



INDIAN SCHOOL NIZWA - WORKSHEET

CHEMISTRY

CH:5 COORDINATION COMPOUNDS

Name: _____ Date: _____ Class: XII Sec: _____

I Write the formula of the following

Bis(ethane-1, 2-diamine)dihydroxidochromium(III) chloride.

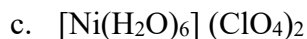
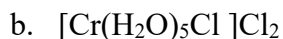
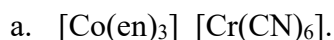
Copper hexacyanoferrate (II)

Potassium tetracyanonickelate(II)

Pentaammine chloridoplatinum (IV) chloride

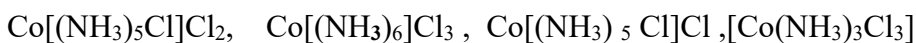
Diammine silver (I) cation

2. Write IUPAC names of the following

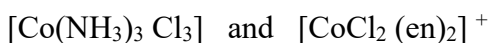


3. Does ionization isomer for the following compound exist? Justify your answer.
 $\text{Hg}[\text{Co}(\text{SCN})_4]$

4. Arrange the following complexes in increasing order of electrical conductivity.



5. Draw the structures of geometrical isomers of the following coordination compounds.



6. Which among $[\text{Ag} (\text{NH}_3)_2] \text{Cl}$, $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{CuCl}_4]^{2-}$ are colourless in aqueous solution and why?

7. Among the coordination complexes $[\text{Co} (\text{en})_2(\text{ONO}) \text{Cl}]$ & $[\text{Ni} (\text{CN})_4]^{2-}$

i) which has square planar geometry?

ii) which remains colourless in aqueous solutions and why?

8. Name the type of isomerism exhibited by the following.



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- a. $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2] \text{Br}$ and $[\text{Pt}(\text{NH}_3)_2(\text{H}_2\text{O})(\text{Br})] \text{NO}_2$
b. $[\text{Cr}(\text{H}_2\text{O})_5 \text{SCN}]^{2+}$ and $[\text{Cr}(\text{H}_2\text{O})_5 \text{NCS}]^{2+}$
c. $[\text{Co}(\text{NH}_3)_5(\text{NO}_2)](\text{NO}_3)$ d) $[\text{Co}(\text{NH}_3)_5 \text{NO}_2]^{2+}$
9. Draw the structures of the following complexes
a) $[\text{Pt}(\text{NH}_3)_4] [\text{NiCl}_4]$ b) $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})_2] \text{Cl}_3$
10. Is the central metal atom in coordination complexes a Lewis acid or a Lewis base? Explain.
11. Draw the structures of the following complexes
a) $[\text{Pt}(\text{NH}_3)_4] [\text{NiCl}_4]$ b) $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})_2] \text{Cl}_3$
c) $\text{Trans } [\text{Co}(\text{NH}_3)_4 \text{Cl}_2]^+$ d) $\text{cis } [\text{CrCl}_2(\text{ox})_2]^{3-}$
12. Explain how $[\text{Pt}(\text{NH}_3)_2 \text{Cl}_2]$ and $[\text{Pt}(\text{NH}_3)_6] \text{Cl}_2$ will differ in their electrolytic conductances. Give the hybridization states of Pt in these compounds. [At no: 78]
13. Explain why a chelating complex is more stable than a non chelated complex.
14. CO is a stronger complexing agent than NH_3 . Why?
15. Which among the following is more stable complex and why?
 $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{Co}(\text{en})_3]^{3+}$
16. When a coordination compound $\text{CoCl}_3 \cdot 6\text{NH}_3$ is mixed with AgNO_3 , 2 mols of AgCl are precipitated per mole of the compound.
a) Write the structural formula of the complex.
b) What is the IUPAC name of the complex?
17. On the basis of crystal field theory, write the electronic configuration for d^4 with a strong field ligand and weak ligand. Draw the crystal field splitting diagram of the above complexes.
18. Using valence bond theory, predict the hybridization and magnetic character of the complex : $[\text{Ni}(\text{CO})_4]$
19. Using Crystal Field Theory, write the electronic configuration of iron ion in the following complex ion. Also predict its magnetic behaviour : $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
20. Out of NH_3 and CO , which ligand forms a more stable complex with a transition metal and why?



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