



**CHEMISTRY ONLINE**  
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# CHEMISTRY

## ORGANIC CHEMISTRY

Level & Board	AQA (A-LEVEL)
TOPIC:	ALKANES
PAPER TYPE:	QUESTION PAPER - 3
TOTAL QUESTIONS	10
TOTAL MARKS	26

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## Alkanes - 3

1. There are nine structural isomers of molecular formula  $C_4H_8Br_2$ , three of which have branched carbon chains.

(a) Give the names and draw the graphical formulae for any two of the branched chain isomers of  $C_4H_8Br_2$ .

(4)

(b) Compound A ( $M_r = 215.8$ ) contains 22.24% carbon, 3.71% hydrogen and 74.05% bromine by mass.

Show that the molecular formula of A is  $C_4H_8Br_2$ .

(3)

2. Which is a propagation step in the chlorination of methane?

- A.  $H^\bullet + Cl_2 \rightarrow HCl + Cl^\bullet$   
B.  $Cl^\bullet + CH_4 \rightarrow CH_3Cl + H^\bullet$   
C.  $^\bullet CH_3 + Cl^\bullet \rightarrow CH_3Cl$   
D.  $^\bullet CH_3 + Cl_2 \rightarrow CH_3Cl + Cl^\bullet$

(1)

3. Ethanol dissolves in water.

Draw a diagram to show how one molecule of ethanol interacts with one molecule of water in the solution.

Include partial charges and all lone pairs.

**(3)**

4. Which statement is not correct about the pollutant sulfur dioxide?

- A. It can be removed from car exhaust gases by a catalytic converter.
- B. It can be removed from power station flue gases by reaction with calcium oxide.
- C. It can cause respiratory problems.
- D. It can cause acid rain.

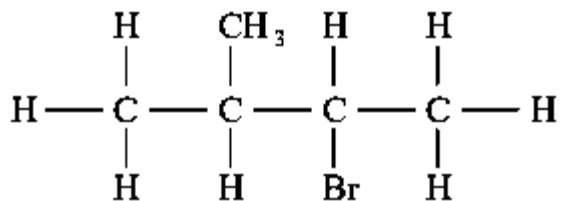
**(1)**

5. There are eight structural isomers with the molecular formula  $C_5H_{11}Br$ .

Four of these are classed as primary, three as secondary and one as tertiary.

The graphical formula of one of the secondary compounds, isomer A, is shown below.

I am Sorry !!!!!



isomer A

(a) Give the name of isomer A.

(2)

(b) Explain what is meant by the term structural isomers.

(2)

6. Which statement is correct about thermal cracking?

- A. A pressure between 100 and 200 kPa is used.
- B. Aromatic hydrocarbons are the major products.
- C. C–C bonds are broken.
- D. Zeolite catalysts are used.

(1)

7. Describe briefly how fractional distillation can be used to convert crude oil into a small number of fractions.

(4)

8. An excess of methane reacts with chlorine in the presence of ultraviolet radiation. What are the main products of this reaction?

- A.  $\text{CCl}_4$  and  $\text{H}_2$
- B.  $\text{CCl}_4$  and  $\text{HCl}$
- C.  $\text{CH}_3\text{Cl}$  and  $\text{H}_2$
- D.  $\text{CH}_3\text{Cl}$  and  $\text{HCl}$

(1)

9. Methane can be obtained from crude oil.

Some of this crude oil contains an impurity called methanethiol ( $\text{CH}_3\text{SH}$ ). This impurity causes environmental problems when burned.

Write an equation to show the complete combustion of methanethiol.

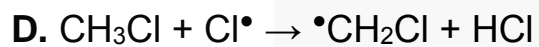
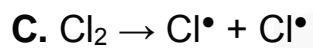
State why calcium oxide can be used to remove the sulfur-containing product of this combustion reaction.

State one pollution problem that is caused by the release of this sulfur-containing product into the atmosphere.

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(3)

10. Which equation represents a propagation step?



(1)



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- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
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