

NAMING OF METAL ION

It is already mentioned in naming of Ionic Complexes Cation is named first then anion and it has been also mentioned in naming Complex ion Ligands are named first then Central metal ion.

Now following Rules has been observed in naming Central Metal ion.

(a) If Complex ion is Cation then Central metal ion is named as usual and no characteristic of suffix is given.

For example: -  $[Ni(NH_3)_6]Cl_2 \rightleftharpoons [Ni(NH_3)_6]^{2+} + 2Cl^-$   
 i.e. the Central metal ion Ni is Placed in the Cationic Part Hence its name is given as follows.

$[Ni(NH_3)_6]Cl_2 \rightarrow$  Hexa Amine Nickel II chloride  
 $[Ni(NH_3)_6]^{2+} \rightarrow$  Hexa Amine Nickel II Ion.

(ii)  $[Cr(NH_3)_6](NO_3)_3 \rightarrow$  Hexa Amine Chromium III Nitrate  
 $[Cr(H_2O)_6](ClO_4)_3 \rightarrow$  Hexa Aquo Chromium III Perchlorate.

NON IONIC Complexes:-

$[Pt(NH_3)_2Cl_4] \rightarrow$  Tetra chloro diamine Platinum IV  
 $[Co(NH_3)_3(NO_2)_3] \rightarrow$  Tri Nitro triamine Cobalt III

(b) If the Complex ion is Anion but Complex is not an acid, then the name of Central metal ion ends with 'ate'.

- e.g.
- Cobalt  $\rightarrow$  Cobaltate
  - Nickel  $\rightarrow$  Nickelate
  - Platinum  $\rightarrow$  Platinate
  - Iron  $\rightarrow$  Ferrate
  - Gold  $\rightarrow$  Aurate
  - Silver  $\rightarrow$  Argentate
  - Lead  $\rightarrow$  Plumbate
  - Silicon  $\rightarrow$  Silicate
  - Zinc  $\rightarrow$  Zincate

i.e.  $K_2[Al(C_2O_4)_3] \rightarrow$  Potassium tri Oxalato Aluminate IV  
 $x-6 = -2$   
 $x = 6-2 = 4$

If the Complex is an ~~acid~~ IONIC but nature of the Complex is acidic then the name of Central metal ion ends with IC  
 Pt = Platonic; Pb,  $\rightarrow$  Plumbic

(c) Metal to metal bonding: - If Complexes containing metal to metal bonds then the prefix bi is used before the name of the metal

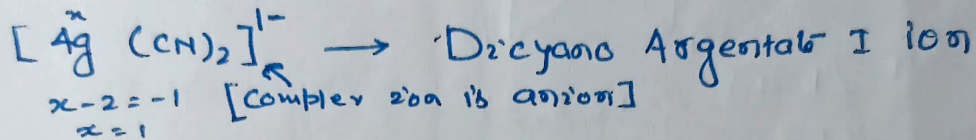
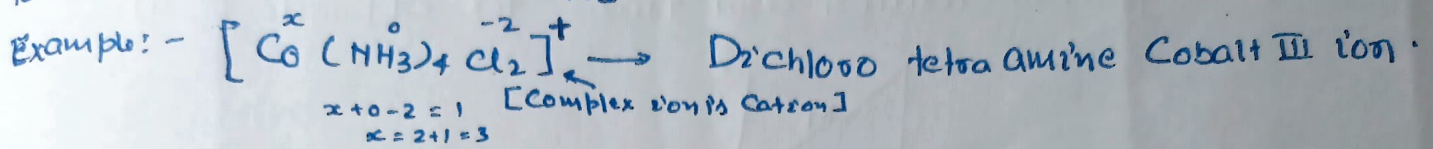
For example: -  $[(CH_3NH_2)_4Pt - Pt(NH_2CH_3)_4]^{2+} 2Cl^-$

Sym-dichloro Octakis (methyl-amine) bis Platinum II Chloride.

# Oxidation state of Central metal ion in Complex

Oxidation state of Central metal ion is written after the name of Central ion in small bracket in Roman Numerals i.e. I II III IV ... etc.

If we have to name any "Complex ion" not a complex compound, then word "ion" is named after Oxidation state.



For Zero Oxidation state a letter '0' is written in Bracket and for a negative Oxidation state the "negative sign" is used before Roman Numerals.

For example: - (i)  $K_4[Ni(CN)_4]$  O.S. of Ni is Zero  
Now name is as Potassium tetra cyano Nickelate [0]  
Nickel is named as Nickelate because  $[Ni(CN)_4]^{4-}$  is anion

(ii)  $Na[Co(CO)_4]$  O.S. of Co is -1  
Naming as Sodium tetra Carbonyl Cobaltate (-1)