

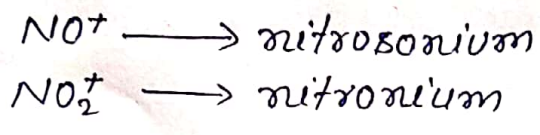
**Naming of Complexes:** The standards of nomenclature use the rules published by IUPAC in 1989, IUPAC suggested the following rules for systematic naming of Complexes:

- (i) The cationic part of the complex is named first followed by its anionic part just like simple salts because co-ordination compounds are actually salts. Any salt, say NaCl has two parts: cation  $\text{Na}^+$  & anion  $\text{Cl}^-$ . The cation is named first followed by the name of anion e.g. Sodium chloride.
- (ii) The constituents of co-ordination sphere are named in the order anionic ligands, neutral ligands and central metal or ion.
- (iii) Naming of ligands:
  - (a) If the name of the anion ends in 'ide', the 'ide' is replaced by 'o' but if it ends in 'ate' or 'ite', then only 'e' is replaced by 'o' e.g.
 

Halide	→	Halo
Sulphate	→	Sulphato
Sulphite	→	Sulphito
  - (b) Some ligands may become attached to the central metal through different donor atoms e.g.  $\text{NO}_2^-$  may become attached to metal through O-atom ( $\text{M} \leftarrow \text{ONO}$ ) or through N-atom ( $\text{M} \leftarrow \text{NO}_2$ ), then the ligand is given the name nitro-O and nitro-N respectively.
  - (c) Neutral ligands have their special names. e.g.
 

$\text{NH}_3$	→	ammine
$\text{H}_2\text{O}$	→	aquo
$\text{NO}$	→	nitrosyl
$\text{CO}$	→	carbonyl

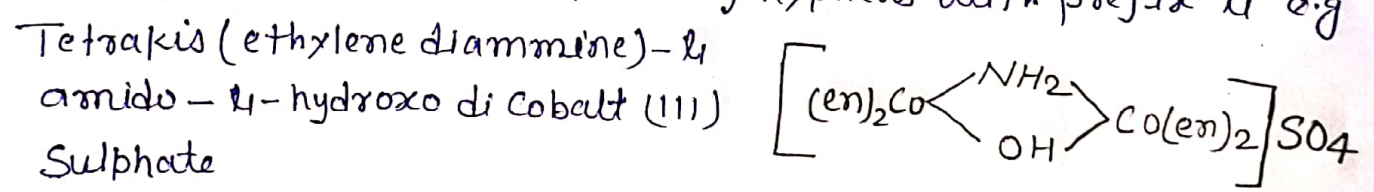
(d) The names of rarely observed cationic ligands end in 'ium' e.g



(e) If several ligands are present within a co-ordination sphere they are listed alphabetically and the prefixes di, tri, tetra etc. are used to express their numbers. However, these prefixes are not considered while determining the alphabetical order. In case of chelating ligands, the number is expressed as bis, tris, tetrakis etc for 2, 3, 4 molecules respectively before their short names in bracket e.g ethylene diammine as (en)

Complex	IUPAC Name
$[Co(NH_3)_3NO_2ClCN]$	Chlorocyanonitro triammine cobalt(III)
$[Cr(en)_3Cl_3]$	Tris(ethylene diammine chromium(III) chloride

(f) Names of bridge ligands (which link two metals) are separated from the rest of the complexes by hyphens with prefix 'μ' e.g



(iv) Naming of the central metal atom: Metals of cationic complexes have their usual names followed by oxidation states in Roman numerals within bracket but metals of anionic complexes are called by its symbolic names which are made to end in 'ate' followed by oxidation state in Roman numerals within bracket e.g.

$[Pt(NH_3)_6]Cl_4$	Hexammine platinum(IV) chloride
$K_4[Fe(CN)_6]$	Pot. hexacyano ferrate(II)
$K[Ag(CN)_2]$	Pot. dicyanoargentate(I)

(v) Complexes having both cationic and anionic complex ions are named as follows

$[Pt(NH_3)_4][PtCl_4]$  - Tetraammine platinum(II) tetrachloro-platinate(II).