

Crude Oil

Question Paper

Level	GCSE
Subject	Chemistry
Exam Board	Edexcel IGCSE
Module	Double Award (Paper 1C)
Topic	Chemistry in Industry
Sub-Topic	Crude Oil
Booklet	Question Paper

Time Allowed: 48 minutes

Score: /40

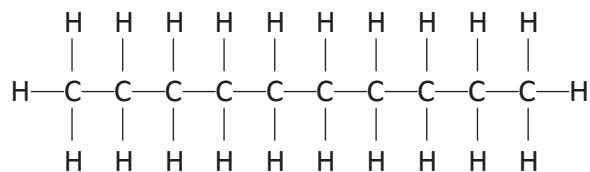
Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

1 Decane is a hydrocarbon found in crude oil.

The diagram shows the structure of a decane molecule.



(a) (i) Explain why decane is described as a hydrocarbon.

(2)

.....

.....

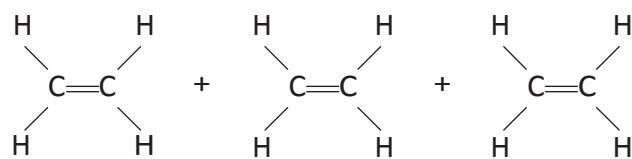
(ii) Give the molecular formula for decane.

(1)

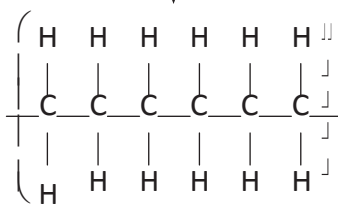
.....

(b) Decane and ethene, C_2H_4 , are produced during the cracking of eicosane, $\text{C}_{20}\text{H}_{42}$.

Ethene is used to make poly(ethene).



ethene



poly(ethene)

(i) What is the name given to this type of polymerisation?

(1)

.....

(ii) Use the diagram to state **two** changes that occur during the formation of poly(ethene).

(2)

.....

.....

.....

.....

.....

(c) Explain why cracking is an important process in the oil industry.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

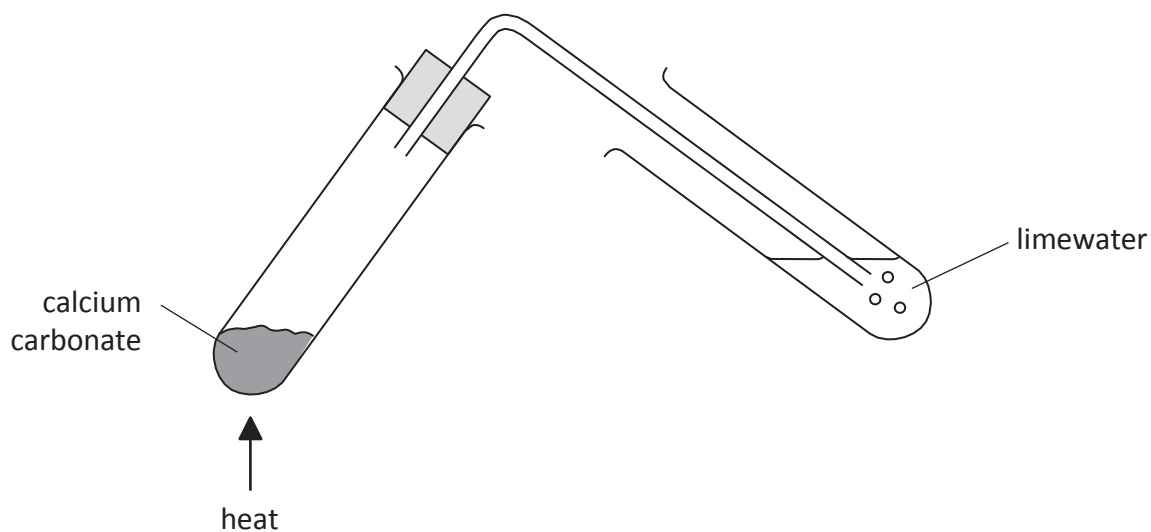
.....

.....

(Total for Question 1 = 10 marks)

2 Some powdered calcium carbonate was heated strongly in a test tube.

The gas given off was bubbled through limewater.



The equation for the reaction taking place in the heated tube is



(a) What type of chemical reaction is taking place when calcium carbonate is heated?

(1)

- A dehydration
- B oxidation
- C reduction
- D thermal decomposition

(b) State the appearance of the limewater before and after the gas was bubbled through it.

(2)

appearance before

appearance after

(c) The Taj Mahal is a famous building in India. It is made out of a form of calcium carbonate called marble.



The appearance of the marble has changed gradually over the years because of the effects of sulfur dioxide in the atmosphere.

Describe how sulfur dioxide has caused this change in appearance.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 2 = 6 marks)

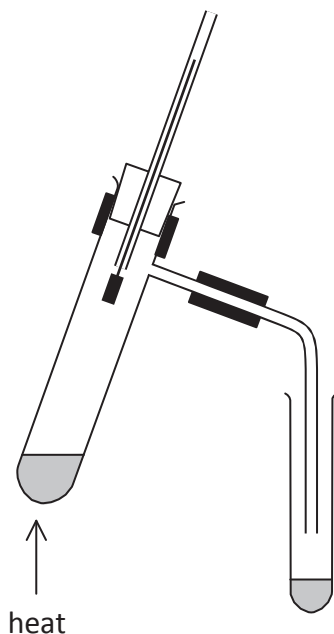
3 Crude oil is a mixture of substances.

(a) Which word best describes the main substances in crude oil?

(1)

- A bases
- B carbohydrates
- C elements
- D hydrocarbons

(b) This apparatus can be used to separate the substances present in a sample of crude oil into several fractions.



These sentences describe the steps in the method for separating the substances into fractions, but the steps are in the wrong order.

- R Connect a delivery tube to the boiling tube.
- S Pour crude oil into a boiling tube.
- T Collect each fraction in a different test tube.
- U Fit a thermometer into the boiling tube.
- V Heat the crude oil gently at first, then more strongly.

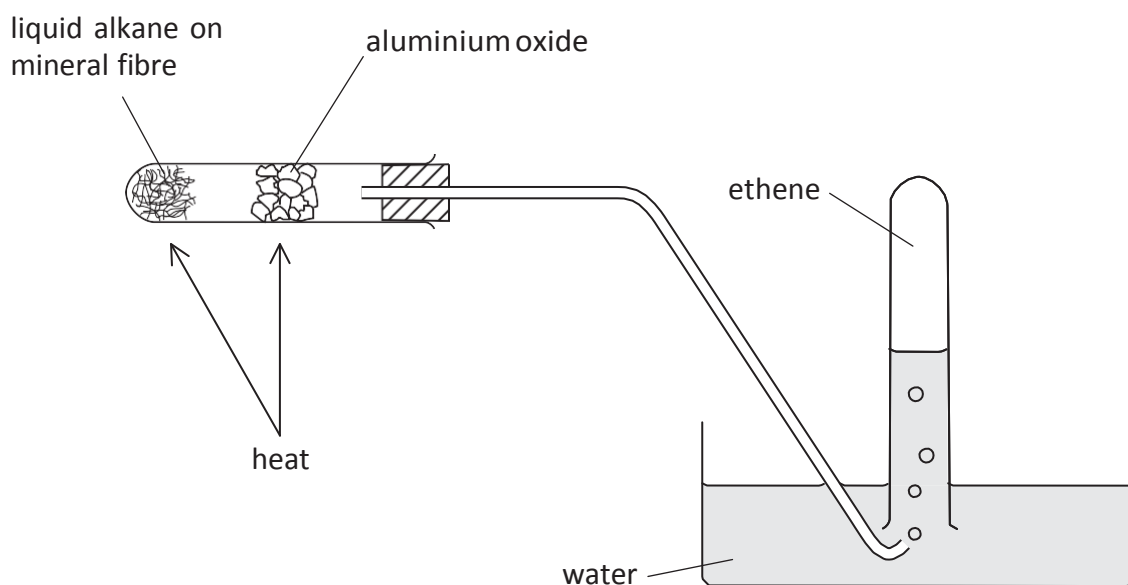
Put a letter in each box to show the correct order. One has been done for you.

(2)

	U			
--	---	--	--	--

(Total for Question 3 = 3 marks)

4 This apparatus can be used to obtain ethene by cracking a liquid alkane.



(a) What is meant by the term **cracking**?

(1)

.....

.....

.....

(b) Give a chemical test to show that the gas collected is unsaturated.

(2)

.....

.....

.....

(c) Cracking is also carried out in industry.

Give the name of the catalyst and the temperature used in the catalytic cracking of hydrocarbons.

(2)

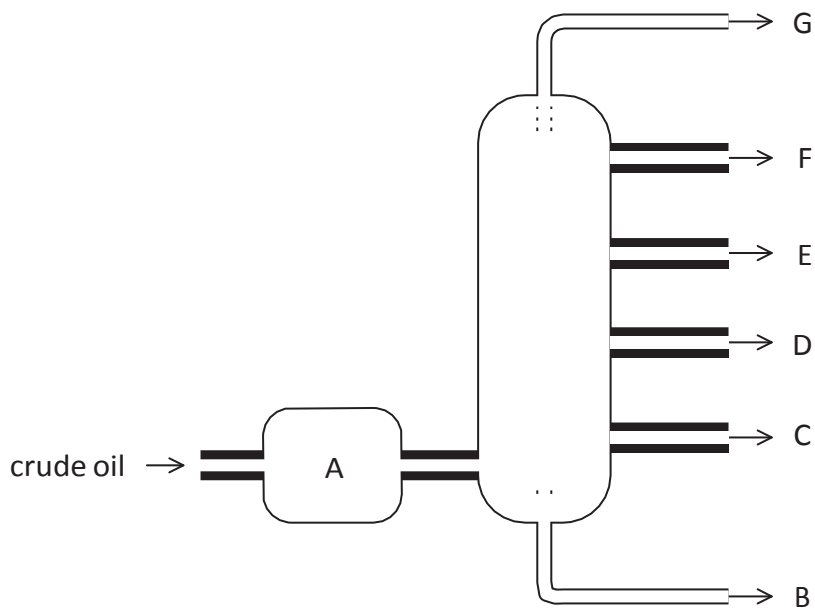
catalyst.....

temperature.....

(Total for Question 4 = 5 marks)

5 Crude oil is an important source of organic compounds.

(a) The diagram shows how crude oil is separated into fractions in the oil industry.



(i) What happens to the crude oil in A?

(1)

.....

.....

.....

(ii) Most of the compounds in crude oil are hydrocarbons.

What is meant by the term **hydrocarbons**?

(2)

.....

.....

(b) Some of the fractions are catalytically cracked. The general equation for some reactions in this process is



(i) State two conditions used in catalytic cracking.

(2)

1

.....

2

.....

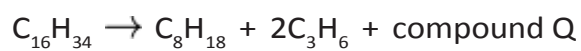
(ii) How does the bonding in an alkene molecule differ from the bonding in an alkane molecule?

(1)

.....

.....

(iii) The chemical equation for one cracking reaction is



Deduce the molecular formula of Q.

(1)

.....

(c) The compound with molecular formula C_3H_6 can be used to make a polymer.

(i) Give the name of the compound C_3H_6

(1)

(ii) Complete the table of information about this compound.

(3)

Type of formula	Formula
molecular	C_3H_6
	C_nH_{2n}
	CH_2
displayed	

(iii) Complete this structure to show the part of the polymer formed from two molecules of C_3H_6

(2)



(Total for Question 5 = 16 marks)