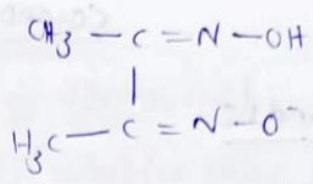
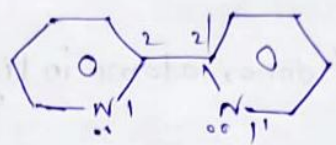


dmg (dimethyl glyoximate):

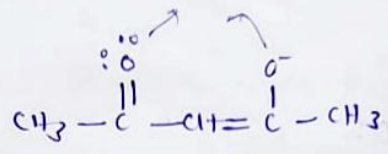


dipy (dipyridyl)



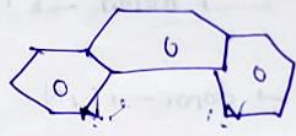
2,2' dipyridyl

acac (acetylacetonate)
acetone



O, O⁻ → donors

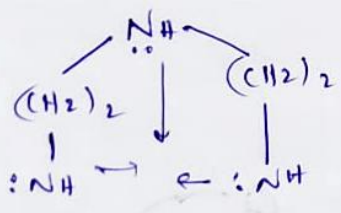
o-phen (ortho-phenanthroline)



donors → N

Tridentate:

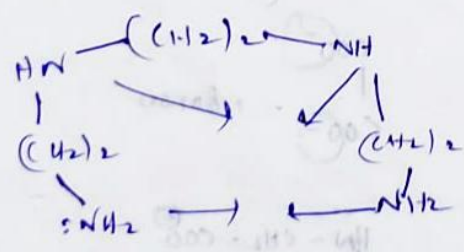
dien (diethylene triamine)



3 N → donors

Tetradentate:

trien



4 N → donors

pentadentate:

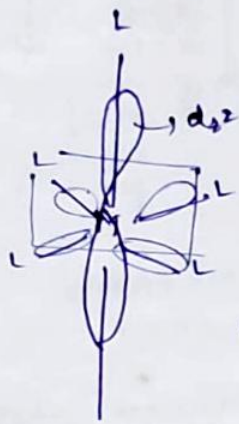
EDTA⁻³ → ethylene diamine tri acetate

Jahn teller effect: (Tetragonal distortions):

see symmetrical (or) unsymmetrical also filling.

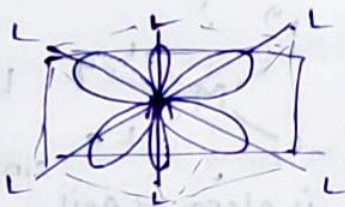
unsymmetrical filling of eg orbitals cause distortion

in d_{z^2} if e^- fills and no e^- in $d_{x^2-y^2}$



elongation

if $d_{x^2-y^2}$ has e^- and d_{z^2} no e^-



compression

if symmetrical then jahn teller not observed.

* in which orbitals configuration jahn teller ~~not~~ observed

d^4 s.l.

d^5 s.l.

d^7 s.l.

d^9 w.l.

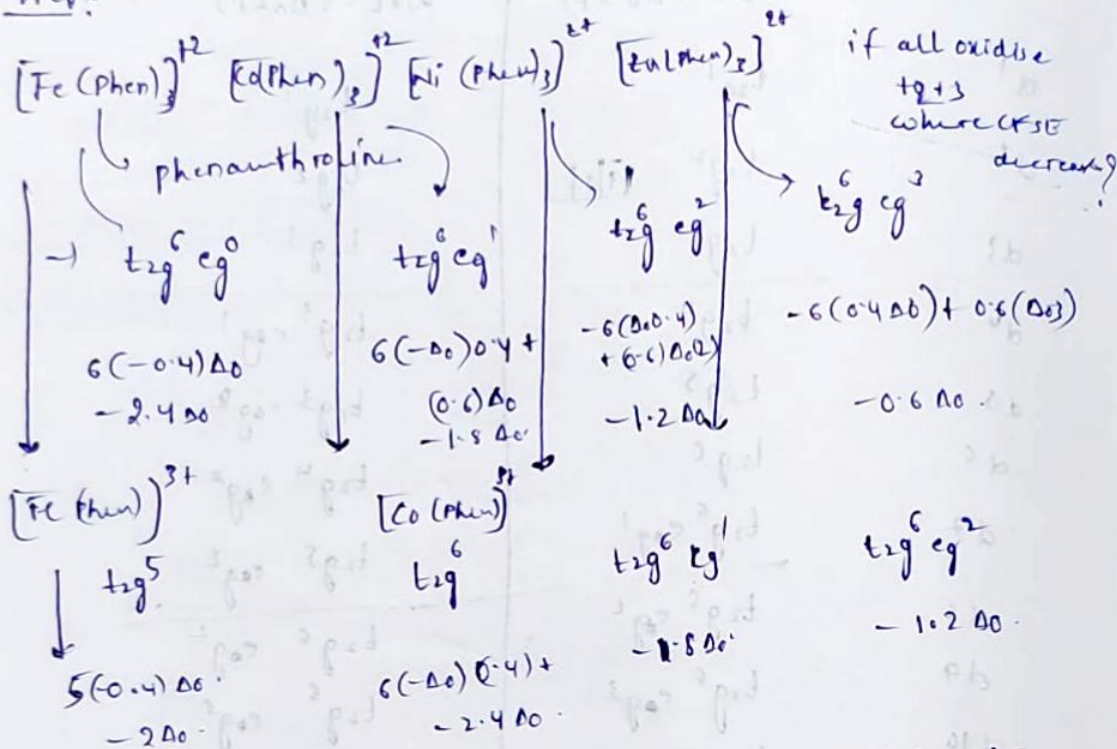
→ eg^1

→ eg^3

(∴ unsymmetrical)

(∴ observed distortion)

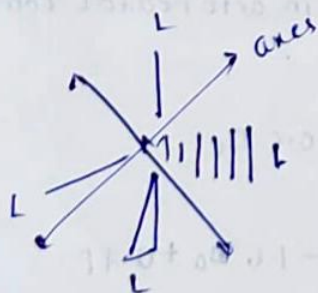
Prqy:



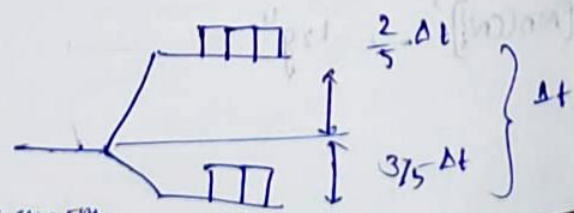
Here the magnitudes are seen because energy diff is CFSE factors:

1. Δ_0 : $sd \Delta_0 < 4d < 5d < 6d$
2. strength of ligand more; Δ_0 more because splitting more
3. for metals charge more ligand approach more so; splitting more

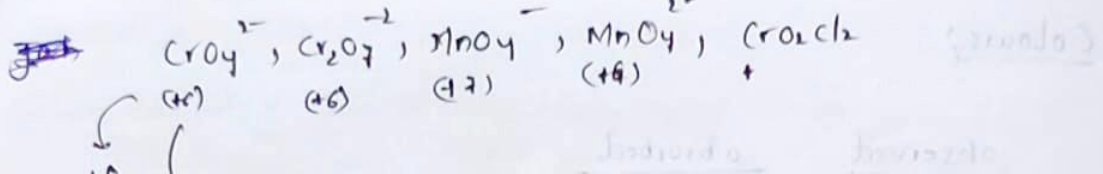
Tetrahedral complex:



the orbitals are not on axis



t_{2g} is more repulsion ligand approach from in blue axis so; t_{2g} more energy



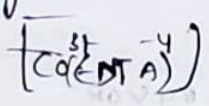
$3d^0$
 yellow colour
 due to the charge transfer phenomena
 $(\because \text{Cr}^{+6} \rightarrow \text{Cr}^{+5})$
 and colour exhibit

observed	observed
red violet	yellow green
blue	green
blue green	red
yellow	purple

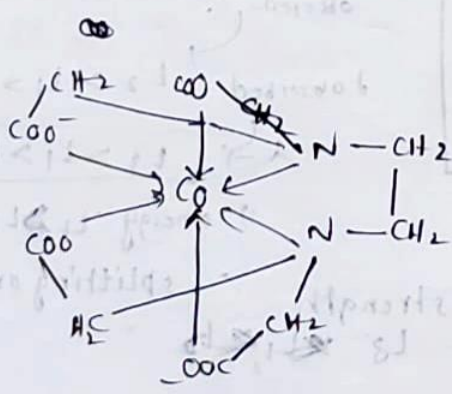
stability of complex: $3d < 4d < 5d$

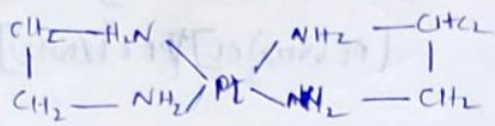
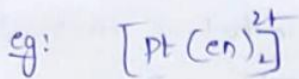
1. complexes with s: L more stable
2. and CFSE should be more "ve"
3. More charge density $\approx \frac{\text{charge}}{\text{size}}$

Thermodynamic stability



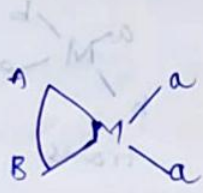
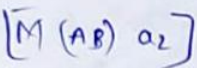
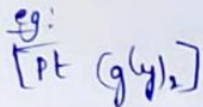
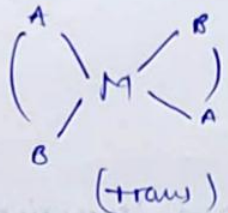
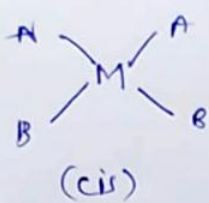
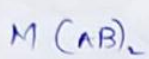
more no. of rings
 thermodynamic stability more





NO G.I.

for different groups in same bidentate

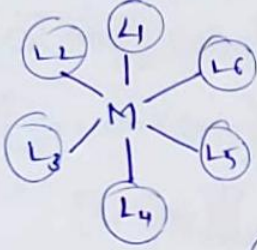


no G.I. X

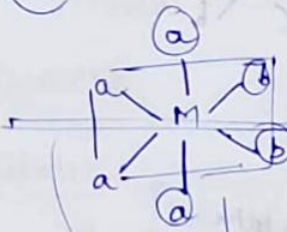
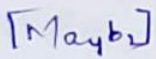


not possible

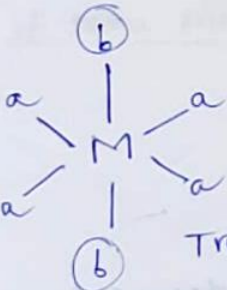
Octahedral complexes:



opposite లో ఉండే యిద్దరినూ "trans" పేరికొనవస్తో "cis".



ఇలా trans; cis ఒకే అనాల వచ్చి స్టెరియో ఐసోమర్లను ఏర్పరుస్తాయి. అందుకే అన్ని లిగండ్లు విభిన్నమై ఉన్నప్పుడు మాత్రమే ఐసోమర్లు ఏర్పడతాయి.



Trans.

square orientation పూర్తిగా విభిన్నమై వస్తుంది; అందుకే బి బి పోజిషన్ ఏర్పడతాయి.

Plane of

3 pos

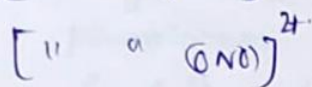
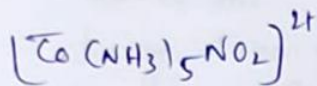
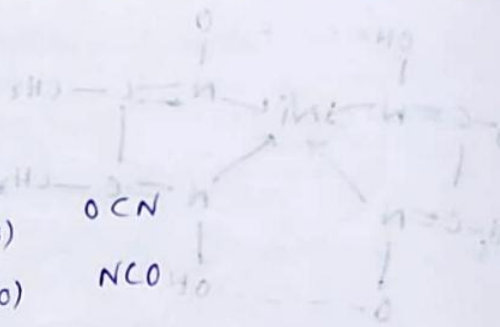
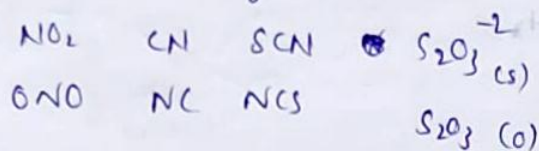
no optical.

symmetry ఉండే వల్ల optical isomerism ఏర్పడదు.

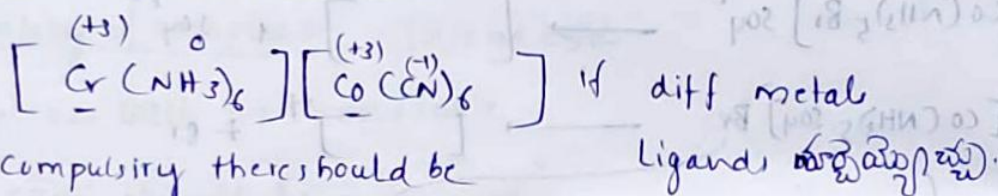
total stereo isomers $\rightarrow 2$.

Linkage isomerism:

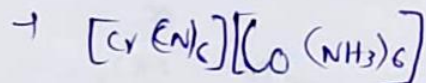
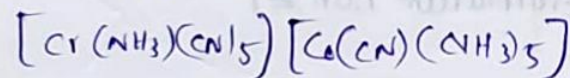
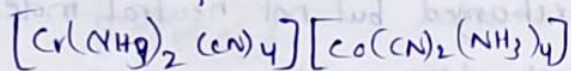
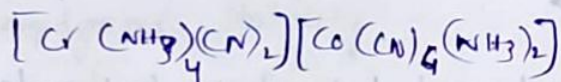
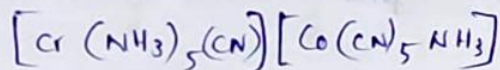
when ambident ligands



Co-ordination isomerism:

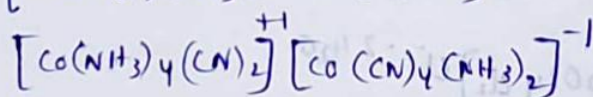
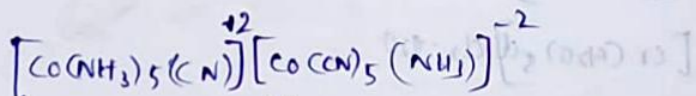
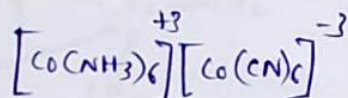


Compulsory there should be charges on both complexes because, if no charge they don't exist combinedly.

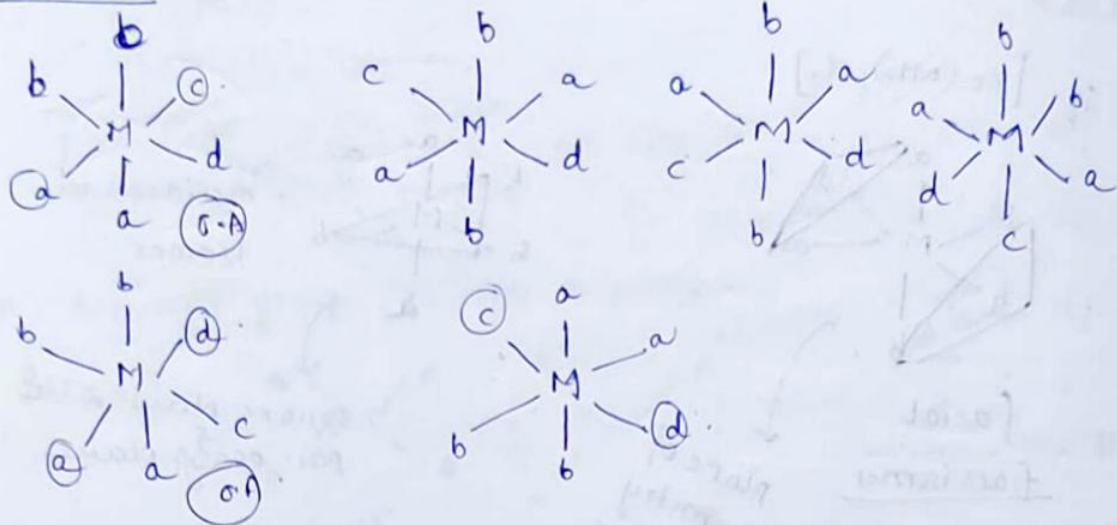


totally 6^4 isomers

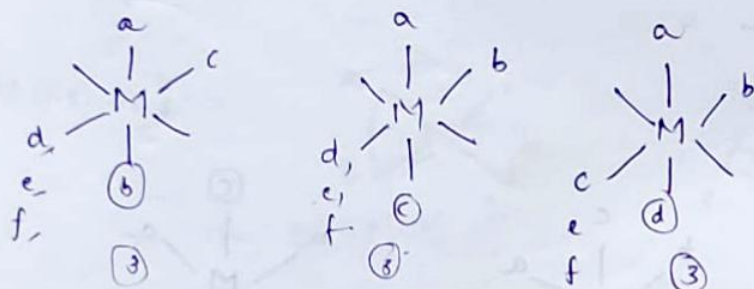
if same metals:



M_2b_3cd :



$Mabcdef$:

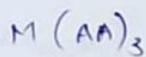


$n! 6_{c_2} = 15$

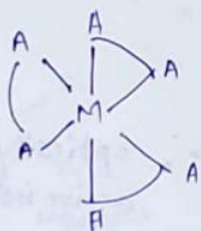
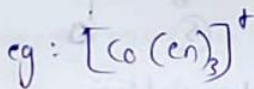
15 Geometrical
all are optically
active (∴ no sym-
metry)

⇒ optically active are 10 (achiral
enantiomeric pairs)

Racemic mixture (or) enantiomeric pairs: "15"



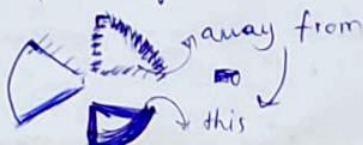
↳ bidentate ligands



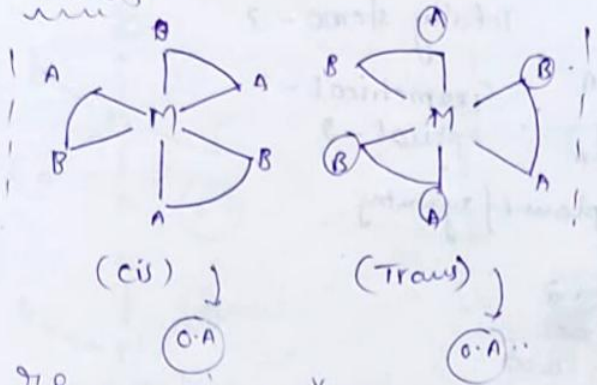
No Geometrical
isomerism

So; stereoisomers → 2
Geometrical → 0

∴ no plane of symmetry ∴ optically active



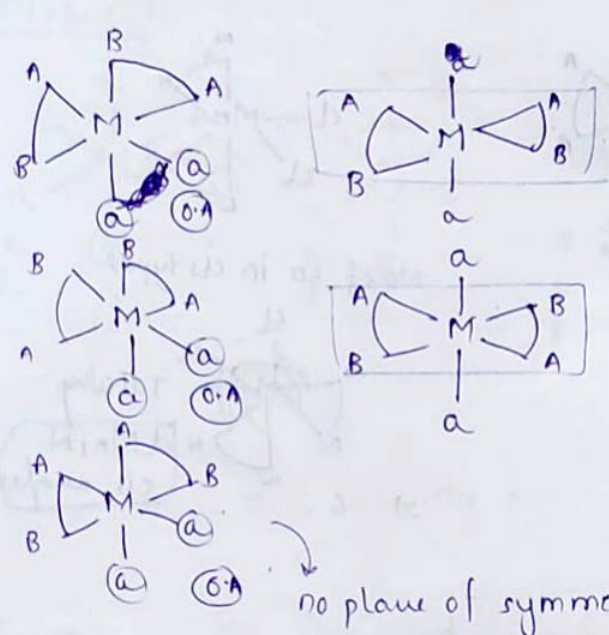
$M(AB)_3$:-



Total stereo = 4
 o.n = 4
 geometrical → 2

mirror image

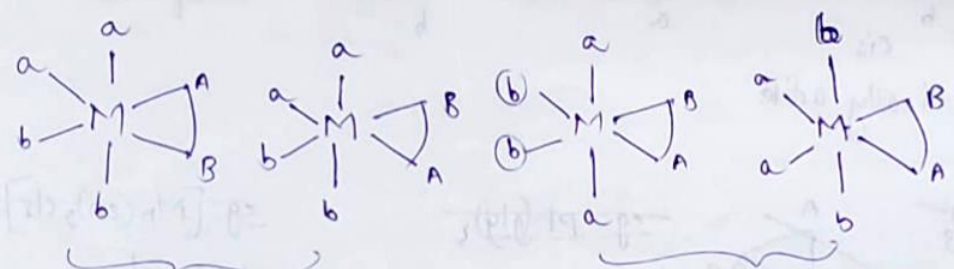
$M(AB)_2 a_2$



Plane of symmetry

Total stereo → 8
 optical → 6
 geometrical → 5

$M(AB) a_2 b_2$



No POS square "o.n"

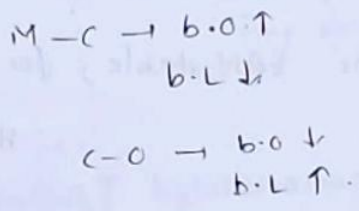
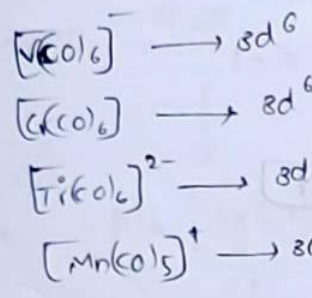
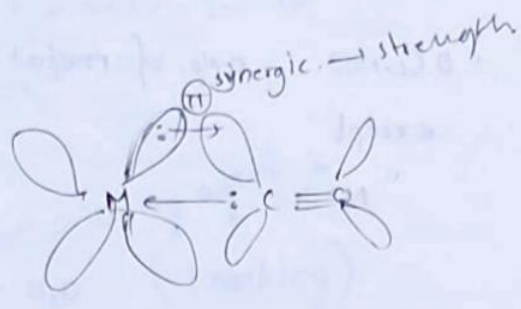
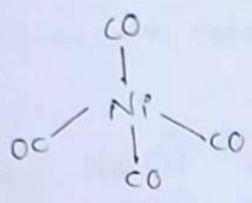
plane of symmetry
 square plane

total stereo = 6

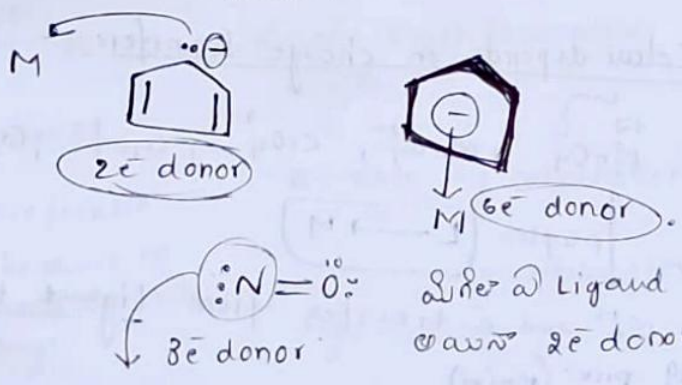
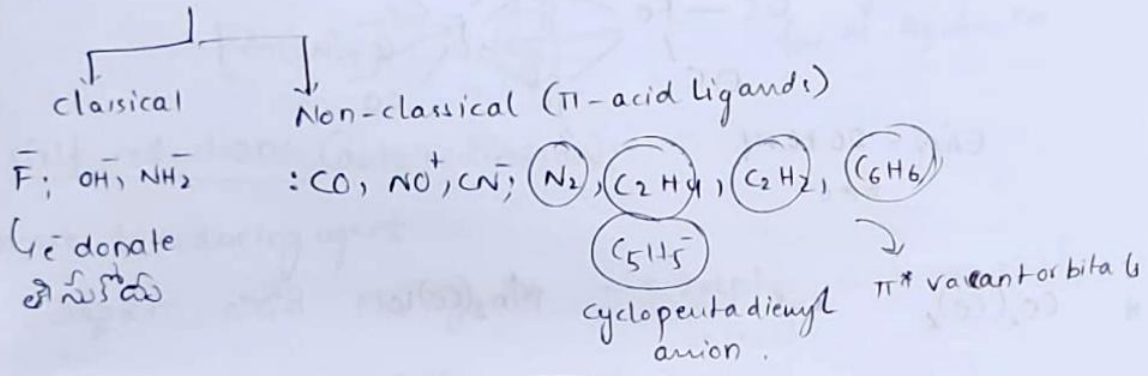
optical = 4 Geometrical = 4

ORGANO METALLICS: (M-C)

metal carbonyls:



Types of ligands



*) Max. No. of (NO) can be replaced in $[\text{Mn}(\text{CO})_5]^-$ is 4.
 A) $[\text{Mn}(\text{NO})_4]^+$ ⇒ max. "4" (∵ totally 11e should be donated to Mn.)
 because these two have same EAN