

34 Ethane reacts with chlorine.

Which row identifies the type of reaction and the formulae of the products formed?

	reaction	products
A	addition	$\text{CH}_3\text{CH}_2\text{Cl} + \text{H}_2$
B	addition	$\text{CH}_3\text{CH}_2\text{Cl} + \text{HCl}$
C	substitution	$\text{CH}_3\text{CH}_2\text{Cl} + \text{HCl}$
D	substitution	$\text{CH}_3\text{CH}_2\text{Cl} + \text{H}_2$

31 Which type of reaction takes place when methane reacts with chlorine in the presence of ultraviolet light?

- A** addition
- B** cracking
- C** polymerisation
- D** substitution

5 This question is about the homologous series of alkanes.

Three general characteristics of alkanes are:

- they are generally unreactive because they do **not** have a functional group
- they show trends in their physical properties, such as melting points and boiling points
- they have similar chemical properties.

(a) Describe **two other** general characteristics of the homologous series of alkanes.

1.....

2.....

[2]

(b) (i) State the trend in the boiling points of the alkanes as the carbon chain length increases.

..... [1]

(ii) Name **one other** physical property of alkanes that shows a trend, other than melting points and boiling points.

Describe this trend as the carbon chain length of alkanes increases.

name

description.....

[2]

(c) State why alkanes are described as saturated.

..... [1]

(d) Propane has the structural formula $\text{CH}_3\text{CH}_2\text{CH}_3$.

When propane undergoes a monosubstitution reaction with chlorine at room temperature, **two** organic products can be formed.

(i) State **one** condition needed for this substitution reaction to take place.

..... [1]

(ii) Give the structural formula and state the name of each organic product formed.

- structural formula of product 1

name of product 1

- structural formula of product 2

name of product 2 [4]

(iii) The two products formed are structural isomers of each other.

Define the term structural isomers.

.....
..... [1]

[Total: 12]

34 What is the **total** number of covalent bonds in one molecule of propane?

- A** 8 **B** 9 **C** 10 **D** 11

35 Ethane reacts with chlorine in the presence of ultraviolet light.

Which products are formed?

- A** $\text{ClCH}_2\text{CH}_2\text{Cl}$ and H_2
B $2\text{CH}_3\text{Cl}$ and H_2
C $\text{C}_2\text{H}_5\text{Cl}$ and HCl
D $\text{CH}_2=\text{CH}_2$ and 2HCl

35 Compound W is a hydrocarbon that contains single bonds only.

Which homologous series contains W?

- A** alkenes
- B** alkanes
- C** carboxylic acids
- D** alcohols

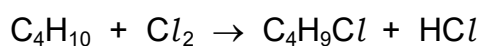
36 Methane forms chloromethane in a photochemical reaction using ultraviolet light.

Which statement about this reaction is correct?

- A** Methane is mixed with hydrogen chloride gas, and ultraviolet light prevents a combustion reaction.
- B** Methane is mixed with hydrogen chloride gas, and ultraviolet light provides the activation energy for the reaction.
- C** Methane is mixed with chlorine gas, and ultraviolet light prevents a combustion reaction.
- D** Methane is mixed with chlorine gas, and ultraviolet light provides the activation energy for the reaction.

36 The structural formula of methyl propane is $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_3$.

The equation represents the reaction of methyl propane with chlorine.



How many structural isomers with the molecular formula $\text{C}_4\text{H}_9\text{Cl}$ can be formed from this reaction?

- A** 1 **B** 2 **C** 3 **D** 4