

Nomenclature of coordination compound

The following rules, are recommended by IUPAC are applied for naming the coordination compounds.

1. Order of naming ions:- In ionic coordination complex the cation is named first and then the anion.
2. Naming the coordination sphere:- In naming the coordination sphere, the ligands are named first and then the central metal ion.
3. Names of ligands:- The names of negative ligands end in o and of positive ligands end in ium. The neutral ligands are named as such.

Negative ligands	Names.
Cl^-	Chloro
Br^-	Bromo
F^-	Fluoro
CN^-	Cyano
CH_3COO^-	Acetato
SO_4^{2-}	Sulphato
$(\text{COO})_2^-$	Oxalato
CO_3^{2-}	Carbonato
NO_2^-	Nitrito-N
NO_3^-	Nitrato
ONO^-	Nitrito-O
OH^-	Hydroxo
NH_2^-	Imido
H^-	Hydrido
O_2^{2-}	Peroxo
SCN^-	Thiocynato-S
NCS^-	Thiocyanato-N

(ii) Positive ligands:-

NO^+ Nitrosonium

NO_2^+ Nitronium 6

NH_2NH_3^+ Hydrazinium

(iii) Neutral ligands:-

However there are few exceptions in naming neutral ligands for M_2 .

H_2O Aqua NO nitrosyl

NH_3 Ammine Co Carbonyl.

(iv) Neutral ligand written as such.

$\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$ Ethylenediamine

$(\text{C}_6\text{H}_5)_3\text{P}$ Triphenyl phosphine

$\text{C}_6\text{H}_5\text{N}$ Pyridine.

4. Order of naming the ligands:- According to the latest IUPAC convention, the ligands are named ∞ in the alphabetical order.

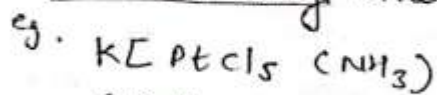
5. Numerical prefixes to indicate the number of ligands:-

For simple ligands like chloro, nitro, oxalato
2- di, 3- tri, 4- tetra, 5- penta,
6- hexa etc.

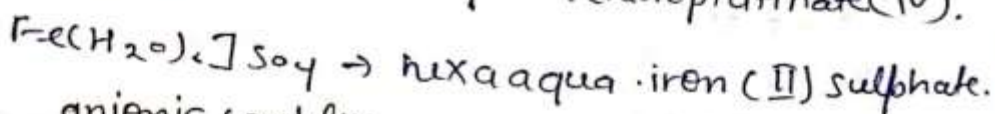
For complex ligands:- like ethylenediamine

2- bis, 3- tris, 4- tetrakis

6. Ending of names:- When the complex is anionic the name of the central metal atom ends in ate-. For cationic and neutral complex the name of the metal is given without any characteristic ending.



Potassium ammine pentachloroplatinate(IV).



Pf- anionic complex

Cu - cuprate

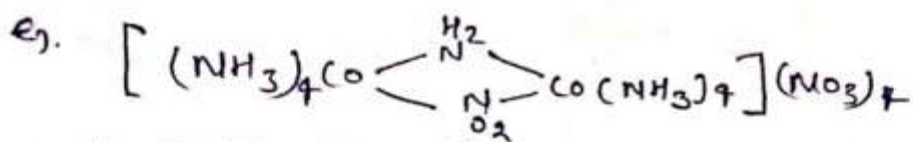
Fe - Ferrate

Ag - argentate

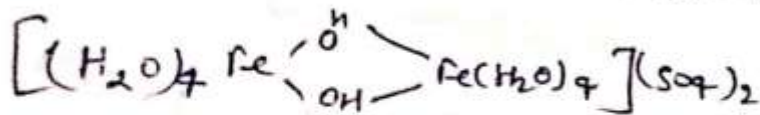
Au \rightarrow aurate.

7. Oxidation state of the central ion:- is designated by a Roman numeral such as II, III, IV etc.

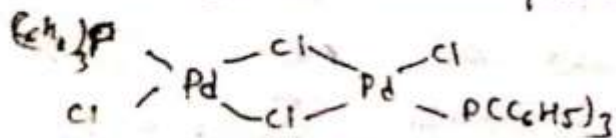
8. Bridging groups:- For ligands which act as bridges between 2 metal atoms, the greek letter μ is written before their names.



μ -imidido- μ -nitrito-N-octammine dicobalt(III) nitrate



di- μ -hydroxo-octaaqua diiron(III) sulphate.



μ -chloro-dichlorobis(triphenylphosphine) dipalladium(II).