CH103
Tutorial 1
01.04.2022

1. Write the structure of the chelating amines with following abbreviations.
    a. en
    b. dien
    c. tacn
    d. trien
    e. tren

2. In class, you have learnt about the ligand acetylacetonato. What is the IUPAC name of this ligand? A certain ligand is abbreviated as nacnac. Predict the structure of this ligand, its IUPAC name and formula.

3. Several phosphorus based chelating ligands are also known in literature. Some of the most popular ones are dppe and BINAP. Write the structure of these two chelating phosphine ligands.

4. Draw the structure of the ligand that you will obtain if you react ethylenediamine with salicylaldehyde. What is the common name and IUPAC name for that ligand?

5. Draw the structure of the ligand that you will obtain if you react o-phenylenediamine (instead of ethylenediamine) with salicylaldehyde. What is the common name for that ligand?

6. Two Cobalt complexes are shown below.

$$[Co(NH_3)_4(H_2O)Cl]Br_2 \qquad \text{and} \qquad [Co(NH_3)_4Br_2]Cl \cdot H_2O$$

Clearly, the above two complexes are isomers because they have the same overall formula. What kind of structural/constitutional isomers would you consider the above complexes. How will you chemically distinguish the two complexes?

7. What is the chemical composition of Magnus green salt? Mention the structure of other complexes that are it's a) coordination isomer(s) and b) polymerization isomer(s).

8. How many coordination isomers are possible for the complex with formula $[Co(bpy)_3]^{3+}[Fe(CN)_6]^{3-}$. Give formulae for compounds that are coordination isomers $[Co(bpy)_3]^{3+}[Fe(CN)_6]^{3-}$. What is the structure of bpy ligand? Can it act as a bridging ligand and why?

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