

Chemistry  
PAPER 2  
Foundation Tier

Tuesday 11 June 2024 – Morning

Time: 1 hour 45 minutes

Diagram Booklet

THIS DIAGRAM BOOKLET MUST BE RETURNED WITH THE QUESTION PAPER AT THE END OF THE EXAMINATION.

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

## INSTRUCTIONS

There may be spare copies of some diagrams in case you need them.

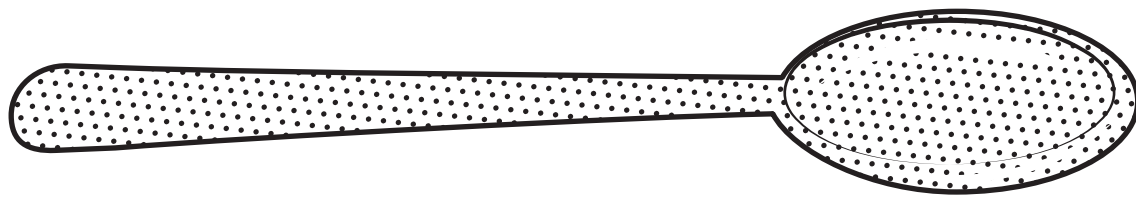
**CONTENTS**

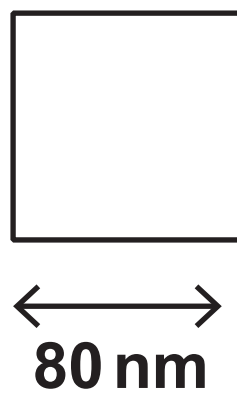
**Page**

<b>4</b>	<b>Question 1(a)</b>
<b>5</b>	<b>Question 1(c)</b>
<b>6</b>	<b>Question 2(a)</b>
<b>7</b>	<b>Question 2(b)</b>
<b>8</b>	<b>Question 3</b>
<b>9</b>	<b>Question 3(d)(ii)</b>
<b>10</b>	<b>Question 4(b)</b>
<b>11</b>	<b>Question 4(b)(iv)</b>
<b>12</b>	<b>Question 5(a)</b>
<b>13</b>	<b>Question 5(b)</b>
<b>14</b>	<b>Question 6(b)(i)</b>
<b>15</b>	<b>Question 6(c)</b>
<b>16</b>	<b>Question 7(a)</b>
<b>17</b>	<b>Question 7(b)</b>
<b>18</b>	<b>Question 7(c)</b>
<b>19</b>	<b>Question 8(a)</b>
<b>20</b>	<b>Question 8(b)</b>
<b>21</b>	<b>Question 9(d)</b>
<b>22</b>	<b>Question 10(a)</b>
<b>23</b>	<b>Question 10(b)</b>

**Spare Copies**

<b>24</b>	<b>Question 4(b)(iv)</b>
<b>25</b>	<b>Question 6(b)(i)</b>
<b>26</b>	<b>Question 7(b)</b>
<b>27</b>	<b>Question 8(a)</b>
<b>28</b>	<b>Question 10(b)</b>

**Question 1(a)****FIGURE 1**

**Question 1(c)****FIGURE 2****one face of the cube**

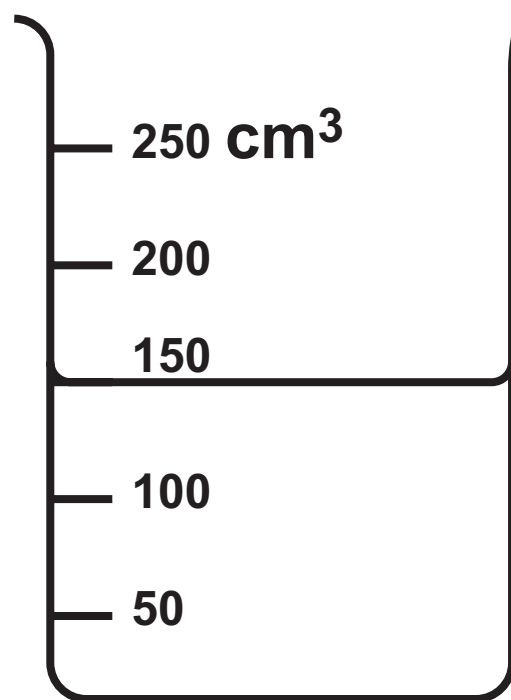
Question 2(a)

FIGURE 3

symbol	atomic number	melting point in °C
Na	11	98
Mg	12	650
Al	13	660
Si	14	1410
P	15	44
Cl	17	−101
Ar	18	−189

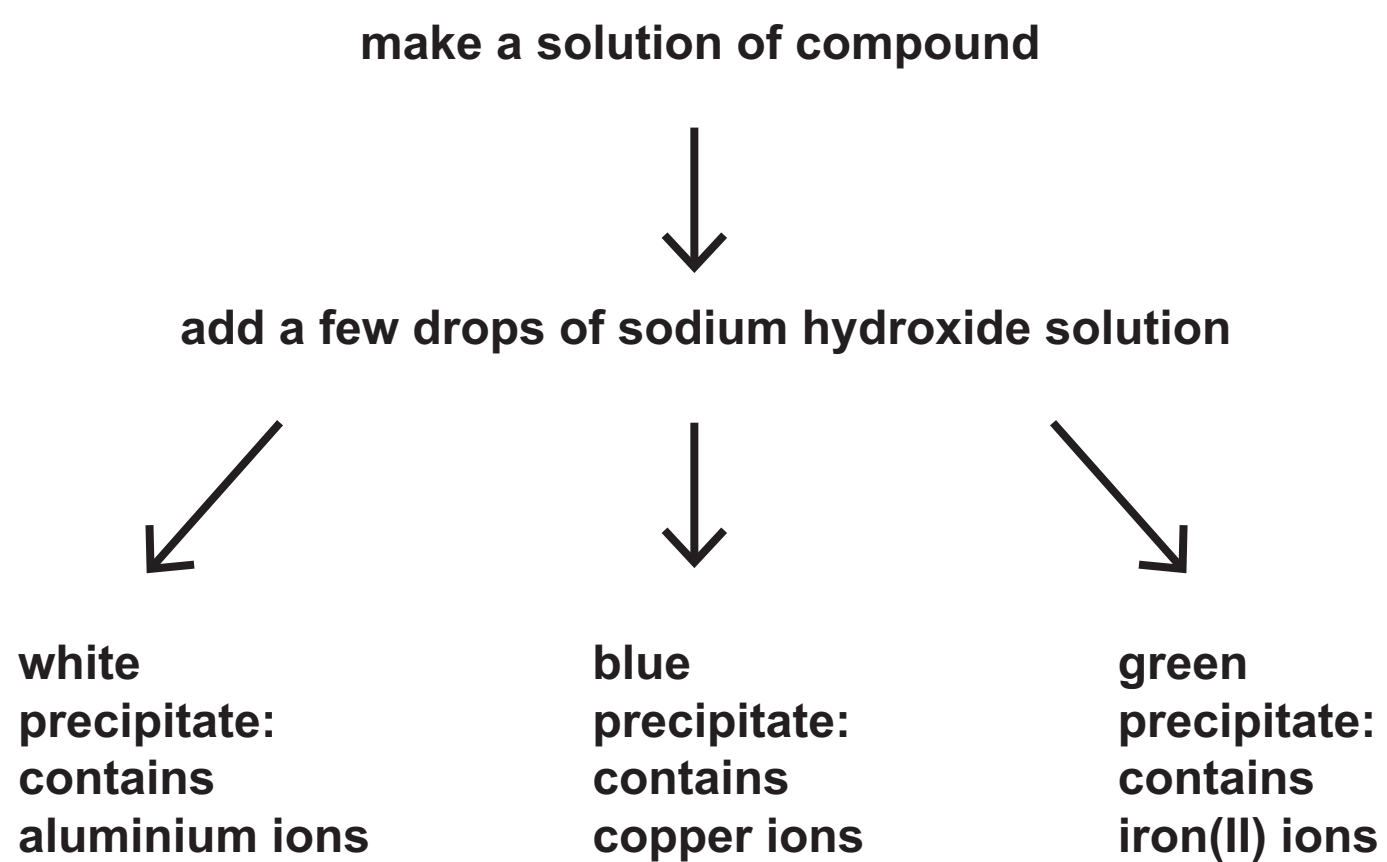
## Question 2(b)

FIGURE 4



## Question 3

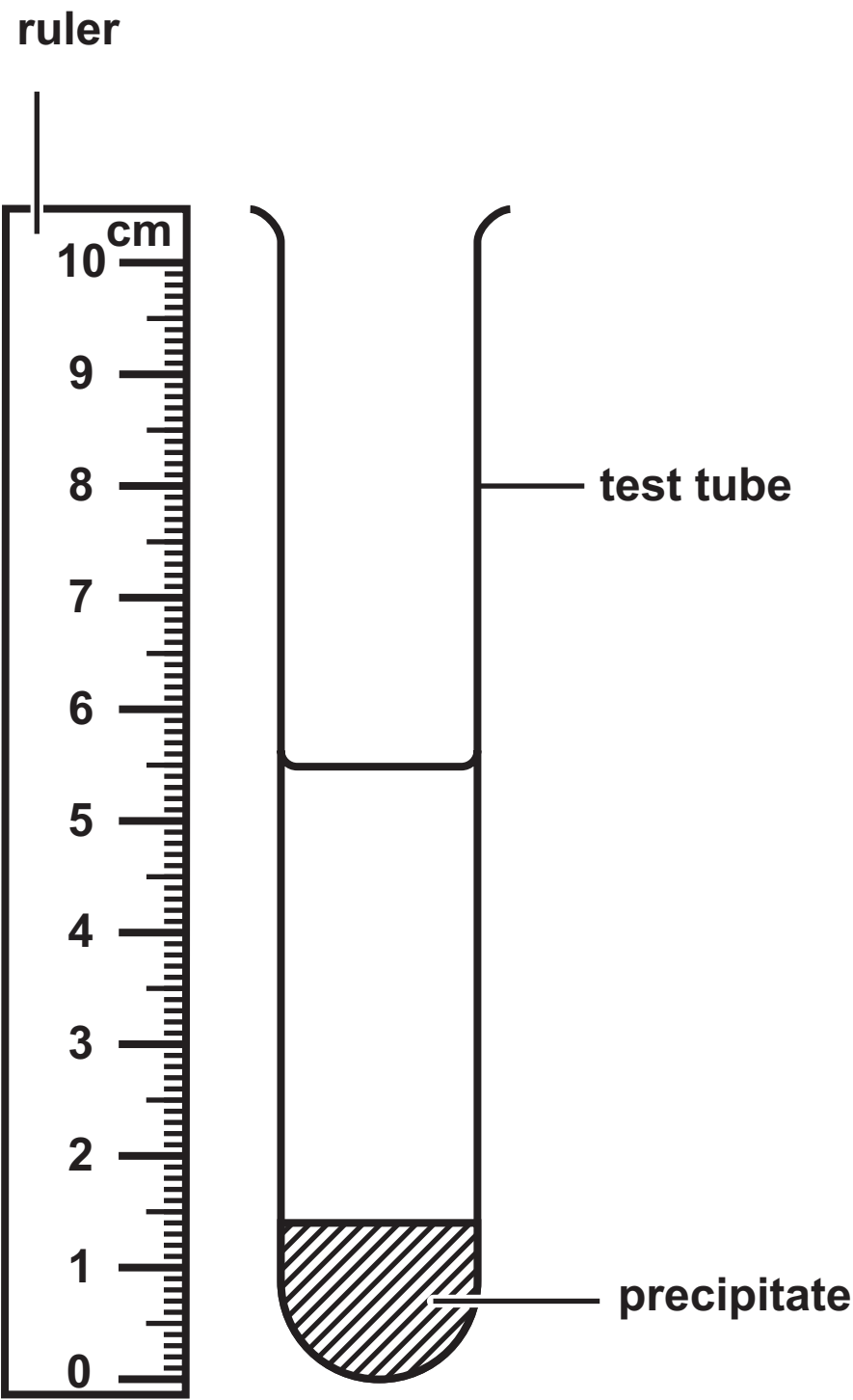
FIGURE 5





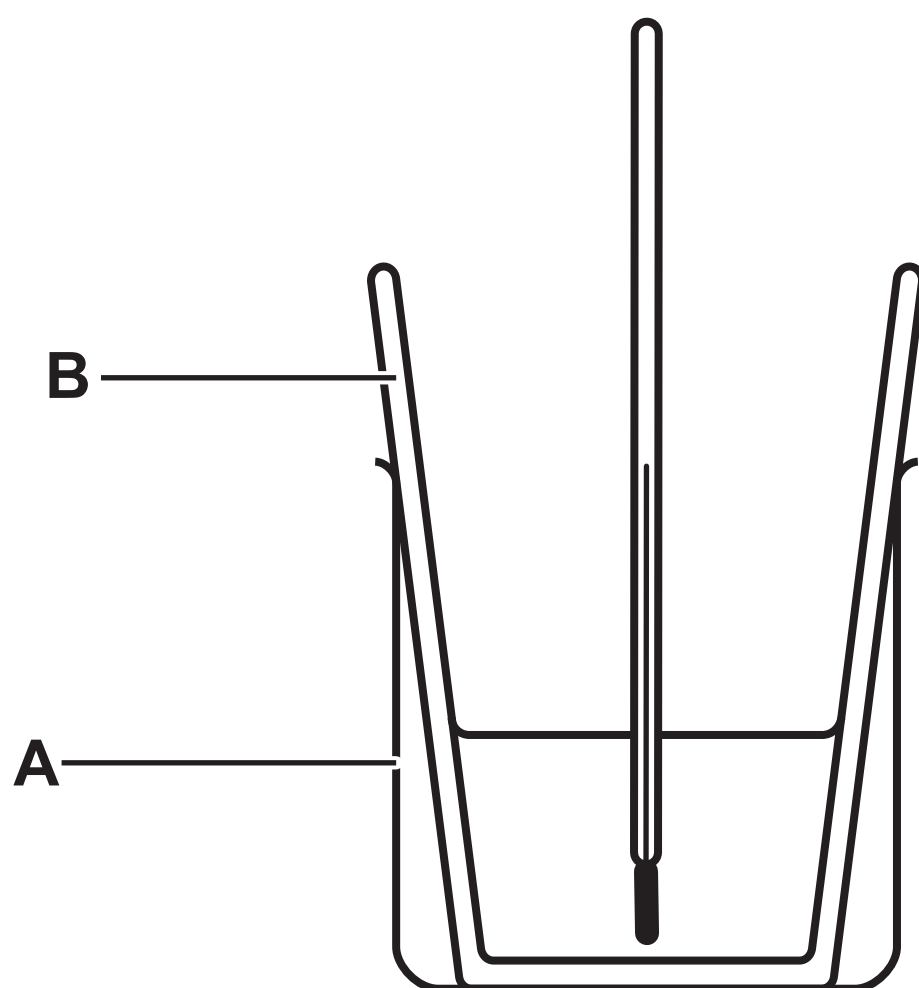
Question 3(d)(ii)

FIGURE 6



## Question 4(b)

FIGURE 7



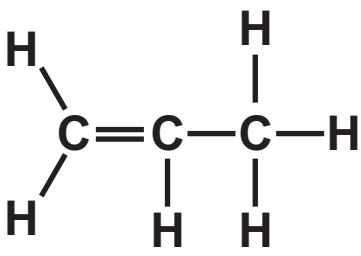
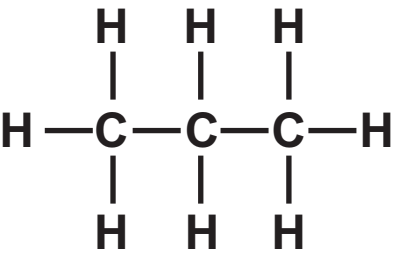
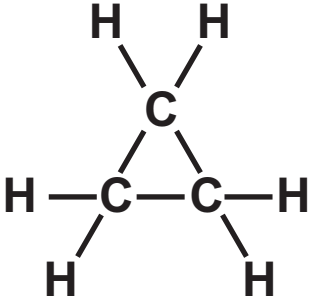
Question 4(b)(iv)

FIGURE 8

	salt P	salt Q	salt R	salt S
starting temperature in °C	20·0	20·0	20·0	20·0
final temperature in °C	22·4	19·5	23·0	18·5
temperature change in °C	+2·4	−0·5		
salt that absorbed most heat energy when it dissolved				

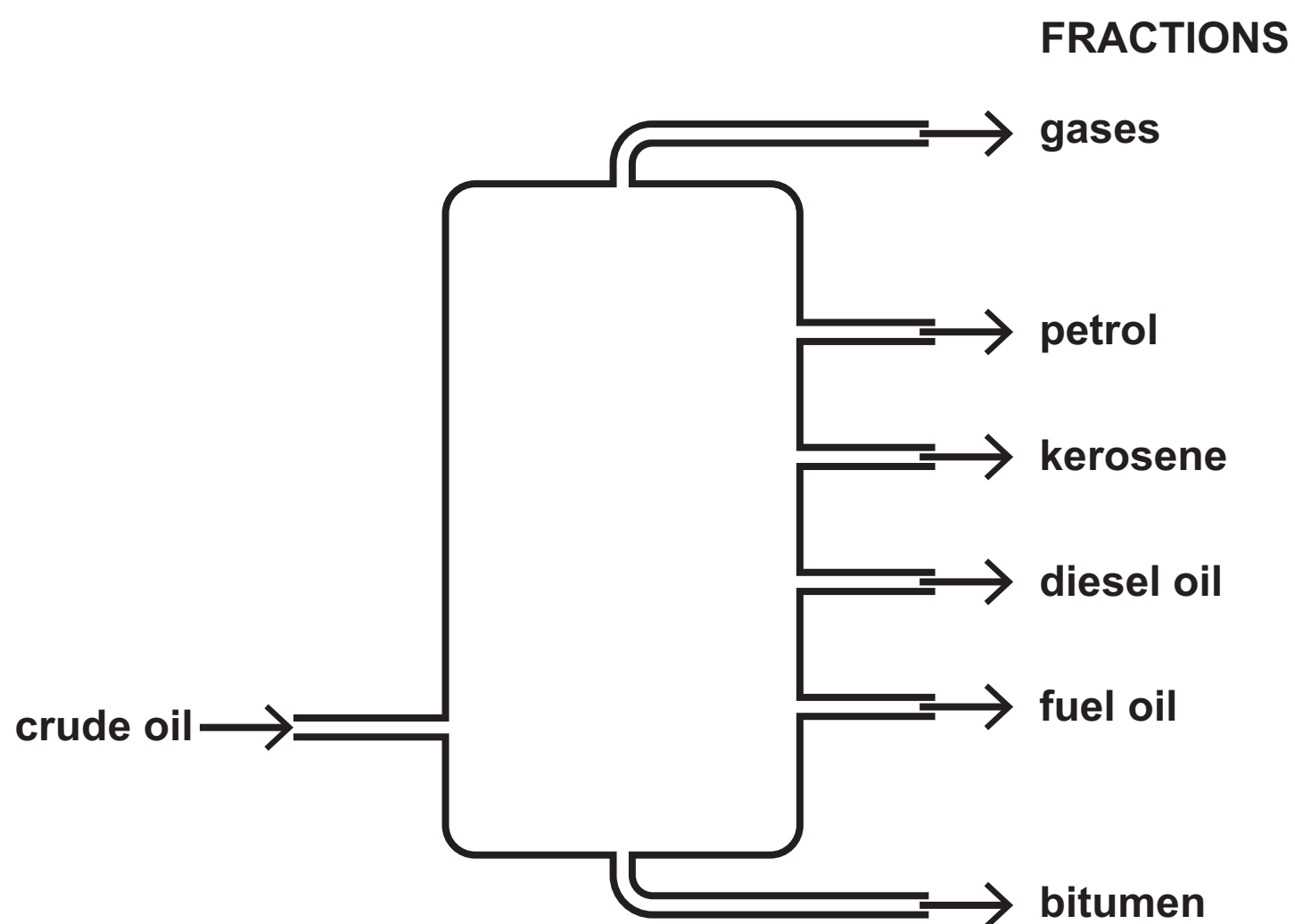
## Question 5(a)

FIGURE 9

X	Y	Z
		

## Question 5(b)

FIGURE 10





+

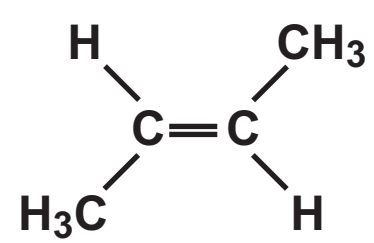
Question 6(c)

FIGURE 11

halogen	relative speed of reaction
fluorine	
chlorine	reacts very quickly
bromine	reacts quickly
iodine	reacts slowly

## Question 7(a)

FIGURE 12





Question 7(b)

NATURAL POLYMER

DNA

proteins

starch

MONOMER

amino acids

nucleotides

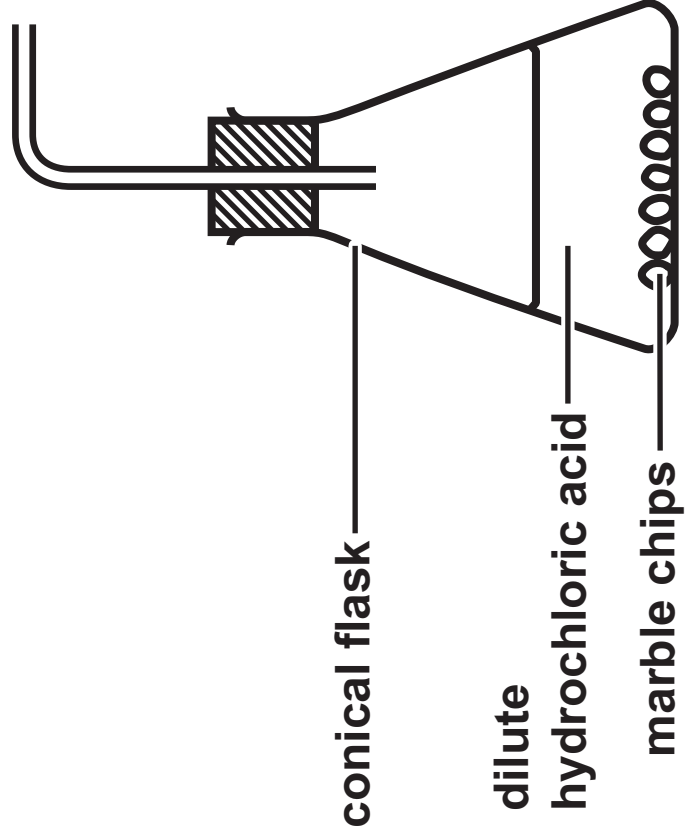
PVC

sugars

FIGURE 13

compound	boiling point in °C	reaction with limewater	reaction with bromine water	products when burned in oxygen
E	−78	mixture turns milky	no reaction	does not burn
F	−104	no reaction	mixture goes colourless	carbon dioxide and water
G	−89	no reaction	no reaction	carbon dioxide and water
H	−1	no reaction	no reaction	carbon dioxide and water

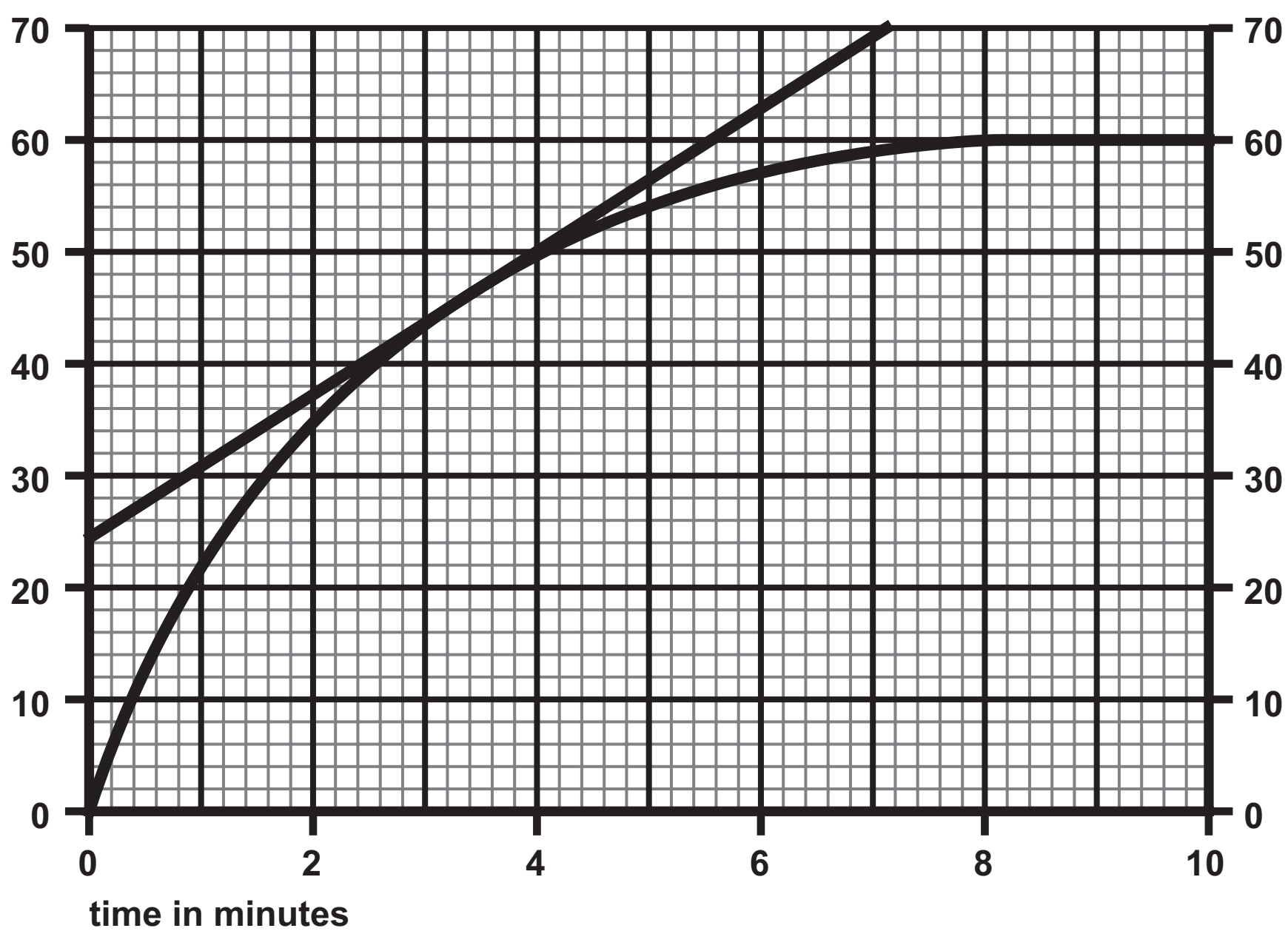
FIGURE 14



## Question 8(b)

FIGURE 15

volume of carbon dioxide  
in  $\text{cm}^3$



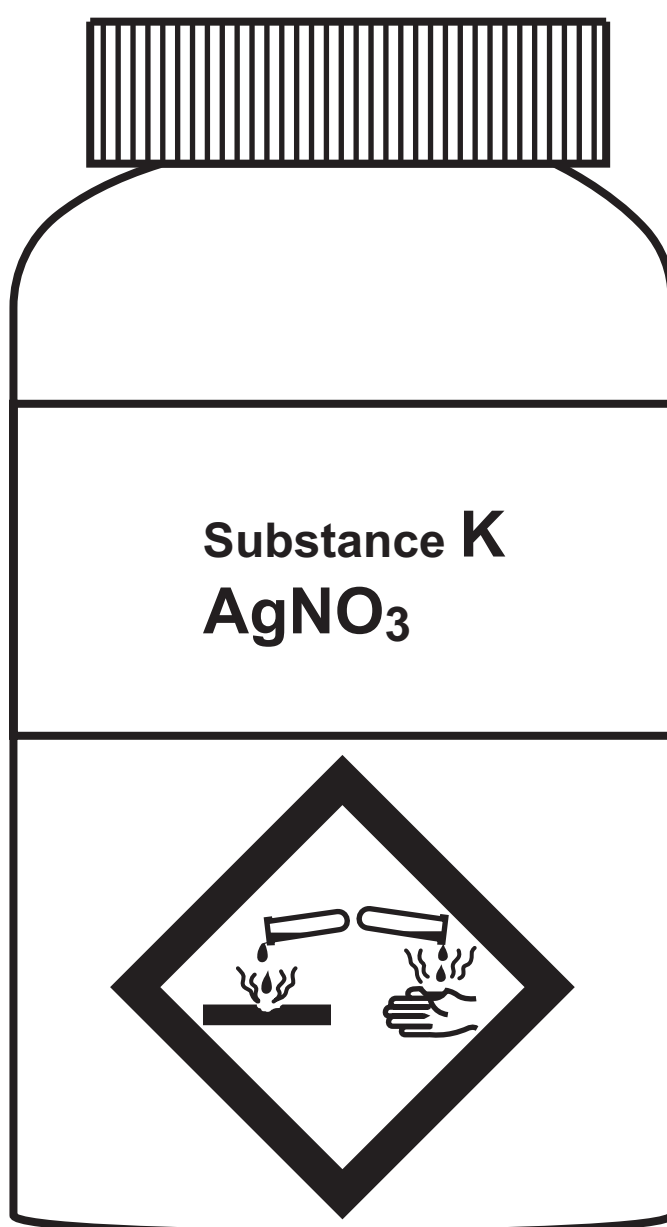
Question 9(d)

FIGURE 16

period of time	plant life	amount of carbon dioxide in atmosphere	amount of oxygen in atmosphere
the earliest Earth	no plant life	very high	none
about 3,500 million years ago	plant life evolved	high	very low
about 10,000 years ago	about <b>60%</b> of land covered by trees	<b>0·03%</b>	about <b>21%</b>
today	less than <b>40%</b> of land covered by trees	<b>0·04%</b>	about <b>21%</b>

## Question 10(a)

FIGURE 17





Question 4(b)(iv)

FIGURE 8

	salt P	salt Q	salt R	salt S
starting temperature in °C	20·0	20·0	20·0	20·0
final temperature in °C	22·4	19·5	23·0	18·5
temperature change in °C	+2·4	−0·5		
salt that absorbed most heat energy when it dissolved				



\_\_\_\_\_ + \_\_\_\_\_ → \_\_\_\_\_

Question 7(b)

NATURAL POLYMER

DNA

proteins

starch

MONOMER

amino acids

nucleotides

PVC

sugars

FIGURE 14

