STRUCTURES OF ORGANO-TRANSITION METAL COMPLEXES DETERMINED BY DIFFRACTION METHODS. REPORTS APPEARING DURING 1977.*

MICHAEL I. BRUCE

Department of Physical and Inorganic Chemistry, University of Adelaide, Adelaide, South Australia, 5001.

As mentioned in the 1976 survey, the large and increasing number of structures of organo-transition metal complexes determined by diffraction methods has rendered impractical continuing surveys of this type. Nevertheless, the author has found it both of interest and of some use to maintain a file of such structures, and the editor has agreed that a considerably shorter annual tabulation should be continued.

What follows, therefore, is a listing of structural studies reported during 1977, classified by ligand type, and by metal, together with a tabulation ordered by molecular formula. Section A lists determined structures, arranged by ligand in order of increasing number of carbon atoms bonded to the metal atom (as denoted by the η symbol). Where several different groups are present, the structure appears under the largest group. The headings are generally the same as those used in the 1975 and 1976 surveys. Further arrangement has usually been in order of Periodic Group. Reference numbers (as superscripts in square brackets [ ]) refer to the list at the end of the article. Only those structures which are not immediately obvious from the formulas are illustrated, and these by line diagrams, rather than those based on the crystallographic figures which we have used in previous years.

Section B contains a summary of structures ordered by transition

---

* Annual survey for 1976: M.I. Bruce, *J.Organometallic Chem.*, 151 (1978) 313.

metal present, and only the entry number in Section A is used.

Table 1 presents a summary of determined structures arranged by formula in order of increasing C,H content. Although the crystal space group, Z, and unit cell dimensions have not been incorporated this year, the number of intensity data and R factors have been quoted, to give an indication of the accuracy of the determination. The majority of structures were determined by X-ray diffraction methods at ambient temperature; if data was collected at a significantly different temperature, this is indicated in the Notes column of the summary table. This column also indicates the few complexes studied by electron (ED) or neutron diffraction (ND) methods.

In 1977, 513 separate structures were reported in 451 notes and papers. The compounds studied fall naturally into two groups, those containing conventional organic ligands attached to one metal atom, and those containing metal-metal bonds or metal atom clusters. Over a third of the reported structures are of the latter type, reflecting the importance of this technique for elucidating the nature of reaction products in this area. The compilation of metal-metal bond distances has been omitted from this year's summary.

Tables 2, 3, 4 and 5 summarise structural determinations on metal hydride and borohydride complexes, nitrosyls, dinitrogen and related complexes, and transition metal complexes containing tertiary phosphines as the only ligands.

Electron or neutron diffraction studies

Investigations using electron diffraction methods included determinations of the structures of $Mn(CF_3)(CO)_5$,[21] $Ti(H_2BH_2)(C_5H_5)_2$,[65] and the high- and low-spin forms of $Mn(C_5H_4Me)_2$;[99] a comparative study of the carbonylmetal hydrides $HMn(CO)_5$, $H_2Fe(CO)_4$ and $HCo(CO)_4$,[8] and further refinement of data obtained for $TiCl_2(C_5H_5)_2$ and $ZrCl_2(C_5H_5)_2$.[52]

Neutron diffraction studies are of obvious importance in the location of hydrogen atoms. That in $NEt_4[Cr_2H(CO)_{10}]$ was located equidistant between the metal atoms, but off the internuclear axis,[44] and structure

determinations of $MoH_2(C_5H_5)_2$[62] and $Ru_3H(CO)_9(C_2Bu^t)$[151] were reported, as was a comparative X-ray - neutron diffraction study of $TaH_3(C_5H_5)_2$.[64]

Acknowledgement The author thanks Professor Jack Lewis and the University Chemical Laboratory, Cambridge for their hospitality during study leave 1977-78, during which time material for this review was assembled.

Abbreviations

acac	acetylacetonate
bipy	2,2'-bipyridyl
bq	benzoquinone
cod	1,5-cyclooctadiene
cot	cyclooctatetraene
Cy	cyclohexyl
dba	dibenzylideneacetone
diars	1,2-bis(dimethylarsino)benzene
dmf	dimethylformamide
dmg	dimethylglyoximate
dmpe	1,2-bis(dimethylphosphino)ethane
dpam	bis(diphenylarsino)methane
dppe	1,2-bis(diphenylphosphino)ethane
dppm	bis(diphenylphosphino)methane
dppp	1,3-bis(diphenylphosphino)propane
dppx	α,α'-bis(diphenylphosphino)xylene
dtfa	di-*p*-tolylformamidino
Fc	ferrocenyl
gaz	guaiazulene
hfac	hexafluoroacetylacetonato
ind	indenyl
lut	lutidine
mbt	mercaptobenzothiazole anion
Mepip	4-methylpiperidine

Me_2pz	3,5-dimethylpyrazole
mnt	maleonitriledithiolate
nap	1-naphthyl
nbd	norbornadiene
np_3	$N(CH_2CH_2PPh_2)_3$
pic	picoline
py	pyridine
pz	pyrazolyl
sal_2en	N,N'-ethylenebis(salicylideneiminato)
tcnq	tetracyanoquinodimethan
tfba	trifluorobenzoylacetonate
thf	tetrahydrofuran
tol	*p*-tolyl
tpp	*meso*-tetraphenylporphin
tren	2,2',2''-triaminotriethylamine
Vi	vinyl

A. ORGANO-TRANSITION METAL COMPLEXES

η^1-LIGANDS

Simple carbonyls

(*1*) $K_2[Fe(CO)_4]$[14]

(*2*) $[Na(crypt)]_2[Fe(CO)_4]$[14]

crypt = $N[(CH_2)_2O(CH_2)_2O(CH_2)_2]_3N$

Carbonyl hydrides and borohydrides

(*3*) $[(Ph_3P)_2N][Mo(H_2BH_2)(CO)_4]$[9]

(*4*) $MnH(CO)_5$[8]

(*5*) $FeH_2(CO)_4$[8]

(*6*) $CoH(CO)_4$[8]

Carbonyl halides

(*7*) $ReBr(CO)_5$[18]

(*8*) $[Re(CO)_3(C_6Me_6)][(OC)_3Re(\mu\text{-}Cl)_3\text{-}Re(CO)_3]$[20]

(*9*) $[Re(CO)_3(PhMe)][(OC)_3Re(\mu\text{-}Br)_3\text{-}Re(CO)_3]$[20]

(*10*) $IrCl(CO)_3$[7]

Carbonyls containing N-donor ligands

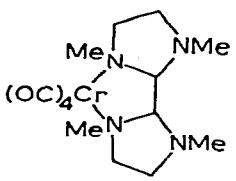
(*11*) $Cr(CO)_5(NCSMe)$ [22]

(*12*) $Cr(CO)_4(L_2^{Me}\text{-}N,N'')$ [141]

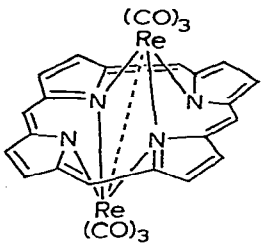
(*13*) [*fac*-$Re(CO)_3(NCMe)_3]BF_4$ [40]

(*14*) $\{[Re(CO)_3]_2(\mu\text{-tpp})\}SbCl_6$ [428]

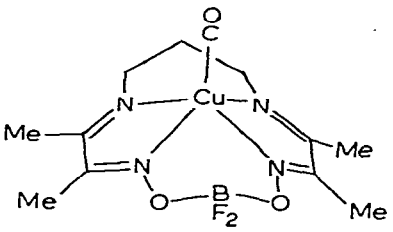
(*15*) $Cu(CO)(1bf_2)$ [104]



(12)



(14)



(15)

Carbonyls containing P- or As-donor ligands

(*16*) $Cr(CO)_5[P(:NSiMe_3)(NHBu^t)]$ [105]

(*17*) $Cr(CO)_5\{P(:NBu^t)[N(SiMe_3)_2]\}$ [166]

(*18*) *meso*-$[Cr(CO)_5]_2P_2Cl_2Ph_2$ [276]

(*19*) *rac*-$[Cr(CO)_5]_2P_2Cl_2Ph_2$ [276]

(*20*) *cis*-$Mo(CO)_4(NHC_5H_{10})$-$[P(OMe)_3]$ [106]

(*21*) $Mo(CO)_4[(PhHPSiMe_2)_2]$ [254]

(*22*) $Mo(CO)_4[(Me_2AsC_4F_4)_2]$ [179]

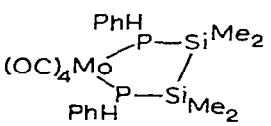
(*23*) $Mo(CO)(NO)(PPh_3)[(pz)_3B$-$(pz)]$ [354]

(*24*) $[Ph_2POMn(CO)_4]_2$ [359]

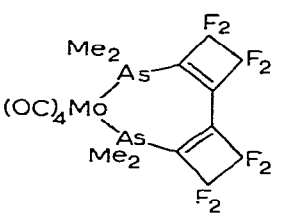
(*25*) $\{Fe(CO)_3[MeN(PF_2)_2]\}_2$ [23]

(*26*) $[Co(CO)[P(OMe)_3]\{PhP[(CH_2)_3$-$PPh_2]_2\}]BF_4$ [400]

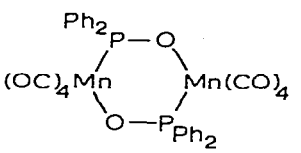
(*27*) $Rh(CO)(EtOH)[Ph_2P(CH_2)_2O(CH_2)_2$-$O(CH_2)_2PPh_2]\}PF_6$ [366]



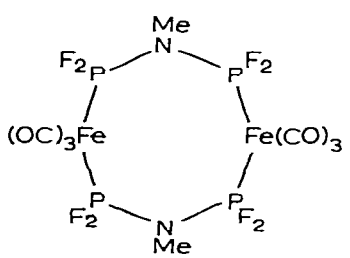
(21)



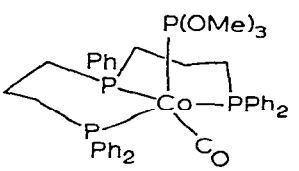
(22)



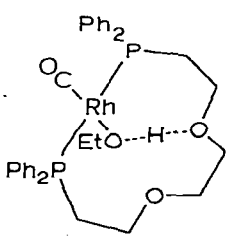
(24)



(25)



(26)



(27)

Carbonyls containing Group VI-donor ligands

(*28*) $Cr(CO)_5(SCMe_2)$ [30]

(*29*) $Cr(CO)_5[S(O)C_4H_6]$ [36]

(*30*) $[Mo(CO)_2(S_2CNEt_2)_2]_2(\mu\text{-}N_2H_4)$ [310]

(*31*) $NEt_4\{[W(CO)_5]_2(\mu\text{-}SC_6Cl_5)\}$ [193]

(*32*) $Mn_4S_4(CO)_{15}$ [170]

(*33*) $[Re(CO)_4]_2[\mu\text{-}SRe(CO)_5]\,(\mu\text{-}SSnMe_3)$ [174]

(*34*) $[Re(mbt)(CO)_3]_2$ [236]

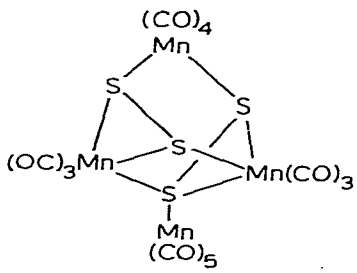
(*35*) $Ru(mbt)_2(py)_2(CO)_2$ [322]

(*36*) $Ru(CO)(PPh_3)_2[S_2C_2(CF_3)_2]$ (violet) [404]

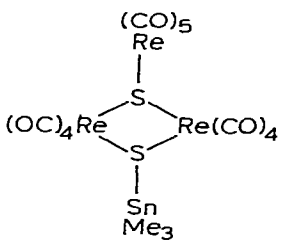
(*37*) $Rh(CO)_2(tfba)$ [88]

(*38*) $[Rh(CO)(acac)]_2(\mu\text{-dppx})$ [384]

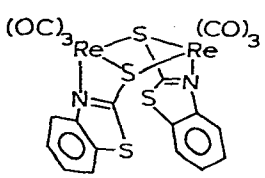
(*39*) $Rh_2S(CO)_2(dppm)_2$ [434]



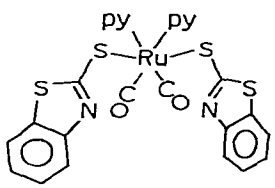
(32)



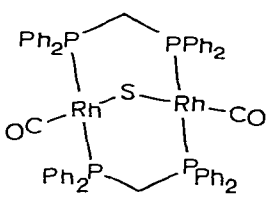
(33)



(34)



(35)



(39)

Carbonyl halides containing Group V-donor ligands

(*40*) $MoCl_2(CO)_3(PEt_3)_2$ [167]

(*41*) $MoBr_2(CO)_2(PMe_2Ph)_3$ [330]

(*42*) $MoCl_2(CO)_2(dppm)_2$ [433]

(*43*) $MoCl_2(CO)_2(dpam)_2$ [433]

(*44*) $[WI(CO)_2(dmpe)_2]I$ [144]

(*45*) $WI_2(CO)_3(dpam)$ [340]

(*46*) $MnCl(CO)_3[(Me_2pz)PPh_2]$ [241]

(*50*) $CoH(CO)(PPh_3)_3$ [441]

(*51*) $RhCl(CO)(PBu^t_3)_2$ [318]

(*52*) *trans*-$Rh(N_3)(CO)(PPh_3)_2$ [384]

(*53*) $RhCl(CO)(bdpbp)$ [421]

(*54*) $[RhCl(CO)\{O[(CH_2)_2PPh_2]_2\}]_2$ [366]

(*55*) $IrCl(CO)[Bu^t_2PC{\equiv}C(CH_2)_5\text{-}C{\equiv}CPBu^t_2]$ [332]

(47) $MnBr(CO)_3(CyN{:}CHCH{:}NCy)$ [205]

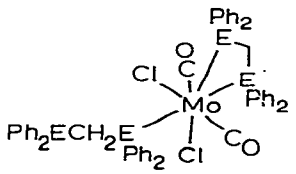
(48) $ReCl(CO)_3(Pr^iN{:}CHCH{:}NPr^i)$ [84]

(49) *trans*-$RuH(CO)(PPh_3)_2$-(*p*-tolNCHN-*p*-tol) [435]

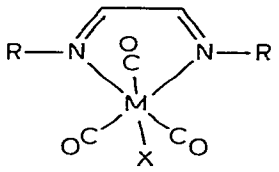
(56) $IrCl_2(N_2C_6H_4NO_2\text{-}o)(CO)(PPh_3)_2$ [415]

(57) $[PdCl(dpam)]_2(\mu\text{-}CO)$ [430]

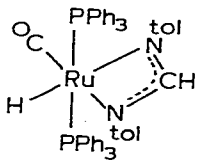
(58) *cis*-$PtCl_2(CO)(PEt_3)$ [26]



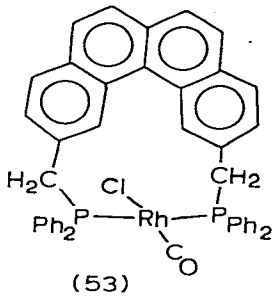
(42) E = P
(43) E = As



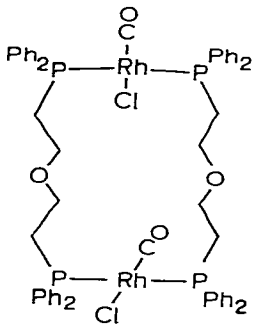
(47) M = Mn, X = Br, R = Cy
(48) M = Re, X = Cl, R = Pr^i



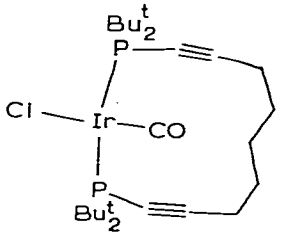
(49)



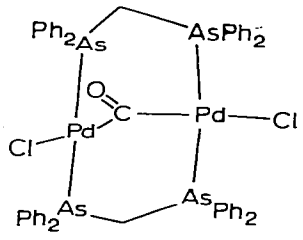
(53)



(54)



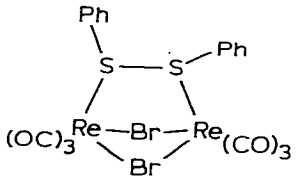
(55)



(57)

Carbonyl halides containing S-donor ligands

(59) $[ReBr(CO)_3]_2S_2Ph_2$ [208]



(59)

Selenocarbonyls

(*60*) $RuCl_2(CO)(CSe)(PPh_3)_2$ [388]

Isocyanide complexes

(*61*) $Cr(thf)_3[NCCr(CO)_5]_3$ [350]

(*62*) $Mo(CO)_5(CNGeMe_2Ph)$ [132]

(*63*) $[MoI(CNBu^t)_4(Bu^tNHC_2NHBu^t)]I$ [353]

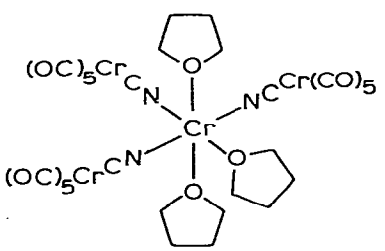
(*64*) $Fe(CNBu^t)_5$ [317]

(*65*) $[FeCl(PPh_3)_2(CN\text{-}p\text{-}tol)_3]FeCl_4$ [446]

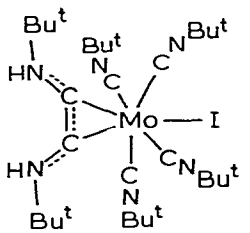
(*66*) $Fe(CNC_6H_4Cl\text{-}p)_2(S_2CNEt_2)_2ZnI_2$ [304]

(*67*) $Ru(CNBu^t)_4(PPh_3)$ [391]

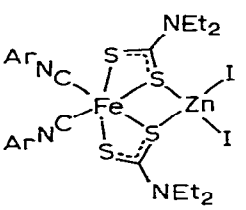
(*68*) $\{[Pd(CNMe)(dppm)]_2(\mu\text{-}CNMe)\}(PF_6)_2$ [444]



(61)

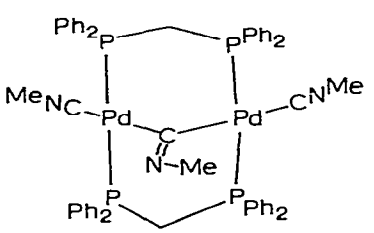


(63)



Ar = p-ClC_6H_4

(66)



(68)

See also: *80, 177, 282, 375, 378, 431, 462.*

Carbene complexes

(*69*) $Cr(CO)_5[CCl(NEt_2)]$ [50]

(*70*) $Cr(CO)_5[C(NCO)(NEt_2)]$ [78]

(*71*) $Cr(CO)_5[C(NCS)(NEt_2)]$ [78]

(*72*) $Cr(CO)_5[C(OEt)(SiPh_3)]$ [323]

(*73*) $Cr(CO)_5[C(2\text{-furyl})(2\text{-thienyl})]$ [126]

(*74*) $Cr(CO)_4[S(CH_2)_3SC{:}C(OH)C(OEt)]$ [96]

(*75*) $Cr(CO)_3(CNBu^t)[S(CH_2)_3SC{:}C(OEt)C(OEt)]$ [219,220]

(*76*) $Mo(CO)_5[C(OEt)(SiPh_3)]$ [323]

(*77*) *cis*-$Mo(CO)_4[CNMe(CH_2)_2NMe]_2$ [142]

(*78*) $W(CO)_5(CPh_2)$ [210]

(*79*) $(Me_3P)_3Ru(\mu\text{-}CH_2)_3Ru(PMe_3)_3$ [274]

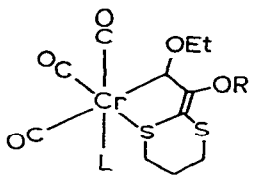
(*80*) $RuI_2[CH(NMe\text{-}p\text{-}tol)](CO)(CN\text{-}p\text{-}tol)(PPh_3)$ [376]

(*81*) $RhCl[(EtOCONCS)_3](PPh_3)_2$ [427]

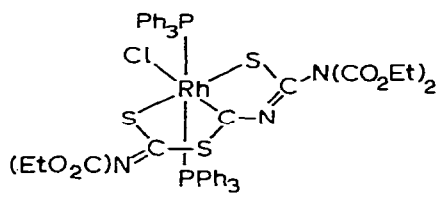
(*82*) $IrCl[Bu^t_2P(CH_2)_2C(CH_2)_2PBu^t_2]$ [273]

(*83*) $PdCl_2[C(COPh)PPh_2(CH_2)_2PPh_2]$ [368]

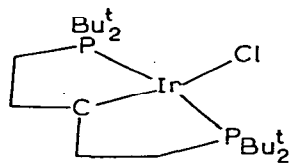
(*84*) $\{Pt[C(NHMe)_2]_4\}(PF_6)_2$ [110]



	R	L
(74)	H	CO
(75)	Et	$CNBu^t$



(81)



(82)

See also: *286, 287, 293, 294, 353, 367, 368, 417, 420.*

Carbyne complexes

(*85*) *trans*-$CrBr[C(C_6H_4CF_3\text{-}p)](CO)_4$ [87]

(*86*) $CrBr(CPh)(CO)_2(CNBu^t)_2$ [230]

(*87*) $CrBr(CPh)(CO)_2[P(OPh)_3]_2$ [230]

See also: *283, 284.*

Alkyls

(*88*) $Mn(CF_3)(CO)_5$ [21]

(*89*) $CoMe[R\text{-}(+)\text{-}NH_2CHMePh](dmg)_2$ [206]

(*90*) $Co[R\text{-}CHMe(CO_2Me)][R\text{-}(+)\text{-}NH_2CHMePh](dmg)_2$ [262]

(*102*) *cis*-$Pt(C{\equiv}CPh)_2(PPh_3)_2$ [431]

(*103*) *trans*-$Pt[C(:CH_2)Ph](C{\equiv}CPh)(PPh_3)_2$ [432]

(*104*) *trans*-$Pd[C(CO_2Me){:}CH(CO_2Me)]$-

(*91*) $[CoMe(C_{20}H_{27}N_5)]I_2$ [271]

(*92*) $[NiMe(np_3)]BPh_4$ [419]

(*93*) $Ni[(CH_2PMe_2)_2N]_2$ [109]

(*94*) *trans*-$PdMe(HCO_3)(PEt_3)_2$ [145]

(*95*) $PdCl(CBu^t{:}CMeCMe{:}CClBu^t)$-(bipy) [307]

(*96*) $Pd[CPh{:}CPhCPh{:}C(OEt)Ph](acac)$-$(PMe_2Ph)$ [418]

(*97*) $\{[Pt(CH_2C_6H_4CN\text{-}o)(Ph_2PCH{:}CH\text{-}PPh_2)]_2\}(BF_4)_2$ [448]

(*98*) $PtBr(CH_2CH{:}CH_2)(PEt_3)_2$ [168]

(*99*) $PtCl(CH_2CH{:}CH_2)(PPh_3)_2$ [394]

(*100*) *trans*-$PtCl(CH{:}CH_2)(PEt_2Ph)_2$ [286]

(*101*) *trans*-$PtCl[C(:CH_2)CMe{:}CH_2](PPh_3)_2$ [407]

(*105*) *trans*-$PtCl(C{\equiv}CCMe{:}CH_2)(PPh_3)_2$ [405,406]

(*106*) *trans*-$Pt(C{\equiv}CCMe{:}CH_2)[C(:CH_2)CMe{:}CH_2](PPh_3)_2$ [407]

(*107*) *trans*-$Pd(NCS)(C{\equiv}CC_6H_4C{\equiv}CH\text{-}o)(PEt_3)_2$ [293]

(*108*) $[Co(CH_2SiMe_3)]_4$ [191]

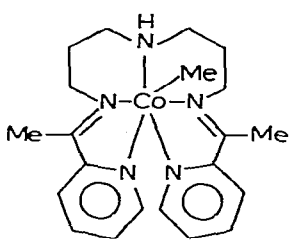
(*109*) $Me_2Au(\mu\text{-}Br)_2AuBr_2$ [3]

(*110*) $AuMe_2(OSO_2CF_3)(OH_2)$ [5]

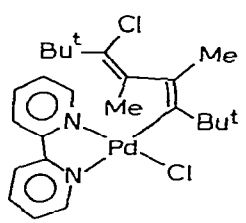
(*111*) $AuMe(CH_2SOMe_2)$ [19]

(*112*) $[Au(CH_2)_2PEt_2]_2$ [108]

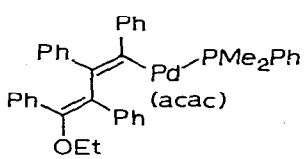
(*113*) $AuMe(PPh_3)$ [228]



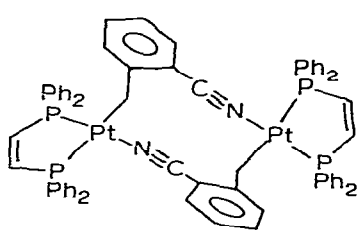
(91)



(95)



(96)



(97)

See also: *207, 255, 256, 257, 258, 259, 260, 261, 298, 300, 308, 313, 430.*

Acyls

(*114*) *cis*-$Re(COMe)(NH_2Ph)(CO)_4$ [93]

(*115*) *fac*-$Re[C(O)SiPh_3](CO)_3(dppe)$ [426]

(*116*) $OsH(CS_2Me)(CO)_2(PPh_3)_2$ [399]

(*117*) $AsPh_4[RhI(COEt)(PPh_3)(mnt)]$ [313]

(*118*) $Rh(COPr)(PEt_3)_2(mnt)$ [263]

See also: *299*.

Complexes containing chelating σ-bonded ligands

(*119*) $\overbrace{Mn[(C_6H_3Me)P(tol)_2]}(CO)_4$ [314]

(*120*) $\overbrace{Mn\{C_6H_3C(O)[\overbrace{Mn(CO)_3(PPh_3)}]PPh_2\}}-(CO)_4$ [420]

(*121*) $\overbrace{Mn\{C_6H_3C(O)[\overbrace{Mn(CO)_4}]PPh_2\}}-(CO)_3(PPh_3)$ [333]

(*122*) $\overbrace{Mn\{C_6H_3C(O)[\overbrace{Mn(CO)_3(PPh_3)}]PPh_2\}}-(CO)_3(PPh_3)$ [420]

(*123*) $\overbrace{Mn\{C_6H_3C(O)[\overbrace{Re(CO)_4}]PPh_2\}}-(CO)_4$ [333]

(*124*) $\overbrace{RuCl[MeC_6H_3N(CH_2)_2CN(tol)]}-(PEt_3)_2$ [346]

(*125*) $[\overbrace{IrF(FC_6H_3N:NH)}(CO)(PPh_3)_2]-[BF_3(OH)]$ [416]

(*126*) $[\overbrace{Ir(O_2NC_6H_3NHNH)}(CO)(PPh_3)_2]-BF_4$ [417]

(*127*) $\{\overbrace{IrF[C_6H_3(CF_3)N:NH]}(CO)-(PPh_3)_2\}BF_4$ [417]

(*128*) $\overbrace{IrCl[(MeC_6H_3O)_2P(Otol)]}-(\gamma\text{-pic})_2$ [365]

(*129*) $\overbrace{PdCl[C(O)CH_2CH_2NEt_2]}(NHEt_2)$ [86]

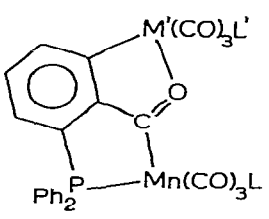
(*130*) $\{\overbrace{PdCl[CH(CHO)CMe_2CH_2NMe_2]}\}_2$ [189]

(*131*) $\overbrace{PdCl(\textit{R}\text{-}C_{10}H_6CHMeNMe_2)}(\textit{S}\text{-}PPr^iBu^tPh)$ [337]

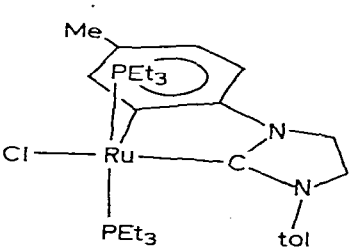
(*132*) $\overbrace{PtCl(CH_2OC_6H_4PPh_2)}(py)$ [297]

(*133*) *trans*-$\overbrace{Pt(ONO_2)(C_6H_4PBu^t_2)}(PBu^t_2\text{-}Ph)$ [243]

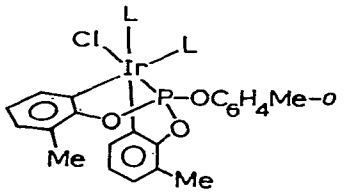
(*134*) $\overbrace{Pt[CH(CH_2OMe)C_6H_4AsPh_2]}-(hfac)$ [328]



	L	M'	L'
(120)	PPh_3	Mn	CO
(121)	CO	Mn	PPh_3
(122)	PPh_3	Mn	PPh_3
(123)	CO	Re	CO

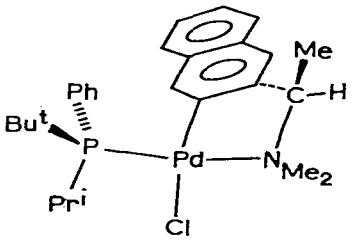


(124)



L = 4-MeC_5H_4N

(128)



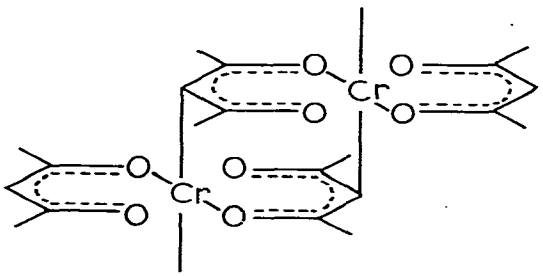
(131)

See also: *277, 376.*

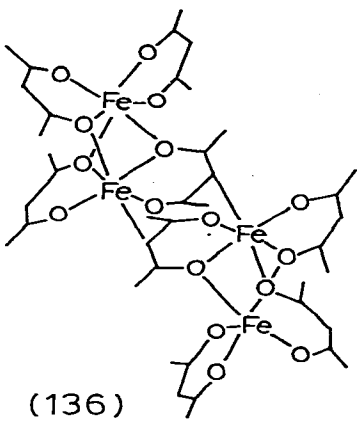
Miscellaneous complexes containing M-C interactions

(*135*) $Cr(acac)_2$ [66]

(*136*) $[Fe(acac)_2]_4$ [401]



(135)



(136)

η^2-LIGANDS

Metallocycles

(*137*) $Fe(CO)_4(C_4H_2O_2)$ [27]

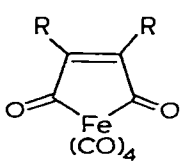
(*138*) $Fe(CO)_4(C_{10}H_{10}O_2)$ [130]

(*139*) $Fe(CO)_4(C_{12}H_8F_{12})$ [173]

(*140*) $\overline{OsH(CS_2}CNMe\text{-}p\text{-}tol)(CO)(PPh_3)_2$ [425]

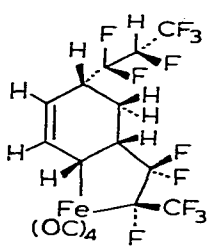
(*141*) $RhCl_2(C_3Ph_3)(PMe_2Ph)_2$ [386]

(*142*) $Ni(C_6H_{10}Me_4)(bipy)$ [261]

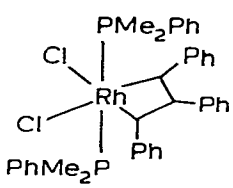


(137) R = Me

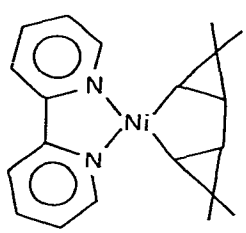
(138) R = c-C_3H_5



(139)



(141)



(142)

See also: *152, 207, 269, 301, 302, 303.*

Olefin complexes

(*143*) $[MoH(C_2H_4)_2(cis\text{-}Ph_2PCH{:}CH\text{-}PPh_2)_2]CF_3CO_2$ [443]

(*144*) $Fe(CO)_4(C_{10}H_8O)$ [128]

(*145*) $Fe(CO)_3(C_9H_9N_3)$ [91]

(*146*) $Fe(CO)_3(C_4H_6SO)$ [24]

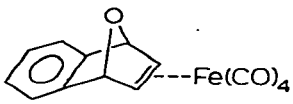
(*147*) $Co[C_2H_2(CO_2Et)_2]_2(NCMe)_2$ [259]

(*148*) $Ni(C_{14}H_{10})(PCy_3)_2$ [429]

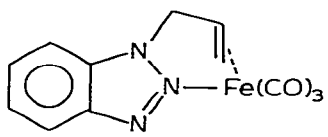
(*149*) $Pd(dba)(bipy)$ [335]

(*150*) $Pt(C_7H_{10})_3$ [272]

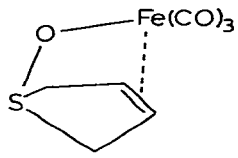
(*151*) $Pt(bq)(PPh_3)_2$ [411]



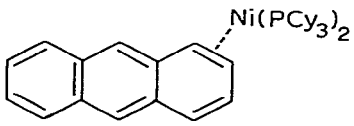
(144)



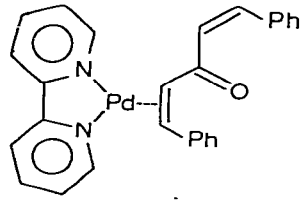
(145)



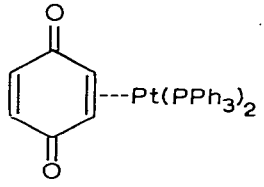
(146)



(148)



(149)

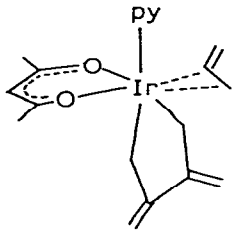


(151)

See also: *288, 294.*

Allene complex

(*152*) $Ir(C_3H_4)(C_6H_8)(acac)(py)$ [201]



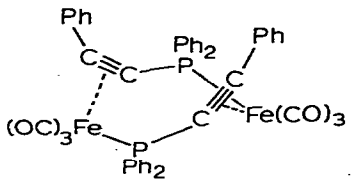
(152)

See also: *392.*

Alkyne complexes

(*153*) $[Fe(CO)_3(PhC{\equiv}CPPh_2)]_2$ [423]

(*154*) $Pt[C_2(CF_3)_2](PCy_3)_2$ [403]



(153)

See also: *260, 391, 393, 394, 414, 415, 418, 422, 432, 437.*

Halide complexes containing olefins or alkynes

(*155*) $[Mo_2Cl_3(C_7H_7)_2]$-$\{MoCl[C_2(CF_3)_2]_3\}$ [111]

(*156*) $RhCl(C_2H_4)(PPr^i_3)_2$ [224]

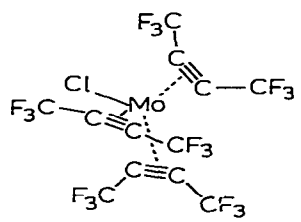
(*157*) $K[PtCl_3(C_2H_4)]$ [1]

(*158*) $[Pt(dppe)_2][PtCl_3(C_2H_4)]_2$ [2]

(*159*) $\bar{P}tCl_3(CH_2{:}CHCH_2\overset{+}{N}H_3)$ [6]

(*160*) $\bar{P}tCl_3[CH_2{:}CH(CH_2)_2\overset{+}{N}H_3]$ [6]

(*161*) $\bar{P}tCl_3[CH_2{:}CH(CH_2)_4\overset{+}{N}H_3]$ [6]



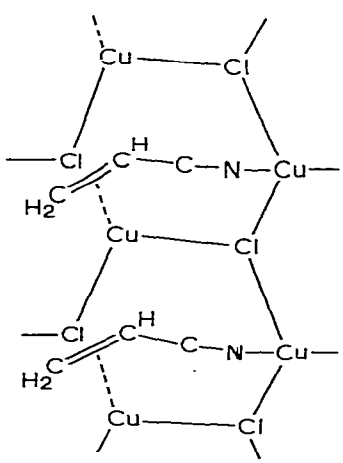
(155)

(*162*) *cis*-$PtCl_2(CH_2{:}CHCHMe_2]$-[*S*-Me(O)S(*p*-tol)] [122]

(*163*) $\{\overline{PtCl(CH_2{:}CMeC_6H_4NMe_2\text{-}o)}$-(bipy)$\}ClO_4$ [270]

(*164*) $\overline{PtCl_2(CH_2{:}CHC_6H_4AsPh_2\text{-}o)}$ [240]

(*165*) $Cu_2Cl_2(CH_2{:}CHCN)$ [4]



(165)

Complexes containing η^2-heteroatom ligands

(*166*) $Mn(\eta^2\text{-}CH_2\text{:}NMeCH_2Fc)(CO)_4$ [200]

(*167*) $Fe(\eta^2\text{-}S\text{:}CS)(CO)_2(PMe_3)(PPh_3)$ [302]

(*168*) $[Ru(\eta^2\text{-}S\text{:}CSMe)(CO)_2(PPh_3)_2]\text{-}ClO_4$ [398]

(*169*) $[Os(\eta^2\text{-}S_2Me)(CO)_2(PPh_3)_2]ClO_4$ [393]

(*170*) $(+)_{546}\text{-}\Delta\text{-}cis\text{-}\beta\text{-}[Co(O_2)\text{-}(R,R\text{-}as_4)]ClO_4$ [308]

(*171*) $RhCl(O_2)(PPh_3)_3$ [439]

(*172*) $[RhCl(O_2)(PPh_3)_2]_2$ [449]

(*173*) $RhCl(O_2)(PPr^i_3)_2$ [224]

(*174*) $RhCl(N_2)(PPr^i_3)_2$ [224]

(*175*) $Rh(\eta^2\text{-}O\text{:}SO)(NO)(PPh_3)_2$ [374]

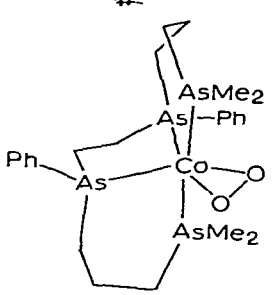
(*176*) $\{Ni(\eta^2\text{-}S\text{:}CNMe_2)[SC(NMe_2)SC\text{-}(NMe_2)]\}BPh_4$ [43]

(*177*) $Ni(\eta^2\text{-}N_2C_{13}H_8)(CNBu^t)_2$ [292]

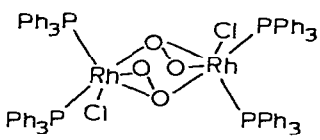
(*178*) $PdCl(\eta^2\text{-}CH_2\text{:}SMe)(PPh_3)$ [242]

(*179*) $Pt[(CF_3)_2C\text{:}NN\text{:}C(CF_3)_2]\text{-}(PPh_3)_2$ [410]

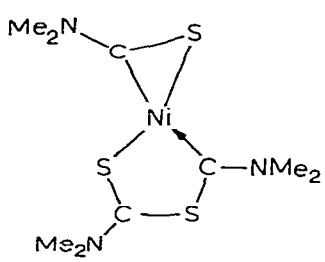
(*180*) $Pt(\eta^2\text{-}CHMe\text{:}PEt_2)(MeC_2B_{10}H_{10})\text{-}(PEt_3)$ [169]



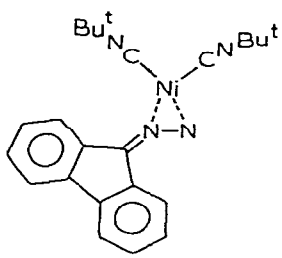
(170)



(172)



(176)



(177)

See also: *247, 254, 255, 259, 274, 275, 285, 297.*

η^3-LIGANDS

η^3-*Allyls*

(*181*) $V(CO)_3(dppe)(C_3H_5)$ [361]

(*186*) $Ru(NO)(C_3H_5)(PPh_3)_2$ [395]

(*182*) $MoCl(CO)_2(dppe)(C_3H_5)$ [355]

(*183*) $Mo(CO)_2(C_3H_5)[(pz)_3BPh]$ [247]

(*184*) $Mo(CO)_2(\eta^3\text{-}C_7H_7)[(pz)_3BPh]$ [247]

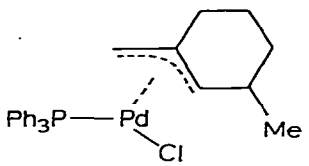
(*185*) $WBr(CO)_2(C_3H_5)(CyN{:}CH\text{-}CH{:}NCy)$ [233]

(*187*) $[IrCl(CO)(PMe_2Ph)_2(C_3H_5)]PF_6$ [255]

(*188*) $NiBr(lut)(CH_2CMeCHCO_2Me)$ [120]

(*189*) $PdCl(\beta\text{-pic})(CH_2CMeCHMe)$ [83]

(*190*) $PdCl(PPh_3)(\eta^3\text{-}C_8H_{13})$ [329]



(190)

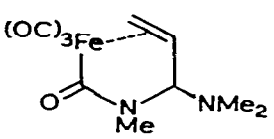
See also: *267*, *268*, *423*, *424*, *426*, *427*, *428*.

$(\eta^1 + \eta^2)$-*Ligands*

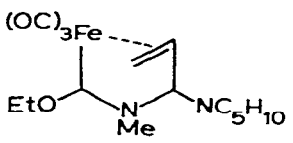
(*191*) $Fe(CO)_3[C(O)NMeC(NMe_2)\text{-}CH{:}CH_2]$ [61]

(*192*) $\{Fe(CO)_3[C(OEt)NMeC(NC_5H_{10})\text{-}CH{:}CH_2]\}BF_4$ [61]

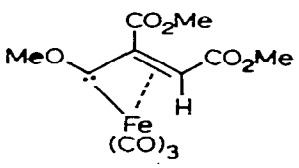
(*193*) $Fe(CO)_3[C(OMe)C(CO_2Me){:}CH(CO_2Me)]$ [79]



(191)



(192)

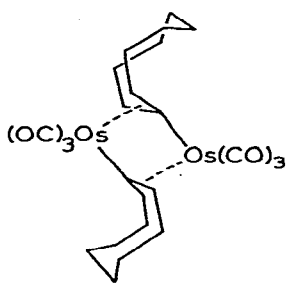


(193)

η^4-LIGANDS

$(\eta^1 + \eta^3)$-*Ligand*

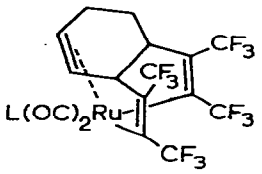
(*194*) $[Os(CO)_3]_2(\mu\text{-}C_9H_{14})_2$ [158]



(194)

$(2\eta^1 + \eta^2)$-*Ligand*

(*195*) $Ru(CO)_2[P(OCH_2)_3CMe][C_6H_8(C_4F_6)_2]$ [267]



L = $P(OCH_2)_3CMe$

(195)

$(2\eta^2)$-*Ligands*

(*196*) $Fe(CO)_3[C_8Me_4(CF_3)_2O_2]$ [153]

(*197*) $RuCl_2(CO)(NCMe)(cod)$ [82]

(*198*) $[RuH(cod)(NH_2NMe_2)_3]PF_6$ [146]

(*199*) $[RuHCl(cod)]_2(\mu\text{-}NH_2NMe_2)$ [223]

(*200*) $Rh(py)(hfac)[C_7H_6\text{-}(CO_2Me)_2]$ [268]

(*201*) $Rh(cod)(2S,3S\text{-}Ph_2PCHMe\text{-}CHMePPh_2)]ClO_4$ [379]

(*202*) $(cot)Rh(\mu\text{-}SPh)_2Rh(CO)_2$ [280]

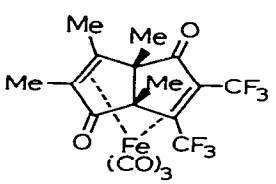
(*203*) $Ni(cod)[\eta^4\text{-}C_4Ph_4AlPh(OEt_2)]$ [424]

(*204*) $PdCl_2(cod)$ [31]

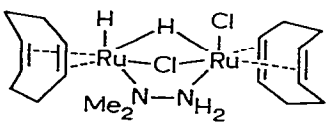
(*205*) $PdCl(CH_2SO_2Ph)(cod)$ [163]

(*206*) $Pt[C(CF_3)_2OC(CF_3)_2O](cod)$ [133]

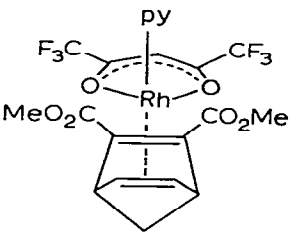
(*207*) $[Pt(cod)]_2(\mu\text{-}C_4F_6)_2$ [301]



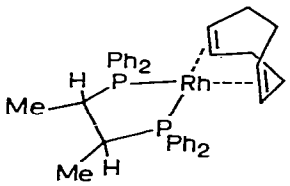
(196)



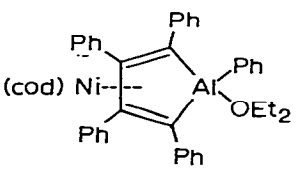
(199)



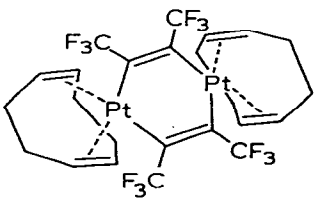
(200)



(201)



(203)



(207)

See also: *265, 429, 430, 439.*

η^4-Dienes

(*208*) $TaCl(dmpe)_2(\eta^4\text{-}C_{10}H_8)$ [237]

(*209*) $Fe(CO)_3(C_4H_4CO)$ [28]

(*210*) $Fe(CO)_3(C_4H_2Me_2SO_2)$ [39]

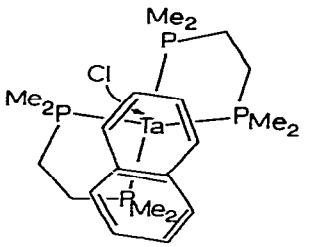
(*211*) $Fe(CO)_3(C_7H_7Ph)$ [180]

(*212*) $Fe(CO)_3[C_6Me_4(CF_3)_2]$ [153]

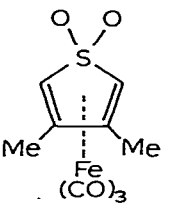
(*213*) $Fe(CO)_3[C_8H_6(CPh_3)(SiMe_3)]$ [364]

(*214*) $[Fe(CO)_3]_2(MeC_6H_4CMe{:}CH_2)$ [181]

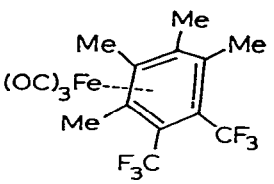
(*215*) $Fe(CO)(bipy)[C_4H_4(CO_2Et)_2]$ [269]



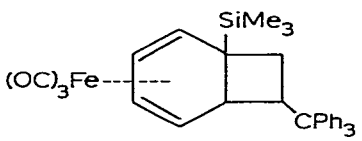
(208)



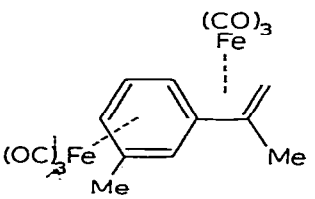
(210)



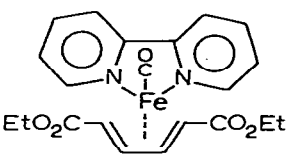
(212)



(213)



(214)



(215)

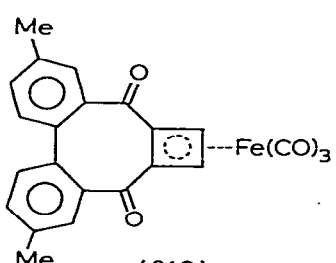
See also: *260, 266, 280, 281, 282, 393, 397, 401, 405.*

Cyclobutadiene complexes

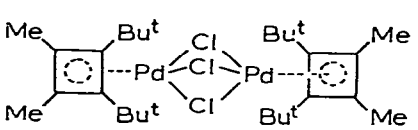
(*216*) $Fe(CO)_3(C_{20}H_{14}O_2)$ [290]

(*217*) $[NiBr_2(C_4Et_4)]_2$ [309]

(*218*) $[(C_4Me_2Bu^t_2)Pd(\mu\text{-}Cl)_3Pd\text{-}(C_4Me_2Bu^t_2)]_2[Pd_2Cl_6]$ [344]



(216)



(218)

See also: *263, 264, 379, 393, 424.*

η^5-LIGANDS

Cyclopentadienyls

(*219*) $[Yb(C_5H_5)_3]_2(\mu\text{-}C_4H_4N_2)$ [370]

(*220*) $Mn(C_5H_4Me)_2$ [99]

(*221*) $[Fe(C_5H_5)_2]BiCl_4$ [56]

Cyclopentadienyls with anionic ligands

(*222*) $U(H_3BH)_2(C_5H_5)_2$ [68]

(*223*) $TiCl_2(C_5H_5)_2$ [52]

(*224*) $ZrCl_2(C_5H_5)_2$ [52]

(*225*) $[Ti(H_3BH)(C_5H_5)]_2(\mu\text{-}Cl)_2$ [67]

(*226*) $[TiCl_2(C_5H_5)]_2O$ [53]

(*227*) $Ti(H_2BH_2)(C_5H_5)_2$ [65]

(*228*) $[Ti(\mu\text{-}Cl)(C_5H_5)_2]_2$ [248]

(*229*) $[Ti(\mu\text{-}Br)(C_5H_4Me)_2]_2$ [248]

(*230*) $[Ti(\mu\text{-}Cl)(C_5H_4Me)_2]_2$ [248]

(*231*) $TiCl(OC_6H_4Cl\text{-}2)(C_5H_5)(C_5H_3Me\text{-}1\text{-}Pr^i\text{-}3)$ [253]

(*232*) $TiCl(OC_6H_3Me_2\text{-}2,6)(C_5H_5)(C_5H_3Me\text{-}1\text{-}Pr^i\text{-}3)$ [253]

(*233*) $Ti(OC_6H_4Cl\text{-}2)(OC_6H_3Me_2\text{-}2,6)(C_5H_5)(C_5H_3Me\text{-}1\text{-}Pr^i\text{-}3)$ [253]

(*234*) $[Ti(OCOPh)_2(C_5H_5)]_2$ [389]

(*239*) $NbH_3(C_5H_5)_2$ [64]

(*240*) $TaH_3(C_5H_5)_2$ [64]

(*241*) $MoH_2(C_5H_5)_2$ [62]

(*242*) $[Mo_2O_4(C_5H_4Me)_2]_2$ [100]

(*243*) $[(C_5H_5)_2Mo(\mu\text{-}O_2PO_2)Mo(C_5H_5)_2](PF_6)_2$ [252]

(*244*) $[Mo(L\text{-prolinato})(C_5H_5)_2]PF_6$ [161]

(*245*) $[Mo(L\text{-leucinato})(C_5H_5)_2]PF_6$ [161]

(*246*) $\{[(C_5H_5)Mo(\mu\text{-}H)(\mu\text{-}OH)Mo(C_5H_5)](\mu\text{-}C_{10}H_8)\}(PF_6)_2$ [250,251]

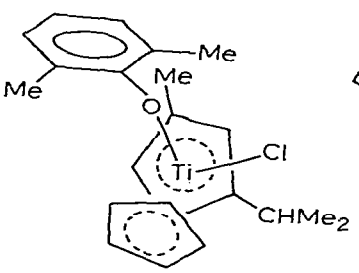
(*247*) $Mo(\eta^2\text{-}P_2H_2)(C_5H_5)_2$ [63]

(*248*) $[IrCl(C_5Me_5)]_2(\mu\text{-}H)(\mu\text{-}Cl)$ [257]

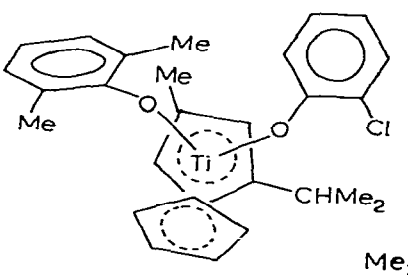
(*249*) $[RhCl(C_5Me_5)]_2(\mu\text{-}Cl)_2$ [258]

(*250*) $[IrCl(C_5Me_5)]_2(\mu\text{-}Cl)_2$ [257]

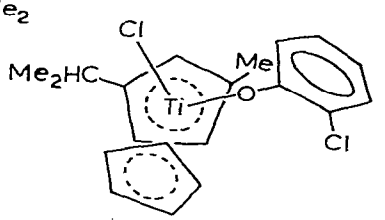
(*251*) $Co[(NO)_2C_7H_6(CO_2Me)_2](C_5H_5)$ [185]



(232)



(233)



(231)

(*235*) $Ti(N_3)_2(C_5H_5)_2$ [57]

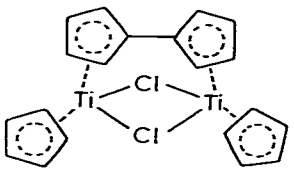
(*236*) $[Ti(\mu\text{-}Cl)(C_5H_5)]_2(\mu\text{-}C_{10}H_8)$ [244]

(*237*) $VCl(C_5H_5)_2$ [51]

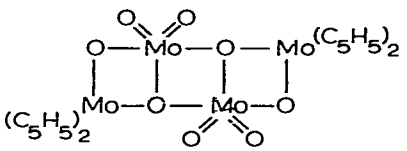
(*238*) $[Nb(OH)Cl_3(C_5H_4Me)]_2O$ [101]

(*252*) $[(C_5Me_5)Rh(\mu\text{-}O_2PF_2)_3Rh(C_5Me_5)]PF_6$ [260]

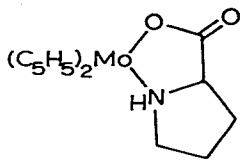
(*253*) $Rh(NCBPh_3)(S_2PMe_2)(C_5Me_5)$ [356]



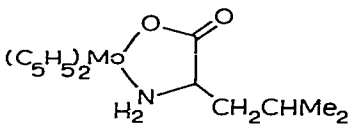
(236)



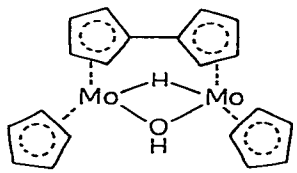
(242)



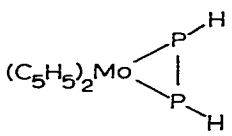
(244)



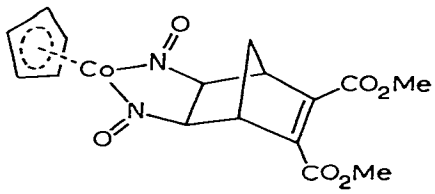
(245)



(246)



(247)



(251)

Cyclopentadienyls containing other η-hydrocarbon ligands

(*254*) $TiCl(\eta^2\text{-}O{:}CMe)(C_5H_5)_2$ [98]

(*255*) $ZrMe(\eta^2\text{-}O{:}CMe)(C_5H_5)_2$ [119]

(*256*) $Zr(CHPh_2)_2(C_5H_5)_2$ [375]

(*257*) $Hf(CHPh_2)_2(C_5H_5)_2$ [375]

(*258*) $[NbBu(C_5H_5)_2]_2O$ [342]

(*259*) $Nb(CH_2CH{:}CH_2)(\eta^2\text{-}S{:}CS)(C_5H_5)_2$ [137]

(*260*) $Mo[C_2(CF_3)_2][C(CF_3){:}C(CF_3)C_5H_5](C_5H_5)$ [209]

(*261*) $[WH(C_5H_5)](\mu\text{-}\eta^1{:}\eta^5\text{-}C_5H_4)_2[W(CH_2SiMe_3)(C_5H_5)]$ [306]

(*262*) $Fe\{\eta^5\text{-}(CF_3)_2CCHC(CF_3)CFC[{:}C(CF_3)_2]\}(C_5H_5)$ [172]

(*263*) $Co[trans\text{-}C_4Ph_2(2\text{-thienyl})_2](C_5H_5)$ [345]

(*264*) $[Co(C_5H_5)]_2\{\mu\text{-}trans\text{-}C_4Ph_2(2\text{-thienyl})]_2\}$ [345]

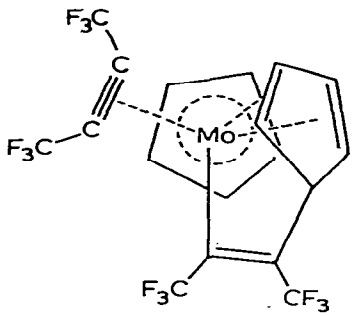
(*265*) $Rh(cod)(C_5H_4CO_2Me)$ [164]

(*266*) $Rh(C_{13}H_8F_{12})(ind)$ [278]

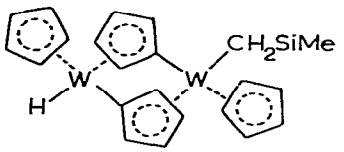
(*267*) $IrCl(C_4H_7)(C_5H_5)$ [41]

(*268*) $IrI(C_4H_7)(C_5H_5)$ [41]

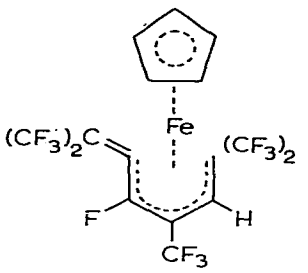
(*269*) $Pd[C_4(CO_2Me)_4](C_5H_4PPh_3)$ [371]



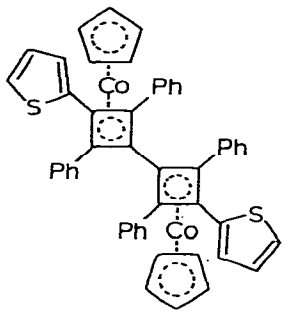
(260)



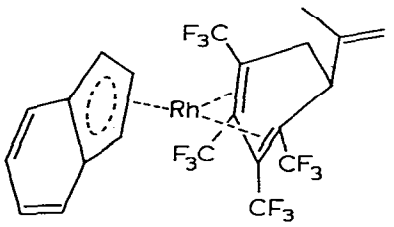
(261)



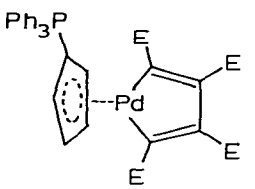
(262)



(264)



(266)



(269)

E = CO_2Me

Cyclopentadienyl complexes containing CO, PR_3 or CNR ligands

(*270*) $Ti(CO)_2(C_5H_5)_2$ [94]

(*271*) $NbCl_3(dppe)(C_5H_5)$ [101]

(*272*) $Cr(CO)_3(C_5H_4SMe_2)$ [55]

(*273*) $NBu_4[Mo(CO)_3(C_5H_5)]$ [29]

(*274*) $Mo(CO)_2(\eta^2\text{-MeC:NPh})(C_5H_5)$ [156]

(*275*) $Mo(CO)_2(\eta^2\text{-O:NCMe}_2)(C_5H_5)$ [60]

(*276*) $(-)_{578}\text{-}\overline{Mo[SCMeN(S\text{-CHMePh})]}(CO)_2(C_5H_5)$ [202]

(*277*) $\overline{Mo(COCHPhCHMeNHMe)}(CO)_2(C_5H_5)$ [217]

(*278*) $MoI(CO)[\eta^3\text{-C(NMe}_2)\text{CMeNMe}](C_5H_5)$ [103]

(*279*) $MoCl[(PF_2)_2NMe]_2(C_5H_5)$ [25]

(*281*) $MoCl(PEt_3)(\eta^4\text{-}C_5H_5Et\text{-}endo)(C_5H_5)$ [222]

(*282*) $Mo(CF_3)(CNBu^t)[\eta^4\text{-}C_4(CF_3)_4\text{-}CNBu^t](C_5H_5)$ [298]

(*283*) $W(C\text{-}p\text{-tol})(CO)_2(C_5H_5)$ [154]

(*284*) $W(CSiPh_3)(CO)_2(C_5H_5)$ [326]

(*285*) $W(CO)(PMe_3)[\eta^2\text{-C}(p\text{-tol}):CO](C_5H_5)$ [218]

(*286*) $Mn(CMe_2)(CO)_2(C_5H_5)$ [59]

(*287*) $Mn(C:CHPh)(CO)_2(C_5H_5)$ [152]

(*288*) $Mn(CO)_2(\eta^2\text{-}C_8H_8)(C_5H_5)$ [155]

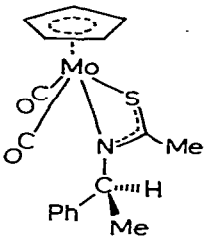
(*289*) $Mn(CO)_2[\overline{PhPOC(:CH_2)CH:C(Me)O}](C_5H_5)$ [215]

(*290*) $Mn(CO)_2[PHPh(CPh:CHPh)](C_5H_5)$ [334]

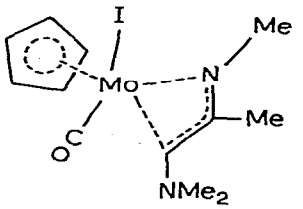
(*280*) $[Mo(dppe)(\eta^4\text{-}C_6H_8)(C_5H_5)]PF_6$ [280]

(*291*) $[Mn(CO)_3]_2(C_{14}H_8Me_2)$ [277]

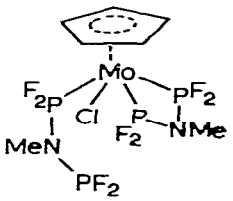
(272)



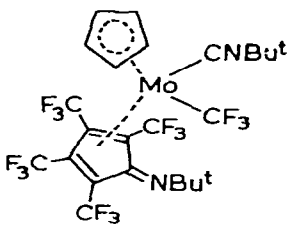
(276)



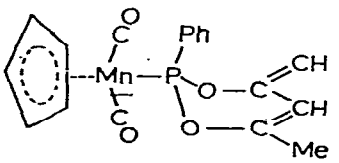
(278)



(279)



(282)



(289)

(*292*) $[Mn(CO)_3]_2(C_{20}H_{16})$ [321]

(*293*) $[Re(CPhPMe_3)(CO)_2(C_5H_5)]BCl_4$ [204]

(*294*) $[Re(CO)_2(C_5H_5)]_2(\mu\text{-}C{:}CPh\text{-}CPh{:}CH_2)$ [349]

(*295*) $Fe[SC(S)Me](CO)_2(C_5H_5)$ [38]

(*296*) $[Fe(CO)_2(C_7H_6N_2)(C_5H_5)]BPh_4$ [131]

(*297*) $(C_5H_4Me)Fe(\mu\text{-}S_2)_2Fe(CO)(C_5H_4Me)$ [118]

(*298*) $\{[Fe(CO)_2(C_5H_5)]_2(\mu\text{-}C_3H_5)\}PF_6$ [199]

(*299*) $Fe(COPh)(dppe)(C_5H_5)$ [390]

(*300*) $\overline{Ru[C(CF_3){:}CH(CF_3){:}C{:}C{:}}\text{-}CH(CF_3)](PPh_3)(C_5H_5)$ [360]

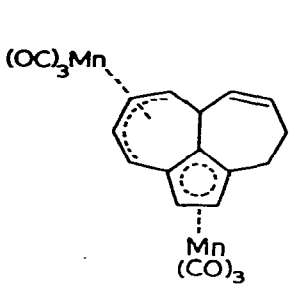
(*301*) $Co[C(O)C(CO_2Et){:}C(O)OEt]\text{-}(CO)(C_5H_5)$ [135]

(*302*) $\overline{Co[CH_2(CH_2)_2CH_2]}(PPh_3)\text{-}(C_5H_5)$ [336]

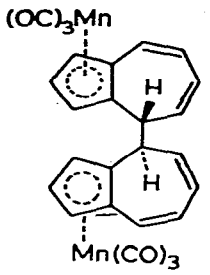
(*303*) $Ir[CH_2(CH_2)_2CH_2](PPh_3)(C_5Me_5)$ [336]

(*304*) $[Co\{[P(OEt)_2O]_3BF\}(C_5H_5)]BF_4$ [207]

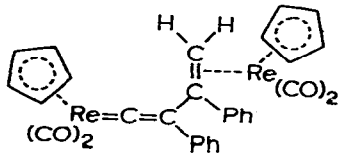
A large number of other complexes also contain η-cyclopentadienyl groups: *321-323, 340, 342-346, 351, 353-355, 358, 363, 365, 377-382, 391, 392, 395, 396, 398, 417-422, 424-427, 443-445, 449, 480-482, 484, 485, 488-490, 493, 495, 497, 499, 502, 504, 509-513.*



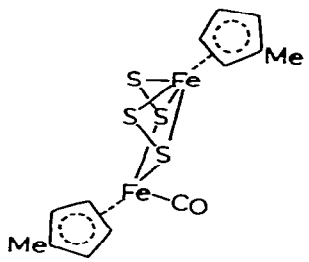
(291)



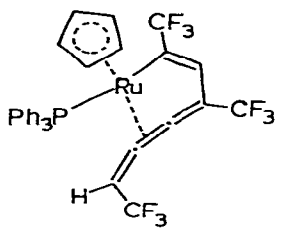
(292)



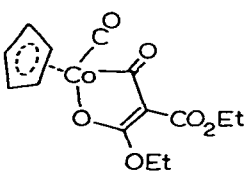
(294)



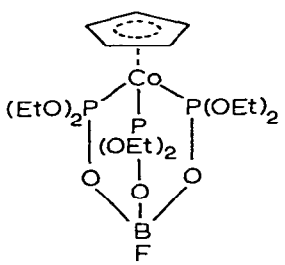
(297)



(300)



(301)



(304)

Ferrocenes

(*305*) $[FcCH_2(NC_5H_5)]I$[184]

(*306*) $FcSiHPh_2$[281]

(*307*) Fc_2SnCl_2[243]

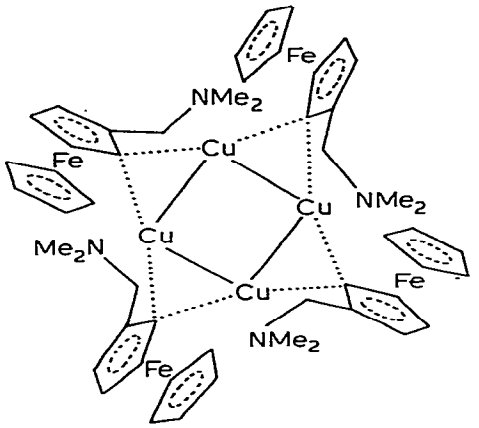
(*308*) $[Cu(C_5H_3CH_2NMe_2\text{-}2)(C_5H_5)\text{-}Fe]_4$[437]

(*309*) 3,4'-Diacetyl-[5]-ferrocenophane[229]

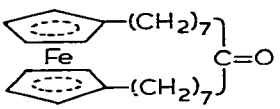
(*310*) [15]-Ferrocenophan-8-one[316]

(*311*) 1,1'-Tetraphenyl-*o*-phenylene-ferrocene[396]

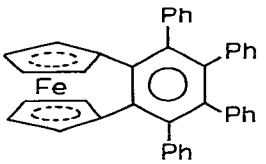
See also: *166*.



(308)



(310)

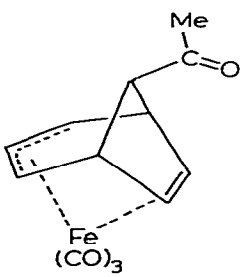


(311)

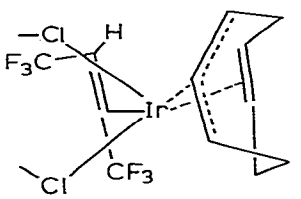
($\eta^2 + \eta^3$)-*Ligands*

(*312*) $[Fe(CO)_3(C_8H_8Ac)]PF_6$ [115]

(*313*) $\{IrCl[C(CF_3):CH(CF_3)](C_8H_{11})\}_2$ [299]



(312)



half dimeric molecule

(313)

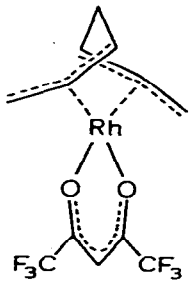
See also: *325*, *326*.

η^6-LIGANDS

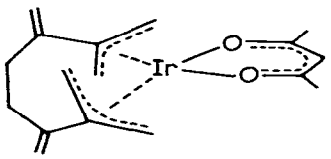
($2\eta^3$)-*Ligands*

(*314*) $Rh(hfac)(C_7H_{10})$ [95]

(*315*) $Ir(hfac)(C_{12}H_{16})$ [201]



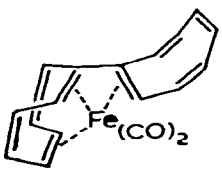
(314)



(315)

$(\eta^2 + \eta^4)$-*Ligand*

(*316*) $Fe(CO)_2(C_{16}H_{14})$ [212]



(316)

Arene complexes

(*317*) $[Nb_3Cl_6(C_6Me_6)_3]^{2+}$-$(tcnq^-)_2$ [382]

(*318*) $Cr(CO)_3(PhMe)$ [49]

(*319*) $Mo(CO)_3(C_6H_3Me_3$-1,3,5) [97]

(*320*) $Mo(CO)_3(C_6Me_6)$ [97]

(*321*) $[Re(CO)_3(PhMe)][Re_2Br_3$-$(CO)_6]$ [20]

(*322*) $[Re(CO)_3(C_6Me_6)][Re_2Cl_3$-$(CO)_6]$ [20]

(*323*) $\{Fe[C_5H_4(CH_2)_3C_6H_5]\}PF_6$ [136]

(*324*) $[Fe(C_5H_5)(\eta^6$-$C_{13}H_{10})]PF_6$ [214]

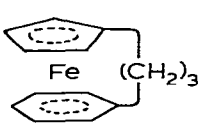
(*325*) $[Fe(C_5H_5)(\eta^6$-$C_{13}H_9Me$-9-*exo*$)]$-PF_6 [214]

(*326*) $\{[Ru(OH)(C_6H_6)]_4\}(SO_4)_2$ [305]

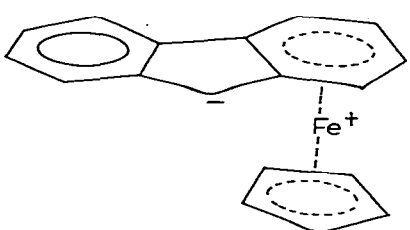
(*327*) $Ru(\eta^5$-$C_8H_{11})(\eta^6$-$PhBF_3)$ [138]

(*328*) $Ru(\eta^5$-$C_8H_{11})(\eta^6$-$PhBPh_3)$ [138]

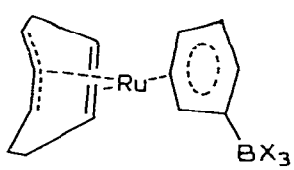
(*329*) $[\{Rh[\eta^6$-$PhPPh(CH_2)_2PPh_2]\}_2]$-$(BF_4)_2$ [436]



(323)



(324)

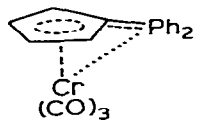


(327) X = Ph
(328) X = F

See also: *347*.

Other η^6*-ligands*

(*330*) $Cr(CO)_3(\eta^6\text{-}C_5H_4CPh_2)$ [265]



(330)

η^7-LIGANDS

(*331*) $[Mo(OH_2)(acac)(C_7H_7)]BF_4$ [102]

(*332*) $(C_7H_7)Mo(\mu\text{-}OMe)_3Mo(CO)_2(\eta^3\text{-}C_7H_7)$ [231,232]

(*333*) $(C_7H_7)Mo(\mu\text{-}SBu^t)_3Mo(CO)_3$ [232]

(*334*) $[(C_7H_7)Mo(\mu\text{-}Cl)_3Mo(C_7H_7)]BF_4$ [134]

(*335*) $[(C_7H_7)Mo(\mu\text{-}Cl)_3Mo(C_7H_7)][MoCl(C_4F_6)_3]$ [111]

(*326*) $[(C_7H_7)Mo(\mu\text{-}OH)_2(\mu\text{-}Br)Mo(C_7H_7)]BF_4$ [139]

η-HETEROATOM LIGANDS

(*337*) $Fe(CO)_3[PhB(CH{:}CH)_2SiMe_2]$ [159]

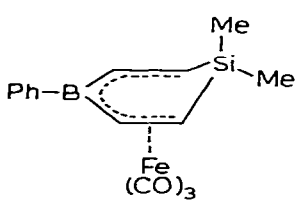
(*338*) $Fe(CO)_3[S(BNMe_2)_2(CEt)_2]$ [123]

(*339*) $Mn(CO)_3(C_9H_8N)$ [90]

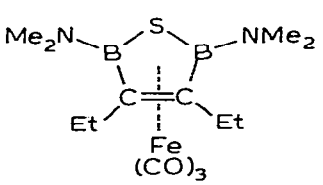
(*340*) $Mn(CO)_3\{C_4H_4N\overline{Mn[NC_4H_3C(O)Me]}(CO)_3\}$ [178]

(*341*) $Fe(C_4H_2Me_2P)(C_5H_5)$ [81]

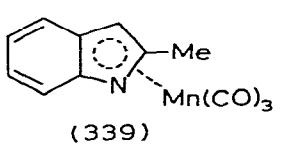
See also: *203, 278, 399, 400.*



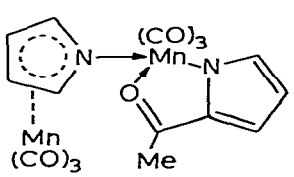
(337)



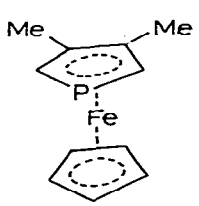
(338)



(339)



(340)



(341)

B. COMPLEXES CONTAINING METAL-METAL BONDS

TRANSITION METAL–MAIN GROUP METAL BONDS

Main Group II

(*342*) MoH[MgBr(thf)]$(C_5H_5)_2$ [140]

(*343*) $MoH_2[ZnBr_2(dmf)](C_5H_5)_2$ [121]

(*344*) Mo[ZnBr(thf)$_2$]$(CO)_3(C_5H_5)$ [188]

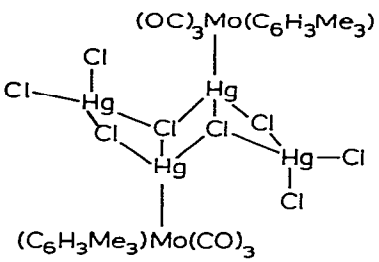
(*345*) $[Mo(CO)_3(C_5H_5)]_2Hg$ [176]

(*346*) Mo(HgI)$(CO)_2(AsMe_2Ph)(C_5H_4Me)$ [176]

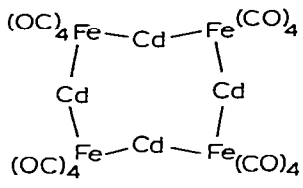
(*347*) $[Mo(HgCl_2)_2(CO)_3(C_6H_3Me_3)]_2$ [300]

(*348*) $[CdFe(CO)_4]_4$ [192]

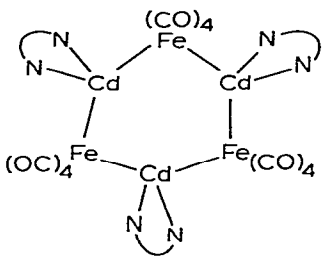
(*349*) $[(bipy)CdFe(CO)_4]_3$ [409]



(347)



(348)



(349)

Main Group III

(*350*) Cr[InBr(thf)](CO)$_5$ [37]

(*351*) $W(GaMe_2)(CO)_3(C_5H_5)$ [58]

Main Group IV

(*352*) Cr{Ge[CH$(SiMe_3)_2$]$_2$}$(CO)_5$ [234]

(*353*) Mo$(GePh_3)(CO)_2$[CPh(OEt)](C_5H_5) [369]

(*354*) [Mn$(SnCl_3)(CO)_2(PPh_3)(C_5H_5)$]$SnCl_5$ [311]

(*355*) ReH$(SiPh_3)(CO)_2(C_5H_5)$ [315]

(*356*) *cis*-Fe$(SiMe_3)_2(CO)_4$ [69]

(*357*) *cis*-Fe$(SnPh_3)_2(CO)_4$ [397]

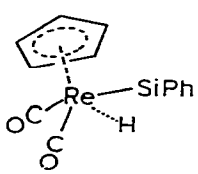
(*358*) FeH$(SiF_2Me)_2(CO)(C_5H_5)$ [32]

(*359*) (+)-Co[GeMePh(nap)]$(CO)_4$ [266]

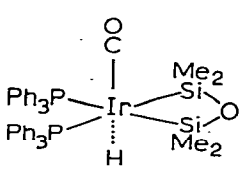
(*360*) IrH$(SiMe_2OSiMe_2)(CO)(PPh_3)_2$ [408]

(*361*) [Ni$(SnPh_3)(np_3)$]BPh_4 [447]

(*362*) *trans*-PtCl[Si$(OCH_2CH_2)_3N$]$(PMe_2Ph)_2$ [283]



(355)



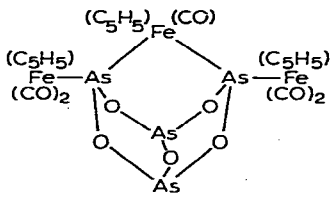
(360)

Main Group V

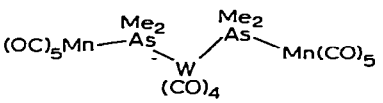
(*363*) $[Fe_3(As_4O_5)(CO)_5(C_5H_5)_3]BF_4$ [237]

(*364*) $W[(\mu\text{-}AsMe_2)Mn(CO)_5]_2(CO)_4$ [211]

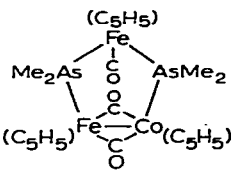
(*365*) $Fe_2Co(AsMe_2)_2(CO)_3(C_5H_5)_3$ [285]



(363)



(364)



(365)

BINUCLEAR TRANSITION METAL COMPLEXES

Carbonyls

(*366*) $NEt_4[(OC)_5Cr(\mu\text{-}H)Cr(CO)_5]$ [44]

(*367*) $(OC)_4W(\mu\text{-}CO)[\mu\text{-}CPh(PMe_3)]Re(CO)_4$ [226]

(*368*) *cis*-$Re_2(CO)_8[C(OMe)(p\text{-}tol)]_2$ [327]

(*369*) $[Fe(CO)_3]_2(\mu\text{-}CO)(\mu\text{-}C_4H_4N_2)$ [74]

(*370*) $[Fe(CO)_2]_2(\mu\text{-}CO)[\mu\text{-}MeN(PF_2)_2]$ [23]

(*371*) $Os_3(CO)_{12}I_2$ [112]

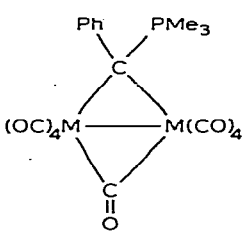
(*372*) $[Co(CO)_2]_2(\mu\text{-}CO)_2[\mu\text{-}HN(PPh_2)_2]$ [348]

(*373*) $[Co(CO)_2][\mu\text{-}MeN(PF_2)_2]_3$ [15]

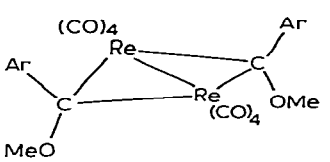
(*374*) $\{Co[PF_2(NHMe)]\}_2[\mu\text{-}MeN(PF_2)_2]_3$ [15]

(*375*) $Co_2(CNBu^t)_8$ [391]

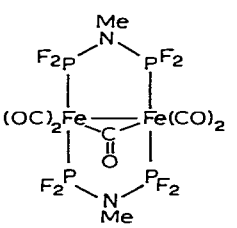
(*376*) $Pd[Co(CO)_4](C_6H_4CMe{:}NNHPh)(py)$ [291]



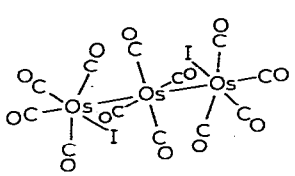
(367) M,M = W,Re



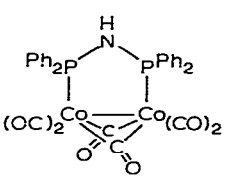
(368) Ar = *p*-MeC_6H_4



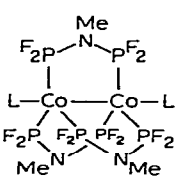
(370)



(371)



(372)



(373) L = CO
(374) L = $PF_2(NHMe)$

Cyclobutadiene and cyclopentadienyl complexes

(*377*) $[Fe(CO)_2(C_5H_4)]_2SiMe_2$ [183]

(*378*) *trans,anti*-$[Fe(CO)(\mu\text{-}CNPh)(C_5H_5)]_2$ [324,325]

(*379*) $Co_2(CO)_6(C_4H_4)$ [47]

(*380*) $(Ph_3P)_2N[Co_2(CO)_2(C_5H_5)_2]$ [92]

(*381*) $Co_2(\mu\text{-}CO)(\mu\text{-}NO)(C_5H_5)_2$ [76,77]

(*382*) $[Co(\mu\text{-}NO)(C_5H_5)]_2$ [54]

Metal-metal bonded alkyls

(*383*) $V_2[C_6H_3(OMe)_2\text{-}2,6]_4$ [363]

(*384*) $Cr_2[C_6H_3(OMe)_2\text{-}2,6]_4$ [362]

(*385*) $Cr_2[C_6H_2(OMe)_3\text{-}2,4,6]_4$ [380]

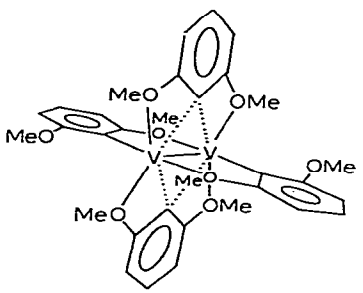
(*386*) $Mo_2[C_6H_3(OMe)_2\text{-}2,6]_4$ [362]

(*387*) $[Li(thf)]_4[W_2Me_4Cl_4]$ [11]

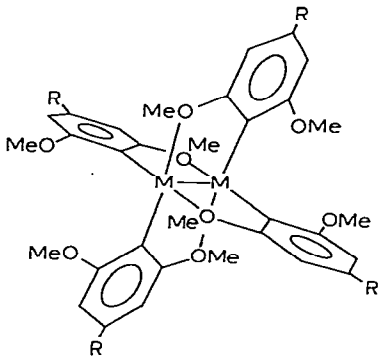
(*388*) $W_2Me_2(O_2CNEt_2)_4$ [148]

(*389*) $Cr_2(CH_2SiMe_3)_2(\mu\text{-}CH_2SiMe_3)_2(PMe_3)_2$ [288]

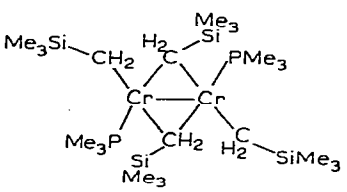
(*390*) $Mn_2(CH_2C_6H_4NMe_2\text{-}o)_4$ [381]



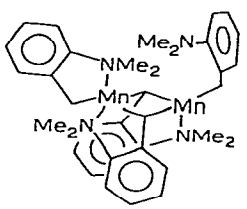
(383)



	M	R
(384)	Cr	H
(385)	Cr	OMe
(386)	Mo	H



(389)



(390)

Metal-metal bonds bridged by hydrocarbon ligands

(*391*) $[Mo(CO)_2(C_5H_5)]_2(\mu\text{-}C_2H_2)$ [182]

(*392*) $[Mo(CO)_2(C_5H_5)]_2(\mu\text{-}C_3H_4)$ [198]

(*393*) $Mo_2(CO)_3(C_2Ph_2)(C_4Ph_4)(C_4Ph_4CO)$ [450]

(*396*) $[Mo(CO)(C_5H_5)]_2(\mu\text{-}C_8H_8)$ (purple) [246]

(*397*) $W_2(C_8H_8)_3$ [303]

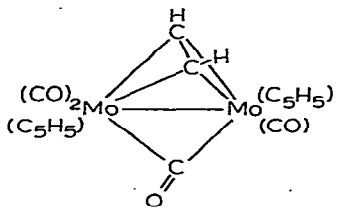
(*398*) $[Mn(CO)_2(C_5H_5)]_2(\mu\text{-}C{:}CHPh)$ [279]

(*394*) $W_2Br_2(CO)_5(C_2Me_2)(dpam)$ [367]

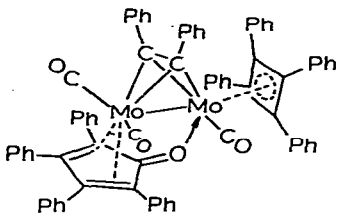
(*395*) $[Mo(CO)(C_5H_5)]_2(\mu\text{-}C_8H_8)$ (orange) [246]

(*399*) $Mn_2(CO)_7(C_4H_2Me_2PBu^t)$ [195]

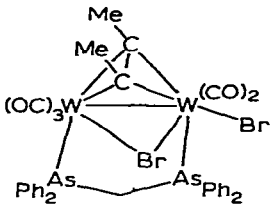
(*400*) $Mn_3(CO)_{11}(C_4H_2Me_2P)$ [195]



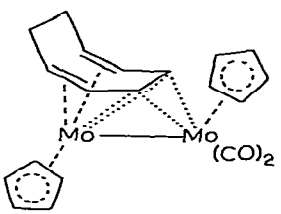
(391)



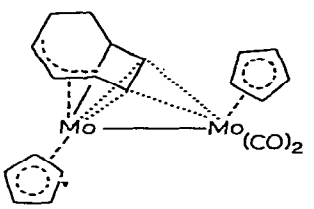
(393)



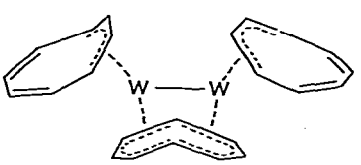
(394)



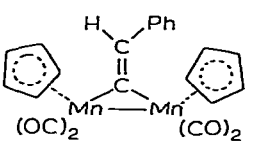
(395)



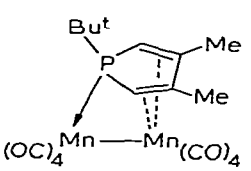
(396)



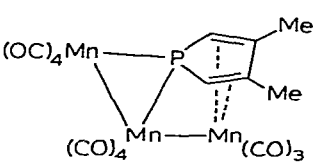
(397)



(398)



(399)



(400)

(*401*) $[Fe(CO)_3]_2C_9H_6[Fe(CO)_3]$ [181]

(*402*) $Fe_2(CO)_5$(gaz) (isomer I) [245]

(*403*) $Fe_2(CO)_5$(gaz) (isomer II) [245]

(*404*) $Fe_2(CO)_4(PEt_3)$(gaz) [245]

(*405*) $[Fe_2(CO)_5]C_{14}H_8Me_2[Fe(CO)_3]$ [277]

(*406*) $Fe_2(CO)_6(\mu\text{-}CNEt_2)_2$ [186,187]

(*419*) $[Rh(C_5H_5)]_2\{\mu\text{-}(C_2Me_2)CO\text{-}[C_2(CF_3)_2]\}$ [227]

(*420*) $[Rh(C_5H_5)]_2(\mu\text{-}CO)(\mu\text{-}CPh_2)_2$ [385]

(*421*) $[Ir(CO)(C_5H_5)]_2(\mu\text{-}C_6H_4)$ [213]

(*422*) $[Ni(C_5H_5)]_2[\mu\text{-}CF_3C_2P(O)Ph_2]$ [312]

(*423*) $[Ni_2(CO)_2(\mu\text{-}Cl)(\mu\text{-}C_3Cl_3)]_2$ [72]

(*407*) $Fe_2(CO)_5(C_9H_8)$ [129]

(*408*) $Fe_2(CO)_6[C_2H_2C(O)S]$ [33]

(*409*) $Fe_2(CO)_6(C_4H_3MeS)$ [75]

(*410*) $Fe_2(CO)_6(C_8H_6S_2)$ [127]

(*411*) $Fe_2(CO)_6[C(CHO)P(C_6H_4)Ph_2]$ [320]

(*412*) $[Ru(CO)_2(PBu^t_3)]_2(\mu\text{-}O_2CPr)_2$ [383]

(*413*) $Ru_2(CO)_4(\mu\text{-}I)(C_7H_6Ph)$ [196]

(*414*) $Co_2(CO)_4(\mu\text{-dppm})(C_2Ph_2)$ [414]

(*415*) $Co_2(CO)_2(\mu\text{-dpam})_2(C_2Ph_2)$ [414]

(*416*) $Co_2(CO)_4(\mu\text{-CO})(PMe_2Ph)(\mu\text{-CPh:NPhCPh:NPh})$ [392]

(*417*) $[Rh(CO)(C_5H_5)]_2(\mu\text{-}CH_2)$ [116,117]

(*418*) $[Rh(CO)(C_5H_5)]_2[\mu\text{-}C_2(CF_3)_2]$ [175]

(*424*) $(C_4Ph_4)Ni(\mu\text{-}C_3Ph_3)Ni(C_5Ph_5)$ [452]

(*425*) $[Pd(PPr^i_3)]_2(\mu\text{-Br})(\mu\text{-}C_5H_5)$ [294]

(*426*) $[Pd(PPh_3)]_2(\mu\text{-}C_4H_7)(\mu\text{-}C_5H_5)$ [422]

(*427*) $\{Pd[P(O\text{-}o\text{-tol})_3]\}_2(\mu\text{-}C_4H_7)(\mu\text{-}C_5H_5)$ [422]

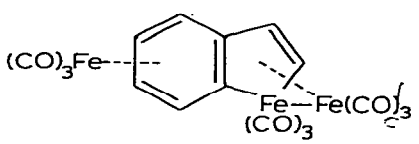
(*428*) $Pd_3(acac)_2[\mu\text{-}C_3Ph(C_6H_4OMe\text{-}p)_2]_2$ [442]

(*429*) $[Pt(cod)]_2[\mu\text{-}OC(CF_3)_2]$ [133]

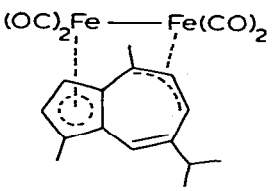
(*430*) $(cod)Pt(\mu\text{-}C_4F_6)Pt(\mu\text{-}C_4F_6)(\mu\text{-}C_8F_{12})Pt(cod)$ [301]

(*431*) $[Pt(CNBu^t)_2]_2[\mu\text{-}OC(CPh)_2]$ [372]

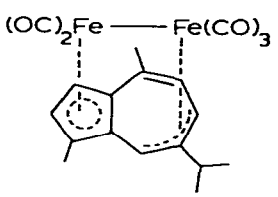
(*432*) $Pt_3(PEt_3)_4(\mu\text{-}C_2Ph_2)_2$ [438]



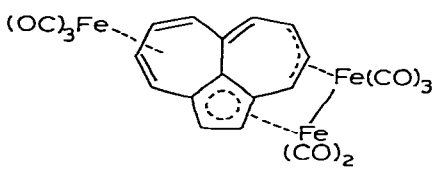
(401)



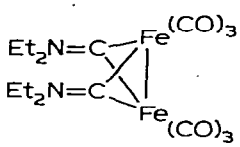
(402) L = CO
(404) L = PEt_2



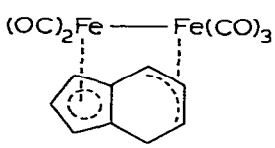
(403)



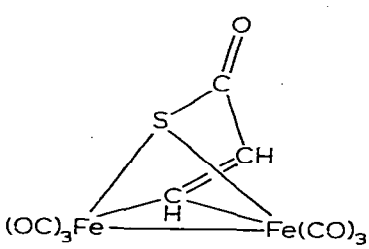
(405)



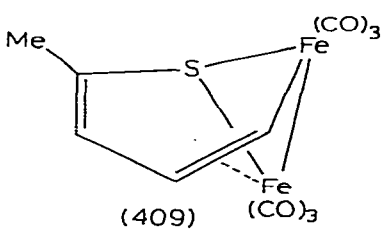
(406)



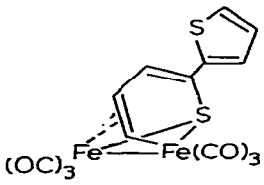
(407)



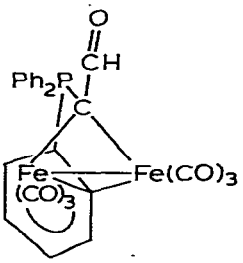
(408)



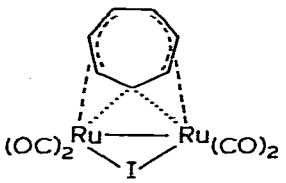
(409)



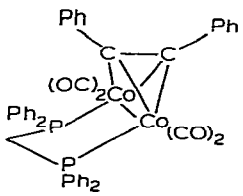
(410)



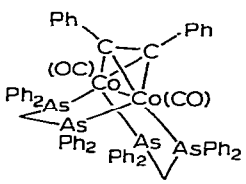
(411)



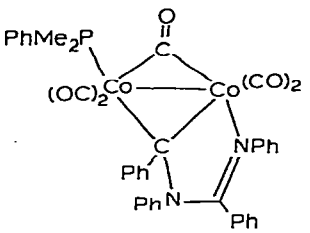
(413)



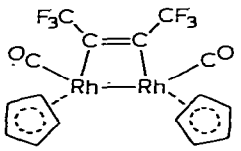
(414)



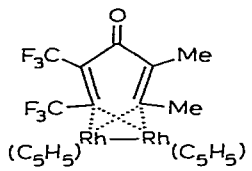
(415)



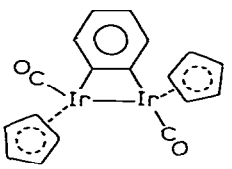
(416)



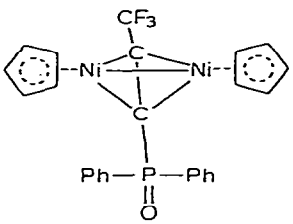
(418)



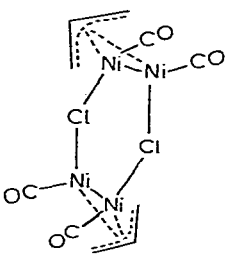
(419)



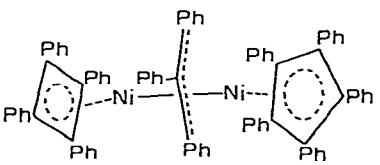
(421)



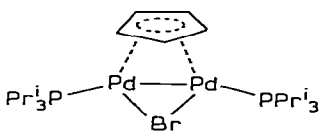
(422)



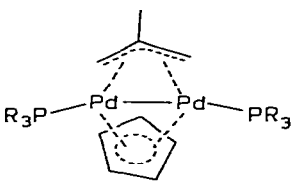
(423)



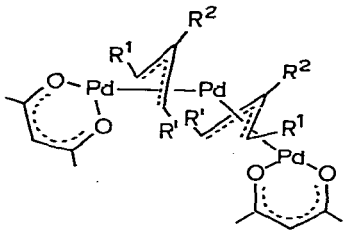
(424)



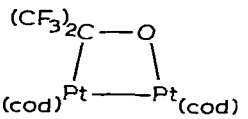
(425)



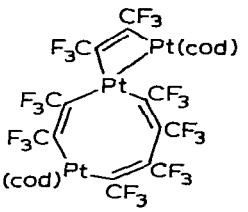
(426) R = Ph
(427) R = O-*o*-tol



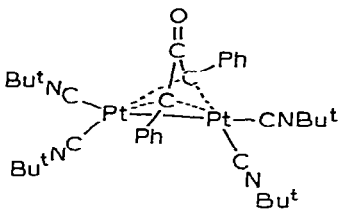
(428) $R^1 = C_6H_4OMe\text{-}p$, $R^2 = Ph$



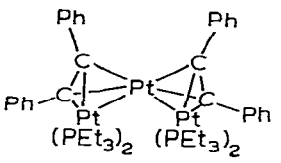
(429)



(430)



(431)

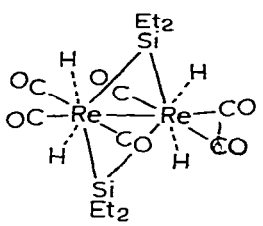


(432)

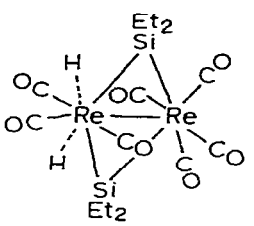
Main Group IV ligand-bridged metal-metal bonds

(*433*) $[ReH_2(CO)_3]_2(\mu\text{-}SiEt_2)_2$ [143]

(*434*) $[ReH_2(CO)_3](\mu\text{-}SiEt_2)_2[Re(CO)_4]$ [165]



(433)



(434)

Main Group V ligand-bridged metal-metal bonds

(*435*) $Fe_2(CO)_6(\mu\text{-}AsMe_2)_2$ [35]

(*436*) $Fe_2(CO)_6(\mu\text{-}AsMe_2)(\mu\text{-}OCNMe_2)$ [80]

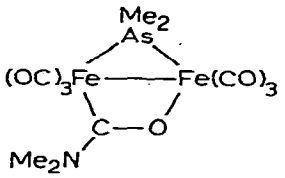
(*437*) $Fe_2(CO)_5(PPh_3)(\mu\text{-}PPh_2)(\mu\text{-}C_2Ph)$ [413]

(*438*) $FeCo(CO)_7(\mu\text{-}PMe_2)$ [35]

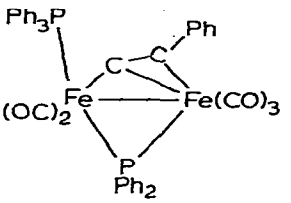
(*439*) $(OC)_4Fe(\mu\text{-}AsMe_2)Co(CO)_2(nbd)$ [157]

(*440*) $(ON)_2Fe(\mu\text{-}PMe_2)_2Fe(CO)_2(\mu\text{-}PMe_2)Fe(CO)_2(NO)$ [70]

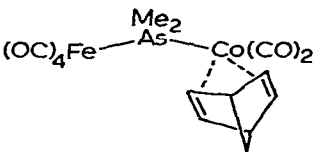
(*441*) $(ON)_2Fe(\mu\text{-}PMe_2)_2Fe(CO)_2(\mu\text{-}PMe_2)Co(CO)_3$ [70]



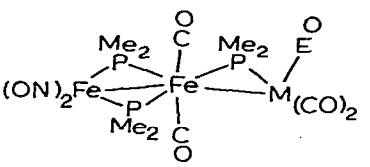
(436)



(437)



(439)



(440) M = Fe, E = N
(441) M = Co, E = F

Main Group VI ligand-bridged metal-metal bonds

(*442*) $[Mn_3(CO)_8(PMe_2Ph)](\mu\text{-}OEt)_3$ [284]

(*443*) $\{[Mn(CO)_2(C_5H_4Me)]_2(\mu\text{-}SEt)\}ClO_4$ [216]

(*444*) $(C_5H_5)_2Mo(\mu\text{-}S)_2MoS_2$ [100]

(*445*) $\{[Fe(CO)(C_5H_5)]_2(\mu\text{-}CO)(\mu\text{-}SEt)\}SbF_6$ [160]

(*446*) $[Fe(CO)_2(PMe_3)(\mu\text{-}SMe)]_2$ [107]

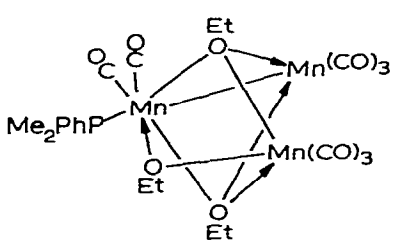
(*447*) $[Ru(CO)_2(py)(\mu\text{-}mbt)]_2$ [339]

(*448*) $[Rh(CO)(PMe_3)(\mu\text{-}SPh)]_2$ [256]

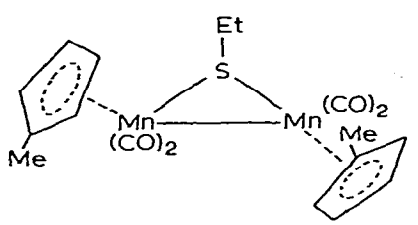
(*449*) $[Rh(\mu\text{-}SPh)(C_5H_5)]_2$ [282]

(*450*) $[Ir(\mu\text{-}SPh)(CO)_2]_2$ [177]

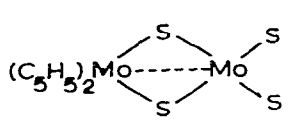
Complexes *332–336* also contain metal–metal bonds.



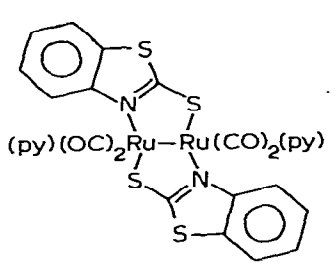
(442)



(443)



(444)



(447)

C. CLUSTER COMPLEXES

CLUSTERS CONTAINING SIMPLE DONOR LIGANDS

3-metal atoms

(*451*) $NEt_4[Re_3H_4(CO)_{10}]$ [48]

(*452*) $Ru_3(CO)_{12}$ [114]

(*453*) $Os_3(CO)_{12}$ [115]

(*454*) $Os_3H_2(CO)_{10}$ [45,46]

(*455*) $Os_3H_2(CO)_{11}$ [73]

(*456*) $Os_3H_2(CO)_{10}(PPh_3)$ [338]

(*457*) $Ru_3(CO)_{10}(C_4H_4N_2)$ [125]

(*458*) $Os_3(CO)_{10}(OMe)_2$ [45]

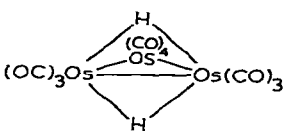
(*459*) $Os_3H(CO)_{10}(SMe)$ [45]

(*460*) $Rh_3H_3[P(OMe)_3]_6$ [225]

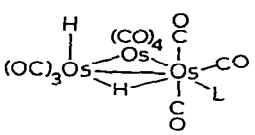
(*461*) $Pt_3(CO)_3(PCy_3)_3$ [445]

(*462*) $Pt_3(CNBu^t)_6$ [352]

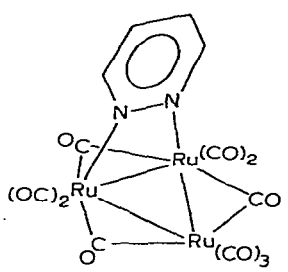
(*463*) $Pt_3(SO_2)_3(PPh_2)_3$ [440]



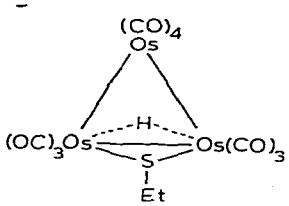
(454)



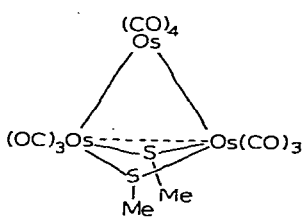
(455) L = CO
(456) L = PPh_3



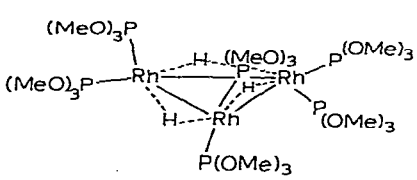
(457)



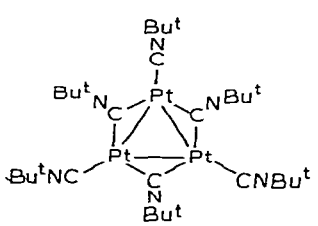
(458)



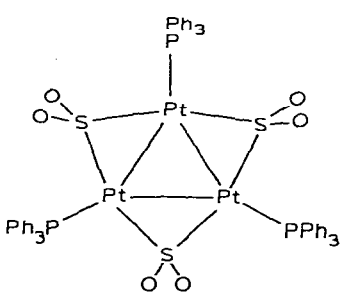
(459)



(460)



(462)



(463)

4-metal atoms

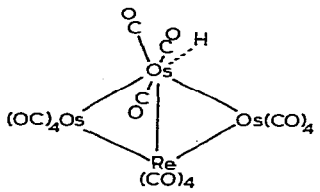
(*464*) $[NMe_3(CH_2Ph)]_2[Re_4H_6(CO)_{12}]$ [89]

(*465*) $ReOs_3H(CO)_{15}$ [149]

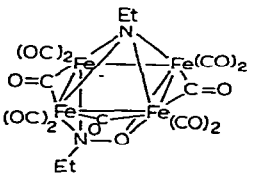
(*466*) $Fe_4(CO)_{11}(NEt)(ONEt)$ [150]

(*467*) $Ru_4H_4(CO)_{10}(dppe)$ [373]

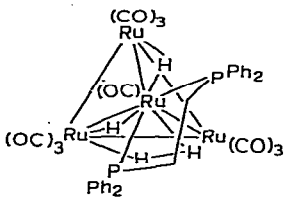
(*468*) $Rh_4(CO)_8[P(OPh)_3]_4$ [451]



(465)



(466)



(467)

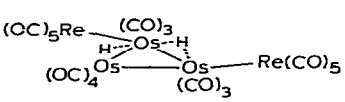
5-, 6- or 7-metal atoms

(*469*) $Re_2Os_3H_2(CO)_{20}$ [235]

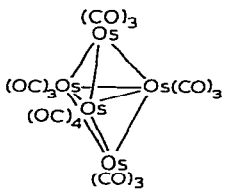
(*470*) $Os_5(CO)_{16}$ [194]

(*471*) $Os_7(CO)_{21}$ [275]

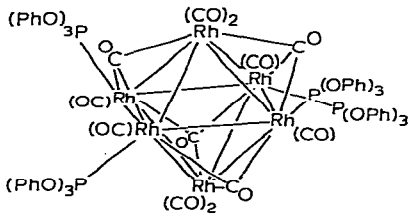
(*472*) $Rh_6(CO)_{12}[P(OPh)_3]_4$ [451]



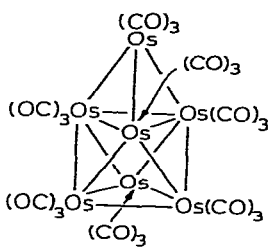
(469)



(470)



(472)



(471)

CLUSTER COMPLEXES CONTAINING HYDROCARBON LIGANDS

3-metal atoms

(*473*) $Fe_3(CEt)(CO)_8(C_5H_2Me_2Vi)$ [239]

(*474*) $Ru_3H(CO)_9(C_2Bu^t)$ [151]

(*475*) $Ru_3(CO)_6(C_{16}H_{14})$ [212]

(*477*) $Os_3H(CO)_8[\overline{CEtCHCHC(CHMe)CO}]$ [197]

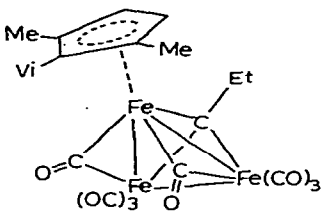
(*478*) $Os_3H(CO)_{10}(\bar{C}HCH_2\overset{+}{P}Me_2Ph)$ [238]

(*479*) $Os_3(CO)_{10}(C_2Ph_2)$ [295]

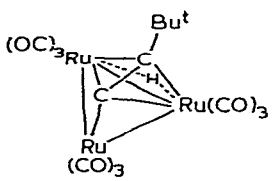
(*480*) $[Rh(C_5H_5)]_3(CO)(C_2Ph_2)$ [347]

(*476*) $Ru_3(CO)_6(C_{12}H_{20})(C_{13}H_{20}O)$ [357]

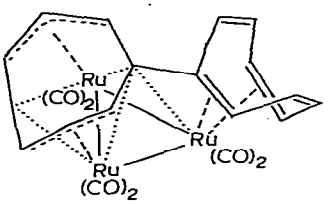
(*481*) $[Rh(C_5H_5)]_3(CO)[C_2(C_6F_5)_2]$ [347]



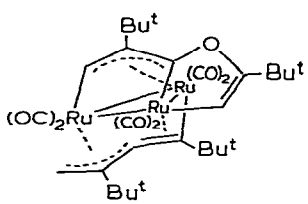
(473)



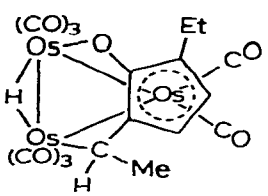
(474)



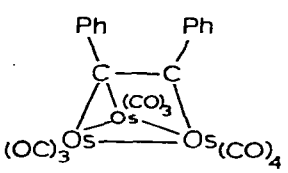
(475)



(476)



(477)



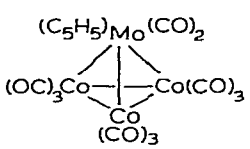
(479)

4- or 6-metal atoms

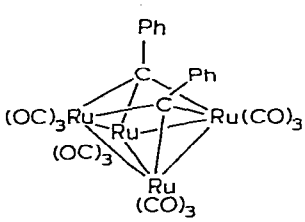
(*482*) $MoCo_3(CO)_{11}(C_5H_5)$ [171]

(*483*) $Ru_4(CO)_{12}(C_2Ph_2)$ [319]

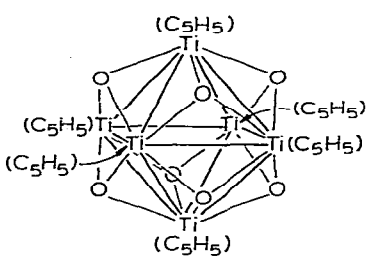
(*484*) $Ti_6O_8(C_5H_5)_6$ [351]



(482)



(483)



(484)

CLUSTERS CONTAINING MAIN GROUP ELEMENTS

(*485*) $\{MoHg[Mo(CO)_3(C_5H_5)]\}_4$ [358]

(*486*) $(NEt_4)_2[Re_3H_3O(CO)_9]$ [34]

(*490*) $[Fe_4S_4(C_5H_5)_4](PF_6)_2$ [249]

(*491*) $Co_3(CMe)(CO)_8(PCy_3)$ [341]

(*487*) $Fe_3(AsPh)_2(CO)_9$ [264]

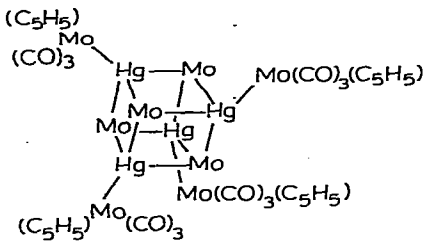
(*488*) $Fe_3[SnFe(CO)_2(C_5H_5)]_2(CO)_9$ [289]

(*489*) $[Fe_4S_4(C_5H_5)_4]Br$ [249]

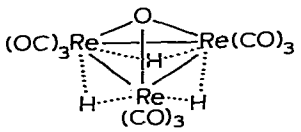
(*492*) $Co_5(CO)_{11}(PMe_2)_3$ [203]

(*493*) $\{[Co(CO)(C_5H_5)]_4As\}BF_4$ [296]

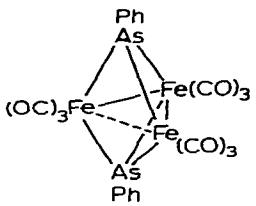
(*494*) $[Pd_3Cl(PPh_2)_2(PEt_3)_3]BF_4$ [412]



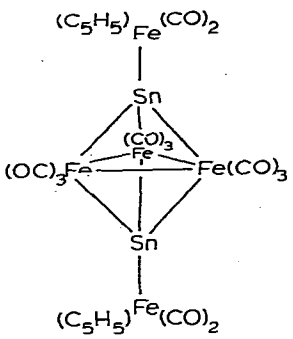
(485)



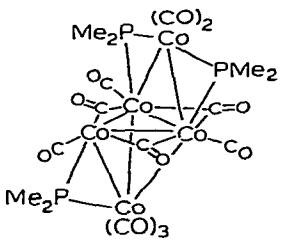
(486)



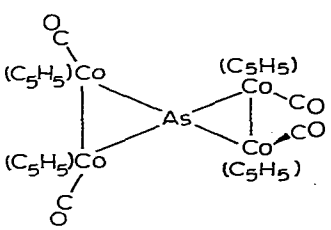
(487)



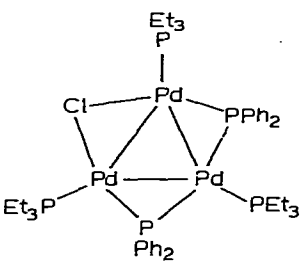
(488)



(492)



(493)



(494)

METALLOBORANE COMPLEXES

(arranged in order of increasing polyhedron size)

(*495*) $[(C_5H_5)Co]_3B_3H_5$ [162]

(*496*) $(Ph_3P)_2CuB_5H_8$ [377]

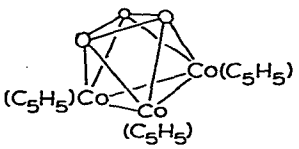
(*497*) $[(C_5H_5)Co]_3B_4H_4$ [162]

(*498*) $NBu_4[(OC)_4FeB_7H_{12}]$ [10]

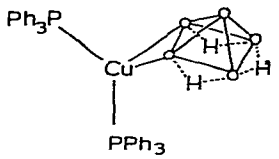
(*499*) $5\text{-}[(C_5H_5)Co]B_9H_{13}$ [16]

(*500*) $9,9\text{-}(Ph_3P)_2\text{-}6,9\text{-}SPtB_8H_{10}$ [378]

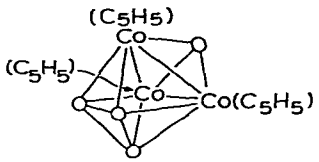
(*501*) $9,9\text{-}(Ph_3P)_2\text{-}6,9\text{-}SPtB_8H_9\text{-}(OEt)\text{-}8$ [378]



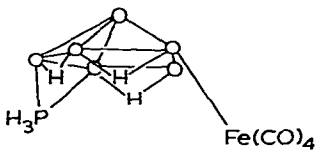
(495)



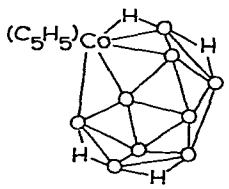
(496)



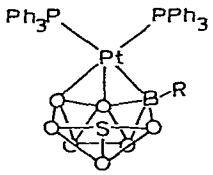
(497)



(498)



(499)



(500) R = H
(501) R = OEt

METALLOCARBORANE COMPLEXES

(arranged in order of increasing polyhedron size)

(*502*) 1-(C_5H_5)-2,3-Me_2-1,2,3-$CoC_2B_4H_4$ [42]

(*503*) 2,2-$(Et_3P)_2$-3,8-Me_2-2,3,8-$PtC_2B_6H_6$ [190]

(*504*) $(C_5H_5)Fe[\eta^5\text{-}B_{10}H_{10}C(OEt_2)]$ [71]

(*505*) $[Li(thf)_4]_2[UCl_2(C_2B_9H_{11})_2]$ [13]

(*506*) $Co(C_2B_9H_{10})$-8,8'-OMe [17]

(*507*) $[(Et_3P)_2Pt]$-3,4-$C_2B_9H_{11}$ [147]

(*508*) $[Au(S_2CNEt_2)_2]$-$[Au(C_2B_9H_{11})_2]$ [12]

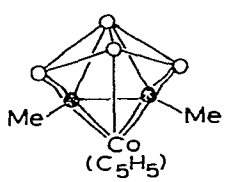
(*509*) $NMe_4[2,3\text{-}(C_5H_5)_2\text{-}2,3,1\text{-}Co_2CB_9H_{10}]$ [85]

(*510*) $[(C_5H_5)Fe]Me_4C_4B_7H_8$ [124]

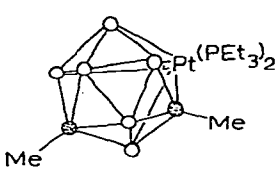
(*511*) $[(C_5H_5)Fe]_2Me_4C_4B_8H_8$ (isomer I) [221]

(*512*) $[(C_5H_5)Fe]_2Me_4C_4B_8H_8$ (isomer II) [221]

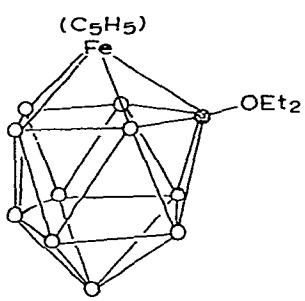
(*513*) $[(C_5H_5)Fe]_2Me_4C_4B_8H_8$ (isomer V) [221]



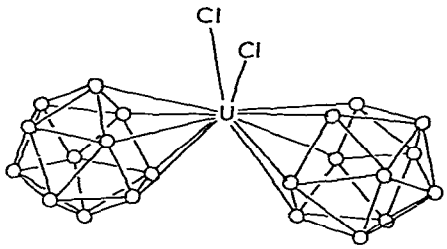
(502)



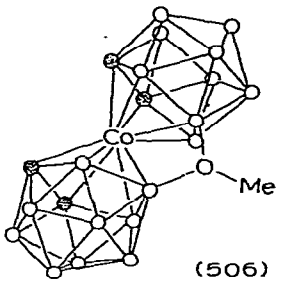
(503)



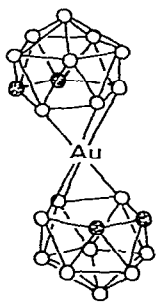
(504)



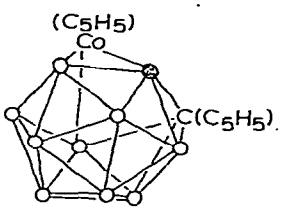
(505)



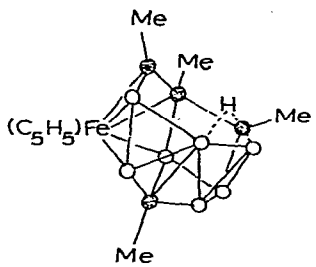
(506)



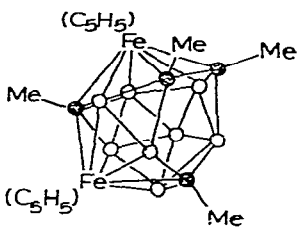
(508)



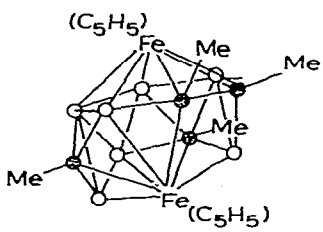
(509)



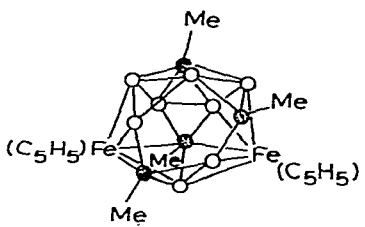
(510)



(511)



(512)



(513)

STRUCTURES ORDERED BY TRANSITION METAL

Ti: *223, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 254, 270, 484* (16).

V: *181, 237, 383* (3).

Cr: *11, 12, 16, 17, 18, 19, 28, 29, 61, 69, 70, 71, 72, 73, 74, 75, 85, 86, 87, 135, 272, 318, 330, 350, 352, 366, 384, 385, 389, 533, 535* (31).

Mn: *4, 24, 32, 46, 47, 88, 119, 120, 121, 122, 123, 166, 220, 286, 287, 288, 289, 290, 291, 292, 339, 340, 354, 364, 390, 398, 399, 400, 422, 443* (30).

Fe: *1, 2, 5, 25, 64, 65, 66, 136, 137, 138, 139, 144, 145, 146, 153, 166, 167, 191, 192, 193, 196, 209, 210, 211, 212, 213, 214, 215, 216, 221, 262, 295, 296, 297, 298, 299, 305, 306, 307, 308, 309, 310, 311, 312, 316, 323, 324, 325, 337, 338, 341, 348, 349, 356, 357, 358, 363, 365, 369, 370, 377, 378, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 435, 436, 437, 438, 439, 440, 441, 445, 446, 466, 473, 487, 488, 489, 490, 498, 504, 510, 511, 512, 513, 528, 529, 530, 531, 532, 536, 537, 541, 543, 544, 546* (105).

Co: *6, 26, 50, 89, 90, 91, 147, 170, 251, 263, 264, 301, 302, 304, 359, 365, 372, 373, 374, 375, 376, 379, 380, 381, 382, 414, 415, 416, 438, 439, 441, 482, 491, 492, 493, 495, 497, 499, 502, 506, 509, 526, 538, 540, 547, 550, 551* (47).

Ni: *92, 93, 142, 148, 176, 177, 188, 203, 217, 361, 422, 423, 424, 523, 525, 549* (16).

Cu: *15, 108, 165, 496, 527* (5).

Zr: *224, 255, 256* (3).

Nb: *238, 239, 258, 259, 271, 317* (6).

Mo: *3, 20, 21, 22, 23, 30, 40, 41, 42, 43, 62, 63, 76, 77, 143, 155, 182, 183, 184, 241, 242, 243, 244, 245, 246, 247, 260, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 319, 320, 331, 332, 333, 334, 335, 336, 342, 343, 344, 345, 346, 347, 353, 386, 391, 392, 393, 395, 396, 444, 482, 485* (61).

Ru: *35, 36, 49, 60, 67, 79, 80, 124, 168, 186, 195, 197, 198, 199, 300, 326, 327, 328, 412, 413, 447, 452, 457, 467, 474, 475, 476, 483, 517, 524, 534, 545* (32).

Rh: *27, 37, 38, 39, 51, 52, 53, 54, 81, 117, 118, 141, 156, 171, 172, 173, 174, 175, 200, 201, 202, 249, 250, 252, 253, 265, 266, 314, 329, 417, 418, 419, 420, 448, 449, 460, 468, 471, 480, 481, 521, 539, 542, 553* (44).

Pd: *57, 68, 83, 94, 95, 96, 104, 107, 129, 130, 131, 149, 178, 189, 190, 204, 205, 218, 269, 376, 425, 426, 427, 428, 494* (25).

Hf: *257* (1).

Ta: *208, 240* (2).

W: *31, 44, 45, 78, 185, 261, 283, 284, 285, 351, 364, 367, 387, 388, 394, 397, 548* (17).

Re: *7, 8, 9, 13, 14, 33, 34, 48, 59, 114, 115, 123, 293, 294, 355, 367, 368, 433, 434, 451, 464, 465, 469, 486, 518* (25).

Os: *116, 140, 169, 194, 371, 453, 454, 455, 456, 458, 459, 465, 469, 470, 472, 477, 478, 479, 514* (19).

Ir: *10, 55, 56, 82, 125, 126, 127, 128, 152, 187, 248, 267, 268, 303, 313, 315, 360, 421, 450, 520* (20).

Pt: *58, 84, 97, 98, 99, 100, 101, 102, 103, 105, 106, 132, 133, 134, 150, 151, 154, 157, 158, 159, 160, 161, 162, 163, 164, 179, 180, 206, 207, 362, 429, 430, 431, 432, 461, 462, 463, 500, 501, 503, 507, 515, 516, 519, 522, 552, 554, 555* (48).

Au: *109, 110, 111, 112, 113, 508* (6).

Yb: *219* (1).

U: *222, 505* (2).

TABLE 1. ORGANO-TRANSITION METAL COMPLEXES

No.	Formula	Structure	Data	R	R_w	Notes	Reference
	C2						
157	$C_2H_4Cl_3Pt^-.K^+$	$K[PtCl_3(C_2H_4)]$	488	2.5		*a*	1
158	$2C_2H_4Cl_3Pt^-.C_{52}H_{48}P_4Pt^{2+}$	$[Pt(dppe)_2][PtCl_3(C_2H_4)]_2$	2005	8.8			2
109	$C_2H_6Au_2Br_4$	$[AuBr_2Me]_2$	1125	5.8	5.0		3
	C3						
165	$C_3H_3Cl_2Cu_2N$	$Cu_2Cl_2(CH_2{:}CHCN)$	1596	8.0	8.5		4
110	$C_3H_8AuF_3O_4S$	$AuMe_2(OSO_2CF_3)(OH_2)$	1541	5.6	3.6		5
153	$C_3H_8Cl_3NPt$	$PtCl_3(C_3H_8N)$	1077	5.1	7.1	*b*	6
10	C_3ClIrO_3	$IrCl(CO)_3$	501	1.9			7
	C4						
6	C_4HCoO_4	$CoH(CO)_4$				ED	8
5	$C_4H_2FeO_4$	$FeH_2(CO)_4$				ED	8
3	$C_4H_4BMoO_4^-.C_{36}H_{30}NP_2^+$	$[(Ph_3P)_2N][Mo(H_2BH_2)(CO)_4]$	3208	8.3	8.1		9

a Anhydrous. *b* C_3H_8N = η^2-allylammonium.

160	$C_4H_{10}Cl_3NPt$	$PtCl_3(C_4H_{10}N)$	1325	4.3	6.2	*a*	6
498	$C_4H_{12}B_7FeO_4^-.C_{16}H_{36}N^+$	$NBu_4[Fe(CO)_4(B_7H_{12})]$	2685	6.8	7.5		10
387	$C_4H_{12}Cl_4W_2^{4-}.4C_4H_8LiO^+$	$[Li(thf)]_4[W_2Cl_4Me_4]$	436	4.1	4.5	*d*	11
508	$C_4H_{22}AuB_{18}^-.C_{10}H_{20}AuN_2S_4^+$	$[Au(S_2CNEt_2)_2][Au(C_2B_9H_{11})_2]$	1486	2.2	2.4		12
505	$C_4H_{22}B_{18}Cl_2U^{2-}.2C_{16}H_{32}LiO_4^+$	$[Li(thf)_4]_2[UCl_2(C_2B_9H_{11})_2]$	2020	5.8	6.1		13
2	$C_4FeO_4^{2-}.2C_{18}H_{36}N_3NaO_6^+$	$[Na(crypt)]_2[Fe(CO)_4]$	2158	9.3		*e*	14
1	$C_4FeO_4^{2-}.2K^+$	$K_2[Fe(CO)_4]$	386	4.9			14
	C5						
4	C_5HMnO_5	$MnH(CO)_5$				ED	8
373	$C_9H_9Co_2F_{12}N_3P_6$	$Co_2(CO)_2[MeN(PF_2)_2]_3$	2250	3.14			15
374	$C_5H_{17}Co_2F_{16}N_5P_8$	$Co_2(PF_2NHMe)_2[MeN(PF_2)_2]_3$	1017	2.88			15
499	$C_5H_{18}B_9Co$	$5-[Co(C_5H_5)]B_9H_{13}$	1166	4.3	5.1		16
500	$C_5H_{23}B_{18}CoO$	$Co[(B_9C_2H_{10})_2OMe-8,8']$	1885	13.1			17
7	C_5BrO_5Re	$ReBr(CO)_5$	371	9.8			18
	C6						
161	$C_6H_{14}Cl_3NPt$	$PtCl_3(C_6H_{14}N)$	1129	4.1	6.2	*f*	6
111	$C_6H_{17}AuOS$	$AuMe_3(CH_2SOMe_2)$	824	9.0	10.0		19

c $C_4H_{10}N$ = η^2-but-3-enylammonium. *d* Me,Cl positions averaged. *e* crypt = $N[(CH_2)_2O(CH_2)_2O(CH_2)_2]_3N$.

f $C_6H_{14}N$ = η^2-hex-5-enylammonium.

9	$C_6Br_3O_6Re_2^-.C_{10}H_8O_3Re^+$	$[Re(CO)_3(PhMe)][Re_2Br_3(CO)_6]$	2220	8.8			20
8	$C_6Cl_3O_6Re_2^-.C_{15}H_{18}O_3Re^+$	$[Re(CO)_3(C_6Me_6)][Re_2Cl_3(CO)_6]$	4900	18.0			20
88	$C_6F_3MnO_5$	$Mn(CF_3)(CO)_5$				ED	21
	C7						
11	$C_7H_3CrNO_5S$	$Cr(CO)_5(NCSMe)$	1513	3.8	5.6		22
370	$C_7H_6F_8Fe_2N_2O_5P_4$	$Fe_2(CO)_5[MeN(PF_2)_2]_2$	978	4.11	4.14		23
146	$C_7H_8FeO_4S$	$Fe(CO)_3(C_4H_6OS)$	1036	5.2	6.5	*g*	24
279	$C_7H_{11}ClF_8MoN_2$	$MoCl[MeN(PF_2)_2]_2(C_5H_5)$	2160	2.91	3.10		25
58	$C_7H_{15}Cl_2OPPt$	*cis*-$PtCl_2(CO)(PEt_3)$	1820	3.7	4.7		26
	C8						
137	$C_8H_2FeO_6$	$Fe(CO)_4(C_4H_2O_2)$	625	2.2		*h*	27
209	$C_8H_4FeO_4$	$Fe(CO)_3(C_4H_4CO)$	780	5.6		*i*	28
273	$C_8H_5MoO_3^-.C_{16}H_{36}N^+$	$NBu_4[Mo(CO)_3(C_5H_5)]$	2133	4.3	5.1		29
28	$C_8H_6CrO_5S$	$Cr(CO)_5(SCMe_2)$	1435	7.5	11.0		30
25	$C_8H_6F_8Fe_2N_2O_6P_4$	$\{Fe(CO)_3[MeN(PF_2)_2]\}_2$	893	8.39	5.11		23
204	$C_8H_{12}Cl_2Pd$	$PdCl_2(cod)$	2841	3.5			31
358	$C_8H_{12}F_4FeOSi_2$	$FeH(SiF_2Me)_2(CO)(C_5H_5)$	981	2.8			32

g C_4H_6OS = 2,5-dihydrothiophene-1-oxide. *h* $FeC_4H_2O_2$ = ferra-3-cyclopentene-2,5-dione. *i* C_4H_4CO = η^4-cyclopentadienone.

C9

408	$C_9H_2Fe_2O_7S$	$Fe_2(CO)_6[C_2H_2C(O)S]$	1491	5.3		*j*	33
486	$C_9H_3O_{10}Re_3^{2-}.2C_8H_{20}N^+$	$(NEt_4)_2[Re_3H_3O(CO)_9]$	1147	3.2	3.9		34
438	$C_9H_6CoFeO_7P$	$FeCo(PMe_2)(CO)_7$	789	3.9			35
29	$C_9H_6CrO_6S$	$Cr(CO)_5[S(O)C_4H_6]$	1629	4.0	4.5		36
350	$C_9H_8BrCrInO_6$	$Cr[InBr(thf)](CO)_5$	2349	10.9			37
295	$C_9H_8FeO_2S_2$	$Fe[SC(S)Me](CO)_2(C_5H_5)$		5.6			38
210	$C_9H_8FeO_5S$	$Fe(CO)_3(C_4H_2Me_2SO_2)$	950	2.6		*k*	39
13	$C_9H_9N_3O_3Re^+.BF_4^-$	[*fac*-$Re(CO)_3(MeCN)_3$]BF_4		4.1	3.9		40
267	$C_9H_{12}ClIr$	$IrCl(C_4H_7)(C_5H_5)$	1189	13.8			41
268	$C_9H_{12}IIr$	$IrI(C_4H_7)(C_5H_5)$	1520	10.3			41
502	$C_9H_{15}B_4Co$	$[Co(C_5H_5)]Me_2C_2B_4H_4$	1498	5.0	6.1		42
176	$C_9H_{18}N_3NiS_3^+.C_{24}H_{20}B^-$	$\{\overline{Ni(SCNMe_2)[SC(NMe_2)SC(NMe_2)]}\}BPh_4$	2496	7.4	8.1		43

C10

366	$C_{10}HCr_2O_{10}^-.C_8H_{20}N^+$	$NEt_4[Cr_2H(CO)_{10}]$	2050	7.2	7.4	ND	44
454	$C_{10}H_2O_{10}Os_3$	$Os_3H_2(CO)_{10}$	2440	4.8			45
			2049	3.5	3.6		46
379	$C_{10}H_4Co_2O_6$	$Co_2(CO)_6(C_4H_4)$	1539	2.7	2.6	238K	47

j [1,2:4,5-η^4-(1,1,1-$(CO)_3$-1-ferra-2-thia-4-cyclopentene-3-one)]$Fe(CO)_3$. *k* $C_4H_2Me_2SO_2$ = η^4-3,4-Me_2thiophene-1,1-dioxide.

451	$C_{10}H_4O_{10}Re_3^-.C_8H_{20}N^+$	$NEt_4[Re_3H_4(CO)_{10}]$	753	8.5			48
318	$C_{10}H_7CrO_3$	$Cr(CO)_3(PhMe)$	1163		4.1		49
321	$C_{10}H_8O_3Re^+.C_6Br_3O_6Re_2^-$	$[Re(CO)_3(PhMe)][Re_2Br_3(CO)_6]$	2220	8.8			20
69	$C_{10}H_{10}ClCrNO_5$	$Cr(CO)_5[CCl(NEt_2)]$	1659	4.2			50
237	$C_{10}H_{10}ClV$	$VCl(C_5H_5)_2$	760	5.4	6.9		51
223	$C_{10}H_{10}Cl_2Ti$	$TiCl_2(C_5H_5)_2$				ED	52
224	$C_{10}H_{10}Cl_2Zr$	$ZrCl_2(C_5H_5)_2$				ED	52
226	$C_{10}H_{10}Cl_4OTi_2$	$[TiCl_2(C_5H_5)]_2O$	689	4.8			53
382	$C_{10}H_{10}Co_2N_2O_2$	$[Co(NO)(C_5H_5)]_2$	1178	4.9	5.4		54
272	$C_{10}H_{10}CrO_3S$	$Cr(CO)_3(C_5H_4SMe_2)$	1172	4.6			55
221	$C_{10}H_{10}Fe^+.BiCl_4^-$	$[Fe(C_5H_5)_2]BiCl_4$	1374	3.0	3.7		56
235	$C_{10}H_{10}N_6Ti$	$Ti(N_3)_2(C_5H_5)_2$	456	7.2	6.2		57
351	$C_{10}H_{11}GaO_3W$	$W(GaMe_2)(CO)_3(C_5H_5)$	1936	7.5	8.9		58
286	$C_{10}H_{11}MnO_2$	$Mn(CO)_2(CMe_2)(C_5H_5)$	584	2.4		210K	59
275	$C_{10}H_{11}MoNO_3$	$Mo(Me_2CNO)(CO)_2(C_5H_5)$	865	5.3	7.1		60
435	$C_{10}H_{12}As_2Fe_2O_6$	$Fe_2(AsMe_2)_2(CO)_6$	1143	6.8			35
191	$C_{10}H_{12}FeN_2O_4$	$Fe(CO)_3[C(O)NMeC(NMe_2)CH{:}CH_2]$	1163	5.6	5.1		61
241	$C_{10}H_{12}Mo$	$MoH_2(C_5H_5)_2$	1327	7.4	10.1	ND	62
247	$C_{10}H_{12}MoP_2$	$Mo(P_2H_2)(C_5H_5)_2$	1837	3.5	4.3		63
239	$C_{10}H_{13}Nb$	$NbH_3(C_5H_5)_2$	1530	3.52	4.31		64

240	$C_{10}H_{13}Ta$	$TaH_3(C_5H_5)_2$	841	6.9	5.1	XND	64
227	$C_{10}H_{14}BTi$	$Ti(H_2BH_2)(C_5H_5)_2$				ED	65
135	$C_{10}H_{14}CrO_4$	$Cr(acac)_2$	740	5.1	7.4		66
225	$C_{10}H_{18}B_2Cl_2Ti_2$	$[TiCl(H_3BH)(C_5H_5)]_2$	1259	2.8			67
222	$C_{10}H_{18}B_2U$	$U(H_3BH)_2(C_5H_5)_2$	1250	12.0			68
356	$C_{10}H_{18}FeO_4Si_2$	*cis*-$Fe(SiMe_3)_2(CO)_4$	710	3.0	3.8		69
440	$C_{10}H_{18}Fe_3N_3O_7P_3$	$Fe_3(PMe_2)_3(CO)_4(NO)_3$	1387	8.3			70
504	$C_{10}H_{25}B_{10}FeO$	$Fe(C_5H_5)[B_{10}C(OEt_2)H_{10}]$				*l*	71
423	$C_{10}Cl_8Ni_4O_4$	$[Ni_2Cl(C_3Cl_3)(CO)_2]_2$	2304	4.8	6.1		72
	C11						
455	$C_{11}H_2O_{11}Os_3$	$Os_3H_2(CO)_{11}$	2259	3.68	3.52		73
369	$C_{11}H_4Fe_2N_2O_7$	$Fe_2(CO)_7(C_4H_4N_2)$	1497	4.5	6.0		74
409	$C_{11}H_6Fe_2O_6S$	$Fe_2(CO)_6(C_4H_3MeS)$	2048	2.8		*m*	75
381	$C_{11}H_{10}Co_2O_2$	$Co_2(CO)(NO)(C_5H_5)_2$	1158	3.1	3.4		76,77
71	$C_{11}H_{10}CrN_2O_5S$	$Cr(CO)_5[C(NCS)(NEt_2)]$	1237	7.6			78
70	$C_{11}H_{10}CrN_2O_6$	$Cr(CO)_5[C(NCO)(NEt_2)]$	1213	6.9			78
193	$C_{11}H_{10}FeO_8$	$Fe(CO)_3[C(OMe)C(CO_2Me):CH(CO_2Me)]$	2024	3.9			79

l Diagram only.

m [2,3:6-η^3-(1,1,1-$(CO)_3$-3-methyl-1-ferra-2-thia-3,5-cyclohexadiene]$Fe(CO)_3$.

436	$C_{11}H_{12}AsFe_2NO_7$	$Fe_2(CO)_6(AsMe_2)(Me_2NCO)$	1550	5.1		80
341	$C_{11}H_{13}FeP$	$Fe(C_5H_5)(C_4H_2Me_2P)$	1279	4.1	*n*	81
197	$C_{11}H_{15}Cl_2NORu$	$RuCl_2(CO)(MeCN)(cod)$	1086	9.2		82
189	$C_{11}H_{16}ClNPd$	$PdCl(\beta\text{-pic})(CHMeCMeCH_2)$	3023	8.7	6.8	83
48	$C_{11}H_{16}ClN_2O_3Re$	$ReCl(CO)[(CHNPr^i)_2]$	1185	5.3		84
441	$C_{11}H_{18}CoFe_2N_2O_7P_3$	$Fe_2Co(PMe_2)_3(CO)_5(NO)_2$	1212	8.5		70
509	$C_{11}H_{20}B_9Co_2^-.C_4H_{12}N^+$	$NMe_4\{[Co(C_5H_5)]_2CB_9H_{10}\}$	2085	3.8		85
129	$C_{11}H_{25}ClN_2OPd$	$PdCl[C(O)CH_2CH_2NEt_2](NHEt_2)$	806	4.7	5.3	86

C12

85	$C_{12}H_4BrCrF_3O_4$	*trans*-$CrBr(CC_6H_4CF_3)(CO)_4$	893	8.0		87
37	$C_{12}H_6F_3O_4Rh$	$Rh(CO)_2(tfba)$	881	7.8		88
459	$C_{12}H_6O_{10}Os_3S$	$Os_3H(SEt)(CO)_{10}$	1270	5.5		45
458	$C_{12}H_6O_{12}Os_3$	$Os_3(OMe)_2(CO)_{10}$	1783	8.4		45
464	$C_{12}H_6O_{12}Re_4^{2-}.2C_{10}H_{16}N^+$	$[NMe_3(CH_2Ph)]_2[Re_4H_6(CO)_{12}]$	1334	5.1	6.1	89
339	$C_{12}H_8MnNO_3$	$Mn(CO)_3(C_9H_8N)$	660	8.77	10.96 *o*	90
145	$C_{12}H_9FeN_3O_3$	$Fe(CO)_3(C_9H_9N_3)$	1167	5.9	4.0 *p*	91
380	$C_{12}H_{10}Co_2O_2^-C_{36}H_{30}NP_2^+$	$[(Ph_3P)_2N][Co_2(CO)_2(C_5H_5)_2]$	2871	7.3		92
114	$C_{12}H_{10}NO_5Re$	*cis*-$Re(COMe)(NH_2Ph)(CO)_4$	2059	3.3	4.4	93

n $C_4H_2Me_2P$ = η^5-3,4-Me_2-1-phospholyl. *o* C_9H_8N = 2-methylindolyl. *p* $C_9H_9N_3$ = η-1,*N*-allylbenzotriazole.

270	$C_{12}H_{10}O_2Ti$	$Ti(CO)_2(C_5H_5)_2$	648	8.6	8.2		94
314	$C_{12}H_{11}F_6O_2Rh$	$Rh(hfac)(C_7H_{10})$	521	6.7		*q*	95
74	$C_{12}H_{12}CrO_6S_2$	*cis*-$Cr\{C(OEt)[C(OH)CS(CH_2)_3\}S](CO)_4$	1473	5.8			96
319	$C_{12}H_{12}MoO_3$	$Mo(CO)_3(C_6H_3Me_3)$	1789	3.72	4.47		97
254	$C_{12}H_{13}ClOTi$	$Ti(COMe)Cl(C_5H_5)_2$	438	8.2	10.4		98
220	$C_{12}H_{14}Mn$	$Mn(C_5H_4Me)_2$				ED	99
444	$C_{12}H_{14}Mo_2S_4$	$Mo_2S_4(C_5H_4Me)_2$	1018	3.5			100
238	$C_{12}H_{16}Cl_6Nb_2O_3$	$[NbCl_3(OH)(C_5H_4Me)]_2O$	4974	4.8			101
331	$C_{12}H_{16}MoO_3^+.BF_4^-$	$[Mo(acac)(OH_2)(C_7H_7)]BF_4$	3226	5.9	7.1		102
278	$C_{12}H_{17}IMoN_2O$	$MoI(CO)[C(NMe_2)CMeNMe](C_5H_5)$	1801	2.5	2.7		103
15	$C_{12}H_{18}BCuF_2N_4O_3$	$Cu(CO)(C_{11}H_{18}BF_2N_4O_2)$	2511	5.5		*r*	104
16	$C_{12}H_{19}CrN_2O_5PSi$	$Cr(CO)_5[P(NSiMe_3)NHBu^t]$	2739	5.0	5.0		105
20	$C_{12}H_{20}MoNO_7P$	*cis*-$Mo(CO)_4(NHC_5H_{10})[P(OMe)_3]$	1422	2.8	3.2		106
446	$C_{12}H_{24}Fe_2O_4P_2S_2$	$[Fe(SMe)(CO)_2(PMe_3)]_2$	2156	5.8	5.0		107
112	$C_{12}H_{28}Au_2P_2$	$[Au(CH_2)_2PEt_2]_2$	1123	8.2			108
93	$C_{12}H_{32}N_2NiP_4$	$Ni[(CH_2PMe_2)_2N]_2$	723	4.5			109
84	$C_{12}H_{32}N_8Pt^{2+}.2F_6P^-$	$\{Pt[C(NHMe)_2]_4\}(PF_6)_2$	1899	2.88	3.55		110
155	$C_{12}ClF_{18}Mo^-.C_{14}H_{14}Cl_3Mo_2^+$	$[Mo_2Cl_3(C_7H_7)_2][MoCl(C_4F_6)_3]$	5813	11.3			111

[q] C_7H_{10} = (±)-(Z,Z)-1-3η:5-7η-heptadienediyl. [r] $C_{11}H_{18}BF_2N_4O_2$ = difluoro-3,3'-(trimethylenedinitrilo)bis(2-butanone oximato)borate.

371	$C_{12}I_2O_{12}Os_3$	$Os_3I_2(CO)_{12}$	2014	6.2	7.7	112
453	$C_{12}O_{12}Os_3$	$Os_3(CO)_{12}$	3040	3.35	3.62	113
452	$C_{12}O_{12}Ru_3$	$Ru_3(CO)_{12}$	2281	2.6	2.8	114
	C13					
312	$C_{13}H_{11}FeO_4^+.F_6P^-$	$[Fe(CO)_3(C_8H_8Ac)]PF_6$	1207	4.7	4.6	115
417	$C_{13}H_{12}O_2Rh_2$	$[Rh(CO)(C_5H_5)]_2(\mu\text{-}CH_2)$	2718	3.79	5.46	116,117
297	$C_{13}H_{14}Fe_2OS_4$	$Fe_2(S_2)_2(CO)(C_5H_4Me)_2$	859	8.0	7.0	118
255	$C_{13}H_{16}OZr$	$ZrMe(COMe)(C_5H_5)_2$			*l*	119
188	$C_{13}H_{18}BrNNiO_2$	$NiBr(lut)[C_3H_3Me(CO_2Me)]$	1717	7.5		120
343	$C_{13}H_{19}Br_2MoNOZn$	$MoH_2[ZnBr_2(dmf)](C_5H_5)_2$	1568	5.4	9.7	121
162	$C_{13}H_{20}Cl_2OPtS$	*cis*-$PtCl_2[Me(O)S(p\text{-}tol)]$-$[CH_2{:}CHCHMe_2]$	3031	3.77	4.49	122
338	$C_{13}H_{22}B_2FeN_2O_3S$	$Fe(CO)_3[S(BNMe_2)_2(CEt)_2]$	2987	2.7	4.1	*s* 123
510	$C_{13}H_{25}B_7Fe$	$[Fe(C_5H_5)]Me_4C_4B_7H_8$	2370	3.8	4.5	124
	C14					
457	$C_{14}H_4N_2O_{10}Ru_3$	$Ru_3(CO)_{10}(C_4H_4N_2)$	2304	2.4	3.9	125
73	$C_{14}H_6CrO_6S$	$Cr(CO)_5[C(C_4H_3O)(C_4H_3S)]$	909	5.9		126
410	$C_{14}H_6Fe_2O_6S_2$	$Fe_2(CO)_6(C_4H_3S)_2$	780	12.2	15.3	*t* 127

l Diagram only. *s* $S(BNMe_2)_2(CEt)_2$ = η^5-3,4-Et_2-2,5-$(NMe_2)_2$-1,2,5-thiadiborolen.

t [2,3:6-η-[1,1,1-$(CO)_3$-3-(2-thienyl)-1-ferra-2-thia-3,5-cyclohexadiene]$Fe(CO)_3$.

144	$C_{14}H_8FeO_5$	$Fe(CO)_4(C_{10}H_8O)$	2990	7.3	7.8	*u*	128
407	$C_{14}H_8Fe_2O_5$	$Fe_2(CO)_5(C_9H_8)$	1535	4.6	6.0	*v*	129
138	$C_{14}H_{10}FeO_6$	$\overline{Fe(CO)_4[C(O)C(C_3H_5):C(C_3H_5)C(O)]}$	898	8.1		*w*	130
296	$C_{14}H_{11}FeN_2O_2^+.C_{24}H_{20}B^-.C_3H_6O$	$[Fe(C_7H_6N_2)(CO)_2(C_5H_5)]BPh_4.Me_2CO$	2580	7.9		*x*	131
62	$C_{14}H_{11}GeMoNO_5$	$Mo(CO)_5(CNGeMe_2Ph)$	1121	2.0	2.7		132
206	$C_{14}H_{12}F_{12}O_2Pt$	$\overline{Pt[C(CF_3)_2OC(CF_3)O]}(cod)$	2659	2.9	3.5		133
334	$C_{14}H_{14}Cl_3Mo_2^+.BF_4^-$	$[Mo_2Cl_3(C_7H_7)_2]BF_4$	801	8.3		213K	134
335	$C_{14}H_{14}Cl_3Mo_2^+.C_{12}ClF_{18}Mo^-$	$[Mo_2Cl_3(C_7H_7)_2][MoCl(C_4F_6)_3]$	5813	11.3			111
301	$C_{14}H_{15}CoO_6$	$\overline{Co(CO)[C(O)C(CO_2Et):C(O)OEt]}(C_5H_5)$	1393	7.4			135
323	$C_{14}H_{15}Fe^+.F_6P^-$	$\{Fe[C_5H_4(CH_2)_3C_6H_5]\}PF_6$	753	10.5			136
259	$C_{14}H_{15}NbS_2$	$Nb(C_3H_5)(CS_2)(C_5H_5)_2$	1178	7.0			137
327	$C_{14}H_{16}BF_3Ru$	$Ru(\eta^6\text{-}PhBF_3)(\eta^5\text{-}C_8H_{11})$	1345	7.6			138
336	$C_{14}H_{16}BrMo_2O^+.BF_4^-$	$[Mo_2Br(OH)_2(C_7H_7)_2]BF_4$	3284	10.6	12.9		139
342	$C_{14}H_{19}BrMgMoO$	$MoH[MgBr(thf)](C_5H_5)_2$	1334	6.6			140
12	$C_{14}H_{20}CrN_4O_4$	$Cr(CO)_4(C_{10}H_{20}N_4)$	1225	3.4	3.9	*y*	141
77	$C_{14}H_{20}MoN_4O_4$	*cis*-$Mo(CO)_4(C_5H_{10}N_2)_2$	2439	2.3	2.8	*z*	142

[u] $C_{10}H_8O$ = 2,3-η-1,4-dihydro-1,4-epoxynaphthalene. [v] C_9H_8 = 7*H*-indene.

[w] $\overline{FeC(O)C_3H_5:C(C_3H_5)CO}$ = 3,4-dicyclopropyl-1-ferra-3-cyclopentene-2,5-dione. [x] $C_7H_6N_2$ = 1,*N*-benzimidazole.

[y] $C_{10}H_{20}N_4$ = N,N',N'',N'''-tetramethylbi(imidazolidin-2-ylidene)-*N*,*N*''. [z] $C_5H_{10}N_2$ = N,N'-dimethylimidazolidine.

433	$C_{14}H_{24}O_6Re_2Si_2$	$Re_2H_4(SiEt_2)_2(CO)_6$	1510	3.4	4.5		143
44	$C_{14}H_{32}IO_2P_4W^+.I^-$	$[WI(CO)_2(dmpe)_2]I$	2438	8.0			144
94	$C_{14}H_{34}O_3P_2Pd$	*trans*-$PdMe(HCO_3)(PEt_3)_2$	1535	7.46	6.38		145
198	$C_{14}H_{37}N_6Ru^+.F_6P^-$	$[RuH(cod)(NH_2NMe_2)_3]PF_6$	1780	6.3			146
507	$C_{14}H_{41}B_9P_2Pt$	$[Pt(PEt_3)_2]C_2B_9H_{11}$	6289	5.0			147
388	$C_{14}H_{46}N_4O_8W_2$	$W_2Me_2(O_2CNEt_2)_4$	2671	4.0	5.4		148

C15

465	$C_{15}HO_{15}Os_3Re$	$ReOs_3H(CO)_{15}$	554	3.1	3.2		149
466	$C_{15}H_{10}Fe_4N_2O_{12}$	$Fe_4(CO)_{11}(NEt)(ONEt)$	2249	8.1			150
474	$C_{15}H_{10}O_9Ru_3$	$Ru_3H(CO)_9(C_2Bu^t)$	1339	2.8		ND	151
287	$C_{15}H_{11}MnO_2$	$Mn(CO)_2(C{:}CHPh)(C_5H_5)$	600	9.3			152
212	$C_{15}H_{12}F_6FeO_3$	$Fe(CO)_3[C_6Me_4(CF_3)_2]$	3920	6.5	7.3		153
283	$C_{15}H_{12}O_2W$	$W(CO)_2(CC_6H_4Me\text{-}p)(C_5H_5)$	1190	5.7			154
288	$C_{15}H_{13}MnO_2$	$Mn(CO)_2(C_8H_8)(C_5H_5)$	2787	3.4			155
274	$C_{15}H_{13}MoNO_2$	$Mo(CO)_2(MeCNPh)(C_5H_5)$	2012	3.9	4.0		156
439	$C_{15}H_{14}AsCoFeO_6$	$FeCo(AsMe_2)(CO)_6(nbd)$	2650	4.0			157
337	$C_{15}H_{15}BFeO_3Si$	$Fe(CO)_3[BPh(CH{:}CH)_2SiMe_2]$	934	5.5			159
445	$C_{15}H_{15}Fe_2O_3S^+.F_6Sb^-$	$[Fe_2(CO)_3(SEt)(C_5H_5)_2]SbF_6$	1505	4.4	4.0		160
244	$C_{15}H_{18}MoNO_2^+.F_6P^-$	$[Mo(C_5H_8NO_2)(C_5H_5)_2]PF_6$	2919	4.4		*aa*	161

aa $C_6H_8NO_2$ = *L*-prolinato.

320	$C_{15}H_{18}MoO_3$	$Mo(CO)_3(C_6Me_6)$	2186	4.12	5.42		97
322	$C_{15}H_{18}O_3Re^+.C_6Cl_3O_6Re_2^-$	$[Re(CO)_3(C_6Me_6)][Re_2Cl_3(CO)_6]$	4900	18.0			20
497	$C_{15}H_{19}B_4Co_3$	$[Co(C_5H_5)]_3B_4H_4$	1272	3.2	4.2		162
205	$C_{15}H_{19}ClO_2PdS$	$PdCl(CH_2SO_2Ph)(cod)$	5179	4.8			163
265	$C_{15}H_{19}O_2Rh$	$Rh(cod)(C_5H_4CO_2Me)$	2023	3.9			164
495	$C_{15}H_{20}B_3Co_3$	$[Co(C_5H_5)]_3B_3H_5$	1297	3.5	4.5		162
192	$C_{15}H_{21}FeN_2O_4^+.BF_4^-$	$\{Fe(CO)_3[C(OEt)NMeC(NC_5H_{10})-CH:CH_2)]\}BF_4$	1178	7.6	7.4		61
434	$C_{15}H_{22}O_7Re_2Si_2$	$Re_2H_2(SiEt_2)_2(CO)_7$	2020	4.0	5.0		165
17	$C_{15}H_{27}CrN_2O_5PSi_2$	$Cr(CO)_5[P(NBu^t)N(SiMe_3)_2]$	2745	5.2	4.1		166
40	$C_{15}H_{30}Cl_2MoO_3P_2$	$MoCl_2(CO)_3(PEt_3)_2$	1175	8.5			167
98	$C_{15}H_{35}BrP_2Pt$	$PtBr(CH_2CH:CH_2)(PEt_3)_2$	3469	3.5	3.2	113K	168
180	$C_{15}H_{42}B_{10}P_2Pt$	$\overline{Pt(CHMe:PEt_2)}(PEt_3)(MeC_2B_{10}H_{10})$	2961	9.5			169
32	$C_{15}Mn_4O_{15}S_4$	$Mn_4S_4(CO)_{15}$	3179	4.1			170
	C16						
482	$C_{16}H_5Co_3MoO_{11}$	$Co_3Mo(CO)_{11}(C_5H_5)$	1393	7.7			171
262	$C_{16}H_6F_{16}Fe$	$Fe(C_5H_5)[(CF_3)_2C:CCFC(CF_3)CH-C(CF_3)_2]$	1500	8.3			172
139	$C_{16}H_8F_{12}FeO_4$	$Fe(CO)_4(C_{12}H_8F_{12})$	2523	6.3	7.4	*bb*	173
33	$C_{16}H_9O_{13}Re_3S_2Sn$	$Re_3(SnMe_3)S_2(CO)_{13}$	1105	7.6			174

bb $FeC_{12}H_8F_{12}$ = 2,3,3-trifluoro-3a,4,5,7a-tetrahydro-5-(1,1,2,3,3,3-hexafluoropropyl)-2-trifluoromethyl-1-ferraindane.

418	$C_{16}H_{10}F_6O_2Rh_2$	$[Rh(CO)(C_5H_5)]_2(\mu\text{-}C_4F_6)$	3893	7.5	8.5		175
345	$C_{16}H_{10}HgMo_2O_6$	$[Mo(CO)_3(C_5H_5)]_2Hg$	867	6.5	8.2		176
450	$C_{16}H_{10}Ir_2O_4S_2$	$[Ir(CO)_2]_2(\mu\text{-}SPh)_2$				*l*	177
340	$C_{16}H_{10}Mn_2N_2O_7$	$\overline{Mn(CO)_3[NC_4H_3C(O)Me]}[(NC_4H_4)\text{-}Mn(CO)_3]$	1770	3.7	2.8		178
22	$C_{16}H_{12}As_2F_8MoO_4$	$Mo(CO)_4[(C_4F_4AsMe_2)_2]$	2764	6.9			179
211	$C_{16}H_{12}FeO_3$	$Fe(CO)_3(C_7H_7Ph\text{-}exo)$	406	8.12			180
214	$C_{16}H_{12}Fe_2O_6$	$[Fe(CO)_3]_2(MeC_6H_4CMe{:}CH_2)$	2653	4.2			181
391	$C_{16}H_{12}Mo_2O_4$	$[Mo(CO)_2(C_5H_5)]_2(\mu\text{-}C_2H_2)$	2560	4.1	6.4		182
377	$C_{16}H_{14}FeO_4Si$	$[Fe(CO)_2(C_5H_4)]_2SiMe_2$	1658	4.3			183
305	$C_{16}H_{16}FeN^+.I^-$	$[FcCH_2(py)]I$	3061	7.2	7.7		184
251	$C_{16}H_{17}CoN_2O_6$	$Co[(NO)_2C_7H_6(CO_2Me)_2](C_5H_5)$	1831	4.6	5.9		185
346	$C_{16}H_{18}AsHgIMoO_2$	$Mo(HgI)(CO)_2(AsMe_2Ph)(C_5H_4Me)$	1889	7.9	7.3		176
406	$C_{16}H_{20}Fe_2N_2O_6$	$\{Fe(CO)_3[C(NEt_2)]\}_2$	2449	4.4	5.9		186,187
344	$C_{16}H_{21}BrMoO_5Zn$	$Mo[ZnBr(thf)_2](CO)_3(C_5H_5)$	1681	4.2	4.9		188
245	$C_{16}H_{22}MoNO_2^+.F_6P^-$	$[Mo(C_6H_{12}NO_2)(C_5H_5)_2]PF_6$	2135	6.1		*cc*	161
130	$C_{16}H_{32}Cl_2N_2O_2Pd_2$	$\{\overline{PdCl[CH(CHO)CMe_2CH_2NMe_2]}\}_2$	2045	3.4	4.3		189
503	$C_{16}H_{42}B_6P_2Pt$	$[Pt(PEt_3)_2]Me_2C_2B_6H_6$	4542	6.9	8.8		190
108	$C_{16}H_{44}Cu_4Si_4$	$[Cu(CH_2SiMe_3)]_4$	2044	4.9		233K	191
348	$C_{16}Cd_4Fe_4O_{16}.2C_3H_6O$	$[FeCd(CO)_4]_4.2Me_2CO$	1602	3.2	3.7		192

l Diagram only. *cc* $C_6H_{12}NO_2$ = *L*-leucinato.

31	$C_{16}Cl_5O_{10}SW_2^-.C_8H_{20}N^+$	$NEt_4[W_2(SC_6Cl_5)(CO)_{10}]$	2770	3.6			193
470	$C_{16}O_{16}Os_5$	$Os_5(CO)_{16}$	809	3.3	3.4		194
	C17						
400	$C_{17}H_8Mn_3O_{11}P$	$Mn_3(CO)_{11}(C_6H_8P)$	1850	5.5	4.9	*dd*	195
413	$C_{17}H_{11}IO_4Ru_2$	$Ru_2I(CO)_4(C_7H_6Ph)$	2200	3.1	3.1		196
196	$C_{17}H_{12}F_6FeO_5$	$Fe(CO)_3[C_8Me_4(CF_3)_2O_2]$	4376	4.7	5.8		153
477	$C_{17}H_{12}O_9Os_3$	$Os_3H(CO)_8[\overline{C(O)C(CHMe)CHCHCEt}]$	2624	5.3			197
392	$C_{17}H_{14}Mo_2O_4$	$[Mo(CO)_2(C_5H_5)]_2(\mu\text{-}C_3H_4)$	1306	3.0	4.6		198
298	$C_{17}H_{15}Fe_2O_4^+.F_6P^-$	$\{[Fe(CO)_2(C_5H_5)]_2C_3H_5\}PF_6$	2548	7.3			199
166	$C_{17}H_{16}FeMnNO_4$	$\overline{Mn[CH_2NMe(CH_2Fc)]}(CO)_4$	1271	5.7	6.1		200
315	$C_{17}H_{17}F_6IrO_2$	$Ir(hfac)(C_{12}H_{16})$	2223			*ee*	201
399	$C_{17}H_{17}Mn_2O_7P$	$Mn_2(CO)_7(C_{10}H_{17}P)$	1914	3.8	3.9	*ff*	195
276	$C_{17}H_{17}MoNO_2S$	$Mo[SCMeN(CHMePh)](CO)_2(C_5H_5)$	2715	3.6			202
492	$C_{17}H_{18}Co_5O_{11}P_3$	$Co_5(PMe_2)_3(CO)_{11}$	3617	4.1			203
293	$C_{17}H_{19}O_2PRe^+.BCl_4^-$	$[Re(CO)_2(CPhPMe_3)(C_5H_5)]BCl_4$	1834	3.9			204
47	$C_{17}H_{24}BrMnN_2O_3$	$MnBr(CO)_3[(CHNCy)_2]$	668	8.0			205
89	$C_{17}H_{28}CoN_5O_4.C_6H_6$	$CoMe[NH_2(CHMePh)](dmg)_2.C_6H_6$	1413	6.3			206
304	$C_{17}H_{35}BCoFO_9P_3^+.BF_4^-$	$[Co\{[PO(OEt)_2]_3BF\}(C_5H_5)]BF_4$	1723	9.6			207

dd C_6H_8P = 3,4-dimethylphospholyl. *ee* $C_{12}H_{16}$ = 1,2,2a-η^3:7,7a,8-η^3-3,6-dimethylene-1,7-octadienediyl.

ff $C_{10}H_{17}P$ = 1-*t*-butyl-3,4-dimethylphosphole.

C18

401	$C_{18}H_6Fe_3O_9$	$[Fe(CO)_3]_2C_9H_6Fe(CO)_3$	2269	8.3		*gg*	181
59	$C_{18}H_{10}Br_2O_6Re_2S_2$	$[ReBr(CO)_3]_2S_2Ph_2$	1918	7.8	8.6		208
260	$C_{18}H_{10}F_{12}Mo$	$Mo[C(CF_3):C(CF_3)C_5H_5][C_2(CF_3)_2]$-$(C_5H_5)$	2148	3.9	4.4		209
78	$C_{18}H_{10}O_5W$	$W(CO)_5(CPh_2)$	2707	5.0	5.5		210
364	$C_{18}H_{12}As_2Mn_2O_{14}W$	$WMn_2(AsMe_2)_2(CO)_{14}$	1109	4.3			211
316	$C_{18}H_{14}FeO_2$	$Fe(CO)_2(C_{16}H_{14})$	994	4.4	3.8		212
421	$C_{18}H_{14}Ir_2O_2$	$[Ir(CO)(C_5H_5)]_2(\mu$-$C_6H_4)$	2083	4.1	3.6		213
324	$C_{18}H_{15}Fe^+.F_6P^-$	$[Fe(C_5H_5)(C_{13}H_{10})]PF_6$	2318	4.5	4.9		214
289	$C_{18}H_{16}MnO_4P$	$Mn(CO)_2[PhPOC(:CH_2)CH:C(O)Me](C_5H_5)$	1249	6.1			215
443	$C_{18}H_{19}Mn_2O_4S^+.ClO_4^-$	$\{[Mn(CO)_2(C_5H_4Me)]_2(SEt)\}ClO_4$	1785	5.1	5.6		216
277	$C_{18}H_{19}MoNO_3$	$Mo[C(O)CHPhCHMeNHMe](CO)_2(C_5H_5)$	1292	5.6	5.5		217
285	$C_{18}H_{22}O_2PW$	$W(CO)(PMe_3)(O:C:CH$-*p*-tol$)(C_5H_5)$	977	6.0			218
75	$C_{18}H_{25}CrNO_5S_2$	*fac*-$Cr(CO)_3(CNBu^t)(C_{10}H_{16}O_2S_2)$	2098	4.0		*hh*	219,220
511	$C_{18}H_{30}B_8Fe_2$	$[Fe(C_5H_5)]_2Me_4C_4B_8H_8$ (isomer I)	2796	4.1	6.2		221
512	$C_{18}H_{30}B_8Fe_2$	$[Fe(C_5H_5)]_2Me_4C_4B_8H_8$ (isomer II)	2403	4.2	5.9		221
513	$C_{18}H_{30}B_8Fe_2$	$[Fe(C_5H_5)]_2Me_4C_4B_8H_8$ (isomer V)	1661	4.7	5.7		221
281	$C_{18}H_{30}ClMoP$	$MoCl(PEt_3)(C_5H_5Et)(C_5H_5)$	2692	5.4			222

gg 4-7η^4-[2,3,9,8-η^4-1,1,1-$(CO)_3$-1-ferraindene)$Fe(CO)_3$]$Fe(CO)_3$.

hh $C_{10}H_{16}O_2S_2$ = 1,3-dithian-2-ylidene(ethoxy)methyl(ethoxy)carbene-*C*,*S*.

199	$C_{18}H_{34}Cl_2N_2Ru_2$	$[RuHCl(cod)]_2(NH_2NMe_2)$	1487	7.3			223
174	$C_{18}H_{42}ClN_2P_2Rh$	$RhCl(N_2)(PPr^i_3)_2$	1603	4.8			224
173	$C_{18}H_{42}ClO_2P_2Rh$	$RhCl(O_2)(PPr^i_3)_2$	1327	3.9			224
460	$C_{18}H_{57}O_{18}P_6Rh_3$	$\{RhH[P(OMe)_3]_2\}_3$	2482	3.2			225

C19

367	$C_{19}H_{14}O_9PReW$	$WRe(CO)_9(CPhPMe_3)$	856	7.4			226
419	$C_{19}H_{16}F_6ORh_2$	$[Rh(C_5H_5)]_2\{\mu\text{-}[(C_2Me_2)CO(C_4F_6)]\}$	2161	4.1	4.7	*ii*	227
325	$C_{19}H_{17}Fe^+.F_6P^-$	$[Fe(C_5H_5)(exo\text{-}MeC_{13}H_9)]PF_6$	4975	13.2	16.9		214
113	$C_{19}H_{18}AuP$	$AuMe(PPh_3)$	1867	9.2	9.7		228
309	$C_{19}H_{22}FeO_2$	3,4'-$(MeCO)_2$-[5]-ferrocenophane	1194	4.3	3.8		229
86	$C_{19}H_{23}BrCrN_2O_2$	$CrBr(CO)_2(CNBu^t)_2(CPh)$	1016	8.8			230
332	$C_{19}H_{23}Mo_2O_5$	$Mo_2(OMe)_3(CO)_2(C_7H_7)_2$	5830	7.5			231,232
429	$C_{19}H_{24}F_6OPt_2$	$Pt_2[(CF_3)_2CO](cod)$	2083	3.8	4.4		133
152	$C_{19}H_{24}IrNO_2$	$IrC_6H_8(C_3H_4)(py)(acac)$	2263				201
185	$C_{19}H_{29}BrN_2O_2W$	$WBr(CO)_2[(CHNCy)_2](C_3H_5)$	1419	5.2			233
352	$C_{19}H_{38}CrGeO_5Si_4$	$Cr(CO)_5\{Ge[CH(SiMe_3)_2]_2\}$	2791	4.7			234

C20

469	$C_{20}H_2O_{20}Os_3Re_2$	$Re_2Os_3H_2(CO)_{20}$	2764	4.5	4.9		235
34	$C_{20}H_8N_2O_6Re_2S_4$	$[Re(CO)_3(mbt)]_2$	2104	5.4	5.5		236

ii $C_2Me_2COC_4F_6$ = 1,2,5-η^3:1,4,5-η^3-1,2-Me_2-3-oxo-4,5-$(CF_3)_2$-1,4-pentadiene-1,5-diyl.

363	$C_{20}H_{15}As_4Fe_3O_{10}^+.BF_4^-$	$[Fe_3(As_4O_5)(CO)_5(C_5H_5)_3]BF_4$	2400	4.5	5.1		237
478	$C_{20}H_{15}O_{10}Os_3P$	$Os_3H(CHCH_2PMe_2Ph)(CO)_{10}$	3342	3.61	3.31		238
473	$C_{20}H_{16}Fe_3O_8$	$Fe_3(CEt)(CO)_8(C_5H_2Me_2Vi)$	3145	3.2			239
164	$C_{20}H_{17}AsCl_2Pt$	$PtCl_2(CH_2{:}CHC_6H_4AsPh_2)$	2258	4.7			240
46	$C_{20}H_{17}ClMnN_2O_3P$	$MnCl(CO)_3[(Me_2pz)PPh_2]$	1615	7.0			241
178	$C_{20}H_{18}ClPPdS$	$PdCl(CH_2SMe)(PPh_3)$	3499 3209	4.9 6.8	6.1 7.5	113K 293K	242
307	$C_{20}H_{18}Cl_2Fe_2Sn$	Fc_2SnCl_2	1007	10.0			243
236	$C_{20}H_{18}Cl_2Ti_2$	$Ti_2Cl_2(C_{10}H_8)(C_5H_5)_2$	1955	4.3	4.3		244
402	$C_{20}H_{18}Fe_2O_5$	$Fe_2(CO)_5$(gaz) (isomer I)	1462	12.3	11.4		245
403	$C_{20}H_{18}Fe_2O_5$	$Fe_2(CO)_5$(gaz) (isomer II)	2050	6.8	8.5		245
395	$C_{20}H_{18}Mo_2O_2$	$[Mo(CO)(C_5H_5)]_2C_8H_8$ (orange)	2095	8.4			246
396	$C_{20}H_{18}Mo_2O_2$	$[Mo(CO)(C_5H_5)]_2C_8H_8$ (purple)	4164	7.9			246
183	$C_{20}H_{19}BMoN_6O_2$	$Mo(CO)_2(C_3H_5)[(pz)_3BPh]$	3108	5.3	7.1		247
228	$C_{20}H_{20}Cl_2Ti_2$	$[TiCl(C_5H_5)_2]_2$	3615	8.5	4.7		248
489	$C_{20}H_{20}Fe_4S_4^+.Br^-$	$[Fe_4S_4(C_5H_5)_4]Br$	1053	8.0	7.1		249
490	$C_{20}H_{20}Fe_4S_4^{2+}.2F_6P^-$	$[Fe_4S_4(C_5H_5)_4](PF_6)_2$	515	5.2	6.6		249
246	$C_{20}H_{20}Mo_2O^{2+}.2F_6P^-.\frac{1}{2}H_2O$	$\{[Mo(C_5H_5)]_2(\mu\text{-}H)(\mu\text{-}OH)(\mu\text{-}C_{10}H_8)\}$-$(PF_6)_2.\frac{1}{2}H_2O$	2004	7.3			250,251
243	$C_{20}H_{20}Mo_2O_4P^{2+}.2F_6P^-$	$\{[MoO_2(C_5H_5)_2]_2P\}(PF_6)_2$	3491	4.1			252
231	$C_{20}H_{22}Cl_2OTi$	$TiCl(OC_6H_4Cl)(C_5H_5)(C_5H_3MePr^i)$	1840	9.2			253

21	$C_{20}H_{24}MoO_4P_2Si_2$	$Mo(CO)_4[(PhHPSiMe_2)_2]$	3173	5.9	5.2		254
187	$C_{20}H_{27}ClIrOP_2^+.F_6P^-$	$[IrCl(CO)(PMe_2Ph)_2(C_3H_5)]PF_6$	3018	6.6	8.0		255
448	$C_{20}H_{28}O_2P_2Rh_2S_2$	$[Rh(SPh)(CO)(PMe_3)]_2$	3749	4.5	5.3		256
250	$C_{20}H_{30}Cl_4Ir_2$	$[IrCl(C_5Me_5)]_2(\mu\text{-}Cl)_2$	1095	3.3	4.6		257
249	$C_{20}H_{30}Cl_4Rh_2$	$[RhCl(C_5Me_5)]_2(\mu\text{-}Cl)_2$	1513	2.57	3.47		258
147	$C_{20}H_{30}CoN_2O_8$	$Co(MeCN)_2[C_2H_2(CO_2Et)_2]_2$	2215	6.0			259
252	$C_{20}H_{30}F_6O_6P_3Rh_2^+.F_6P^-$	$[Rh_2(PO_2F_2)_3(C_5Me_5)_2]PF_6$	4210	11.2			260
142	$C_{20}H_{30}N_2Ni$	$Ni(C_6H_{10}Me_4)(bipy)$	1614	5.0	5.9	*jj*	261
248	$C_{20}H_{31}Cl_3Ir_2$	$[IrCl(C_5Me_5)]_2(\mu\text{-}H)(\mu\text{-}Cl)$	1089	4.4	4.9		257
90	$C_{20}H_{32}CoN_5O_6$	$Co(CHMeCO_2Me)(NH_2CHMePh)(dmg)_2$	2146	4.8			262
118	$C_{20}H_{37}N_2OP_2RhS_2$	$Rh(COPr)(PEt_3)_2(mnt)$	2614	4.0	5.9		263
156	$C_{20}H_{46}ClP_2Rh$	$RhCl(C_2H_4)(PPr^i_3)_2$	4586	2.2			224

C21

487	$C_{21}H_{10}As_2Fe_3O_9$	$Fe_3(AsPh)_2(CO)_9$	3786	4.8			264
330	$C_{21}H_{14}CrO_3$	$Cr(CO)_3(C_5H_4CPh_2)$	1091	7.4	6.9		265
359	$C_{21}H_{15}CoGeO_4$	$Co[GeMePh(nap)](CO)_4$	1654	4.7	6.0		266
195	$C_{21}H_{17}F_{12}O_5PRu$	$Ru(CO)_2[P(OCH_2)_3CMe][C_6H_8(C_4F_6)_2]$	2418	7.8	8.0		267
200	$C_{21}H_{18}F_6NO_6Rh$	$Rh(hfac)(py)[C_7H_6(CO_2Me)_2]$	2786	7.72	8.7		268
215	$C_{21}H_{22}FeN_2O_5$	$Fe(CO)(bipy)[C_4H_4(CO_2Et)_2]$	2394	6.5			269

jj $NiC_6H_{10}Me_4$ = 1-nickela-3,3,7,7-tetramethyl-*trans*-tricyclo[4.1.0.$0^{2,4}$]heptane.

163	$C_{21}H_{23}ClN_3Pt^+.ClO_4^-$	$\{PtCl(bipy)[CH_2{:}CHC_6H_4NMe_2]\}ClO_4$	691	6.8			270
91	$C_{21}H_{30}CoN_5^{2+}.2I^-.2H_2O$	$[CoMe(C_{20}H_{27}N_5)]I_2.2H_2O$	2493	5.3	5.1	*kk*	271
150	$C_{21}H_{30}Pt$	$Pt(C_7H_{10})_3$	1781	5.5	6.6	83K	272
82	$C_{21}H_{44}ClIrP_2$	$IrCl[Bu^t_2P(CH_2)_2C(CH_2)_2PBu^t_2]$	2229	1.6			273
79	$C_{21}H_{60}P_6Ru_2$	$Ru_2(\mu\text{-}CH_2)_3(PMe_3)_6$	4561	2.92			274
471	$C_{21}O_{21}Os_7$	$Os_7(CO)_{21}$	1801	8.9	9.3		275

C22

18	$C_{22}H_{10}Cl_2Cr_2O_{10}P_2$	*meso*-$[Cr(CO)_5]_2P_2Cl_2Ph_2$	1379	3.7		183K	276
19	$C_{22}H_{10}Cl_2Cr_2O_{10}P_2$	*rac*-$[Cr(CO)_5]_2P_2Cl_2Ph_2$	633	6.2			276
291	$C_{22}H_{14}Mn_2O_6$	$[Mn(CO)_3]_2(C_{14}H_8Me_2)$	1079	6.7		*ll*	277
475	$C_{22}H_{14}O_6Ru_3$	$Ru_3(CO)_6(C_{16}H_{14})$	2630	5.2	5.9		212
266	$C_{22}H_{15}F_{12}Rh$	$Rh(ind)(C_{13}H_8F_{12})$	2879	6.3		*mm*	278
398	$C_{22}H_{16}Mn_2O_4$	$[Mn(CO)_2(C_5H_5)]_2(C{:}CHPh)$	1200	7.1			279
202	$C_{22}H_{18}O_2Rh_2S_2$	$Rh(CO)_2(\mu\text{-}SPh)_2Rh(cot)$	4012	5.5			280
306	$C_{22}H_{20}FeSi$	$FcSiHPh_2$	2160	4.1	4.1		281
449	$C_{22}H_{20}Rh_2S_2$	$[Rh(SPh)(C_5H_5)]_2$	1331	7.0			282
362	$C_{22}H_{24}ClNO_3P_2PtSi$	*trans*-$PtCl[Si(OCH_2CH_2)_3N](PMe_2Ph)_2$	2165	4.8	6.2		283

kk $C_{20}H_{27}N_5$ = 2,12-di-2-pyridyl-3,7,11-triazatrideca-2,11-diene-$N^{2'}$,$N^{2''}$,N^3,N^7,N^{11}.

ll $C_{14}H_8Me_2$ = 3,5-dimethylacenaphthene. *mm* $C_{13}H_8F_{12}$ = 5-isopropenyl-1,2,3,4-$(CF_3)_4$-1,3-cyclohexadiene.

442	$C_{22}H_{26}Mn_3O_{11}P$	$Mn_3(CO)_8(OEt)_3(PMe_2Ph)$	1666	8.0			284
365	$C_{22}H_{27}As_2CoFe_2O_3$	$Fe_2Co(AsMe_2)_2(CO)_3(C_5H_5)_3$	3045	7.6			285
232	$C_{22}H_{27}ClOTi$	$TiCl(OC_6H_3Me_2)(C_5H_5)(C_5H_3MePr^i)$	627	7.2			253
100	$C_{22}H_{33}ClP_2Pt$	*trans*-$PtCl(CH{:}CH_2)(PEt_2Ph)_2$	1420	4.4	6.0		286
333	$C_{22}H_{34}Mo_2O_3S_3$	$Mo_2(CO)_3(SBu^t)_3(C_7H_7)$				*l*	232
208	$C_{22}H_{40}ClP_4Ta$	$TaCl(C_{10}H_8)(dmpe)_2$	4019	4.8			287
389	$C_{22}H_{62}Cr_2P_2$	$Cr_2(CH_2SiMe_3)_4(PMe_3)_2$	4345	3.0			288
	C23						
488	$C_{23}H_{10}Fe_5O_{13}Sn_2$	$[Fe(CO)_2(C_5H_5)]_2Sn_2Fe_3(CO)_9$	1865	8.3			289
216	$C_{23}H_{14}FeO_5$	$Fe(CO)_3(C_{20}H_{14}O_2)$	3265	7.0		*nn*	290
376	$C_{23}H_{18}CoN_3O_4Pd$	$Pd[Co(CO)_4](C_{14}H_{13}N_2)(py)$	2843	6.8	5.8	*oo*	291
177	$C_{23}H_{26}N_4Ni$	$Ni(C_{13}H_8N_2)(CNBu^t)_2$	2095	4.6	6.3	*pp*	292
107	$C_{23}H_{35}NP_2PdS$	$Pd(C_2C_6H_4C_2H)(NCS)(PEt_3)_2$	2332	4.4			293
425	$C_{24}H_{47}BrP_2Pd_2$	$[Pd(PPr^i_3)]_2(\mu\text{-}Br)(\mu\text{-}C_5H_5)$	1933	4.2			294
	C24						
479	$C_{24}H_{10}O_{10}Os_3$	$Os_3(CO)_{10}(C_2Ph_2)$	3372	2.6	3.2		295
405	$C_{24}H_{14}Fe_3O_8$	$Fe_3(CO)_8(C_{14}H_8Me_2)$	1930	5.6		*ll*	277

l Diagram only. *nn* $C_{20}H_{14}O_2$ = 1,2,2a,12a-η^4-5,10-Me_2dibenzo[*a*,*e*]cyclobuta[*f*]cyclooctene-3,12-dione.

oo $C_{14}H_{13}N_2$ = *ortho*-metallated acetophenonephenylhydrazone. *pp* $C_{13}H_8N_2$ = N,N'-η^2-diazofluorene.

493	$C_{24}H_{20}AsCo_4O_4^+.BF_4^-.\frac{1}{2}C_6H_6$	$[Co_4(\mu\text{-}As)(CO)_4(C_5H_5)_4]BF_4.\frac{1}{2}C_6H_6$	1784	4.8	5.2		296
184	$C_{24}H_{21}BMoN_6O_2$	$Mo(CO)_2[(pz)_3BPh](C_7H_7)$	2384	3.0	3.8		247
132	$C_{24}H_{21}ClNOPPt$	$PtCl(CH_2OC_6H_4PPh_2)(py)$	2560	10.1			297
282	$C_{24}H_{23}F_{15}MoN_2$	$Mo(CF_3)(CNBu^t)[(CF_3)_4C_5NBu^t](C_5H_5)$	7900	12.7	15.9		298
313	$C_{24}H_{24}Cl_2F_{12}Ir_2.2C_6D_6$	$\{IrCl[C(CF_3):CH(CF_3)](C_8H_{11})\}_2.2C_6D_6$	1755	7.1	7.6		299
347	$C_{24}H_{24}Cl_8Hg_4Mo_2O_6$	$[Mo(HgCl_2)_2(CO)_3(C_6H_3Me_3)]_2$	1598	3.5			300
207	$C_{24}H_{24}F_{12}Pt_2$	$Pt_2(cod)_2(C_4F_6)_2$	3451	4.2	5.0		301
167	$C_{24}H_{24}FeO_2P_2S_2$	$Fe(CS_2)(CO)_2(PMe_3)(PPh_3)$	1881	3.6	4.2		302
397	$C_{24}H_{24}W_2$	$W_2(C_8H_8)_3$	2063	3.8	4.8		303
229	$C_{24}H_{28}Br_2Ti_2$	$[TiBr(C_5H_4Me)_2]_2$	1459	4.9	3.6		248
66	$C_{24}H_{28}Cl_2FeI_2N_4S_4Zn$	$Fe(I_2Zn)(CNC_6H_4Cl)_2(S_2CNEt_2)_2$	915	3.9			304
230	$C_{24}H_{28}Cl_2Ti_2$	$[TiCl(C_5H_4Me)_2]_2$	3935	6.1			248
242	$C_{24}H_{28}Mo_4O_8$	$[Mo_2O_4(C_5H_4Me)_2]_2$	1671	7.1			100
326	$C_{24}H_{28}O_4Ru_4^{4+}.2O_4S^{2-}.12H_2O$	$\{[Ru(OH)(C_6H_6)]_4\}(SO_4)_2.12H_2O$	204	11.0			305
194	$C_{24}H_{28}O_6Os_2$	$[Os(CO)_3]_2(\mu\text{-}C_9H_{14})_2$	1145	2.7	2.9	*qq*	158
261	$C_{24}H_{30}SiW_2$	$W_2H(CH_2SiMe_3)(\mu\text{-}C_5H_4)_2(C_5H_5)$	3057	8.9			306
95	$C_{24}H_{32}Cl_2N_2Pd$	$PdCl(bipy)(CBu^t:CMeCMe:CClBu^t)$	2913	6.0			307
170	$C_{24}H_{38}As_4CoO_2^+.ClO_4^-$	*cis*-$\{Co(O_2)[Me_2As(CH_2)_3AsPh(CH_2)_2$-$AsPh(CH_2)_3AsMe_2]\}ClO_4$	3660	5.57	4.99	*rr*	308

qq C_9H_{14} = 1,3η^3:2η^1-cyclononaallyl. *rr* Structure determined using data obtained from two crystals.

217	$C_{24}H_{40}Br_2Ni_2$	$[NiBr(C_4Et_4)]_2$	1439	5.6	5.9		309
30	$C_{24}H_{44}Mo_2N_4O_4S_8.CH_2Cl_2$	$[Mo(CO)_2(S_2CNEt_2)_2]_2N_2H_4.CH_2Cl_2$	6129	5.8	8.5		310
	C25						
354	$C_{25}H_{20}Cl_3MnO_2PSn^+.Cl_5Sn^-$	$[Mn(SnCl_3)(CO)_2(PPh_3)(C_5H_5)]SnCl_5$	2245	4.5			311
422	$C_{25}H_{20}F_3Ni_2OP$	$[Ni(C_5H_5)]_2[\mu\text{-}Ph_2P(O)C_2CF_3]$	1796	4.0	4.5		312
117	$C_{25}H_{20}IN_2OPRhS_2^-.C_{24}H_{20}As^+$	$AsPh_4[RhI(COEt)(PPh_3)(mnt)]$	2557	4.00	4.37		313
119	$C_{25}H_{20}MnO_4P$	$Mn[(C_6H_3Me)P(p\text{-}tol)_2](CO)_4$	1459	6.0	6.1		314
355	$C_{25}H_{21}O_2ReSi$	$ReH(SiPh_3)(CO)_2(C_5H_5)$	1559	3.5			315
404	$C_{25}H_{33}Fe_2O_4P$	$Fe_2(CO)_4(PEt_3)$(gaz)	1107	7.5	8.5		245
310	$C_{25}H_{36}FeO$	[15]-Ferrocenophan-8-one	1270	5.4			316
64	$C_{25}H_{45}FeN_5$	$Fe(CNBu^t)_5$	4339	10.5		193K	317
51	$C_{25}H_{54}ClOP_2Rh$	$RhCl(CO)(PBu^t_3)_2$	2460	3.5			318
	C26						
483	$C_{26}H_{10}O_{12}Ru_4$	$Ru_4(CO)_{12}(C_2Ph_2)$	2929	5.6	5.4		319
411	$C_{26}H_{15}Fe_2O_7P$	$Fe_2(CO)_6[C(CHO)P(C_6H_4Ph_2)]$	4070	5.0	4.4		320
292	$C_{26}H_{16}Mn_2O_6$	$[Mn(CO)_3]_2(C_{20}H_{16})$	2946	3.98	3.17	*ss*	321
35	$C_{26}H_{18}N_4O_2RuS_4$	$Ru(CO)_2(py)_2(mbt)_2$	2402	3.3	3.1		322
72	$C_{26}H_{20}CrO_6Si$	$Cr(CO)_5[C(OEt)(SiPh_3)]$	806	7.9			323

ss $C_{20}H_{16}$ = 1,2,3,9,10-η^5:1',2',3',9',10'-η^5-4,4'-diazulene.

378	$C_{26}H_{20}Fe_2N_2O_2$	$[Fe(CO)(CNPh)(C_5H_5)]_2$	1652	4.1			324,325
76	$C_{26}H_{20}MoO_6Si$	$Mo(CO)_5[C(OEt)(SiPh_3)]$	1062	7.0			323
284	$C_{26}H_{20}O_2SiW$	$W(CO)_2(CSiPh_3)(C_5H_5)$	1350	4.9			326
368	$C_{26}H_{20}O_{10}Re_2$	*cis*-$Re_2(CO)_8[C(OMe)C_6H_4Me]_2$	986	7.4		173K	327
134	$C_{26}H_{21}AsF_6O_3Pt$	$\overline{Pt(hfac)[CH(CH_2OMe)C_6H_4AsPh_2]}$	2345	5.7			328
190	$C_{26}H_{28}ClPPd$	$PdCl(PPh_3)(C_8H_{13})$	3684	5.0		*tt*	329
41	$C_{26}H_{33}Br_2MoO_2P_3$	$MoBr_2(CO)_2(PMe_2Ph)_3$	2377	6.2			330
104	$C_{26}H_{42}O_4P_2Pd$	*trans*-$Pd(C_2Ph)[C(CO_2Me):CH(CO_2Me)](PEt_3)_2$	3966	7.5			331
55	$C_{26}H_{46}ClIrOP_2$	*trans*-$IrCl(CO)[Bu^t_2PC{\equiv}C(CH_2)_5C{\equiv}CPBu^t_2]$	3085	2.6	2.6		332
	C27						
123	$C_{27}H_{13}MnO_9PRe$	$\overline{Mn\{C_6H_3C(O)\}[Re(CO)_4]PPh_2\}(CO)_4}$	3064	4.1	4.5		333
290	$C_{27}H_{22}MnO_2P$	$Mn(CO)_2[PHPh(CPh:CHPh)](C_5H_5)$	1132	4.5			334
149	$C_{27}H_{22}N_2OPd.\frac{1}{2}C_6H_6$	$Pd(dba)(bipy).\frac{1}{2}C_6H_6$	3379	5.9	6.3		335
302	$C_{27}H_{28}CoP$	$Co(CH_2)_4(PPh_3)(C_5H_5)$	2181	5.4			336
131	$C_{27}H_{37}ClNPPd$	$\overline{PdCl(C_{10}H_6CHMeNMe_2)}(PPr^iBu^tPh)$	3756	3.7	5.5		337

tt C_8H_{13} = η^3-1-methylene-3-methylcyclohexyl.

C28

456	$C_{28}H_{17}O_{10}Os_3P$	$Os_3H_2(CO)_{10}(PPh_3)$	4698	4.38	3.27	338
447	$C_{28}H_{18}N_4O_4Ru_2S_4$	$[Ru(CO)_2(py)_2(mbt)]_2$	3407	3.7	3.9	339
45	$C_{28}H_{22}As_2I_2O_3W$	$WI_2(CO)_3(dpam)$	2312	5.8		340
233	$C_{28}H_{31}ClO_2Ti$	$Ti(OC_6H_4Cl)(OC_6H_3Me_2)(C_5H_5)$-$(C_5H_3MePr^i)$	995	7.8		253
491	$C_{28}H_{36}Co_3O_8P$	$Co_3(CMe)(CO)_8(PCy_3)$	673	6.5		341
258	$C_{28}H_{38}Nb_2O$	$[NbBu(C_5H_5)_2]_2O$	1656	4.9	5.1	342
133	$C_{28}H_{45}NO_3P_2Pt$	*trans*-$Pt(ONO_2)(C_6H_4PBu^t_2)(PBu^t_2Ph)$	2263	4.3	5.4	343
218	$2C_{28}H_{48}Cl_3Pd_2^+.Cl_6Pd_2^{2-}$	$[Pd_2Cl_3(C_4Me_2Bu^t_2)_2]_2[Pd_2Cl_6]$	4712	4.9		344

C29

263	$C_{29}H_{21}CoS_2$	$Co[C_4Ph_2(C_4H_3S)_2](C_5H_5)$	2436	6.0	5.0	345
124	$C_{29}H_{47}ClN_2P_2Ru$	$RuCl[(C_6H_3Me)N(CH_2)_2N(p\text{-}tol)C]$-$(PEt_3)_2$	3035	6.6		346

C30

481	$C_{30}H_{15}F_{10}ORh_3$	$[Rh(C_5H_5)]_3(CO)[C_2(C_6F_5)_2]$	2668	5.8	6.4	347
372	$C_{30}H_{21}Co_2NO_6P_2$	$Co_2(CO)_6[\mu\text{-}(Ph_2P)_2NH]$	3891	5.8	8.0	348
294	$C_{30}H_{22}O_4Re_2$	$[Re(CO)_2(C_5H_5)]_2(C{:}CPhCPh{:}CH_2)$	2440	5.2		349
61	$C_{30}H_{24}Cr_4N_3O_{18}$	$Cr(thf)_3[NCCr(CO)_5]_3$	2222	5.5		350

480	$C_{30}H_{25}ORh_3.\frac{1}{2}C_6H_6$	$[Rh(C_5H_5)]_3(CO)(C_2Ph_2).\frac{1}{2}C_6H_6$	2940	4.4	5.6	347
484	$C_{30}H_{30}O_8Ti_6$	$[Ti(C_5H_5)]_6O_8$	2649	4.9	4.0	351
462	$C_{30}H_{54}N_6Pt_3$	$Pt_3(CNBu^t)_6$	3543	5.7	7.0	352
63	$C_{30}H_{56}IMoN_6^+.I^-$	$[MoI(CNBu^t)_4(Bu^tNHC_2NHBu^t)]I$	4038	5.9		353
	C31					
23	$C_{31}H_{27}BMoN_9O_2P$	$Mo(CO)(PPh_3)(NO)[B(pz)_4]$	3759	5.7	5.4	354
182	$C_{31}H_{29}ClMoO_2P_2$	$MoCl(CO)_2(dppe)(C_3H_5)$	2006	6.0	5.7	355
271	$C_{31}H_{29}Cl_3NbP_2.C_7H_8$	$NbCl_3(dppe)(C_5H_5).PhMe$	6188	8.8		101
253	$C_{31}H_{36}BNPRhS_2$	$Rh(NCBPh_3)(S_2PMe_2)(C_5Me_5)$	838	7.0		356
476	$C_{31}H_{40}O_7Ru_3$	$Ru_3(CO)_6(C_{12}H_{20})(C_{13}H_{20}O)$	3834	4.6		357
	C32					
485	$C_{32}H_{20}Hg_4Mo_8O_{12}$	$\{MoHg[Mo(CO)_3(C_5H_5)]\}_4$	1172	5.0		358
24	$C_{32}H_{20}Mn_2O_{10}$	$\{Mn(CO)_4[PPh_2(O)]\}_2$	2453	5.3		359
300	$C_{32}H_{22}F_9PRu$	$Ru[C(CF_3):CHC(CF_3):C:C:CH(CF_3)](PPh_3)(C_5H_5)$	2712	7.9	8.8	360
430	$C_{32}H_{24}F_{24}Pt_3$	$Pt_3(cod)_2(C_4F_6)_4$	3595	6.0	7.3	301
181	$C_{32}H_{29}O_3P_2V$	$V(CO)_3(dppe)(C_3H_5)$	3061	4.0		361
328	$C_{32}H_{31}BRu$	$Ru(\eta^6\text{-}PhBPh_3)(C_8H_{11})$	4561	9.5		138
384	$C_{32}H_{36}Cr_2O_8$	$Cr_2[C_6H_3(OMe)_2]_4$	2438	5.9	8.0	362

386	$C_{32}H_{36}Mo_2O_8$	$Mo_2[C_6H_3(OMe)_2]_4$		4.5	5.8		362
383	$C_{32}H_{36}O_8V_2.2C_4H_8O$	$V_2[C_6H_3(OMe)_2]_4.2thf$	2652	7.4	9.9		363
303	$C_{32}H_{38}IrP$	$Ir(CH_2)_4(PPh_3)(C_5Me_5)$	1285	6.7			336
	C33						
213	$C_{33}H_{30}FeO_3Si$	$Fe(CO)_3[C_8H_6(SiMe_3)(CPh_3)]$	3842	5.5	6.8		364
128	$C_{33}H_{33}ClIrN_2O_3P$	$IrCl[(MeC_6H_2O)_3P(OC_6H_4Me)](\gamma\text{-pic})_2$	2583	4.0			365
27	$C_{33}H_{38}O_4P_2Rh^+.F_6P^-$	$\{Rh(CO)(EtOH)[Ph_2P(CH_2)_2O(CH_2)_2O(CH_2)_2PPh_2]\}PF_6$	2369	7.0			366
	C34						
394	$C_{34}H_{28}As_2Br_2O_5W_2$	$W_2Br_2(CO)_5(dpam)(C_2Me_2)$	3001	4.9			367
83	$C_{34}H_{29}Cl_2OP_2Pd$	$PdCl_2(bdep)$	2652	6.5		*uu*	368
353	$C_{34}H_{30}GeMoO_3$	$Mo(GePh_3)(CO)_2[CPh(OEt)](C_5H_5)$	2414	5.6	5.7		369
219	$C_{34}H_{34}N_2Yb_2$	$[Yb(C_5H_5)_3]_2(\mu\text{-}C_4H_4N_2)$	1304	3.91	4.55		370
	C35						
269	$C_{35}H_{31}O_8PPd$	$Pd[C_4(CO_2Me)_4](C_5H_4PPh_3)$	3027	8.6			371
431	$C_{35}H_{46}N_4OPt_2$	$Pt_2(CNBu^t)_4[\mu\text{-}(PhC)_2CO]$	4494	7.0			372

uu bdep = (benzoylmethylene)diphenyl-2-(diphenylphosphino)ethylphosphorane.

C36

467	$C_{36}H_{28}O_{10}P_2Ru_4$	$Ru_4H_4(CO)_{10}(dppe)$	3630	3.8	2.5	373
175	$C_{36}H_{30}NO_3P_2RhS$	$Rh(NO)(SO_2)(PPh_3)_2$	2615	3.8		374
257	$C_{36}H_{32}Hf$	$Hf(CHPh_2)_2(C_5H_5)_2$		9.4	9.9	375
256	$C_{36}H_{32}Zr$	$Zr(CHPh_2)_2(C_5H_5)_2$	2989	6.4	6.2	375
80	$C_{36}H_{33}I_2N_2OPRu.H_2O$	$RuI_2(CO)(CN\text{-}p\text{-}tol)[CHNMe(p\text{-}tol)](PPh_3).H_2O$	2726	4.3	6.0	376
496	$C_{36}H_{38}B_5CuP_2$	$Cu(B_5H_8)(PPh_3)_2$	1998	5.47	6.05	377
500	$C_{36}H_{40}B_8P_2PtS$	$[Pt(PPh_3)_2]SB_8H_{10}$	3211	4.3	4.9	378
201	$C_{36}H_{40}P_2Rh^+.ClO_4^-.C_4H_8O$	$\{Rh(cod)[(Ph_2PCHMe)_2]\}ClO_4.thf$	6691	4.03	5.05	379
385	$C_{36}H_{44}Cr_2O_{12}$	$Cr_2[C_6H_2(OMe)_3]_4$	1698	6.6	9.1	380
390	$C_{36}H_{48}Mn_2N_4$	$Mn_2(CH_2C_6H_4NMe_2)_4$	2945	6.8		381
317	$C_{36}H_{54}Cl_6Nb_3^{2+}.2C_{12}H_4N_4^-$	$[Nb_3Cl_6(C_6Me_6)_3](tcnq)_2$	2172	5.3	6.5	382
412	$C_{36}H_{68}O_8P_2Ru_2$	$[Ru(CO)_2(PBu^t_3)]_2(O_2CPr)_2$	2479	4.6		383

C37

52	$C_{37}H_{30}N_3OP_2Rh$	$Rh(N_3)(CO)(PPh_3)_2$	2179	8.8		384
420	$C_{37}H_{30}ORh_2$	$[Rh(CPh_2)_2(C_5H_5)]_2(CO)$	2394	4.0		385
141	$C_{37}H_{37}Cl_2P_2Rh$	$Re(C_3Ph_3)Cl_3(PMe_2Ph)_2$	2550	4.1	6.2	386
280	$C_{37}H_{37}MoP_2^+.F_6P^-.OS_2$	$[Mo(dppe)(C_6H_8)(C_5H_5)]PF_6.SO_2$	3513	6.1	7.6	387

C38

60	$C_{38}H_{30}Cl_2OP_2RuSe$	$RuCl_2(CO)(CSe)(PPh_3)_2$	2208	7.4	9.1	388
234	$C_{38}H_{30}O_8Ti_2$	$[Ti(OCOPh)_2(C_5H_5)]_2$	660	15.4		389
299	$C_{38}H_{34}FeOP_2$	$Fe(COPh)(dppe)(C_5H_5)$	3460	3.8		390
501	$C_{38}H_{44}B_8OP_2PtS$	$[Pt(PPh_3)_2]SB_8H_9(OEt)$	2962	5.4	5.9	378
67	$C_{38}H_{51}N_4PRu$	$Ru(CNBu^t)_4(PPh_3)$	1760	9.7		391

C39

416	$C_{39}H_{31}Co_2N_2O_5P$	$Co_2(CO)_5(PMe_2Ph)[(PhCNPh)_2]$	2524	6.1	6.8	392
169	$C_{39}H_{33}O_2OsP_2S_2^+.ClO_4^-.\frac{1}{2}C_6H_6$	$[Os(S_2Me)(CO)_2(PPh_3)_2]ClO_4.\frac{1}{2}C_6H_6$	4693	7.6		393
99	$C_{39}H_{35}ClP_2Pt$	$PtCl(CH_2CH{:}CH_2)(PPh_3)_2$	6289	4.8	6.4	394
186	$C_{39}H_{35}NOP_2Ru$	$Ru(NO)(C_3H_5)(PPh_3)_2$	2074	2.99	3.83	395

C40

311	$C_{40}H_{28}Fe$	$Fe(C_5H_4C_6Ph_4C_5H_4)$	2939	5.40	6.25	396
357	$C_{40}H_{30}FeO_4Sn_2$	*cis*-$Fe(CO)_4(SnPh_3)_2$	3718	4.5	6.0	397
168	$C_{40}H_{33}O_2P_2RuS_2^+.ClO_4^-$	$[Ru(CS_2Me)(CO)_2(PPh_3)_2]ClO_4$	3049	9.7		398
116	$C_{40}H_{34}O_2OsP_2S_2.\frac{1}{2}C_6H_6$	$OsH(CS_2Me)(CO)_2(PPh_3)_2.\frac{1}{2}C_6H_6$	7005	3.6		399
26	$C_{40}H_{46}CoO_4P_4^+.BF_4^-.C_4H_8O$	$[Co(CO)[P(OMe)_3]\{PhP[(CH_2)_3PPh_2]_2\}]-BF_4.thf$	2964	11.0	14.8	400
136	$C_{40}H_{56}Fe_4O_{16}$	$[Fe(acac)_2]_4$	1430 1365	5.6 10.9	6.9	401 402

154	$C_{40}H_{66}F_6P_2Pt$	$Pt[C_2(CF_3)_2](PCy_3)_2$	6678	6.24	6.31	403
375	$C_{40}H_{72}Co_2N_8$	$Co_2(CNBu^t)_8$	2522	7.0		391
	C41					
36	$C_{41}H_{30}F_6OP_2RuS_2$	$Ru(CO)(PPh_3)_2[S_2C_2(CF_3)_2]$ (violet)	2386	6.0	5.5	404
105	$C_{41}H_{35}ClP_2Pt.\ ^2/_3CHCl_3$	*trans*-$PtCl(C_2CMe{:}CH_2)(PPh_3)_2.-\ ^2/_3CHCl_3$	3371	4.9		405
105	$C_{41}H_{35}ClP_2Pt.2C_6H_6$	*trans*-$PtCl(C_2CMe{:}CH_2)(PPh_3)_2.2C_6H_6$	5806	5.1		406
101	$C_{41}H_{37}ClP_2Pt$	*trans*-$PtCl[C(:CH_2)CMe{:}CH_2](PPh_3)_2$	3888	5.6		407
360	$C_{41}H_{43}IrO_2P_2Si_2$	$\overline{IrH(Me_2SiOSiMe_2)}(CO)(PPh_3)_2$	4580	7.8	10.6	408
	C42					
349	$C_{42}H_{24}Cd_3Fe_3N_6O_{12}.\ ^3/_4C_6H_3Cl_3$	$\{Fe[Cd(bipy)](CO)_4\}_3.\ ^3/_4C_6H_3Cl_3$	5643	6.6	9.9	409
179	$C_{42}H_{30}F_{12}N_2P_2Pt$	$Pt[(CF_3)_2C{:}NN{:}C(CF_3)_2](PPh_3)_2$	5046	5.5	5.9	410
151	$C_{42}H_{34}O_2P_2Pt$	$Pt(bq)(PPh_3)_2$	2505	9.0	12.2	411
494	$C_{42}H_{65}ClP_5Pd_3^+.BF_4^-$	$[Pd_3Cl(PPh_2)_2(PEt_3)_3]BF_4$	2866	10.5		412
	C43					
437	$C_{43}H_{30}Fe_2O_5P_2.C_6H_{12}$	$Fe_2(PPh_2)(C_2Ph)(CO)_5(PPh_3).C_6H_{12}$	3973	3.8	4.5	413
414	$C_{43}H_{32}Co_2O_4P_2$	$Co_2(CO)_4(dppm)(C_2Ph_2)$	3144	8.8	10.2	414
56	$C_{43}H_{34}Cl_2IrN_3O_3P_2.2C_3H_6O$	$IrCl(N_2C_6H_4NO_2)(CO)(PPh_3)_2.2Me_2CO$	1616	8.9		415

125	$C_{43}H_{34}F_2IrN_2OP_2^+.HBF_3O^-$	$[IrF(C_6H_3FN{:}NH)(CO)(PPh_3)_2][BF_3(OH)]$	2300	5.3			416
126	$C_{43}H_{35}IrN_3O_3P_2^+.BF_4^-$	$[Ir(C_6H_3NO_2NHNH)(CO)(PPh_3)_2]BF_4$	2069	4.2			417
96	$C_{43}H_{43}O_3PPd$	$Pd[C_4Ph_4(OEt)](acac)(PMe_2Ph)$	9538	5.9			418
92	$C_{43}H_{45}NNiP_3^+.C_{24}H_{20}B^-.C_3H_6O$	$[NiMe(np_3)]BPh_4.Me_2CO$	1738	6.1	6.2		419
	C44						
120	$C_{44}H_{28}Mn_2O_8P_2$	$Mn\{C_6H_3C(O)[Mn(CO)_3(PPh_3)]PPh_2\}(CO)_4$	2183	7.5	7.7		420
121	$C_{44}H_{28}Mn_2O_8P_2$	$Mn\{C_6H_3C(O)[Mn(CO)_4]PPh_2\}(CO)_3(PPh_3)$	3211	5.7	6.2		333
127	$C_{44}H_{34}F_4IrN_2OP_2^+.BF_4^-.2CH_4O$	$[IrF(CF_3C_6H_3N{:}NH)(CO)(PPh_3)_2]BF_4$–2MeOH	624	8.5			417
38	$C_{44}H_{42}O_6P_2Rh_2$	$[Rh(acac)(CO)]_2(dppx)$	1078	14.7			384
	C45						
53	$C_{45}H_{34}ClOP_2Rh$	$RhCl(CO)(bdpbp)$	3861	5.5	4.6	*vv*	421
87	$C_{45}H_{35}BrCrO_8P_2$	$CrBr(CPh)(CO)_2[P(OPh)_3]_2$	2637	6.9			230
426	$C_{45}H_{42}P_2Pd_2$	$[Pd(PPh_3)]_2(C_4H_7)(C_5H_5)$	2207	8.9			422
	C46						
153	$C_{46}H_{30}Fe_2O_6P_2$	$Fe_2(CO)_6(PhC_2PPh_2)_2$	3400	6.5			423
106	$C_{46}H_{42}P_2Pt$	*trans*-$Pt(C_2CMe{:}CH_2)$-$[C(:CH_2)CMe{:}CH_2](PPh_3)_2$	2790	5.0			407
203	$C_{46}H_{47}AlNiO$	$Ni(cod)[C_4Ph_4AlPh(OEt_2)]$	4774	4.93	6.14		424

vv bdpbp = 2,11-bis(diphenylphosphinomethyl)benzo[*c*]phenanthrene.

	C47					
140	$C_{47}H_{41}NOOsP_2S_2$	$OsH(CS_2CNMe\text{-}p\text{-}tol)(CO)(PPh_3)_2$	1544	9.6		425
	C48					
116	$C_{48}H_{39}O_4P_2ReSi$	*fac*-$Re[C(O)SiPh_3](CO)_3(dppe)$	3604	4.01	4.05	426
81	$C_{48}H_{45}ClN_3O_6P_2RhS_3$	$RhCl[(EtOCONCS)_3](PPh_3)_2$	7375	6.5	7.9	427
	C50					
14	$C_{50}H_{28}N_4O_6Re^+.Cl_6Sb^-.2CH_2Cl_2$	$\{[Re(CO)_3]_2(tpp)\}SbCl_6.2CH_2Cl_2$	1513	8.0	8.7	428
264	$C_{50}H_{36}Co_2S_2$	$[Co(C_5H_5)]_2[C_4Ph_2(C_4H_3S)]_2$	1934	5.5	5.0	345
148	$C_{50}H_{76}NiP_2.C_7H_8$	$Ni(C_{14}H_{10})(PCy_3)_2.PhMe$	4734	3.9	4.6	429
	C51					
57	$C_{51}H_{44}As_4Cl_2OPd_2$	$[PdCl(dpam)]_2(CO)$	1698	9.6		430
427	$C_{51}H_{54}O_6P_2Pd_2$	$\{Pd[P(O\text{-}o\text{-}tol)_3]\}_2(C_4H_7)(C_5H_5)$	1877	5.3		422
	C52					
102	$C_{52}H_{40}P_2Pd$	*cis*-$Pt(C_2Ph)_2(PPh_3)_2$	5528	11.0		431
103	$C_{52}H_{42}P_2Pt.\frac{1}{2}CHCl_3$	*trans*-$Pt(C_2Ph)(CPh{:}CH_2)(PPh_3)_2$-$\frac{1}{2}CHCl_3$	3051	6.4		432
43	$C_{52}H_{44}As_4Cl_2MoO_2$	$MoCl_2(CO)_2(dpam)_2$	1974	6.8		433

42	$C_{52}H_{44}Cl_2MoO_2P_4.xC_6H_6$	$MoCl_2(CO)_2(dppm)_2.\sim^3/_4C_6H_6$	2623	11.2			433
39	$C_{52}H_{44}O_2P_4Rh_2S$	$Rh_2(S)(CO)_2(dppm)_2$	1884	4.59	5.41		434
49	$C_{52}H_{46}N_2OP_2Ru$	*trans*-$RuH(dtfa)(CO)(PPh_3)_2$	5805	6.3	8.5		435
329	$C_{52}H_{48}P_4Rh_2^{2+}.2BF_4^-.C_2H_3F_3O$	$\{Rh_2[(\eta^6\text{-Ph})PPh(CH_2)_2PPh_2]_2\}$-$(BF_4)_2.CF_3CH_2OH$	3824	5.7	8.9		436
308	$C_{52}H_{64}Cu_4Fe_4N_4$	$\{Fe(C_5H_5)[C_5H_3(CH_2NMe_2)Cu]\}_4$	540	6.0			437
432	$C_{52}H_{80}P_4Pt_3$	$Pt_3(C_2Ph_2)_2(PEt_3)_4$	3226	5.0			438
	C54						
171	$C_{54}H_{45}ClO_2P_3Rh.2CH_2Cl_2$	$RhCl(O_2)(PPh_3)_3.2CH_2Cl_2$	2073	4.9	5.9		439
463	$C_{54}H_{45}O_6P_3Pt_3S_3.C_7H_8.O_2S$	$Pt_3(SO_2)_3(PPh_3)_3.C_7H_8.SO_2$	2321	2.9			440
	C55						
50	$C_{55}H_{46}CoOP_3$	$CoH(CO)(PPh_3)_3$	1982	8.7	3.8		441
	C56						
428	$C_{56}H_{52}O_8Pd_3$	$Pd_3[\mu\text{-}C_3Ph(C_6H_4OMe\text{-}p)_2]_2(acac)_2$	2259	7.6			442
143	$C_{56}H_{53}MoP_4^+.C_2F_3O_2^-.3CH_2Cl_2$	$[MoH(C_2H_4)(cis\text{-}Ph_2PCH{:}CHPPh_2)_2]$-$CF_3CO_2.3CH_2Cl_2$	1528	12.0			443
68	$C_{56}H_{53}N_3P_4Pd_2^{2+}.2F_6P^-$	$[Pd_2(CNMe)_3(dppm)_2](PF_6)_2$	1990	8.0		85K	444

	C57					
461	$C_{57}H_{99}O_3P_3Pt_3$	$Pt_3(CO)_3(PCy_3)_3$	3232	7.9		445
	C58					
54	$C_{58}H_{56}Cl_2O_4P_4Rh_2.xCH_2Cl_2$	$[RhCl(CO)\{O[(CH_2)_2PPh_2]_2\}]_2.$ ~3 CH_2Cl_2	1149	11.4		366
	C60					
65	$C_{60}H_{51}ClFeN_3P_2^+.Cl_4Fe^-$	$[FeCl(CN\text{-}p\text{-}tol)_3(PPh_3)_2]FeCl_4$	7530	4.2		446
361	$C_{60}H_{57}NNiP_3Sn^+.C_{24}H_{20}B^-$	$[Ni(SnPh_3)(np_3)]BPh_4$	1919	8.8	9.4	447
	C61					
122	$C_{61}H_{43}Mn_2O_7P_3$	$Mn\{C_6H_3C(O)[Mn(CO)_3(PPh_3)]PPh_2\}-(CO)_3(PPh_3)$	2112	8.8	8.8	421
	C66					
415	$C_{66}H_{54}As_4Co_2O_2.C_2H_4Cl_2$	$Co_2(CO)_2(dpam)_2(C_2Ph_2).C_2H_4Cl_2$	4158	8.6	7.5	414
	C68					
97	$C_{68}H_{56}N_2P_4Pt_2^{2+}.2BF_4^-$	$\{[Pt(CH_2C_6H_4CN)(Ph_2PCH{:}CHPPh_2)]_2\}-(BF_4)_2$	3402	7.2		448

	C72					
172	$C_{72}H_{60}Cl_2O_4P_4Rh_2.2CH_2Cl_2$	$[RhCl(O_2)(PPh_3)_2]_2.2CH_2Cl_2$	1658	4.4	5.5	449
	C74					
393	$C_{74}H_{50}Mo_2O_4$	$Mo_2(CO)_3(C_2Ph_2)(C_4Ph_4)(C_4Ph_4CO)$	4811	11.1	15.0	450
	C80					
468	$C_{80}H_{60}O_{20}P_4Rh_4$	$Rh_4(CO)_8[P(OPh)_3]_4$	1354	8.7		451
	C84					
424	$C_{84}H_{60}Ni_2$	$Ni_2(C_3Ph_3)(C_4Ph_4)(C_5Ph_5)$	3095	7.5		452
472	$C_{84}H_{60}O_{24}P_4Rh_6$	$Rh_6(CO)_{12}[P(OPh)_3]_4$	3480	5.0		451

TABLE 2. TRANSITION METAL HYDRIDE AND BOROHYDRIDE COMPLEXES

No.	Formula	Structure	Data	R	R_w	Notes	Reference
514	$C_{24}H_{37}OsP_3$	$OsH_4(PMe_2Ph)_3$	3486 3381	5.5 4.4	6.0 4.2	ND,90K	453
515	$C_{37}H_{68}O_2P_2Pt$	*trans*-$PtH(O_2CH)(PCy_3)_2$	4411	6.0			454
516	$C_{38}H_{70}O_3P_2Pt.CH_4O$	*trans*-$PtH(O_2COMe)(PCy_3)_2.MeOH$	5451	4.9			454
517	$C_{40}H_{56}P_5Ru^+.F_6P^-$	$[RuH(PMe_2Ph)_5]PF_6$	1954	6.1			455
518	$C_{40}H_{68}P_4Re_2$	$Re_2H_8(PEt_2Ph)_4$	2367 2729	5.3 8.6	5.7 4.9	ND,80K	456
519	$C_{45}H_{43}N_2P_2Pt^+.BF_4^-.C_6H_6$	*trans*-$[PtH(PhHNNC_3H_6)(PPh_3)_2]$-$BF_4.C_6H_6$	5635	4.6	6.3		457
520	$C_{52}H_{50}IrP_4^+.F_6P^-$	*cis*-$[IrH_2(dppe)_2]PF_6$	3255	9.4			458
521	$C_{54}H_{46}F_3P_4Rh.\frac{3}{2}C_6H_6$	$RhH(PF_3)(PPh_3)_3.\frac{3}{2}C_6H_6$	1668	7.4	9.6		459
522	$C_{54}H_{56}P_3Pt^+.C_4HF_6O_4^-$	$[PtH(PPh_3)_3](CF_3CO_2)_2H$	5549	11.4			460
523	$C_{54}H_{102}P_4Ni_2$	$\{NiH[Cy_2P(CH_2)_3PCy_2]\}_2$	4051	4.45	3.5		461
524	$C_{56}H_{61}B_{10}N_2P_3RuS.3C_6H_6$	$RuH_2(N_2B_{10}H_8SMe_2)(PPh_3)_3.3C_6H_6$	5590	7.2			462
525	$C_{14}H_{42}B_2N_4Ni_2^{2+}.2C_{24}H_{20}B^-$	$\{[Ni(CNBH_3)(tren)]_2\}(BPh_4)_2$	4153	4.9	4.8		463
526	$C_{36}H_{71}BCoP_2$	$CoH(H_2BH_2)(PCy_3)_2$	3707	6.2			464
527	$C_{39}H_{43}BCuP_3$	$Cu(HBH_3)(PMePh_2)_3$	3113	2.6			465

Other (non-cluster) complexes containing hydride ligands are: *4*, *5*, *6*, *49*, *50*, *140*, *143*, *239*; *240*, *241*, *246*, *248*, *261*, *342*, *343*, *355*, *358*, *360*, *366*, *433*, *434*. Other borohydride complexes: *3*, *222*, *225*, *227*.

TABLE 3. COMPLEXES CONTAINING NITROSYL GROUPS

No.	Formula	Structure	Data	R	R_w	Notes	Reference
528	$C_4FeN_5O^{2-}.2C_8H_{20}N^+$	$(NEt_4)_2[Fe(NO)(CN)_4]$	1363	6.0			466
529	$C_5FeN_6O^{2-}.Sr^{2+}.4H_2O$	$Sr[Fe(NO)(CN)_5].4H_2O$	1014	9.9			467
530	$C_5FeN_6O^{2-}.2C_{24}H_{20}As^+$	$(AsPh_4)_2[Fe(NO)(CN)_5]$	1607	12.0			468
531	$C_8H_{18}FeN_3OS_2$	$Fe(NO)[S(CH_2)_2NMe(CH_2)_2NMe(CH_2)_2S]$	2557	3.6	4.3		469
532	$C_{10}H_{20}FeN_4O_3S_4$	*cis*-$Fe(NO)(NO_2)(S_2CNEt_2)_2$	2908	5.9	10.1		470
533	$C_{15}H_{15}CrN_6O_5.C_5H_5N$	$Cr(NO)(ONO)_2(py)_3.py$	722	5.9	7.9		471
534	$C_{16}H_{14}N_4O_5Ru$	$Ru(NO)(ONO)(sal_2en)$	3552	4.3			472
535	$C_{16}H_{32}CrN_6O_3^+.F_6P^-$	$[Cr(NO)(NO_2)(Me_6[14]dieneN_4)]PF_6$	1853	6.1	12.6	*a*	473
536	$C_{20}H_{32}As_4FeNO^{2+}.2ClO_4^-$	$[Fe(NO)(diars)_2](ClO_4)_2$	2310	6.38	7.75		474
537	$C_{21}H_{32}As_4FeN_2OS^+.C_{24}H_{20}B^-.C_3H_6O$	$[Fe(NO)(NCS)(diars)_2]BPh_4.Me_2CO$	4675	5.80	7.88		474
538	$C_{26}H_{24}CoN_2O_2P_2^+.F_6P^-$	$[Co(NO)_2(dppe)]PF_6$	2663	6.8	8.6		475
539	$C_{36}H_{30}NO_5P_2RhS$	$Rh(NO)(SO_4)(PPh_3)_2$	2187	6.5			476
540	$C_{36}H_{36}Co_2N_5OS_4^+.BF_4^-$	$[\{(Co[S(CH_2)_2NMe(CH_2)_2NMe(CH_2)_2S]\}_2-(NO)]BF_4$	2371	5.1	4.8		477
541	$C_{36}H_{36}Fe_2N_5OS_4^+.F_6P^-.C_3H_6O$	$[\{Fe[S(CH_2)_2NMe(CH_2)_2NMe(CH_2)_2S]\}_2-(NO)]PF_6.Me_2CO$	1345	3.2	3.7		477,478
542	$C_{42}H_{39}N_4OP_2Rh^{2+}.2F_6P^-$	$[Rh(NO)(MeCN)_3(PPh_3)_2](PF_6)_2$	8502	7.5	9.5	215K	479

a $Me_6[14]dieneN_4$ = 5,7,7,12,14,14-Me_6-tetraazacyclotetradeca-4,11-diene.

543	$C_{50}H_{45}FeN_6O$	Fe(NO)(Mepip)(tpp)	3011	8.7	8.1		480
544	$C_{50}H_{45}FeN_6O.CHCl_3$	Fe(NO)(Mepip)(tpp).$CHCl_3$	3337	10.9	11.3		480
545	$C_{51}H_{46}NOP_4Ru^+.C_{24}H_{20}B^-$	$[Ru(NO)(dppp)_2]BPh_4$	1570	7.2			481
546	$Fe_4N_7O_7S_3^-.C_{24}H_{20}As^+$	$AsPh_4[Fe_4(NO)_7S_3]$	2148	4.5	4.9		482

Other complexes containing nitrosyls: 23, 186, 381, 382, 440, 441.

TABLE 4. DINITROGEN AND RELATED COMPLEXES

No.	Formula	Structure	Data	R	R_w	Notes	Reference
547	$C_{54}H_{162}Co_6K_6N_{12}P_{18}$	$[KCo(N_2)(PMe_3)_3]_6$	2639	8.5			483
548	$C_{55}H_{54}BrN_2P_4W^+.Br^-$	$[WBr(NN{:}CMe_2)(dppe)_2]Br$	6402	8.2			484

TABLE 5. BINARY TRANSITION METAL-TERTIARY PHOSPHINE COMPLEXES

No.	Formula	Structure	Data	R	R_w	Notes	Reference
549	$C_{12}H_{36}NiP_4^+.C_{24}H_{20}B^-$	$[Ni(PMe_3)_4]BPh_4$	2008	5.4	4.8		485
550	$C_{25}H_{45}CoO_{15}P_5^+.C_2H_3CoN_4O_9^-$	$\{Co[P(OCH_2)_3CMe]_5\}[Co(NO_3)_3(MeCN)]$	3944	9.1	11.1		486
551	$C_{40}H_{51}CoO_6P_5^+.BF_4^-$	$[Co[P(OMe)_3]_2\{PhP[(CH_2)_2PPh_2]_2\}]BF_4$	2256	9.3	10.8		400
552	$C_{52}H_{48}P_4Pt^{2+}.2C_2H_4Cl_3Pt^-$	$[Pt(dppe)_2][PtCl_3(C_2H_4)]_2$	2005	8.8			2
553	$C_{54}H_{45}P_3Rh^+.ClO_4^-.CH_2Cl_2$	$[Rh(PPh_3)_3]ClO_4.CH_2Cl_2$	3318	7.5	8.1		487
554	$C_{54}H_{99}P_3Pt$	$Pt(PCy_3)_3$	5446	6.7			488
555	$C_{82}H_{78}P_6Pt$	$Pt[MeC(CH_2PPh_2)_3]_2$	4774	8.4	12.2		489

REFERENCES

1. P.G. Eller, R.R. Ryan and R.O. Schaeffer, *Cryst.Struct.Comm.*, 6 (1977) 163.
2. N. Bresciani-Pahor and G. Bruno, *Cryst.Struct.Comm.*, 6 (1977) 717.
3. S. Komiya, J.C. Huffman and J.K. Kochi, *Inorg.Chem.*, 16 (1977) 1253.
4. M. Massaux, M.-T. Le Bihan and R. Chevalier, *Acta Cryst.*, B33 (1977) 2084.
5. S. Komiya, J.C. Huffman and J.K. Kochi, *Inorg.Chem.*, 16 (1977) 2138.
6. P. Mura, R. Spagna and L. Zambonelli, *J.Organometallic Chem.*, 142 (1977) 403.
7. A.H. Reis, V.S. Hagley and S.W. Peterson, *J.Amer.Chem.Soc.*, 99 (1977) 4185.
8. E.A. McNeill and F.R. Scholer, *J.Amer.Chem.Soc.*, 99 (1977) 6243.
9. S.W. Kirtley, M.A. Andrews, R. Bau, G.W. Grynkewich, T.J. Marks, D.L. Tipton and B.R. Whittlesey, *J.Amer.Chem.Soc.*, 99 (1977) 7154.
10. M. Mangion, W.R. Clayton, O. Hollander and S.G. Shore, *Inorg.Chem.*, 16 (1977) 2110.
11. D.M. Collins, F.A. Cotton, S. Koch, M. Millar and C.A. Murillo, *J.Amer. Chem.Soc.*, 99 (1977) 1259.
12. H.M. Colquhoun, T.J. Greenhough and M.G.H. Wallbridge, *Acta Cryst.*, B33 (1977) 3604.
13. F.R. Fronczek, G.W. Halstead and K.N. Raymond, *J.Amer.Chem.Soc.*, 99 (1977) 1769.
14. R.G. Teller, R.G. Finke, J.P. Collman, H.B. Chin and R. Bau, *J.Amer. Chem.Soc.*, 99 (1977) 1104.
15. M.G. Newton, R.B. King, M. Chang, N.S. Pantaleo and J. Gimeno, *J.C.S. Chem.Comm.*, (1977) 531.
16. J.R. Pipal and R.N. Grimes, *Inorg.Chem.*, 16 (1977) 3251.
17. V. Subrtova, V. Petricek, A. Linek and J. Jecny, *Z.Krist*, 144 (1976) 139.
18. M.C. Couldwell and J. Simpson, *Cryst.Struct.Comm.*, 6 (1977) 1.
19. J.P. Fackler and C. Paparizos, *J.Amer.Chem.Soc.*, 99 (1977) 2363.

20. R.L. Davis and N.C. Baenziger, *Inorg.Nuclear Chem.Letters*, 13 (1977) 475.

21. B. Beagley and G.G. Young, *J.Molec.Struct.*, 40 (1977) 295.

22. B.J. Helland, M.H. Quick, R.A. Jacobson and R.J. Angelici, *J.Organometallic Chem.*, 132 (1977) 95.

23. M.G. Newton, R.B. King, M. Chang and J. Gimeno, *J.Amer.Chem.Soc.*, 99 (1977) 2802.

24. F.A.J.J. van Santvoort, H. Krabbendam, G. Roelofsen and A.L. Spek, *Acta Cryst.*, B33 (1977) 3000.

25. R.B. King, M.G. Newton, J. Guimeno and M. Chang, *Inorg.Chim.Acta*, 23 (1977) L35.

26. L. Manojlovic-Muir, K.W. Muir and T. Solomun, *J.Organometallic Chem.*, 142 (1977) 265.

27. K. Hoffmann and E. Weiss, *J.Organometallic Chem.*, 128 (1977) 399.

28. K. Hoffmann and E. Weiss, *J.Organometallic Chem.*, 128 (1977) 237.

29. D.E. Crotty, E.R. Corey, T.J. Anderson, M.D. Glick and J.P. Oliver, *Inorg.Chem.*, 16 (1977) 920.

30. B.A. Karcher and R.A. Jacobson, *J.Organometallic Chem.*, 132 (1977) 387.

31. L. Benchekroun, P. Herpin, M. Julia and L. Saussine, *J.Organometallic Chem.*, 128 (1977) 275.

32. R.A. Smith and M.J. Bennett, *Acta Cryst.*, B33 (1977) 1118.

33. K. Hoffmann and E. Weiss, *J.Organometallic Chem.*, 128 (1977) 225.

34. G. Ciani, A. Sironi and V.G. Albano, *J.C.S.Dalton*, (1977) 1667.

35. E. Keller and H. Vahrenkamp, *Chem.Ber.*, 110 (1977) 430.

36. A.L. Spek, *Cryst.Struct.Comm.*, 6 (1977) 835.

37. H. Behrens, M. Moll, E. Sixtus and G. Thiele, *Z.Naturforsch*, 32b (1977) 1109.

38. L. Busetto, A. Palazzi, E. Foresti Serantoni and L. Riva di Sanseverino, *J.Organometallic Chem.*, 129 (1977) C55.

39. K. Hoffmann and E. Weiss, *J.Organometallic Chem.*, 128 (1977) 389.

40. L.Y.Y. Chan, E.E. Isaacs and W.A.G. Graham, *Can.J.Chem.*, 55 (1977) 111.

41. T.N. Sal'nikova, V.G. Andrianov, A.S. Ivanov, A.Z. Rubezhov and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 599: *Chem.Abs.*, 87 (1977) 135818.

42. R. Weiss and R.F. Bryan, *Acta Cryst.*, B33 (1977) 589.

43. W.K. Dean, R.S. Charles and V.G. VanDerveer, *Inorg.Chem.*, 16 (1977) 3328.

44. J. Roziere, J.M. Williams, R.P. Stewart, J.L. Petersen and L.F. Dahl, *J.Amer.Chem.Soc.*, 99 (1977) 4497.

45. V.F. Allen, R. Mason and P.B. Hitchcock, *J.Organometallic Chem.*, 140 (1977) 297.

46. M.R. Churchill, F.J. Hollander and J.P. Hutchinson, *Inorg.Chem.*, 16 (1977) 2697.

47. P.E. Riley and R.E. Davis, *J.Organometallic Chem.*, 137 (1977) 91.

48. G. Ciani, G. D'Alfonso, M. Freni, P. Romiti, A. Sironi and A. Albinati, *J.Organometallic Chem.*, 136 (1977) C49.

49. F. van Meurs and H. van Koningsveld, *J.Organometallic Chem.*, 131 (1977) 423.

50. G. Huttner, A. Frank, E.O. Fischer and W. Kleine, *J.Organometallic Chem.*, 141 (1977) C17.

51. B.F. Fieselmann and G.D. Stucky, *J.Organometallic Chem.*, 137 (1977) 43.

52. I.A. Ronova and N.V. Alekseev, *Zh.strukt.Khim.*, 18 (1977) 212.

53. U. Thewalt and D. Schomburg, *J.Organometallic Chem.*, 127 (1977) 169.

54. I. Bernal, J.D. Korp, G.M. Reisner and W.A. Herrmann, *J.Organometallic Chem.*, 139 (1977) 321.

55. V.G. Andrianov, Y.T. Struchkov, V.N. Setkina, A.Z. Zhakaeva and V.I. Zdanovich, *J.Organometallic Chem.*, 140 (1977) 169.

56. N.J. Mammano, A. Zalkin, A. Landers and A.L. Rheingold, *Inorg.Chem.*, 16 (1977) 297.

57. E. Rudolfo de Gil, M. de Burguera, A.V. Rivera and P. Maxfield, *Acta Cryst.*, B33 (1977) 578.

58. J.N. St Denis, W. Butler, M.D. Glick and J.P. Oliver, *J.Organometallic Chem.*, 129 (1977) 1.

59. P. Friedrich, G. Besl, E.O. Fischer and G. Huttner, *J.Organometallic Chem.*, 139 (1977) C68.

60. G.P. Khare and R.J. Doedens, *Inorg.Chem.*, 16 (1977) 907.

61. T.N. Sal'nikova, V.G. Andrianov and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 1607; *Chem.Abs.*, 87 (1977) 209749.

62. A.J. Schultz, K.L. Stearley, J.M. Williams, R. Mink and G.D. Stucky, *Inorg.Chem.*, 16 (1977) 3303.

63. E. Cannillo, A. Coda, K. Prout and J.-C. Daran, *Acta Cryst.*, B33 (1977) 2608.

64. R.D. Wilson, T.F. Koetzle, D.W. Hart, A. Kvick, D.L. Tipton and R. Bau, *J.Amer.Chem.Soc.*, 99 (1977) 1775.

65. G.I. Mamaeva, I. Hargittai and V.P. Spiridonov, *Inorg.Chim.Acta*, 25 (1977) L123.

66. F.A. Cotton, C.E. Rice and G.W. Rice, *Inorg.Chim.Acta*, 24 (1977) 231.

67. K.N. Semenenko, E. Lobkovskii and A.I. Shumakov, *Zh.strukt.Khim.*, 17 (1976) 1073.

68. P. Zanella, G. de Paoli, G. Bombieri, G. Zanotti and R. Rossi, *J.Organometallic Chem.*, 142 (1977) C21.

69. L. Vancea, M.J. Bennett, C.E. Jones, R.A. Smith and W.A.G. Graham, *Inorg.Chem.*, 16 (1977) 897.

70. E. Keller and H. Vahrenkamp, *Angew.Chem.*, 89 (1977) 568; *Angew.Chem. Internat.Edit.*, 16 (1977) 542.

71. W. Johnson and J. Huffman, unpublished results cited in: R.V. Schultz, F. Sato and L.J. Todd, *J.Organometallic Chem.*, 125 (1977) 115.

72. R.G. Posey, G.P. Khare and P.D. Frisch, *J.Amer.Chem.Soc.*, 99 (1977) 4863.

73. M.R. Churchill and B.G. DeBoer, *Inorg.Chem.*, 16 (1977) 878.

74. F.A. Cotton, B.E. Hanson, J.D. Jamerson and B.R. Stults, *J.Amer. Chem.Soc.*, 99 (1977) 3293.

75. P. Hübener and E. Weiss, *J.Organometallic Chem.*, 129 (1977) 105.

76. W.A. Herrmann and I. Bernal, *Angew.Chem.*, 89 (1977) 186; *Angew.Chem. Internat.Edit.*, 16 (1977) 172.

77. I. Bernal, J.D. Korp, G.M. Reisner and W.A. Herrmann, *J.Organometallic Chem.*, 139 (1977) 321.

78. E.O. Fischer, W. Kleine, F.R. Kreissl, H. Fischer, P. Friedrich and G. Huttner, *J.Organometallic Chem.*, 128 (1977) C49.

79. K. Nakatsu, T. Mitsudo, H. Nakanishi, Y. Watanabe and Y. Takegami, *Chem.Letters*, (1977) 1447.

80. E. Keller, A. Trenkle and H. Vahrenkamp, *Chem.Ber.*, 110 (1977) 441.

81. F. Mathey, A. Mitschler and R. Weiss, *J.Amer.Chem.Soc.*, 99 (1977) 3537.

82. R.O. Gould, C.L. Jones, D.R. Robertson and T.A. Stephenson, *J.C.S.Dalton*, (1977) 129.

83. H.A. Graf, R. HUttel, G. Nagorsen and B. Rau, *J.Organometallic Chem.*, 136 (1977) 389.

84. A.J. Graham, D. Akrigg and B. Sheldrick, *Cryst.Struct.Comm.*, 6 (1977) 577.

85. V. Subrtova, A. Linek, C. Novak, V. Petricek and J. Jecny, *Acta Cryst.*, B33 (1977) 3843.

86. L.S. Hegedus, O.P. Anderson, K. Zetterberg, G. Allen, K. Siirala-Hansen, D.J. Olsen and A.B. Packard, *Inorg.Chem.*, 16 (1977) 1887.

87. E.O. Fischer, A. Schwanzer, H. Fischer, D. Neugebauer and G. Huttner, *Chem.Ber.*, 110 (1977) 53.

88. J.G. Leipoldt, L.D.C. Bok, S.S. Basson, J.S. van Vollenhoven and T.I.A. Gerber, *Inorg.Chim.Acta*, 25 (1977) L63.

89. G. Ciani, A. Sironi and V.G. Albano, *J.Organometallic Chem.*, 136 (1977) 339.

90. J.A.D. Jeffreys and C. Metters, *J.C.S.Dalton*, (1977) 1624.

91. A.N. Nesmeyanov, G.G. Aleksandrov, M.Y. Antipin, Y.T. Struchkov, Y.A. Belousov, V.N. Babin and N.S. Kochetkova, *J.Organometallic Chem.*, 137 (1977) 207.

92. N.E. Schore, C.S. Illenda and R.G. Bergman, *J.Amer.Chem.Soc.*, 99 (1977) 1781.

93. C.M. Lukehart and J.V. Ziele, *J.Organometallic Chem.*, 140 (1977) 309.

94. J.L. Atwood, K.E. Stone, H.G. Alt, D.C. Hrncir and M.D. Rausch, *J.Organometallic Chem.*, 132 (1977) 367.

95. N.W. Alcock and J.A. Conneely, *Acta Cryst.*, B33 (1977) 141.

96. G.J. Kruger, J. Coetzer, H.G. Raubenheimer and S. Lotz, *J.Organometallic Chem.*, 142 (1977) 249.

97. D.E. Koshland, S.E. Myers and J.P. Cheswick, *Acta Cryst.*, B33 (1977) 2013.

98. G. Fachinetti, C. Floriani and H. Stoeckli-Evans, *J.C.S.Dalton*, (1977) 2297.

99. A. Almenningen, S. Samdal and A. Haaland, *J.C.S.Chem.Comm.*, (1977) 14.

100. J.-C. Daran, K. Prout, G.J.S. Adam, M.L.H. Green and J. Sala-Pala, *J.Organometallic Chem.*, 131 (1977) C40.

101. J.-C. Daran, K. Prout, A. de Cian, M.L.H. Green and N. Siganporia, *J.Organometallic Chem.*, 136 (1977) C4.

102. M. Green, H.P. Kirsch, F.G.A. Stone and A.J. Welch, *J.C.S.Dalton*, (1977) 1755.

103. R.D. Adams and D.F. Chodosh, *J.Amer.Chem.Soc.*, 99 (1977) 6544.

104. R.R. Gagné, J.L. Allison, R.S. Gall and C.A. Koval, *J.Amer.Chem.Soc.*, 99 (1977) 7170.

105. S. Pohl, *J.Organometallic Chem.*, 142 (1977) 195.

106. J.L. Atwood and D.J. Darensbourg, *Inorg.Chem.*, 16 (1977) 2314.

107. G. LeBorgne, D. Grandjean, R. Mathieu and R. Poilblanc, *J.Organometallic Chem.*, 131 (1977) 429.

108. H. Schmidbaur, J.E. Mandl, W. Richter, V. Bejenke, A. Frank and G. Huttner, *Chem.Ber.*, 110 (1977) 2236.

109. H. Schmidbaur, H.-J. Füller, V. Bejenke, A. Franck and G. Huttner, *Chem.Ber.*, 110 (1977) 3536.

110. S.Z. Goldberg, R. Eisenberg and J.S. Miller, *Inorg.Chem.*, 16 (1977) 1502.

111. R. Bowerbank, M. Green, H.P. Kirsch, A. Mortreux, L.E. Smart and F.G.A. Stone, *J.C.S.Chem.Comm.*, (1977) 245.

112. N. Cook, L. Smart and P. Woodward, *J.C.S.Dalton*, (1977) 1744.

113. M.R. Churchill and B.G. DeBoer, *Inorg.Chem.*, 16 (1977) 878.

114. M.R. Churchill, F.J. Hollander and J.P. Hutchinson, *Inorg.Chem.*, 16 (1977) 2655.

115. A.D. Charles, P. Diversi, B.F.G. Johnson, K.D. Karlin, J. Lewis, A.V. Rivera and G.M. Sheldrick, *J.Organometallic Chem.*, 128 (1977) C31.

116. W.A. Herrmann, C. Krüger, R. Goddard and I. Bernal, *Angew.Chem.*, 89 (1977) 342; *Angew.Chem.Internat.Edit.*, 16 (1977) 334.

117. W.A. Herrmann, C. Krüger, R. Goddard and I. Bernal, *J.Organometallic Chem.*, 140 (1977) 73.

118. C. Giannotti, A.M. Ducourant, H. Chanaud, A. Chiaroni and C. Riche, *J.Organometallic Chem.*, 140 (1977) 289.

119. F. Marchetti and S. Merlino, unpublished results cited in: G. Fachinetti, G. Fochi and C. Floriani, *J.C.S.Dalton*, (1977) 1946.

120. G.D. Andretti, G. Bocelli, P. Sgarabotto, G.P. Chiusoli and F. Guerriri, *Transition Metal Chem.*, 1 (1976) 220.

121. D.E. Crotty, T.J. Anderson, M.D. Glick and J.P. Oliver, *Inorg.Chem.*, 16 (1977) 2346.

122. R.G. Ball and N.C. Payne, *Inorg.Chem.*, 16 (1977) 1871.

123. W. Siebert, R. Full, J. Edwin, K. Kinberger and C. Krüger, *J.Organometallic Chem.*, 131 (1977) 1.

124. W.M. Maxwell, R.F. Bryan and R.N. Grimes, *J.Amer.Chem.Soc.*, 99 (1977) 4008.

125. F.A. Cotton, B.E. Hanson and J.D. Jamerson, *J.Amer.Chem.Soc.*, 99 (1977) 6588.

126. E.O. Fischer, W. Held, F.R. Kreissl, A. Frank and G. Huttner, *Chem.Ber.*, 110 (1977) 656.

127. G. LeBorgne and D. Grandjean, *Acta Cryst.*, B33 (1977) 344.

128. C.L. Raston, D. Wege and A.H. White, *Aust.J.Chem.*, 30 (1977) 2153.

129. F.A. Cotton and B.E. Hanson, *Inorg.Chem.*, 16 (1977) 1861.

130. F.H. Herbstein and M. Kaftory, *Acta Cryst.*, B33 (1977) 3318.

131. A.N. Nesmeyanov, Y.A. Belousov, V.N. Babin, G.G. Aleksandrov, Y.T. Struchkov and N.S. Kochetkova, *Inorg.Chim.Acta*, 23 (1977) 155.

132. P.M. Treichel, D.B. Shaw and J.C. Calabrese, *J.Organometallic Chem.*, 139 (1977) 31.

133. M. Green, J.A.K. Howard, A. Laguna, L.E. Smart, J.L. Spencer and F.G.A. Stone, *J.C.S.Dalton*, (1977) 278.

134. N.W. Alcock, *Acta Cryst.*, B33 (1977) 2943.

135. M.L. Ziegler, K. Weidenhammer and W.A. Herrmann, *Angew.Chem.*, 89 (1977) 557; *Angew.Chem.Internat.Edit.*, 16 (1977) 555.

136. A.N. Nesmeyanov, M.V. Tolstaya, M.I. Rybinskaya, G.B. Shul'pin, N.G. Bokii, A.S. Batsanov and Y.T. Struchkov, *J.Organometallic Chem.*, 142 (1977) 89.

137. M.G.B. Drew and L.S. Pu, *Acta Cryst.*, B33 (1977) 1207.

138. T.V. Ashworth, M.J. Nolte, R.H. Reimann and E. Singleton, *J.C.S.Chem. Comm.*, (1977) 937.

139. A.J. Welch, *Inorg.Chim.Acta*, 24 (1977) 97.

140. S.G. Davies, M.L.H. Green, K. Prout, A. Coda and V. Tazzoli, *J.C.S. Chem.Comm.*, (1977) 135.

141. P.B. Hitchcock, M.F. Lappert and P.L. Pye, *J.C.S.Dalton*, (1977) 2160.

142. M.F. Lappert, P.L. Pye and G.M. McLaughlin, *J.C.S.Dalton*, (1977) 1272.

143. M. Cowie and M.J. Bennett, *Inorg.Chem.*, 16 (1977) 2321.

144. M.G.B. Drew and A.P. Wolters, *Acta Cryst.*, B33 (1977) 1027.

145. R.J. Crutchley, J. Powell, R. Faggiani and C.J.L. Lock, *Inorg.Chim. Acta*, 24 (1977) L15.

146. T.V. Ashworth, M.J. Nolte and E. Singleton, *J.Organometallic Chem.*, 139 (1977) C73.

147. D.M.P. Mingos, M.I. Forsyth and A.J. Welch, *J.C.S.Chem.Comm.*, (1977) 605.

148. M.H. Chisholm, F.A. Cotton, M.W. Extine and B.R. Stults, *Inorg.Chem.*, 16 (1977) 603.

149. M.R. Churchill and F.J. Hollander, *Inorg.Chem.*, 16 (1977) 2493.

150. G. Gervasio, R. Rossetti and P.L. Stanghellini, *J.C.S.Chem.Comm.*, (1977) 387.

151. M. Catti, G. Gervasio and S.A. Mason, *J.C.S.Dalton*, (1977) 2260.

152. G.G. Aleksandrov, A.B. Antonova, N.E. Kolobova and Y.T. Struchkov, *Koord.Khim.*, 2 (1976) 1684.

153. A. Bond, M. Bottrill, M. Green and A.J. Welch, *J.C.S.Dalton*, (1977) 2372.

154. E.O. Fischer, T.L. Lindner, G. Huttner, P. Friedrich, F.R. Kreissl and J.O. Besenhard, *Chem.Ber.*, 110 (1977) 3397.

155. I.B. Benson, S.A.R. Knox, R.F.D. Stansfield and P. Woodward, *J.C.S. Chem.Comm.*, (1977) 404.

156. R.D. Adams and D.F. Chodosh, *J.Organometallic Chem.*, 122 (1976) C11.

157. H.J. Langenbach, E. Keller and H. Vahrenkamp, *Angew.Chem.*, 89 (1977) 197; *Angew.Chem.Internat.Edit.*, 16 (1977) 188.

158. B.E. Reichert and G.M. Sheldrick, *Acta Cryst.*, B33 (1977) 175.

159. G.E. Herberich, E. Bauer, J. Hengesbach, U. Kölle, G. Huttner and H. Lorenz, *Chem.Ber.*, 110 (1977) 760.

160. R.B. English, L.R. Nassimbeni and R.J. Haines, *J.Organometallic Chem.*, 135 (1977) 351.

161. K. Prout, S.R. Critchley, E. Cannillo and V. Tazzoli, *Acta Cryst.*, B33 (1977) 456.

162. J.R. Pipal and R.N. Grimes, *Inorg.Chem.*, 16 (1977) 3255.

163. L. Benchekroun, P. Herpin, M. Julia and L. Saussine, *J.Organometallic Chem.*, 128 (1977) 275.

164. M. Arthurs, S.M. Nelson and M.G.B. Drew, *J.C.S.Dalton*, (1977) 779.

165. M. Cowie and M.J. Bennett, *Inorg.Chem.*, 16 (1977) 2325.

166. S. Pohl, *J.Organometallic Chem.*, 142 (1977) 185.

167. M.G.B. Drew and J.D. Wilkins, *J.C.S.Dalton*, (1977) 194.

168. J.C. Huffman, M.P. Laurent and J.K. Kochi, *Inorg.Chem.*, 16 (1977) 2639.

169. N. Bresciani-Pahor, *Acta Cryst.*, B33 (1977) 3214.

170. V. Küllmer, E. Röttinger and H. Vahrenkamp, *J.C.S.Chem.Comm.*, (1977) 782.

171. G. Schmid, K. Bartl and R. Boese, *Z.Naturforsch.*, 32b (1977) 1277.

172. G.G. Aleksandrov, I.B. Zlotina, N.E. Kolobova and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 262.

173. R. Goddard and P. Woodward, *J.C.S.Dalton*, (1977) 1181.

174. E. Röttinger, V. Küllmer and H. Vahrenkamp, *Chem.Ber.*, 110 (1977) 1216.

175. R.S. Dickson, S.H. Johnson, H.P. Kirsch and D.J. Lloyd, *Acta Cryst.*, B33 (1977) 2057.

176. M.M. Mickiewicz, C.L. Raston, A.H. White and S.B. Wild, *Aust.J.Chem.*, 30 (1977) 1685.

177. J.J. Bonnec, J. Galy, D. de Montauzon and R. Poilblanc, *J.C.S.Chem. Comm.*, (1977) 47.

178. N.I. Pyshnograeva, V.N. Setkina, V.G. Andrianov, Y.T. Struchkov and D.N. Kursanov, *J.Organometallic Chem.*, 128 (1977) 381.

179. A.R. Davis, F.W.B. Einstein and J.D. Hazlett, *Acta Cryst.*, B33 (1977) 212.

180. J.A.D. Jeffreys and C. Metters, *J.C.S.Dalton*, (1977) 729.

181. F.H. Herbstein and M.G. Reisner, *Acta Cryst.*, B33 (1977) 3304.

182. W.I. Bailey, D.M. Collins and F.A. Cotton, *J.Organometallic Chem.*, 135 (1977) C53.

183. P.A. Wegner, V.A. Uski, R.P. Kiester, S. Dabestani and V.W. Day, *J.Amer.Chem.Soc.*, 99 (1977) 4846.

184. G.M. Brown and L.H. Hall, *Acta Cryst.*, B33 (1977) 876.

185. G. Evrard, R. Thomas, B.R. Davis and I. Bernal, *J.Organometallic Chem.*, 124 (1977) 59.

186. G.G. Cash, R.C. Pettersen and R.B. King, *J.C.S.Chem.Comm.*, (1977) 30.

187. R.C. Pettersen and G.G. Cash, *Acta Cryst.*, B33 (1977) 2331.

188. D.E. Crotty, E.R. Corey, T.J. Anderson, M.D. Glick and J.P. Oliver, *Inorg.Chem.*, 16 (1977) 920.

189. E.C. Alyea, S.A. Dias, G. Ferguson, A.J. McAlees, R. McCrindle and P.J. Roberts, *J.Amer.Chem.Soc.*, 99 (1977) 4985.

190. A.J. Welch, *J.C.S.Dalton*, (1977) 962.

191. J.A.J. Jarvis, R. Pearce and M.F. Lappert, *J.C.S.Dalton*, (1977) 999.

192. R.D. Ernst, T.J. Marks and J.A. Ibers, *J.Amer.Chem.Soc.*, 99 (1977) 2090.

193. M.K. Cooper, M. Saporta and M. McPartlin, *J.Organometallic Chem.*, 133 (1977) C33.

194. B.E. Reichert and G.M. Sheldrick, *Acta Cryst.*, B33 (1977) 173.

195. J.M. Rosalky, B. Metz, F. Mathey and R. Weiss, *Inorg.Chem.*, 16 (1977) 3307.

196. J.A.K. Howard and P. Woodward, *J.C.S.Dalton*, (1977) 366.

197. M.R. Churchill, R.A. Lashewycz, M. Tachikawa and J.R. Shapley, *J.C.S.Chem.Comm.*, (1977) 699.

198. M.H. Chisholm, L.A. Rankel, W.I. Bailey, F.A. Cotton and C.A. Murillo, *J.Amer.Chem.Soc.*, 99 (1977) 1261.

199. M. Laing, J.R. Moss and J. Johnson, *J.C.S.Chem.Comm.*, (1977) 656.

200. S.S. Crawford, C.B. Knobler and H.D. Kaesz, *Inorg.Chem.*, 16 (1977) 3201.

201. P. Diversi, G. Ingrosso, A. Immirzi, W. Porzio and M. Zocchi, *J.Organometallic Chem.*, 125 (1977) 253.

202. M.G. Reisner, I. Bernal, H. Brunner and J. Wachter, *J.Organometallic Chem.*, 137 (1977) 329.

203. E. Keller and H. Vahrenkamp, *Angew.Chem.*, 89 (1977) 746; *Angew.Chem. Internat.Edit.*, 16 (1977) 731.

204. F.R. Kreissl and P. Friedrich, *Angew.Chem.*, 89 (1977) 553; *Angew. Chem.Internat.Edit.*, 16 (1977) 543.

205. A.J. Graham, D. Akrigg and B. Sheldrick, *Cryst.Struct.Comm.*, 6 (1977) 571.

206. Y. Ohashi and Y. Sasada, *Bull.Chem.Soc.Japan*, 50 (1977) 1710.

207. W. Kläui, H. Neukomm, H. Werner and G. Huttner, *Chem.Ber.*, 110 (1977) 2283.

208. I. Bernal, J.L. Atwood, F. Calderazzo and D. Vitali, *Gazzetta*, 106 (1976) 971.

209. J.L. Davidson, M. Green, F.G.A. Stone and A.J. Welch, *J.C.S.Dalton*, (1977) 287.

210. C.P. Casey, T.J. Burkhardt, C.A. Bunnell and J.C. Calabrese, *J.Amer. Chem.Soc.*, 99 (1977) 2127.

211. E. Röttinger and H. Vahrenkamp, *J.Chem.Research*, (1977) 815(M), 76(S).

212. J.D. Edwards, J.A.K. Howard, S.A.R. Knox, V. Riera, F.G.A. Stone and P. Woodward, *J.C.S.Dalton*, (1976) 75.

213. M.D. Rausch, R.G. Gastinger, S.A. Gardner, R.K. Brown and J.S. Wood, *J.Amer.Chem.Soc.*, 99 (1977) 7870.

214. J.W. Johnson and P.M. Treichel, *J.Amer.Chem.Soc.*, 99 (1977) 1427.

215. J. von Seyerl, D. Neugebauer and G. Huttner, *Angew.Chem.*, 89 (1977) 896; *Angew.Chem.Internat.Edit.*, 16 (1977) 858.

216. J.C.T.R. Burckett-St.Laurent, M.R. Caira, R.B. English, R.J. Haines and L.R. Nassimbeni, *J.C.S.Dalton*, (1977) 1077.

217. A.T. Liu, W. Beck, G. Huttner and H. Lorenz, *J.Organometallic Chem.*, 129 (1977) 91.

218. F.R. Kreissl, P. Friedrich and G. Huttner, *Angew.Chem.*, 89 (1977) 110; *Angew.Chem.Internat.Edit.*, 16 (1977) 102.

219. H.G. Raubenheimer, S. Lotz, J. Coetzer and G. Kruger, *J.C.S.Chem.Comm.*, (1977) 494.

220. G.J. Kruger, J. Coetzer, H.G. Raubenheimer and S. Lotz, *J.Organometallic Chem.*, 142 (1977) 249.

221. W.M. Maxwell, R. Weiss, E. Sinn and R.N. Grimes, *J.Amer.Chem.Soc.*, 99 (1977) 4016.

222. E. Cannillo and K. Prout, *Acta Cryst.*, B33 (1977) 3916.

223. T.V. Ashworth, M.J. Nolte, R.H. Reimann and E. Singleton, *J.C.S. Chem.Comm.*, (1977) 757.

224. C. Busetto, A. D'Alfonso, F. Maspero, G. Perego and A. Zazzetta, *J.C.S.Dalton*, (1977) 1828.

225. V.W. Day, M.F. Fredrich, G.S. Reddy, A.J. Sivak, W.R. Pretzer and E.L. Muetterties, *J.Amer.Chem.Soc.*, 99 (1977) 8091.

226. F.R. Kreissl, P. Friedrich, T.L. Lindner and G. Huttner, *Angew.Chem.*, 89 (1977) 325; *Angew.Chem.Internat.Edit.*, 16 (1977) 314.

227. R.S. Dickson, B.M. Gatehouse and S.H. Johnson, *Acta Cryst.*, B33 (1977) 319.

228. P.D. Gavens, J.J. Guy, M.J. Mays and G.M. Sheldrick, *Acta Cryst.*, B33 (1977) 137.

229. T.N. Sal'nikova, V.G. Andrianov, Y.M. Antipin and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 939: *Chem.Abs.*, 87 (1977) 61096.

230. A. Frank, U. Schubert and G. Huttner, *Chem.Ber.*, 110 (1977) 3020.

231. B. Kanellakopulos, D. Nöthe, K. Weidenhammer, H. Wienand and M.L. Ziegler, *Angew.Chem.*, 89 (1977) 271; *Angew.Chem.Internat.Edit.*, 16 (1977) 261.

232. D. Mohr, H. Wienand and M.L. Ziegler, *J.Organometallic Chem.*, 134 (1977) 281.

233. A.J. Graham, D. Akrigg and B. Sheldrick, *Cryst.Struct.Comm.*, 6 (1977) 253.

234. M.F. Lappert, S.J. Miles, P.P. Power, A.J. Carty and N.J. Taylor, *J.C.S.Chem.Comm.*, (1977) 458.

235. J.R. Shapley, G.A. Pearson, M. Tachikawa, G.E. Schmidt, M.R. Churchill and F.J. Hollander, *J.Amer.Chem.Soc.*, 99 (1977) 8064.

236. S. Jeannin, Y. Jeannin and G. Lavigne, *Transition Metal Chem.*, 1 (1976) 195.

237. C.F. Campana, J.D. Sinclair and L.F. Dahl, *J.Organometallic Chem.*, 127 (1977) 223.

238. M.R. Churchill and B.G. DeBoer, *Inorg.Chem.*, 16 (1977) 1141.

239. S. Aime, L. Milone, E. Sappa and A. Tiripicchio, *J.C.S.Dalton*, (1977) 227.

240. M.K. Cooper, P.J. Guerney, M. Elder and M. McPartlin, *J.Organometallic Chem.*, 137 (1977) C22.

241. R.E. Cobbledick and F.W.B. Einstein, *Acta Cryst.*, B33 (1977) 2020.

242. K. Miki, Y. Kai, N. Yasuoka and N. Kasai, *J.Organometallic Chem.*, 135 (1977) 53.

243. N.G. Bokii, Y.T. Struchkov, V.V. Korol'kov and T.P. Tolstaya, *Koord. Khim.*, 1 (1975) 1144.

244. G.J. Olthof, *J.Organometallic Chem.*, 128 (1977) 367.

245. F.A. Cotton, B.E. Hanson, J.R. Kolb, P. Lahuerta, G.G. Stanley, B.R. Stults and A.J. White, *J.Amer.Chem.Soc.*, 99 (1977) 3673.

246. R. Goddard, S.A.R. Knox, F.G.A. Stone, M.J. Winter and P. Woodward, *J.C.S.Chem.Comm.*, (1976) 559.

247. F.A. Cotton, C.A. Murillo and B.R. Stults, *Inorg.Chim.Acta*, 22 (1977) 75.

248. R. Jungst, D. Sekutowski, J. Davis, M. Luly and G. Stucky, *Inorg.Chem.*, 16 (1977) 1645.

249. Trinh-Toan, W.P. Fehlhammer and L.F. Dahl, *J.Amer.Chem.Soc.*, 99 (1977) 402.

250. N.J. Cooper, M.L.H. Green, C. Couldwell and K. Prout, *J.C.S.Chem.Comm.*, (1977) 145.

251. K. Prout and M.C. Couldwell, *Acta Cryst.*, B33 (1977) 2146.

252. K. Prout, M.C. Couldwell and R.A. Forder, *Acta Cryst.*, B33 (1977) 218.

253. J. Besançon, S. Top, J. Tirouflet, Y. Dusausoy, C. Lecomte and J. Protas, *J.Organometallic Chem.*, 127 (1977) 153.

254. W.S. Sheldrick and A. Borkenstein, *Acta Cryst.*, B33 (1977) 2916.

255. J.A. Kaduk, A.T. Poulos and J.A. Ibers, *J.Organometallic Chem.*, 127 (1977) 245.

256. J.-J. Bonnet, P. Kalck and R. Poilblanc, *Inorg.Chem.*, 16 (1977) 1514.

257. M.R. Churchill and S.A. Julis, *Inorg.Chem.*, 16 (1977) 1488.

258. M.R. Churchill, S.A. Julis and F.J. Rotella, *Inorg.Chem.*, 16 (1977) 1137.

259. G. Agnes, I.W. Bassi, C. Benedicenti, R. Intrito, M. Calcaterra and C. Santini, *J.Organometallic Chem.*, 129 (1977) 401.

260. S.J. Thompson, P.M. Bailey, C. White and P.M. Maitlis, *Angew.Chem.*, 88 (1976) 506; *Angew.Chem.Internat.Edit.*, 15 (1976) 490.

261. P. Binger, M.J. Doyle, J. McMeeking, C. Krüger and Y.-H. Tsay, *J.Organometallic Chem.*, 135 (1977) 405.

262. Y. Ohashi and Y. Sasada, *Bull.Chem.Soc.Japan*, 50 (1977) 2863.

263. C.-H. Cheng, D.E. Hendriksen and R. Eisenberg, *J.Organometallic Chem.*, 142 (1977) C65.

264. M. Jacob and E. Weiss, *J.Organometallic Chem.*, 131 (1977) 263.

265. V.G. Andrianov and Y.T. Struchkov, *Zh.strukt.Khim.*, 18 (1977) 318.

266. F. Dahan and Y. Jeannin, *J.Organometallic Chem.*, 136 (1977) 251.

267. M. Bottrill, R. Davies, R. Goddard, M. Green, R.P. Hughes, B. Lewis and P. Woodward, *J.C.S.Dalton*, (1977) 1252.

268. R.P. Hughes, N. Krishnamachari, C.J.L. Lock, J. Powell and G. Turner, *Inorg.Chem.*, 16 (1977) 314.

269. M.A. de Paoli, H.-W. Frühauf, F.-W. Grevels, E.A. Koerner von Gustorf, W. Riemer and C. Krüger, *J.Organometallic Chem.*, 136 (1977) 219.

270. M.K. Cooper, D.W. Yaniuk, M. McPartlin and J.G. Shaw, *J.Organometallic Chem.*, 131 (1977) C33.

271. D.A. Stotter and J. Trotter, *J.C.S.Dalton*, (1977) 868.

272. M. Green, J.A.K. Howard, J.L. Spencer and F.G.A. Stone, *J.C.S.Dalton*, (1977) 271.

273. H.D. Empsall, E.M. Hyde, R. Markham, W.S. McDonald, M.C. Norton, B.L. Shaw and B. Weeks, *J.C.S.Chem.Comm.*, (1977) 589.

274. R.A. Andersen, R.A. Jones, G. Wilkinson, M.B. Hursthouse and K.M. Abdul Malik, *J.C.S.Chem.Comm.*, (1977) 865.

275. C.R. Eady, B.F.G. Johnson, J. Lewis, R. Mason, P.B. Hitchcock and K.M. Thomas, *J.C.S.Chem.Comm.*, (1977) 385.

276. G. Huttner, P. Friedrich, H. Willenberg and H.-D. Müller, *Angew.Chem.*, 89 (1977) 268; *Angew.Chem.Internat.Edit.*, 16 (1977) 260.

277. M.R. Churchill, S.A. Julis, R.B. King and C.A. Harmon, *J.Organometallic Chem.*, 142 (1977) C52.

278. P. Caddy, M. Green, E.O'Brien, L.E. Smart and P. Woodward, *Angew.Chem.*, 89 (1977) 671; *Angew.Chem.Internat.Edit.*, 16 (1977) 648.

279. G.G. Aleksandrov, A.B. Antonova, N.E. Kolobova and Y.T. Struchkov, *Koord.Khim.*, 2 (1976) 1561.

280. R. Hill, B.A. Kelly, F.G. Kennedy, S.A.R. Knox and P. Woodward, *J.C.S.Chem.Comm.*, (1977) 434.

281. W.F. Paton, E.R. Corey, J.Y. Corey, M.D. Glick and K. Mislow, *Acta Cryst.*, B33 (1977) 268.

282. N.G. Connelly, G.A. Johnson, B.A. Kelly and P. Woodward, *J.C.S.Chem. Comm.*, (1977) 436.

283. G.R. Scollary, *Aust.J.Chem.*, 30 (1977) 1007.

284. E.W. Abel, I.D.H. Towle, T.S. Cameron and R.E. Cordes, *J.C.S.Chem. Comm.*, (1977) 285.

285. E. Röttinger, R. Müller and H. Vahrenkamp, *Angew.Chem.*, 89 (1977) 341; *Angew.Chem.Internat.Edit.*, 16 (1977) 332.

286. C.J. Cardin and K.W. Muir, *J.C.S.Dalton*, (1977) 1593.

287. J.O. Albright, L.D. Brown, S. Datta, J.K. Koula, S.S. Wreford and B.M. Foxman, *J.Amer.Chem.Soc.*, 99 (1977) 5518.

288. R.A. Andersen, R.A. Jones, G. Wilkinson, M.B. Hursthouse and K.M. Abdul Malik, *J.C.S.Chem.Comm.*, (1977) 283.

289. T.J. McNeese, S.S. Wreford, D.L. Tipton and R. Bau, *J.C.S.Chem.Comm.*, (1977) 390.

290. W. Stallings and J. Donohue, *J.Organometallic Chem.*, 139 (1977) 143.

291. G. LeBorgne, S.E. Bouaoud, D. Grandjean, P. Braunstein, J. Dehand and M. Pfeffer, *J.Organometallic Chem.*, 136 (1977) 375.

292. A. Nakamura, T. Yoshida, M. Cowie, S. Otsuka and J. Ibers, *J.Amer. Chem.Soc.*, 99 (1977) 2108.

293. U. Behrens and K. Hoffmann, *J.Organometallic Chem.*, 129 (1977) 273.

294. A. Ducruix and C. Pascard, *Acta Cryst.*, B33 (1977) 3688.

295. C.G. Pierpont, *Inorg.Chem.*, 16 (1977) 636.

296. C.F. Campana and L.F. Dahl, *J.Organometallic Chem.*, 127 (1977) 209.

297. K.H.P. O'Flynn and W.S. McDonald, *Acta Cryst.*, B33 (1977) 195.

298. J.L. Davidson, M. Green, J.Z. Nyathi, F.G.A. Stone and A.J. Welch, *J.C.S.Dalton*, (1977) 2246.

299. D.R. Russell and P.A. Tucker, *J.Organometallic Chem.*, 125 (1977) 303.

300. A.M. Ciplys, R.J. Geue and M.R. Snow, *J.C.S.Dalton*, (1976) 35.

301. L.E. Smart, J. Browning, M. Green, A. Laguna, J.L. Spencer and F.G.A. Stone, *J.C.S.Dalton*, (1977) 1777.

302. H. LeBozec, P. Dixneuf, N.J. Taylor and A.J. Carty, *J.Organometallic Chem.*, 135 (1977) C29.

303. F.A. Cotton and S.A. Koch, *J.Amer.Chem.Soc.*, 99 (1977) 7371.

304. J.A. McCleverty, S. McLuckie, N.J. Morrison, N.A. Bailey and N.W. Walker, *J.C.S.Dalton*, (1977) 359.

305. R.O. Gould, C.L. Jones, D.R. Robertson and T.A. Stephenson, *J.C.S. Chem.Comm.*, (1977) 222.

306. M.L.H. Green, M. Berry, C. Couldwell and K. Prout, *Nouveau J.Chim.*, 1 (1977) 187.

307. E.A. Kelly, P.M. Bailey and P.M. Maitlis, *J.C.S.Chem.Comm.*, (1977) 289.

308. D.B. Crump, R.F. Stepaniak and N.C. Payne, *Can.J.Chem.*, 55 (1977) 438.

309. G. Guerch, P. Mauret, J. Jaud and J. Galy, *Acta Cryst.*, B33 (1977) 3747.

310. J.A. Broomhead, J. Budge, J.H. Enemark, R.D. Feltham, J.I. Gelder and P.L. Johnson, *A.C.S.Adv.Chem.Ser.*, 162 (1977) 421.

311. A.G. Ginzburg, N.G. Bokii, A.I. Yanovsky, Y.T. Struchkov, V.N. Setkina and D.N. Kursanov, *J.Organometallic Chem.*, 136 (1977) 45.

312. R.J. Restivo, G. Ferguson, T.W. Ng and A.J. Carty, *Inorg.Chem.*, 16 (1977) 172.

313. C.-H. Cheng, B.D. Spivack and R. Eisenberg, *J.Amer.Chem.Soc.*, 99 (1977) 3003.

314. R.J. McKinney, C.B. Knobler, B.T. Huie and H.D. Kaesz, *J.Amer.Chem.Soc.*, 99 (1977) 2988.

315. R.A. Smith and M.J. Bennett, *Acta Cryst.*, B33 (1977) 1113.

316. T.N. Sal'nikova, V.G. Andrianov and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 768; *Chem.Abs.*, 87 (1977) 135793.

317. J.-M. Bassett, M. Green, J.A.K. Howard and F.G.A. Stone, *J.C.S.Chem. Comm.*, (1977) 853.

318. H. Schumann, M. Heisler and J. Pickardt, *Chem.Ber.*, 110 (1977) 1020.

319. B.F.G. Johnson, J. Lewis, B.E. Reichert, K.T. Schorpp and G.M. Sheldrick, *J.C.S.Dalton*, (1977) 1417.

320. M.R. Churchill, F.J. Rotella, E.W. Abel and S.A. Mucklejohn, *J.Amer. Chem.Soc.*, 99 (1977) 5820.

321. M.R. Churchill, R.A. Lashewycz and F.J. Rotella, *Inorg.Chem.*, 16 (1977) 265.

322. S. Jeannin, Y. Jeannin and G. Lavigne, *Transition Metal Chem.*, 1 (1976) 192.

323. E.O. Fischer, H. Hollfelder, P. Friedrich, F.R. Kreissl and G. Huttner, *Chem.Ber.*, 110 (1977) 3467.

324. J.A.S. Howell, M.J. Mays, I.D. Hunt and O.S. Mills, *J.Organometallic Chem.*, 128 (1977) C29.

325. I.D. Hunt and O.S. Mills, *Acta Cryst.*, B33 (1977) 2432.

326. E.O. Fischer, H. Hollfelder, P. Friedrich, F.R. Kreissl and G. Huttner, *Angew.Chem.*, 89 (1977) 416; *Angew.Chem.Internat.Edit.*, 16 (1977) 401.

327. E.O. Fischer, T.L. Lindner, H. Fischer, G. Huttner, P. Friedrich and F.R. Kreissl, *Z.Naturforsch.*, 32b (1977) 648.

328. M.K. Cooper, P.J. Guerney, P. Donaldson and M. McPartlin, *J.Organometallic Chem.*, 131 (1977) C11.

329. H. Zeiner, R. Ratka and M.L. Ziegler, *Z.Naturforsch.*, 32b (1977) 172.

330. M.G.B. Drew and J.D. Wilkins, *J.C.S.Dalton*, (1977) 557.

331. T. Yasuda, Y. Kai, N. Yasuoka and N. Kasai, *Bull.Chem.Soc.Japan*, 50 (1977) 2888.

332. H.D. Empsall, E. Mentzer, D. Pawson, B.L. Shaw, R. Mason and G. Williams, *J.C.S.Chem.Comm.*, (1977) 311.

333. B.T. Huie, C.B. Knobler, G. Firestein, R.J. McKinney and H.D. Kaesz, *J.Amer.Chem.Soc.*, 99 (1977) 7852.

334. G. Huttner, H.-D. Müller, P. Friedrich and U. Kölle, *Chem.Ber.*, 110 (1977) 1254.

335. C.G. Pierpont, R.M. Buchanan and H.H. Downs, *J.Organometallic Chem.*, 124 (1977) 103.

336. P. Diversi, G. Ingrosso, A. Lucherini, W. Porzio and M. Zocchi, *J.C.S. Chem.Comm.*, (1977) 811.

337. K. Tani, L.D. Brown, J. Ahmed, J.A. Ibers, M. Yokota, A. Nakamura and S. Otsuka, *J.Amer.Chem.Soc.*, 99 (1977) 7876.

338. M.R. Churchill and B.G. DeBoer, *Inorg.Chem.*, 16 (1977) 2397.

339. S. Jeannin, Y. Jeannin and G. Lavigne, *Transition Metal Chem.*, 1 (1976) 186.

340. M.G.B. Drew and A.P. Wolters, *Acta Cryst.*, B33 (1977) 205.

341. T.W. Matheson and B.R. Penfold, *Acta Cryst.*, B33 (1977) 1980.

342. N.I. Kirillova, D.A. Lemenovskii, T.V. Baukova and Y.T. Struchkov, *Koord.Khim.*, 3 (1977) 1600; *Chem.Abs.*, 87 (1977) 192389.

343. R. Countryman and W.S. McDonald, *Acta Cryst.*, B33 (1977) 3580.

344. E.A. Kelly, P.M. Bailey and P.M. Maitlis, *J.C.S.Chem.Comm.*, (1977) 289.

345. A. Clearfield, R. Gopal, M.D. Rausch, E.F. Tokas, F.A. Higbie and I. Bernal, *J.Organometallic Chem.*, 135 (1977) 229.

346. P.B. Hitchcock, M.F. Lappert and P.L. Pye, *J.C.S.Chem.Comm.*, (1977) 196.

347. Trinh-Toan, R.W. Broach, S.A. Gardner, M.D. Rausch and L.F. Dahl, *Inorg.Chem.*, 16 (1977) 279.

348. J. Ellermann, N. Geheeb, G. Zoubek and G. Thiele, *Z.Naturforsch.*, 32b (1977) 1271.

349. N.E. Kolobova, A.B. Antonova, O.M. Khitrova, M.Y. Antipin and Y.T. Struchkov, *J.Organometallic Chem.*, 137 (1977) 69.

350. F. Edelmann and U. Behrens, *J.Organometallic Chem.*, 131 (1977) 65.

351. J.C. Huffman, J.G. Stone, W.C. Krusell and K.G. Caulton, *J.Amer. Chem.Soc.*, 99 (1977) 5829.

352. M. Green, J.A.K. Howard, M. Murray, J.L. Spencer and F.G.A. Stone, *J.C.S.Dalton*, (1977) 1509.

353. C.T. Lam, P.W.R. Corfield and S.J. Lippard, *J.Amer.Chem.Soc.*, 99 (1977) 617.

354. E. Rodulfo de Gil, A.V. Rivera and H. Noguera, *Acta Cryst.*, B33 (1977) 2653.

355. J.W. Faller, D.A. Haitko, R.D. Adams and D.F. Chodosh, *J.Amer.Chem.Soc.*, 99 (1977) 1654.

356. M.C. Cornock, D.R. Robertson, T.A. Stephenson, C.L. Jones, G.H.W. Milburn and L. Sawyer, *J.Organometallic Chem.*, 135 (1977) C50.

357. G. Gervasio, S. Aime, L. Milone, E. Sappa and M. Franchini-Angela, *Transition Metal Chem.*, 1 (1976) 96.

358. J. Deutscher, S. Fadel and M.L. Ziegler, *Angew.Chem.*, 89 (1977) 746; *Angew.Chem.Internat.Edit.*, 16 (1977) 704.

359. S. Hoehne, E. Lindner and B. Schilling, *J.Organometallic Chem.*, 139 (1977) 315.

360. M.I. Bruce, R.C.F. Gardner, J.A.K. Howard, F.G.A. Stone, M. Welling and P. Woodward, *J.C.S.Dalton*, (1977) 621.

361. U. Franke and E. Weiss, *J.Organometallic Chem.*, 139 (1977) 305.

362. F.A. Cotton, S. Koch and M. Millar, *J.Amer.Chem.Soc.*, 99 (1977) 7372.

363. F.A. Cotton and M. Millar, *J.Amer.Chem.Soc.*, 99 (1977) 7886.

364. M. Cooke, J.A.K. Howard, C.R. Russ, F.G.A. Stone and P. Woodward, *J.C.S.Dalton*, (1976) 70.

365. M. Nolte, E. Singleton and E. van der Stok, *J.Organometallic Chem.*, 142 (1977) 387.

366. N.W. Alcock, J.M. Brown and J.C. Jeffery, *J.C.S.Dalton*, (1977) 888.

367. E.O. Fischer, A. Ruhs, P. Friedrich and G. Huttner, *Angew.Chem.*, 89 (1977) 481; *Angew.Chem.Internat.Edit.*, 16 (1977) 465.

368. H. Takahashi, Y. Oosawa, A. Kobayashi, T. Saito and Y. Sasaki, *Bull. Chem.Soc.Japan*, 50 (1977) 1771.

369. L.Y.Y. Chan, W.K. Dean and W.A.G. Graham, *Inorg.Chem.*, 16 (1977) 1067.

370. E.C. Baker and K.N. Raymond, *Inorg.Chem.*, 16 (1977) 2710.

371. C.G. Pierpont, H.H. Downs, K. Itoh, H. Nishiyama and Y. Ishii, *J.Organometallic Chem.*, 124 (1977) 93.

372. W.E. Carroll, M. Green, J.A.K. Howard, M. Pfeffer and F.G.A. Stone, *Angew.Chem.*, 89 (1977) 838; *Angew.Chem.Internat.Edit.*, 16 (1977) 793.

373. J.R. Shapley, S.I. Richter, M.R. Churchill and R.A. Lashewycz, *J.Amer. Chem.Soc.*, 99 (1977) 7384.

374. D.C. Moody and R.R. Ryan, *Inorg.Chem.*, 16 (1977) 2473.

375. J.L. Atwood, G.K. Barker, J. Holton, W.E. Hunter, M.F. Lappert and R. Pearce, *J.Amer.Chem.Soc.*, 99 (1977) 6645.

376. G.R. Clark, *J.Organometallic Chem.*, 134 (1977) 51.

377. N.N. Greenwood, J.A. Howard and W.S. McDonald, *J.C.S.Dalton*, (1977) 37.

378. D.A. Thompson, T.K. Hilty and R.W. Rudolph, *J.Amer.Chem.Soc.*, 99 (1977) 6774.

379. R.G. Ball and N.C. Payne, *Inorg.Chem.*, 16 (1977) 1187.

380. F.A. Cotton and M. Millar, *Inorg.Chim.Acta*, 25 (1977) L105.

381. L.E. Manzer and L.J. Guggenberger, *J.Organometallic Chem.*, 139 (1977) C34.

382. S.Z. Goldberg, B. Spivack, G. Stanley, R. Eisenberg, D.M. Braitsch, J.S. Miller and M. Abkowitz, *Inorg.Chem.*, 16 (1977) 110.

383. H. Schumann, J. Opitz and J. Pickardt, *J.Organometallic Chem.*, 128 (1977) 253.

384. Z.G. Aliev, L.O. Atovmyan, O.V. Golubeva, V.V. Karpov and G.I. Kozub, *Zh.strukt.Khim.*, 18 (1977) 336.

385. H. Ueda, Y. Kai, N. Yasuoka and N. Kasai, *Bull.Chem.Soc.Japan*, 50 (1977) 2250.

386. P.D. Frisch and G.P. Khare, *J.Organometallic Chem.*, 142 (1977) C61.

387. K. Prout and J.-C. Daran, *Acta Cryst.*, B33 (1977) 2303.

388. G.R. Clark and S.M. James, *J.Organometallic Chem.*, 134 (1977) 229.

389. T.N. Tarkhova, E.A. Gladkikh, I.A. Grishin, A.N. Lineva and V.V. Khalmanov, *Zh.strukt.Khim.*, 17 (1976) 1052.

390. H. Felkin, B. Meunier, C. Pascard and T. Prange, *J.Organometallic Chem.*, 135 (1977) 361.

391. G.K. Barker, A.M.R. Galas, M. Green, J.A.K. Howard, F.G.A. Stone, T.W. Turney, A.J. Welch and P. Woodward, *J.C.S.Chem.Comm.*, (1977) 256.

392. R.D. Adams, D.F. Chodosh and N.M. Golembeski, *J.Organometallic Chem.*, 139 (1977) C39.

393. G.R. Clark, D.R. Russell, W.R. Roper and A. Walker, *J.Organometallic Chem.*, 136 (1977) C1.

394. J.A. Kaduk and J.A. Ibers, *J.Organometallic Chem.*, 139 (1977) 199.

395. M.W. Schoonover and R. Eisenberg, *J.Amer.Chem.Soc.*, 99 (1977) 8371.

396. K. Yasufuku, K. Aoki and H. Yamazaki, *Inorg.Chem.*, 16 (1977) 624.

397. R.K. Pomeroy, L. Vancea, H.P. Calhoun and W.A.G. Graham, *Inorg.Chem.*, 16 (1977) 1508.

398. G.R. Clark, T.J. Collins, S.M. James and W.R. Roper, *J.Organometallic Chem.*, 125 (1977) C23.

399. J.M. Waters and J.A. Ibers, *Inorg.Chem.*, 16 (1977) 3273.

400. R. Mason and G.R. Scollary, *Aust.J.Chem.*, 30 (1977) 2395.

401. F.A. Cotton and G.W. Rice, *Nouveau J.Chim.*, 1 (1977) 301.

402. S. Shibata, S. Onuma, A. Iwase and H. Inoue, *Inorg.Chim.Acta*, 25 (1977) 33.

403. J.F. Richardson and N.C. Payne, *Can.J.Chem.*, 55 (1977) 3203.

404. A. Clearfield, E.F. Epstein and I. Bernal, *J.Coord.Chem.*, 6 (1977) 227.

405. A. Chiesi Villa, A. Gaetani Manfredotti, C. Guastini, P. Carusi, A. Furlani and M.V. Russo, *Cryst.Struct.Comm.*, 6 (1977) 629.

406. A. Chiesi Villa, A. Gaetani Manfredotti, C. Guastini, P. Carusi, A. Furlani and M.V. Russo, *Cryst.Struct.Comm.*, 6 (1977) 623.

407. A. Furlani, M.V. Russo, A. Chiesi Villa, A. Gaetani Manfredotti and C. Guastini, *J.C.S.Dalton*, (1977) 2154.

408. J. Greene and M.D. Curtis, *J.Amer.Chem.Soc.*, 99 (1977) 5176.

409. R.D. Ernst, T.J. Marks and J.A. Ibers, *J.Amer.Chem.Soc.*, 99 (1977) 2098.

410. J.D. Oliver and R.E. Davis, *J.Organometallic Chem.*, 137 (1977) 373.

411. R.S. Vagg, *Acta Cryst.*, B33 (1977) 3708.

412. G.W. Bushnell, K.R. Dixon, P.M. Moroney, A.D. Rattray and C. Wan, *J.C.S.Chem.Comm.*, (1977) 709.

413. W.F. Smith, J. Yule, N.J. Taylor, H.N. Paik and A.J. Carty, *Inorg.Chem.*, 16 (1977) 1593.

414. P.H. Bird, A.R. Fraser and D.N. Hall, *Inorg.Chem.*, 16 (1977) 1923.

415. R.E. Cobbledick, F.W.B. Einstein, N. Farrell, A.B. Gilchrist and D. Sutton, *J.C.S.Dalton*, (1977) 373.

416. M. Angoletta, P.L. Bellon, M. Manassero and M. Sansoni, *Gazzetta*, 107 (1977) 441.

417. J.A. Carroll, R.E. Cobbledick, F.W.B. Einstein, N. Farrell, D. Sutton and P.L. Vogel, *Inorg.Chem.*, 16 (1977) 2462.

418. P.-T. Cheng and S.C. Nyburg, *Acta Cryst.*, B33 (1977) 1965.

419. L. Sacconi, P. Dapporto, P. Stoppioni, P. Innocenti and C. Benelli, *Inorg.Chem.*, 16 (1977) 1669.

420. B.T. Huie, C.B. Knobler, R.J. McKinney and H.D. Kaesz, *J.Amer.Chem.Soc.*, 99 (1977) 7862.

421. F. Bachechi, L. Zambonelli and L.M. Venanzi, *Helv.Chim.Acta*, 60 (1977) 2815.

422. H. Werner, A. Kühn, D.J. Tune, C. Krüger, D.J. Brauer, J.C. Sekutowski and Y.-H. Tsay, *Chem.Ber.*, 110 (1977) 1763.

423. A.J. Carty, H.N. Paik and G.J. Palenik, *Inorg.Chem.*, 16 (1977) 300.

424. C. Krüger, J.C. Sekutowski, H. Hoberg and R. Krause-Göing, *J.Organometallic Chem.*, 141 (1977) 141.

425. G.R. Clark, T.J. Collins, D. Hall, S.M. James and W.R. Roper, *J.Organometallic Chem.*, 141 (1977) C5.

426. J.R. Anglin, H.P. Calhoun and W.A.G. Graham, *Inorg.Chem.*, 16 (1977) 2281.

427. K. Itoh, I. Matsuda, F. Ueda, Y. Ishii and J.A. Ibers, *J.Amer.Chem.Soc.*, 99 (1977) 2118.

428. S. Kato, M. Tsutsui, D.L. Cullen and E.F. Meyer, *J.Amer.Chem.Soc.*, 99 (1977) 620.

429. D.J. Brauer and C. Krüger, *Inorg.Chem.*, 16 (1977) 884.

430. R. Colton, M.J. McCormick and C.D. Pannan, *J.C.S.Chem.Comm.*, (1977) 823.

431. M. Bonamico, G. Dessy, V. Fares, M.V. Russo and L. Scaramuzza, *Cryst. Struct.Comm.*, 6 (1977) 39.

432. A. Chiesi Villa, A. Gaetani Manfredotti and C. Guastini, *Cryst.Struct. Comm.*, 6 (1977) 313.

433. M.G.B. Drew, A.P. Wolters and I.B. Tomkins, *J.C.S.Dalton*, (1977) 974.

434. C.P. Kubiak and R. Eisenberg, *J.Amer.Chem.Soc.*, 99 (1977) 6129.

435. L.D. Brown, S.D. Robinson, A. Sahajpal and J.A. Ibers, *Inorg.Chem.*, 16 (1977) 2728.

436. J. Halpern, D.P. Riley, A.S.C. Chan and J.J. Pluth, *J.Amer.Chem.Soc.*, 99 (1977) 8055.

437. A.N. Nesmeyanov, Y.T. Struchkov, N.N. Sedova, V.G. Andrianov, Y.V. Volgin and V.A. Sazonova, *J.Organometallic Chem.*, 137 (1977) 217.

438. N.M. Boag, M. Green, J.A.K. Howard, J.L. Spencer, R.F.D. Stansfield, F.G.A. Stone, M.D.O. Thomas, J. Vicente and P. Woodward, *J.C.S. Chem.Comm.*, (1977) 930.

439. M.J. Bennett and P.B. Donaldson, *Inorg.Chem.*, 16 (1977) 1581.

440. D.C. Moody and R.R. Ryan, *Inorg.Chem.*, 16 (1977) 1052.

441. J.M. Whitfield, S.F. Watkins, G.B. Tupper and W.H. Baddley, *J.C.S.Dalton*, (1977) 407.

442. A. Keasey, P.M. Bailey and P.M. Maitlis, *J.C.S.Chem.Comm.*, (1977) 178.

443. J.W. Byrne, J.R.M. Kress, J.A. Osborn, L. Ricard and R.E. Weiss, *J.C.S.Chem.Comm.*, (1977) 662.

444. M.M. Olmstead, H. Hope, L.S. Benner and A.L. Balch, *J.Amer.Chem.Soc.*, 99 (1977) 5502.

445. A. Albinati, *Inorg.Chim.Acta*, 22 (1977) L31.

446. G. Pelizzi, G. Albertin, E. Bordignon, A.A. Orio and S. Calogero, *Acta Cryst.*, B33 (1977) 3761.

447. S. Midollini, A. Orlandini and L. Sacconi, *Cryst.Struct.Comm.*, 6 (1977) 733.

448. D. Schwarzenbach, A. Pinkerton, G. Chapuis, J. Wenger, R. Ros and R. Roulet, *Inorg.Chim.Acta*, 25 (1977) 255.

449. M.J. Bennett and P.B. Donaldson, *Inorg.Chem.*, 16 (1977) 1585.

450. J.A. Potenza, R.J. Johnson, R. Chirico and A. Efraty, *Inorg.Chem.*, 16 (1977) 2354.

451. G. Ciani, L. Garlaschelli, M. Manassero, U. Sartorelli and V.G. Albano, *J.Organometallic Chem.*, 129 (1977) C25.

452. H. Hoberg, R. Krause-Göing, C. Krüger and J.C. Sekutowski, *Angew.Chem.*, 89 (1977) 179; *Angew.Chem.Internat.Edit.*, 16 (1977) 183.

453. D.W. Hart, R. Bau and T.F. Koetzle, *J.Amer.Chem.Soc.*, 99 (1977) 7557.

454. A. Immirzi and A. Musco, *Inorg.Chim.Acta*, 22 (1977) L35.

455. T.V. Ashworth, M.J. Nolte, E. Singleton and M. Laing, *J.C.S.Dalton*, (1977) 1816.

456. R. Bau, W.E. Carroll, R.J. Teller and T.F. Koetzle, *J.Amer.Chem.Soc.*, 99 (1977) 3872.

457. S. Krogsrud, L. Toniolo, U. Croatto and J.A. Ibers, *J.Amer.Chem.Soc.*, 99 (1977) 5277.

458. T. Debaerdemaeker, *Cryst.Struct.Comm.*, 6 (1977) 11.

459. P.B. Hitchcock, J.F. Nixon and J. Sinclair, *Acta Cryst.*, B33 (1977) 179.

460. R.E. Caputo, D.K. Mak, R.D. Willett, S.G.N. Roundhill and D.M. Roundhill, *Acta Cryst.*, B33 (1977) 215.

461. B.L. Barnett, C. Krüger, Y.-H. Tsay, R.H. Summerville and R. Hoffmann, *Chem.Ber.*, 110 (1977) 3900.

462. K.D. Schramm and J.A. Ibers, *Inorg.Chem.*, 16 (1977) 3287.

463. B.G. Segal and S.J. Lippard, *Inorg.Chem.*, 16 (1977) 1623.

464. M. Nakajima, T. Saito, A. Kobayashi and Y. Sasaki, *J.C.S.Dalton*, (1977) 385.

465. J.L. Atwood, R.D. Rogers, C. Kutal and P.A. Grutsch, *J.C.S.Chem.Comm.*, (1977) 593.

466. J. Kopf and J. Schmidt, *Z.Naturforsch.*, 32b (1977) 275.

467. E.E. Castellano, O.E. Piro and B.E. Rivero, *Acta Cryst.*, B33 (1977) 1725.

468. E.E. Castellano, O.E. Piro and B.E. Rivero, *Acta Cryst.*, B33 (1977) 1728.

469. K.D. Karlin, H.N. Rabinowitz, D.L. Lewis and S.J. Lippard, *Inorg.Chem.*, 16 (1977) 3262.

470. O.A. Ileperuma and R.D. Feltham, *Inorg.Chem.*, 16 (1977) 1876.

471. C.M. Lukehart and J.M. Troup, *Inorg.Chim.Acta*, 22 (1977) 81.

472. M.A.A.F. de C.T. Carrondo, P.R. Rudolf, A.C. Skapski, J.R. Thornback and G. Wilkinson, *Inorg.Chim.Acta*, 24 (1977) L95.

473. D. Wester, R.C. Edwards and D.H. Busch, *Inorg.Chem.*, 16 (1977) 1055.

474. J.H. Enemark, R.D. Feltham, B.T. Huie, P.L. Johnson and K.B. Swedo, *J.Amer.Chem.Soc.*, 99 (1977) 3285.

475. J.A. Kaduk and J.A. Ibers, *Inorg.Chem.*, 16 (1977) 3283.

476. B.C. Lucas, D.C. Moody and R.R. Ryan, *Cryst.Struct.Comm.*, 6 (1977) 57.

477. H.N. Rabinowitz, K.D. Karlin and S.J. Lippard, *J.Amer.Chem.Soc.*, 99 (1977) 1420.

478. K.D. Karlin, D.L. Lewis, H.N. Rabinowitz and S.J. Lippard, *J.Amer. Chem.Soc.*, 96 (1974) 6519.

479. B.A. Kelly, A.J. Welch and P. Woodward, *J.C.S.Dalton*, (1977) 2237.

480. W.R. Scheidt, A.C. Brinegar, E.B. Ferro and J.F. Kirner, *J.Amer.Chem. Soc.*, 99 (1977) 7315.

481. G. Bombieri, E. Forsellini, R. Graziani and G. Zotti, *Transition Metal Chem.*, 2 (1977) 264.

482. C.T.-W. Chu and L.F. Dahl, *Inorg.Chem.*, 16 (1977) 3245.

483. R. Hammer, H.-F. Klein, P. Friedrich and G. Huttner, *Angew.Chem.*, 89 (1977) 499; *Angew.Chem.Internat.Edit.*, 16 (1977) 485.

484. J. Chatt, R.A. Head, P.B. Hitchcock, W. Hussain and G.J. Leigh, *J.Organometallic Chem.*, 133 (1977) C1.

485. A. Gleizes, M. Dartiguenave, Y. Dartiguenave, J. Galy and H.F. Klein, *J.Amer.Chem.Soc.*, 99 (1977) 5187.

486. J.O. Albright, J.C. Clardy and J.G. Verkade, *Inorg.Chem.*, 16 (1977) 1575.

487. Y.W. Yared, S.J. Miles, R. Bau and C.A. Reed, *J.Amer.Chem.Soc.*, 99 (1977) 7076.

488. A. Immirzi, A. Musco and B.E. Mann, *Inorg.Chim.Acta*, 21 (1977) L37.

489. F.C. March, R. Mason and G.R. Scollary, *Aust.J.Chem.*, 30 (1977) 2407.