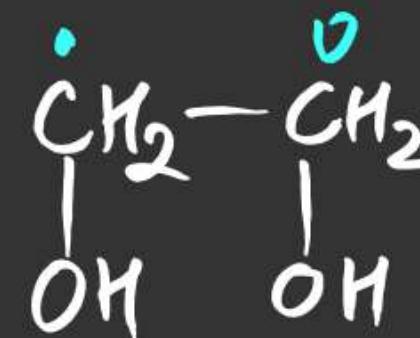


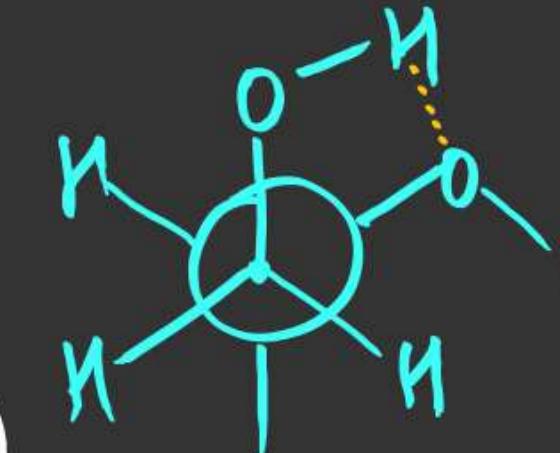
(#) Draw most stable Conformation



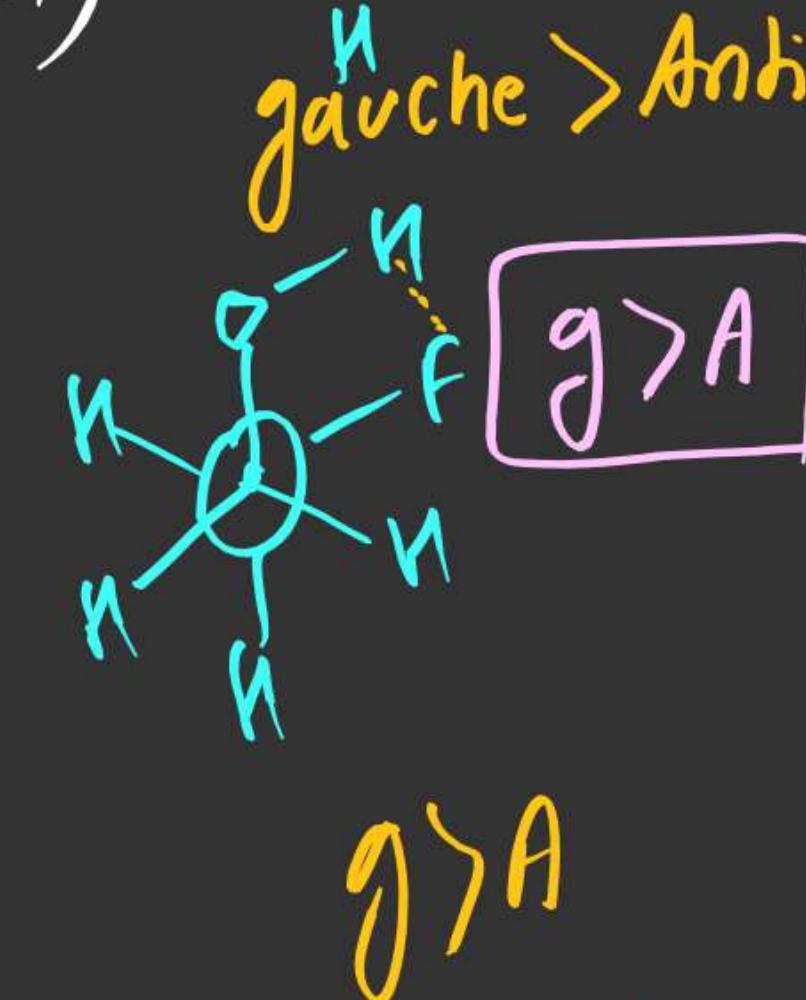
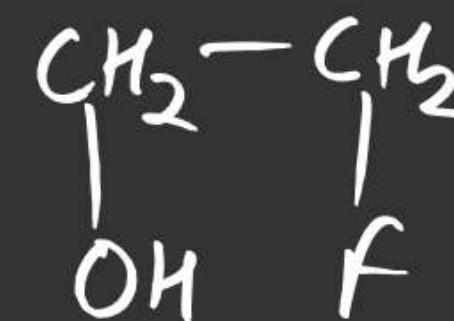
(11)



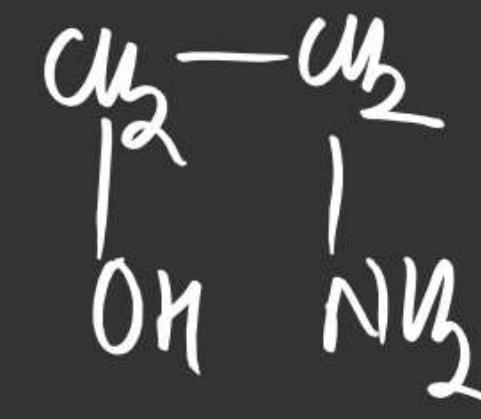
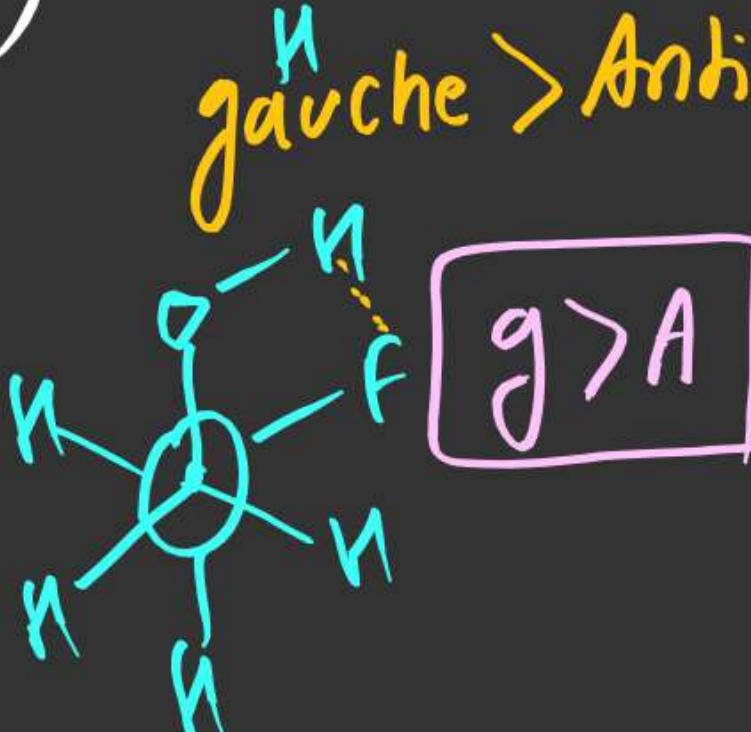
(Ethylene Glycol)



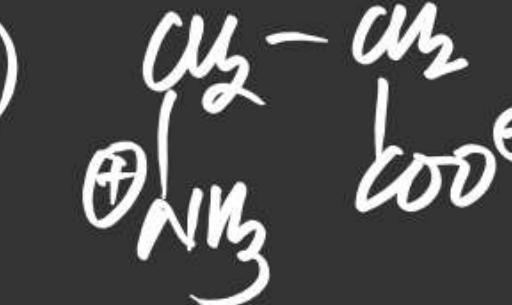
(12)



(13)

 $g > A$  $gauche > Anti$ $g > A$

(14)

 $g > A$

(15)

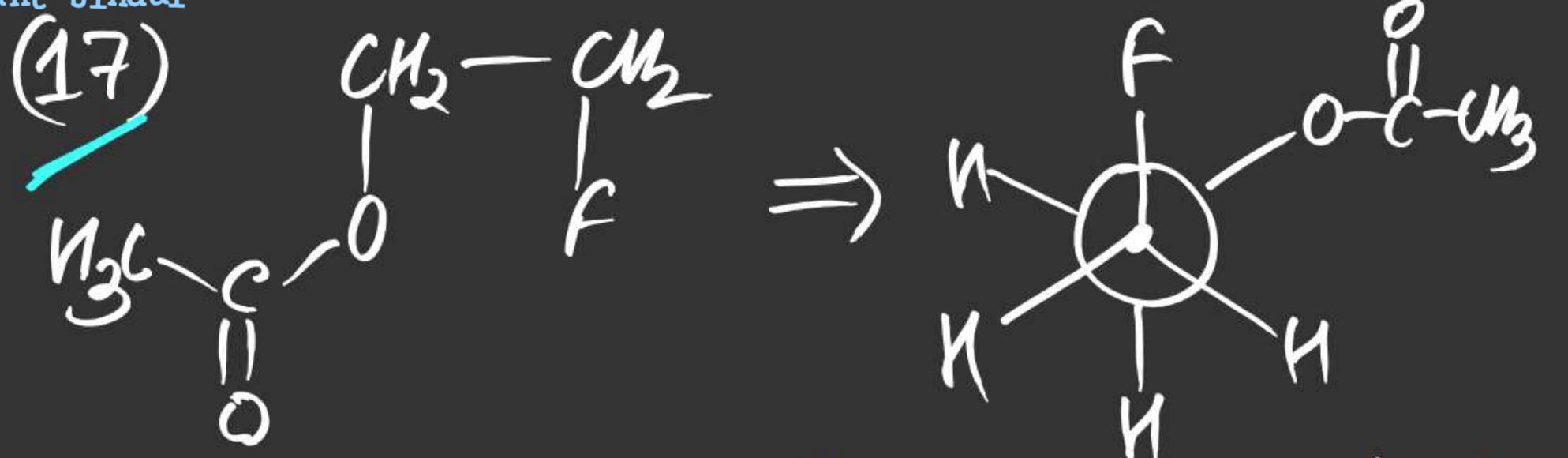
 $g > A$

Electrostatic attraction

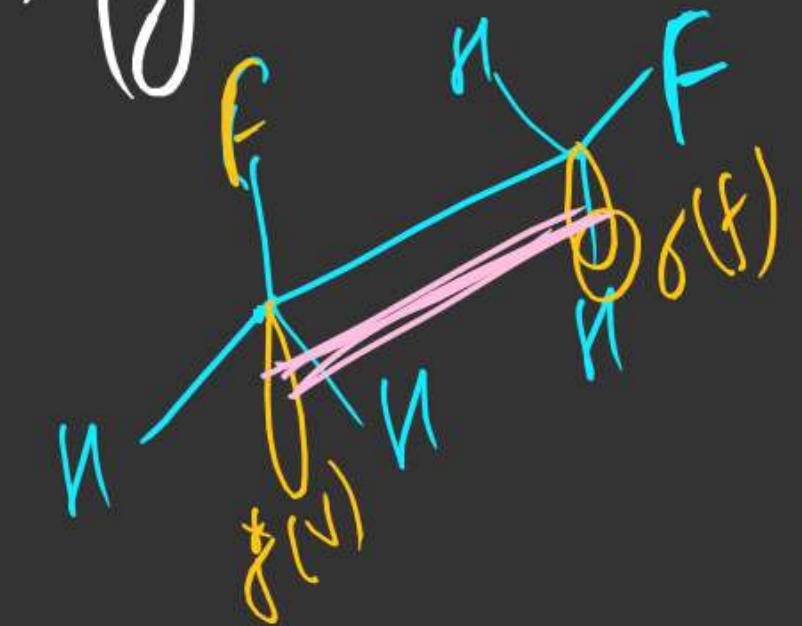
(16)

 $g > A$

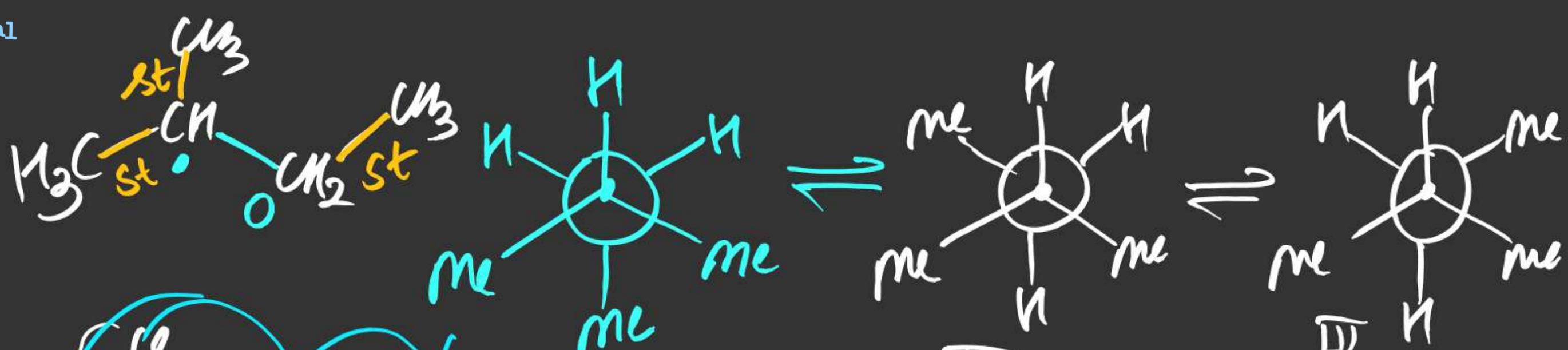
Note! Presence of intramolecular N-Bonding is supporting phenomenon for higher Stability.



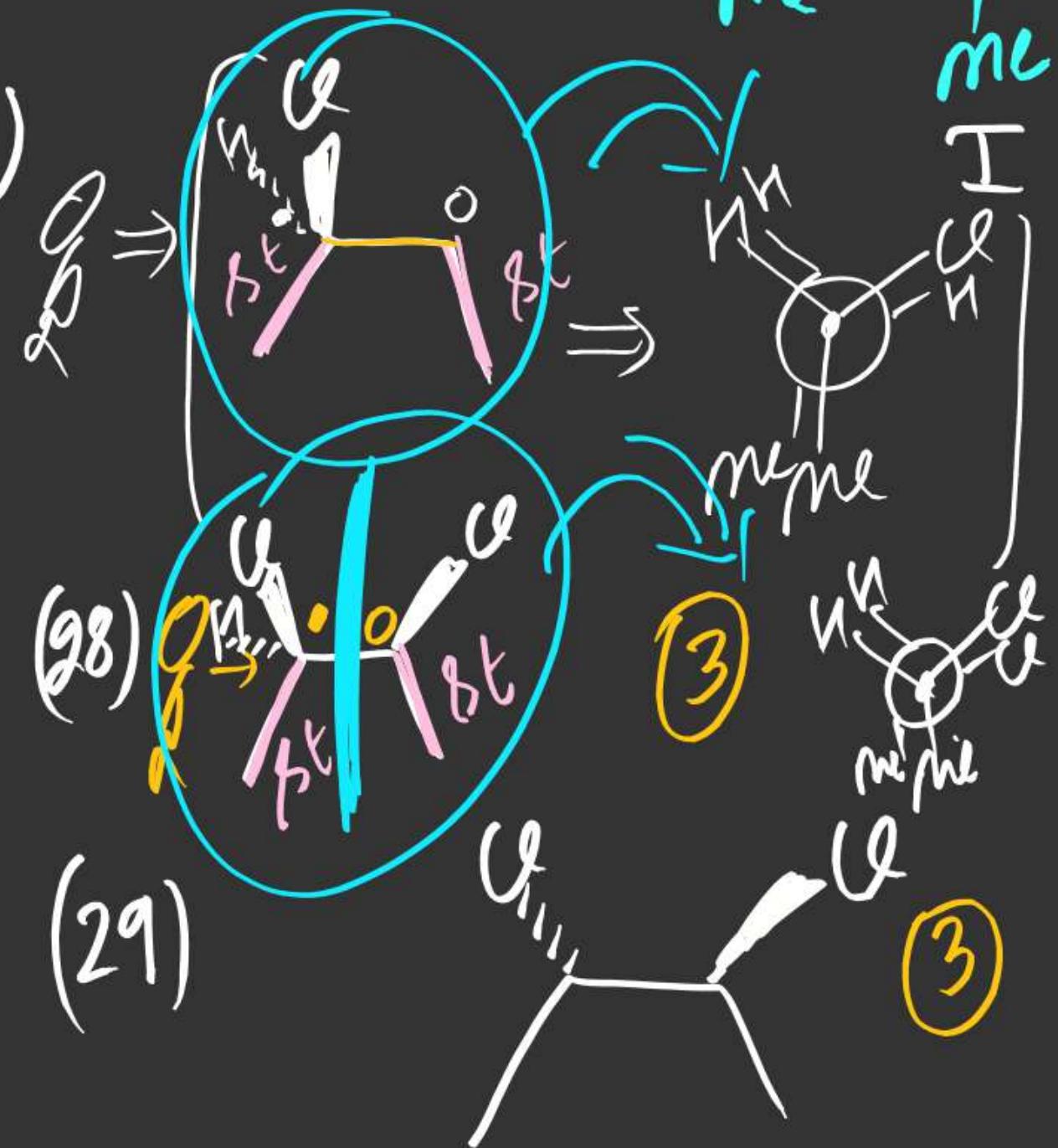
"Gavche" most Stable Conformation



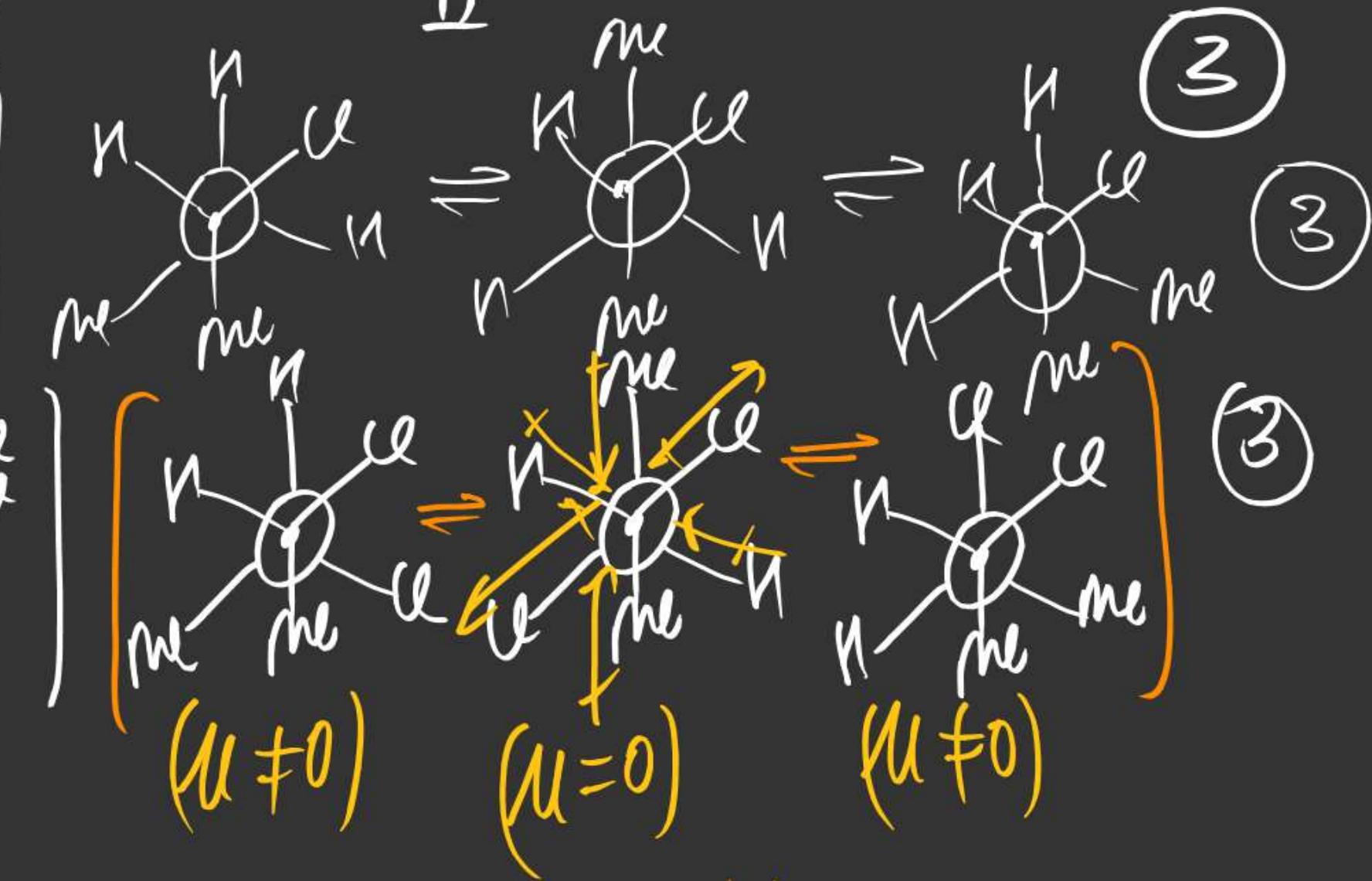
(26)



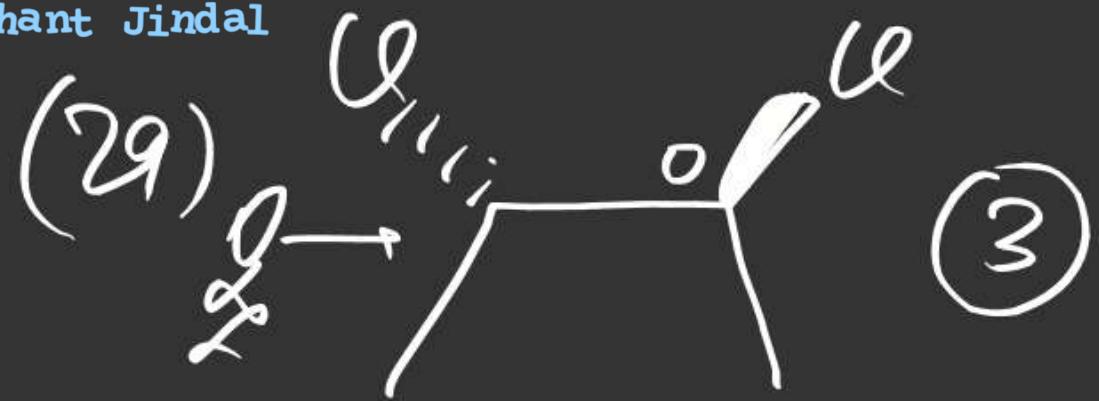
(27)



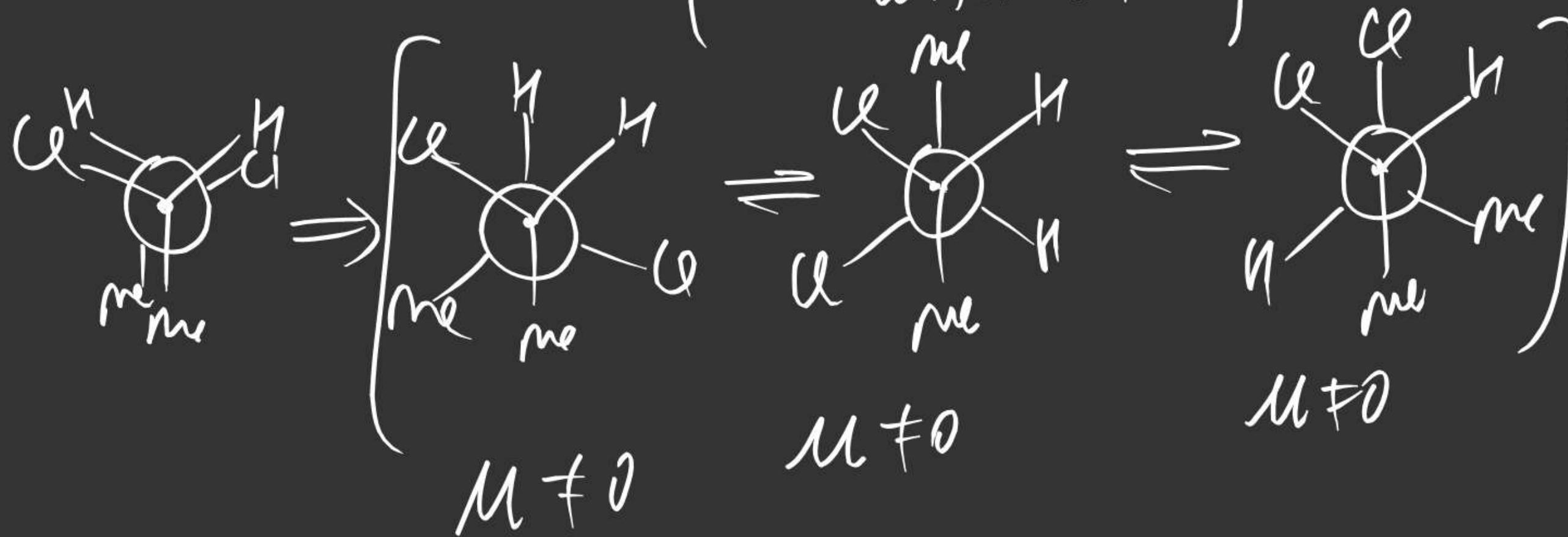
(28)

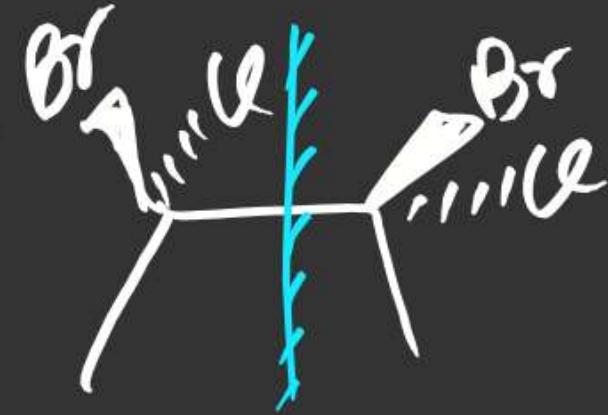


(29)



Total stable Conformation = 3
 Total stable Conformation = 3
 with $\mu \neq 0$





III

Total stable Conformation = 3

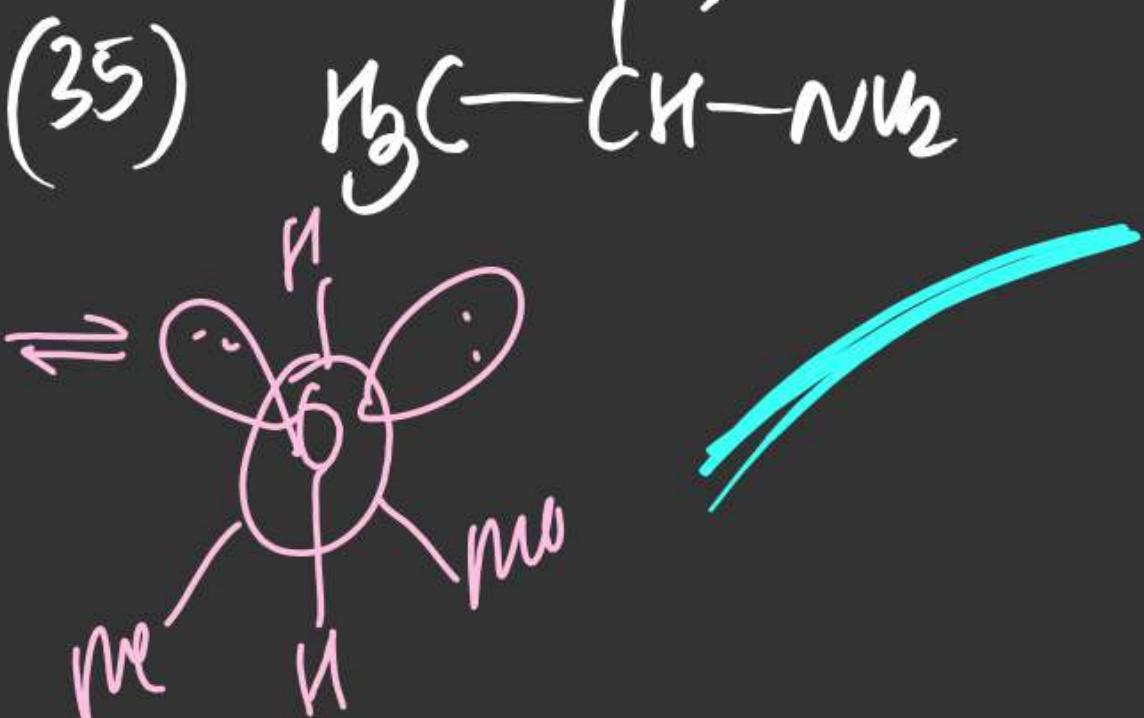
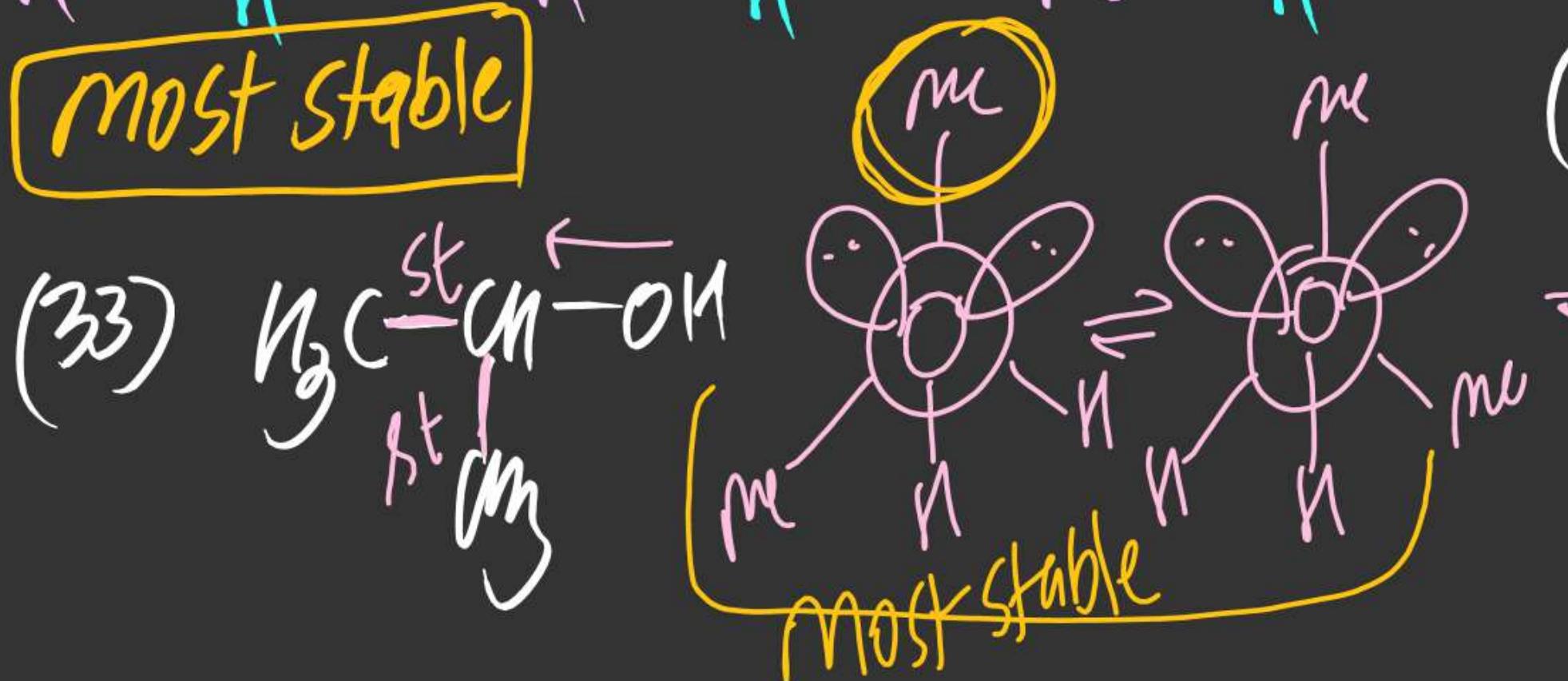
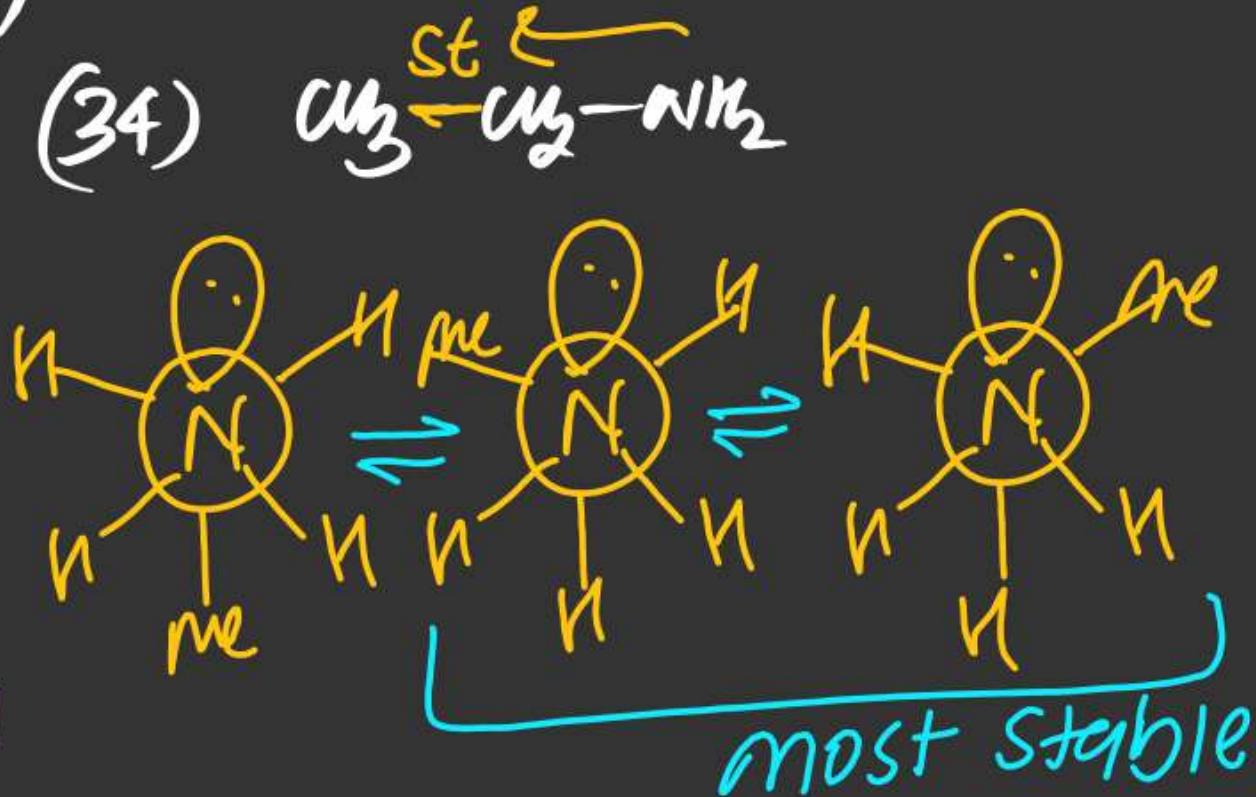
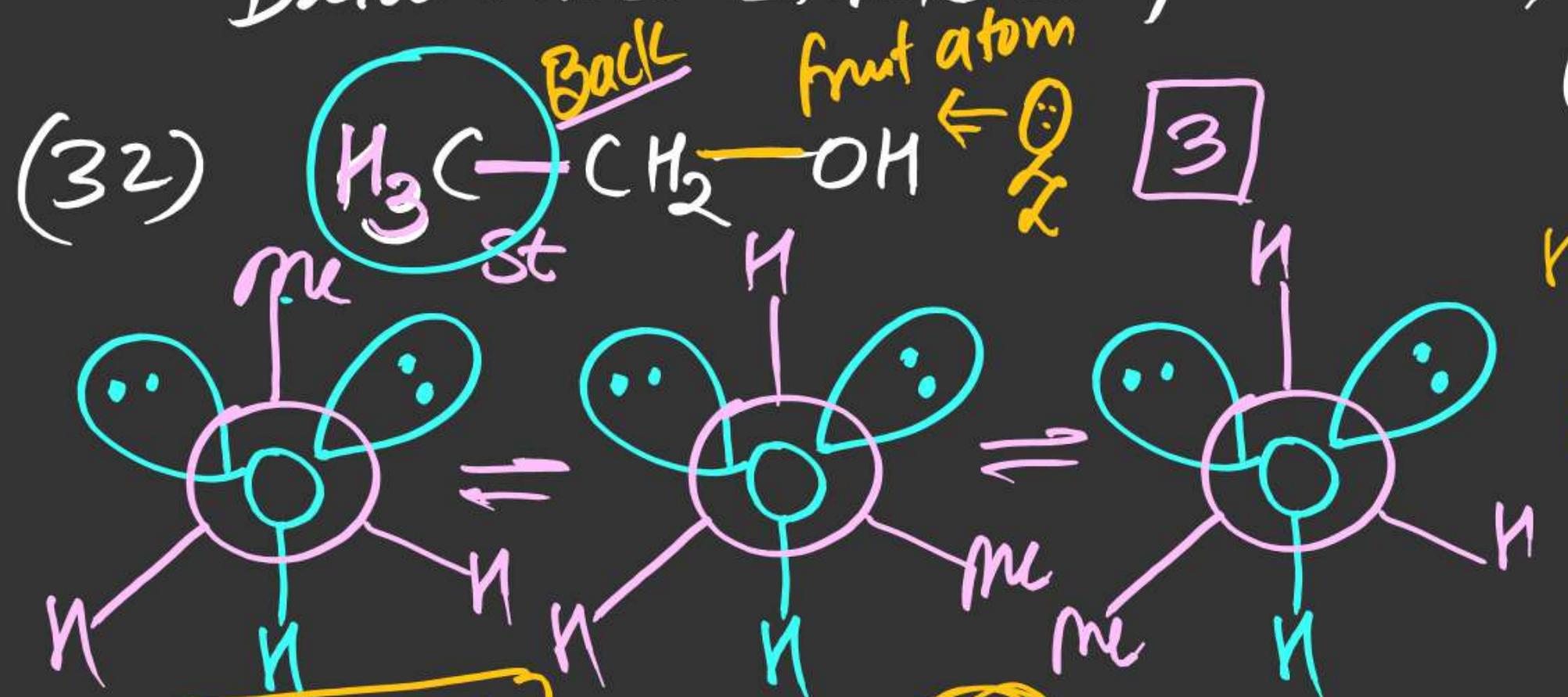
Total stable Conformation with $\alpha \neq 0 = 2$ 

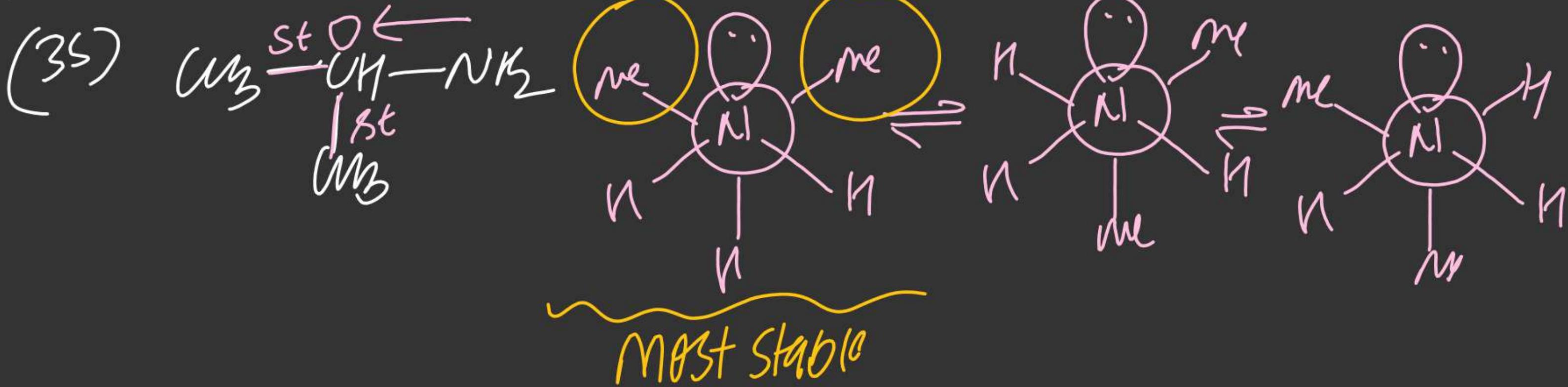
(31)

Total stable Conformation = 3

Total stable Conformation with $\alpha \neq 0 = 3$

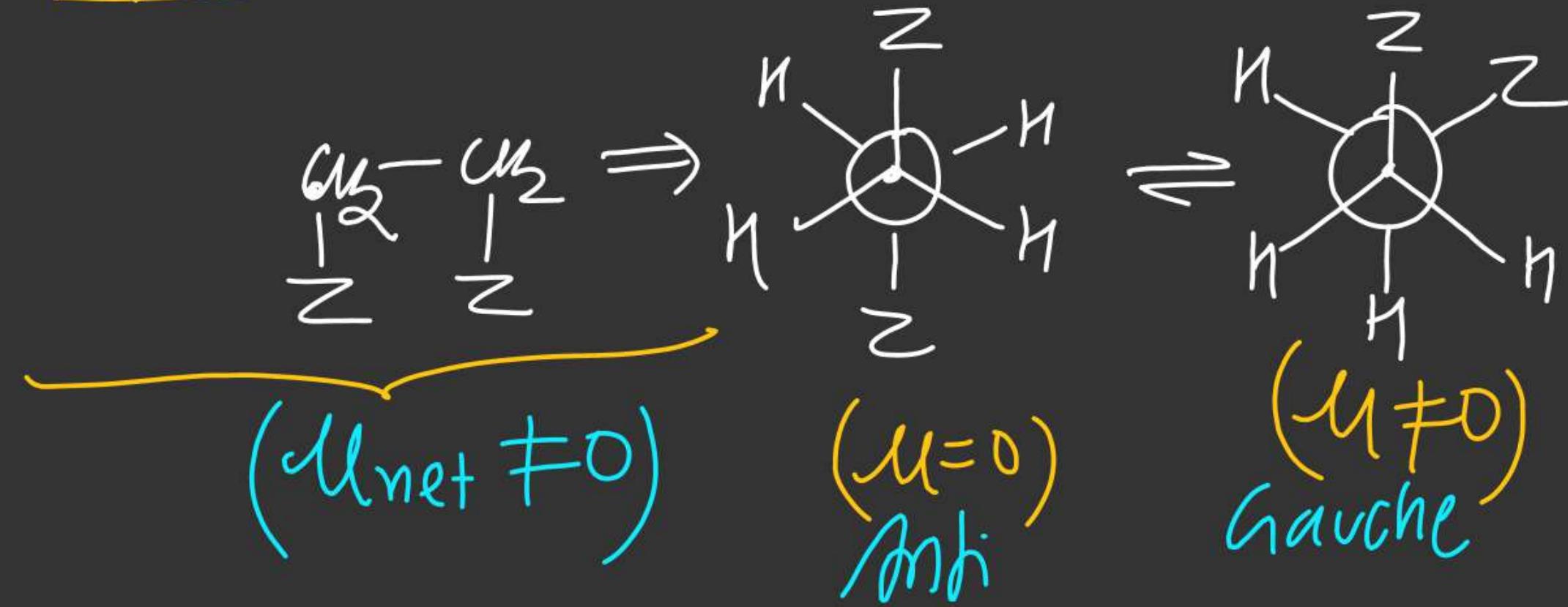
Draw most stable conformation





(#) Dipole moment for Compound showing:
Conformation

Ex-1:



Q-2: Find Compounds with Non zero dipole moment.

(i)

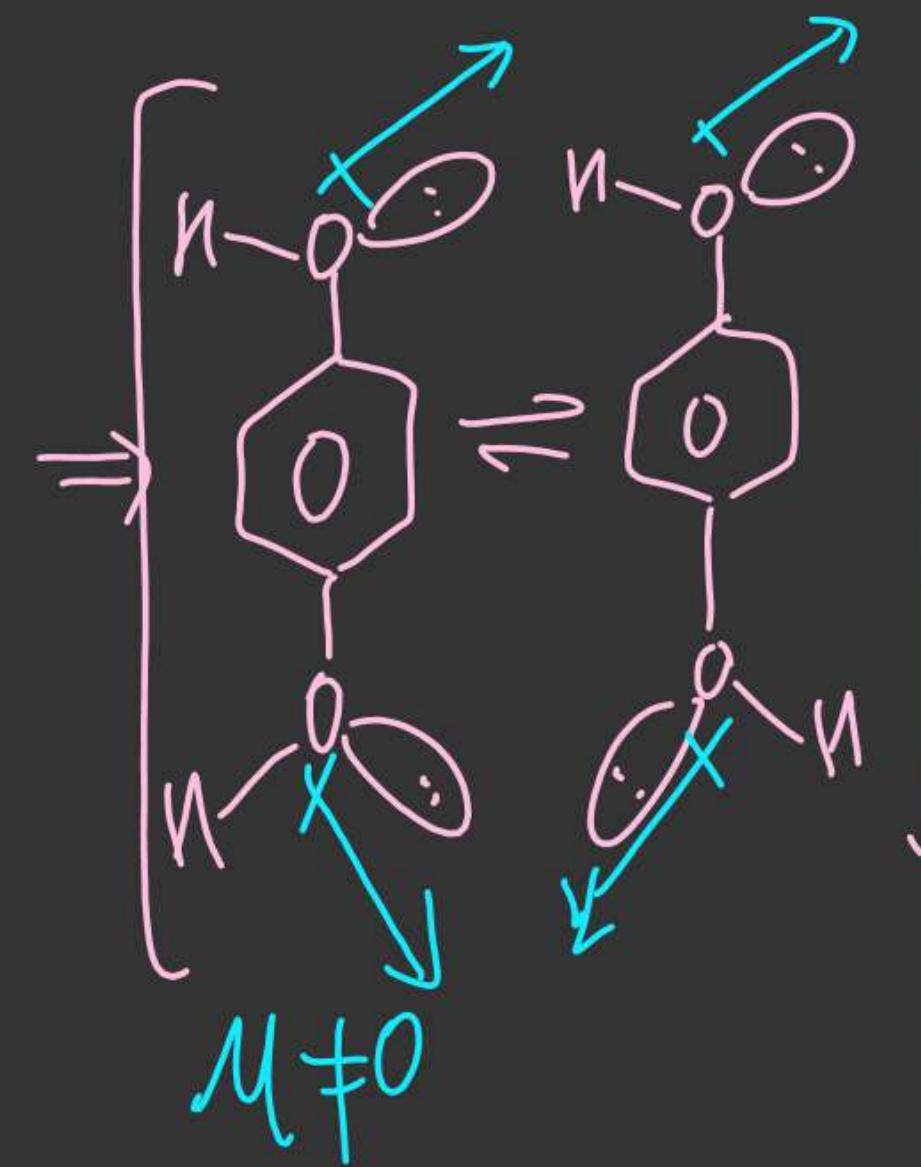


$$(\mu = 0)$$

(ii)



$$(\mu \neq 0)$$



$$\mu \neq 0$$

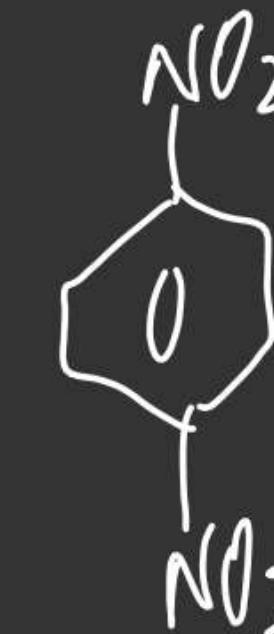
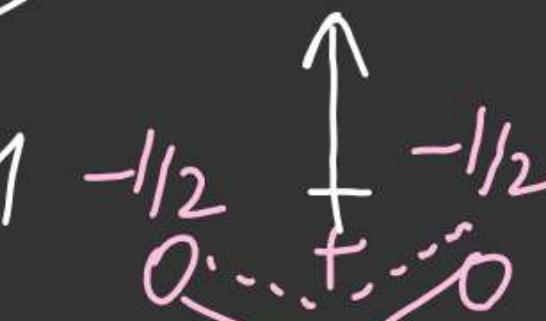


(iii)



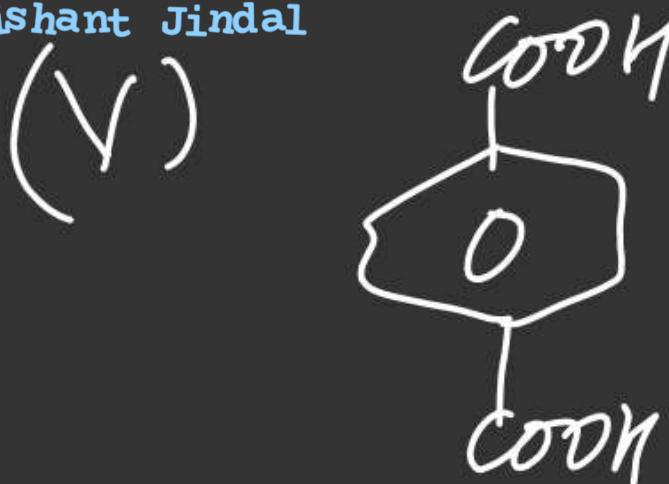
$$S\bar{H}$$

$$\mu \neq 0$$

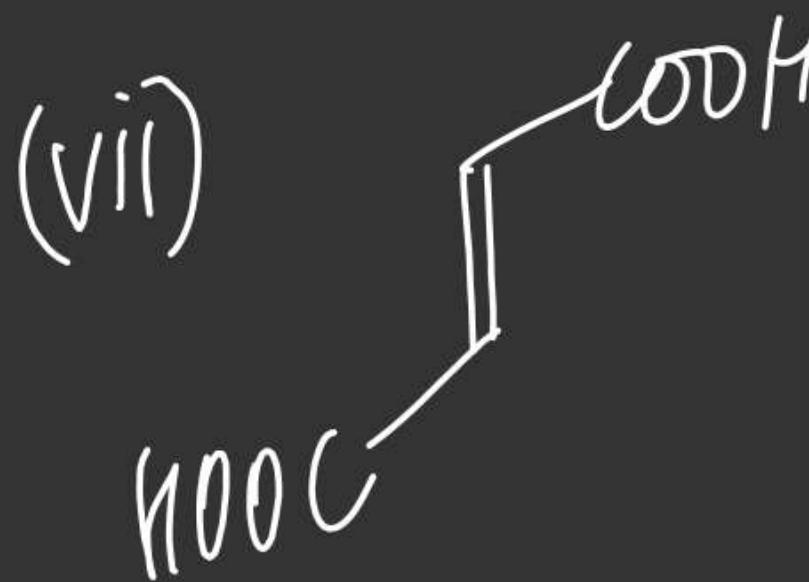
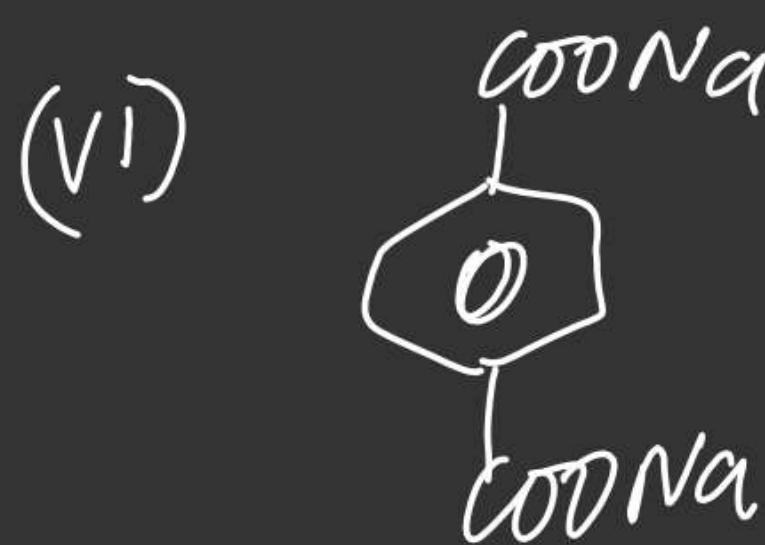


$$\mu = 0$$





~~Ex-3:
Ans~~



Calculate dipole moment of gauche conformation if net dipole moment is 1 D & mole fractions - anti conformation is $0.82 \left(\frac{\mu_2 - \mu_1}{2} \right)$. Formula can be used

Sol:

$$\frac{\mu_2 - \mu_1}{2}$$



$$\Rightarrow \mu_{\text{net}} = 1 \text{ D}$$

$$\Rightarrow \chi_a = 0.82 \quad \chi_g = ?$$

$\chi_i \Rightarrow$ mole fraction
of stable conformation

$\chi_a = 0.82$

$$\mu = \sum \mu_i \chi_i$$

$$\mu_{net} = \mu_a x_a + \mu_g x_g$$

$$\Rightarrow 1 = 0 \times (0.82) + \mu_g (1 - 0.82)$$

$$\Rightarrow 1 = 0.18 \mu_g \Rightarrow \boxed{\mu_g = \frac{1}{0.18} = 5.55 \text{ D}}$$

Conformations of Cyclic Compound:

⇒ Cycloalkanes are not planar (except cyclopropane) & exist in various non planar conformational forms.

Conformations of Cyclohexane

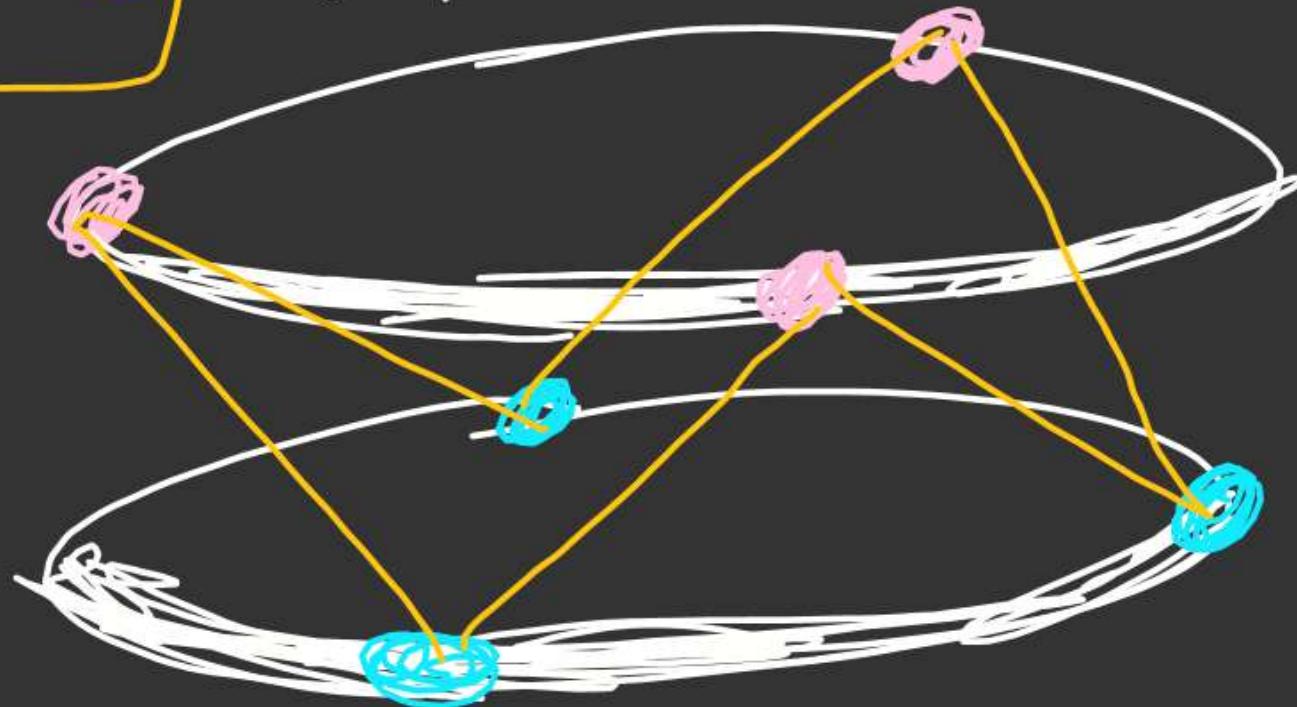


(1) chair conformation:-

(How to Draw)

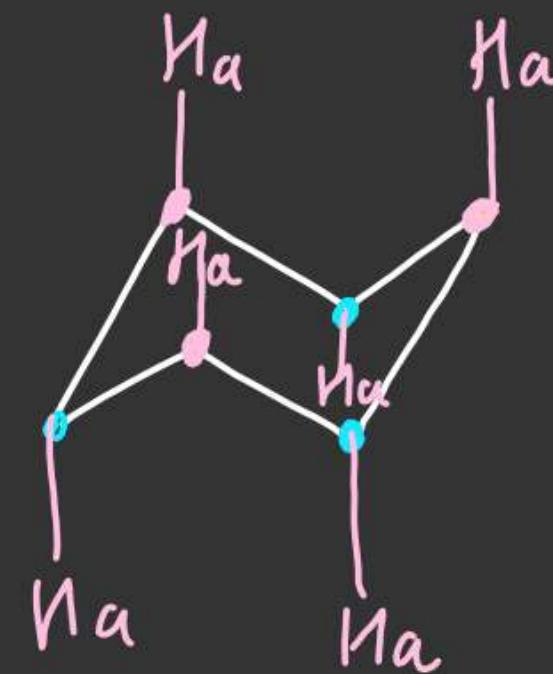


$PQ \parallel RS$
 $QU \parallel TR$
 $US \parallel PT$

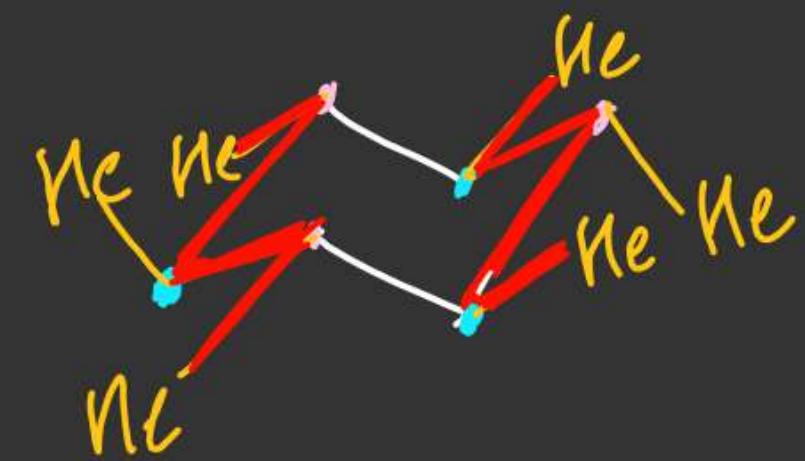


Bonding pattern:-

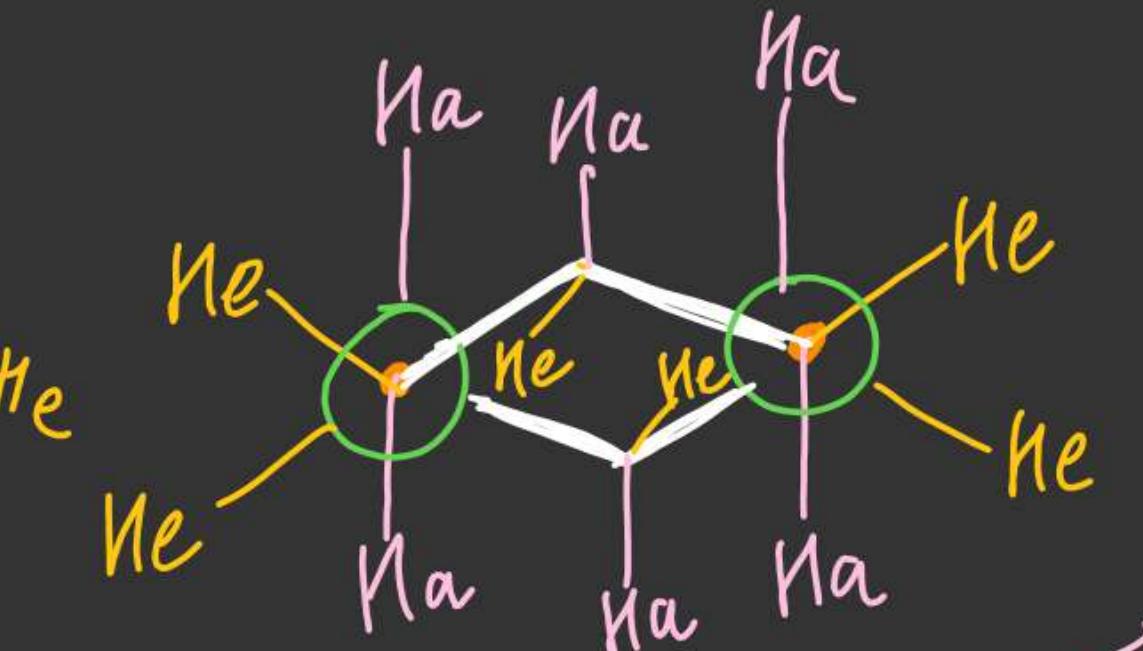
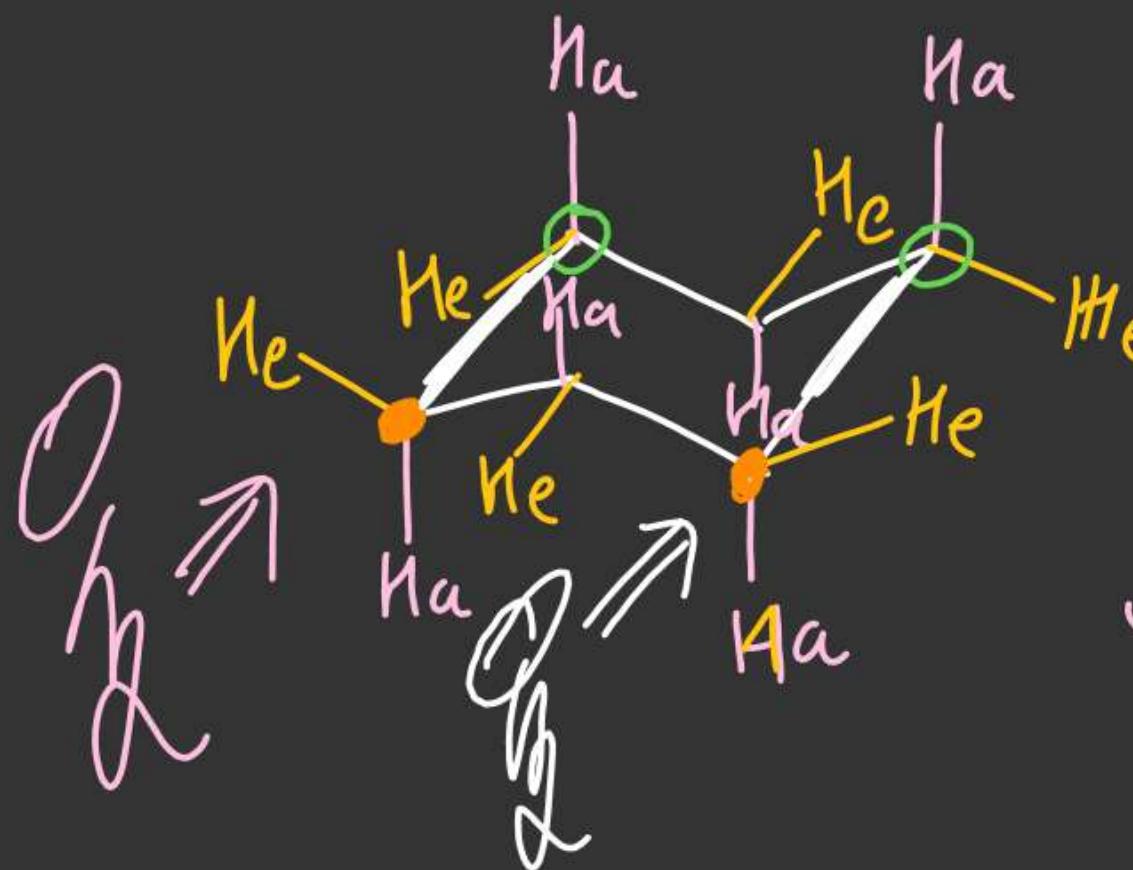
(a) Axial Bond (a)



(b) Equatorial Bond (e)



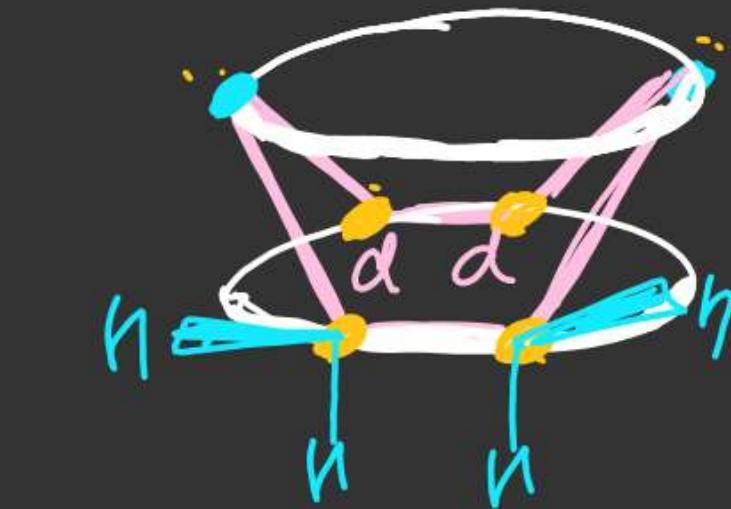
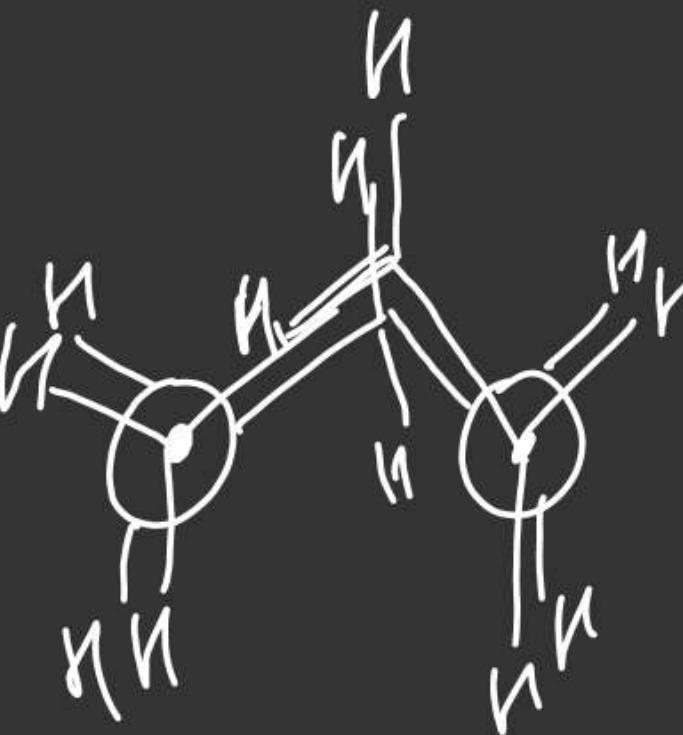
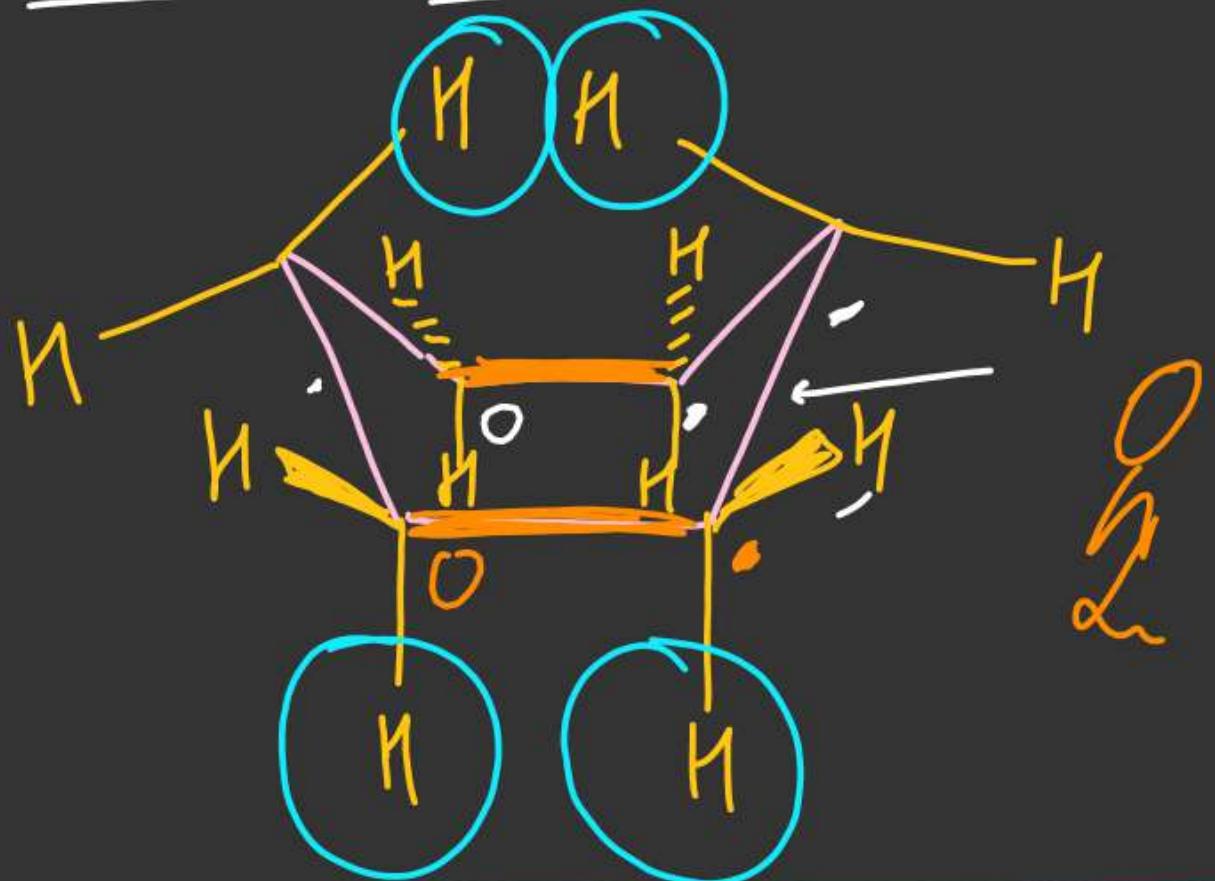
Complete chair Conformation



Newmann projection of chair

All 6 (C-C) Bond \Rightarrow Gauche Conformation

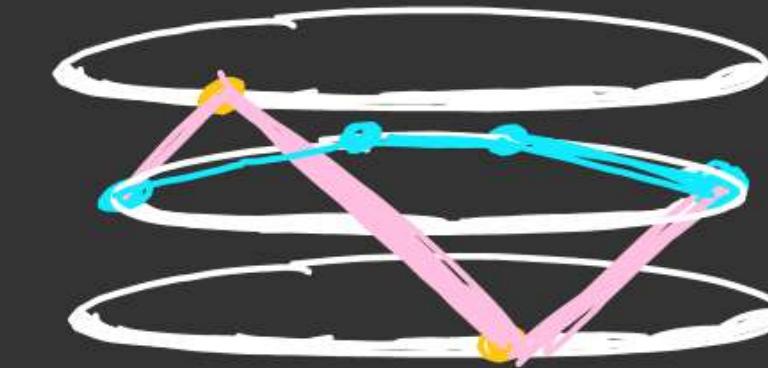
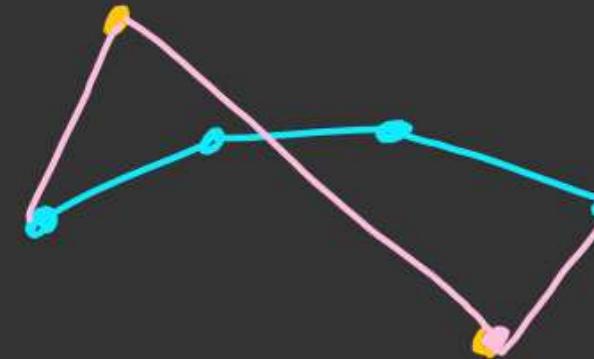
(2) Boat Conformation:



4(C-C) Bond \Rightarrow Gauche
2(C-C) Bond \Rightarrow Equipped

(3) Twist Boat Conformation



(4) Half chair Conformation

$3(C-C)$ \Rightarrow gauche

$3(C-C)$ \Rightarrow Eclipsed.

(5) Half Boat Conformation



$4(C-C)$ \Rightarrow Eclipsed

$2(C-C)$ \Rightarrow gauche

Stability order:

Chair > T-Boat > Boat > H-chair > H-Boat

Potential Enemy order:

H-Boat > H-chair > Boat > T-Boat > Chair

Potential Enemy Diagram