

## UNIT - 9

### CO-ORDINATION COMPOUNDS

#### 1 Mark Questions

1. Write the IUPAC name of the complex  $\text{Na}_3[\text{Cr}(\text{OH})_2\text{F}_4]$ .
2. Write the IUPAC name of  $[\text{CO}(\text{en})_2\text{Cl}(\text{ONO})]^+$
3. Which of these cannot act as ligand and why:  $\text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{CO}$ ,  $\text{CH}_4$ . Give reason?
4.  $\text{NH}_3$  is strong ligand  $\text{NH}_4^+$  ion is not, why?
5. Which of the two is more stable  $\text{K}_4[\text{Fe}(\text{CN})_6]$  or  $\text{K}_3[\text{Fe}(\text{CN})_6]$ .

#### 2 / 3 Mark Questions

1. A coordination compound has a formula  $(\text{CoCl}_3 \cdot 4\text{NH}_3)$ . It does not liberate  $\text{NH}_3$  but precipitates chloride ion as  $\text{AgCl}$ . Give the IUPAC name of the complex and write its structural formula.
2. How is stability of co-ordination compounds determined in aqueous solution? Select a complex formation reaction and write an expression for the stability constant of the complex. Mention the factors affecting stability of complexes.
3. Why do tetrahedral complex not show geometrical isomerism?
4. Write the correct formula for the following co-ordination compounds.  
 $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  (Violet, with 3 Chloride ions/ Unit formula)  
 $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  (Light green colour with 2 Chloride ions/ unit formula)  
 $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  (Dark green colour, with 1 Chloride ion/ unit formula)
5. Aqueous copper sulphate solution (blue in colour) gives:
  - a. a green precipitate with aqueous potassium fluoride
  - b. a bright green solution with aqueous potassium chloride. Explain these experimental results.
6. Identify complexes with different geometries depending upon the type of hybridization.  
(a)  $[\text{Co}(\text{NH}_3)_6]^{3+}$  (b)  $[\text{CoF}_6]^{3-}$
7. One mole of complex compound  $\text{Co}(\text{NH}_3)_5\text{Cl}_3$  gives 3 moles of ions on dissolution in water. One mole of same complex reacts with 2 moles of  $\text{AgCl}(\text{s})$ . What is the structure of the complex and write its formula.
8. When an aqueous solution of Nickel (II) chloride is mixed with ethane-1,2 diamine(en) in the molar ratios en : Ni=1:1, 2:1 and 3:1, the green coloured solution finally turns violet. Explain the chemical reactions based on the data provided.