

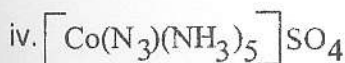
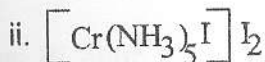
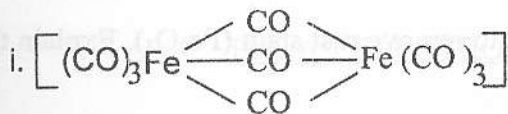


EASTERN UNIVERSITY, SRI LANKA
SECOND YEAR IN SCIENCE
FIRST SEMESTER-2003/2004 (Proper)
CH 201 CO-ORDINATION CHEMISTRY AND MAIN GROUP
CHEMISTRY

Answer All Questions.

Time: 01 Hour

1. a. Write the IUPAC names of the following compounds



b. Write the chemical formula of the following complexes

i. Potassium tetrahydroxoaurate(III)

ii. Trioxalatoferrate(III) ion

iii. Tetrakis(pyridine)platinum(II) tetrachloroplatinate(II)

iv. μ -hydroxo-bis[pentaamminechromium(III)] chloride

c. (I) What are the two major types of isomerism that are exhibited by the co-ordination compounds?

(II) Identify the type of isomerism that is found in each of the following pairs of compounds.

i. $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$

ii. $[\text{Fe}(\text{SCN})]^{2+}$ and $[\text{Fe}(\text{CNS})]^{2+}$

iii. $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Cr}(\text{CN})_6]^{3-}$ and $[\text{Cr}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{CN})_6]^{3-}$

(III) Draw all possible isomers of the following compounds.

i. $[\text{Co}(\text{C}_2\text{O}_4)_2\text{Cl}_2]^{3-}$

ii. $[\text{Co}(\text{en})_3]^{3+}$

- d. (i) Draw the splitting pattern of d orbital energy in an octahedral ligand field.
(ii) Calculate the Crystal Field Stabilization Energy (CFSE) for the ion $[\text{Mn}(\text{CN})_6]^{4-}$ in Dq.

2. a. (i) Write down the two factors contributing to the magnetic moment of an electron.

(ii) Write the equation which is used to calculate the spin-only magnetic moment of an electron. Explain all the terms in it. What is the unit used for the measurement of the magnetic moment?

(iii) Calculate the spin only magnetic moment for the tetrahedral compound $[\text{CoCl}_4]^{2-}$.

b. Oxalic acid is often used to remove rust stain (Fe_2O_3). Explain this observation by giving an equation.

c. (i) List out four uses of phosphorus.

(ii) Explain the following:

- The electrical conductivity of the group 1A elements decrease as the atomic sizes increase.

- Carbon does not form complexes but the other group 4A elements do.

iii. Discuss the structures of the interhalogen compounds ClF_3 and IF_7 .