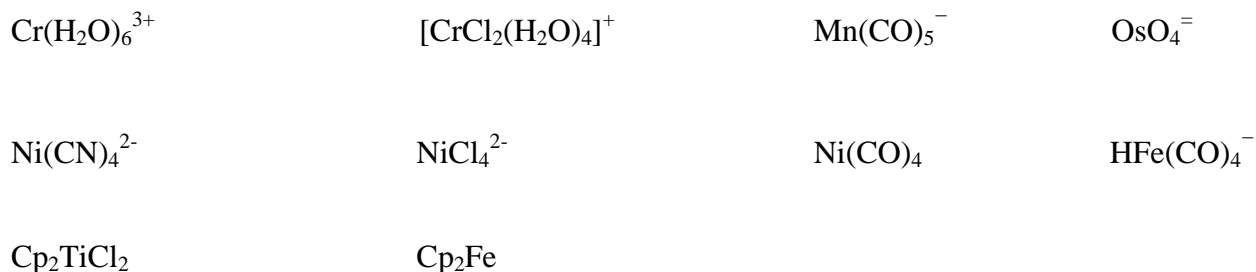


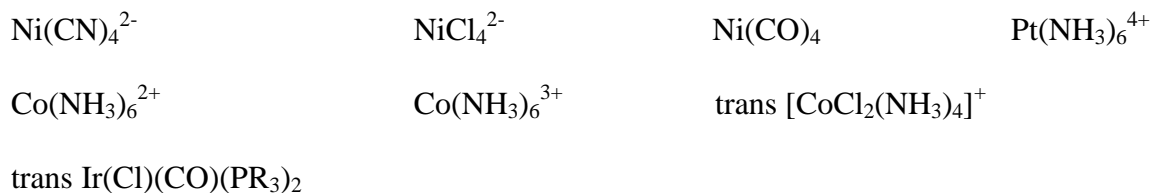
Coordination Chemistry Review

Background Assumed:

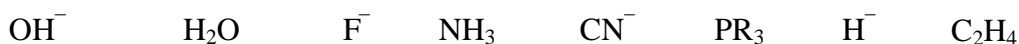
1. Can assign oxidation states on inspection and give d-electron count of transition metal. Check: oxidation state and d-electron count of:



2. Can predict geometries and from geometries of complexes, predict crystal field, d-orbital splitting diagrams, electron assignment, and magnetism:



3. Know the basis of spectrochemical series. Order the following in terms of ligand field strength:



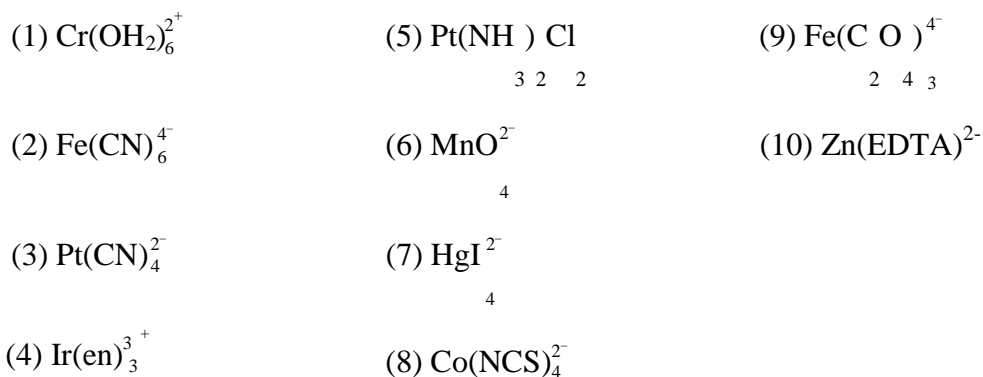
4. Lewis Acids /Bases and HSAB.

Which of the ligands above are “hard” and which are “soft” donors?

5. Predict the composition and geometries of the following:

- (a) the ammine complex of Ru(II) (NH_3)
- (b) the carbonyl complex of Cr(0)
- (c) the bromide complex of Co(II)
- (d) the phenanthroline complex of Co(III)
- (e) the ammine complex of Cu(II)
- (f) the ethylenediamine complex of Cr(II)

6. Consider the following list of species and *indicate by number* (in the spaces provided) those species that possess the indicated property. Note that a given species may possess more than one (or none) of the indicated properties.



- (a) paramagnetic
- (b) inert to ligand substitution _____
- (c) colored
- (d) tetragonally distorted from regular octahedral geometry _____
- (e) tetrahedral complex
- (f) chelate complex
- (g) capable of existing in isomeric form

7. Indicate which of the following complexes would be expected to be inert to ligand substitution:

