

Organometallic Chemistry - 4571

HW # 2 Due: October 30, 2008 (by 2 PM)

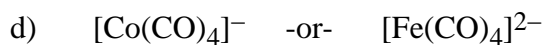
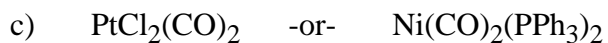
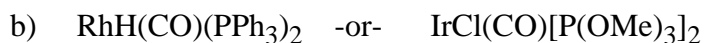
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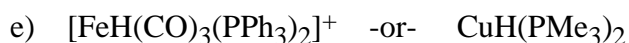
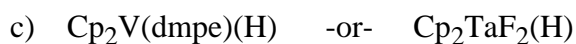
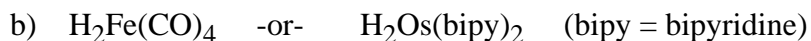
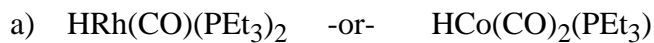
Group: _____

Check the box to the right if you want your graded homework to be placed out in the public rack outside Prof. Stanley's office. Otherwise you will have to pick up your homework from Prof. Stanley in person:

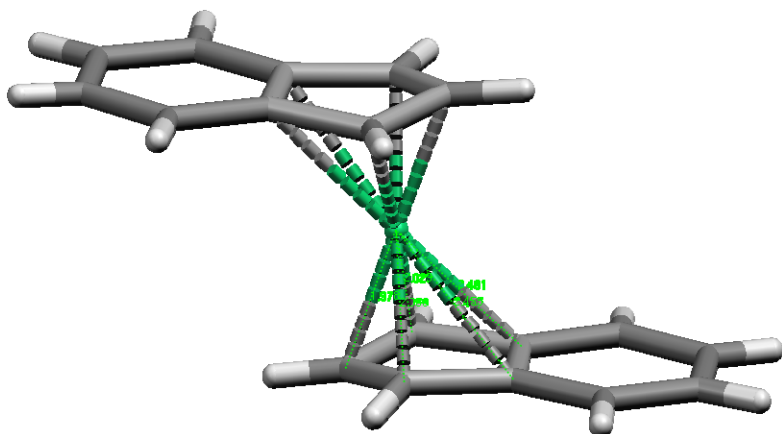
1. (15 pts) For each of the following pairs of metal complexes, circle the one that will have the highest CO stretching frequency. Briefly and clearly discuss your reasoning for each case.



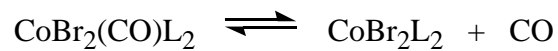
2. (20 pts) For each of the following pairs of metal hydride complexes, circle the one that should have the lowest pK_a value. Briefly and clearly discuss your reasoning for each case.



3. (5 pts) $(\eta^x\text{-indenyl})_2\text{Ni}$ has the structure shown below. Three of the Cp-ring to Ni distances average 2.0 Å, while the other two average 2.46 Å. Describe the indenyl-Ni bonding and show the electron-counting for this complex. For more info on the indenyl ligand see your notes (Cp & ligand substitution chapters).



4. (10 pts) Consider the following equilibrium:



The equilibrium constants for the reaction with various L ligands are given in the table below. Explain the trends in K_d .

L	K_d	ν_{CO} (cm^{-1})	cone angle
PEt ₃	1	1985	132°
PPr ₃	1.1	1980	135°
PEt ₂ Ph	2.5	1990	135°
PEtPh ₂	24	1990	140°
PPh ₃	750	1995	145°