34 Ethane reacts with chlorine.

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

	reaction	products
A	addition	$CH_3CH_2Cl + H_2$
B	addition	$CH_3CH_2Cl + HCl$
C	substitution	$CH_3CH_2Cl + HCl$
D	substitution	$CH_3CH_2Cl + H_2$

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 $CH_3CH_2CH_3$.

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 $Cl CH_2CH_2Cl$ and H_2

B $2CH_3Cl$ and H_2

C C_2H_5Cl and HCl

D $CH_2{=}CH_2$ 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 $CH_3CH(CH_3)CH_3$.

The equation represents the reaction of methyl propane with chlorine.

$$C_4H_{10} + Cl_2 \rightarrow C_4H_9Cl + HCl$$

How many structural isomers with the molecular formula C_4H_9Cl can be formed from this reaction?

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