

GCSE

# Chemistry: Unit 1

Paper 1

Specification AQA 4402

Name

Answer **all** the questions.

The maximum mark for this paper is 40.

**For this paper you must have**

- A ballpoint pen with black ink.
- A ruler with millimeter measurements.
- A calculator.

**Time allowed**

30 minutes.

Question	Mark
1	
2	
3	
TOTAL	

**Grade Boundaries**

A\* **31**

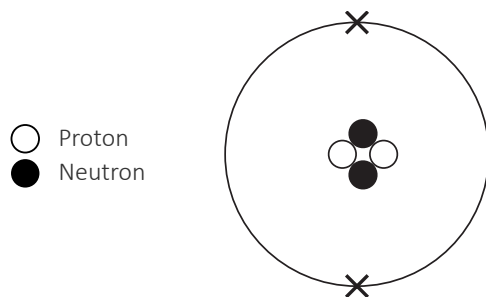
A **25**

B **18**

C **11**

D **6**

1. (a) The diagram shows the structure of a helium atom.



(i) Give the overall charge of a helium atom.

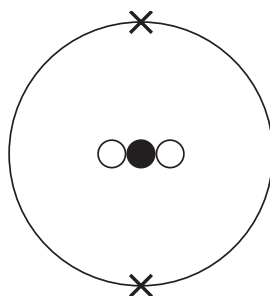
..... (1 mark)

(ii) Explain why the helium atom has this overall charge.

.....  
.....  
.....  
.....

(3 marks)

(b) A second diagram of a helium atom is drawn.



(i) Explain how you can tell this is also a helium atom.

.....  
.....

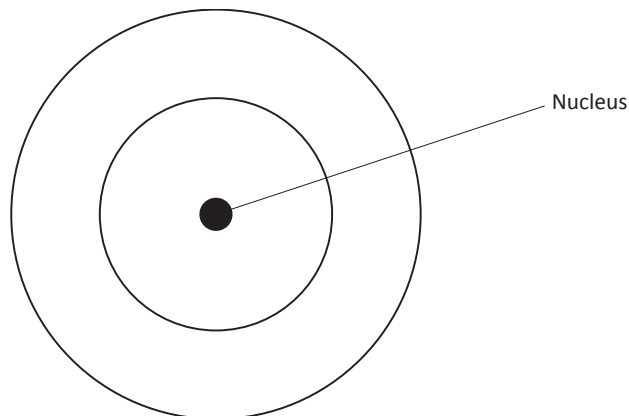
(1 mark)

(ii) Use the diagram to explain why helium is an unreactive gas.

.....  
.....  
.....  
.....

(2 marks)

(c) (i) Neon is also an unreactive gas. Draw the electronic structure of neon.



(2 marks)

(ii) A neon atom has an atomic number of 10 and a mass number of 20.

Complete the table to show the name and number of each sub-atomic particle in this neon atom.

Name	Number
Protons	.....
Neutrons	.....
.....	.....

(3 marks)

12

Turn over for Question 2 ►

2. (a) Copper is a metal and is often used to make water pipes and electrical wiring. Copper occurs naturally as copper carbonate, found in copper-rich ores. During the extraction of copper from these ores the ore is heated which produces a gas. Carbon is then added to the ore to produce copper.



- (i) Explain what is meant by copper-rich ores.

.....  
..... (1 mark)

- (ii) During the extraction of copper a gas is given off. Name this gas.

..... (1 mark)

- (iii) Copper is produced when carbon is added. Explain why.

.....  
.....  
..... (2 marks)

- (b) (i) A company is looking for a new location to start extracting copper from its ore. The company has identified a good location, however, there is a village nearby.

Suggest **one** benefit and **one** drawback **to the company** of extracting copper from this location.

Benefit .....

.....

Drawback .....

..... (2 marks)

(ii) Suggest **one** benefit and **one** drawback **to the village** of the company extracting copper from this location.

Benefit .....

.....

Drawback .....

..... (2 marks)

(iii) The company is moving locations because the location it used to extract copper from is no longer profitable. Suggest why the location became unprofitable.

.....

.....

..... (1 mark)

(c) Suggest why copper is

(i) a good metal to use for electrical wiring;

.....

..... (1 mark)

(ii) a good metal to use for making water pipes.

.....

..... (1 mark)

(d) Copper-rich ores are becoming scarce and so new methods of extracting copper are being developed.

Suggest **one** other method for extracting copper.

.....

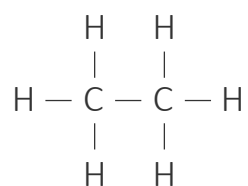
(1 mark)

12

Turn over for Question 3 ►

3. Crude oil contains many hydrocarbons. These hydrocarbons can be split into fractions of similar sized molecules by a process called fractional distillation.

Hydrocarbon **A**, produced from crude oil by fractional distillation, has the following structure.



(a) (i) Give the name of hydrocarbon **A**.

..... (1 mark)

(ii) Hydrocarbon **A** is described as 'saturated'. Explain why.

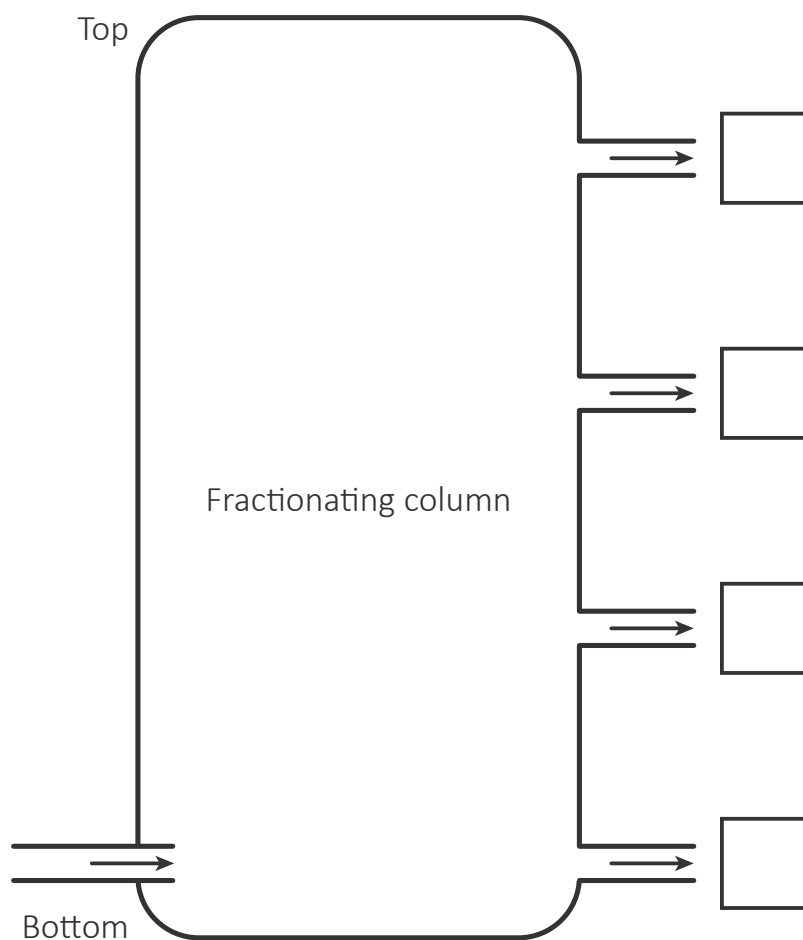
.....  
..... (1 mark)

(iii) Hydrocarbon **A** was produced from the fractional distillation of crude oil. Describe the process of fractional distillation.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... (4 marks)

(b) Hydrocarbon **B** has the structure  $C_{11}H_{24}$ .

Put an **A** and **B** in two of the boxes next to the fractionating column to show where you would expect hydrocarbon **A** and hydrocarbon **B** to be found.



(2 marks)

(c) (i) Some of the hydrocarbons produced from fractional distillation are used as fuels for cars.

Tick the box which correctly describes what happens to the carbon in these fuels when they are burnt in a car engine.

Reduced       Oxidised       Saturated       Unsaturated (1 mark)

Question 3 continues on the back page ►

