**Quiz 8**

# 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. Answer the following questions about Na2[Zn(CN)4] (4 points).
	1. Which ion is the counterion? \_\_\_\_\_\_\_\_\_\_\_\_
	2. What is the name of the compound? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Sketch the stereoisomers of the square planar complex ion CuCl2Br22-. Are any of these isomers chiral (5 points)?
3. What determines whether a transition metal ion is in a high-spin configuration or a low-spin configuration (3 points)?
4. The octahedral crystal field splitting energy, Δo, of tri-1,10-phenanthrolinecobalt(III), Co(phen)33+ is 5.21 × 10-19 J/ion (8 points).
	1. What is the wavelength of this solution in nm?
	2. What is the color of this solution? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Quiz 8**

# 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. Answer the following questions about Na2[Zn(CN)4] (4 points).
	1. Which ion is the counterion? \_\_\_Na+
	2. What is the name of the compound? \_\_\_\_\_\_\_\_\_sodium tetracyanozincate(II)\_\_\_\_\_\_\_\_\_
2. Sketch the stereoisomers of the square planar complex ion CuCl2Br22-. Are any of these isomers chiral (5 points)?

Draw cis and trans isomers.



Neither isomer is chiral.

1. What determines whether a transition metal ion is in a high-spin configuration or a low-spin configuration (3 points)?

Ligand field strength determine whether a complex is high spin or low spin. Stronger ligand fields induce low-spin arrangements.

1. The octahedral crystal field splitting energy, Δo, of tri-1,10-phenanthrolinecobalt(III), Co(phen)33+ is 5.21 × 10-19 J/ion (8 points).
	1. What is the wavelength of this solution in nm?

$$∆\_{o}=\frac{hc}{λ}⇒λ=\frac{hc}{∆\_{o}}=\frac{\left(6.626×10^{-34} J s\right)\left(3.00×10^{8}\frac{m}{s}\right)}{5.21×10^{-19}\frac{J}{ion}}×\frac{1 nm}{10^{-9} m}=382 nm$$

* 1. What is the color of this solution? \_\_\_\_\_\_\_colorless