(17) **Today**

Section 3.5 - 3.7: Properties and Conformations of Alkanes

Chap 4 Cycloalkanes
Section 4.1 Naming Cycloalkanes and Halogen Substituents

Next Class (18)

Section 3.5 - 3.7: Properties and Conformations of Alkanes

Chap 4 Cycloalkanes
Section 4.1 Naming Cycloalkanes and Halogen Substituents

(19) **Second Class from Today**

Sections 4.3 – 4.8 Stability of Cycloalkanes and Conformations of Cyclohexanes

Sections 5.1 – 5.5
Chirality and Determining the Configuration of Chiral Centers

Third Class from Today (20)

Sections 5.1 – 5.5
Chirality and Determining the Configuration of Chiral Centers

Sections 5.6 – 5.12
Diastereomers, N,P, and S, and Prochirality

Office Hours moved from 12:20 to 1:20 to 3:00 to 4:00 for the foreseeable future

Rework Test 1 and hand in on Friday, October 17. Rework means that you should, on a separate piece of paper, write a more complete answer for any question that you did not received full credit for. I do NOT need the test back.

Nomenclature of Alkyl Halides

position#-**stuff hanging off longest chain****longest chain of C atoms**functional group ending

longest chain:

8

parent alkane name:

octane

functional group (?) and position:

none

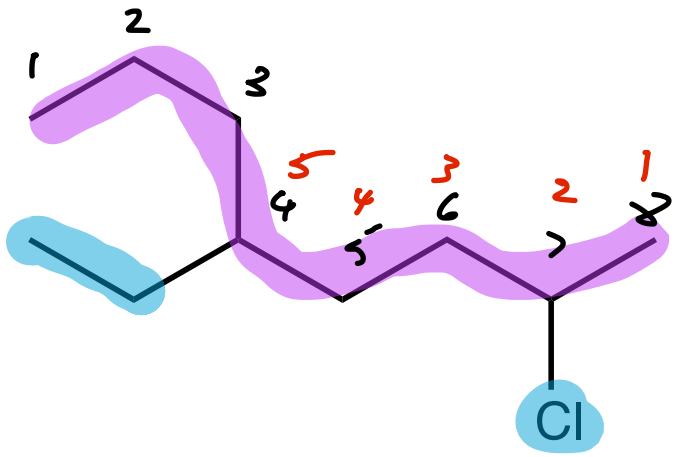
substituent names:

chloro ~~ane~~ => chloro

ethyl

substituent positions:

4,7 or 2,5



2-chloro-5-ethyloctane

Nomenclature of Alkyl Halides and Ethers

position#-**stuff hanging off longest chain****longest chain of C atoms**functional group ending

longest chain:

7

parent alkane name:

heptane

functional group (?) and position:

none

substituent names:

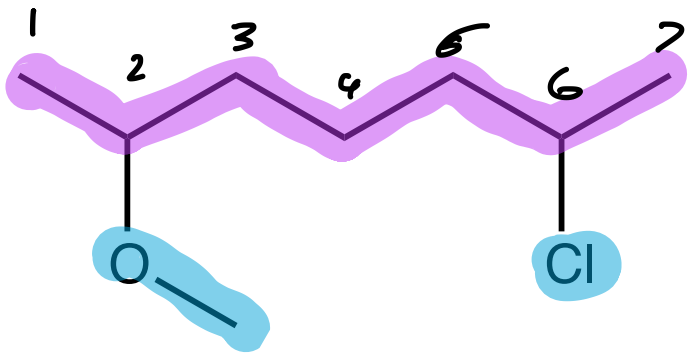
chloro

methane => methoxy

1 C long ether substituent

substituent positions:

2



2-chloro-6-methoxyheptane

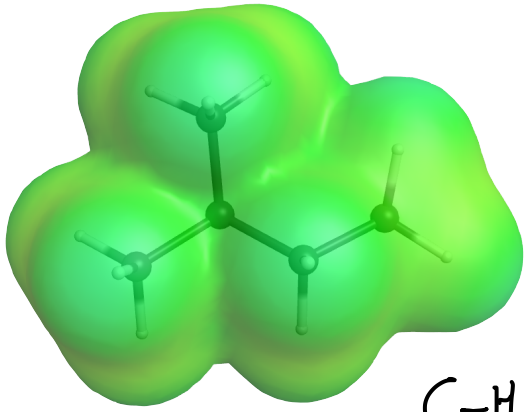
~~6~~ ~~2~~

in the # alphabetically

no areas of high or low e^- density

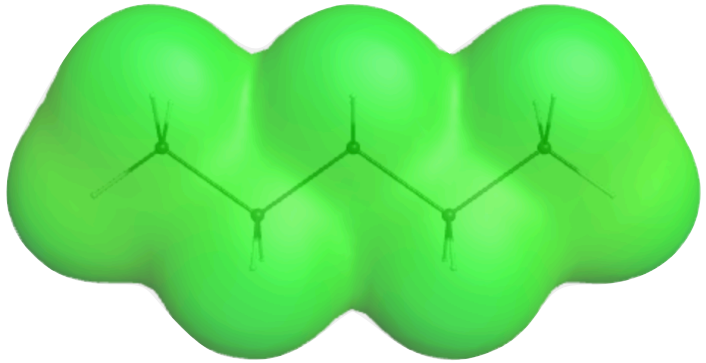
nonpolar ... interact using ...

LDF



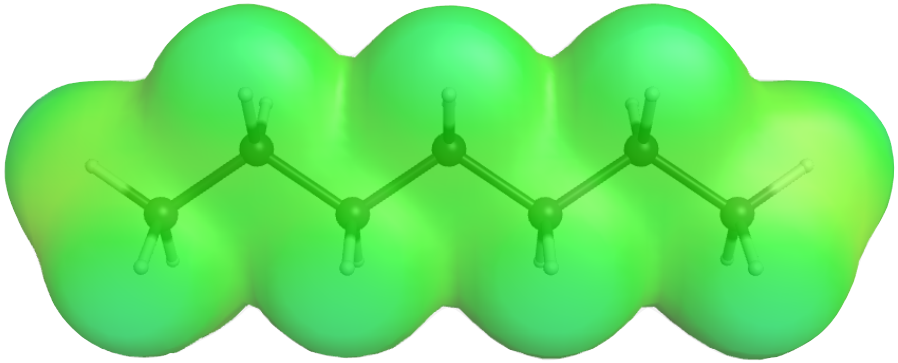
C_5H_{12}

BP = 27.8 °C

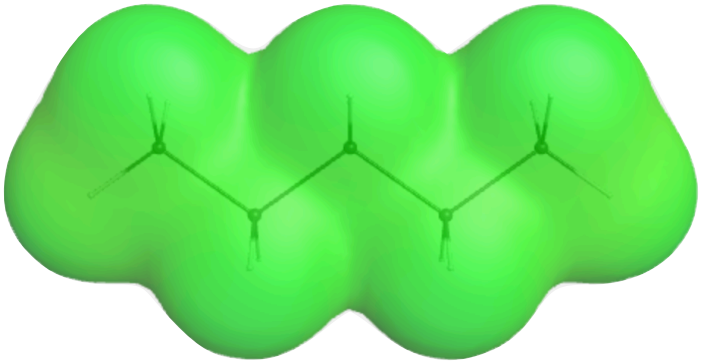


C_5H_{12}

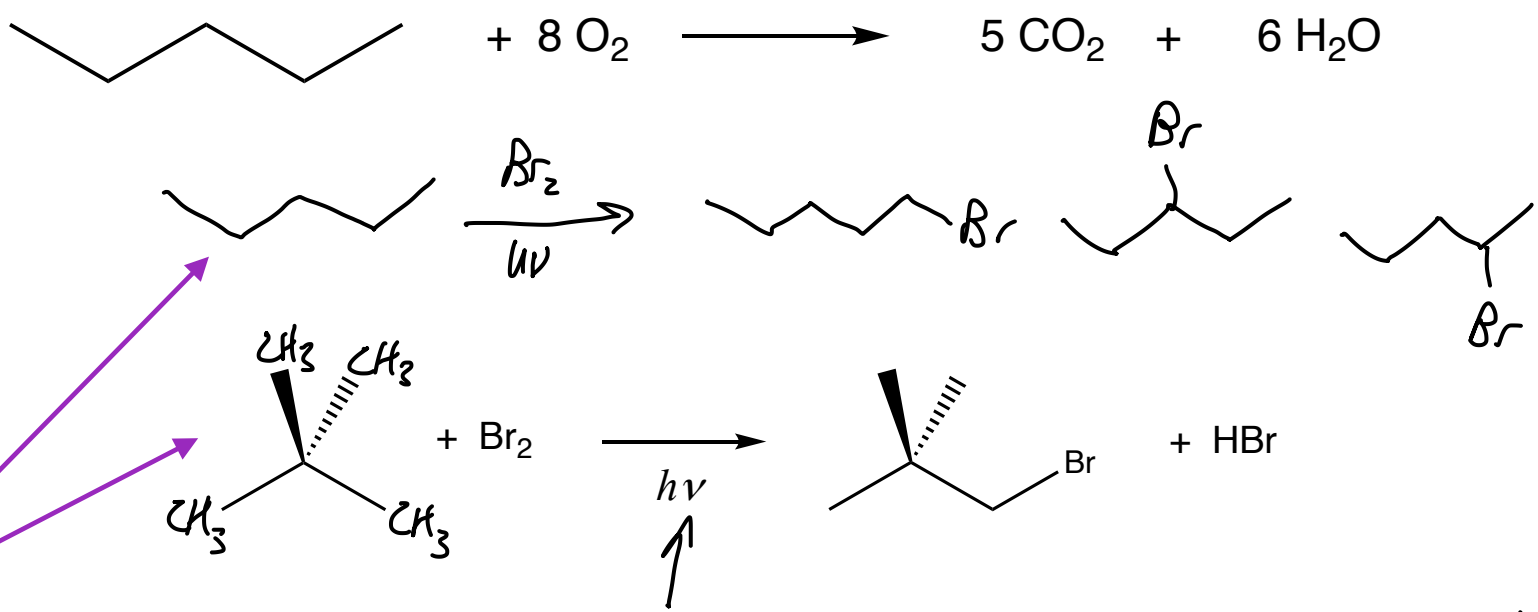
BP = 35.9 °C



BP = 101 °C C_7H_{16}



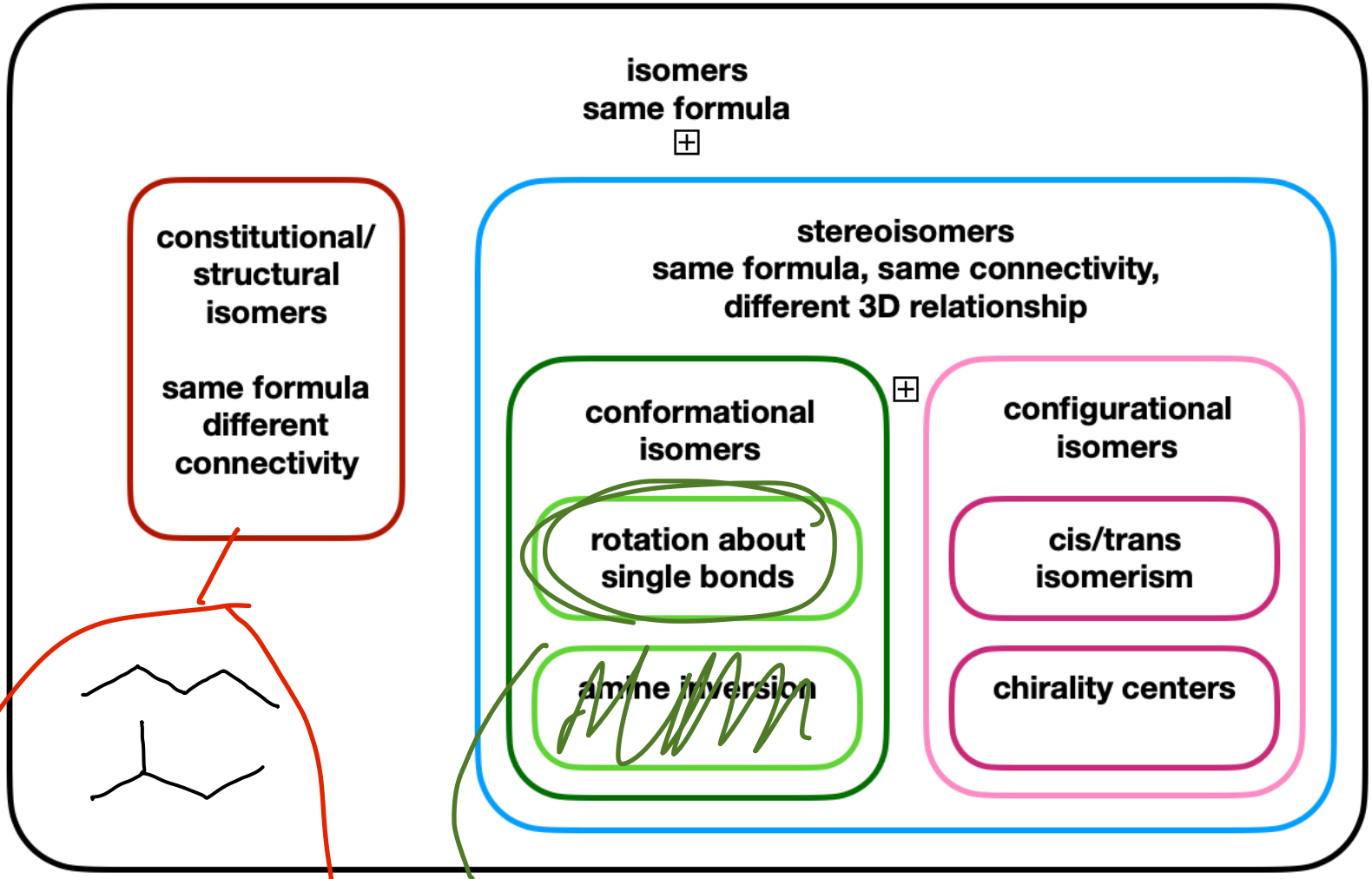
Since there are no areas of high or low e⁻ density, doing organic chemistry on alkanes is not common.



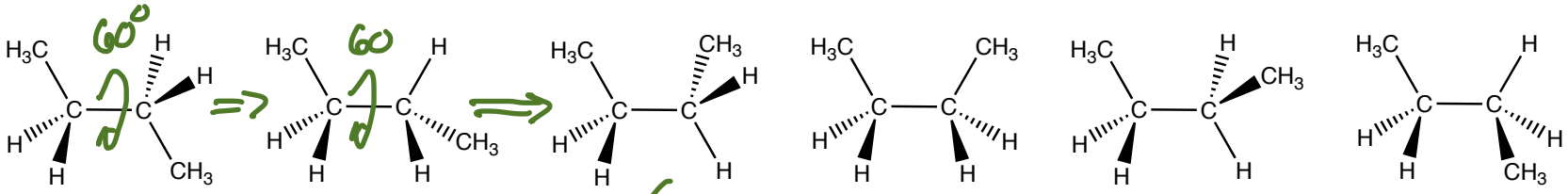
These reactions are not selective.
They make lots of different products.

abbreviation for "shine bright light (usually UV) on the molecules"

Isomers



same connectivity but can be interconverted by rotation around a bond and they usually cannot be separated from each other



isomers
same formula
⊞

constitutional/ structural isomers

same formula different connectivity

stereoisomers
same formula, same connectivity, different 3D relationship

conformational isomers

rotation about single bonds

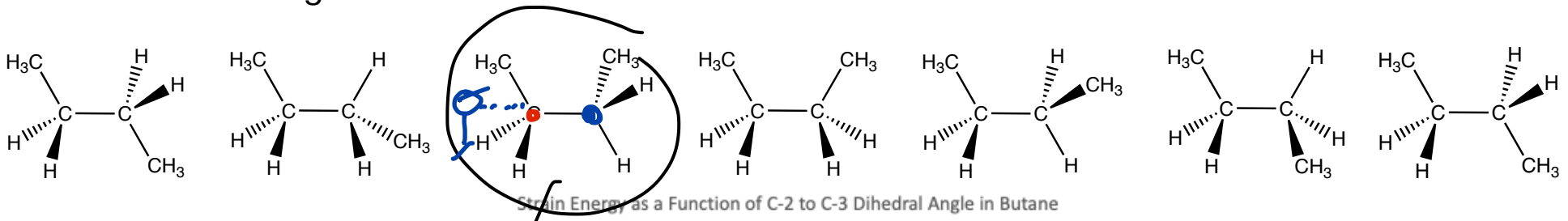
amine inversion

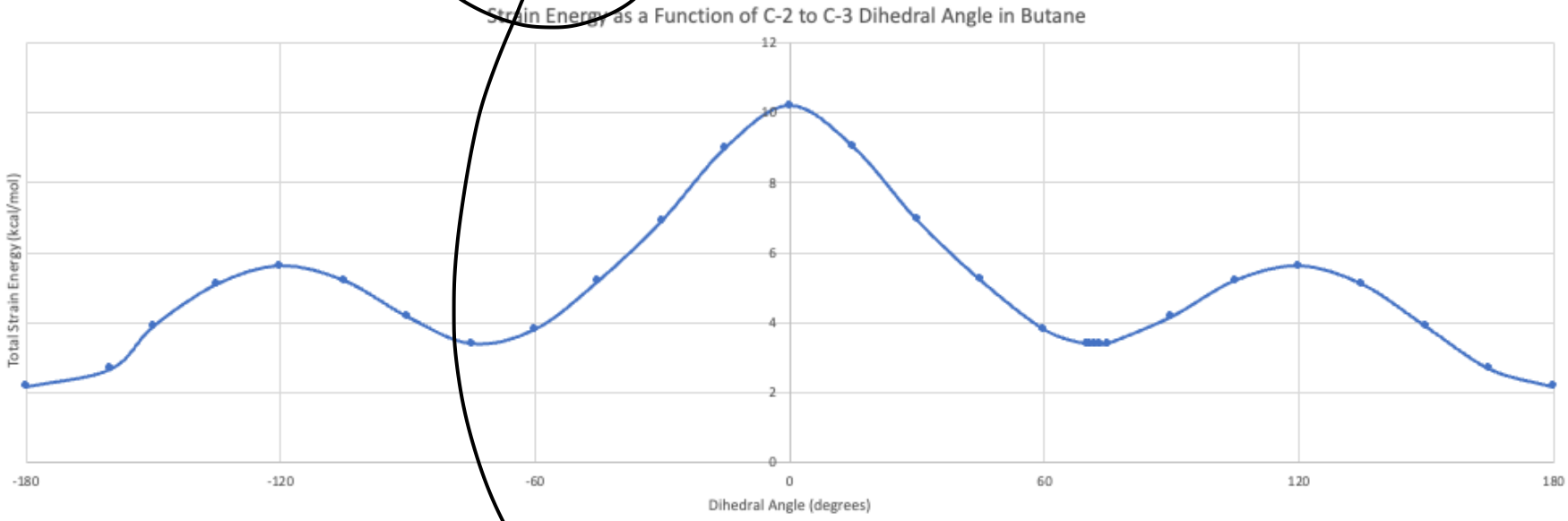
⊞

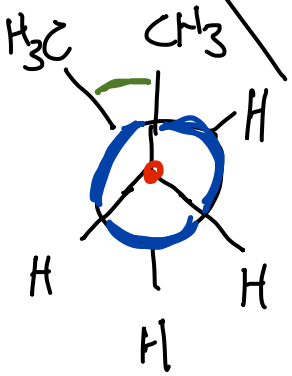
configurational isomers

cis/trans isomerism

chirality centers

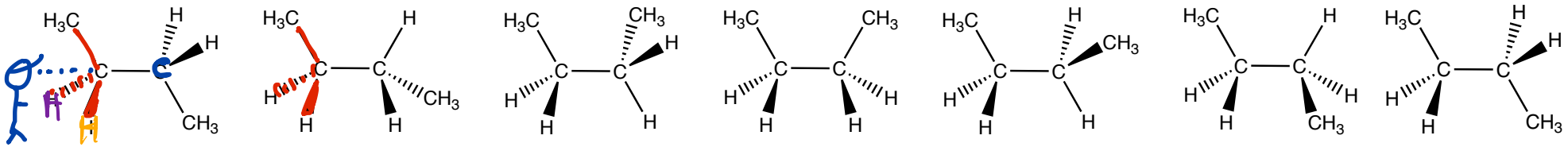






Newman projection is a view designed to show how groups at either end of a bond interact with each other

https://www.westfield.ma.edu/cmasi/organic/newman/newman-plain.html



staggered geometry

eclipsed geometry

staggered geometry

eclipsed geometry

staggered geometry

eclipsed geometry

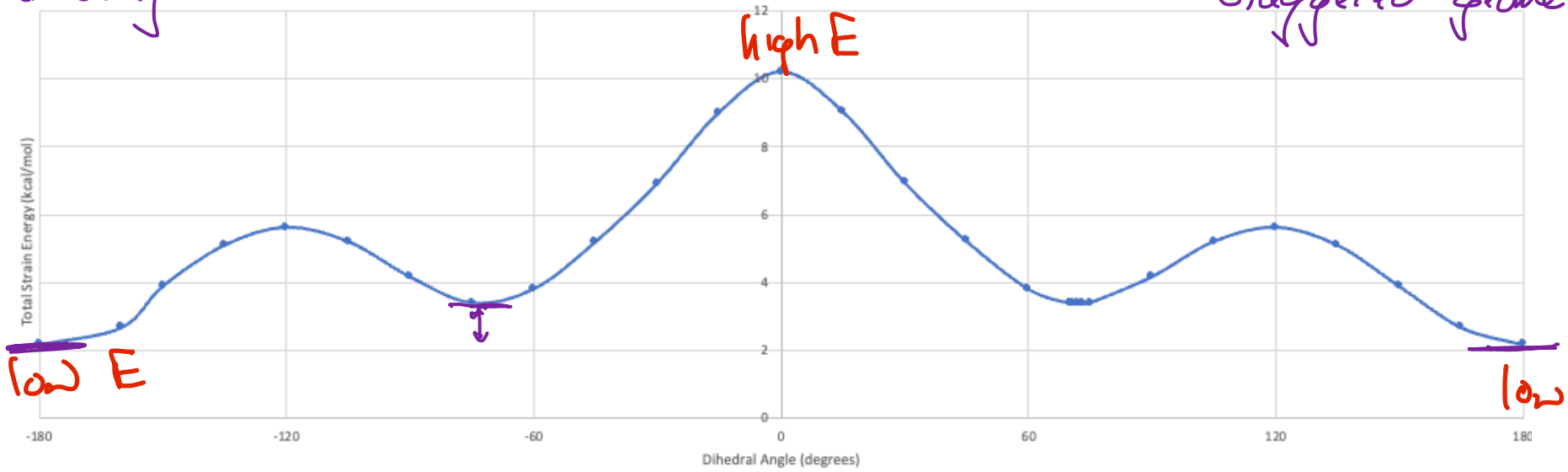
staggered geometry

very little angle strain because CH_3's are far away

gauche interaction

angle strain caused by eclipsing CH_3's

gauche interaction is when two large groups (bigger than H) are close to each other in a staggered geometry

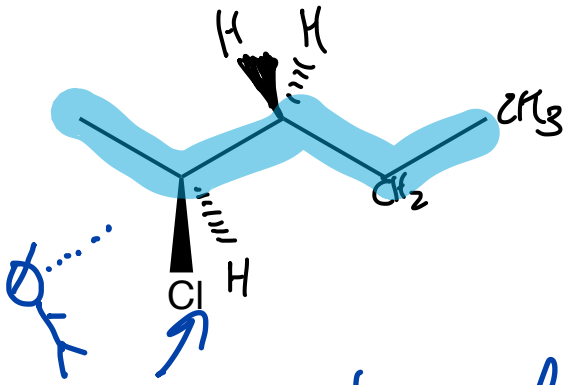


Showing 3-D Relationships (stereochemistry) Using Newman Projections

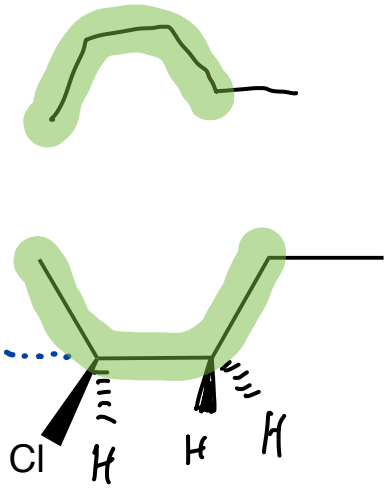
Drawn as though one is looking along a bond C_2 to C_3

Front carbon is a where three bonds come together

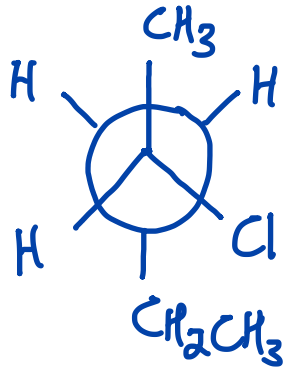
Back carbon is a large circle



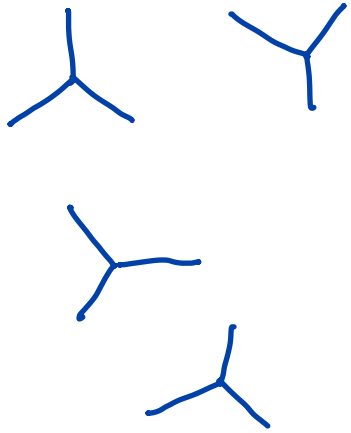
Zig-Zag = staggered

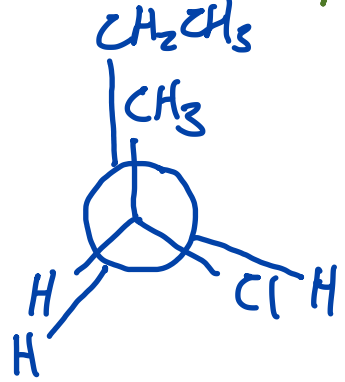


"U" or "N" = eclipsing



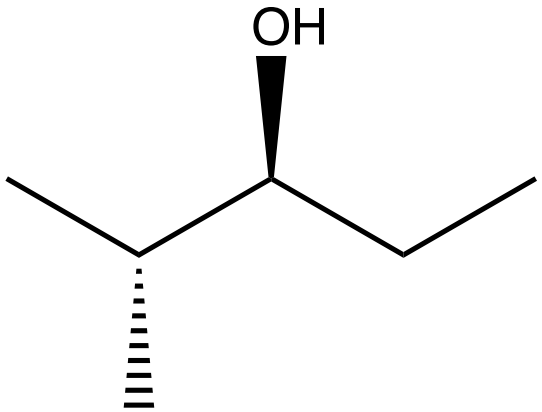
staggered geometry

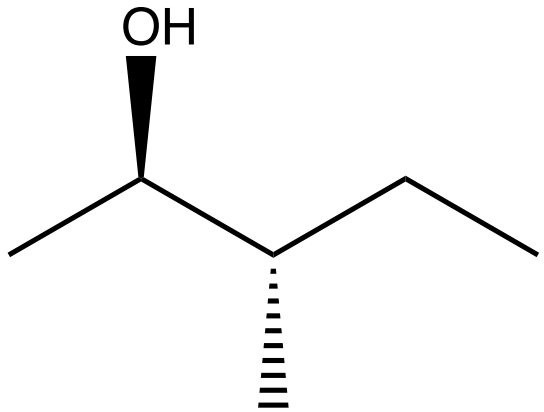




eclipsing

Draw the Newman projection along the C_2 to C_3 bond in the following structures





Draw the Newman projection along the C_3 to C_2 bond in the following structures