What are names for all the possible **ORGANIC** by-products of the chlorination, from partial to complete chlorination, of CH4?

3. **Termination**:

CCl_4 tetrachloromethane

4. Overall equation for complete halogenation of the following 2 compounds:

- Methane: $CH_4 + 4F_2 \xrightarrow[\text{light}]{\text{heat}} CF_4 + 4HF$
- Pentane: (How many completely fluorinated products are possible?)

$CH_3(CH_2)_3CH_3 + 12F_2 \xrightarrow[\text{light}]{\text{heat}} CF_3(CF_2)_3CF_3 + 12HF$

Example similar to 2.45 in HW:

Using abbreviated formula, write the equation for the **mono**chlorination of hexane.

$CH_3(CH_2)_4CH_3 + Cl_2 \rightarrow HCl + CH_3(CH_2)_4CH_2Cl$

Write the equation for the **complete** chlorination of hexane

$CH_3(CH_2)_4CH_3 + 14Cl_2 \rightarrow 14HCl + CCl_2(CCl_2)_4CCl_3$

Problem:

1. **Name all of the products of mono-chlorination of propane:**

1- chloropropane

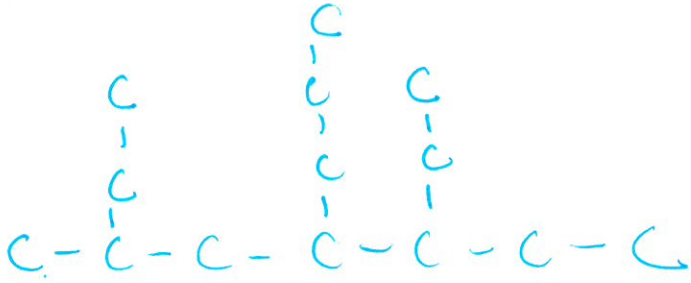
2- chloropropane

2. **Name all of the products of mono-chlorination of cyclopropane**:

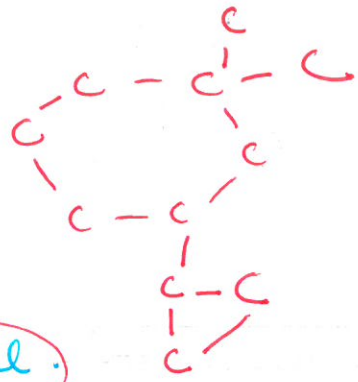
1- chlorocyclopropane.

Review #1
Naming and Drawing Alkanes

1. 5-ehtyl-2-methyl-4propylheptane



2. 3-cyclopropyl-1,1-dimethylcyclohexane



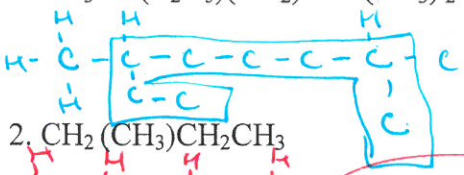
3. Name: $CH_3CH_2C(CH_3)(CH_2CH_3)CH_2CH_2CH_2CH_3$

3,3-dimethylnonane.

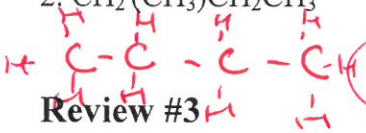
Review #2
Naming Alkanes

2,6-dimethyl octane

1. $CH_3CH(C_2H_5)(CH_2)3CH(CH_3)_2$ ~~2-Methyl-6 octane~~



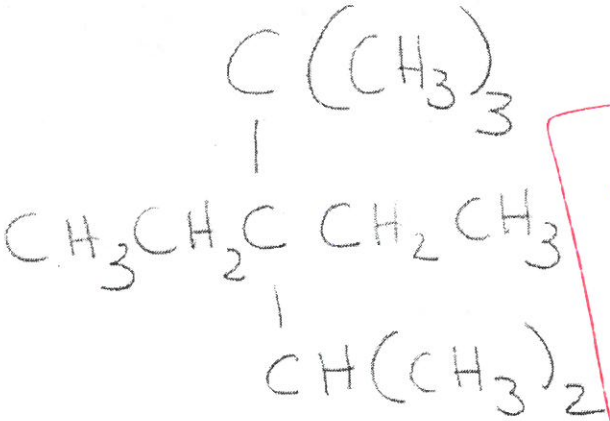
2. $CH_2(CH_3)CH_2CH_3$

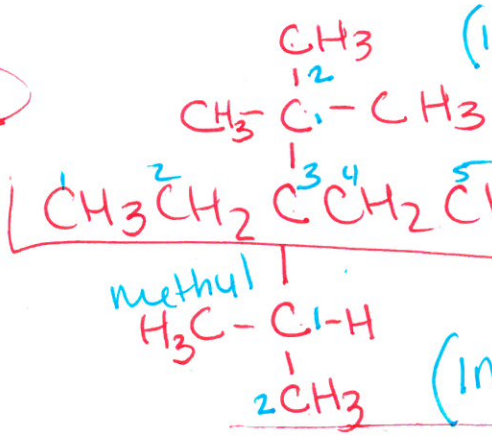


butane

Review #3

1. Name the molecule below





(1,1-dimethylethyl)

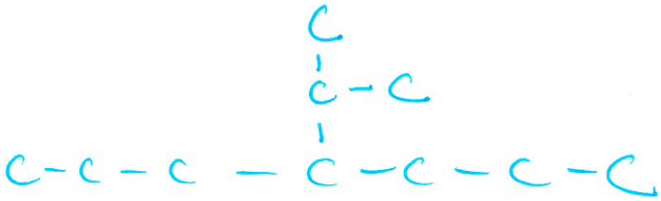
pentane

(1methylethyl)

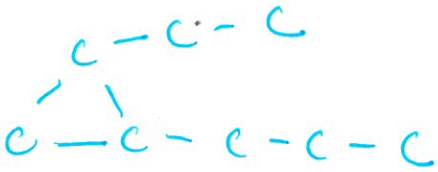
3,3-(1,1-dimethyl ethyl)
(1methylethyl)
pentane

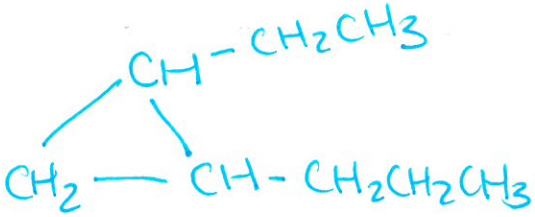
Review #4

1. Draw 4 – (1-methylethyl) heptane



2. Draw condensed 1-ethyl-2-propylcyclopropane



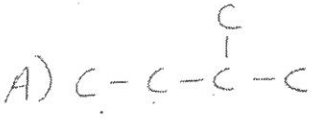


Review #5

1. Arrange from high to low boiling point

↑ # C = ↑ Bpt
↓ branch = ↑ Bpt

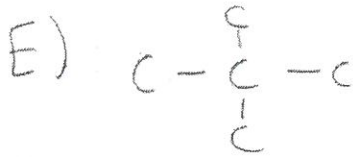
D > C > A > E > B

A) 

B)

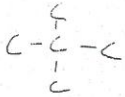
C)

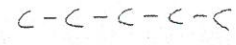
D)

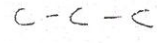
E) 

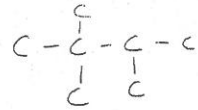
Review #6

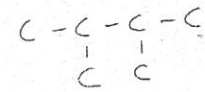
1. Arrange from high to low boiling point

A) 

B) 

C) 

D) 

E) 

D > E > B > A > C

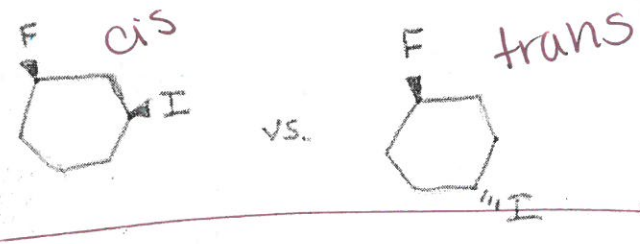
Review #7

1. For each pair, what type of isomer is represented?

(A)

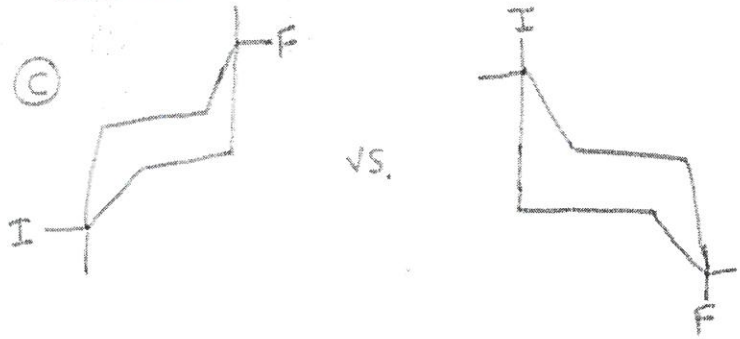
geometric / configuratio a

(B)



configurational / geometric

(C)

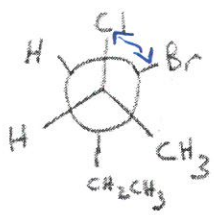


(D) For "A" above, which is the preferred conformation? Why?

Review #8: Newmann Projections

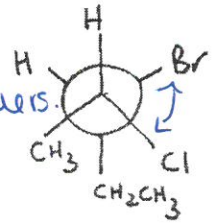
1. Name A – C
2. Are A – C identical, isomers or not related?

(A)

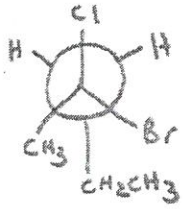


ID { 3 - bromo - 2 - chloropentane
3 - bromo - 2 - chloropentane
2 - bromo - 2 - chloropentane } isomers.

(B)



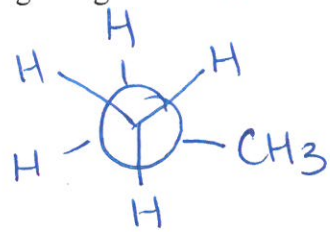
(C)



Review #9: Newman Projections

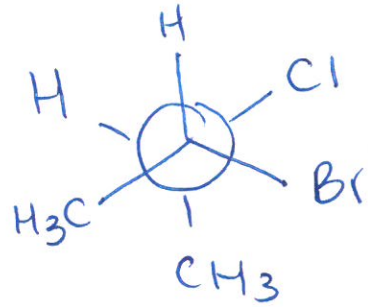
1. Draw a staggered Newman view of propane sighting along the C-1 to C-2 bond.

$CH_3\,CH_2\,CH_3$

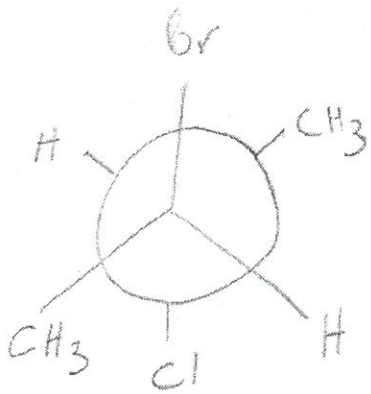


2. Draw staggered 2-bromo-3-chlorobutane sighting from C-2 to C-3.

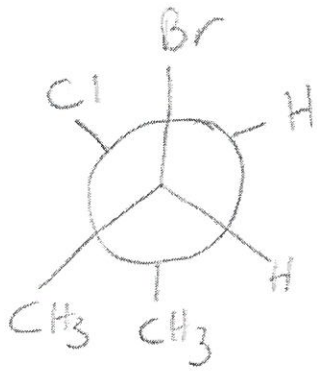
$CH_3\,CHBr\,CHCl\,CH_3$



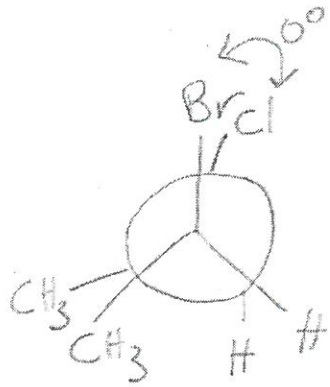
Review #10: Newman Stability



A

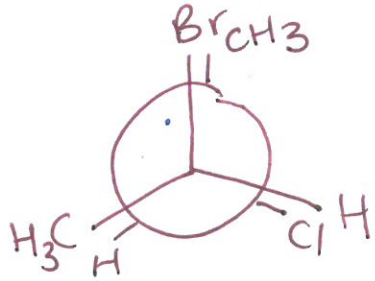


B



C

1. Which conformation is most stable? Least? Why? A - farthest away/across the circle.
2. Was the front or back carbon atom rotated? back
3. Can you draw another eclipsed conformation? yes



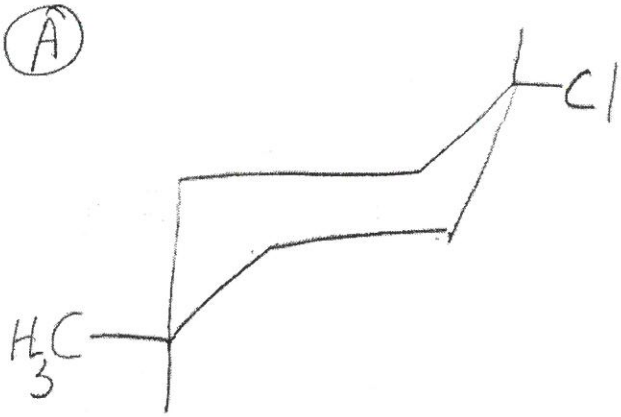
4. Name the molecule

2-bromo-3-chlorobutane.

Review #11: Cyclohexane Names

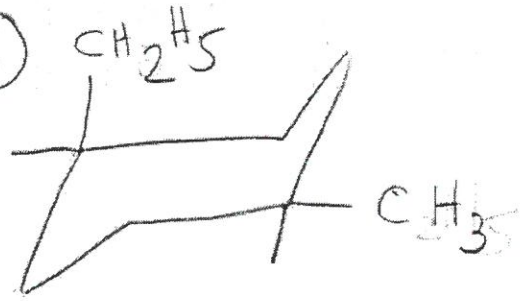
Name the following molecules

(A)



trans-1-chloro-4-methul cyclohexane

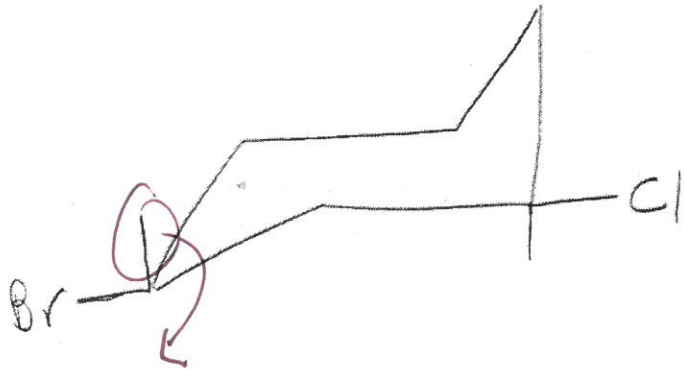
(B)



cis-1-ethul-4-methul cyclohexane

Review #12: Cyclohexane Names

1. Name the following molecule



cis ~~trans~~-1-bromo-3-chlor cyclohexane

2. According to the drawing, would cis or trans be most stable? cis ~~trans~~, both substitu are equatorial.
3. Any comments on the drawing? axial up
4. Does that affect your answer to cis vs. trans stability? yes,

Test Tips: Chapter 2 Alkanes – SEE NEXT PAGE

Test Tips: Chapter 2 Alkanes

1. Circle or draw the longest chain

2. Acyclic Numbering: Start with end closest to the first branch.
   a. If 2 branches equidistant from both ends, number from the end closest to the 3rd branch.
   b. If still equidistant or same sum, priority is given to the first alphabetically.
   c. MUST list #1 in name for all substituents on carbon #1 UNLESS the parent chain is methane.

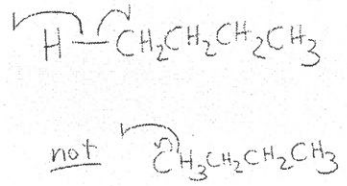
3. List branches alphabetically, disregarding prefixes.

4. Prefixes: di, tri, tetra.

5. Use cis/trans IF appropriate

6. Multiple choice
   a. Eliminate choices: pentane vs. hexane.
   b. Read all remaining choices. May differ only in numbering or in order of substituent names.

7. Chair: For cyclohexane only.
   a. Must show axial AND equatorial lines on carbons w/substituents (to tell what side of ring equa. on)

8. Halogenation: Difference between equation vs. steps

9. Free radical steps:
   a. Arrows to show movement of EACH electron moved.
   b. Show "dot" for radical.
   c. Catalyst only in INITIATION.
   d. Use ABBREVIATED, not structural formulas. This will show WHICH carbon the H is taken from and where the halogen is added. (-C2H5 is only used for ethyl BRANCHES off a parent chain, not the parent)
   e. Show bond being broken. Example: