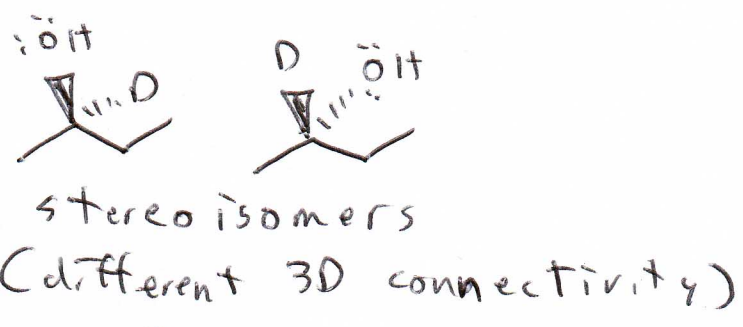
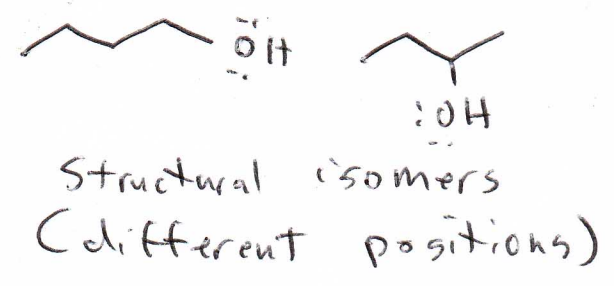
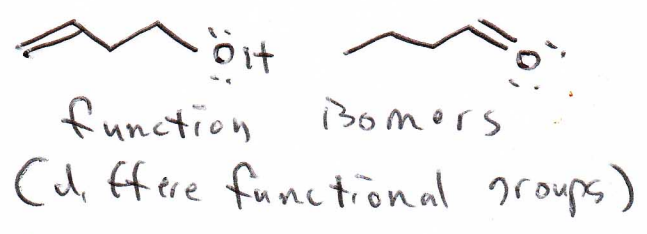


10/10/11

#1

isomers, conformers, rotomers
Newman projections
hyperconjugation
steric hindrance
rotomer energy diagrams

isomers - molecules with the same formula but different structures,

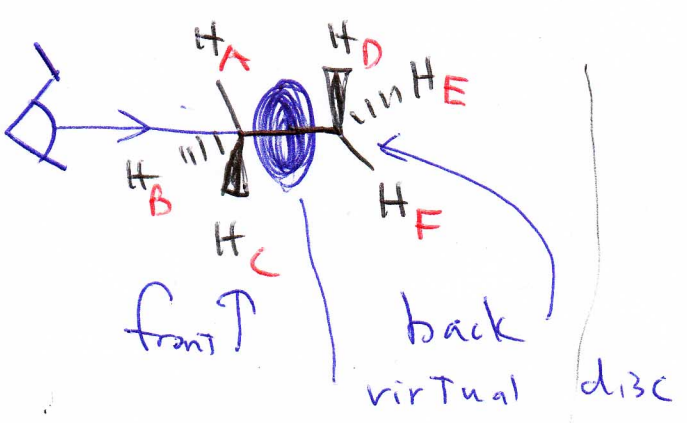


conformation - specific geometric arrangement of atoms in a molecule

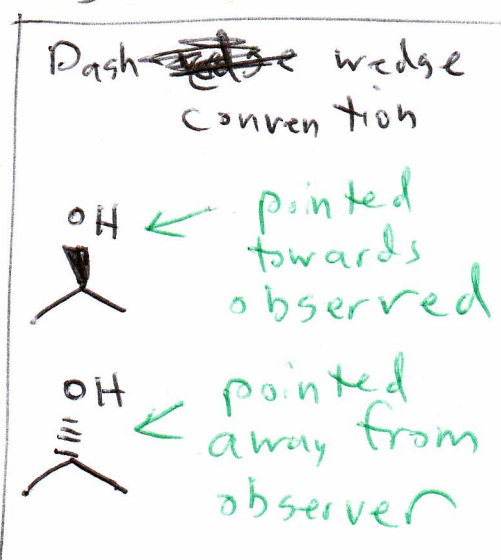
conformers - identical molecules with different conformations (and, potentially, different energies)

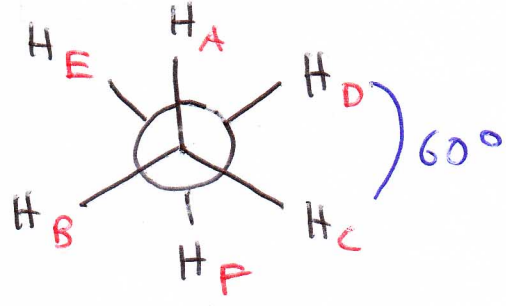
rotational isomer → rotomers
identical molecules in which a single bond has been rotated (subset of conformers)

Newman projection

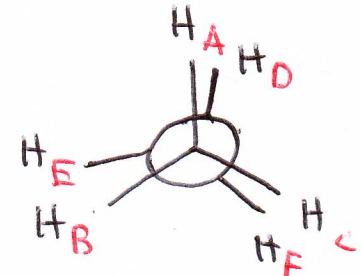
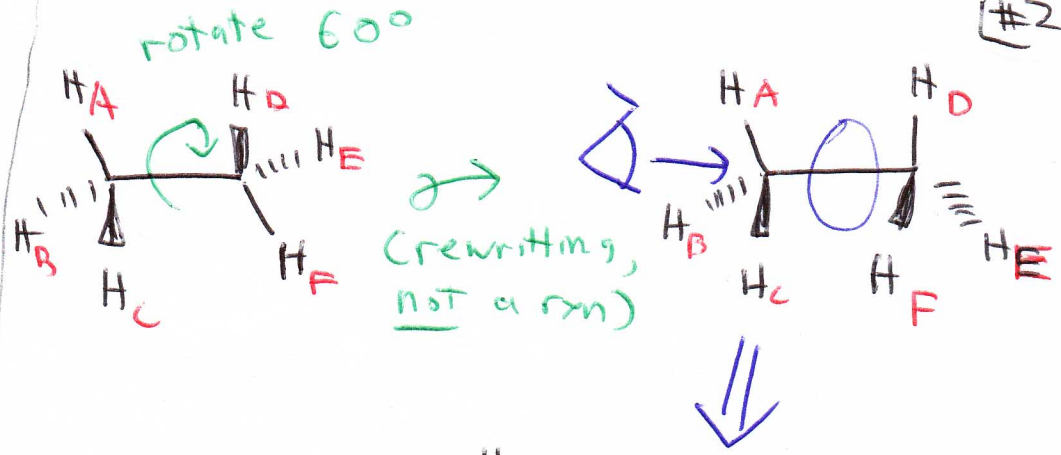


* Properly written tetrahedral structures only have one wedge and one dash



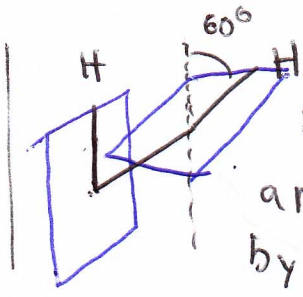


staggered conformation
(no groups overlap front-to-back)

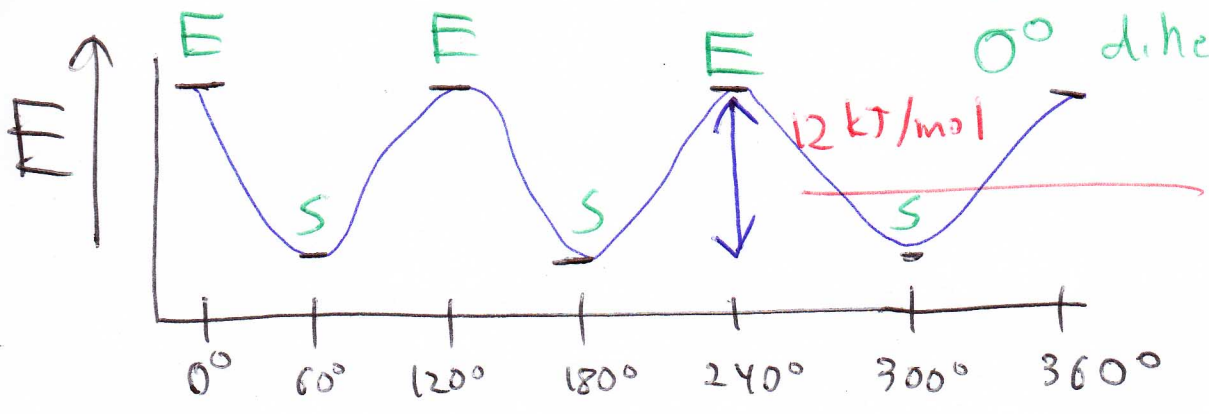


eclipsed conformation
(overlap occurs front-to-back)

→ now defined as 0° dihedral angle



Dihedral angle - an angle created by two different planes



rotational energy barrier

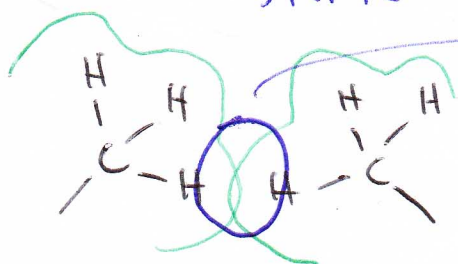
thermal

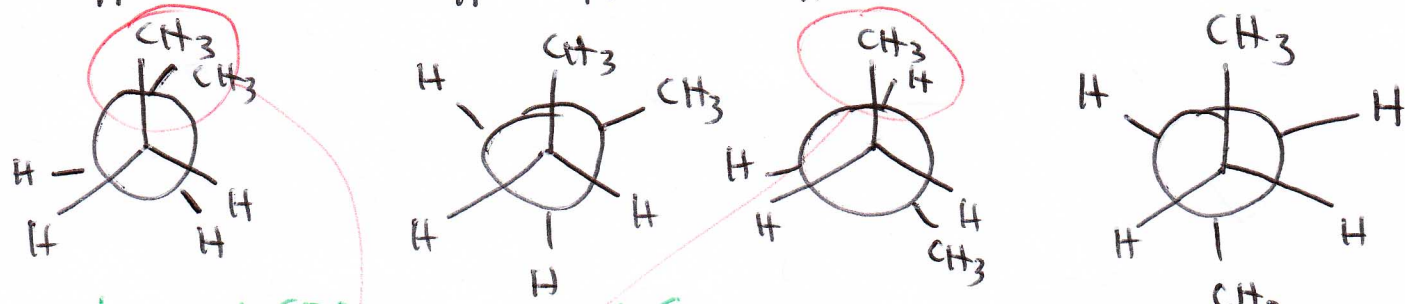
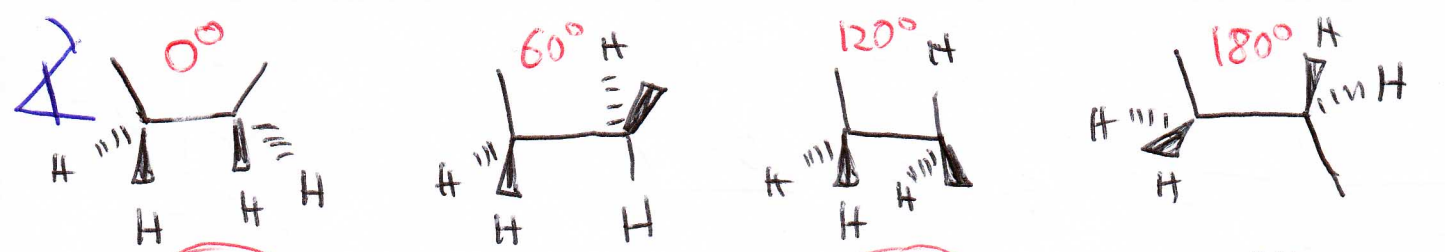
At room temperature, there is usually enough energy to overcome the rotational energy barrier, so σ bonds usually rotate. However, at low enough temp, rotation would cease.

Steric hindrance

Steric - refers to shape/size/volume

when two clouds of e^- attempt to occupy the same space, they will repel and/or the molecular structure will distort → steric hindrance





eclipsed (E)
syn

staggered (S)
gauche

E

S
anti

Two methyl groups experience more steric hindrance than one methyl + hydrogen

