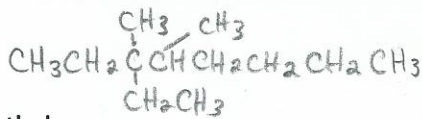


# Key

1. Name and give the symbol for the 4 substituents that are halogens.

- a. fluorine, F                      c. chlorine, Cl  
b. bromine, Br                      d. iodine, I

2. In the following molecule, classify the specified carbon as either primary, secondary, tertiary, or quaternary:



3-ethyl-3,4,5-trimethylnonane

Carbon 2 2°                      carbon 3 4°                      carbon 5 3°

3. Which of the following molecules only contains secondary carbons?

- a. 3-methylhexane                      c. cyclohexane  
b. Hexane                                  d. 1,3-dimethylcyclopentane

4. Fill in the blanks that are needed to make the following haloalkane:



5. Alkane melting points and boiling points are said to be low (high/low).

6. Which has the higher boiling point: butane or decane? Why?

decane; because it has a longer chain

7. Which has the higher boiling point: cyclohexane or hexane? Why?

cyclohexane, because it is a rigid structure with many points of contact (rotation about carbon bonds is limited)

8. Draw and name any six isomers of C<sub>7</sub>H<sub>14</sub>F<sub>2</sub>.

