VIVEKANANDA COLLEGE

THAKURPUKUR

KOLKATA-700063

NAAC ACCREDITED ‘A’ GRADE

Topic: Stereochemistry: Conformational Analysis-2

Course Title: Organic Chemistry -2

Paper: CEMA-CC-2-3-TH

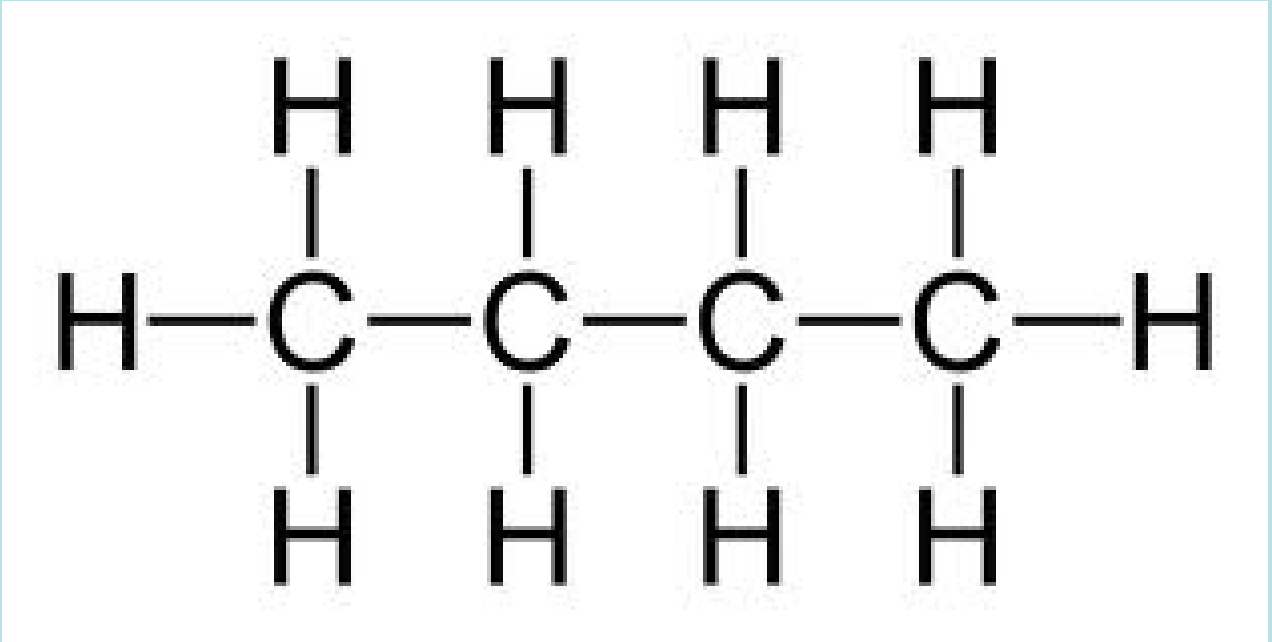
Unit: L-2

Semester: 2 (Hons)

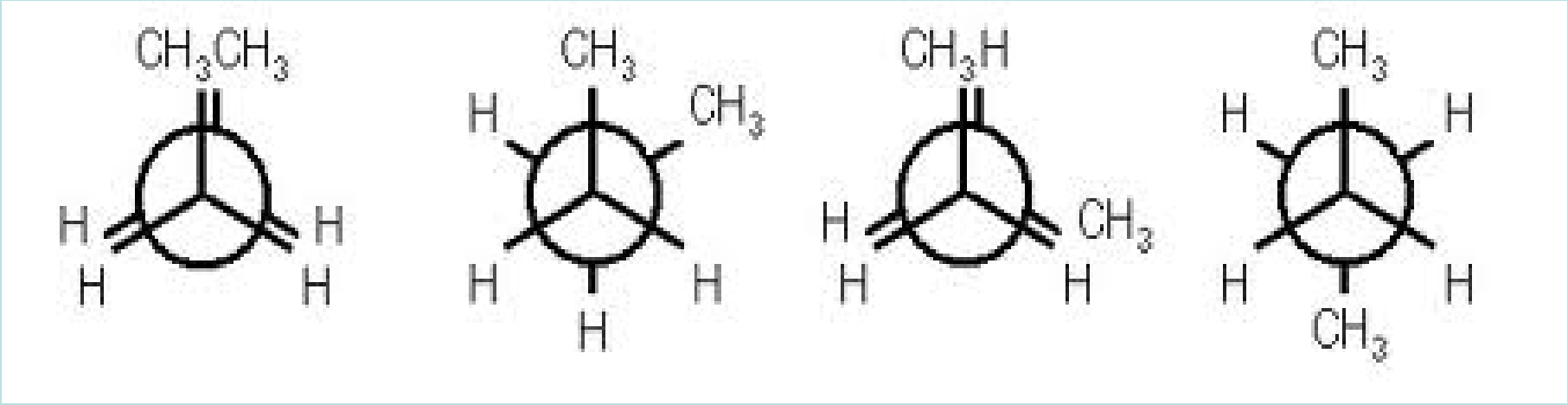
Name of the Teacher: Yasin Nuree

Name of the Department: Chemistry

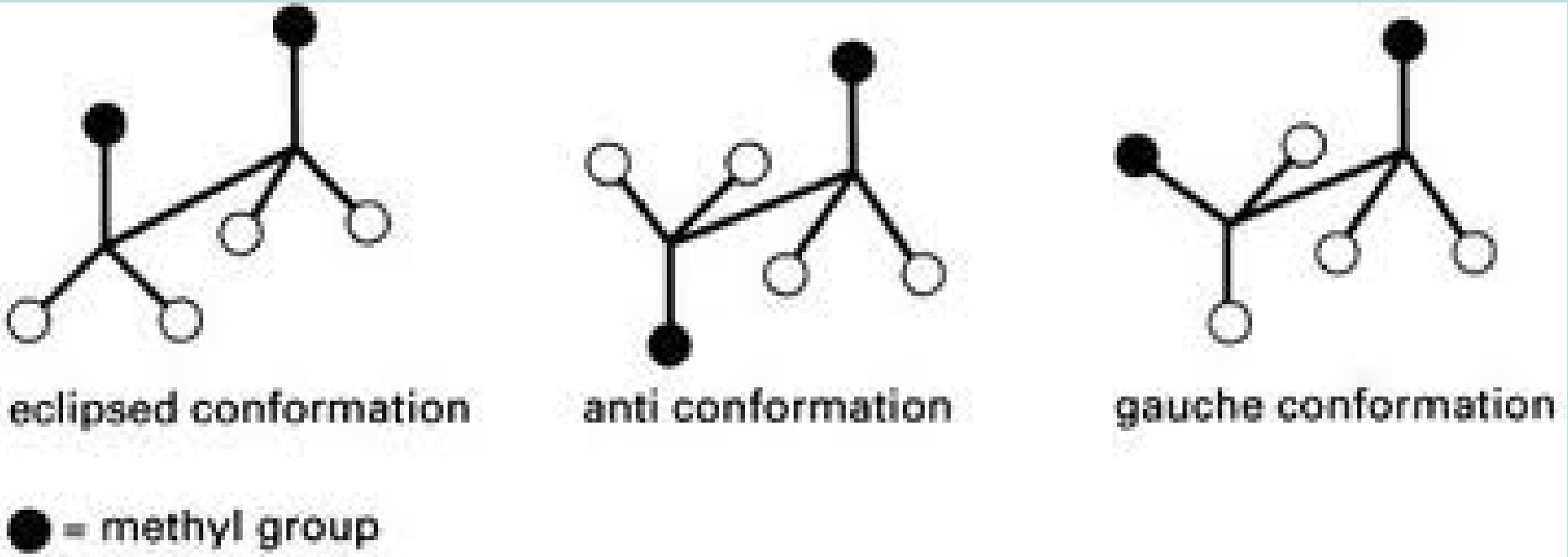
Butane



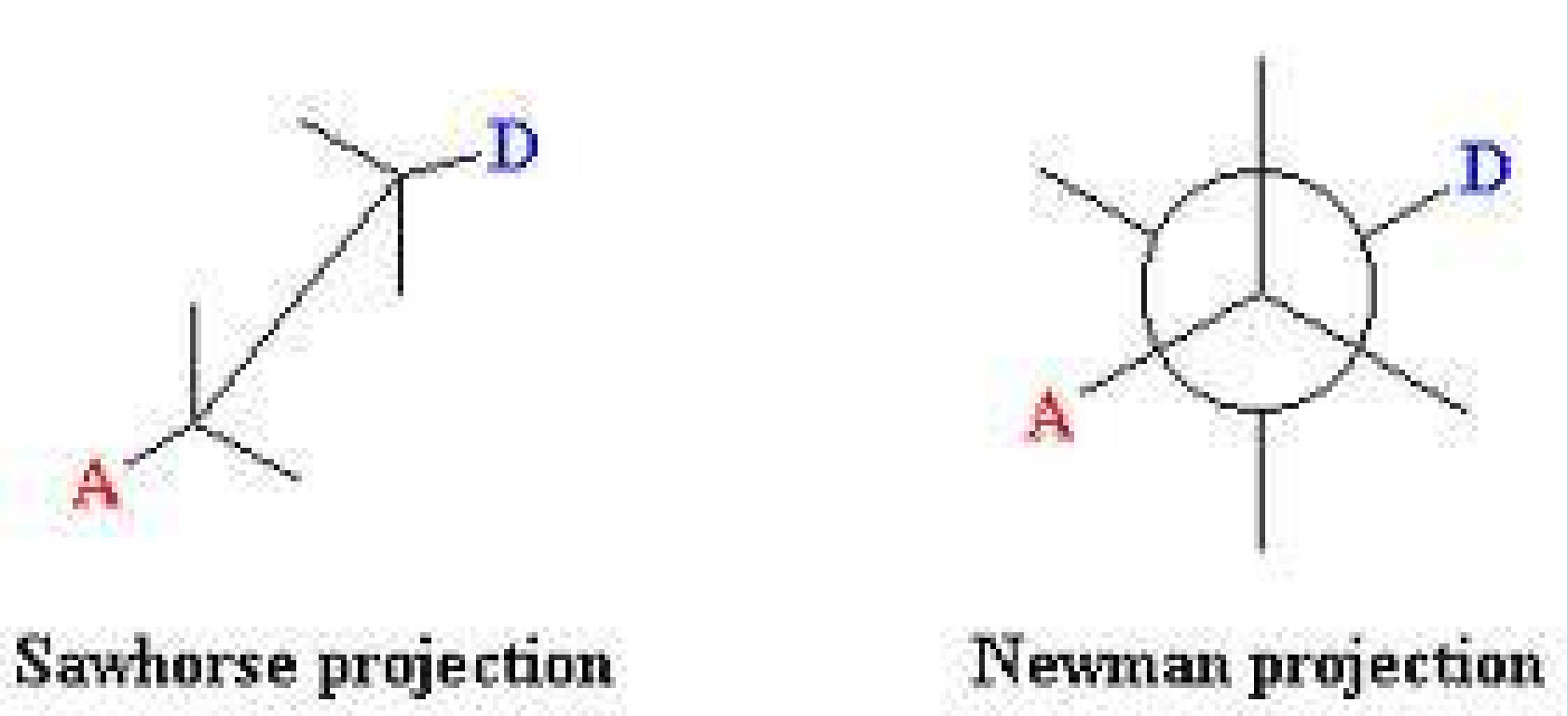
Newman Projection

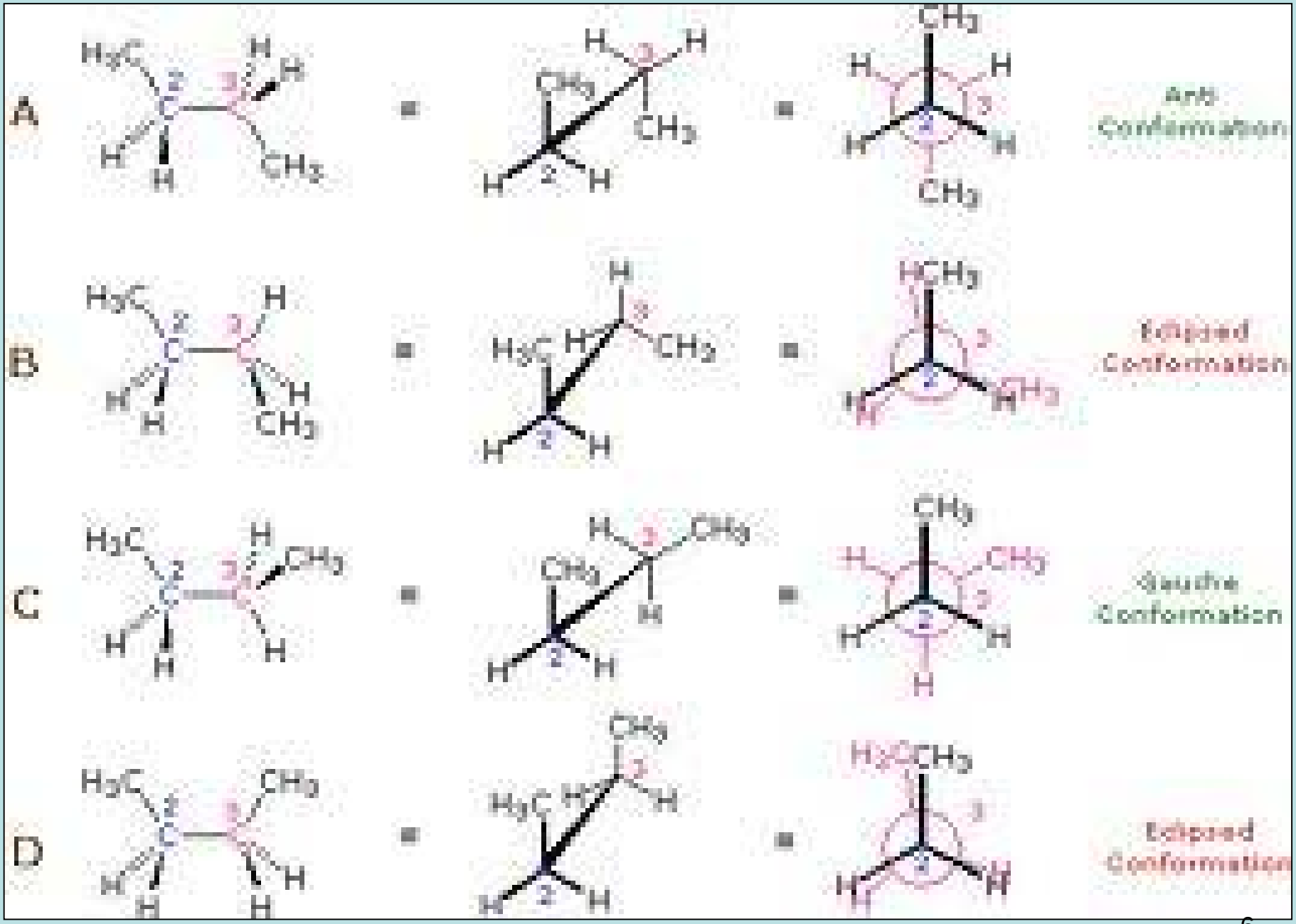


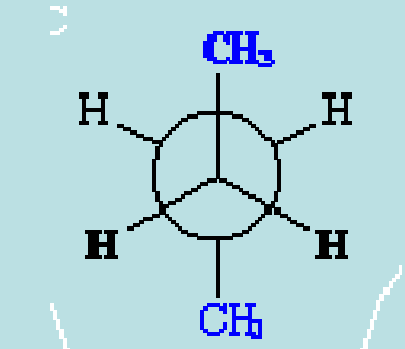
Sawhorse Projection



Conversion of Newman to Sawhorse

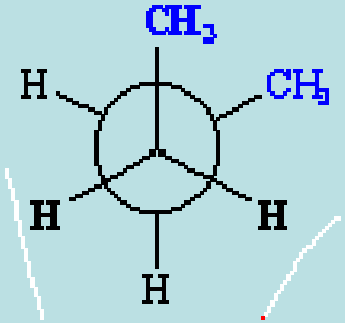



A
B
C
D
Anti Conformation
Eclipsed Conformation
Gauche Conformation
Eclipsed Conformation



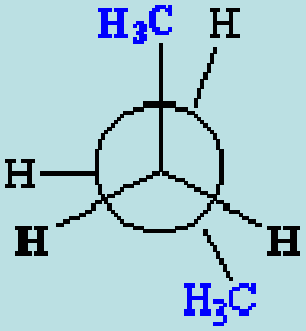
C ➔ “anti-periplanar” or “anti”

No torsional strain as the groups are staggered and CH_3 groups are par apart



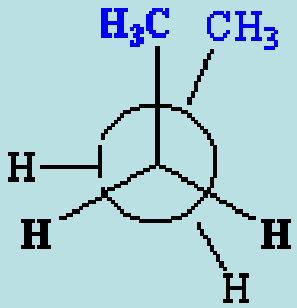
A ➔ “synclinal” or “gauche”

van der Waals forces between two CH_3 groups are repulsive: the electron clouds repel each other which accounts for 0.9 Kcal/mole more energy compared to anti conformer



B ➔ “anticlinal”

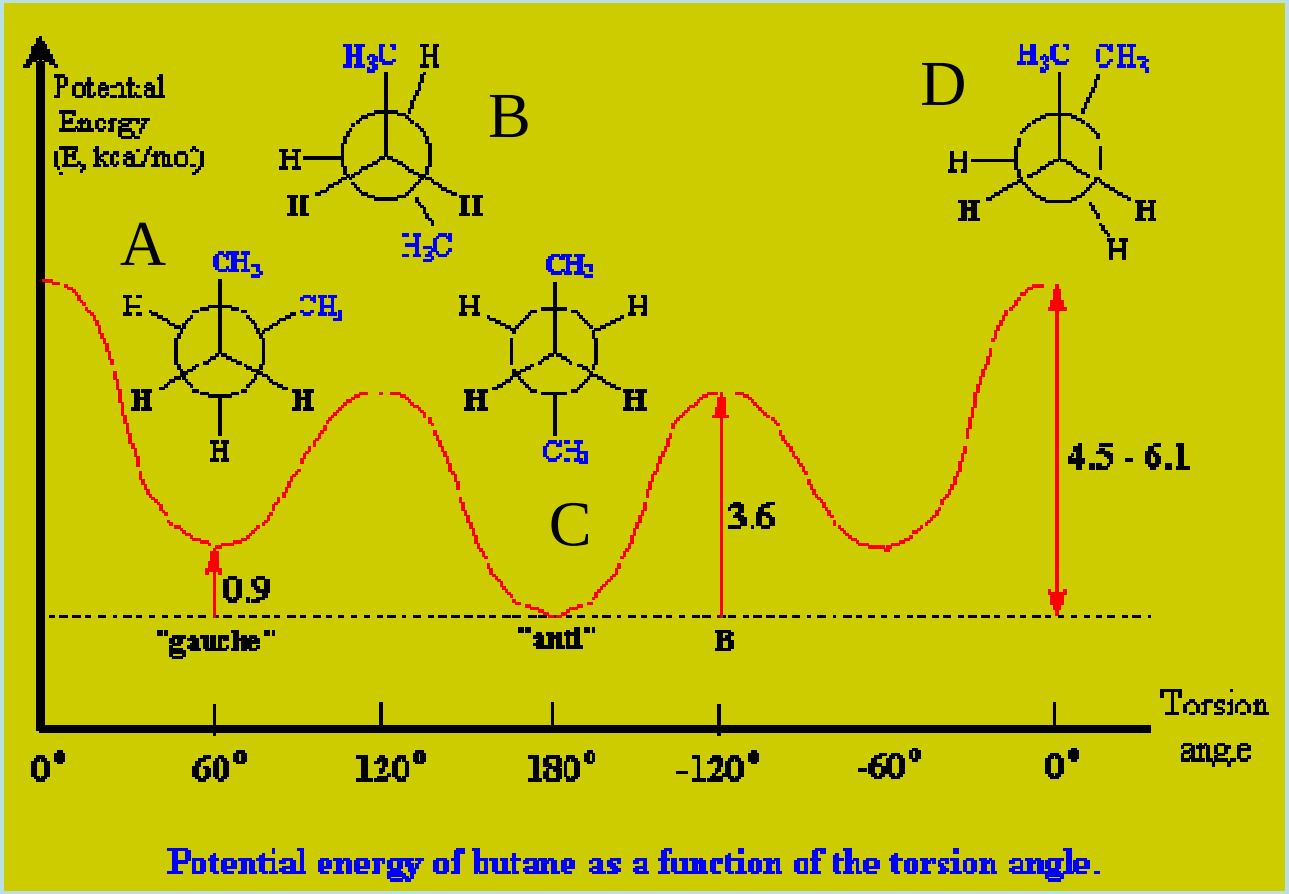
torsional strain and large van der waals repulsive forces between the H and CH_3 groups



D ➔ “syn-periplanar” or “fully eclipsed

Highest energy due to torsional strain and large van der waals repulsive force between the CH_3 groups

Conformations of butane



Potential energy of butane as a function of the torsion angle.

Potential energy of butane as a function of torsion angle

A ➔ “synclinal” or “gauche”
B ➔ “anticlinal”
C ➔ “anti-periplanar” or “anti”
D ➔ “syn-periplanar” or “fully eclipsed

References:

1. Advanced Organic Chemistry By Carey and Sundberg, Cahpter 3 , Part- A
2. Advanced Stereochemistry by D. Nasipuri
3. Advanced Stereochemistry by S Sengupta
4. Advanced Stereochemistry by Eliel.