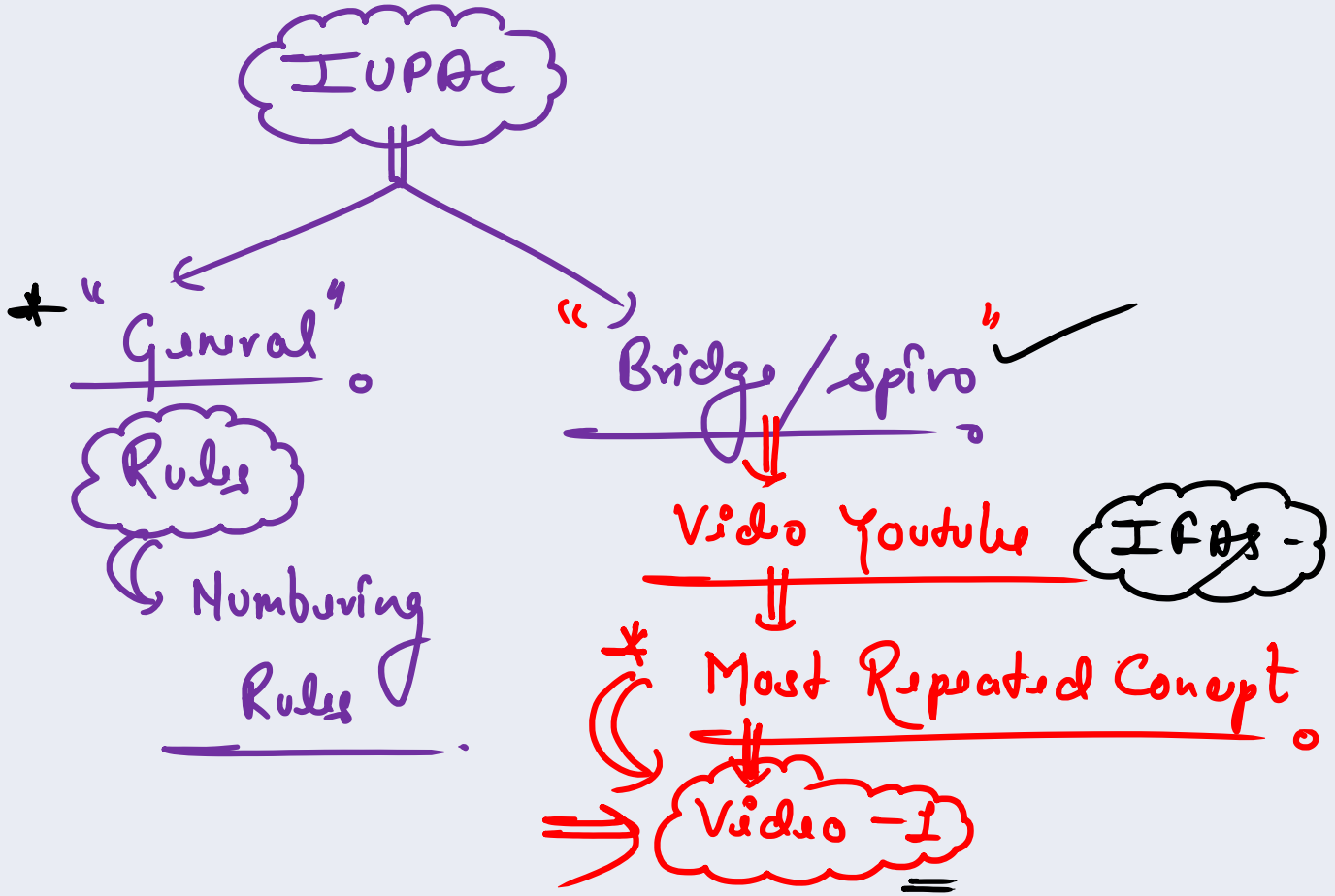
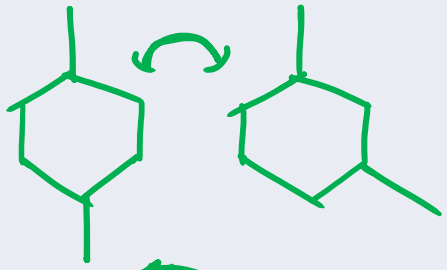

IUPAC
"General"
Rules
Numbering Rules
"Bridge/Spiro"
Video Youtube
IFAS
Most Repeated Concept
Video-1

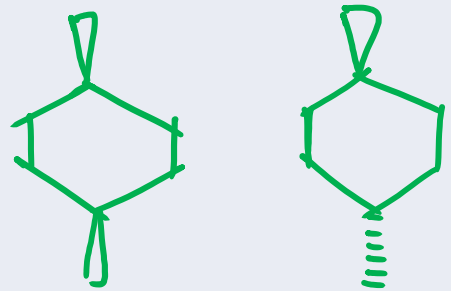
Stereochemistry

NET – 4-5 M
SET – 5-8 M

Isomers

1) Same Molecular formula
2) Diff. atoms. arrangement





Structural / Constitutional

1) Same Mol. formula.
2) Atom – to – Atom Connectivity diff..

Optical / Stereo

1) Same Mol. formula
2) Atom – to – Atom Connectivity same
3) 3-D spatial arrg. diff.

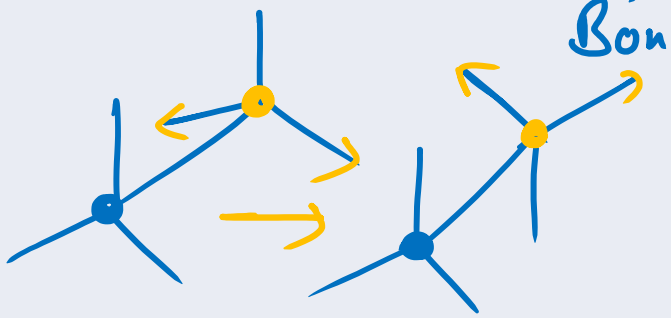
Optical Isomers

- Conformational Enantiomer
- Conformational diastereomer

"Conformational"

* $I_1 \rightleftharpoons I_2$ *

⇓ Bond Rotation

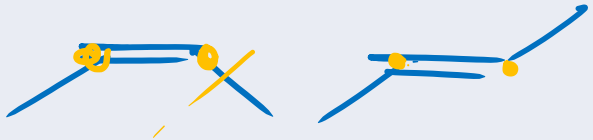


"Configurational"

$I_1 \rightleftharpoons I_2$

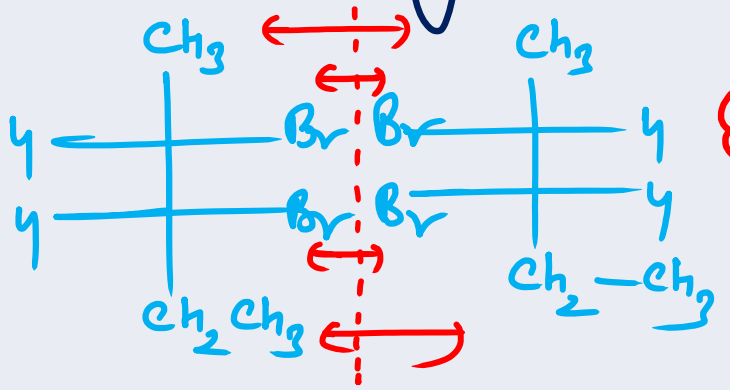
⇓ "Bond Break"

Bond Rotation X



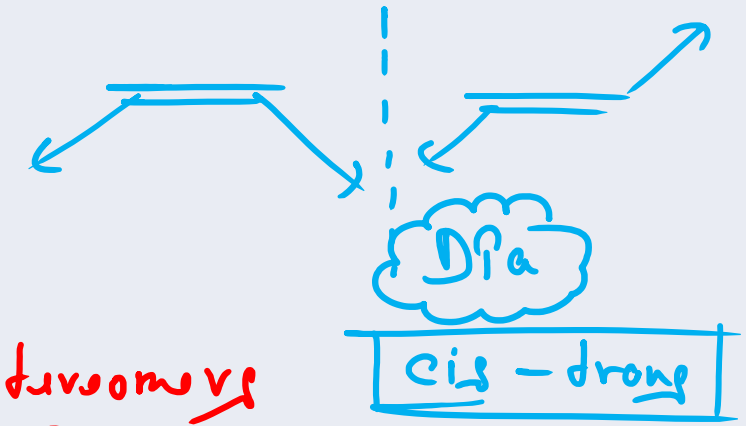
Configurational

* Enantiomers
  1) Non-superimposable.
  2) Mirror image. (MoIo)



Enan

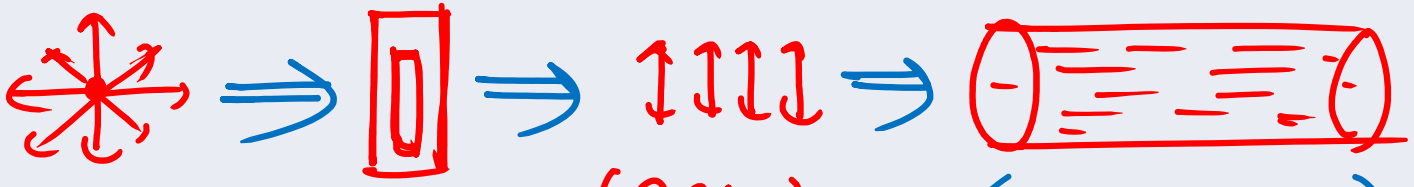
* Diastereomers
  1) Not a MoIo
  2) Not same/identical after Rotation.



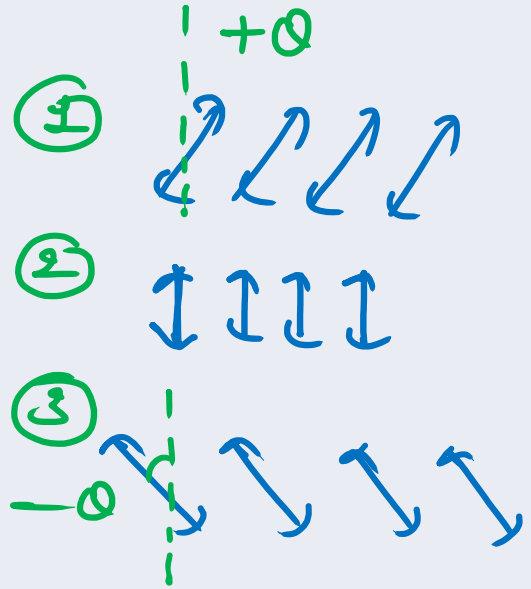
"Optical Activity" ≡ Ability of a molecule to rotate a plane polarised light is called as optical activity.

And molecule is called as chiral / OoA.

"Polarimeter"



(PPL)

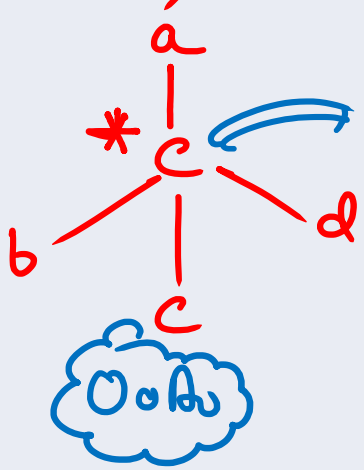


1 and 3 ≡ OoA / chiral

2 ≡ OoI / achiral.

How to identify OoIo / OoAo Compounds?

2) Asymmetric center

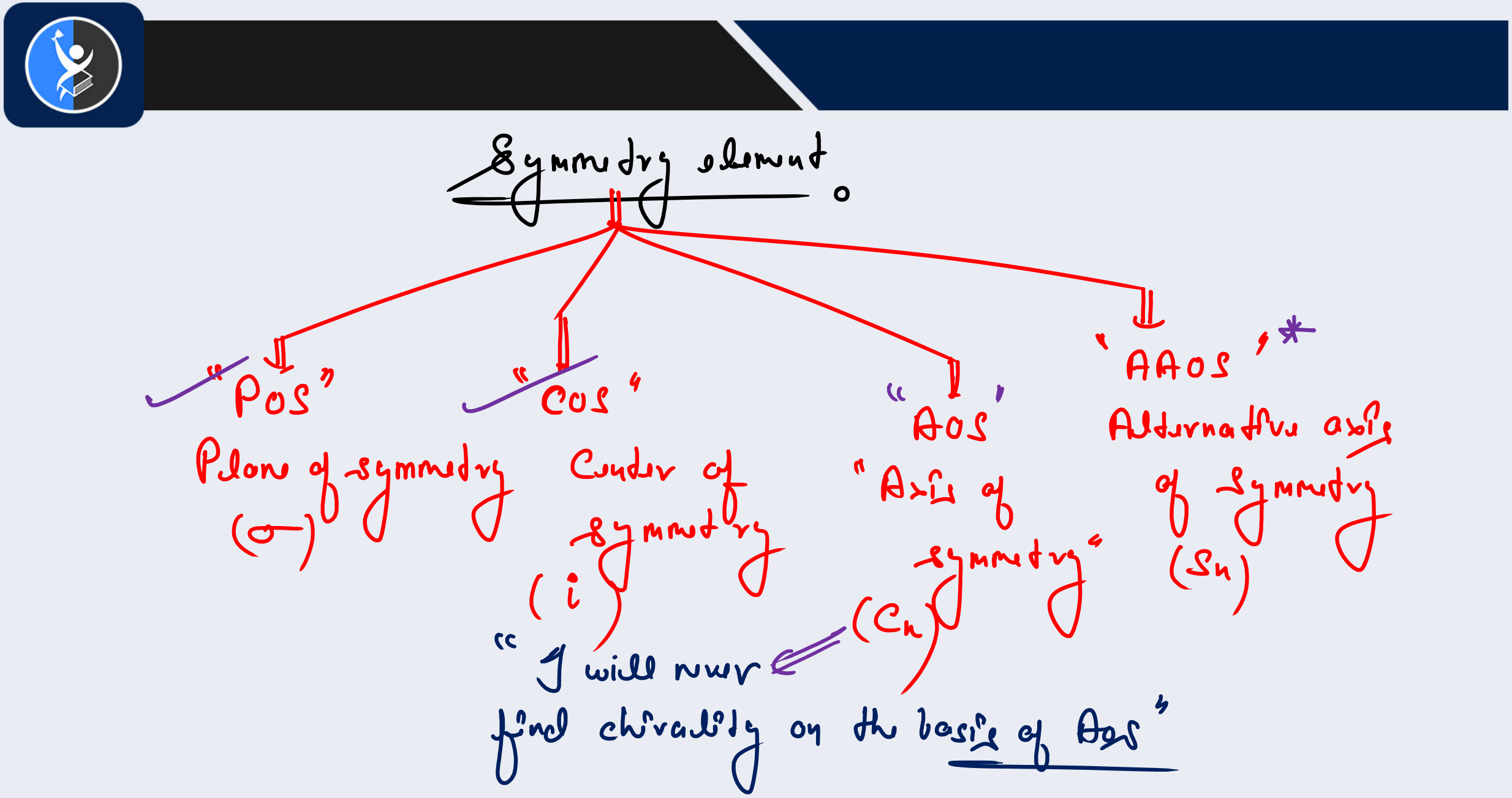


chiral center

1) Symmetry elements

⇒ "Symmetric" ≡ ○ ≡ * OoIo / achiral

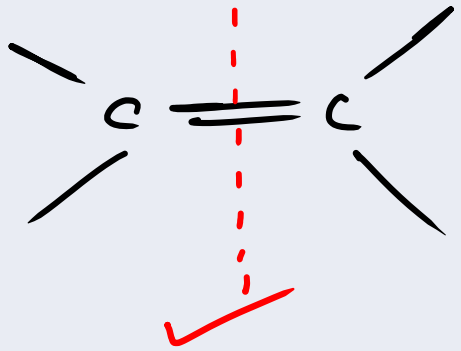
⇒ "Asymmetric" ≡ ☾ ≡ "OoAo / chiral"


Symmetry element
"POS"
Plane of symmetry
(σ)
"COS"
Center of
symmetry
(i)
"AOS"
"Axis of
symmetry"
(Cn)
"AAOS"*
Alternative axis
of symmetry
(Sn)
"I will never
find chirality on the basis of AOS"

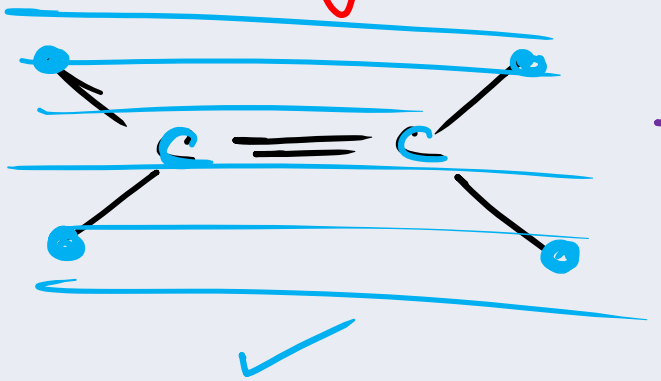
	Pos	Cos	Asos	
Eg-1	✓	✓	✓	O.I$_o$
Eg-2	✗	✓	✓	O.I$_o$
Eg-3	✓	✗	✓	O.I$_o$
Eg-4	✗	✗	✗	O.A$_o$

POS (Plane of Symmetry).

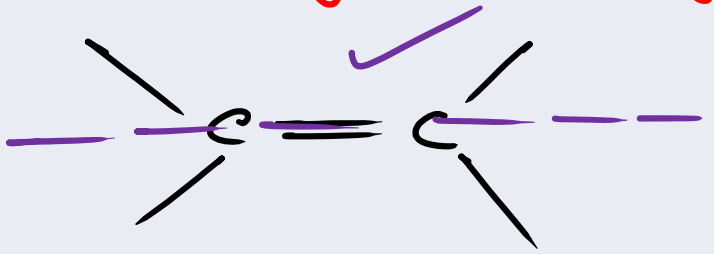
Reflecting Plane

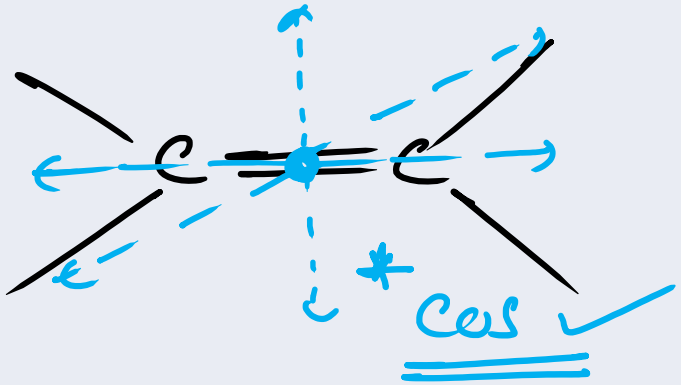


Bisecting Plane

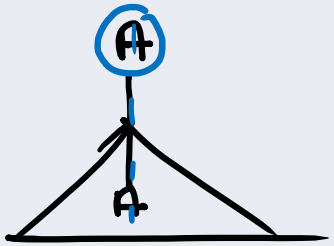


Reflecting + Bisecting




cos

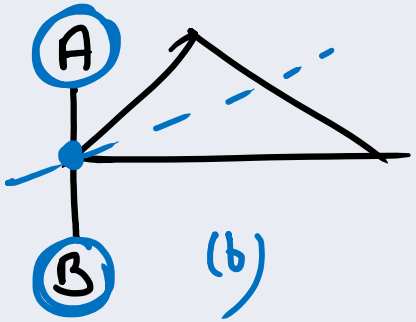
3 - Member Ring



(a)

Pos ✓

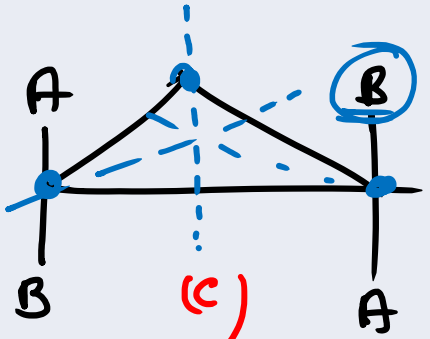
O.I.



(b)

Pos ✓

O.I.

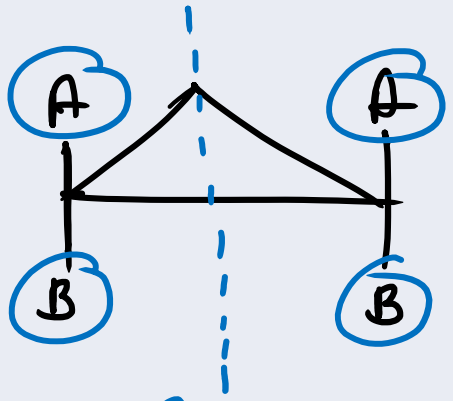


(c)

Cos X

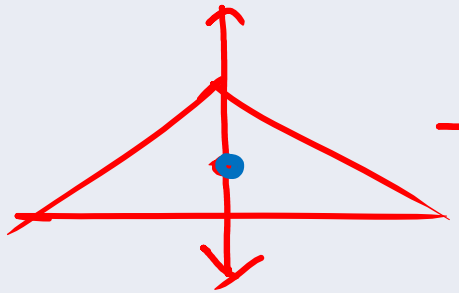
Pos X

AA Pos X



Pos ✓

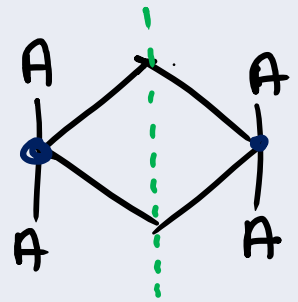
O.I.



Cos X

O.A.

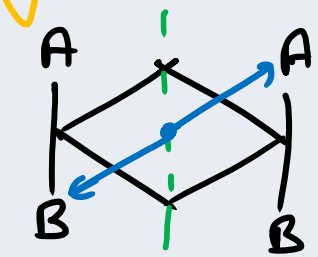
4- Member Ring



(a)

Pos ✓

O.I.

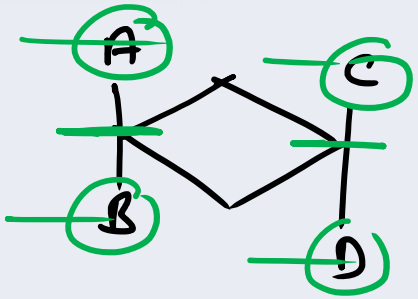


(b)

Pos ✓

O.I.

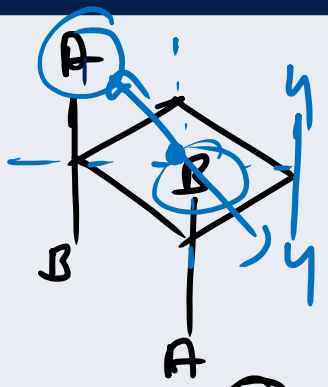
Cos ✗



(c)

Pos ✓

O.I.



(d)

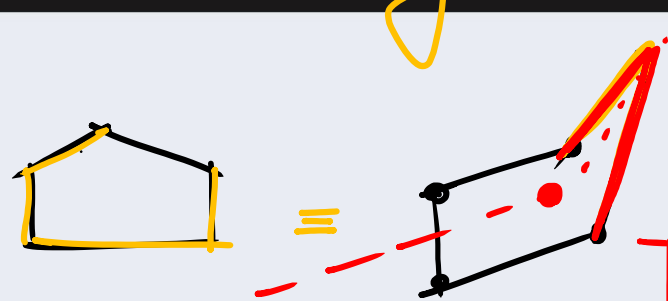
Pos ✗

Cos ✗

A Pos ✗

O.A.

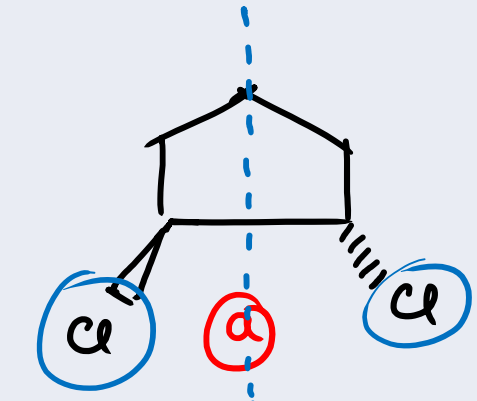
5-Member Ring



Pos ✓

Cos X

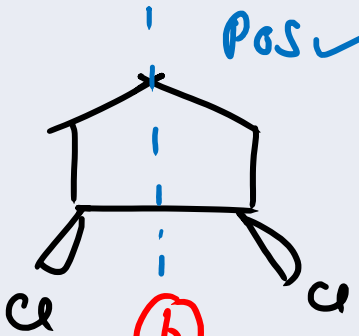
* 10 min



O.H.O

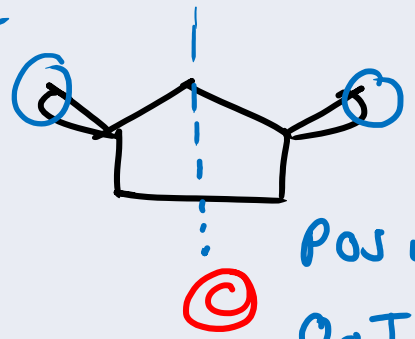
Pos X

Cos X



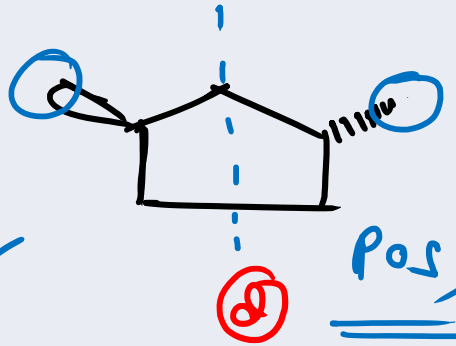
Pos ✓

O.I.O



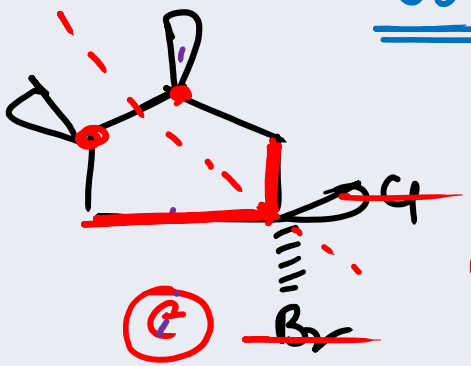
Pos ✓

O.I.O



Pos X

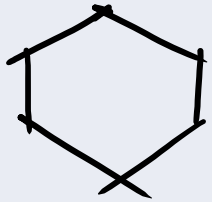
O.R.O

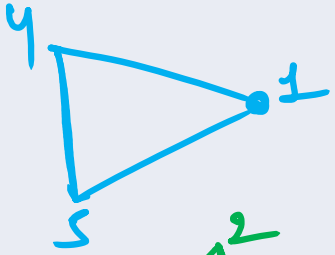


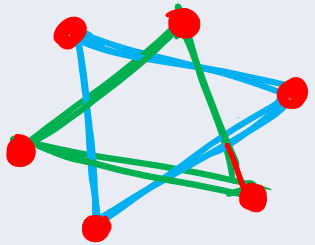
Pos ✓

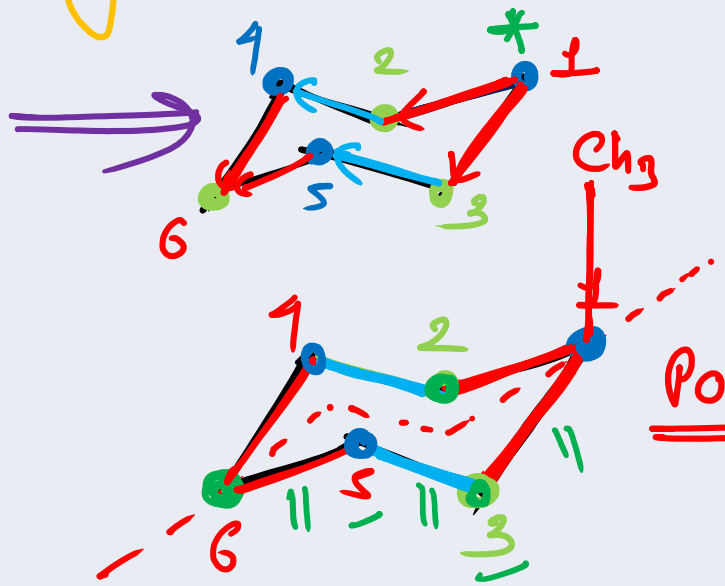
O.I.O

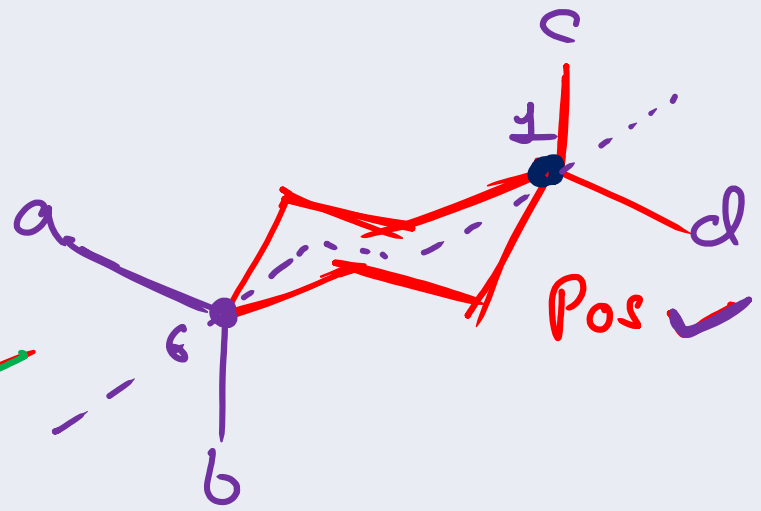
6 - Member Ring

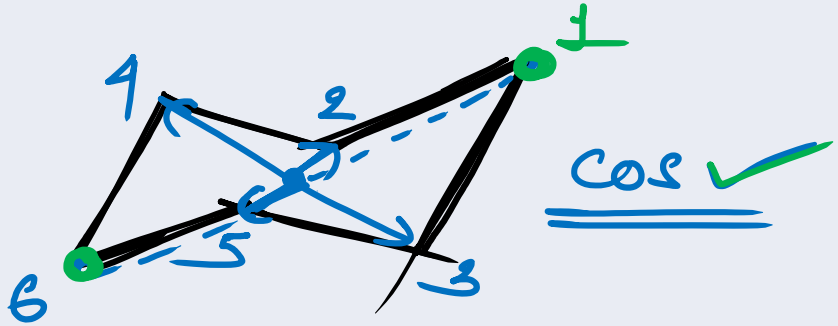




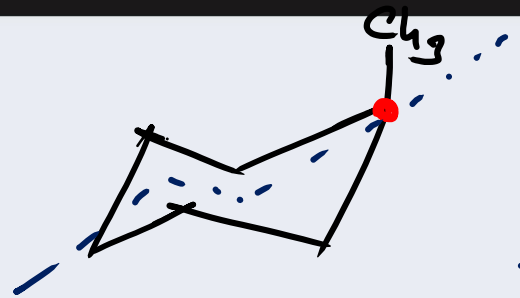






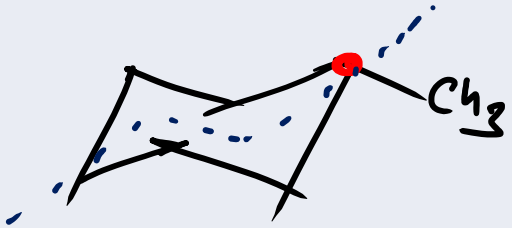


Or



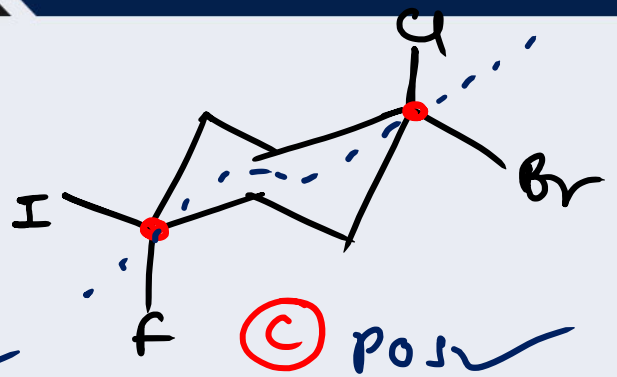
(a) Pos ✓

O.I.



(b) Pos ✓

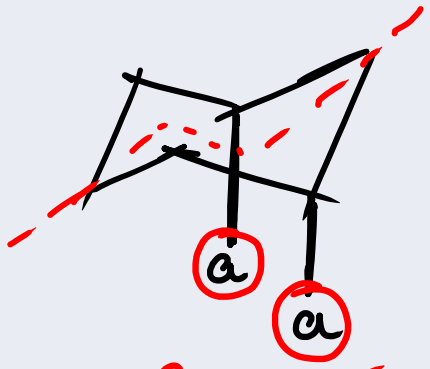
O.I.



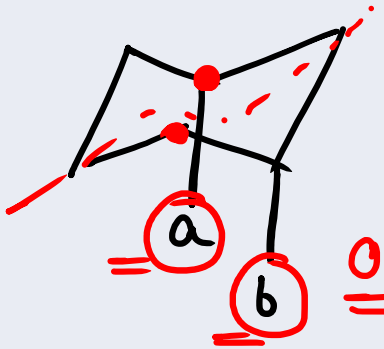
1-1

(c) Pos ✓

O.I.



Pos ✓

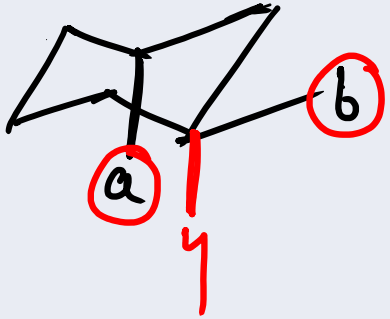


O.A.

Pos ✗

Cis ✗

Or



Pos ✗

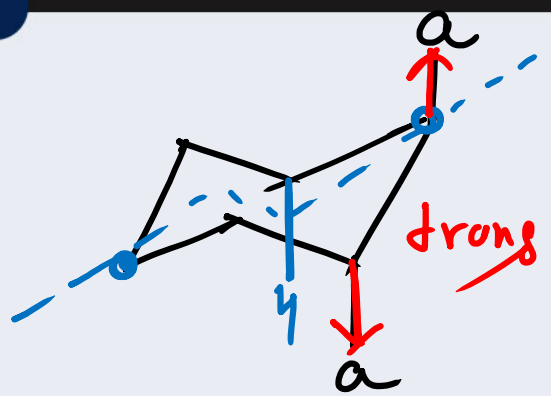
Cis ✗

1-3

Pos ✗

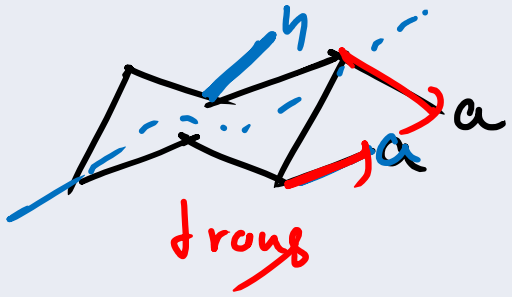
Cis ✗

O.A.



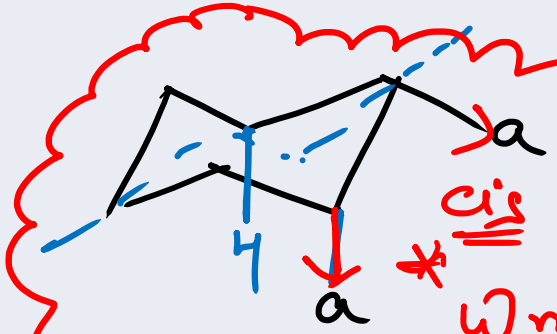
ⓐ

Pos ✗
cos ✗
$\boxed{O_0A_0}$

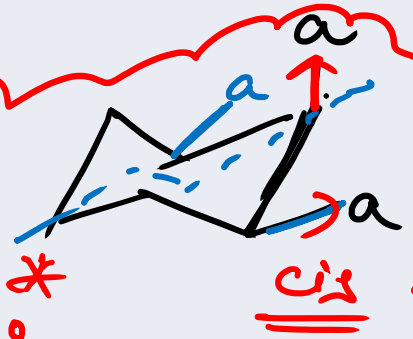


ⓑ

Pos ✗
cos ✗
$\boxed{O_0A_0}$



* Wrong *



ⓒ

Pos ✗
cos ✗
$\boxed{O_0A_0}$

ⓓ

Pos ✗
cos ✗
$\boxed{O_0A_0}$

To be continued....

Thank you