

13/11/11 isomers, conformers, rotomers

Newman projections

hyperconjugation

steric hindrance

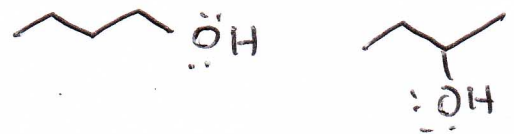
rotomer energy diagrams

isomers - molecules with the same chemical formula but different structures.



functional isomers

(different functional groups)



Structural isomers (different positions)



stereoisomers (different 3D connectivity)

conformation - specific geometric arrangement of atoms in a molecule

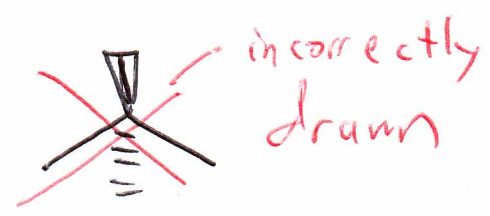
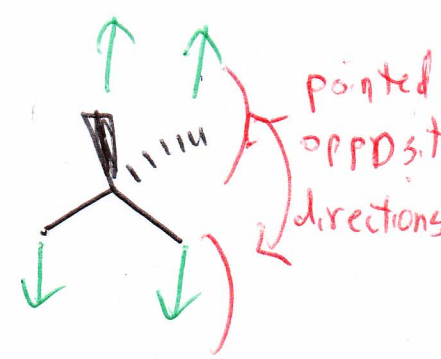
conformers - identical molecules that differ in their conformation (and possibly energy)

rotomers - identical molecules in which a single bond has been rotated (subset of conformers)

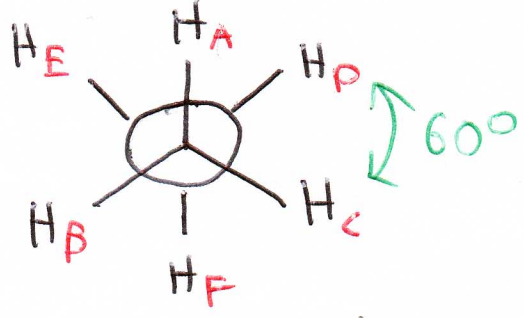
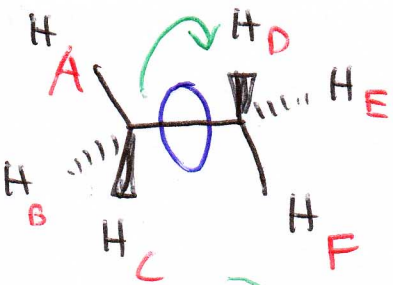
Dash-wedge convention

wedge - pointed towards the observer

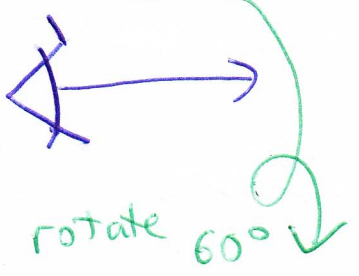
dash - pointed away from the observer



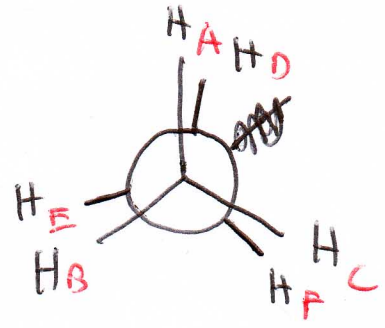
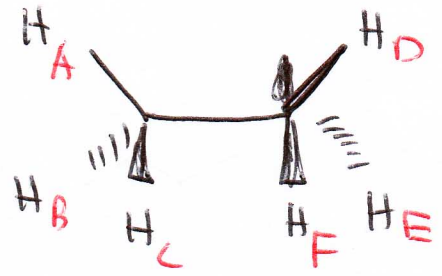
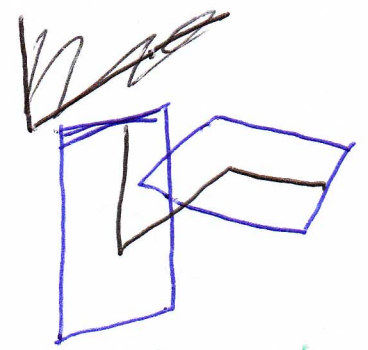
# Newman Projection



Dihedral angle - an angle made between two planes



staggered conformation

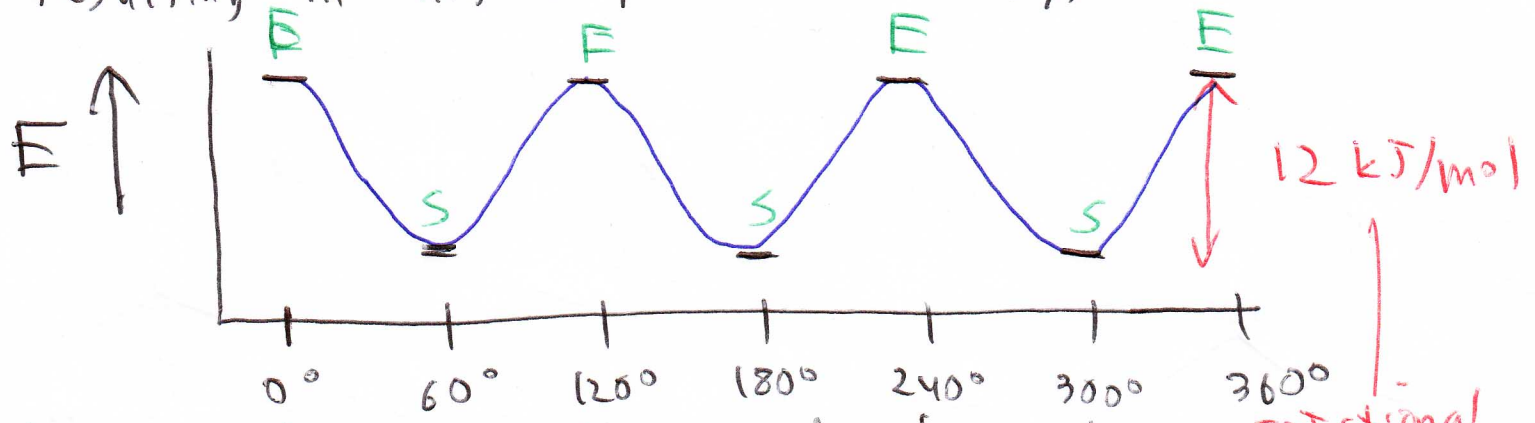


In ethane, the eclipsed conformation is higher in energy due to hyperconjugation

eclipsed conformation

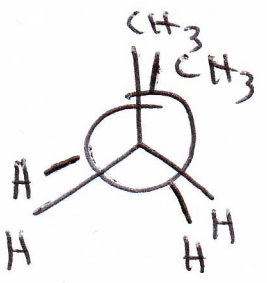
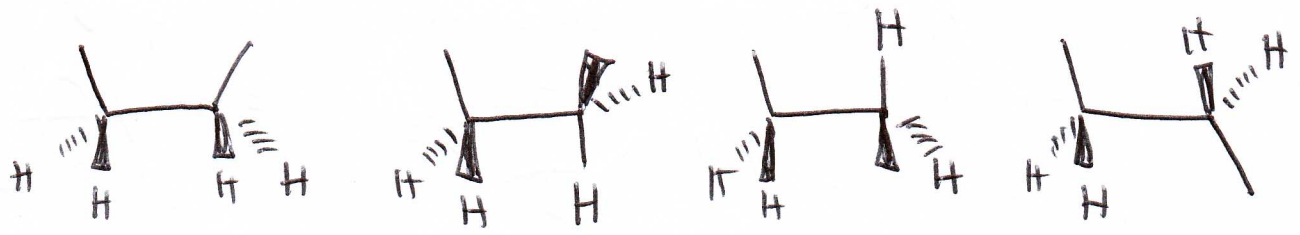
Steric hinderance - steric = shape/volume/size

When two clouds of e<sup>-</sup> attempt to occupy the same space, they will repel, which in some cases causes a distortion in molecular structure, usually resulting in higher potential energy,

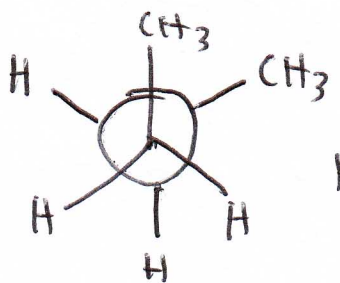


At RT, there is usually enough thermal energy to overcome the rotational energy barrier in a single bond, meaning the bond can rotate freely. At low enough temp, because of the energy barrier, rotation would cease.

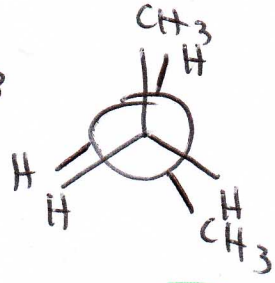
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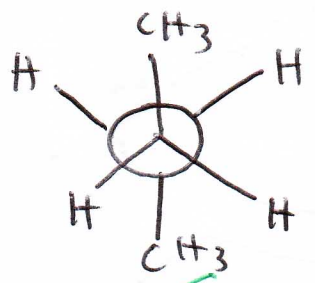
eclipsed (E)  
syn



staggered (S)  
gauche



E



anti

