

14. Hydrocarbons

Starter Quiz

A-Level Chemistry

Name: _____ Score: _____

1. Alkanes are:

- ☐ compounds containing oxygen
- ☐ ionic compounds
- ☐ unsaturated hydrocarbons with a C=C bond
- ☐ saturated hydrocarbons with general formula C_nH_{2n+2}

2. Alkanes react with chlorine by free-radical substitution in the presence of:

- ☐ ultraviolet light
- ☐ a nucleophile
- ☐ water
- ☐ an acid catalyst

3. Alkenes are reactive because they have:

- ☐ an –OH group
- ☐ only single bonds
- ☐ no functional group
- ☐ a C=C double bond (their functional group)

4. In addition polymerisation:

- ☐ a polymer is split apart
- ☐ two different monomers alternate
- ☐ many alkene molecules join into one long chain, with no other product
- ☐ a small molecule like water is lost

5. Cracking is used to:

- ☐ break long-chain alkanes into shorter, more useful molecules
- ☐ join short alkanes into long ones
- ☐ add hydrogen to alkenes
- ☐ burn alkanes

6. Alkanes react with halogens in UV light by free-radical _____.

7. An alkene decolourises bromine water, while an alkane leaves it orange – that is the standard test for a C=C double bond.

- ☐ True ☐ False

8. Many ethene molecules join to form the polymer poly(_____).

9. Alkanes are unsaturated hydrocarbons containing C=C double bonds.

- ☐ True ☐ False

10. The initiation step is:

- ☐ UV light splitting the halogen into two radicals
- ☐ two radicals joining
- ☐ the product forming
- ☐ a radical reacting with the alkane

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Answers ·

A-Level Chemistry

1. **saturated hydrocarbons with general formula C_nH_{2n+2}**

Alkanes have only single C–C bonds (saturated) and follow C_nH_{2n+2} .

2. **ultraviolet light**

UV light starts the reaction by splitting the halogen into radicals.

3. **a C=C double bond (their functional group)**

The electron-rich C=C double bond is the reactive functional group of alkenes (C_nH_{2n}).

4. **many alkene molecules join into one long chain, with no other product**

Alkenes open their double bonds and join into a polymer such as poly(ethene); nothing else is formed.

5. **break long-chain alkanes into shorter, more useful molecules**

Cracking turns heavy crude-oil fractions into smaller, more useful alkanes and alkenes.

6. **substitution**

Initiation, propagation and termination steps.

7. **True**

The π electrons of the C=C attack the bromine; alkanes have no double bond, so nothing happens.

8. **ethene**

Addition polymerisation of the alkene.

9. **False**

False. Alkanes are saturated: they contain only single bonds, with general formula C_nH_{2n+2} . Alkenes contain C=C.

10. **UV light splitting the halogen into two radicals**

Initiation: $Cl_2 \rightarrow 2Cl \cdot$, the homolytic split that starts the chain.