

What are Alkanes?

Worksheet

Alkanes are saturated hydrocarbons with the general formula C_nH_{2n+2} (for straight-chain alkanes). Each carbon forms four single bonds, and there are no double or triple bonds.

Questions

1. General formula for alkanes?

- A) CH
- B) CH_2
- C) CH_4
- D) CH_2

2. How many bonds does each carbon in alkane have?

- A) 2
- B) 3
- C) 4
- D) 5

3. Methane (CH_4) is a

- A) unsaturated hydrocarbon
- B) aromatic compound
- C) saturated hydrocarbon
- D) alkene

4. Boiling point increases with chain length because

- A) more hydrogen
- B) stronger covalent bonds
- C) more surface area more Van der Waals forces
- D) ionic bonding

5. What is the molecular formula of pentane?

6. A straight-chain alkane contains 8 carbons. How many hydrogens?

7. Is CH_4 a valid alkane formula?

8. Define: What is the general formula for straight-chain alkanes?

9. Define: Why are alkanes called saturated hydrocarbons?

10. Define: Name the first three alkanes.

Answer Key

1. B) CH - Straight-chain alkanes follow CH.
2. C) 4 - Carbon always forms 4 bonds; in alkanes, all are single.
3. C) saturated hydrocarbon - Methane has only single CH bonds; it is saturated.
4. C) more surface area more Van der Waals forces - Longer chains have larger surface area, causing stronger London dispersion forces.
5. Pentane has 5 carbons ($n=5$). $CH = CH$
6. $n = 8$ $H = 2(8) + 2 = 18$ Formula: C_8H_{18} (octane)
7. Check: $2(6) + 2 = 14$ Yes, this is hexane.
8. C_nH_{2n} , where $n =$ number of carbons.
9. Because all CC bonds are single bonds; no double or triple bonds.
10. Methane (CH_4), ethane (C_2H_6), propane (C_3H_8).

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