

**(18) Today**

Section 3.5 - 3.7 Conformations of Alkanes

Newman Projections

**Next Class (19)**

Section 3.5 - 3.7 Conformations of Alkanes

Chap 4 Cycloalkanes

Section 4.1 Naming Cycloalkanes and  
Halogen Substituents

Section 4.2 cis-trans isomerism

**(20) Second Class from Today**

Section 4.2 *cis-trans* isomerism

Sections 4.3 – 4.8 Stability of Cycloalkanes  
and Conformations of Cyclohexanes

**Third Class from Today (21)**

Sections 4.3 – 4.8 Stability of Cycloalkanes  
and Conformations of Cyclohexanes

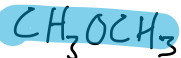
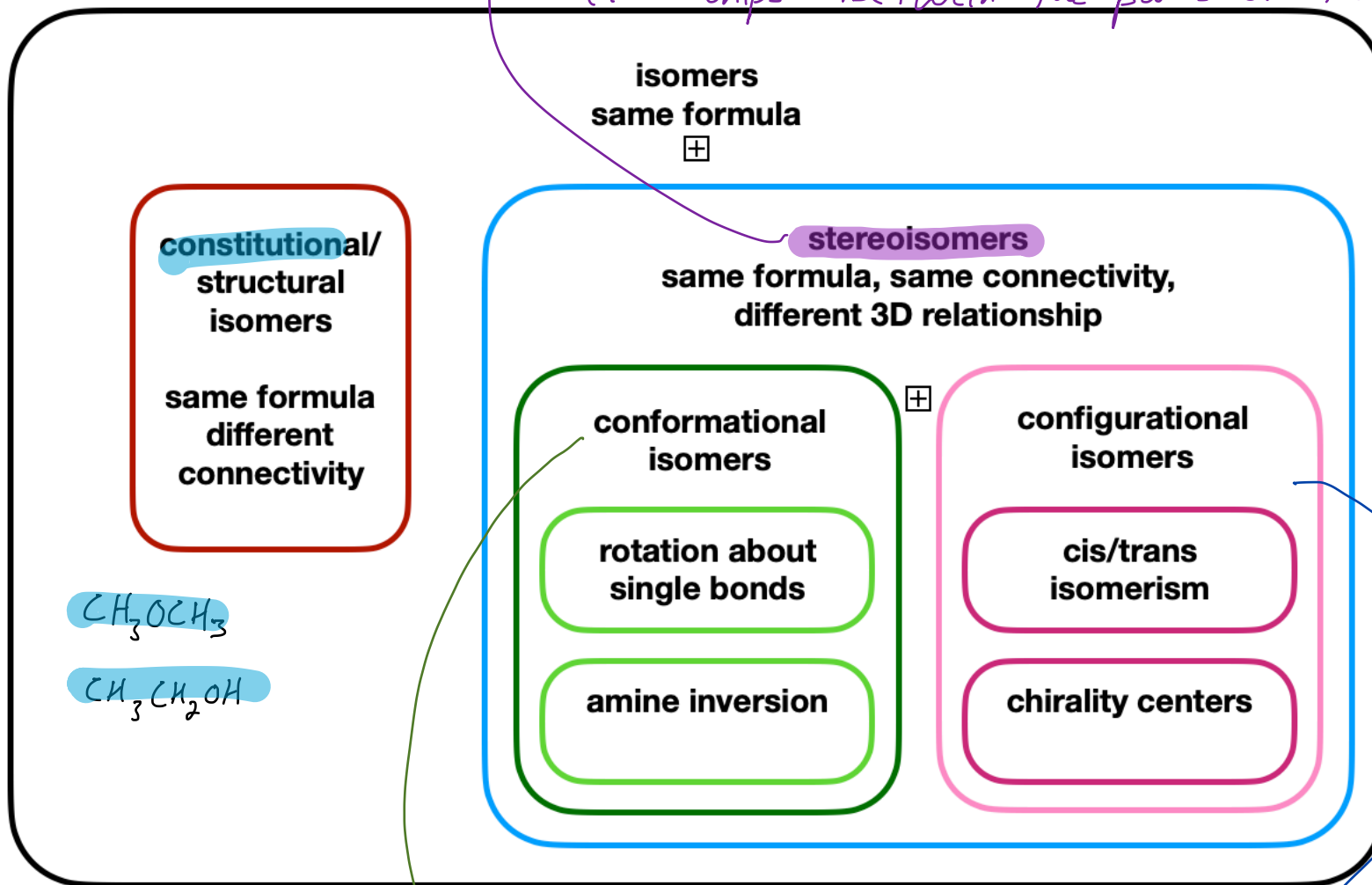
Sections 5.1 – 5.5  
Chirality and Determining the Configuration  
of Chiral Centers

Reworked Test 1's due Wednesday Oct. 23.

On a separate piece of paper provide answers for any question for which you did not receive full credits. I do NOT need the test itself back.

# Isomers

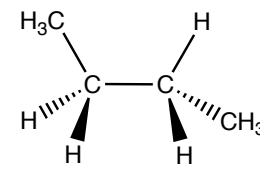
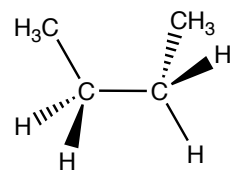
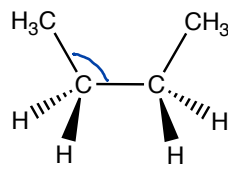
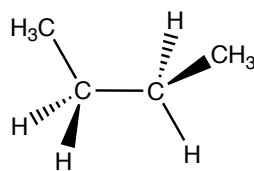
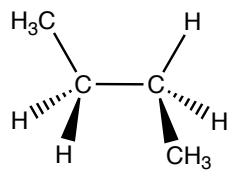
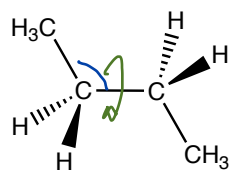
same formulas, same connectivity, different 3D relationships between the parts of the molecule



can be interconverted  
from one version to  
another  
starting here

cannot be  
interconverted from  
one version to  
another

These are different rotamers



bond angle =  $112^\circ$

off by  $2.5^\circ$

from ideal

orbital overlap  
better

sharing  $e^-$  more  
effectively

$e^-$  are lower in E

less angle strain when  
bond angle is closer to  
ideal

bond angle =  $116^\circ$

off by  $6.5^\circ$

from ideal

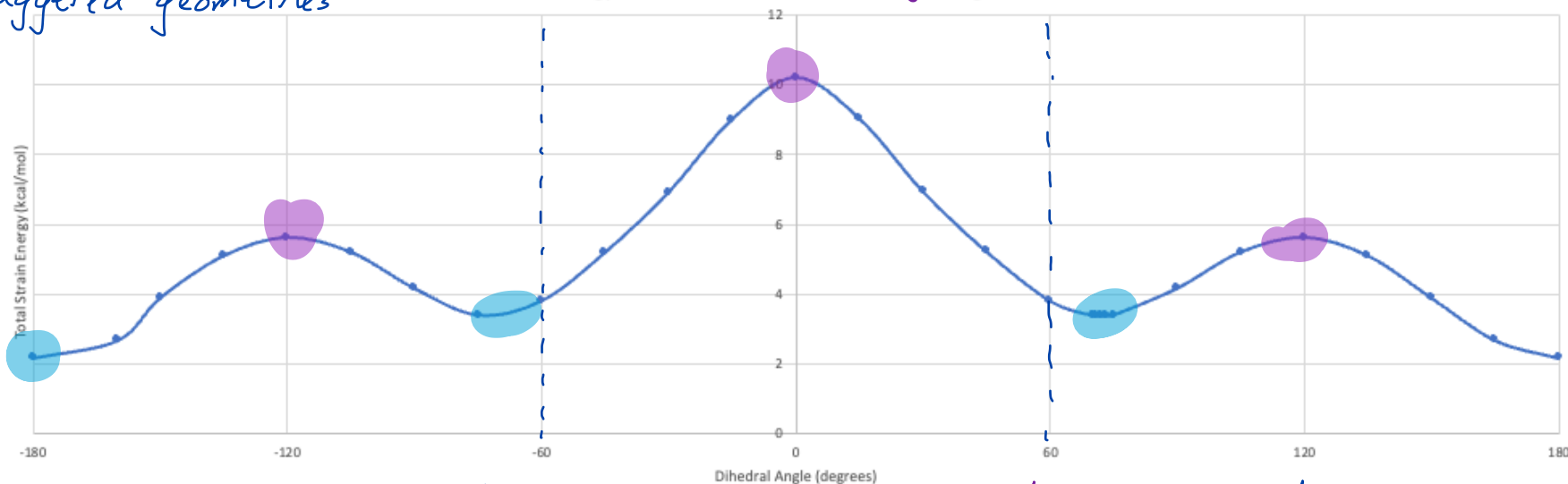
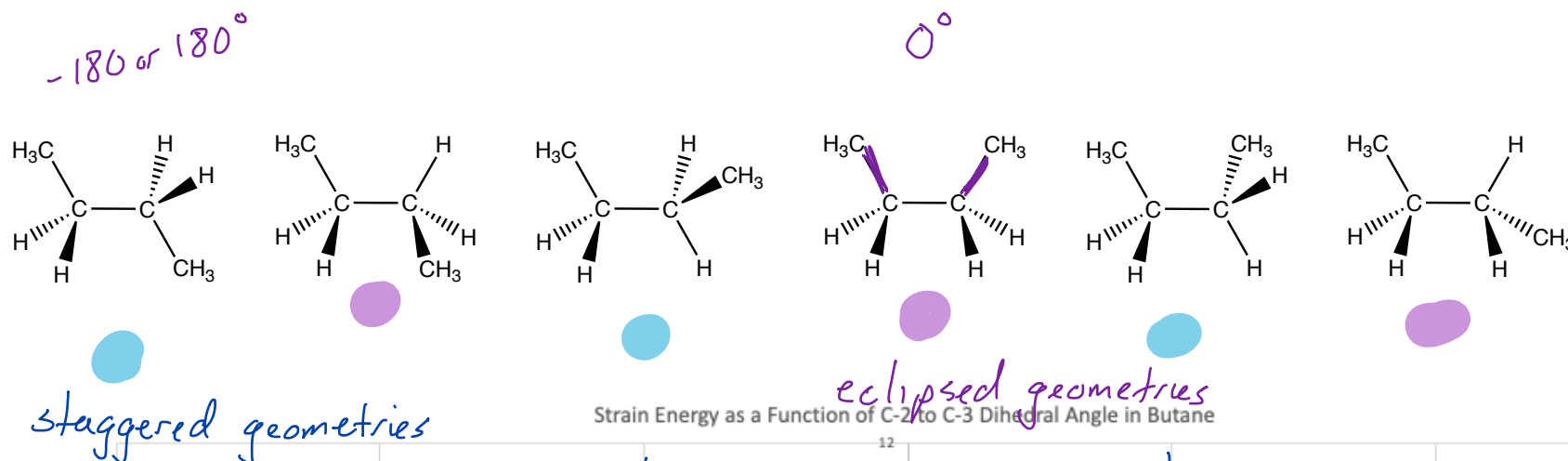
orbital overlap is  
not as good

sharing  $e^-$ 's not as  
effective

$e^-$ 's are higher in E

more angle strain when  
bond angle is further  
from ideal

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



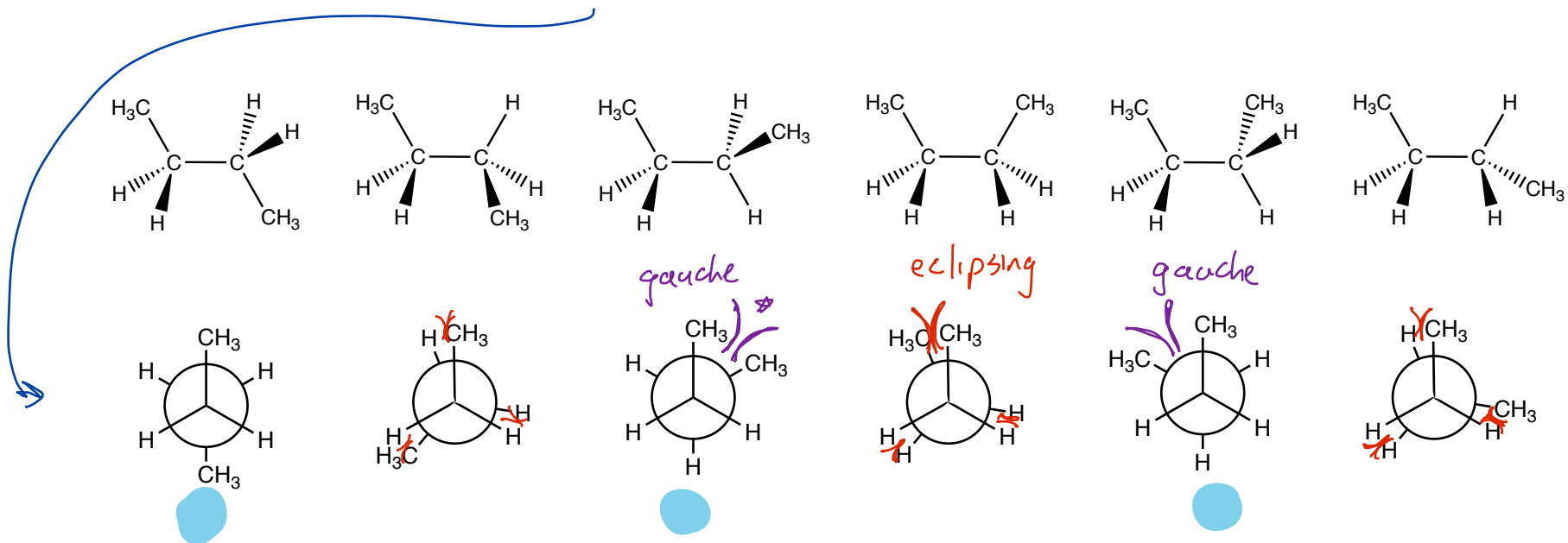
*staggered is lower in E than eclipsed ... so good*

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

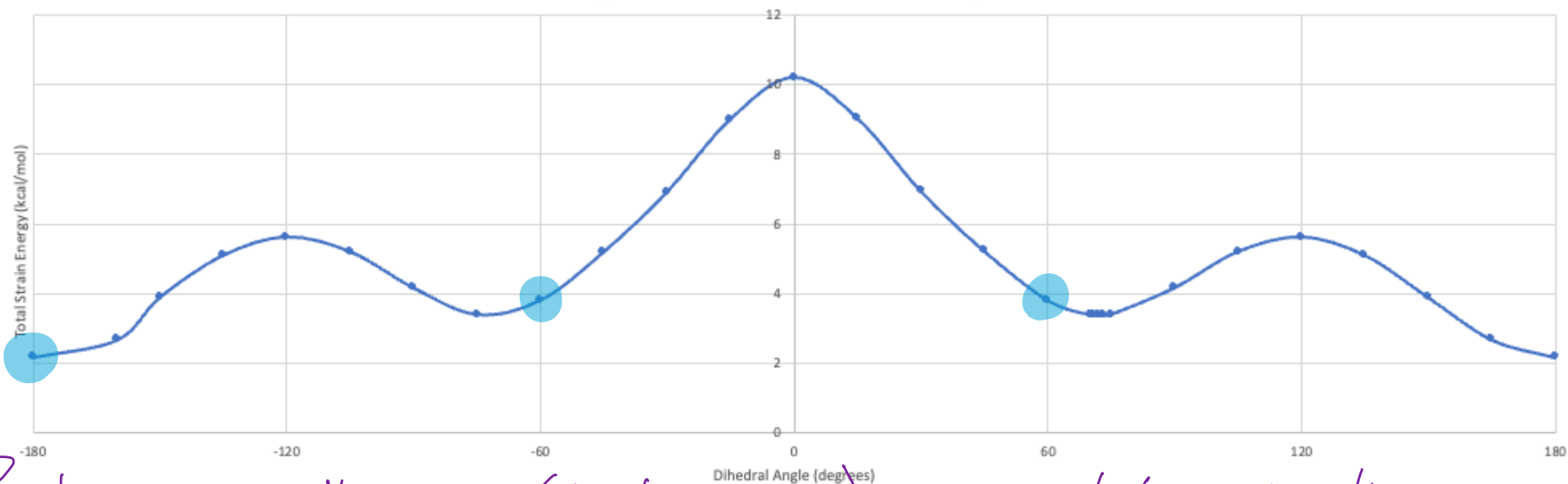
*there is a gauche interaction*

# Rotation around Single Bonds: Newman Projections

## Sections 3.6 - 3.7



Strain Energy as a Function of C-2 to C-3 Dihedral Angle in Butane



gauche interaction } When 2 non-H groups (the big groups) are next to each other in a staggered geometry

# Showing 3-D Relationships (stereochemistry) Using Newman Projections

Sections 3.6 - 3.7

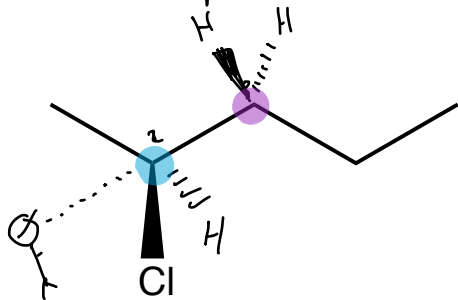
Drawn as though one is looking along a bond  $C_2$  to  $C_3$

Front carbon is a where three bonds come together

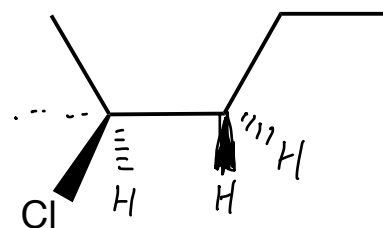
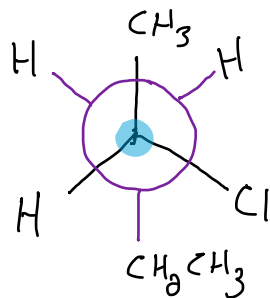
Back carbon is a large circle

2-chloropentane

Zig-zag



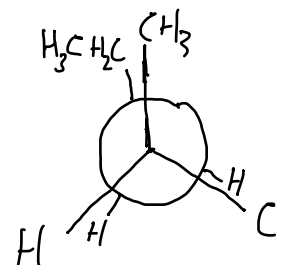
Staggered



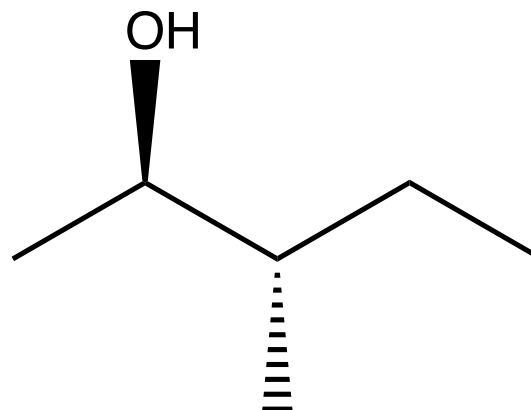
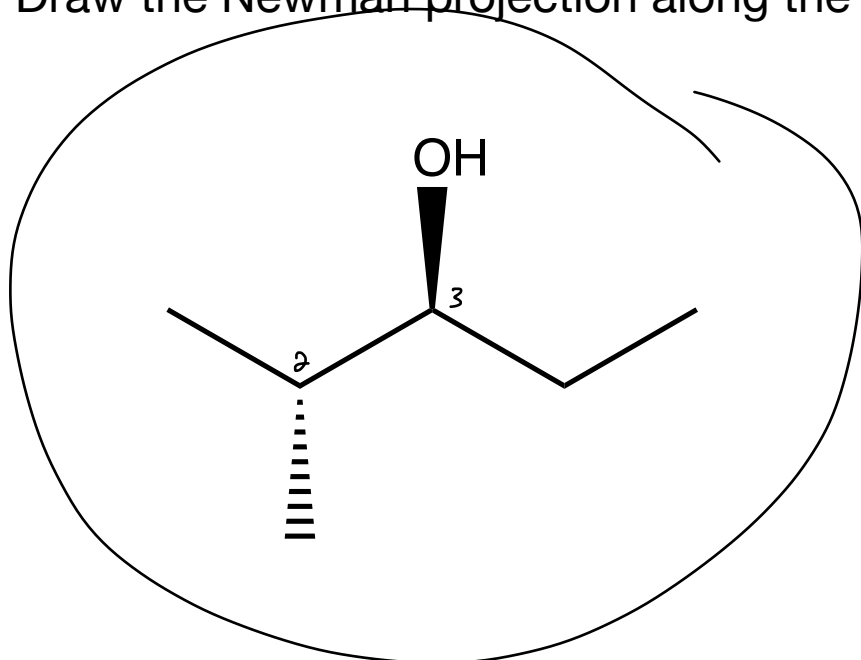
U or N



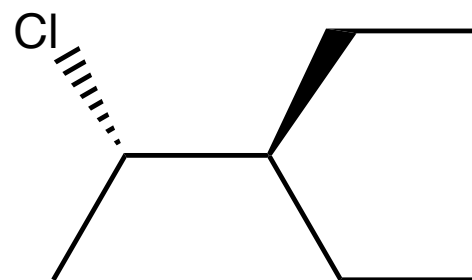
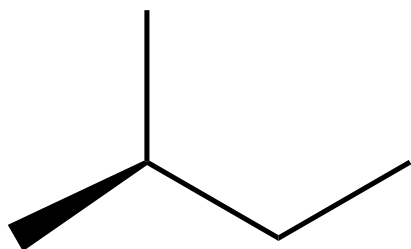
eclipsed



Draw the Newman projection along the C<sub>2</sub> to C<sub>3</sub> bond in the following structure



Draw the Newman projection along the C<sub>3</sub> to C<sub>2</sub> bond in the following structure



# Practice Using Newman Projections

# Sections 3.6 - 3.7

Draw the Newman projection along the C<sub>2</sub> to C<sub>3</sub> bond in the following structure

