Coordination Compound

- EAN = AN − ON + 2×CoN (if equal to noble gas then stable complex)
- Magnetic moment = $\sqrt{n(n+2)}$

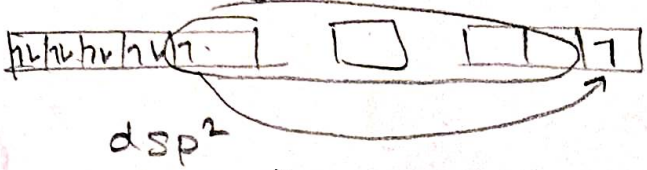
Str. ↑ C, N } pairing; O, F } no pairing

*

- $[Ni(NH_3)_6]^{2+}$

pairing nahi karenge sp^3d^2

- $[Cu(CNH_3)_4]^{2+}$



dsp^2

- $[Fe(CO)_5]$ *

sp^3d

Trigonal bypyramidal

- $[NiCN)_5]^{3-}$

dsp^3 Square pyramidal

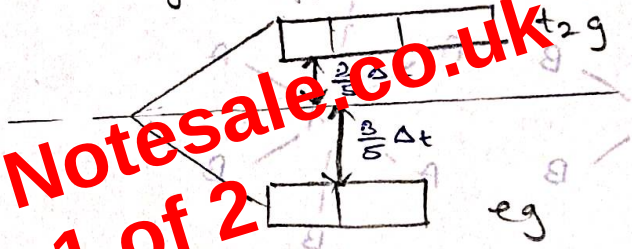
Hybrid	Geometry
sp^3	Tetrahedral
dsp^2	Sq. planar
sp^3d	Trig bypyramid
dsp^3	Sq. pyramidal
sp^3d^2	Octahedral
d^2sp^3	Octahedral

$d_{x^2-y^2}$ → dsp^2; d_{z^2} → sp^3d; $d_{x^2-y^2}$ → dsp^3; $d_{x^2-y^2}, d_{z^2}$ → sp^3d^2

- Pt / Pd / Au in CN = 4 always square planar

b) Tetrahedral

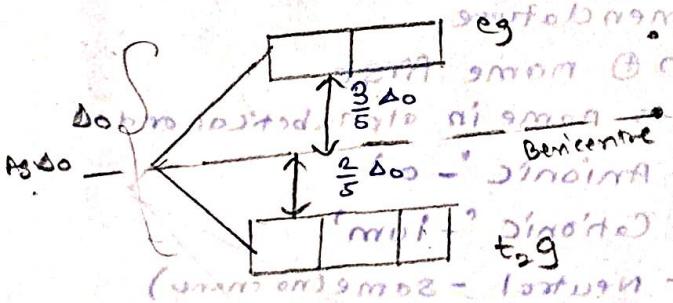
→ Ligand approach from edge centre.



CFT

a) Octahedral

→ ligand approach from facecentre



- $\Delta_o > \Delta_t$
- $\Delta_t = \frac{4}{9}\Delta_o$

- CO is strongest
- I^- is weakest
- H_2O is strongest among weak
- NH_3 is weakest among strong

- CFSE
  - → α O.N of C.M
  - → 5d > 4d > 3d
  - → $\Delta_{sp} > \Delta_o > \Delta_t$
  - → Nature of ligand
    - SFL → CFSE ↑
    - WFL → CFSE ↓

$$CFSE = \frac{3}{5}\Delta_o x + \left(-\frac{2}{5}\Delta_o y\right) + zP$$

x = no. of e^- in eg
y = no. of e^- in t_{2g}
z = no. of extra e^- pair due to splitting
P = pairing energy

PV = O.N
SV = C.N = no. of ligand × Denticity