



## ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI CHEMISTRY-YR 10 REVISION WORKSHEET

1. Substances can be pure or they can be mixtures.

(a) Which of these is a mixture?

(1)

- A chlorine
- B sodium
- C sodium chloride
- D sodium chloride solution

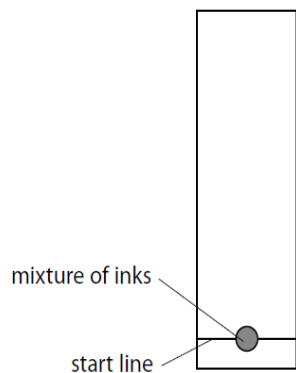
(b) Table.1 shows some mixtures to be separated and possible methods of separation. Place a tick (✓) in one box in each row of the table to show the best method to separate the first named substance from each of the mixtures.

(3)

substance to separate	method of separation			
	crystallisation	filtration	simple distillation	fractional distillation
sand from a mixture of sand and sodium chloride solution				
copper sulfate crystals from copper sulfate solution				
useful liquids from crude oil				

Table.1

(c) Paper chromatography was used to separate a mixture of blue and red inks. A spot of the mixture was placed on chromatography paper as shown in Figure 1.



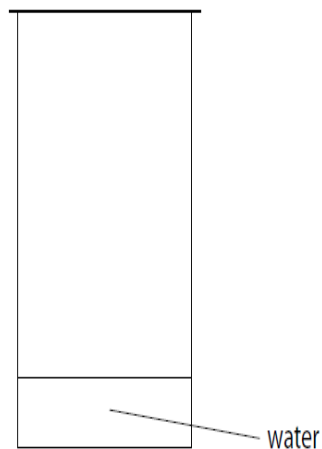
**Figure.1**

(i) Give a reason why the start line is drawn in pencil rather than in ink. (1)

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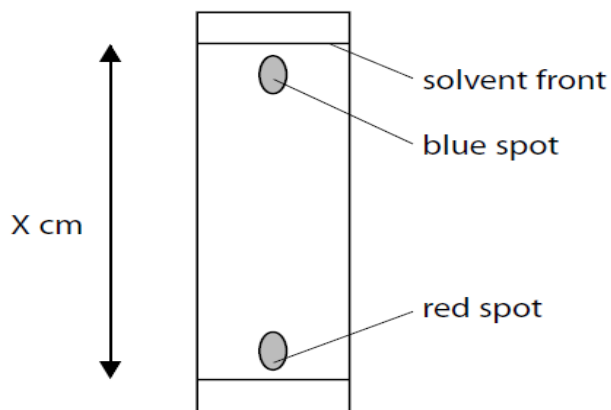
(ii) The chromatography paper, with the spot of mixture on it, was placed in a beaker with the bottom of the paper in solvent.

On Figure 2, complete the diagram showing the position of the chromatography paper with the spot of mixture at the start of the experiment. (1)



**Figure.2**

(iii) The chromatography was carried out and the result is shown in Figure 3.



**Figure.3**

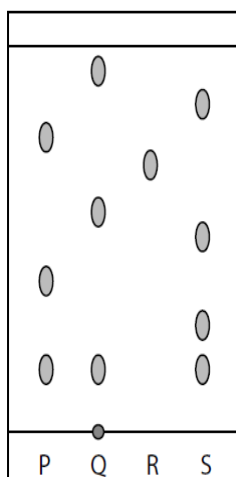
The blue spot had moved 14.5 cm and the solvent front had moved 15.3 cm. Calculate the R<sub>f</sub> value of the substance in the blue spot, giving your answer to 2 significant figures. (2)

$$R_f \text{ value} = \frac{\text{distance travelled by a dye}}{\text{distance travelled by solvent front}}$$

R<sub>f</sub> value = .....

(d) P, Q, R and S are mixtures of food colourings. They are investigated using paper chromatography.

Figure 4 shows the chromatogram at the end of the experiment.



**Figure.4**

(i) Which mixture contains an insoluble food colouring? (1)

- A** mixture **P**
- B** mixture **Q**
- C** mixture **R**
- D** mixture **S**

(ii) Give a change that could be made to the experiment to obtain an  $R_f$  value for the insoluble colouring. (1)

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(iii) Explain, by referring to Figure 5, which mixture is separated into the greatest number of soluble food colourings by this chromatography experiment. (2)

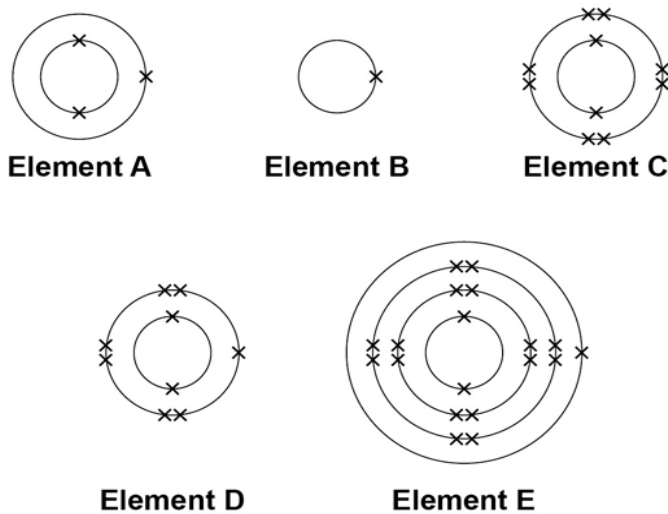
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2. The electronic structure of the atoms of five elements are shown in **Figure 5**. The letters are **not** the symbols of the elements.



**Figure.5**

Choose the element to answer questions (i) to (v). Each element can be used once, more than once or not at all.

Use the periodic table to help you.

- (i) Which element is hydrogen? (1)  
Tick **one** box.

<b>A</b>		<b>B</b>		<b>C</b>		<b>D</b>		<b>E</b>	
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- (ii) Which element is a halogen? (1)  
Tick **one** box.

<b>A</b>		<b>B</b>		<b>C</b>		<b>D</b>		<b>E</b>	
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- iii) Which element is a metal in the same group of the periodic table as element A? (1)  
Tick **one** box.

<b>B</b>		<b>C</b>		<b>D</b>		<b>E</b>	
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- (iv) Which element exists as single atoms? (1)  
Tick **one** box.

<b>A</b>		<b>B</b>		<b>C</b>		<b>D</b>		<b>E</b>	
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- (v) There are two isotopes of element A. Information about the two isotopes is shown in Table 2.

Mass number of the isotope	6	7
Percentage abundance	92.5	7.5

**Table.2**

- Use the information in **Table .2** to calculate the relative atomic mass of element A. Give your answer to 2 decimal places. (4)

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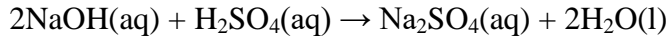
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Relative atomic mass = -----

3. A student uses the neutralisation method to make a sample of the soluble salt, sodium sulfate.

The equation for the reaction he uses is



(a) He does a titration using phenolphthalein indicator.

(i) Which piece of apparatus should the student use to add the sodium hydroxide solution? (1)

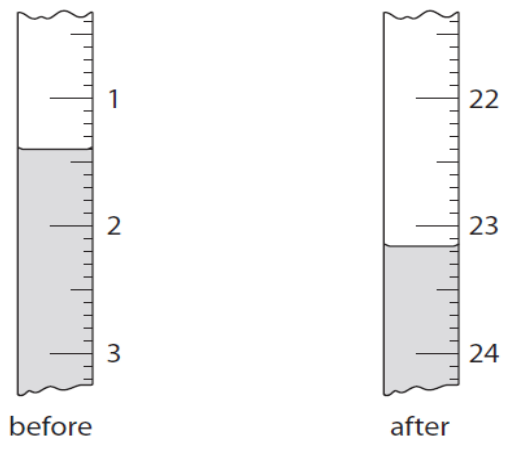
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(ii) What colour change would the student see when he neutralises the sodium hydroxide solution? (2)

colour before neutralisation -----

colour after neutralisation -----

(b) The diagram shows the burette readings in one experiment before and after adding the acid.



Use the readings to calculate the volume of acid added, entering all values to

the nearest 0.05 cm<sup>3</sup>. (3)

burette reading after adding acid -----cm<sup>3</sup>

burette reading before adding acid -----cm<sup>3</sup>

volume of acid added -----cm<sup>3</sup>

(c) The student repeats the experiment and records these results.

burette reading in cm <sup>3</sup> after adding acid	25.20	25.05	23.65	23.50
burette reading in cm <sup>3</sup> before adding acid	2.90	3.10	2.55	2.30
volume of acid added in cm <sup>3</sup>	22.30	21.95	21.10	21.20
titration results to be used (✓)				

The average (mean) volume of acid added should be calculated using only concordant results (those that differ from each other by 0.20 cm<sup>3</sup> or less).

(i) Identify the concordant results by placing ticks (✓) in the table where appropriate. (1)

(ii) Use your ticked results to calculate the average volume of acid added. (2)

average volume = -----cm

4.(a) Magnesium has atomic number 12.

Magnesium exists as magnesium-24, magnesium-25 and magnesium-26 atoms.

(i) Explain, in terms of protons and neutrons, why these atoms are isotopes of magnesium. (2)

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5. Water from a lake in the UK is used to produce drinking water.

(i) What are the two main steps used to treat water from lakes? **(2)**

Give a reason for each step.

Step 1 -----

Reason -----

Step 2 -----

Reason -----

(ii) Explain why it is more difficult to produce drinking water from waste water than from water in lakes. **(3)**

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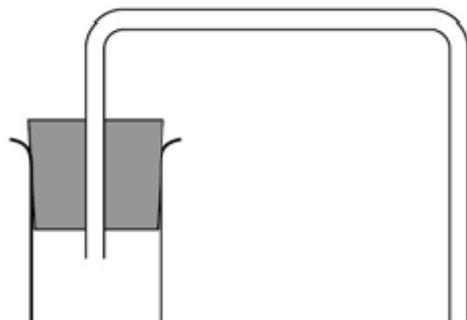
(iii) Some countries make drinking water from sea water.

Complete Figure.1 to show how you can distil salt solution to produce and collect pure water. **(3)**



Label the following

- pure water
- salt solution.



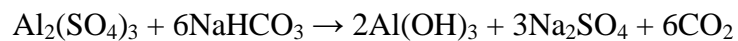
(iii) How could the water be tested to show it is pure? (2)

Give the expected result of the test for pure water.

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**6.** Some types of fire extinguisher use a reaction between aluminium sulfate and sodium hydrogencarbonate.

The equation for this reaction is



(i) State the names of the two metal-containing products of this reaction. (1)

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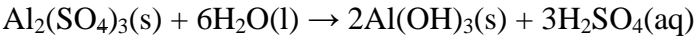
(ii) How will you test carbon dioxide in the laboratory? (2)

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Gardeners can use aluminium sulfate to alter the pH of soil.

The reaction that occurs can be represented as



(iii) The  $\text{Al}(\text{OH})_3$  contains  $\text{OH}^-$  ions and the  $\text{H}_2\text{SO}_4$  contains  $\text{H}^+$  ions.

Suggest, with reference to the state symbols, why this reaction makes the soil more acidic. (2)

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