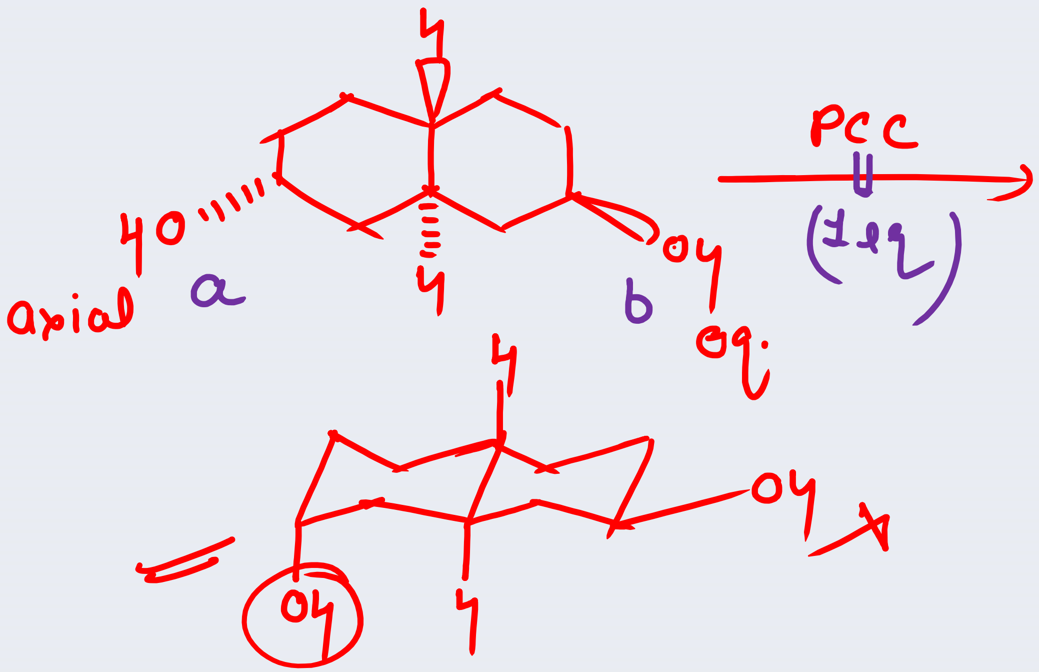
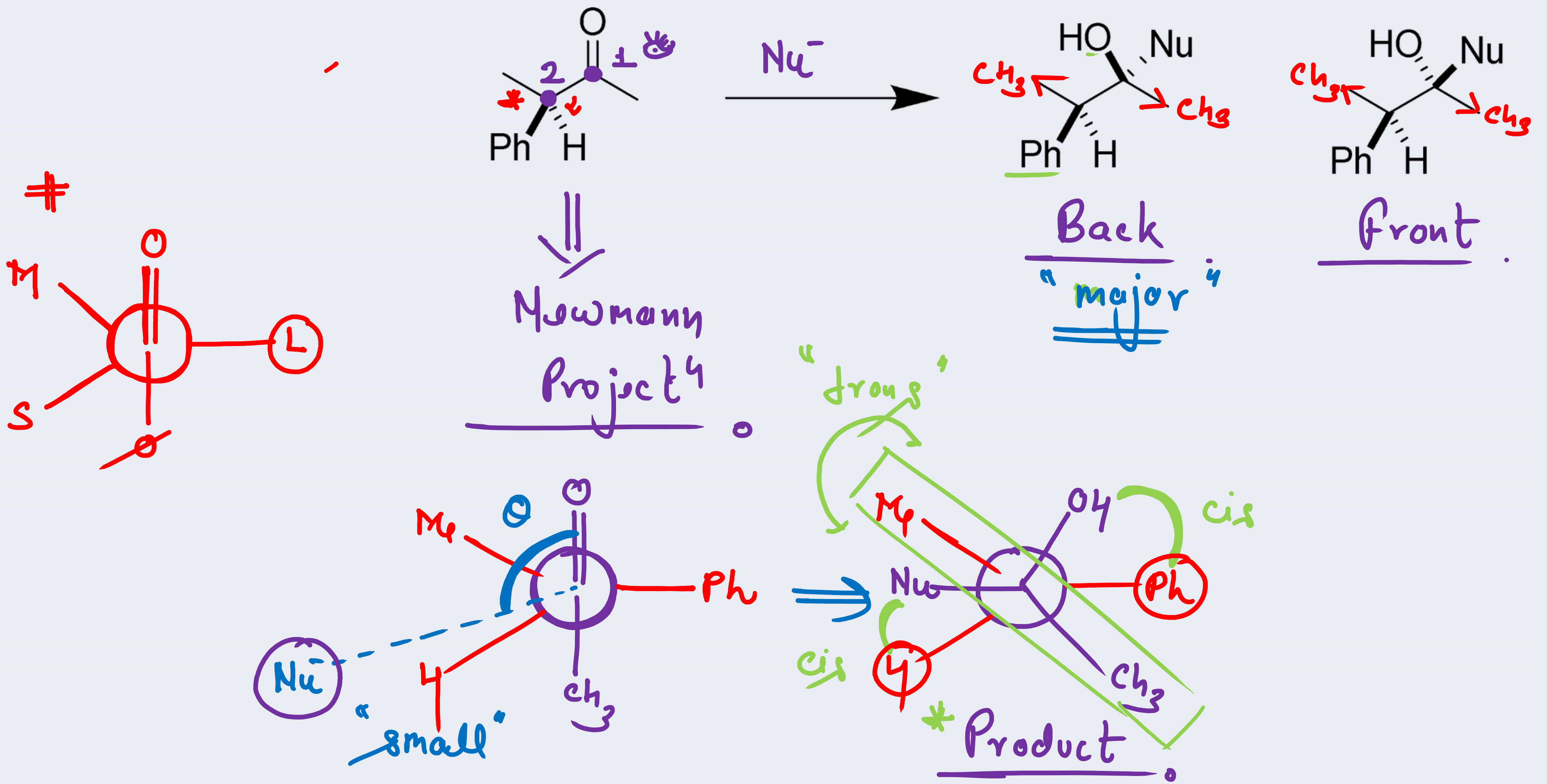
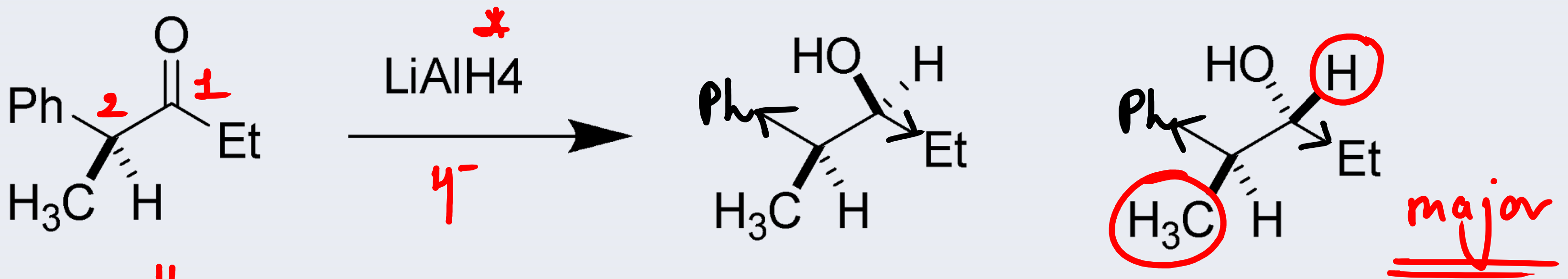
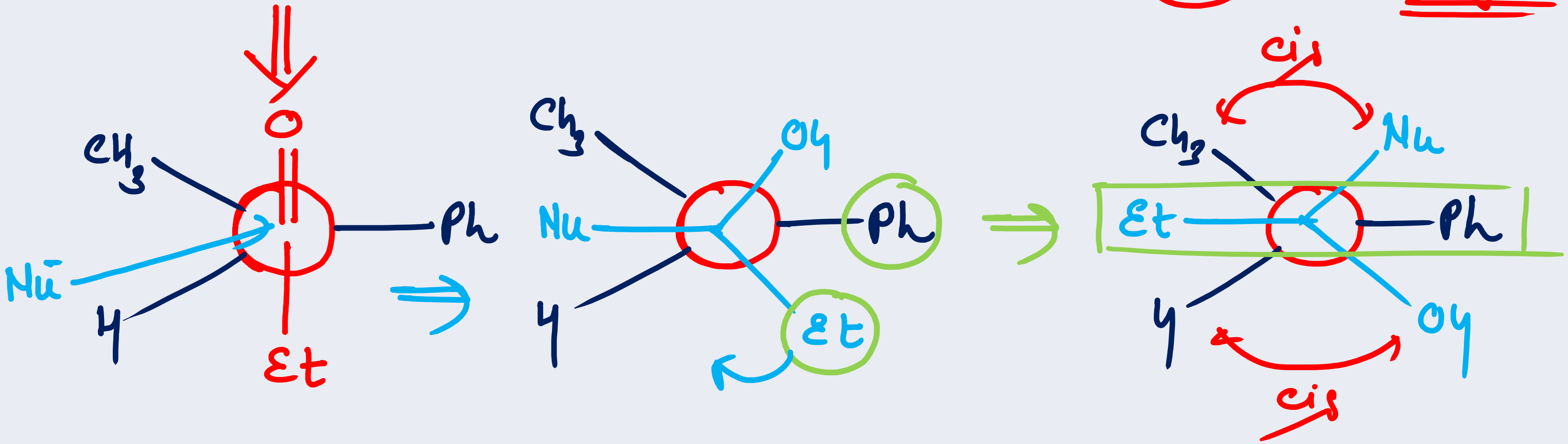

HO
axial
a
b
OH
eq.
PCC
(1 eq)
OH
OH

"Felkin Ahn model".



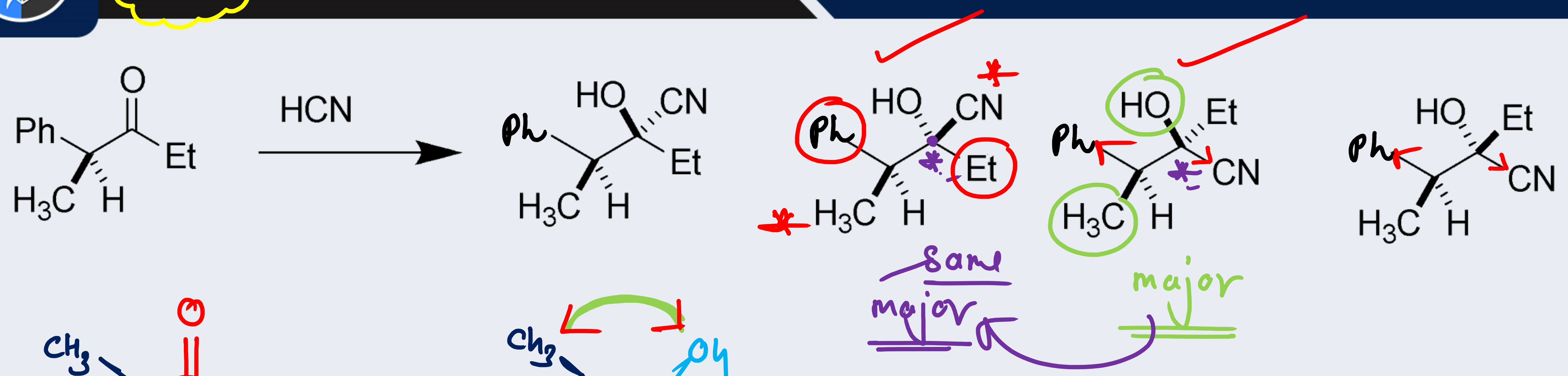


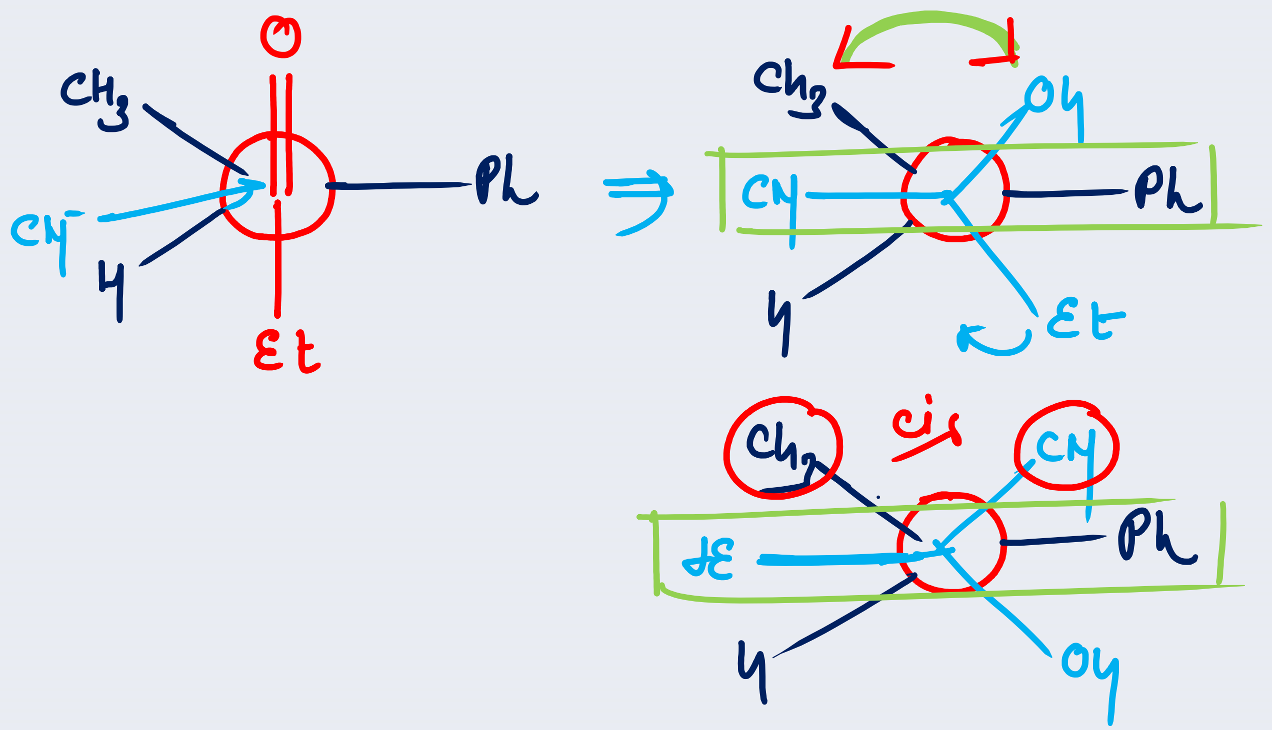
O
Ph
Et
H3C
H
LiAlH4
HO
H
Ph
Et
H3C
H
HO
H
Ph
Et
H3C
H
major



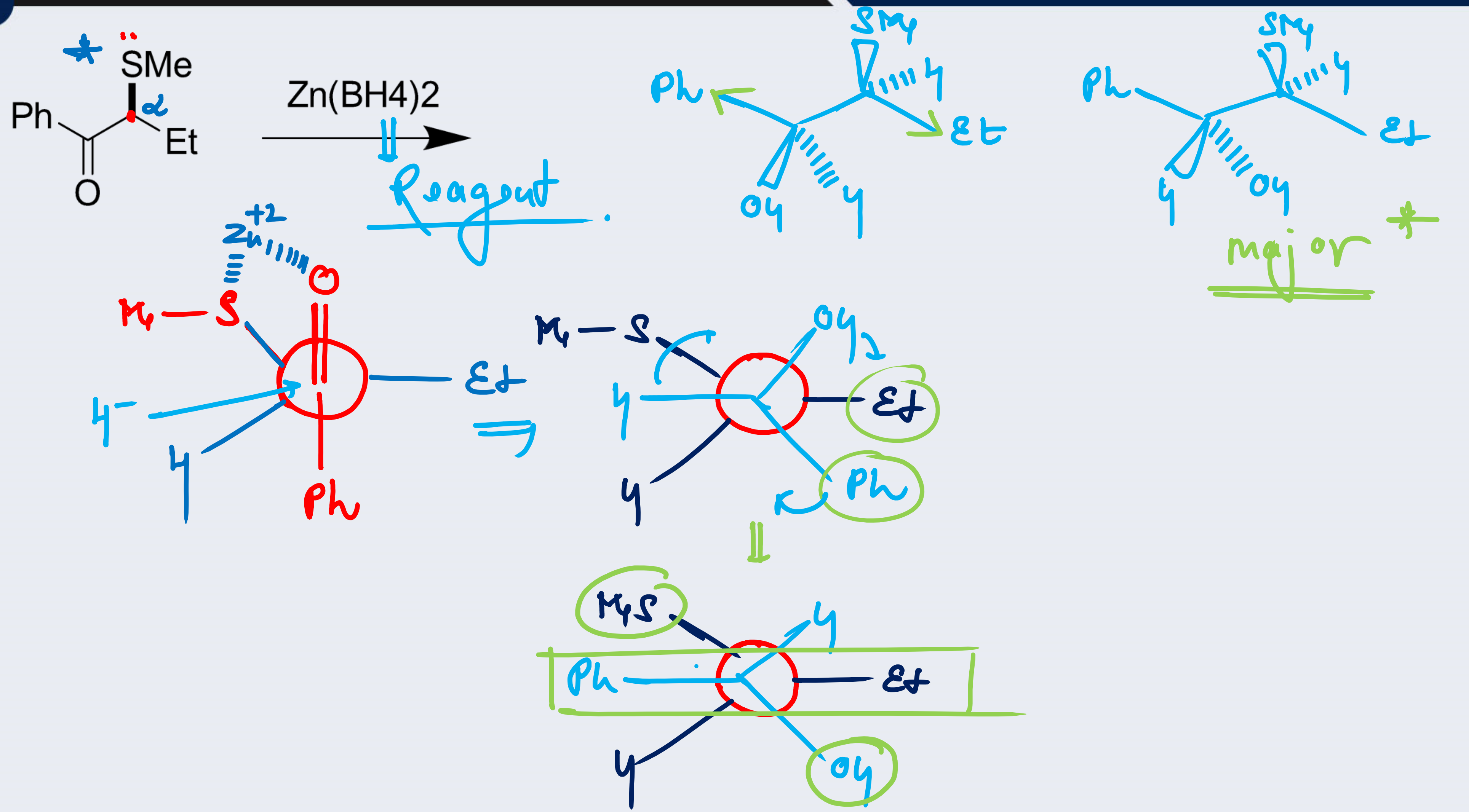
O
CH3
Ph
Nu
H
Et
CH3
OH
Nu
Ph
H
Et
cis
CH3
Nu
Et
Ph
H
OH
cis

MSO





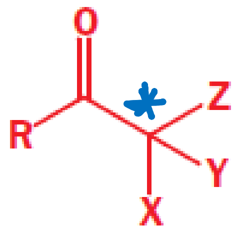
Level-2 : "chelation"



Metals commonly involved in chelation	Metals not usually involved in chelation
Li^+ sometimes	Li^+ often
Mg^{2+}	Na^+
Zn^{2+}	K^+
Cu^{2+}	
Ti^{4+}	
Ce^{3+}	
Mn^{2+}	

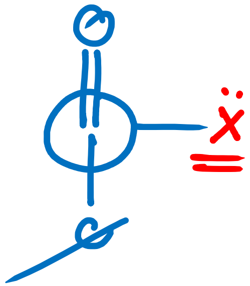
Clay dry

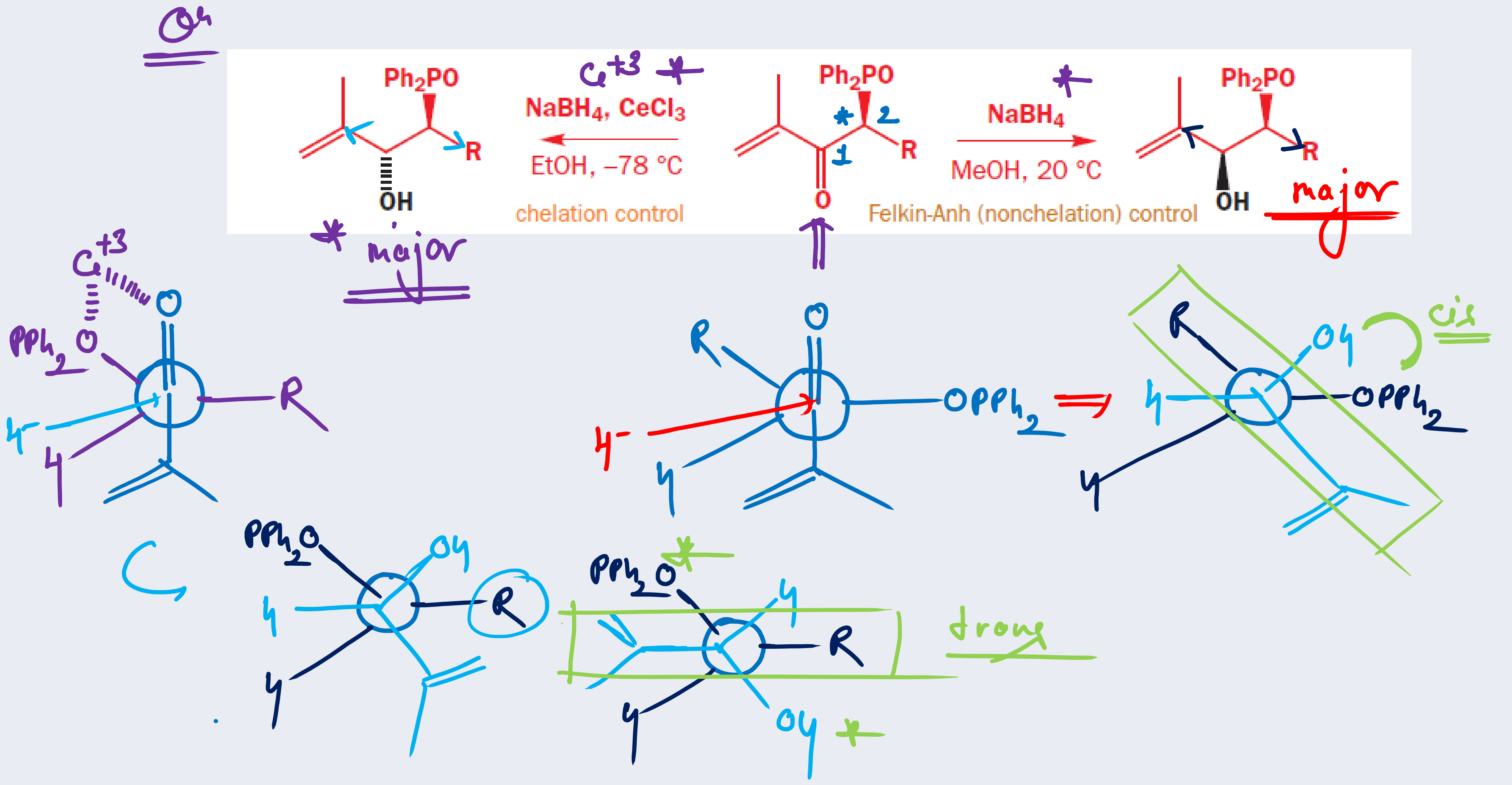
PDF

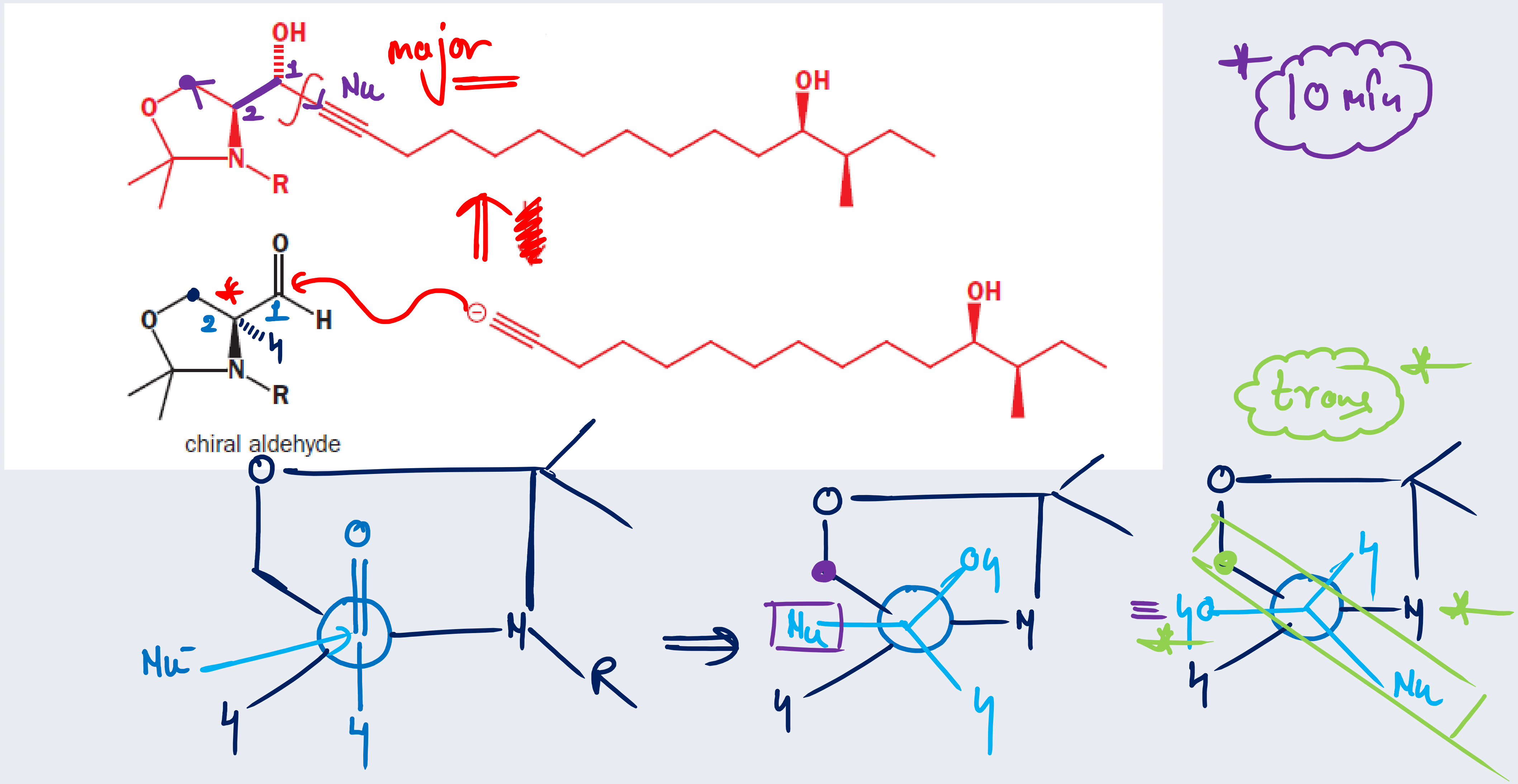


is there a heteroatom at the chiral centre?

- **yes** → is there a metal ion capable of chelation with the heteroatom?
  - **yes** → use chelation model: consider reactions on conformation with C=O and heteroatom held close in space
  - **no** → use Felkin–Anh model: consider reactions on conformations with most electronegative atom perpendicular to C=O
- **no** (No) → use Felkin–Anh model: consider reactions on conformations with largest group perpendicular to C=O

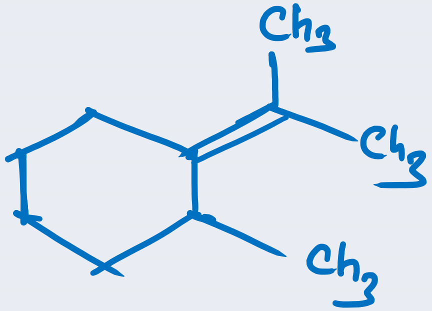


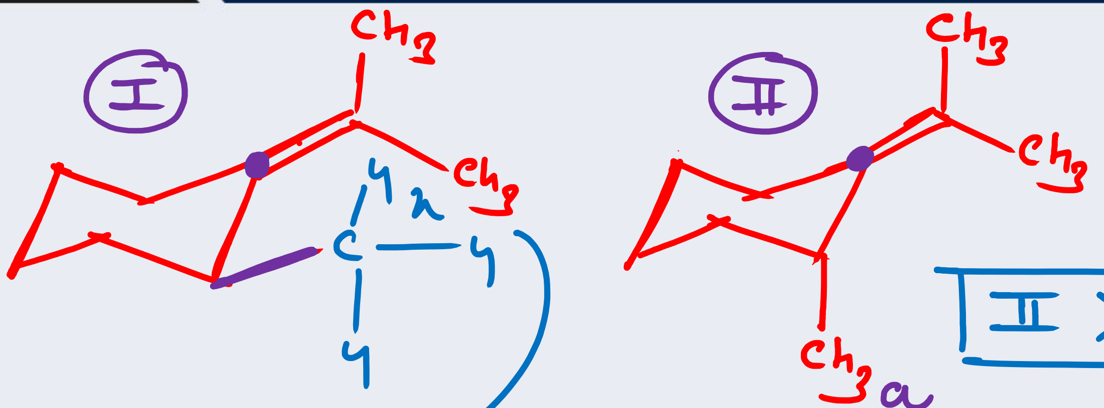

Ph2PO
NaBH4, CeCl3
EtOH, –78 °C
chelation control
NaBH4
MeOH, 20 °C
Felkin-Anh (nonchelation) control
OH
O
R
major
Ce+3
OPPh2
cis
wrong


OH
major
Nu
O
N
R
OH
O
H
N
R
OH
chiral aldehyde
10 min
trans

Unexpected Examples.

1) PYQ





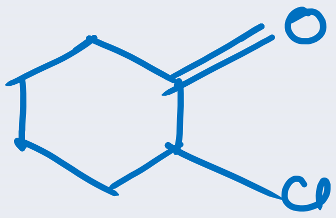
II > I *

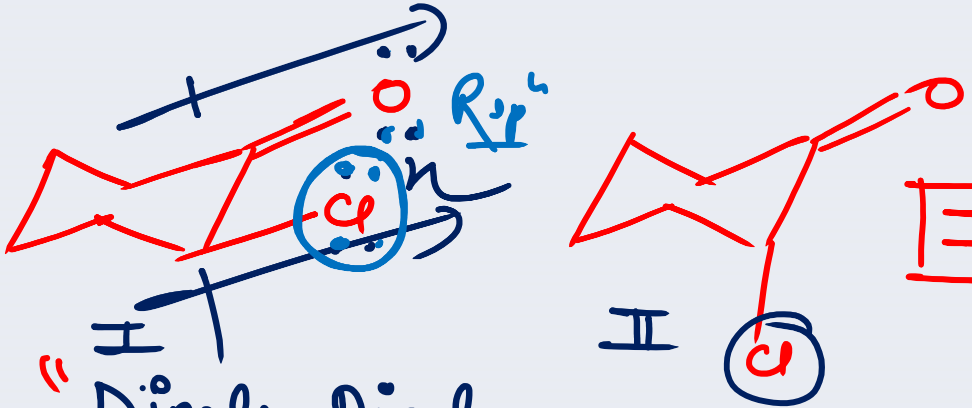
* "Repulsion"

2) NANT2 *

⇓

"Non Polar".

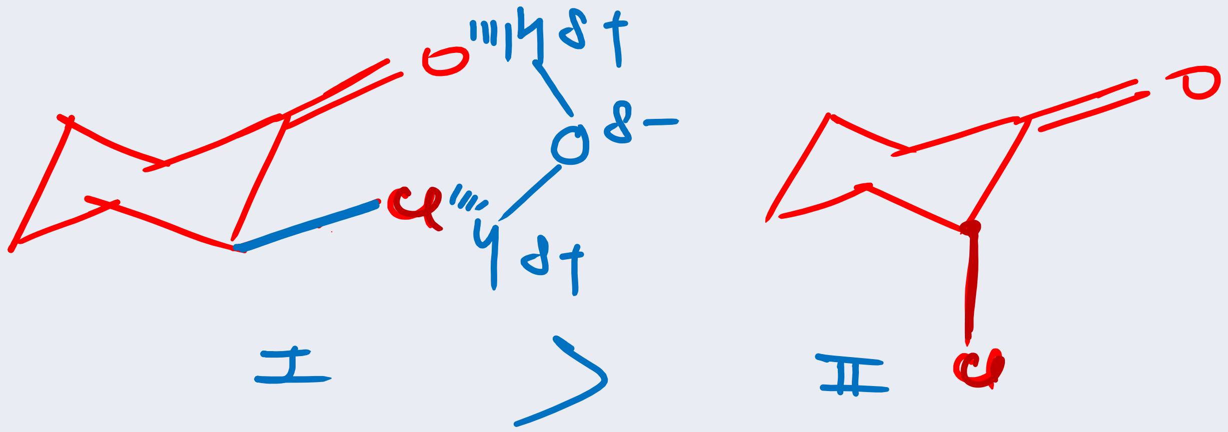




I < II *

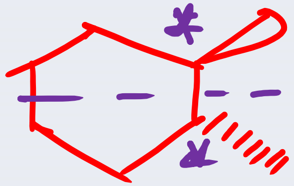
"Dipole-Dipole repul^n".

In Polar solvent like "H_2O"



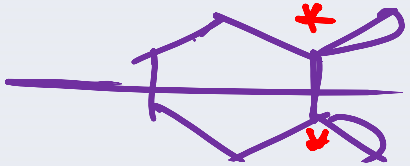
3) 1,2 disubstituted methyl (cis)

trans



Pos x

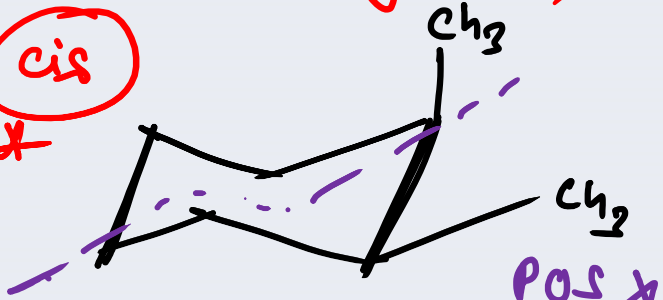
Meso x



Meso x

cis

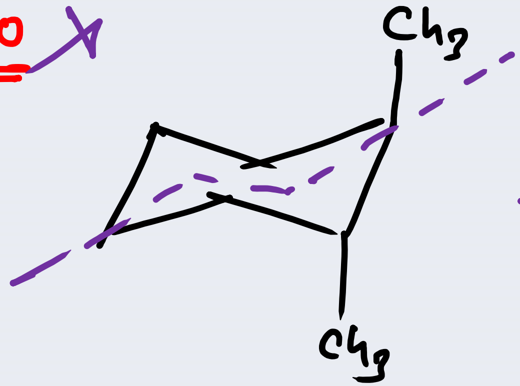
cis



Mo Io

Pos x cos x

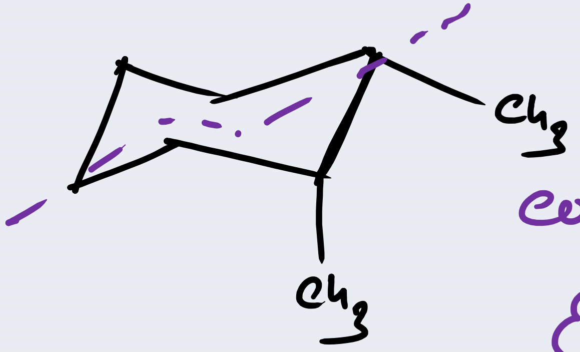
Racemization ⟸ O. Io ?



trans

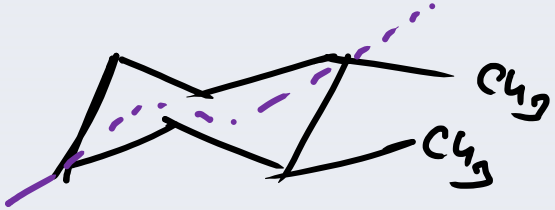
Pos x cos x

O.A



cos x Pos x

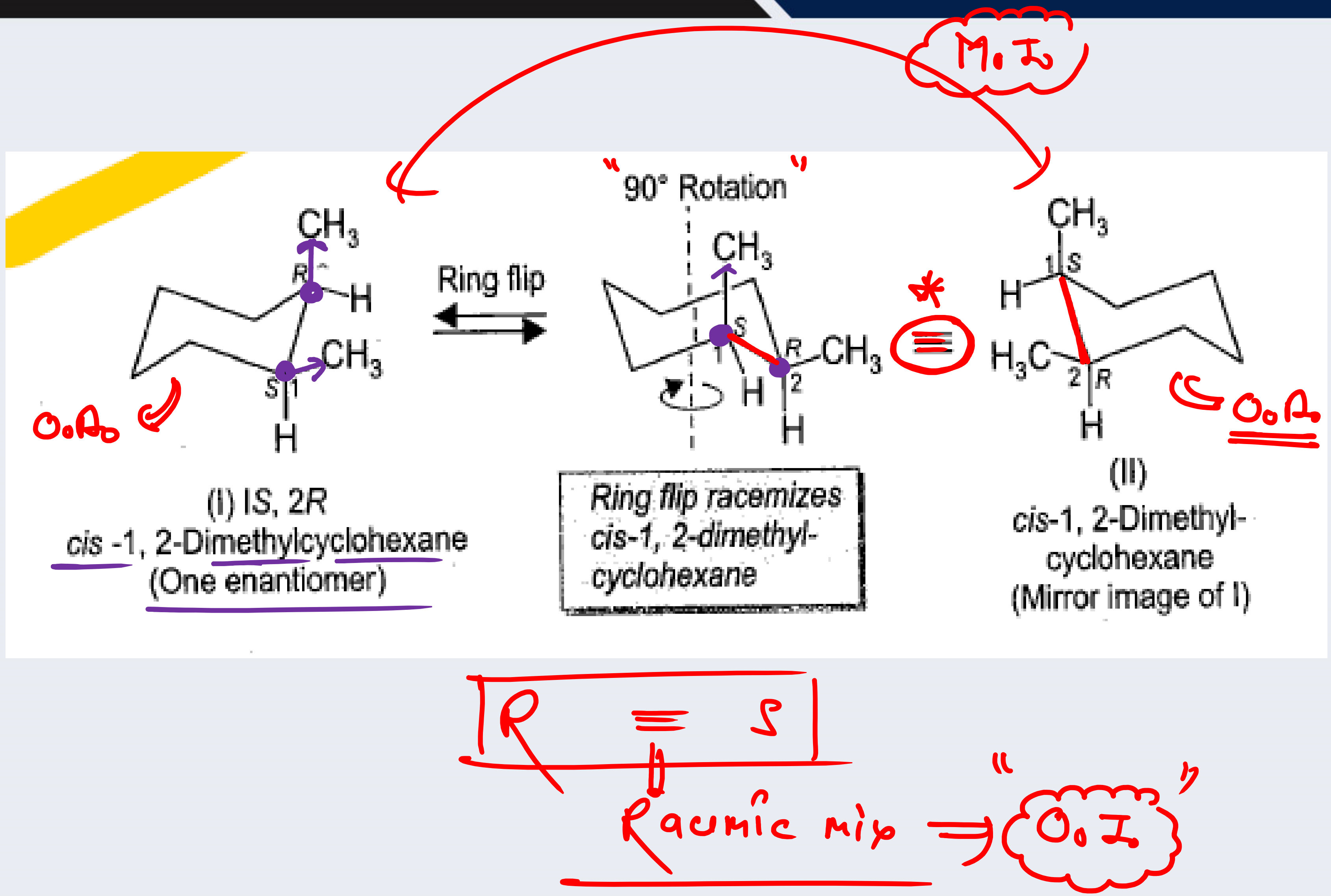
O. I. ?



trans

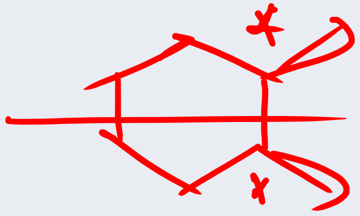
Pos x cos x

O.A



M. I.
"90° Rotation"
CH3
R
H
CH3
S 1
H
O.A.
Ring flip
CH3
S
1
R
CH3
2
H
H
*
≡
CH3
1 S
H
H3C
2 R
H
O.A.
(I) 1S, 2R
cis -1, 2-Dimethylcyclohexane
(One enantiomer)
Ring flip racemizes
cis-1, 2-dimethyl-
cyclohexane
(II)
cis-1, 2-Dimethyl-
cyclohexane
(Mirror image of I)
R ≡ S
Racemic mix ⇒ "O. I."

Q.



⇒ Meso ✗

⇓

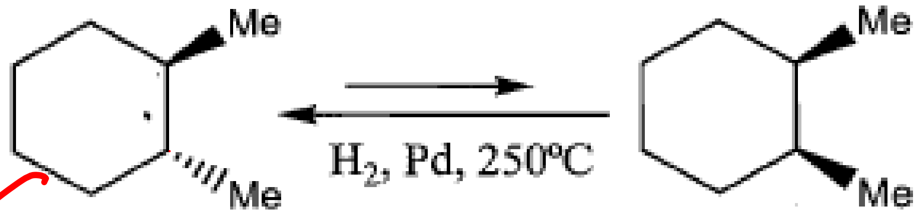
O.I.

⇓

"Racemization"

Given the energy of each gauche butane interaction is 0.9 kcal/mol, ΔG value of the following reaction is

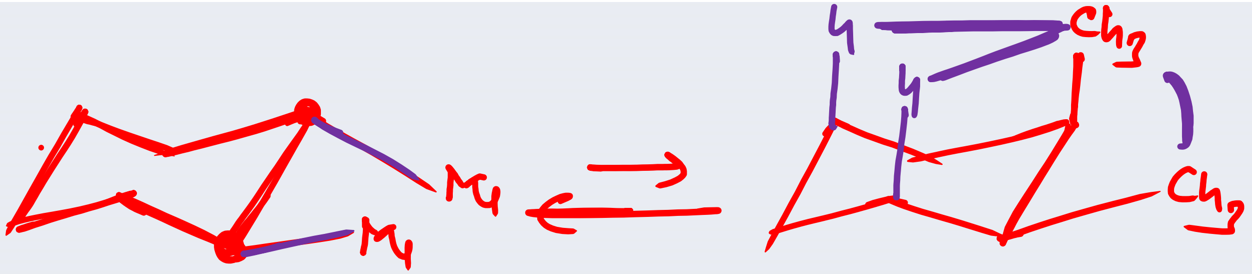
"1 G.B.I. = 0.9 kcal/mol"



(e, e conformer)

[NET Dec. 2012]

(a) 0.9 kcal/mol (b) 1.8 kcal/mol (c) 2.7 kcal/mol (d) 3.6 kcal/mol

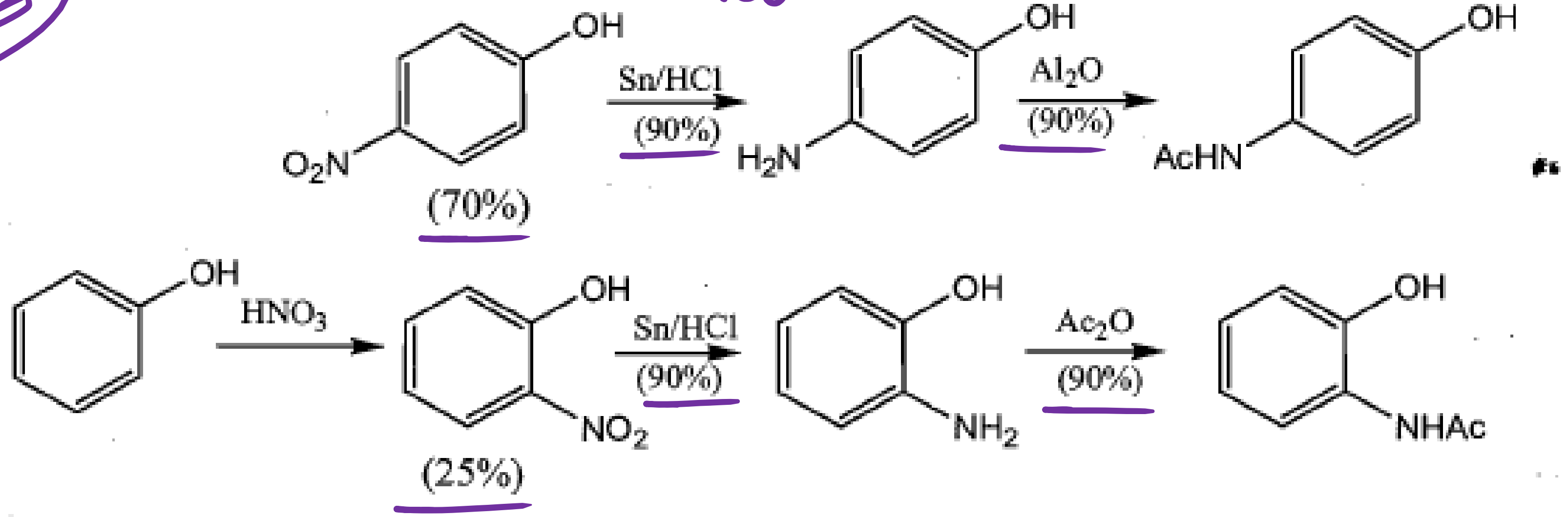


(1)* (3)*

$(3) \times 0.9 - 1(0.9)$

$= 1.8$

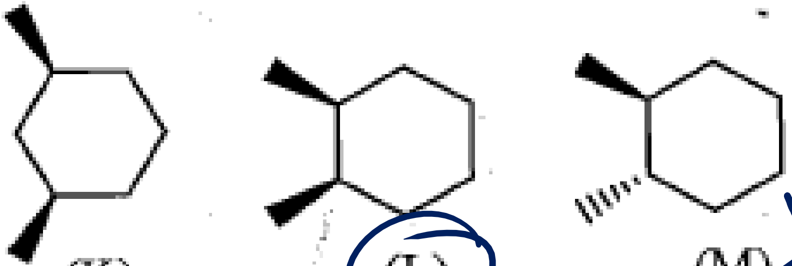
Consider the following reaction sequence [NET June 2013]



The overall yield for the formation of p-hydroxyacetanilide and o-hydroxyacetanilides from phenol, respectively, are approximately

(a) 57 and 20% (b) 57 and 68% (c) 83 and 68% (d) 83 and 20%

The molecules (s) that exist as meso structure (s). [GATE 2007]



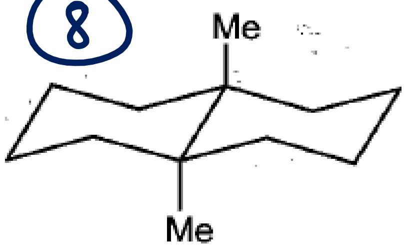
(K) (L) (M)

is/are:

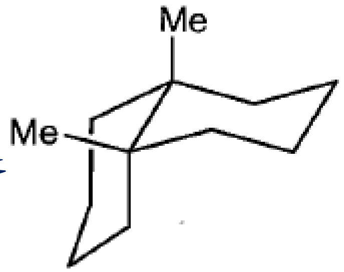
(a) Only M (b) Both K and L (c) Only L (d) Only K

The overall yield (in %) for the following reaction sequence is 57.6% [GATE 2014]

The correct statement about the following compounds is [NET June 2018]



(A)



(B)

(a) A is more stable than B

(b) B is more stable than A

(c) A and B are equally stable

(d) A and B are both locked conformations

Baldwin Rule ⇒ Youtube 5:00 "Monday"

The number of optically active steroisomers possible for $CH_3–CH(OH)–CH(OH)–CH(OH)–CH_3$ is "Formula" [NET Dec. 2017]

(a) two (b) four (c) six (d) eight

An optically pure organic compound has specific rotation of +40°. The optical purity of the sample that exhibits specific rotation of +32° is [NET Dec. 2017]

(a) 8% (b) 12% (c) 20% (d) 80%

Type – III

① ee / O.P. = |%d − %l|

② S.R. of soln = ? × 40°

$32° = O.P. \times 40°$

$\frac{32}{40} = \frac{16}{20} = \frac{8}{10} = 0.8$

80%