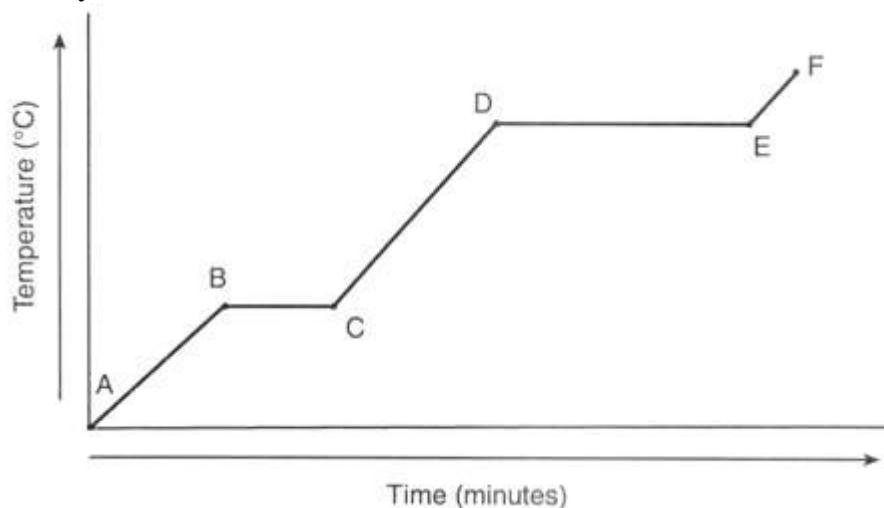


Year 9 Chemistry Revision worksheet 2019-20

1. Given the heating curve where substance *X* starts as a solid below its melting point and is heated uniformly:



- a) Identify the process that takes place during line segment *DE* of the heating. 1

- b) Using "o" to represent particles of substance *X*, draw at least five particles as they would appear in the substance at point *F*. 1

- c) Describe, in terms of energy, movement of particles and distance between the particles, what is happening to substance *X* during line segment *BC*. 3

- d) What do the horizontal lines on the graph in section *BC* and *DE* represent about the temperature? Explain. 2

e) The table shows information about a substance, Y

1

Melting Point	Boiling Point
-218°C	-183°C

Predict the physical state of substance Y at 25°C

f) Which of the following changes occur at the same temperature for the same substance?

1

i. Freezing

ii. Melting

iii. Condensing

iv. Melting and condensing

v. Melting and boiling

vi. Freezing and melting

(Total marks for question 1 = 9)

2. a) Ryan said that 18 carat gold is a mixture, but Jane said it is a pure substance. Who is right? Explain your answer

2

b) Will 18 carat gold melt at a fixed temperature? Explain.

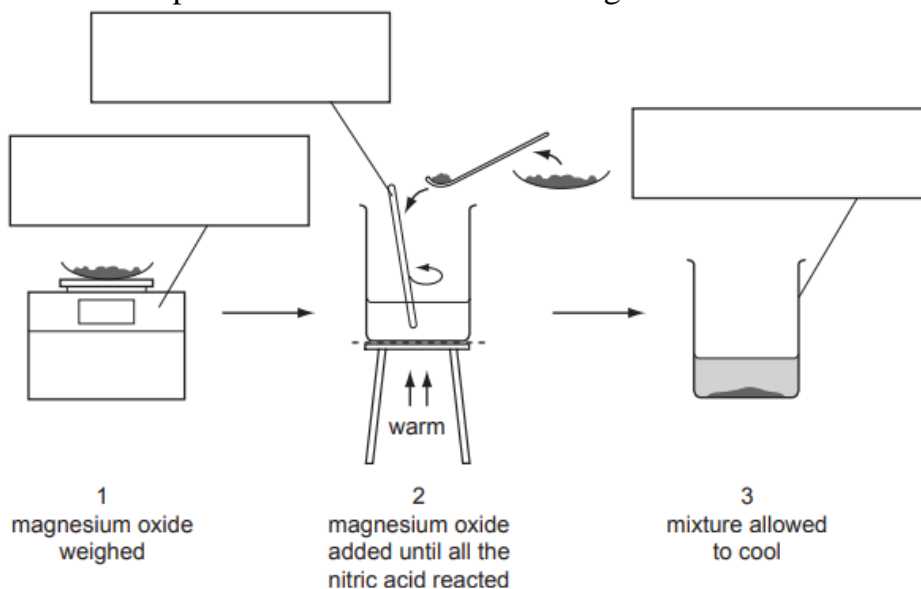
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c) What is the mass of gold in a 2.5g ring made of 18 carat gold?

2

(Total marks for question 2 = 6)

3. A student reacted nitric acid with magnesium oxide to prepare magnesium nitrate. The diagram shows the procedure followed in three stages.



a) Complete the boxes to identify the pieces of apparatus labeled

3

b) i. What term is used to describe the unreacted magnesium oxide

1

ii. What method is used to remove the unreacted magnesium oxide after stage 3

1

c) Describe how crystals of magnesium nitrate could be quickly obtained from the solution

2

(Total marks for question 3 = 7)

4. This is a description of how the orange colouring can be extracted from rose petals.

- crush the petals using a pestle and mortar
- add the crushed petals to some ethanol in a beaker
- heat to about 60°C and stir to produce an orange solution
- separate the orange solution from the petals

a) i. Suggest why ethanol is used instead of water.

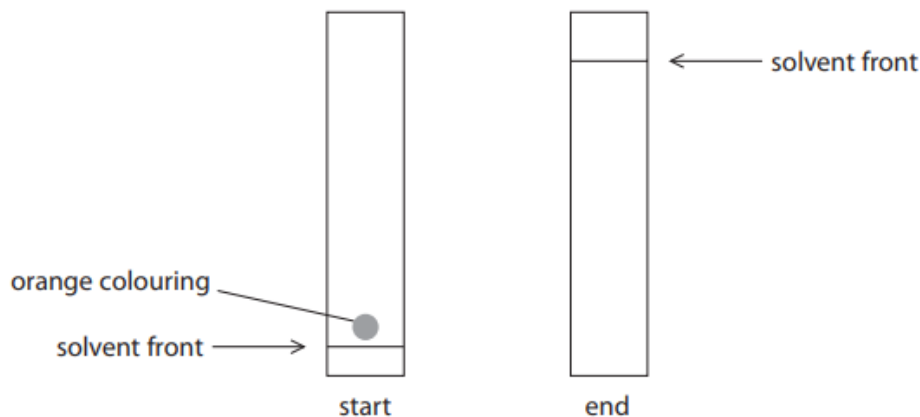
1

ii. Ethanol is a flammable liquid. Suggest how it could be heated safely.

1

b) The orange colouring is analysed using chromatography and is found to consist of two different colours, red and yellow of which red is more soluble than yellow. The diagram shows the chromatography paper at the start of the experiment. Complete the diagram to show a possible result at the end of the experiment.

2



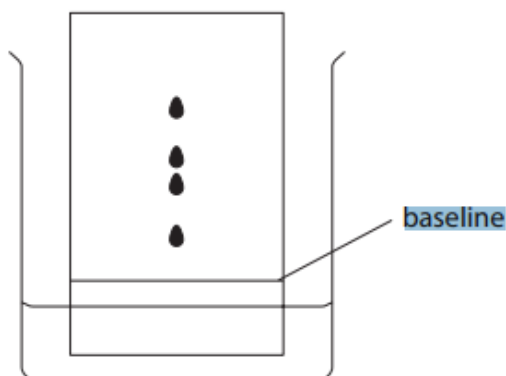
(Total marks for question 4 = 4)

5. A student wants to find out if the green colouring in grass is a mixture of dyes. He uses a solvent to dissolve the green colouring from some grass. He then separates the solution of the green colouring from the remaining grass.

a) Which of these methods is used to separate the solution of the green colouring from the remaining grass? Tick the right answer. 1

- i. Boiling
- ii. Condensation
- iii. Evaporation
- iv. Filtration

b) The student uses a dropping pipette to place a drop of the green solution onto a piece of chromatography paper and produces a chromatogram. The diagram shows his results.



i. Add three more labels to the diagram to show 3

- The mobile phase
- The stationary phase
- The original position of the spot of the green solution

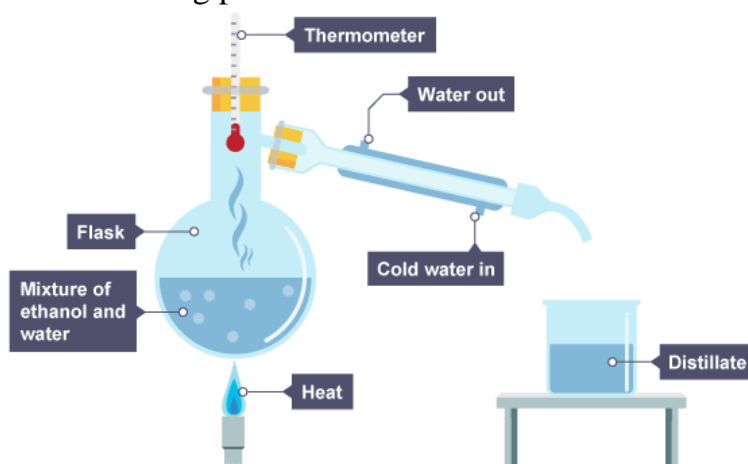
ii. Explain how many different dyes are present in the green colouring 1

(Total for Question 5 = 5 marks)

6. Paper chromatography was carried out on a sample of ink. The solvent front travelled 153 mm and a blue spot travelled 145 mm. Calculate the R_f value of the substance in the blue spot, giving your answer to 2 significant figures.

(Total marks for question 6 = 2)

7. The diagram shows the apparatus which can be used to separate a mixture of ethanol and water. Ethanol has a boiling point of 78°C



- a) Explain how the mixture is separated.

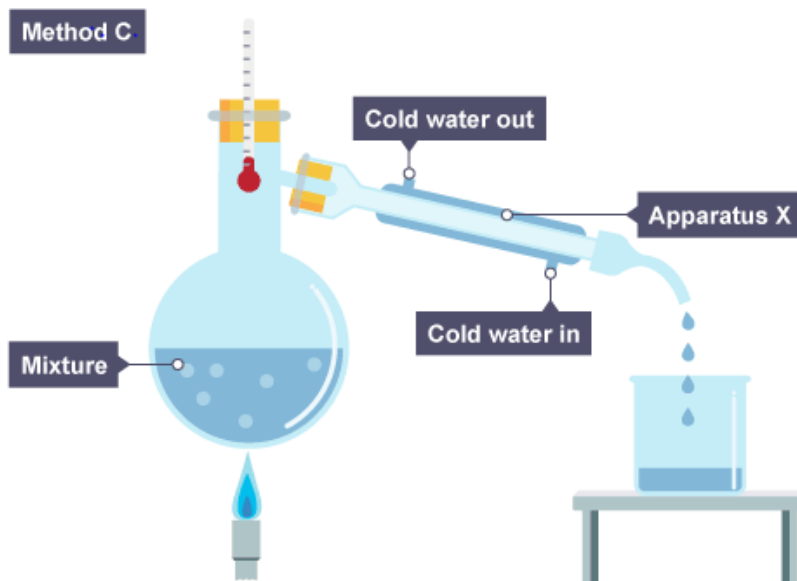
4

b) How could you check if the ethanol collected is pure or not? Explain.

2

(Total marks for question 7 = 6)

8. In the diagram below, compound X has a boiling point of 75°C



a) Suggest why this method would not be very effective in separating compound X and ethanol. 1

b) Suggest how you could adapt the method to improve the separation of compound X and ethanol. 1

(Total marks for question 8 = 3)

9. Manufacturers must provide a Material Safety Data Sheet, or MSDS, when they sell substances. Part of an MSDS for chlorine gas is shown below.

MATERIAL SAFETY DATA SHEET – Chlorine gas

Inhalation: Causes coughing and dizziness. High concentrations may cause unconsciousness and death.

Skin contact: Causes reddening and blistering of the skin.

Eye contact: Causes stinging eyes and a burning feeling.

- a) Explain why chlorine is added to water during its treatment to make it safe for drinking. 1

- b) Suggest why the concentration of chlorine in water is kept to the minimum needed for it to be effective. 1

- c) Choose one hazard of using chlorine gas. Explain how the risk of harm from this hazard can be reduced for workers at a water treatment plant. 1

(Total marks for question 9 = 3)

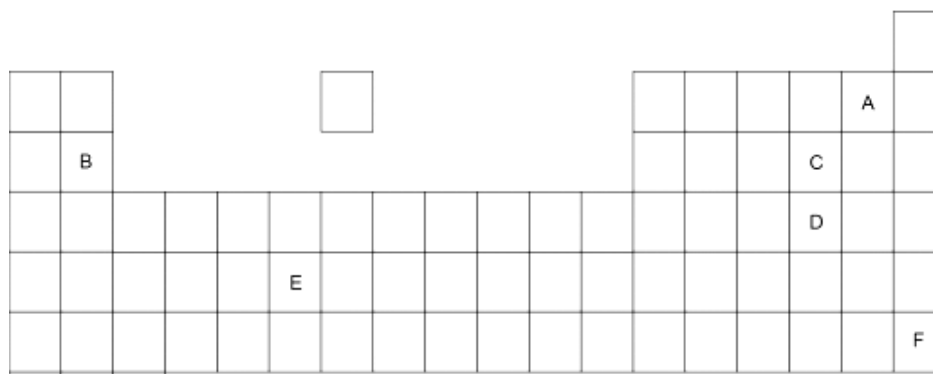
10. a) Complete the table below to give information about protons, neutrons and electrons 2

	Charge	Mass in atomic mass units
proton	1
neutron
electron	negative

- b) Rutherford was a scientist who helped to develop the atomic model. 1
State how Rutherford's work contributed to the development of the atomic model.

(Total marks for question 10 = 3)

11. There are about 90 natural elements, which scientists have classified in the periodic table. The grid below represents an outline of the periodic table. The letters **A** to **F** represent the positions of six different elements in the table.



a) Name the element represented by the letter **A** _____ 1

b) Which two letters represent elements that are metals? _____ 1

c) Each element has an atomic number.

i. State what is meant by the 'atomic number' of an element. 1

ii. Which one of the letters **A** to **F** represents the element with the highest atomic number? 1

d) Describe in terms of protons and neutrons in atoms, what is meant by the term 'isotope'. 2

- e) The table shows the percentage composition by mass of a sample of silicon. 3
Calculate the relative atomic mass of his sample of silicon. Give your answer correct to one decimal place

Isotope	^{28}Si	^{29}Si	^{30}Si
Percentage (%)	92.2	4.70	3.10

Relative atomic mass =

(Total marks for question 11 = 9)

12. a) What physical property of elements did Mendeleev use to place them in order in his table? 1

- b) Mendeleev left gaps in his periodic table, putting question marks for some elements

- i. Why did Mendeleev leave gaps in his first periodic table? 1

- ii. What change did Mendeleev make to the ordering of the elements to make his ideas work? 1

(Total marks for question 11 = 3)