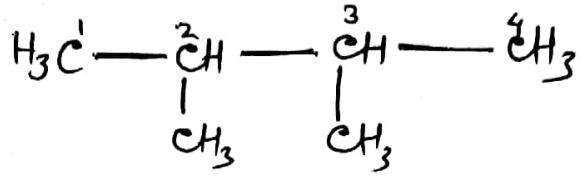
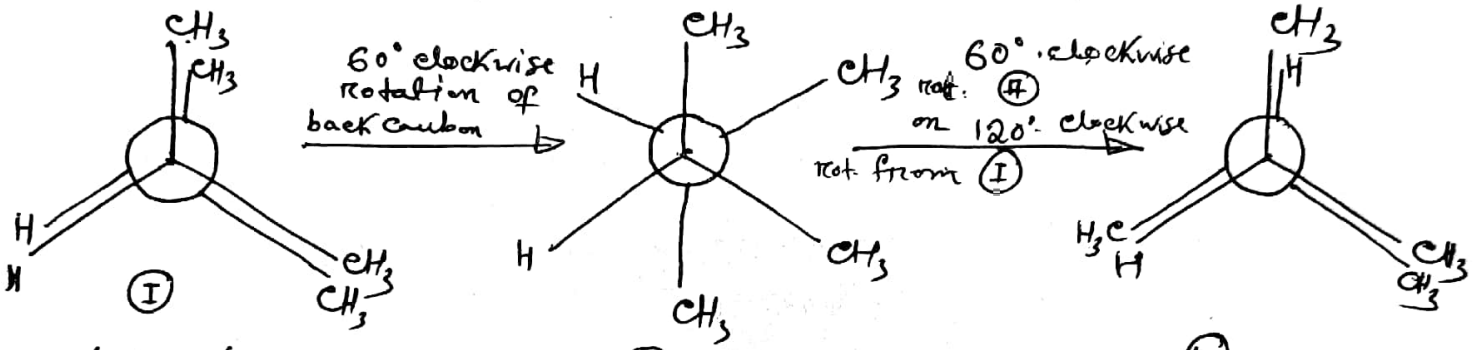
# Conformation

## Class - 4

Conformational isomers of 2,3-dimethyl butane.



Lets assume C—C free rotation around $C_2 - C_3$ single bond.

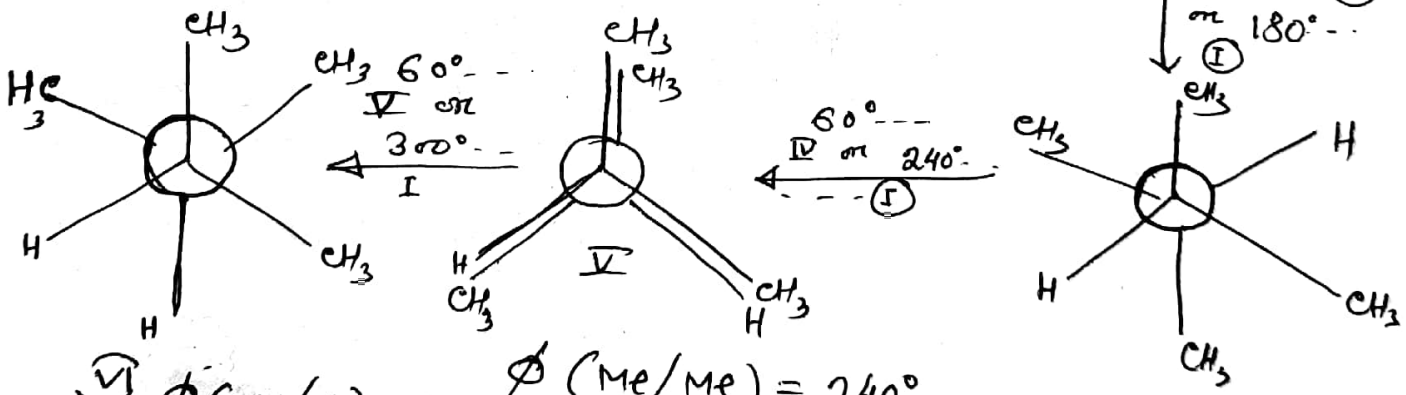



(I) $\phi(Me/Me) = 0°$

(II) $\phi(Me/Me) = 60°$

(III) $\phi(Me/Me) = 120°$

60° --- (III) or 180° --- (I)

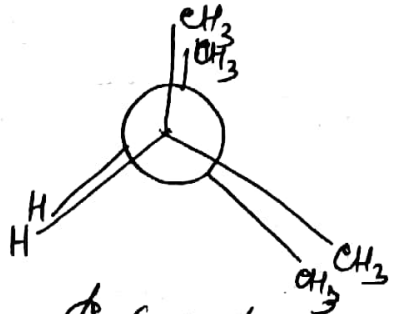



(IV) $\phi(Me/Me) = 180°$

(V) $\phi(Me/Me) = 240°$

(VI) $\phi(Me/Me) = 300°$

60° --- (VI) or 360° --- (I)

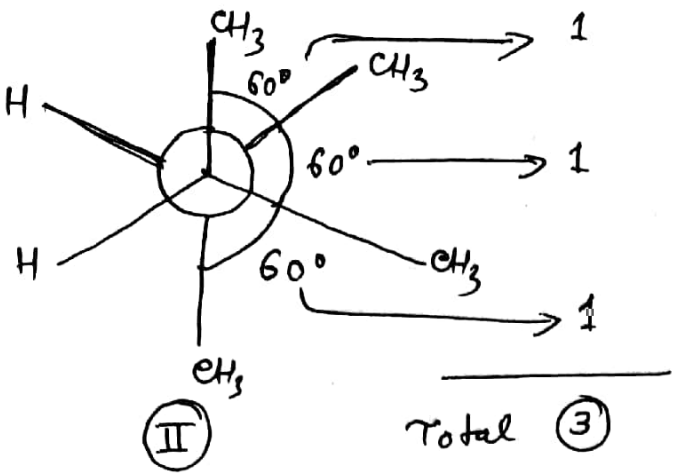


$\phi(Me/Me) = 360°$

Most stable = ?
stability order = ?

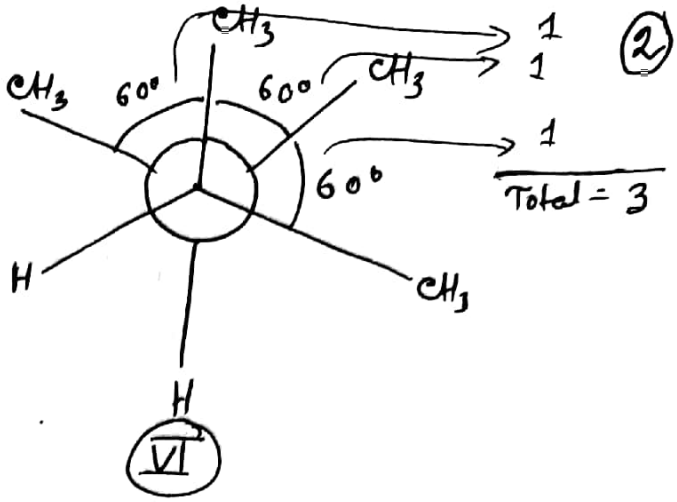
Consider stn. (II), (IV), (VI)

In (II) or (VI) → look the stn's Gauche interaction ($\phi(Me/Me) = 60°$) 3 each




II

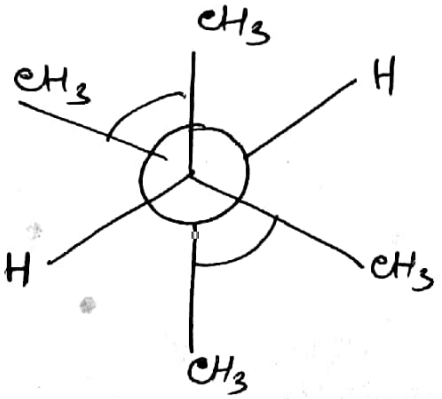
Total (3)




VI

(2)

So energy of str. (II) and str. (IV) are same.




only 2 Me/Me Gauch interaction

So this str. is most stable.

Consider str's (I), (III), (V), (VII).

2 × (Me/Me) - 0° interaction energy < { 2 × (Me/H) 0° interaction energy. + 1 (Me/Me) - 0° interaction energy

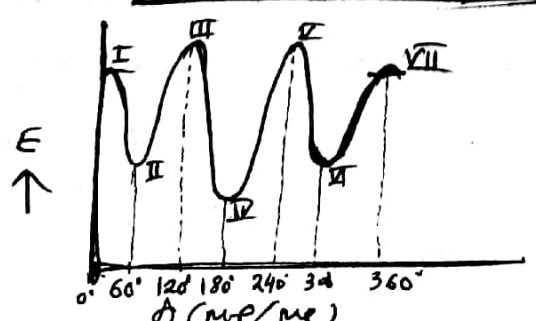
So. III = V

I = VII

But (III), (V) > (I), (VII) - in energy.

So order of energy, (III), (V) > (I), (VII) > (II), (VI) > IV

Energy Profile diagram




Str. (I), (VII) → Fully eclipsed

(III), (V) → Eclipsed.

(II), (VI) → Gauche

IV → staggered.

(H.W) - Draw P/M - Gauche str.