

Alkane Chemistry Questions with Solutions

Q1. What kind of reactions do alkanes undergo?

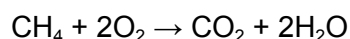
Answer: The two most important reactions of alkanes are combustion and halogenation.

Combustion: Alkanes undergo a combustion reaction to give carbon dioxide and water.

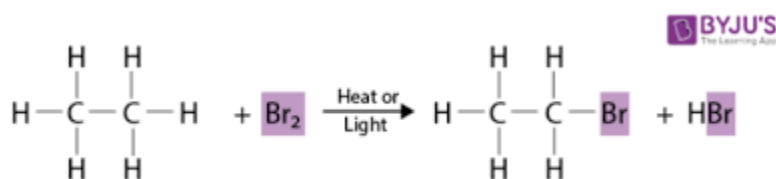
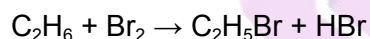
Halogenation: Alkanes undergo a halogenation reaction to give haloalkane.

Q2. Give an example each of combustion reaction and halogenation reaction of alkanes

Answer: Combustion reaction: Methane undergoes combustion reaction to give carbon dioxide and water.



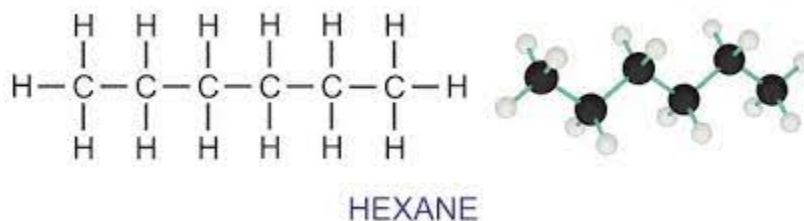
Halogenation reaction: Ethane undergoes bromination reaction to give ethyl bromide in the presence of heat or light.



Q3. Choose the alkane from the following

- (a) Hexane
- (b) Hexene
- (c) Hexyne
- (d) Hexanol

Answer: (a)



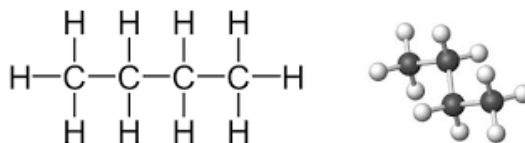
Q4. Choose the correct molecular formula of alkane from the following

- (a) C_4H_{10}
- (b) C_5H_{10}
- (c) C_6H_6
- (d) C_4H_8

Answer: (a)

C_4H_{10} is the alkane butane.

BUTANE STRUCTURE



Q5. Why are alkanes called saturated hydrocarbons?

Answer: Alkanes are called saturated hydrocarbons because they do not contain multiple bonds like double bond or triple bond in their structure. The carbon and hydrogen atoms in alkanes are bonded by single covalent bonds.

Q6. What is meant by incomplete combustion?

Answer: Incomplete combustion is a combustion reaction in which poisonous carbon monoxide gas is released. The energy released in incomplete combustion is less than that of complete combustion.

Q7. Match the following items of column 1 with column 2 and choose the correct answer:

Column 1	Column 2
1) C_5H_{12}	a) Cyclic alkane
2) C_3H_6	b) Branched alkane
3) C_8H_{18}	c) Linear alkane

Answer:

Column 1	Column 2
1) C_5H_{12}	c) Linear alkane
2) C_3H_6	a) Cyclic alkane
3) C_8H_{18}	b) Branched alkane

Q8. What is the bond angle of alkanes?

Answer: The bond angle of alkanes is 109.5° .

Q9. Arrange n-pentane, iso-pentane and neopentane in decreasing order of their boiling points.

Answer: Boiling point decreases with increase in branching of alkanes. Thus, n-pentane > iso-pentane > neopentane is the decreasing order of boiling points.

Q10. Which metal is used in the preparation of grignard reagent from haloalkanes?

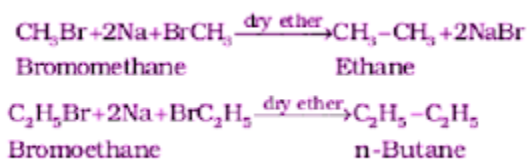
Answer: Magnesium metal is used in the preparation of grignard reagent from haloalkanes.

Q11. Give one use of ethylene dibromide.

Answer: Ethylene dibromide is used as an anti-knocking agent in the combustion chambers to prevent the deposition of lead metal.

Q12. Explain Wurtz reaction.

Answer: The reaction in which 2 moles of alkyl halide react with sodium in presence of dry ether to give alkane is called Wurtz reaction.



Q13. Which compound is most volatile among the following?

- (a) Isobutane
- (b) n-pentane
- (c) 2,2 dimethylpropane
- (d) propane

Answer: (c)

Q14. What is freon-12?

Answer: Dichlorodifluoromethane is known as freon-12. It is a colorless gas and is used as a refrigerant and also as an aerosol spray propellant.

Q15. What is the geometry of a methane molecule?

Answer: Methane molecule is tetrahedral in geometry.

Practice Questions on Alkanes

Q1. Which among the following has the highest boiling point?

- (a) Pentane
- (b) Hexane
- (c) Heptane
- (d) Octane

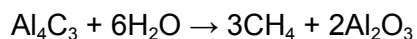
Answer: (d)

Q2. What are alkanes also known as?

Answer: Alkanes are also known as Paraffins as they are unreactive under ordinary conditions.

Q3. What is the product obtained when aluminium carbide is treated with water?

Answer: Methane is produced when aluminium carbide is treated with water.



Q4. What is paraffin wax?

- (a) Saturated hydrocarbon
- (b) Unsaturated hydrocarbon
- (c) Alcohol
- (d) Carboxylic acid

Answer: (a)

Q5. What does petroleum mainly consist of?

- (a) Aromatic hydrocarbons
- (b) Aliphatic hydrocarbons
- (c) Aliphatic alcohols
- (d) Aliphatic acids

Answer: (b)