

**Tutorial I**

1. Give the electronic configuration for the following elements or ions:
  - (i) Fe(0) dan Fe(III)
  - (ii) Co(0) dan Co(V)
  - (iii) V(0) dan V(IV)
  - (iv) Mn(0) dan Mn(VII)
2. What is the oxidation state for the metal in each of the following complexes?
  - (i)  $[\text{Mn}(\text{CO})_5\text{Br}]$
  - (ii)  $[\text{Ni}(\text{en})_3]\text{SO}_4$
  - (iii)  $[\text{Pt}(\text{py})(\text{NH}_3)\text{BrCl}]$
  - (iv)  $[\text{Cr}(\text{NH}_3)_2(\text{H}_2\text{O})_3(\text{OH})](\text{NO}_3)_2$
3. Write the formula for the following compounds.
  - (i) Tetraamminedichlororuthenium(III) nitrate
  - (ii) Hydridonitrosylbis(triphenylphosphine)nickel(II)
  - (iii) Diaquadiiododinitritopalladium(IV) (note: all ligands *trans*)
  - (iv) Aquachlorobis(ethylenediamine)rhodium(III) chloride
4. Suggest an example for each of the following ligands.
  - (i) Asymmetrical bidentate ligand
  - (ii) Tetradentate ligand
  - (iii) Bridging ligand with one donor atom
  - (iv) Hexadentate ligand
5. Give the correct names according to the IUPAC system for the following compounds:
  - (i)  $[\text{Ni}(\text{C}_5\text{H}_5)\text{NO}]$
  - (ii) *cis*- $[\text{PtCl}_2(\text{Et}_3\text{P})_2]$
  - (iii)  $[\text{Co}(\text{NH}_2)_2(\text{NH}_3)_4]\text{OC}_2\text{H}_5$
  - (iv)  $[\text{Fe}(\text{py})_3][\text{Fe}(\text{CO})_4]$
6. For the octahedral complex having the formula  $\text{M}(\text{ABC})(\text{NH}_3)(\text{H}_2\text{O})\text{Br}$ , where ABC = the tridentate ligand  $\text{H}_2\text{N}-\text{C}_2\text{H}_4-\text{PH}-\text{C}_2\text{H}_4-\text{AsH}_2$ ; answer the following questions:
  - (i) How many isomers are possible?
  - (ii) How many of these consist of pairs of enantiomers?

Sketch all isomers.