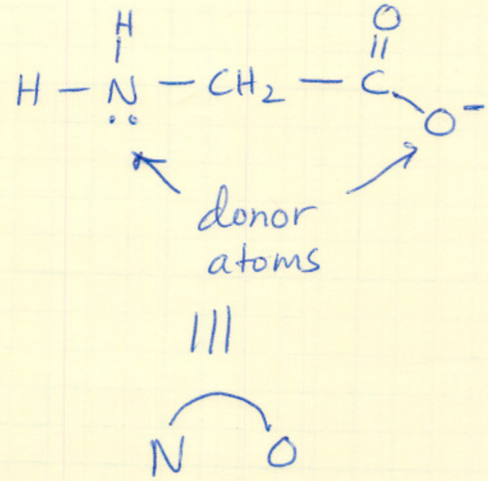
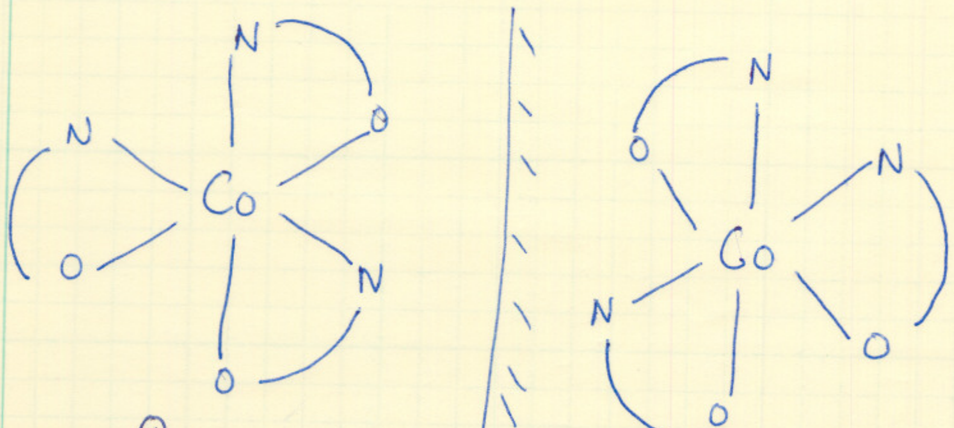
ADVANCED CHEMISTRY

INORGANIC CHEMISTRY – SPRING – WEEK (5)

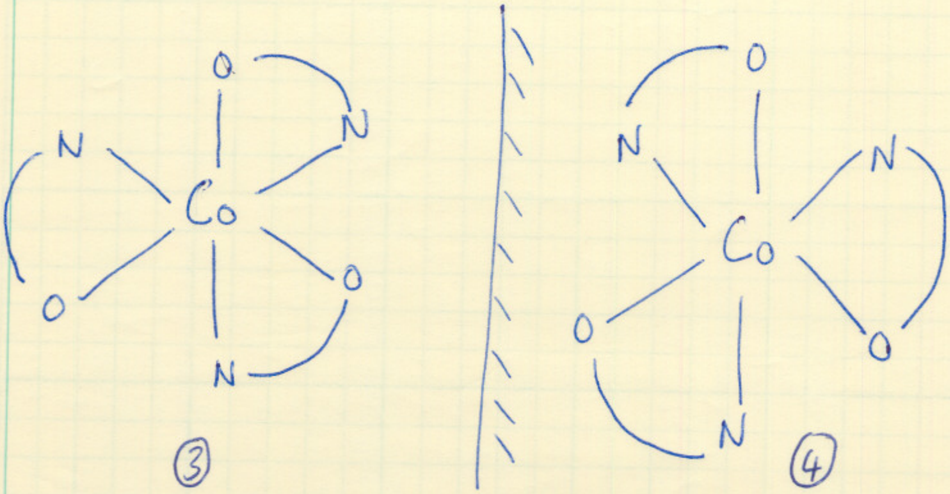
Chapter 9

(6) glycinato ligand



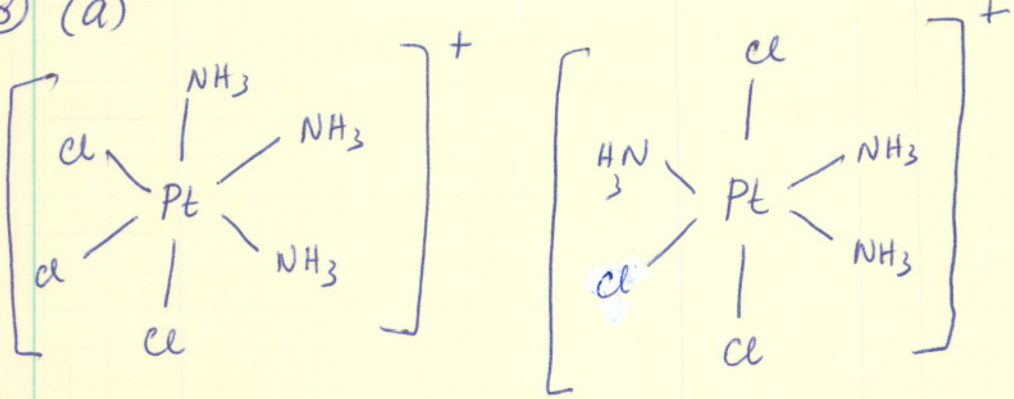


(1) (2)

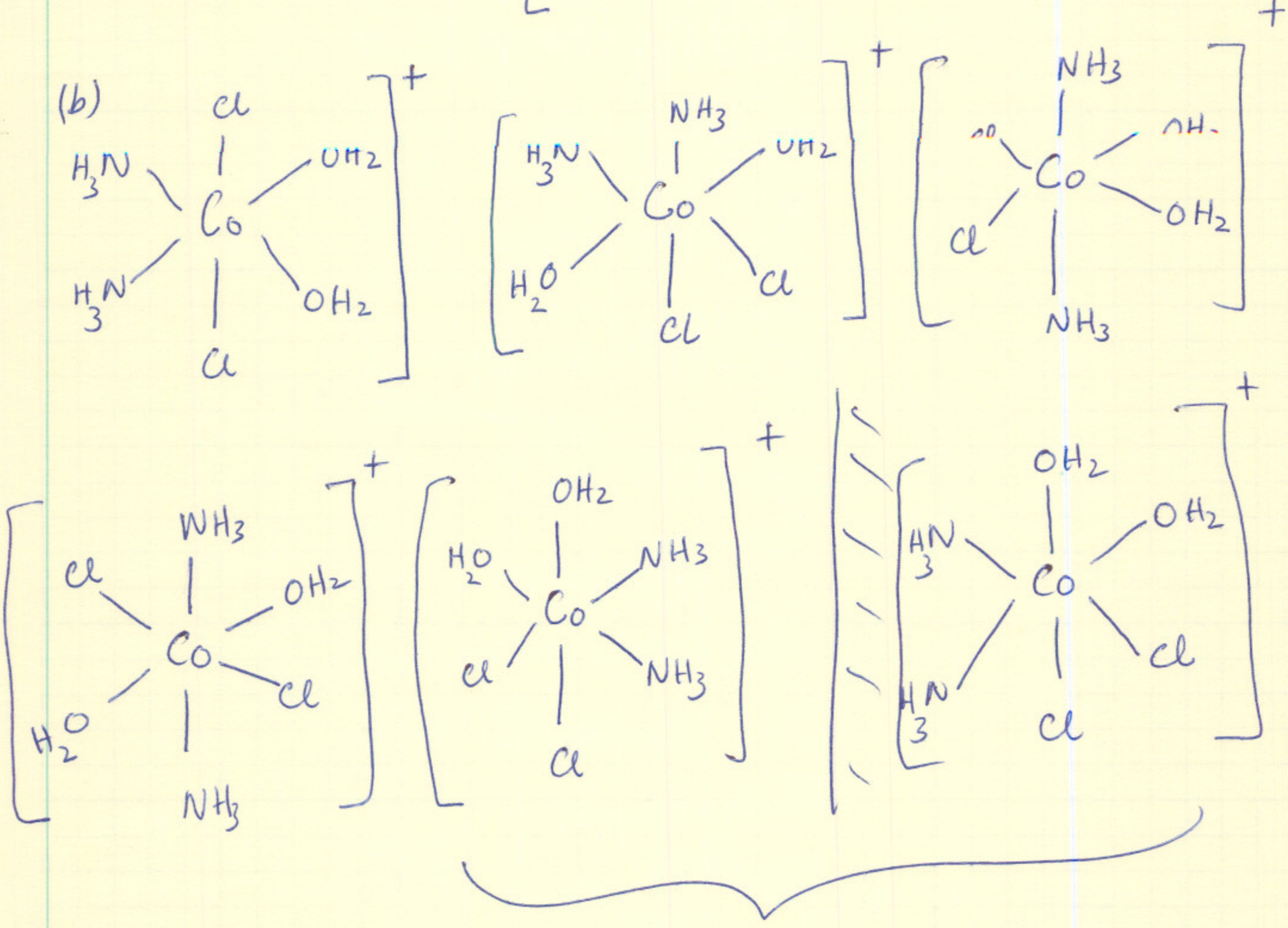


(3) (4)

⑧ (a)

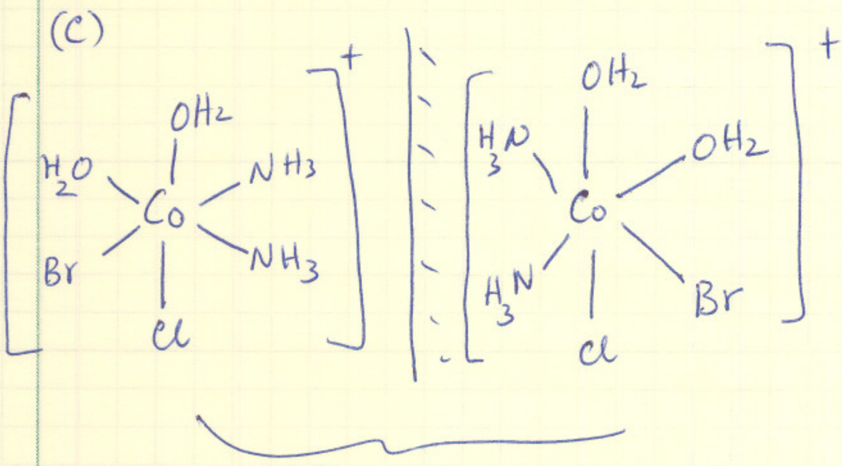


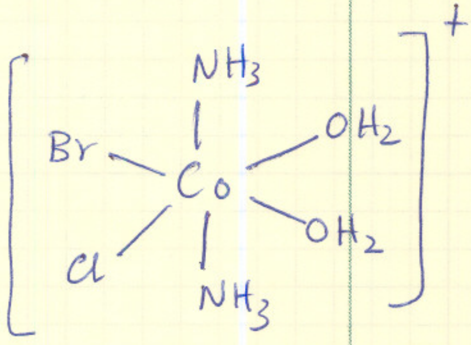
(b)



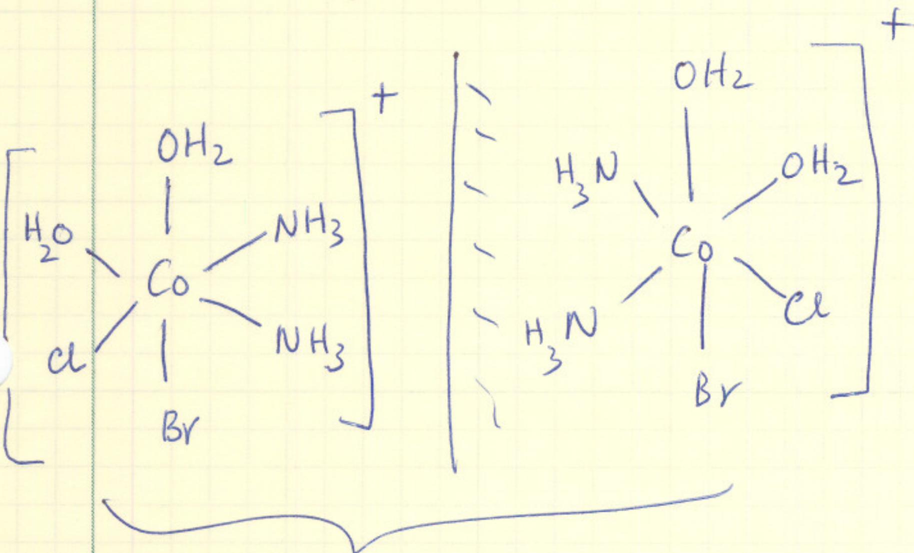
enantiomers

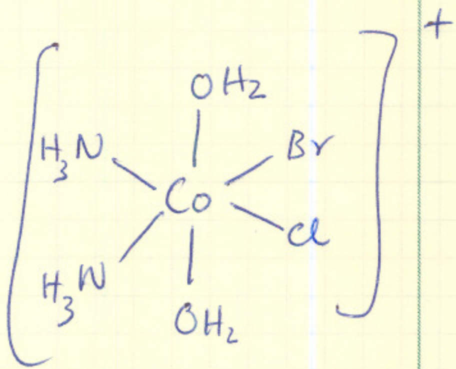
(c)



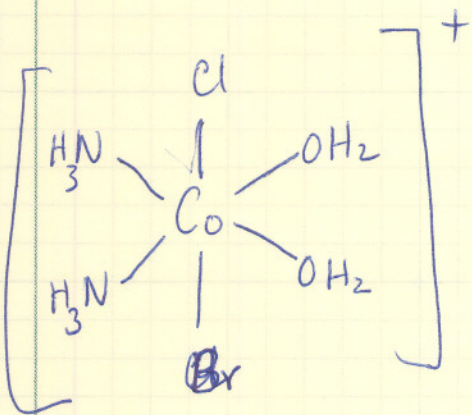


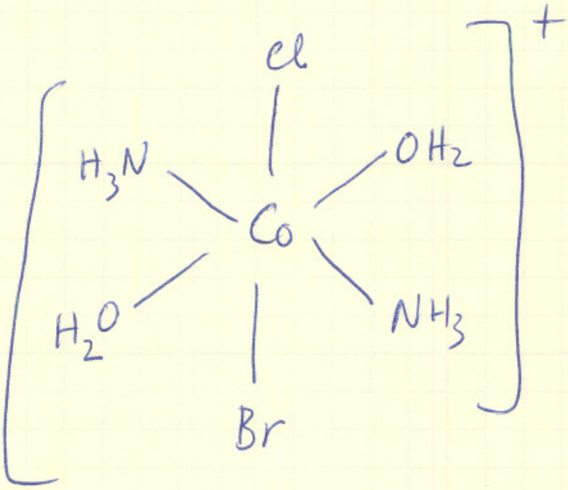
enantiomers



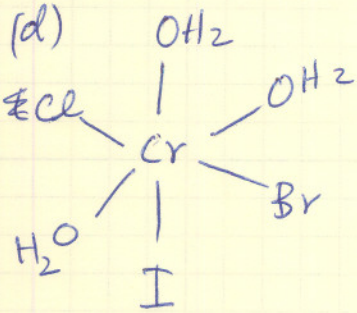


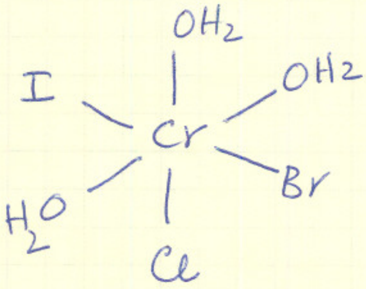
enantiomers

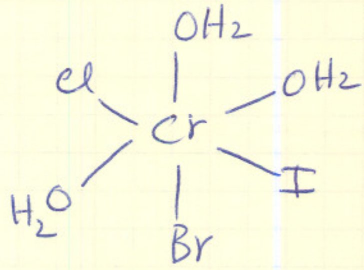


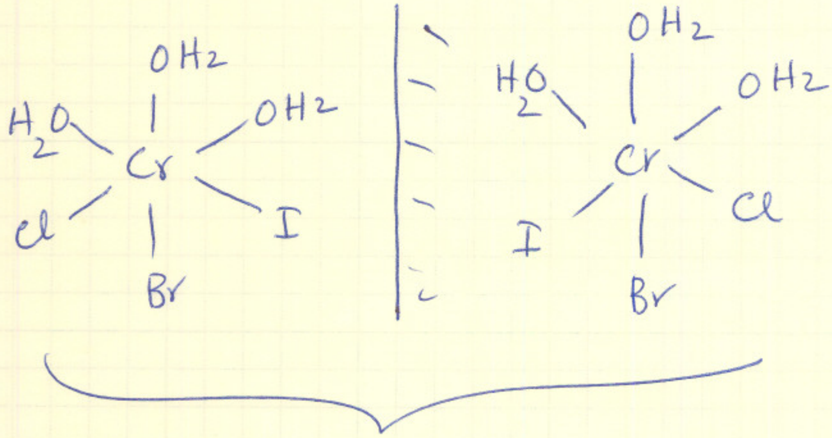


(d)



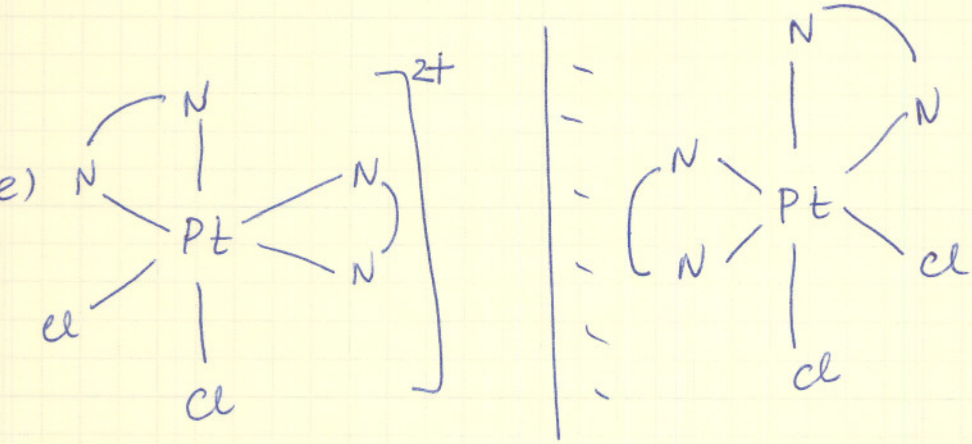






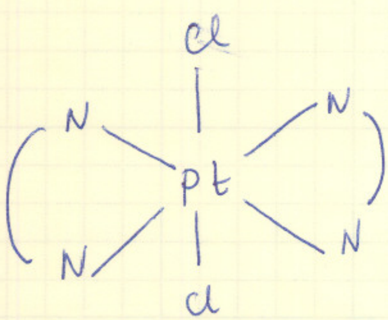
enantiomers.

(e)

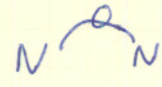


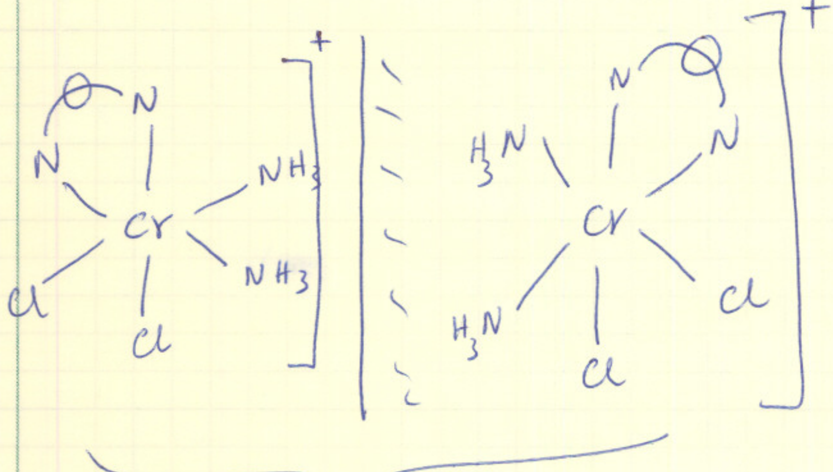
cis

enantiomers



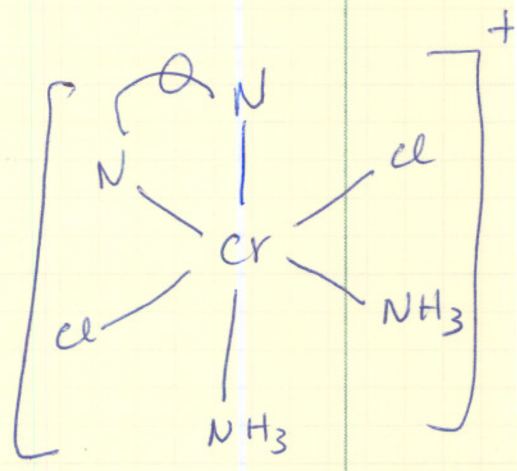
trans

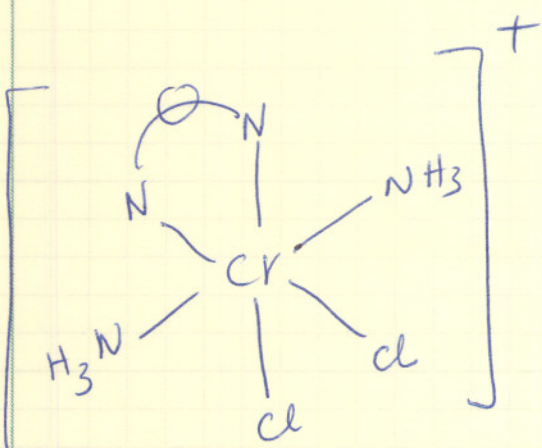
(f) o-phen = 

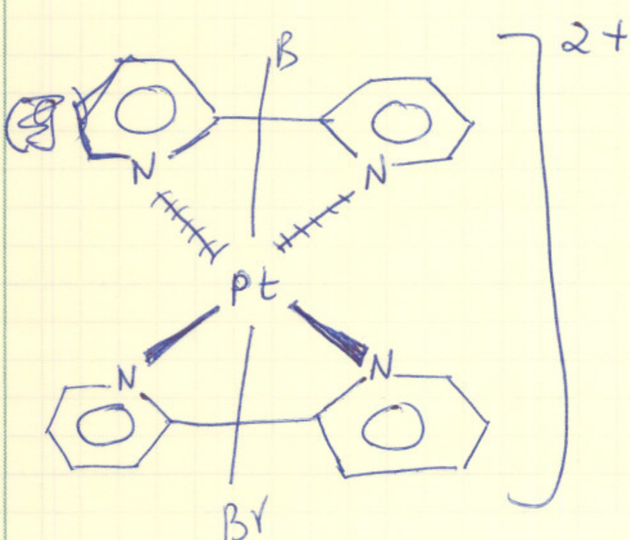


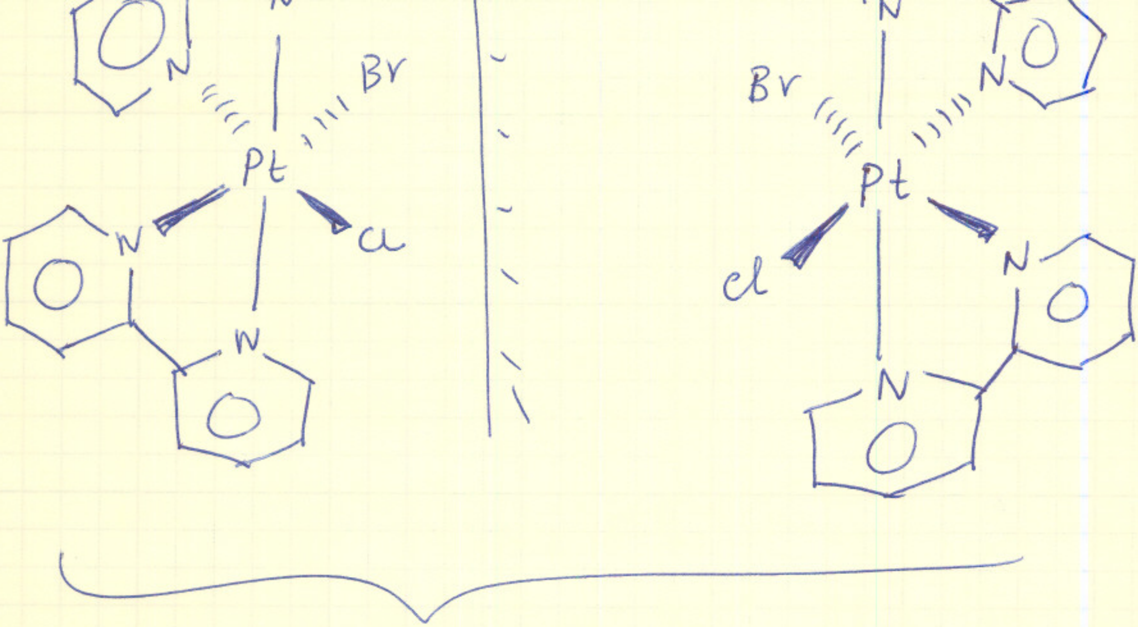
cis

enantiomers



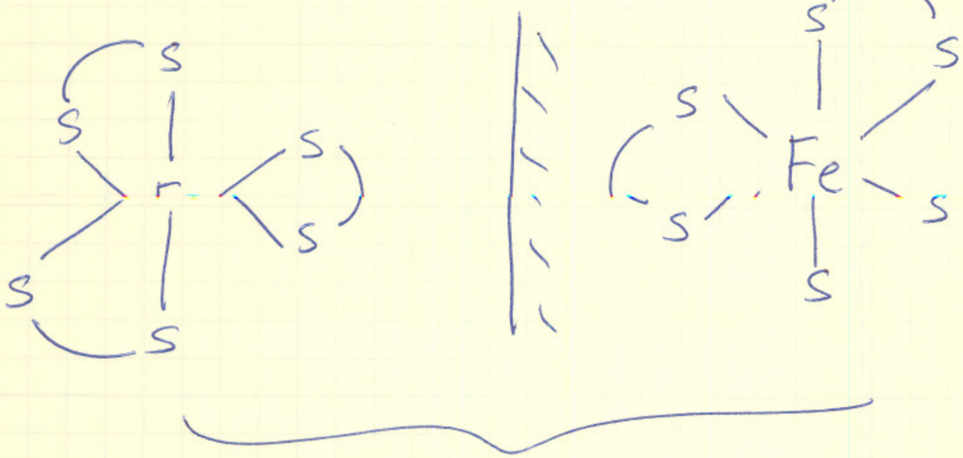


(g) 



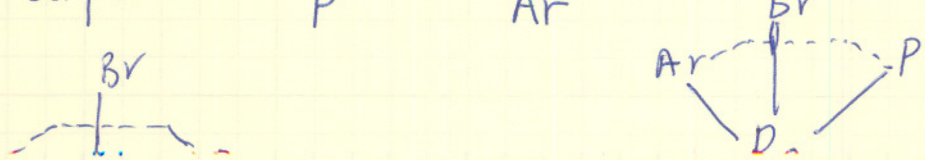
enantiomers

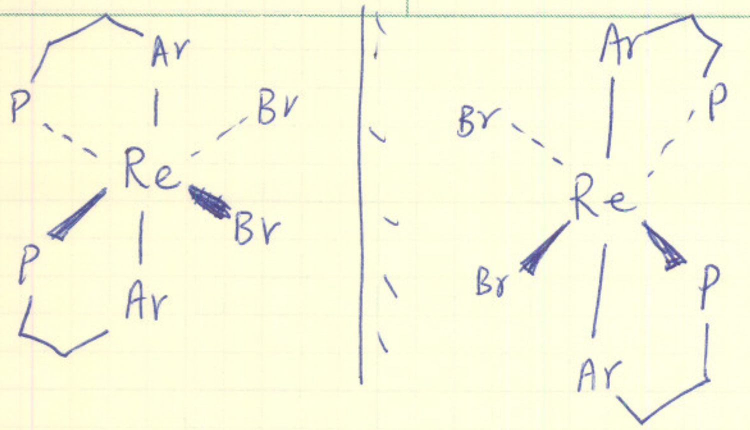
(b) dtc =

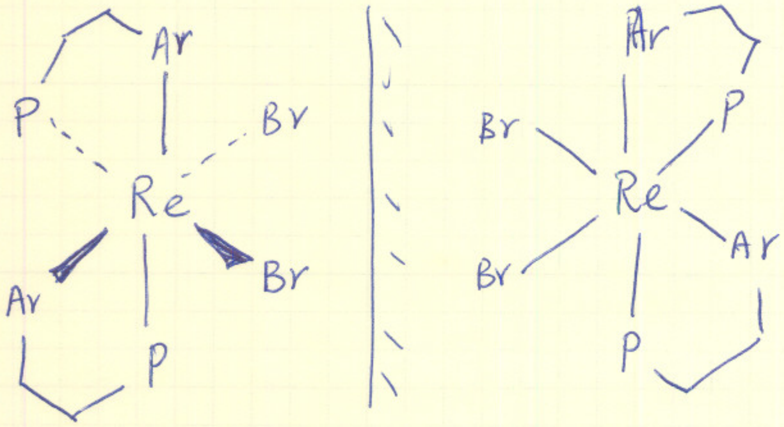


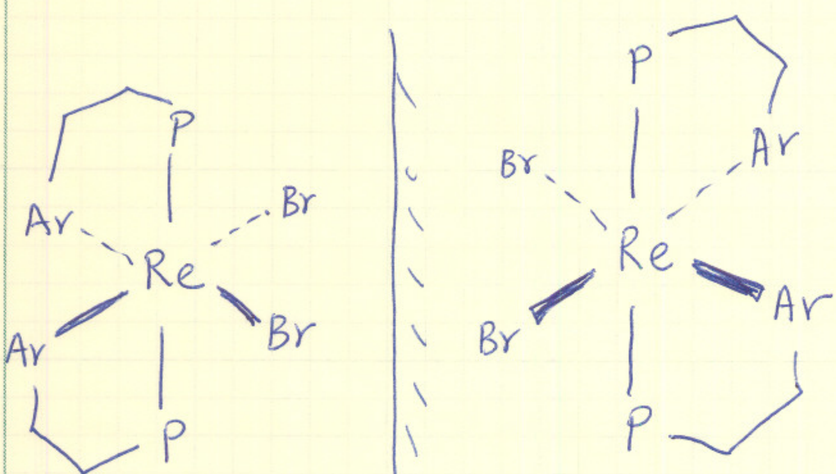
enantiomers

(i) arphos

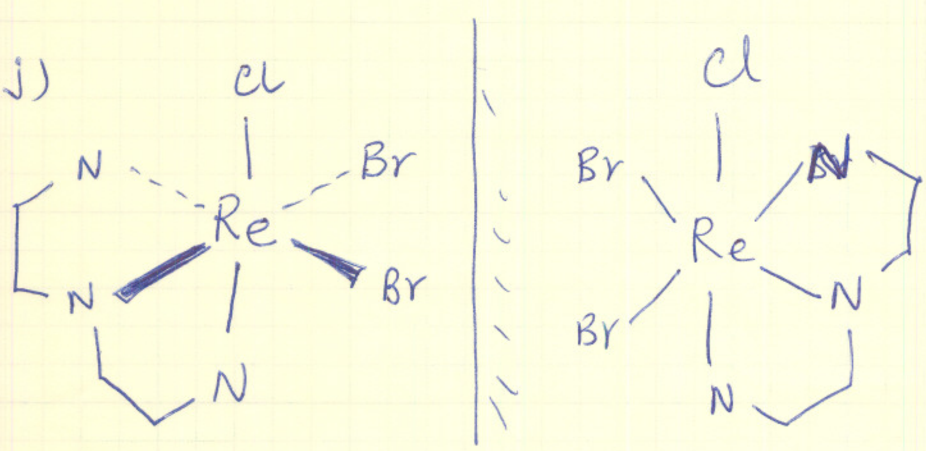



Ar
P
Br
Re
Br
P
Ar
Ar
P
Br
Re
Br
P
Ar

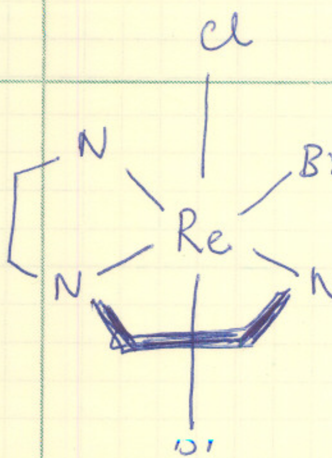

Ar
P
Br
Re
Ar
Br
P
Ar
Br
P
Re
Ar
Br
P

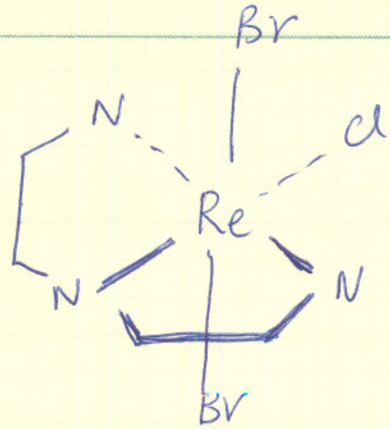

P
Ar
Br
Re
Ar
Br
P
P
Br
Ar
Re
Br
Ar
P

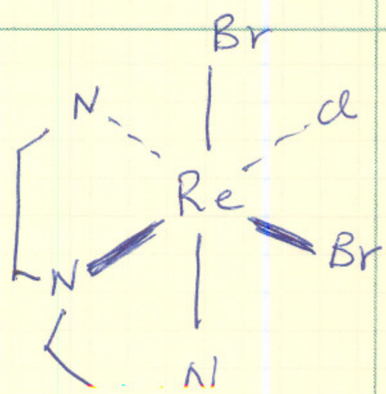
(j)


Cl
N
Br
Re
N
Br
N
Cl
Br
N
Re
Br
N
N

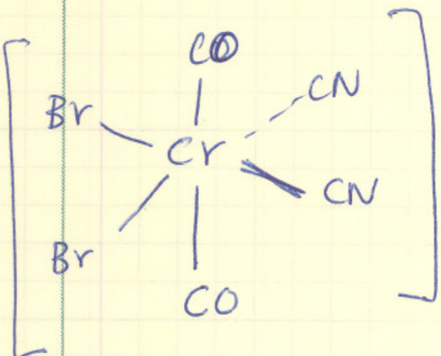
8



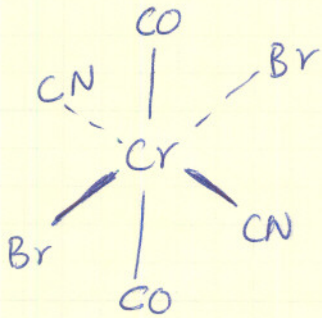




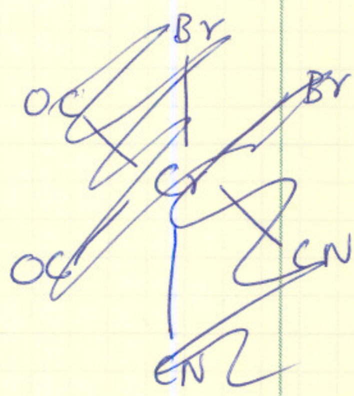
(9) The possible isomers are

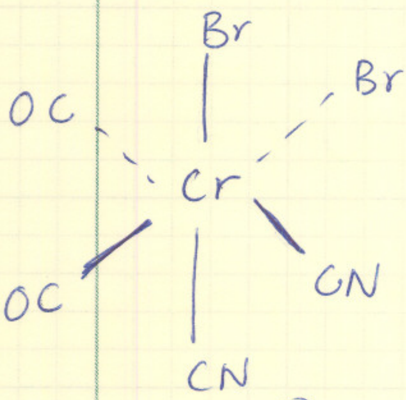


①

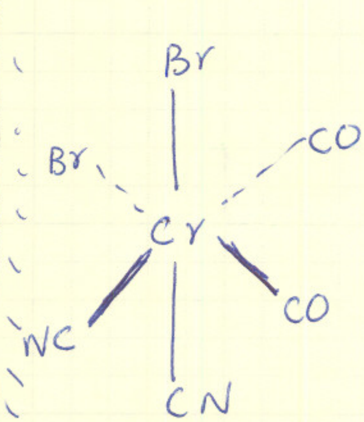


②



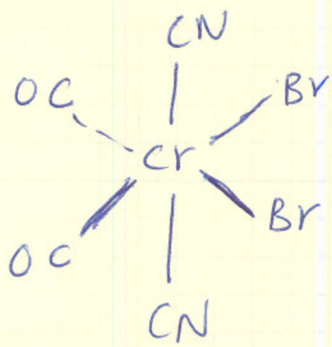


③



④

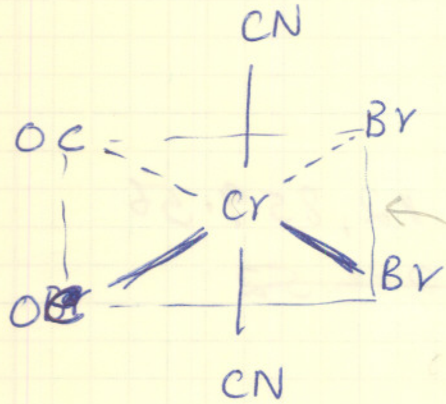
enantiomers



⑤

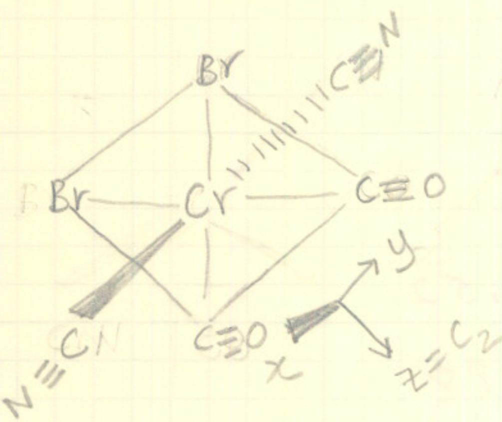
It is sufficient to take one of these isomers and use it to explain the CO and CN stretching vibrations in that isomer.

I am doing this with isomers ⑤ and ②



this is the yz plane
The CN ligands are on the x axis

||

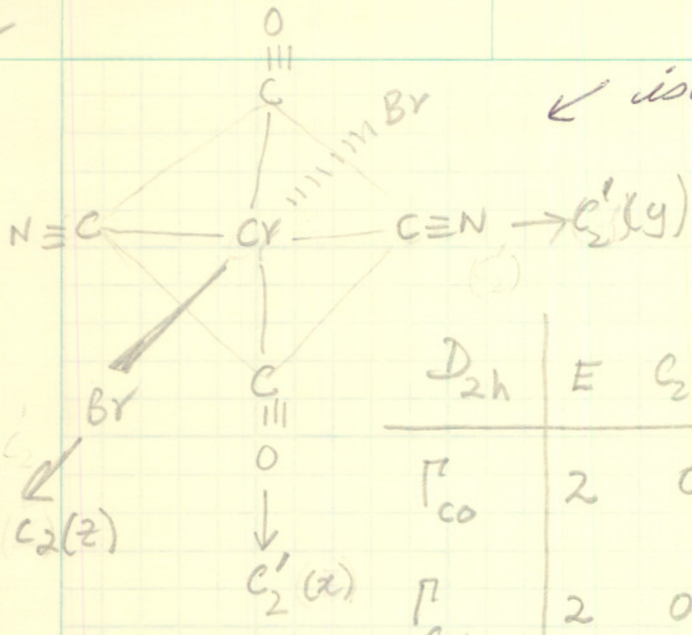


C_{2v}	E	C_2	$\sigma_v(xz)$	$\sigma_v(yz)$
Γ_{CO}	2	0	0	2
Γ_{CN}	2	0	2	0

$\Gamma_{CO} = a_1 + b_2$

$\Gamma_{CN} = a_1 + b_1$

both modes are IR active (does not agree with the information given in the problem.)



↙ isomer (5)

D_{2h}	E	$C_2(z)$	$C_2(y)$	$C_2(x)$	i	$\sigma(xy)$	$\sigma(xz)$	$\sigma(yz)$
Γ_{CO}	2	0	0	2	0	2	0	2
Γ_{CN}	2	0	2	0	0	2	0	2

$\Gamma_{CO} = a_g + b_{3u}$ one IR active mode

$\Gamma_{CN} = a_g + b_{2u}$ one IR active mode

(does not agree with the information either).