Answer all the questions below as fully as you can then check your answers

1. What is the correct name for the complex $[Cr(NH_3)_3Cl_3]$?
    - a) Triamminetrichlorochromium(III)
    - b) Triamminechlorochromium(III)
    - c) Triamminechromium chloride
    - d) Triamminechlorochromium chloride

2. Which ligand name is correct for H_2O in a coordination complex?
    - a) Water
    - b) Aqua
    - c) Hydrate
    - d) Hydroxo

3. Which metal's name changes to its Latin name aurate-derived form in an anionic complex?
    - a) Zinc
    - b) Gold
    - c) Manganese
    - d) Nickel

True/False Questions

4. In a cationic complex, the oxidation state of the metal is written in Roman numerals after the metal name.

5. The prefix "tetra" is replaced with "tetrakis" for ligands like ethylenediamine.

6. Provide the systematic name for the complex $[CuCl_4]^{2-}$.

7. What is the charge on the cobalt ion in the complex $[Co(NH_3)_6]Cl_3$?

8. Name the ligands found in the complex $[Pt(NH_3)_2Cl_2]$.

a. Name this complex

9. Determine the name of the salt $[Ni(CN)_4]^{2-}$. Use the rules provided.

10. Name the salt $K_3[Al(C_2O_4)_3]$.

11. Write the formula for diamminedibromocobalt(III) nitrate.

12. Explain why the name for $[Fe(CN)_6]^{3-}$ is hexacyanoferrate(III) and not hexacyanoiron(III).

Answers

1. What is the correct name for the complex $[Cr(NH_3)_3Cl_3]$?
    a. a) Triamminetrichlorochromium(III)
    b. b) Triamminechlorochromium(III)
    c. c) Triamminechromium chloride
    d. d) Triamminechlorochromium chloride
    Answer: a) Triamminetrichlorochromium(III)
2. Which ligand name is correct for H_2O in a coordination complex?
    a. a) Water
    b. b) Aqua
    c. c) Hydrate
    d. d) Hydroxo
    Answer: b) Aqua
3. Which metal's name changes to its Latin name aurate-derived form in an anionic complex?
    a. a) Zinc
    b. b) Gold
    c. c) Manganese
    d. d) Nickel
    Answer: b) Gold
4. In a cationic complex, the oxidation state of the metal is written in Roman numerals after the metal name.
    Answer: True
5. The prefix "tetra" is replaced with "tetrakis" for ligands like ethylenediamine.
    Answer: True
6. Provide the systematic name for the complex $[CuCl_4]^{2-}$.
    Answer: Tetrachlorocuprate(II)

7. What is the charge on the cobalt ion in the complex $[Co(NH_3)_6]Cl_3$?

   Answer: +3

8. Name the ligands found in the complex $[Pt(NH_3)_2Cl_2]$.

   Answer: Ammine and Chloro

   a. Name this complex

   b. Answer: diamminedichloroplatinum(II)

9. Determine the name of the salt $[Ni(CN)_4]^{2-}$. Use the rules provided.

Answer: The complex is anionic. The nickel ion (Ni^{2+}) is bonded to four cyanide (CN^-) ligands. Cyanide is a negatively charged ligand. The complex is named: tetracyanonickelate(II).

10. Name the salt $K_3[Al(C_2O_4)_3]$.

Answer: The metal complex contains three oxalate ($C_2O_4^{2-}$) ligands, which are anionic. The aluminium ion is in an anionic complex. The name is: potassium tris(oxalato)aluminate(III).

11. Write the formula for diamminedibromocobalt(III) nitrate.

Answer: The complex has three ammine (NH_3) ligands, one bromide (Br^-) ligand, and cobalt in the +3 oxidation state. The nitrate ion balances the charge. Formula: $[Co(NH_3)_3Br_2]NO_3$.

12. Explain why the name for $[Fe(CN)_6]^{3-}$ is hexacyanoferrate(III) and not hexacyanoiron(III).

Answer: In anionic complexes, the metal name changes to its Latin name-when available. "Ferrum" is the Latin name for iron, leading to "ferrate."