M.H. Khan 7-5-20 Thu, topic isomerism, Time 11.40-12.30 marwari college.

$[Fe(CN)_6][Ni(CO)_6] \rightarrow [Fe(CO)_6][Ni(CN)_6]$

4- Hydrated isomerism :- when complex compound show different isomer due to exchange of H_2O and Primary valency.

$[Fe(H_2O)_3]Cl_3 \rightarrow [Fe(H_2O)_2Cl]Cl_2 \cdot H_2O \rightarrow$

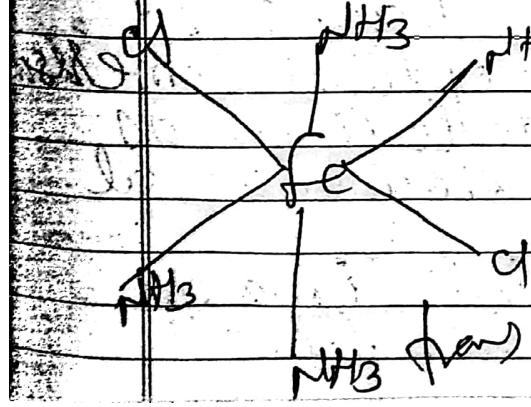
$[Fe(H_2O)Cl_2](H_2O)_2Cl$

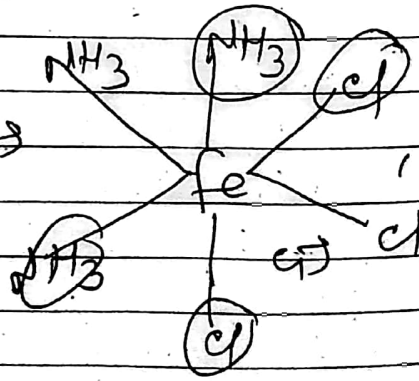
Geometrical isomerism.

1.- Generally octahedral and Tetrahedral show Geometrical isomerism. Cis when diagonal ligand are different. Geometrical isomer shown by ligand present at 90°.

2.- Trans :- when diagonal ligand are same and present at 180°.

eg $K_4[Fe(CN)_3Cl_3] \rightarrow$





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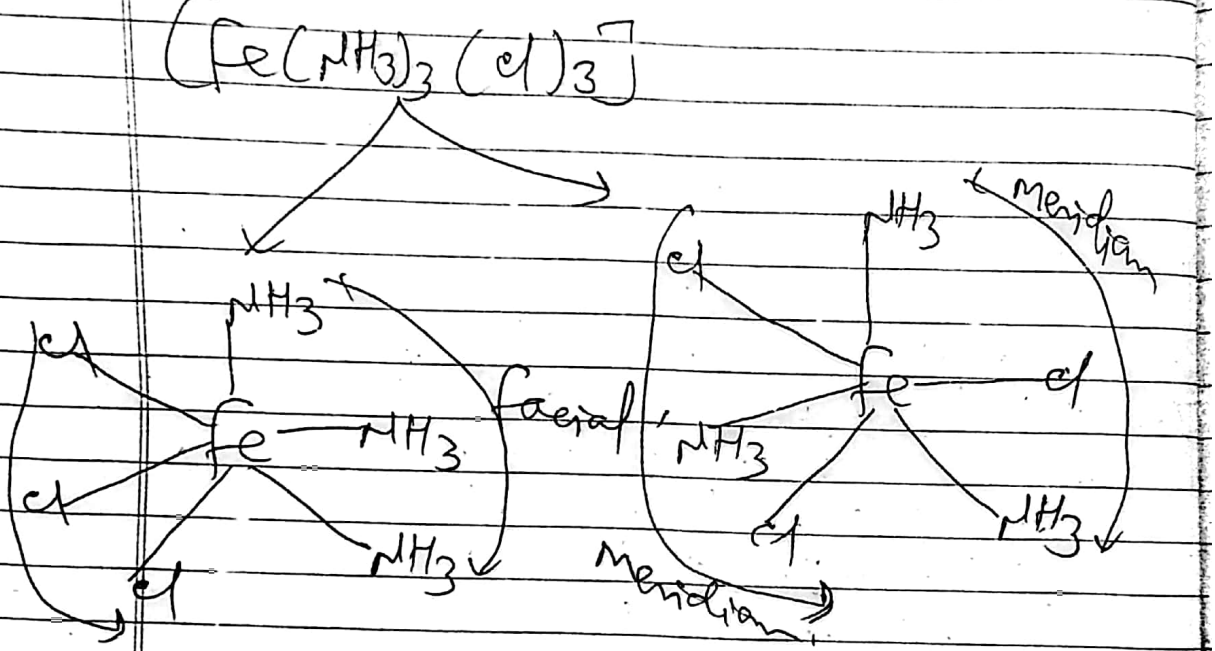
3. Facial :- when same ligand present continue.

4. Meridian :- when different ligand present continue.



5. Optical Isomerism (Enantiomer) :- octahedral and Tetrahedral compd. show optical isomerism. for optical isomerism atleast one bidentate ligand are present. when no. of bidentate ligand Yes than Yes %age probability of optical isomerism when all monodentate ligands are different. than show optical isomerism.

- Cis Isomer show mirror image that is diastereomer hence optically active.

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eg $[Fe(en)_3]$, $[Fe(en)_2Cl_2]$, $[Fe(C_2O_4)_3]$, $[Fe(F)(Cl)(Br)(I)(OH)(NO_2)(ONO)]$, $[Ni(en)(Cl)(Br)(F)]$

Splitting of D-orbital.

- When ligand approach towards D-orbital than split into two set of orbitals one is eg and other is t_{2g}
- eg :- e means doubly degenerate (orbitals having same energy) and different wave function.
  eg :- $d_{x^2-y^2}$ and d_{z^2}
- t_{2g} :- t means triply degenerate (orbitals having same energy but different wave function) eg :- d_{xy}, d_{xz} and d_{yz}.
  g means gerade (having centre of inversion, the centre which divide molecules or compound into two equal half.)

- Splitting of d-orbital in octahedral octahedral field.

eg :- $K_4[Fe(CN)_6]$; $K_4[Ni(Cl)_6]$

- In case of octahedral complex compd. eg. set of orbital having more energy hence move upward from bary centre (0 energy level) but t_{2g} set of orbital having less energy hence move down ward from bary centre.