**Quiz 9**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Is this week’s experiment qualitative or quantitative (2 points)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Rank the following complex ions in order of increasing wavelength of light absorbed (3 points): Co(H2O)63+, Co(CN)63-, CoI63-, Co(en)63+
3. Which of the following ligands are capable of linkage isomerism? Explain your answer (4 points).   
   SCN-, N3-, NO2-, NH2CH2CH2NH­2, OCN-, I-
4. The hexafluorochromate(II) ion is known to have four unpaired electrons (5 points).
   1. Write the chemical formula: \_\_\_\_\_\_\_\_\_\_\_\_
   2. Write the condensed electron configuration of the transition metal ion.
   3. Does the F­- ligand produce a strong or weak field? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. The carbonate ion, CO32- can act as either a monodentate or bidentate ligand (6 points).
   1. Draw a picture of CO32- coordinating to a metal ion as a monodentate and as a bidentate ligand.
   2. The carbonate ion can also act as a bridge between two metal ions. Draw a picture of a CO32- ion bridging between two metal ions.

**Quiz 9**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Is this week’s experiment qualitative or quantitative (2 points)? \_\_\_qualitative\_\_\_\_\_\_
2. Rank the following complex ions in order of increasing wavelength of light absorbed (3 points): Co(H2O)63+, Co(CN)63-, CoI63-, Co(en)63+

Co(CN)63- < Co(en)63+ < Co(H2O)63+ < CoI63-,

1. Which of the following ligands are capable of linkage isomerism? Explain your answer (4 points).   
   SCN-, N3-, NO2-, NH2CH2CH2NH­2, OCN-, I-

SCN-, NO2-, and OCN- can form linkage isomers; all are able to bond to the metal ion in two different ways.

1. The hexafluorochromate(II) ion is known to have four unpaired electrons (5 points).
   1. Write the chemical formula: \_\_\_\_CrF64-
   2. Write the condensed electron configuration of the transition metal ion.

Cr: [Ar] 4s1 3d5

Cr2+: [Ar] 3d4

* 1. Does the F­- ligand produce a strong or weak field? \_\_\_\_weak field

1. The carbonate ion, CO32- can act as either a monodentate or bidentate ligand (6 points).
   1. Draw a picture of CO32- coordinating to a metal ion as a monodentate and as a bidentate ligand.



* 1. The carbonate ion can also act as a bridge between two metal ions. Draw a picture of a CO32- ion bridging between two metal ions.

