

STEREOCHEMISTRY

1.

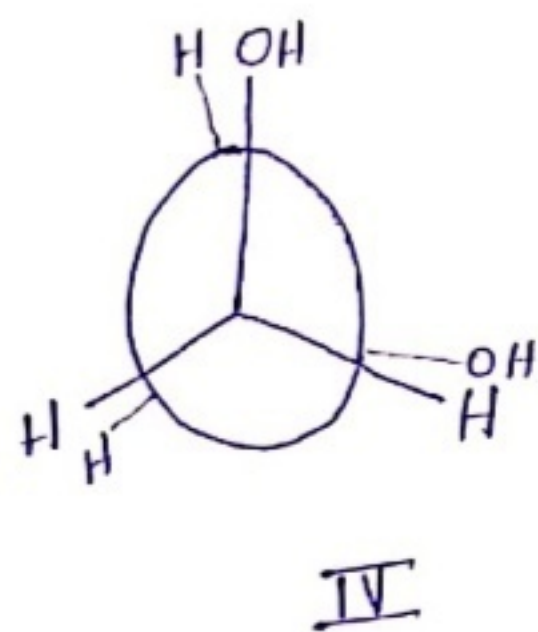
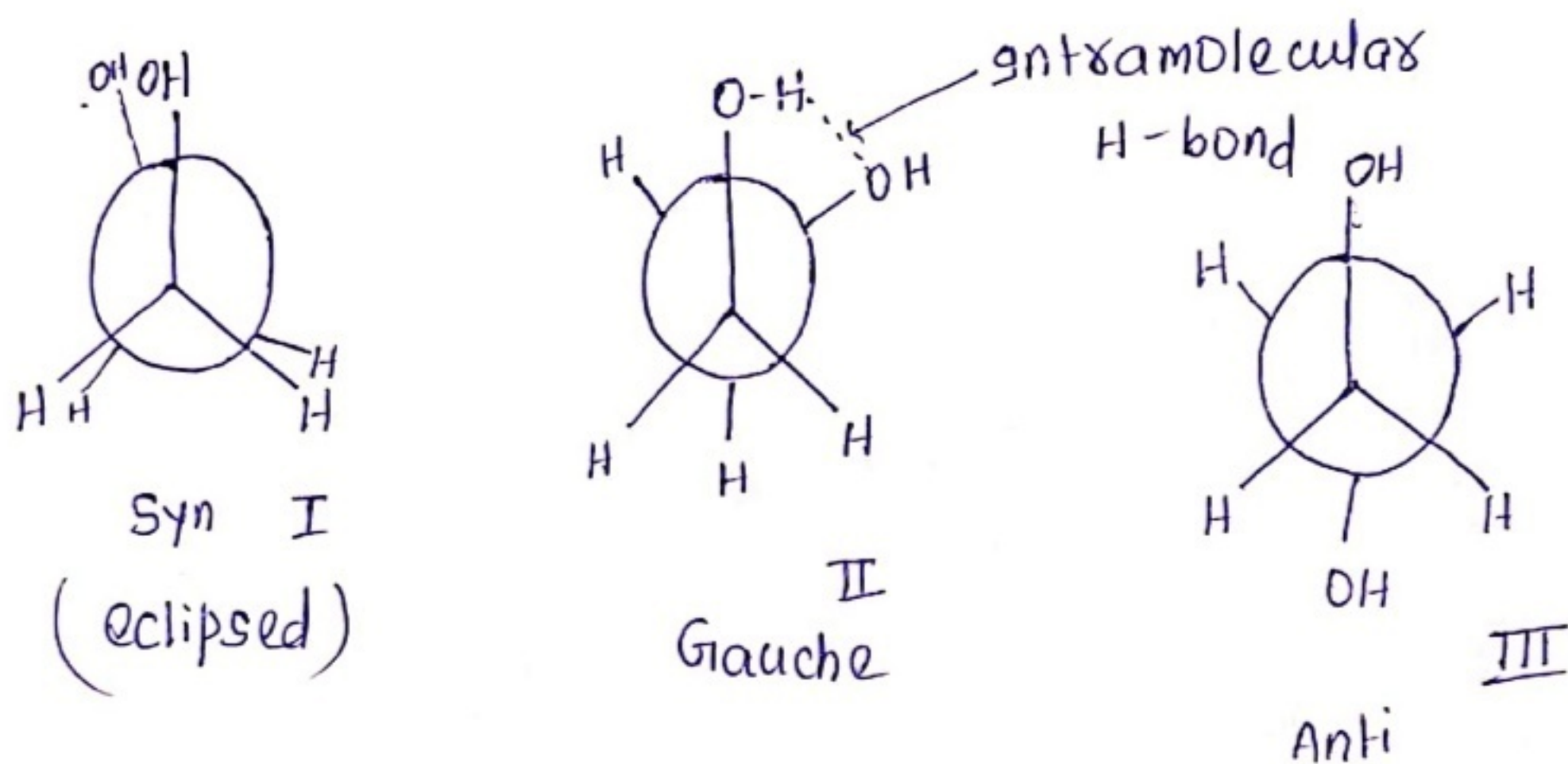
Lecture-16, D-II (H), P-IV, Ch-4

Topic: Conformational Isomerism

(Continued..)

24 AUG.2020

Conformation of Ethan-1,2-diol

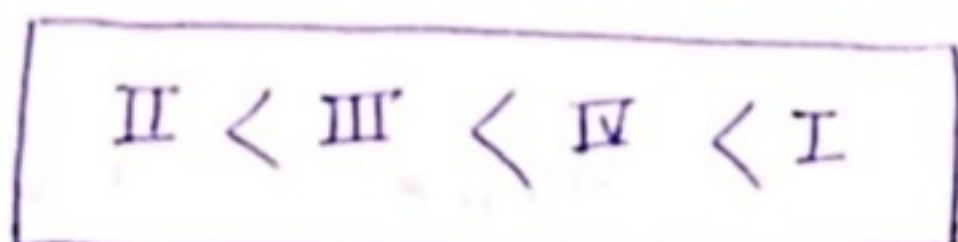


* In Gauche form due to intramolecular H-bond has lowest energy hence most stable conformation.

2.

Although hydrogen bonding is also possible in syn (eclipsed) form but due to torsional strain, it becomes least stable.

Energy order



Stability: II (Gauche) $>$ III (Anti) $>$ IV (Partially eclipsed) $>$ I (Syn)

* All the molecules of the pattern $\text{X}-\text{CH}_2-\text{CH}_2-\text{Y}$ will have gauche form is the most stable form.

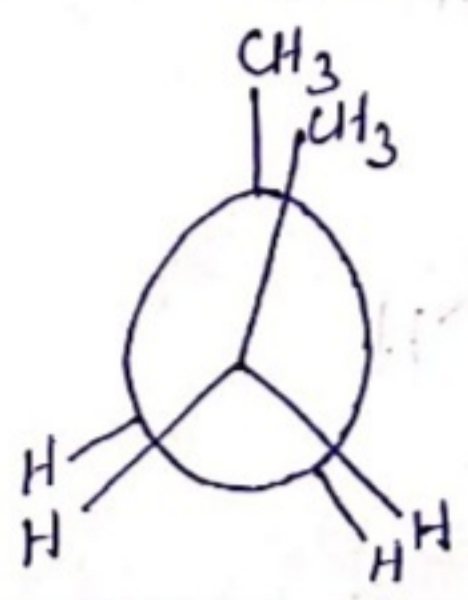
where, $\text{x} = \text{y} = -\text{OH}, -\text{NH}_2, \text{F}, -\text{Cl}, \text{Br}, -\text{I}$

Conformation is not possible in $\text{CH}_4, \text{NH}_2, \text{H}_2\text{O}$

Conformation of n-butane

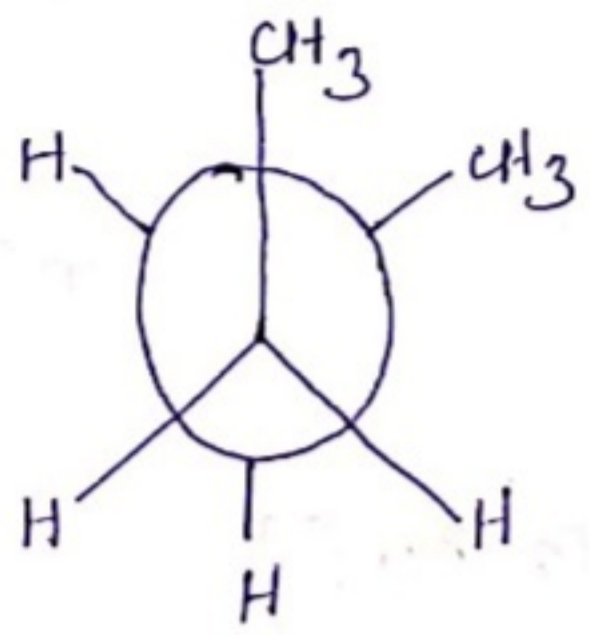
The n-butane is represented by the Newman projections below by designating the two middle carbons, one as the "front" and one as the "behind".

Carbon and connecting the two end methyl groups accordingly.



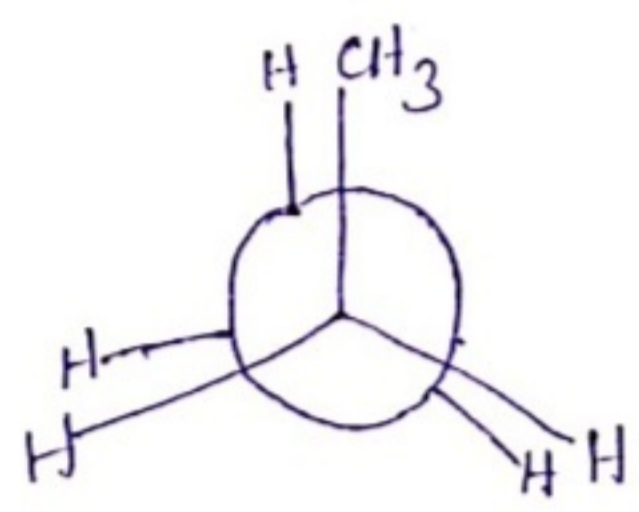
Syn (eclipsed)

(Dihedral angle = $0^\circ, 360^\circ$)

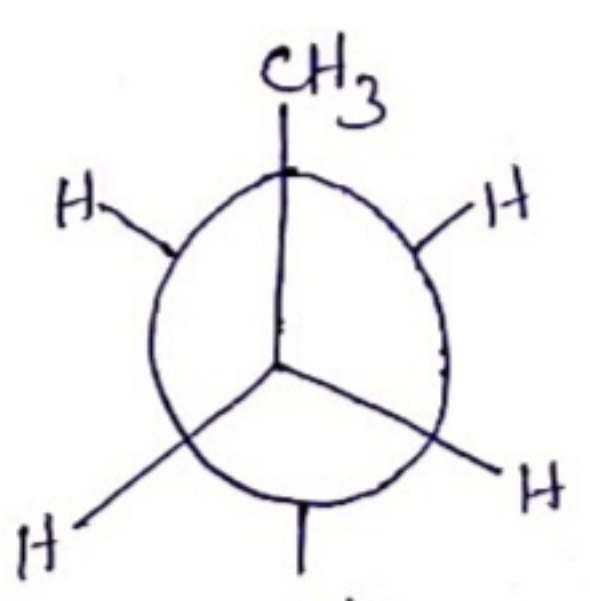


Gauche (staggered)

(Dihedral angle 60°)



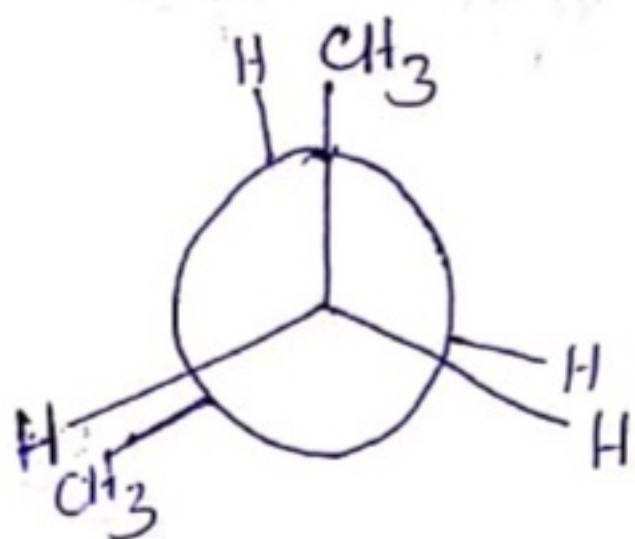
Partially eclipsed
Dihedral angle (120°)



(Dihedral angle = 180°)

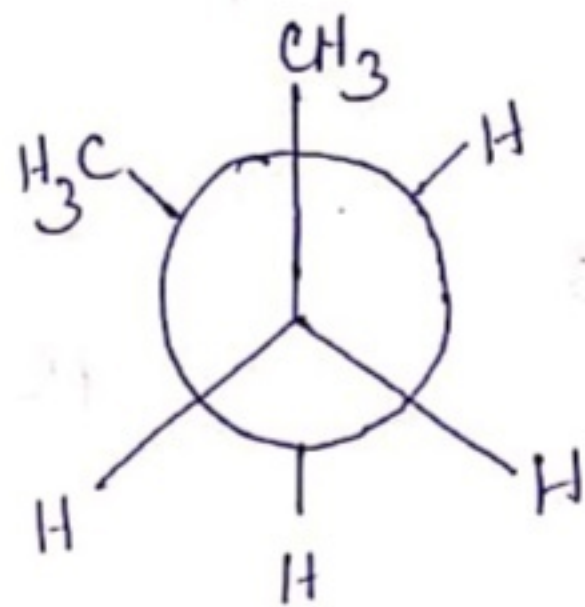
ANTI (staggered)

4.



(eclipsed)

Dihedral (angle 240°)



Gauche (staggered)

Dihedral (angle 300°)

To be continued in next lecture..

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