CH1012 Tutorial 3

Name:

1. Name the following compounds:

   $Na[Co(en)Br_4]$

   $Na_3[CoF_6]$

   $[Mn(en)_2(OH_2)_2]^{2+}$

   $[Mn(H_2O)_5Br]SO_4$

   $[Cr(NH_3)_4(CN)Br]Cl$

   $[Ru(bipy)_3](NO_3)_2$

2. Draw structures of the following complexes and identify those that may exist as geometric isomers:

   • $[Ir(PH_3)_2Cl_2]^-$

   • $[Rh(en)_2ClBr]$

   • $[Cd(H_2O)_2Cl_2]$

3. In metal complexes the ligands which are attached to the metal centre may be classified as either **monodentate** or **polydentate**.
   - What do the terms monodentate and polydentate mean. Explain the key features of a polydentate ligand using a trien iron complex as an example - include the **donor atoms** and the **chelation effect** in your answer.

4. Describe the bonding in transition metal coordination complexes using a Lewis acid / Lewis base description of **coordinate covalent bonding**.
   - Sketch a tetrahedral zinc complex to illustrate your answer.

5. What is **hemoglobin** and how does it function at a molecular level as an oxygen transport protein?