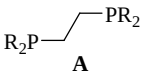
Organometallic Chemistry
Problem Set #1 Name:_____
Due: Sept. 11, 2008

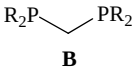
1. Draw a hypothetical transition metal complex with the molecular formula of ML_8 (Hint: it has a cubic structure). Use ligand field theory to determine the splitting of d orbitals and label the d orbitals. (5 pts.)

2. Explain why Δ increases in the order $CrCl_6^{3-}$, $Cr(NH_3)_6^{3+}$, $Cr(CN_6)^{3-}$. (5 pts.)

3. Chelating ligands such as **A** are much more common than **B**? Explain. (4 pts.)



A

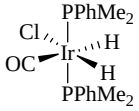


B

4. For each transition metal complex shown list the following: (i) identify each ligand as L-type or X-type; (ii) the formal oxidation state of the metal; (iii) the d^n electron count; (iv) the total electron count of the metal. (6 pts.)

a) $Pd(CH_3CN_2)_2Cl_2$

b)



c) $[Rh(OAc)_2]_2$