Write IUPAC Formula of the following :-

(1) Tetra ammine diaqua Cobalt (III) Chloride -

$$\left[Co\,(NH_3)_4\,(H_2O)_2\right]Cl_3$$

(2) Iron III hexa cynido Ferrate (II)

$$Fe_4^{+3}\left[Fe^{+2}(CN)_6\right]_3^{-4}$$

$+12 \Leftarrow$

(a) $Fe_4\left[Fe(CN)_6\right]$

(b) $Fe\left[Fe(CN)_6\right]$

(c) $Fe_4\left[Fe(CN)_6\right]_3$

(d) All of these.

(3) Dichloride bis (ethelene diammine) Platinum (IV) nitrate.

$$\left[Pt\,(Cl)_2\,(en)_2\right](NO_3)_2$$

$x - 2 = +2$

$x = +4$

Write IUPAC Formula of the following :-

(4) Potassium tetracynido nicklate(II)

$K_2[Ni^{+2}(CN)_4]$

Theories of Coordination Compounds :-

(1) WERNER'S THEORY :-

Werner's mainly Studied Cationic Complexes and found that metal ion in the complex has Two types of Valencies. (1) primary Valencies (1°)
(2) Secondary Valencies (2°)

(1) Primary Valency (1°)

It is equal to oxidation state.

It is satisfied by anions.

It is ionisable

It is non-directional

It is represented by dotted lines in werner theory.

(2) Secondary Valency (2°)

It is equal to the Coordination number (C.N.)
= no of ligand × dentricity.

It is satisfied with anions as well as neutral molecule.

It is non ionisable.

It is directional

It is represented by Solid lines.

(1) Primary Valency (1°)

Not Participate in Geometory

ex :-

(1) $[Co(NH_3)_6]Cl_3$

(i) P.V. :- $x + 0 = +3$

$x = +3$

OR

$x + 6(0) + 3(-1) = 0$

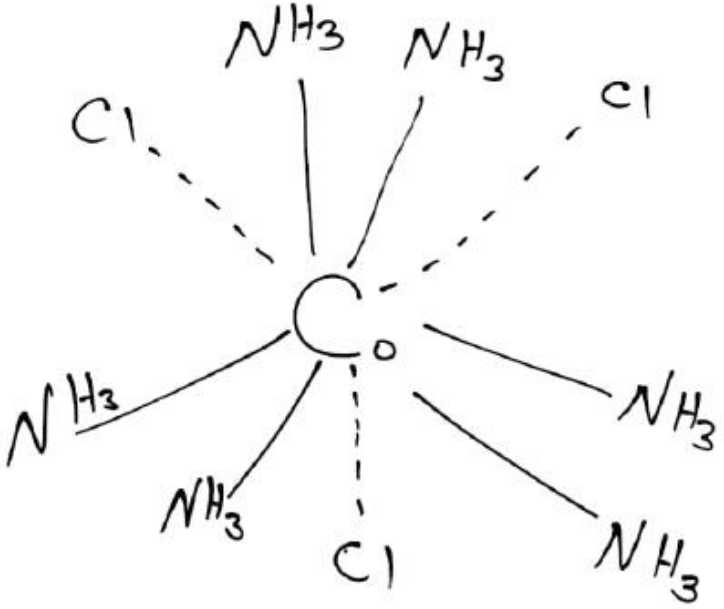
$x = +3$

(ii) S.V. :- C.N. = 6×1

C.N. = 6

(2) Secondary Valency (2°)

Participate in geometory.



(2) $[Co(NH_3)_5(Cl)]Cl_2$

P.V. :- $x + 5(0) - 1 + 2(-1) = 0$

$x = +3$

S.V. :- C.N. $= 5 \times 1 + 1 \times 1$

C.N. $= 6$