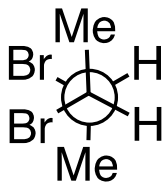


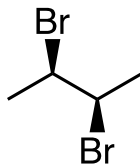
One of these things is not like the others...

Completed in class

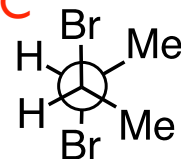
A



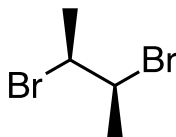
B



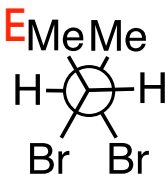
C



D



E



Build a model of cyclohexane. Replace a hydrogen with any other color.  
Arrange your model into a chair conformer.  
Move your model around and look at until you see the chair.  
Draw what you see. Then flip the chair and draw the new version.

first chair

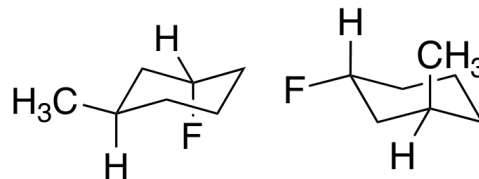
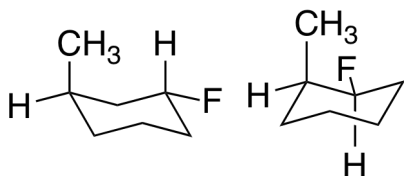
Completed  
in class

chair flip

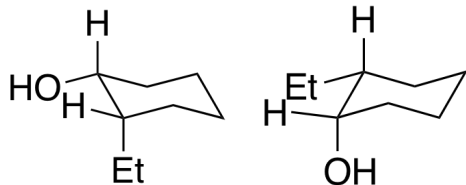
Label all axial and equatorial positions on your drawings.  
What happened to your non-hydrogen?

# Work with a neighbor for this part!

Build models of each pair of structures shown below. How are they related?



completed in class



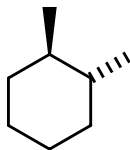
What happens when you change numbering direction?

What happens when you switch axial & equatorial?

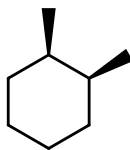
What happens when you switch up & down?

Choose the thermodynamically least stable isomer.

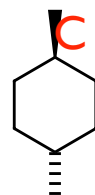
A



B



C

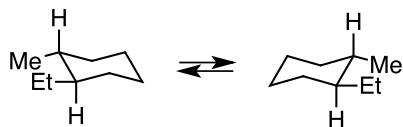


completed in class

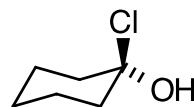
Explain!

# Good, bad, or just ugly?

1.



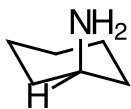
2.



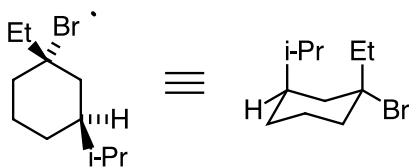
a. Good  
b. Bad  
c. Ugly

completed in class

3.

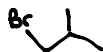


4.

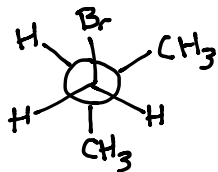


# Practice Problems

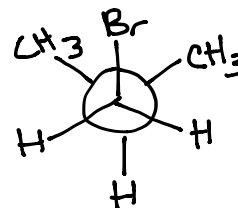
Consider 1-bromo-2-methylpropane, and draw the following.



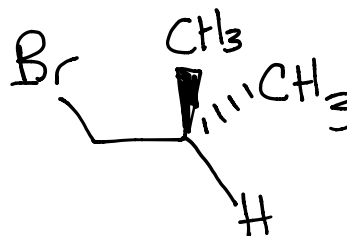
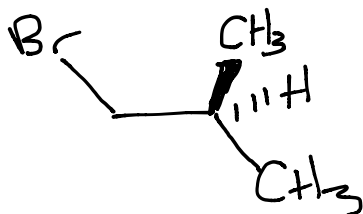
The staggered conformation(s) of lowest energy



The staggered conformation(s) of highest energy

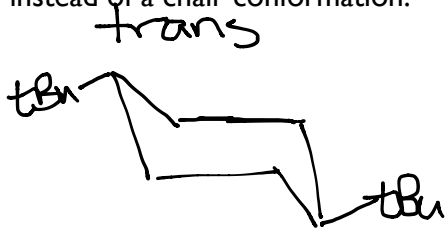


Draw the 3-D representations for each Newman projection.

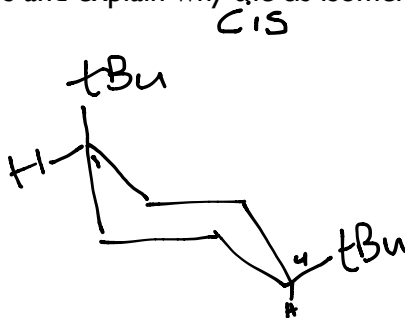


# Practice Problems

*Trans*-1,4-di-*tert*-butylcyclohexane exists in a normal chair conformation. *Cis*-1,4-di-*tert*-butylcyclohexane, however, adopts a twist-boat conformation. Draw both isomers and explain why the *cis* isomer is more stable in a twist-boat conformation instead of a chair conformation.



Both t-Bu groups equatorial.



In either conformer, one group is always axial.

A t-Bu group in an axial position is so high energy that the cyclohexane ring distorts out of the chair conformer and into a twist boat to alleviate steric strain.



# Strain Types

- Give a 1-2 sentence definition and draw an example of each type of strain. Explain how torsional strain is different from steric strain.

angle strain:

completed

torsional strain:

in  
class

steric strain:

# Strain Question

- Where do 1,3-diaxial interactions fit in with types of strain? Explain and give an example.

Completed in class

# Challenge!

Draw the Newman projection looking down the C1-C2 bond!  
(The hydroxyl group is on C1.)

