9,18) Re 290.9(1)	91.4(4,3.6),173.9(3,2.1) 87.1(2,2.2),172.2(3)		108b
$Mn(CO)_5(OTeF_5)$	or	$Pna2_1$	4	1246.2(3) 761.2(2) 1253.9(2)		MnC_5O	OC 189(1,7) O 204(i)	not given		109

a The mean value for chemically identical angle or distance. The first number in parenthesis is the e.s.d. and the second is the maximum deviation from the mean.
b The chemical identity of coordinated atom or ligand.
c By electron diffraction in the gas phase.
d The value of C-Mn-C angle; C-Mn-As = 89.3(5,1.3) and 178.8(5,3)°; C-Mn-Ge = 88.5(5,2) and 179.1(5)°; As-Mn-As = 91.2(1)°; As-Mn-Ge = 91.0(1,2)°.
e There are two crystallographically independent molecules.
f At 269K.
g_1 The value of C-Mn-C angle; C-Mn-P = 93(2,3) and 174(2,3)°; C-Mn-Br = 89(2,2) and 178(2)°; P-Mn-P = 83.9(4)°; P-Mn-Br = 87.7(3,2.7)°.
g_2 The value of C-Mn-C angle; C-Mn-P = 93.2(7,1.6) and 176.3(8,1)°; C-Mn-Br = 89.1(7,2.5) and 177.4(7)°; P-Mn-P = 83.9(4)°; P-Mn-Br = 87.6(2,2.3)°.
h_1 The values of C-Mn-C angles; C-Mn-P = 88.3(4,21) and 173.4(4)°; C-Mn-As = 87.0(4,3.0) and 175.4(4)°; As-Mn-P = 96.52(9)°.
h_2 The values of C-Mn-C angles; C-Mn-P = 91.1(4,2.1)°; C-Mn-As = 89.0(4,2.9)°; As-Mn-P = 177.3(1)°.
i Cannot distinguish between Mn and Fe; C-M-C = 88.2-103.9(5)° and 170.1-174.4(7)°; C-M-As = 85.0-91.9(5) and 164.2-170.6(6)°; As-M-As = 78.8-79.5(4)°.
j C-Mn-Cl = 87.2-88.5(6) and 176.8(7)°; Cl-Mn-As = 83.5-93.3(5) and 174.6(5)°; Cl-Mn-As = 87.5(6)°.
k The value of C-Mn-C angle; C-Mn-H = 85.5(22,8) and 173.8(22)°; C-Mn-N = 98.9(2,7) and 168.6(2,6)°; C-Mn-Fe = 117.5(2,8) and 139.8(2)°; N-Mn-N = 73.0(2)°; N-Mn-H = 86.0(21,1.6)°; N-Mn-Fe = 51.2(1.1)°; Fe-Mn-H = 46.2(20)°.