

Organic chemistry – 2022 GCSE Gateway Chemistry Combined Science A**1. June/2022/Paper_J250/04/No.1**

Supplies of crude oil are running out.

Which word describes crude oil?

- A Finite
- B Renewable
- C Reusable
- D Sustainable

Your answer

[1]

2. June/2022/Paper_J250/04/No.5

Which toxic gas is produced from burning fossil fuels?

- A Carbon dioxide
- B Carbon monoxide
- C Nitrogen
- D Oxygen

Your answer

[1]

3. June/2022/Paper_J250/04/No.6

Alkanes are hydrocarbons with the formula C_nH_{2n+2} .

Which compound is an alkane?

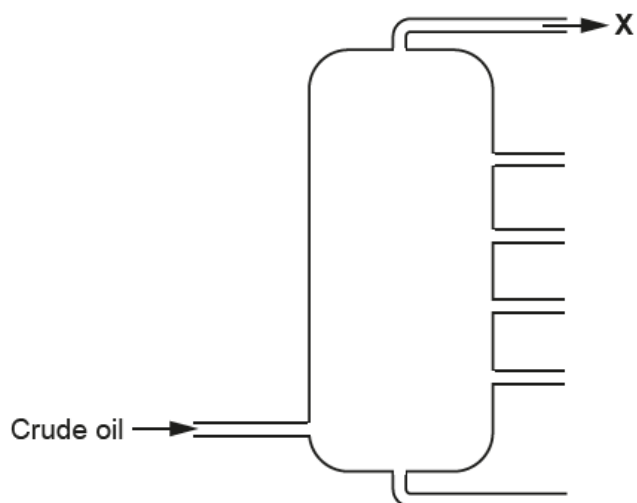
- A C_6H_8
- B C_7H_{12}
- C C_8H_{16}
- D C_9H_{20}

Your answer

[1]

4. June/2022/Paper_J250/04/No.8

The diagram shows the fractional distillation of crude oil.



The table shows the boiling point ranges of four different fractions.

Fraction	Boiling point range (°C)
A	below 20
B	20–80
C	180–260
D	260–320

Which fraction is collected at **X**?

Your answer

[1]

5. June/2022/Paper_J250/04/No.14

The processing of crude oil by the petrochemical industry can be shown by different experiments.

Fig. 14.1 shows an experiment where paraffin is turned into decane and gas X.

Fig. 14.1

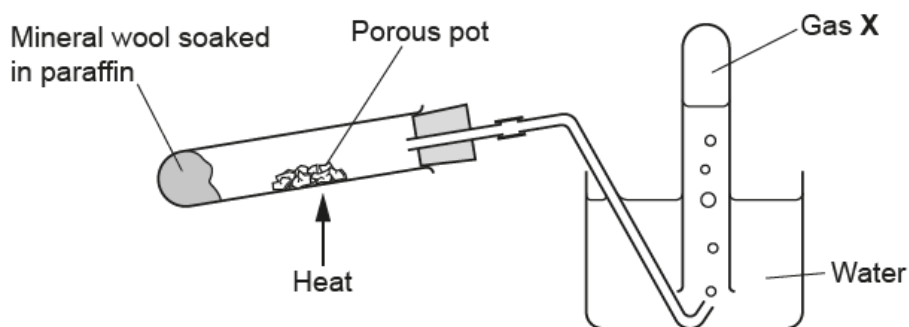
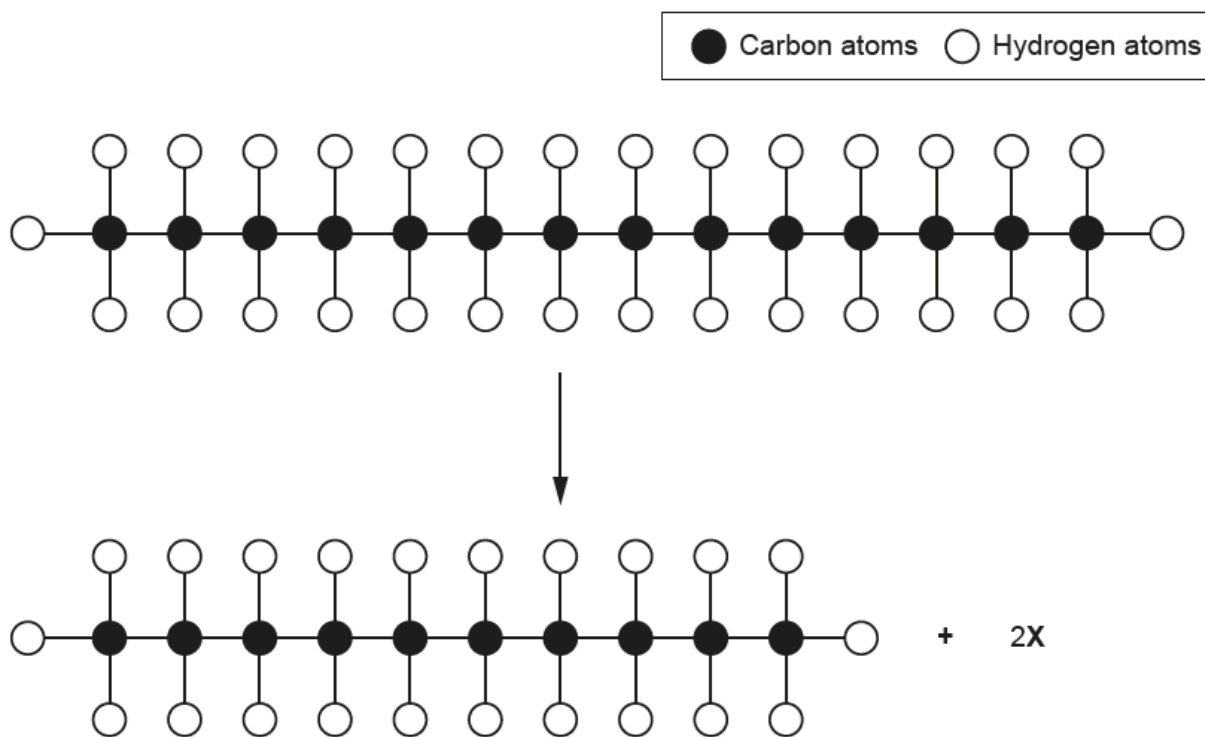


Fig. 14.2 shows the reaction of paraffin, $C_{14}H_{30}$, to make decane, $C_{10}H_{22}$, and gas X.

Fig. 14.2



- (a) Complete the sentences below to describe the experiment.

Put a ring around the correct choice to complete each sentence.

The experiment is called **cracking** / **displacement** / **distillation**.

It is an example of **combustion** / **reduction** / **thermal decomposition**.

[2]

- (b) The porous pot in **Fig. 14.1** acts as a **catalyst** in the reaction.

- (i) What effect does the porous pot have on the **rate of the reaction**?

Put a ring around the correct answer.

decreases it

increases it

no effect

[1]

- (ii) What effect does the porous pot have on the **activation energy** of the reaction?

Put a ring around the correct answer.

decreases it

increases it

no effect

[1]

- (c) Use **Fig. 14.2** to answer these questions.

- (i) Write the formula of gas **X**.

..... [1]

- (ii) Describe what happens to a molecule of paraffin as it turns into a molecule of decane.

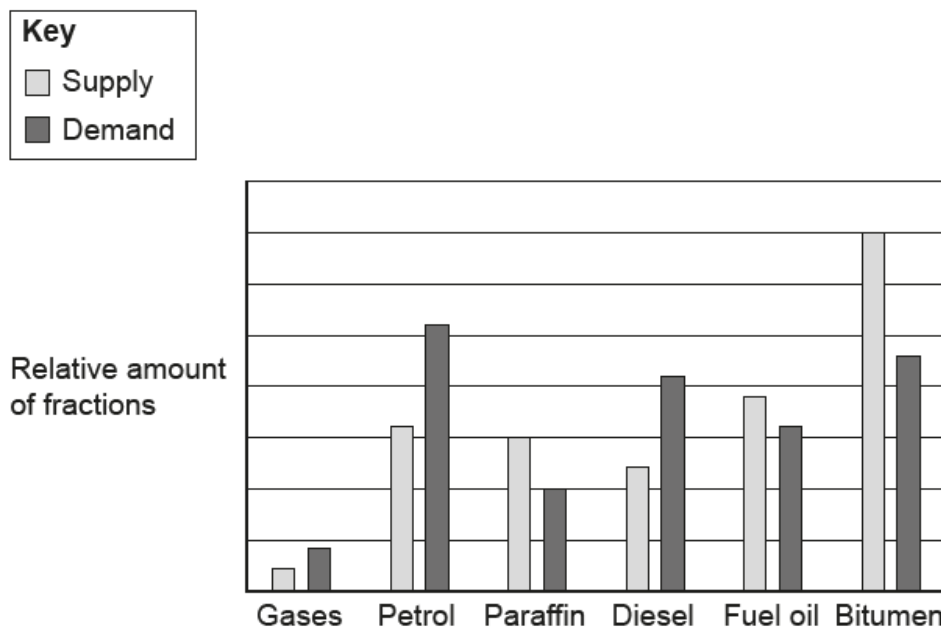
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.....

..... [2]

(d) Fig. 14.3 shows the supply and demand of different fractions of crude oil.

Fig. 14.3



Give **two** reasons why the oil industry turns paraffin into different hydrocarbons.

Use data from Fig. 14.3.

1

.....

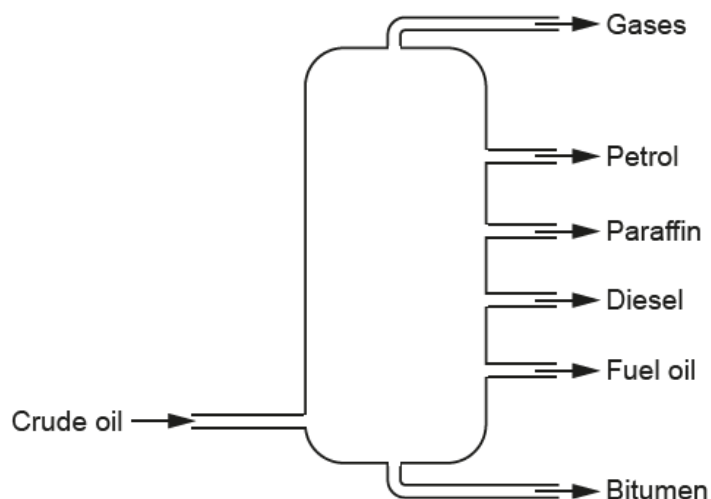
2

.....

[2]

6. June/2022/Paper_J250/10/No.5

The diagram shows how crude oil is separated into its fractions in a fractionating column.



What is the physical state of the crude oil as it enters the fractionating column?

- A Aqueous
- B Gas
- C Liquid
- D Solid

Your answer

☐

[1]

7. June/2022/Paper_J250/10/No.6

Which compound is an alkane?

- A C_6H_8
- B C_7H_{12}
- C C_8H_{16}
- D C_9H_{20}

Your answer

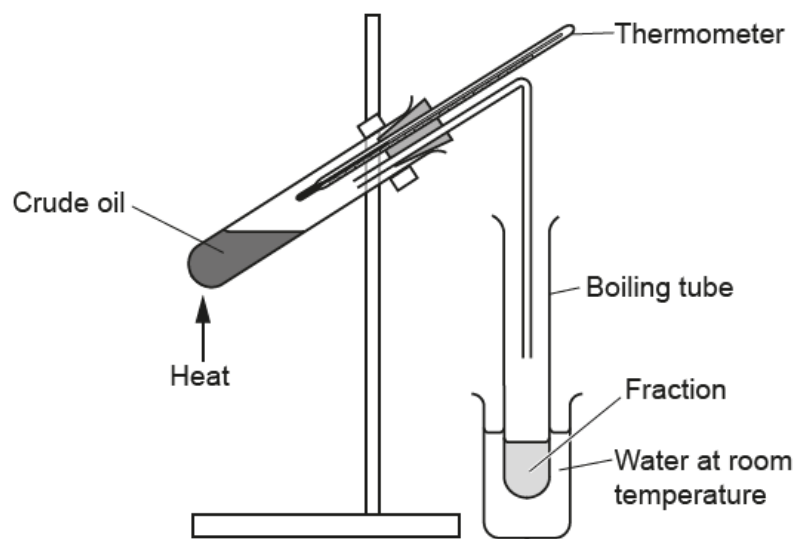
☐

[1]

8. June/2022/Paper_ J250/10/No.12

The processing of crude oil by the petrochemical industry can be shown by different experiments.

The diagram shows how crude oil can be separated into its fractions.



The crude oil is heated. Different fractions are collected at different temperatures.

(a) What is the name of this separation technique?

..... [1]

(b) Explain how a fraction is separated and collected in the experiment.

.....
.....
.....
..... [2]

(c) A fraction with a boiling point of about 10°C is **not** collected in the experiment.

How could the experiment be improved so this fraction is collected?

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

(d) The table shows the temperatures at which four different fractions are collected.

Fraction	Temperature fraction collected (°C)
A	below 100
B	100–150
C	150–200
D	200–250

Which statements about the fractions are **true**, and which are **false**?

Tick (✓) **one** box in each row.

	True	False
The fractions consist mostly of compounds which are hydrocarbons.		
Fraction C is collected before Fraction D .		
The molecules in Fraction A are larger than the molecules in Fraction B .		

[2]