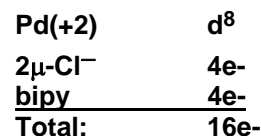
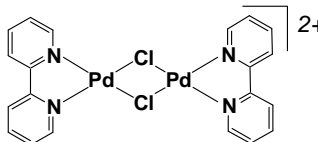
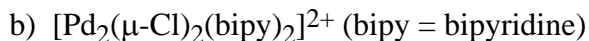
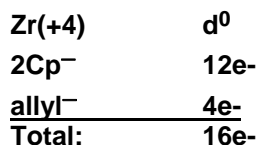
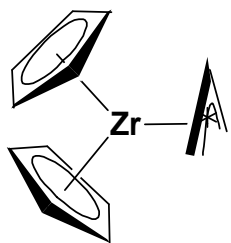
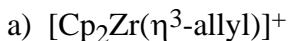
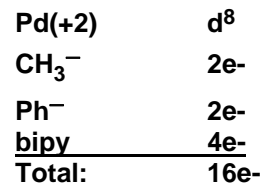
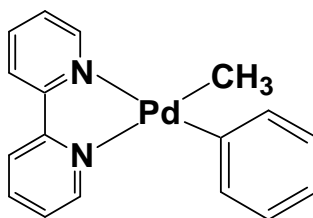
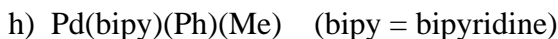
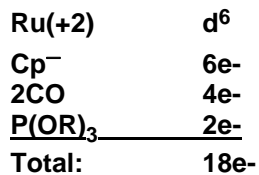
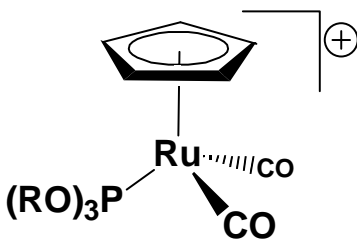
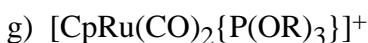
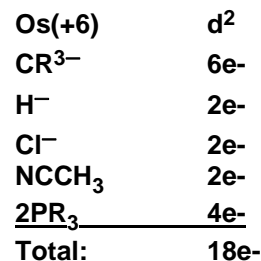
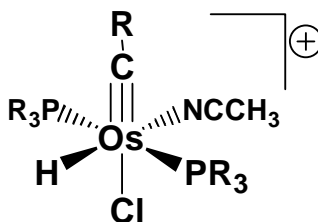
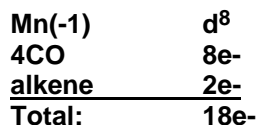
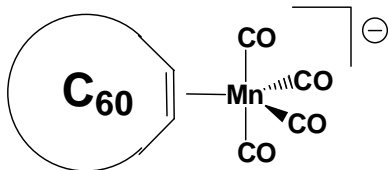
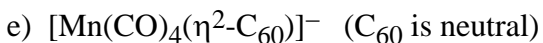
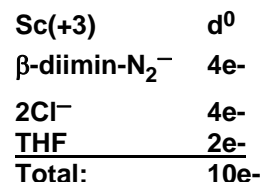
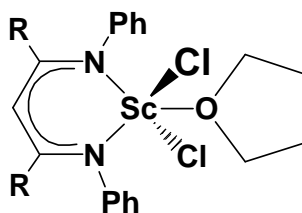
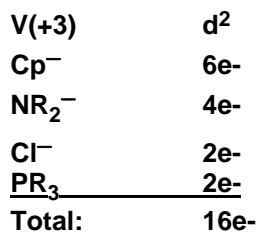
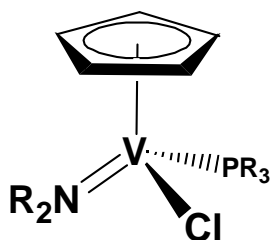


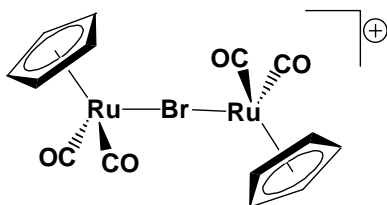
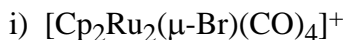
Homework # 1: Due: Sept 25, 2008

1. (38 pts) Sketch out a structure showing the geometry about the metal center as accurately as possible and clearly show the electron counting for the complexes below. Phosphine ligand abbreviations are defined in your notes (see the phosphine ligand section).

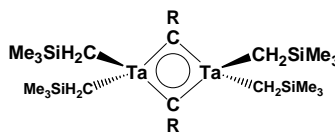
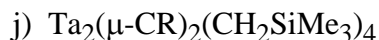


Pd²⁺(d⁸) is usually happy at 16e- (although it can weakly coordinate one more ligand)

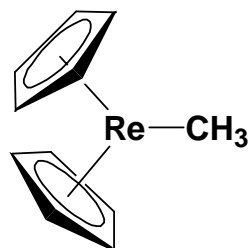




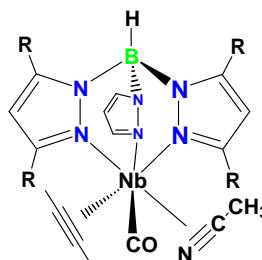
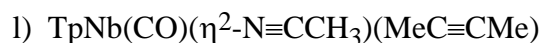
Ru(+2)	d ⁶
Cp ⁻	6e-
μ-Br ⁻	2e-
2CO	4e-
Total:	18e-



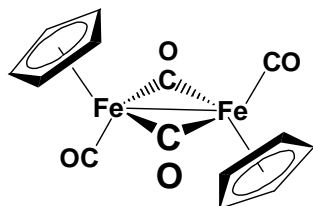
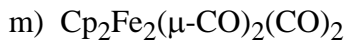
Ta(+5)	d ⁰
2-μCR ³⁻	6e-
2CR ₂ ⁻	4e-
Total:	10e-



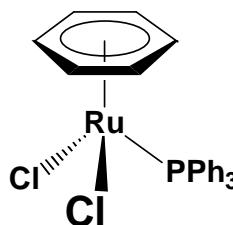
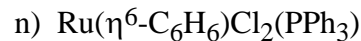
Re(+3)	d ⁴
2Cp ⁻	12e-
CR ₃ ⁻	2e-
Total:	18e-



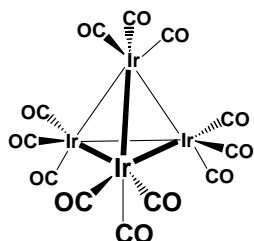
Nb(+1)	d ⁴
Tp ⁻	6e-
CO	2e-
R-C≡C-R	2e-
η ² -NCCH ₃	2e-
Total:	16e-



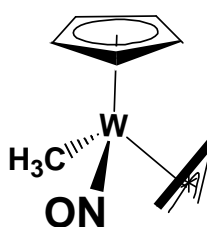
Fe(+1)	d ⁷
Cp ⁻	6e-
2-μCO	2e-
CO	2e-
Fe-Fe	1e-
Total:	18e-



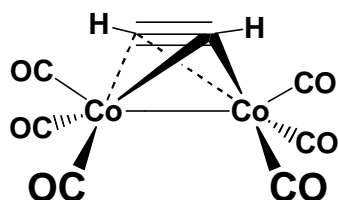
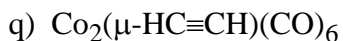
Ru(+2)	d ⁶
C ₆ H ₆	6e-
2Cl ⁻	4e-
PR ₃	2e-
Total:	18e-



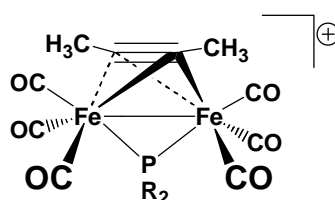
Ir(0)	d ⁹
3CO	6e-
3Ir-Ir	3e-
Total:	18e-



W(+2)	d ⁴
Cp ⁻	6e-
CH ₃ ⁻	2e-
allyl ⁻	4e-
NO ⁺	2e-
Total:	18e-

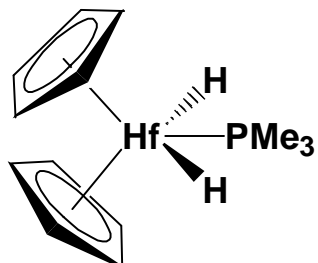


Co(0)	d ⁹
μ-R-C≡C-R	2e-
3CO	6e-
Co-Co	1e-
Total:	18e-

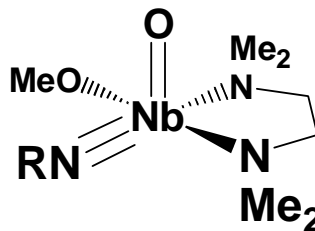


Fe(+1)	d ⁷
μ-R-C≡C-R	2e-
μ-PR ₂ ⁻	2e-
3CO	6e-
Fe-Fe	1e-
Total:	18e-

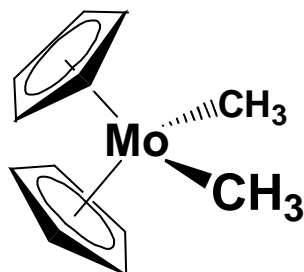
2. (12 pts) Propose an **18e- structure** for the following metal/ligand combinations. Use at least one of each metal and ligand listed. Complexes should be neutral. Don't use more than 2 metal centers. Show your electron counting. Ligands are shown without charges, please indicate the proper ligand charge in your electron counting. Draw a reasonable structure showing the geometry about the metal center(s).

a) Hf, Cp, H, PMe₃

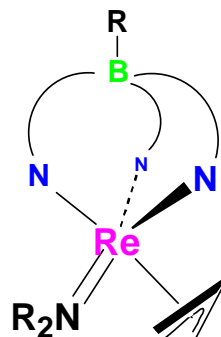
Hf(+4)	d ⁰
PR ₃	2e-
2Cp ⁻	12e-
2H ⁻	4e-
Total:	18e-

b) Nb, O, OMe, NR, Me₂NCH₂CH₂NMe₂

Nb(+5)	d ⁰
2NR ₃	4e-
O ²⁻	4e-
NR ₂ ⁻	6e-
OMe ⁻	4e-
Total:	18e-

c) Mo, Cp, CH₃

Mo(+4)	d ²
2Cp ⁻	12e-
2CR ₃ ⁻	4e-
Total:	18e-

d) Re, Tp (tris(pyrazol)borate), allyl, NR₂

Re(+3)	d ⁴
Tp ⁻	6e-
NR ₂ ⁻	4e-
allyl ⁻	4e-
Total:	18e-