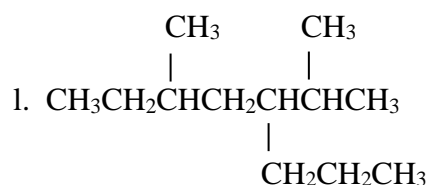
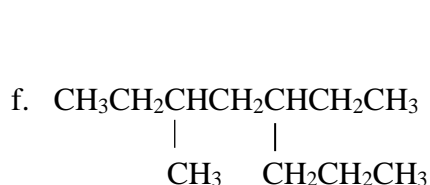


Organic Chemistry 2323  
Alkanes  
Practice Set

1. (3.1) Give the structural formula of:
- |                                |                                |
|--------------------------------|--------------------------------|
| a. 2,2,3,3,-tetramethylpentane | f. 2,5-dimethylhexane          |
| b. 2,3-dimethylbutane          | g. 3-ethyl-2-methylpentane     |
| c. 3,4,4,5-tetramethylheptane  | h. 2,2,4-trimethylpentane      |
| d. 4-ethyl-3,4-dimethylheptane | i. 3-chloro-2-methylpentane    |
| e. 4-ethyl-2,4-dimethylheptane | j. 1,2-dibromo-2-methylpropane |

2. (3.2) Draw out the structural formula and give the IUPAC name of:

- |   |  |
|---|--|
| a. $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{CH}_3$   | g. $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_3$  |
| b. $\text{CH}_3\text{CBr}_2\text{CH}_3$   | h. $(\text{CH}_3)_2\text{CClCH}(\text{CH}_3)_2$  |
| c. $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$                        | i. $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{CH}(\text{C}_2\text{H}_5)_2$                      |
| d. $(\text{C}_2\text{H}_5)_2\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$                        | j. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)\text{CH}_2\text{C}(\text{C}_2\text{H}_5)_2\text{CH}_3$ |
| e. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)_2$ | k. $(\text{CH}_3)_2\text{CHC}(\text{C}_2\text{H}_5)_2\text{CH}_2\text{CH}_2\text{CH}_3$            |



3. (3.4) From Problem 1 or 2, determine which alkane (if any) contains:
- |                                 |  |
|---------------------------------|--|
| a. One isopropyl group          | g. one <i>tert</i> -butyl group  |
| b. Two isopropyl groups         | h. two <i>tert</i> -butyl groups   |
| c. One isobutyl group           | i. an isopropyl group and a <i>sec</i> -butyl group                      |
| d. Two isobutyl groups          | j. a <i>tert</i> -butyl butyl group and an isobutyl group                |
| e. One <i>sec</i> -butyl group  | k. a methyl, an ethyl, a <i>n</i> -propyl, and a <i>sec</i> -butyl group |
| f. Two <i>sec</i> -butyl groups |  |
4. (3.8) Write balanced equations, naming all organic compounds, for the following reactions:
- |  |  |
|--|--|
| a. Isobutyl bromide + Mg/ether           | e. product of (a) + $\text{D}_2\text{O}$     |
| b. <i>Tert</i> -butyl bromide + Mg/ether | f. <i>sec</i> -butyl chloride + Li, then CuI |
| c. Product of (a) + $\text{H}_2\text{O}$ | g. product of (f) + ethyl bromide            |
| d. Product of (b) + $\text{H}_2\text{O}$ |  |
5. (3.9) Write equations for the preparation of *n*-butane from:
- |                              |  |
|------------------------------|--|
| a. <i>n</i> -butyl bromide   | d. 1-butene, $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$ |
| b. <i>sec</i> -butyl bromide | e. 2-butene, $\text{CH}_3\text{CH}=\text{CHCH}_3$          |
| c. ethyl chloride            |  |

6. (3.10) Draw structures of all products expected from monochlorination at room temperature of:

a. *n*-hexane

b. Isohexane

c. 2,2,4-trimethylpentane

d. 2,2-dimethylbutane