BHARATIYA VIDYA BHAVAN'S V M PUBLIC SCHOOL, VADODARA

QUESTION BANK

Chapter -9 Co-ordination Comp. Questions Bank

Vary short answer type questions **[01 marks]**

1) Arrange the following complexes in the increasing order of conductivity of their solution:
   $[Co(NH_3)_3Cl_3]$,$[Co(NH_3)_4Cl_2]Cl$,$[Co(NH_3)_6]Cl_3$,$[Co(NH_3)_5Cl]Cl_2$.
2) What are ambidentate ligands? Give an Example.
3) Name the type of isomerism when ambidentate ligands are attached to central metal ion.
4) What do you understand by denticity of a ligand?
5) Why is CO a stronger ligand than Cl^-?
6) Using IUPAC norms write the formula for the following: Tetrahydroxozincate (II) 7) Using IUPAC norms write the formula for the following: Hexaamminecobalt (III) sulphate.
8) Using IUPAC norms write the formula for the following: Pentaamminecobalt –O-cobalt (III)
9) Write the IUPAC name of the complex $[Cr(NH_3)_4Cl_2]Cl$.
10) Using IUPAC norms write the systematic name of the following: $[Co\ (en)_3]^{3+}$.

Short answer type questions **[02 marks]**

1) A Coordination compound $CoCl_3.\ 4H_2O$ precipitates silver chloride when treated with silver nitrate. The molar conductance of its solution corresponds to a total of two ions. Write structural formula of the compound and name it.
2) Write all the geometrical isomers of $[Pt(NH_3)(Br)(Cl)(py)]$ and how many of these will exhibit optical isomers?
3) Draw the geometrical isomers of (i) $[CoCl_2(en)_2]^+$ (ii) $[Cr(NH_3)_4Cl_2]^+$
4) Draw structure of geometrical isomers of $[Fe(NH_3)_2(CN)_4]$
5) Name the following coordination entities. (i) $[Cr(NH_3)_4Cl_2]^+$ (ii) $[Co(en)_3]^{3+}$

6) Name the following coordination compounds according to IUPAC system of nomenclature.
   (i) $[Co(NH_3)_4(H_2O)Cl_2$ (ii) $[CrCl_2(en)_2]Cl$; (en=etane-1,2-diamine)
7) Write the IUPAC name of the complex $[Cr(NH_3)_4Cl_2]$. What type of isomerism does it exhibit?

8) Draw the structures of (i) $[Ni(CO)_4]$ (ii) $[Fe(CO)_5]$

9) $[Cr(NH_3)_6]^{3+}$ is paramagnetic while $[Ni(CN)_4]^{2-}$ is Diamagnetic. Explain Why?

10) A solution of $[Ni(H_2O)_6]^{2+}$ is green but a solution of $[Ni(CN)_4]^{2-}$ is colourless. Explain.

Short answer type questions **[03 marks]**

1) Write the IUPAC name of following coordination compounds.
   (i) $[Cr(NH_3)_3Cl_3]$
   (ii) $K_3[Fe(CN)_6]$
   (iii) $[CoBr_2(en)_2]^+$, (en= ethylenediamine).

2) Write the types of isomerism exhibited by the following complexes.
   (i) $[Co(NH_3)_5Cl]SO_4$
   (ii) $[Co(en)_3]^{3+}$
   (iii) $[Co(NH_3)_6[Cr(CN)_6]$

3) Draw the structure of the followings:
   (i) Cis – dichloridotetracyanochromate (III)
   (ii) Pentaamminenitrito-N-Cobalt (III)

4) Explain the following cases giving appropriate reasons.
   (i) Nickel does not form low spin octahedral complexes.
   (ii) the π- complexes are known for the transition metals only.
   (iii) Co^{2+} is easily oxidized to Co^{3+} in the presence of a strong ligand.

5) Give the electronic configuration of the following complexes on the basis of crystal field Splitting theory:
   $[CoFe]^{3-}$, $[Fe(CN)_6]^{4-}$ and $[Cu(NH_3)_6]^{2+}$

6) For the complex [NiCL4]2-, write
   (i) The IUPAC name
   (ii) The hybridization type
   (iii) the shape of the complex. (Atomic no. Of Ni =28)