

Name: \_\_\_\_\_

### Chapter 22 Self-Study Assignment: Hydrocarbons

Please complete the following questions on your own paper. Most answers can be found in your textbook, however other sources will be needed. Please write on one side only and attached this assignment to the front. (Value: / )

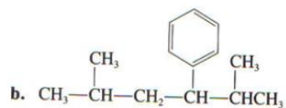
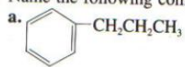
1. Read Chapter 22. Define or explain all of (approximately 20) the highlighted terms. In addition, define the term Organic Chemistry. (Value 20)
2. Prior to 150 years ago, what theory did scientists hold about the formation of carbon compounds? Who performed experiments to counter this theory? Briefly explain his experiment. How would we now define an organic compound? (Value 3)
3. What distinguishes alkanes from the other hydrocarbons? (Value 2)
4. How many bonds will carbon atoms almost always make? (Value 1)
5. Give the names, formulas and draw the structural formulas for the first ten straight-chain (or continuous chain) alkanes. **Memorize them!** (Value 10)
6. What organization recommends the use of the names that you found in question 5? (Value 1)
7. What is the difference between a continuous/straight chain alkane and a branched chain alkane? (Value 2)
8. What is a substituent? What does it usually take the place of on a hydrocarbon chain? What are some typical substituents (draw/name 3) mentioned on page 698? (Value 4)
9. What is a methyl group and ethyl group? What type of substituents are these examples of? Give the names and formulas for the next 5 alkyl groups. (Value 7)
10. How is:  
$$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
different than  
$$\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$$
After all, both of them can be written as  $\text{C}_4\text{H}_{10}$ . (Value 2)
11. List all of the rules for naming branched-chain alkanes. Memorize them. (Value 6)
12. Draw structural formulas for (Value 3)
  - a) 2-methyl pentane
  - b) 3-methyl hexane
  - c) 3-ethyl-2-methyl octane



23. Complete the following: (Value 3)

**Problem**

10. Name the following compounds.



24. Draw the structure for each compound (Value 4)

a) p-diethylbenzene

c) p-xylene

b) 2-methyl-3-phenylpentane

d) toluene