

Inorganic Chemistry
Chapter 21 Homework
DUE Friday December 3, 2010 @ 8:00 AM

For your own benefit do Chapter 21 Problems: 1-9, 31, 35ab, 36 (these will not be collected)

Answer the following on a separate page to turn in for a grade. **Please do your own work.**

1. Solid CrF_3 contains a Cr^{3+} ion surrounded by six F^- ions in an octahedral geometry, all at distances of 190 pm. MnF_3 is in a distorted geometry, with Mn-F distances of 179, 191, and 209 pm (two of each). **Explain.**
2. What are possible magnetic moments of Co(II) in tetrahedral, octahedral, and square planar complexes?
3. A series of aqueous Cr^{3+} complexes were measured with the Agilent 8453 UV-Vis spectrometer in room 411. Unfortunately, the researcher forgot to label the flasks after making each of the complexes. Assign the complex to the ligand field splitting parameter (Δ_o) that was measured. Next, calculate the wavelength of absorption (in nm) for each complex and determine the electron configuration (i.e., $t_{2g}^x e_g^y$) for the complexes (they will be the same).

Ligands
CN^-
F^-
H_2O
NH_3

Δ_o (cm^{-1})
21600
17400
15200
33500