Nishant Jindal

COORDINATION CHEMISTRY

I·U·P·A·C

$K_4[Fe(CN)_6]$

(1) Postive part named first followed by neg. part whether it is simple or complex

In naming of Complex/ion, ligands are named first acc. to to their alphabetic order

if there are many same kind of ligand then di, tri tetra etc. prefix provided to the ligand, if ligand already contain any of these prefix in its name then bis tris tetrakis etc. prefix provided to the ligand and the name of ligands are placed in small paranthesis

( )

-ive ligand has suffix 'o'

positive ligand has 'ium'

neutral ligand has no suffix

ide → o

CN^- Cyanide — cyano / cyanido

NC^- isocyanide — isocyano / isocyanido

$^-OCH_3$ = methoxide — methoxo / methoxide

X^- = Halide — Halo / Halido

O_2^- = superoxide — superoxo / superoxido

O_2^{-2} = peroxide — peroxo / peroxido

ide — ido

NH_2^- = amide — amido

NH^{-2} = Imide — Imido

N_3^- = Azide — Azido

N^{-3} = nitride — nitrido

H^- = Hydride → Hydrido

ate — ato

SO_4^{-2} = sulphate — sulphato

$NH_2CH_2-\overset{O}{\overset{\|}{C}}-O^-$ = glycinate — glycinato

ite — ito

$SnCl_3^-$ = trichlorostannite — trichlorostannito

tive

NO^+ = nitrosonium / nitrosyelium

$NH_2-\overset{+}{N}H_3$ = Hydrazium

Comman names are provided the neutral ligand except

H_2O = aqua / aquo

CO = carbonyl

NO = nitroso / nitrosyl

NH_3 = ammine

C_2H_4 = (ethylene) = (ethene)

(Et$_2$NH = diethyl amine)

(en = ethylenediamine)

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In naming of Metal cation, metal cation has suffix ate along with its english and lattin name when it is present in -ive complex

English name

Hg = mercury → mercurate

W — Tungston — Tungstate

Sb — Antimony — Antimonate

if metal cation/atom present in neutral / positive complex, then there is no suffix, comman use for metal

oxidation state (I), (-I)
(II)
(0)

$K_4[Fe(CN)_6]$

$4 + x + 6(-1) = 0$

$x = +2$

Potassium hexacyanidoferrate (II)

$[Ni(CO)_4]$

Tetracarbonylnickel (0)

$[Cu(NH_3)_4]^{+2}SO_4^{-2}$

Tetraammine copper (II) sulphate

$K_3[Fe(CN)_6]$

Potassium hexacyanidoferrate (III)

$K_3[Fe(ox)_3]$

Potassium trioxalatoferrate (III)

$3 + x + 3(-2) = 0$

$x = +3$

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$[Ni(en)_3]Cl_2$

Tris(ethylene diamine)nickel(II) Chloride

$[Co(NH_3)_6][Co(ONO)_6]$

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O.S states

Monoval.

C.N

$Cu^{+} = 2, 4$

$Ag^{+} = 2, 4$

$Au^{+} = 2, 4$

$Cl^{+} = 6$

Bivalent

$V^{+2} = 4, 6$

$Cr^{+2} = 4, 6$

$Mn^{+2} = 4, 6$

$Fe^{+2} = 4, 6$

$Co^{+2} = 4, 6$

$Ni^{+2} = 4, 6$

$Cu^{+2} = 4, 6$

$Zn^{+2} = 4$

$Cd^{+2} = 4, 6$

$Hg^{+2} = 2, 4$

$Pd^{+2} = 4$

$Pt^{+2} = 4$

Trival.

$Sc^{+3} = 6$

$Ti^{+3} = 6$

$V^{+3} = 6$

$Cr^{+3} = 6$

$Mn^{+3} = 6$

$Fe^{+3} = 6$

$Co^{+3} = 6$

$Rh^{+3} = 6$

$Ir^{+3} = 6$

$Al^{+3} = 4, 6$

Tetravalent

$Sn^{+4} = 6$

$Pd^{+4} = 6$

$Pt^{+4} = 6$

$Mo^{+4} = 6, 8$

other O.S

$Cr^{+6} = 6$

$Os^{+8} = 6$

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$$\left[Co^{+3}(NH_3)_6\right]^{+3}\left[Co^{+3}(O\bar{N}^{-1}O)_6\right]^{-3}$$

Hexaammine cobalt (III) hexanitritoCobaltate (III)

Hexammine cobalt (III) hexanitrito-O-Cobaltate (III)

NO_2^- | $\bar{O}NO$

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$[Pt(NH_3)_4][PtCl_4]$

Tetraammineplatinum(II) tetrachloridoplatinate(II)

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H_2SO_4

$H_2[PtCl_6]$

Hydrogen hexachloridoplatinate (IV)

Hexachloridoplatinic (IV) acid

$H[Au^{+3}Cl_4]$

Tetrachloridoauric (III) acid

$1 + x + 4(-1) = 0$

$H[Ag^{+3}F_4]^{\ominus}$ $(x = +3)$

Tetrafluoridoargentic (III) acid

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di | tri | tetra
Bis | tris |
η | μ

alphabetic order
X not Count

$[Ti(\pi-C_5H_5)_2(\sigma-C_5H_5)_2]$

Bis (η^5-cyclopentadienyl) bis (cyclopentadienyl) titanium (IV)

$K[Pt\,Cl_3(C_2H_4)]$

Potassium trichloro (η^2-ethylene) platinate (II)

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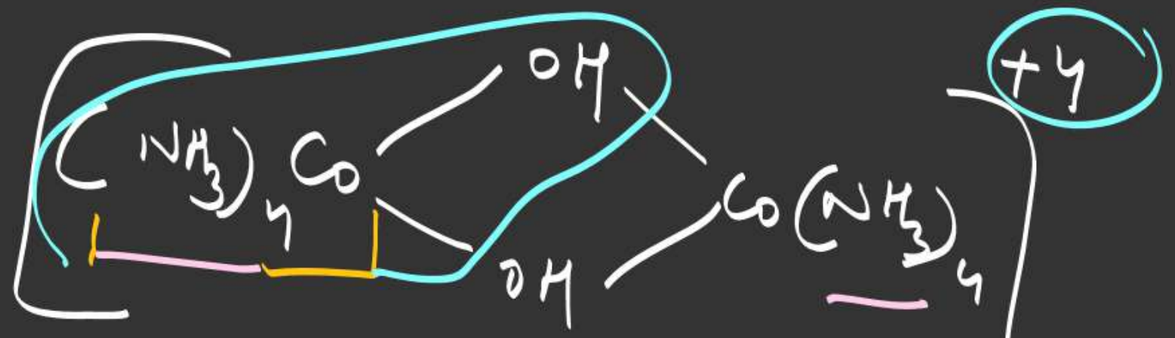
Naming of polynuclear or bridging complex comp.



Tetraammine**Cobalt** (III)-μ-dihydroxidotetraammine**Cobalt** (III)

μ- dihydroxidobis(tetraammine)di**Cobalt** (III)

μ-dihydroxidobis(tetraammine**Cobalt**(III))

Bis(μ-hydroxidotetraammine**Cobalt** (III))

μ-dihydroxidooctaammine di**Cobalt** (II)

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$[Be_4O(CH_3COO)_6]$

μ-Hexaacetato-μ_4-oxidotetraberyllium(II)

$[Zn_4O(NO_3)_6]$

μ-Hexanitrato-μ_4-oxidotetrazinc(II)