

Complex Salts

1. Order of Naming ions or Complex: - In Inorganic complexes or Ionic Complexes Cation is named first then anion. (i.e. NaCl Sodium chloride)
 For Example: - $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2 \rightarrow$ Hexa ammine nickel II chloride.
 [Here Six NH_3 is referred as Hexa ammine, then O.N. of Ni i.e. II then chloride.]

Non Ionic Complexes i.e. Molecular Complexes, However they are given One word Name.

e.g. $[\text{Pt}(\text{NH}_3)_2\text{Cl}_4]$ is named as Tetra chloro diamino Platinum(IV)
 [Most electronegative then less or neutral then Name of Metal with O.N.]

2. Naming of Ligands: - (a) In naming of a complex ion, Ligands are named first and the number of Ligands is indicated by writing di, tri, tetra, etc., before the name of ligand, but the hyphen is not introduced between the name of ligand and the suffix number.

- (b) If there are two or more different kinds of Ligands then Ligands are named in the following order: -

(i) Negative (ii) Neutral (iii) Positive, without separator by hyphen.

Within Ligands of same Category the groups are listed in order of increasing complexity (i.e. Halo substituents are named according to increasing electronegativity)

For example $[\text{Pt}(\text{NH}_3)_4 \cdot \text{NO}_2 \text{Cl}] \text{SO}_4$ is named as Chloro Nitrito tetra ammine - Platinum(IV) Sulphate

$\text{NH}_4[\text{Cr}(\text{NH}_3)_4(\text{NCS})_4]$:- Ammonium tetra thiocyanato diammine Chromate III

- (c) Neutral Ligands are named as the molecule, If However neutral molecule is Water, then it is named as Aquo and Ammonia molecule is named as ~~ammine~~ Amine.

- (d) The names of anion which are bounded with metal ion as Ligand is as follows: -

- (i) Anions bounded with metal ion and its name ends with 'ide' then 'ide' is replaced by 'o'.

F^- - Fluoride $\rightarrow$ Fluoro

Cl^- - chloride $\rightarrow$ chloro

CN^- - cyanide $\rightarrow$ cyano

OH^- - hydroxide $\rightarrow$ Hydroxo

Br^- - bromide $\rightarrow$ Bromo

NH_2^- - imide $\rightarrow$ Imido

NH_2^- - Amide $\rightarrow$ Amido

O_2^{2-} - Peroxide $\rightarrow$ Peroxo

O_2H_2 - Peroxyhydroxide $\rightarrow$ Peroxyhydroxo

- (ii) In some cases, the anionic Ligands which ends with 'ate' or 'ite', the 'e' is replaced by 'o'.

SO_4^{2-} - sulphate $\rightarrow$ Sulphato

$\text{C}_2\text{O}_4^{2-}$ - Oxalate $\rightarrow$ Oxalato

NO_3^- - Nitrate $\rightarrow$ Nitrate

NO_2^- - Nitrite $\rightarrow$ Nitrito

CH_3COO^- - Acetate $\rightarrow$ Acetato

- (iii) The names of Cationic Ligands are the same as those of the corresponding compound or ion.
 e.g. Carbonyl and Pyridine ($\text{C}_5\text{H}_5\text{N}$) is also named as usually.