

Chemistry 322
Inorganic Chemistry
Spring 2007

Final Exam Objectives

The final exam is cumulative. The new material essentially derives from Chapters 8 and 19.1, 19.2 from Shriver & Atkins. Although a greater emphasis of the final exam is on the newer material, it is expected that you have mastered the material to this point. You will be called upon to apply concepts from these earlier sections. Bring your character tables to the exam.

1. Objectives from Exam 1.
2. Objectives from Exam 2.
3. Relate the descriptive chemistry of an inorganic element to its atomic properties. (This specifically includes your presentations and the class notes).
4. Correctly name or give a molecular formula for a transition metal compound.
5. Accurately draw the structure of a transition metal compound, given either the name of the compound or its molecular formula.
6. Know the structures, chemical formulas, and donor atoms (points of coordination to a metal ion) of the ligands listed in the tables posted on ChemBoard.
7. Know the coordination number tendencies and preferences of the transition metals based on the information presented in class and in Chapter 8.
8. Know the different types of isomerism possible in transition metal complexes.
9. For a complex of a given formula and shape, predict what type of isomers will exist.
10. Understand the origin of d orbital splittings from both a crystal field (electrostatic) and ligand field (molecular orbital) perspective.
11. Predict the d orbital splitting pattern and distribute electrons among the d orbitals for a complex given its geometry.
12. Predict the number of unpaired electrons in a complex and correlate that number with the magnetic behavior.
13. Calculate ligand field stabilization energy (LFSE) for a given transition metal complex.
14. Identify the donor and acceptor properties of a given ligand. Understand the effect of the ligand nature on the properties of coordination complexes.
15. Use the spectrochemical series to predict behavior and properties of metal complexes.
16. Identify metal complexes that exhibit a Jahn-Teller effect and explain the origin of this effect.
17. Qualitatively explain the retention or lack of retention of isomerism in metal complexes in light of ligand substitution rates.