

SIMPLE CLASSIFICATION OF **SUBSTANCES**

KCSE QUICK REVISION

*Compilation of Possible Questions in Chemistry
Likely to be Examined in KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 1.*

CHEMISTRY

SERIES 1

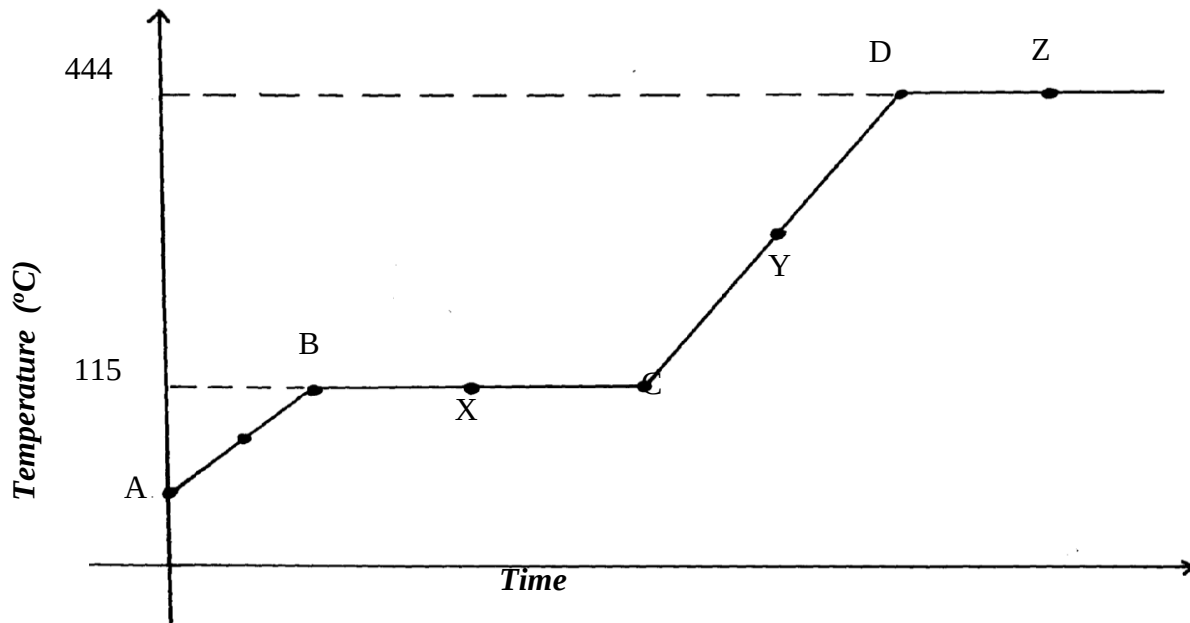
For Marking Schemes

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MWALIMU CONSULTANCY

SIMPLE CLASSIFICATION OF SUBSTANCES

1. The diagram below shows the heating curve of a pure substance. Study it and answer the questions that follow:



- (a) What physical changes are taking place at points **X** and **Z**?
- (b) Explain what happens to the melting point of sodium chloride added to this substance
2. (a) State **two** differences between luminous flame and non-luminous flame
- (b) It is advisable to set a Bunsen burner to luminous flame prior to an experiment. Explain
3. The paper chromatography of a plant extract gave the following results:

Solvent	Number of spots
X	6
Y	2
Z	3

- (a) Which is the most suitable solvent for purifying the extract? Explain
- (b) Ball pen cannot be used to mark solvent front in the above chromatography. Explain

4. Name the process which takes place when:
- (a) Solid Carbon (IV) Oxide (dry ice) changes directly into gas
 - (b) A red litmus paper turns white when dropped into chlorine water
 - (c) Propene gas molecules are converted into a giant molecule
5. A sample of copper turnings was found to be contaminated with copper (II) oxide.
Describe how a sample of copper metal can be separated from the mixture
6. **Copper** (II) oxide and charcoal are black solids. How would you distinguish between the two solids?
7. **a)** What is chromatography?
b) Give **two** applications of chromatography
8. The two elements **P** and **R** were separately burned in air, the products gave the results recorded in the table below:

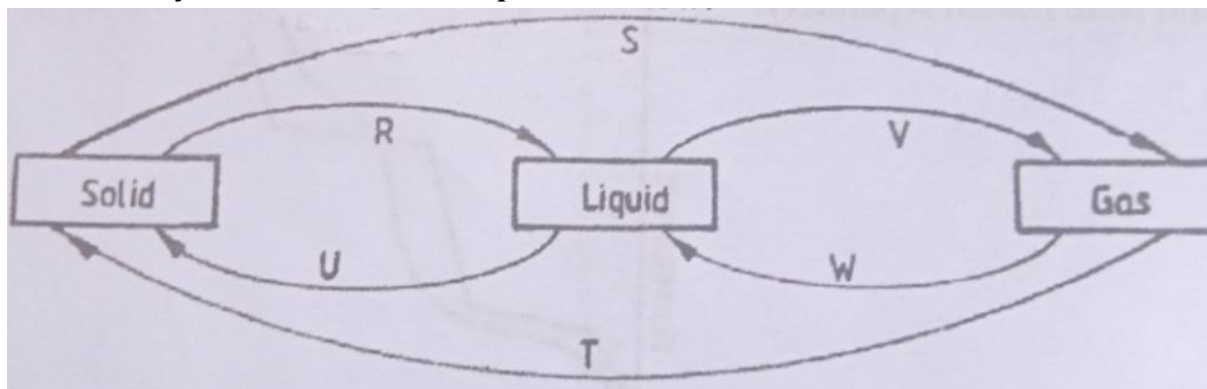
ELEMENTS PHYSICAL STATE AT ROOM TEMPERATURE	P SOLID	R SOLID
Physical states of products	White solid powder only	Colourless gases L and M
Nature of solutions in water	Basic	L strongly acidic M slightly acidic

- (a) Suggest the identity of element **R**.
- (b) Describe how the nature of the solutions of the of the oxides were determined
- 9 The diagram below represents a paper chromatography for the three brands of soft drinks containing banned artificial food additives.

	6	7	
4		5	
1	2	3	
	A	B	C
BRANDS OF SOFT DRINKS			

A and C found to contain the banned artificial food additives. Which numbers indicate the banned artificial food additives?

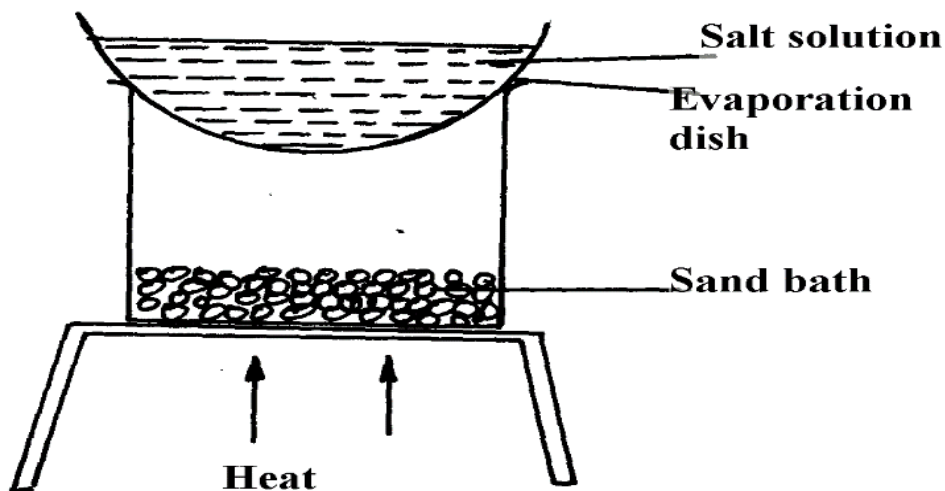
10. Without using any laboratory chemical, describe a simple laboratory experiment to distinguish between calcium hydrogen carbonate and sodium hydrogen carbonate
11. The diagram below shows the relationships between the physical state of matter. Study it and answer the questions that follow



[a] Identify the processes R, V, W and U

[b] Name one substance that can undergo the process represented by S & T

12. Cooking oils comprise of a mixture of compounds which have a boiling point range of 23°C to 27°C .
- (i) What evidence is there to support the statement that cooking oil is a mixture?
- (ii) Name another experimental technique that could be used to confirm your answer in part (i) above
13. A form 1 student carried out the separation as shown in the set-up below:-



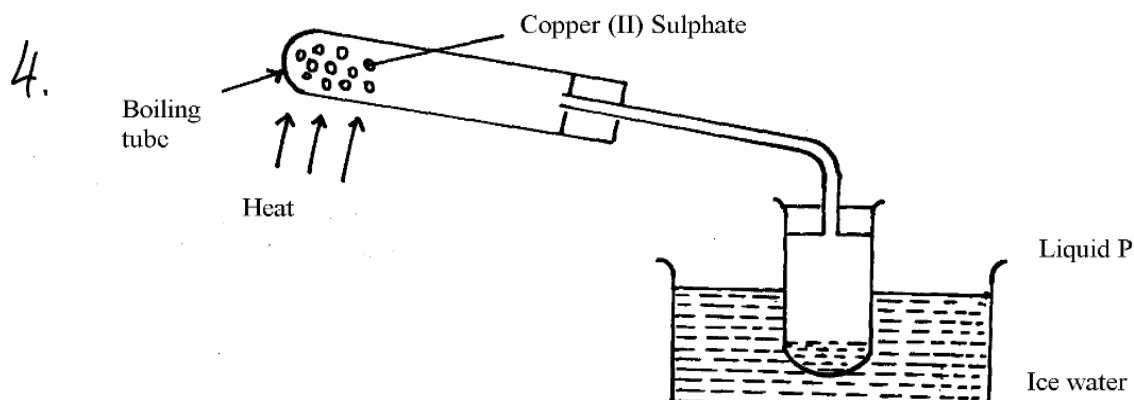
(i) Identify the method above.....

(ii) Give **one** of its disadvantages

(iii) Name a mixture which can be separated by the set-up above

14. What is meant by melting point and boiling point of a substance?

15. The apparatus below were used by a student to study the effect of heat on hydrated copper II sulphate

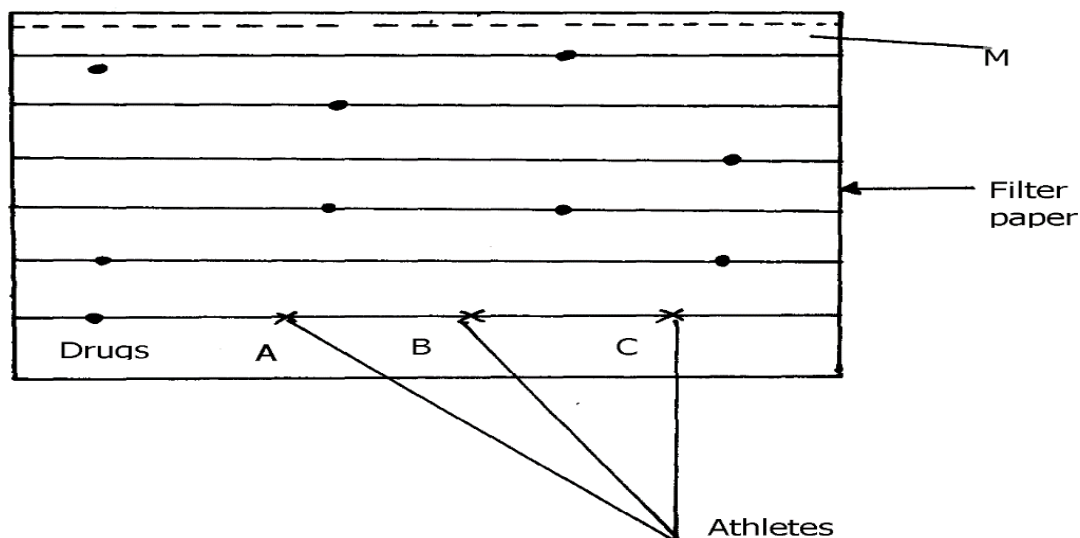


(a) What is the role of the ice cold water

(b) Name liquid P

(c) What observation is made in the boiling tube

17. The diagram below shows chromatograms of blood samples obtained from three athletes. One athlete used illegal drug to improve performance in competition.



(a) Name the line marked **M**

(b) Identify the athlete who used illegal drug

18. Classify the following processes as chemical changes or physical changes

<u>Process</u>	<u>physical or chemical</u>
Neutralization	
Sublimation	
Fractional distillation	
Displacement reaction	

19. Give **two** reasons why a luminous flame is not used for heating purposes

20. Classify the following processes as chemical changes or physical changes

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Neutralization	
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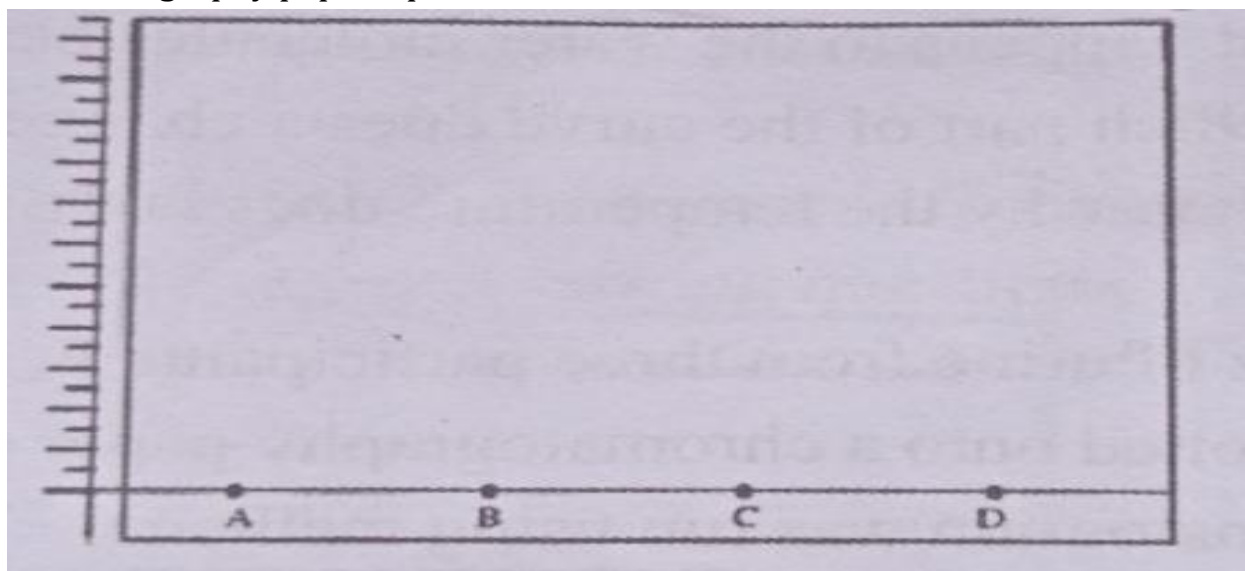
21. Give **two** reasons why a luminous flame is not used for heating purposes

22. State **two** criteria for determining the purity of a substance

23. Study the information in the table below and answer the questions.

i) A mixture contains ethene, Hydrogen and ammonia gases. Explain how a sample of hydrogen gas can be obtained from this mixture.

24. a)i) The diagram below shows spots of a pure substance **A**, **B**, and **C** on chromatography paper. Spot **D** is that of a mixture



After development **A**, **B**, and **C** were found to have moved 8cm, 3cm and 6cm respectively. **D** had separated into two spots which had moved 6cm and 8cm
On the diagram above;

I. Label the baseline (origin)

II. Show the positions of all the spots after development

ii) Identify the substances present in mixture **D**

b) Describe how solid ammonium chloride can be separated from a solid mixture of ammonium chloride and anhydrous calcium chloride

c) The table below shows liquids that are miscible and those that are immiscible

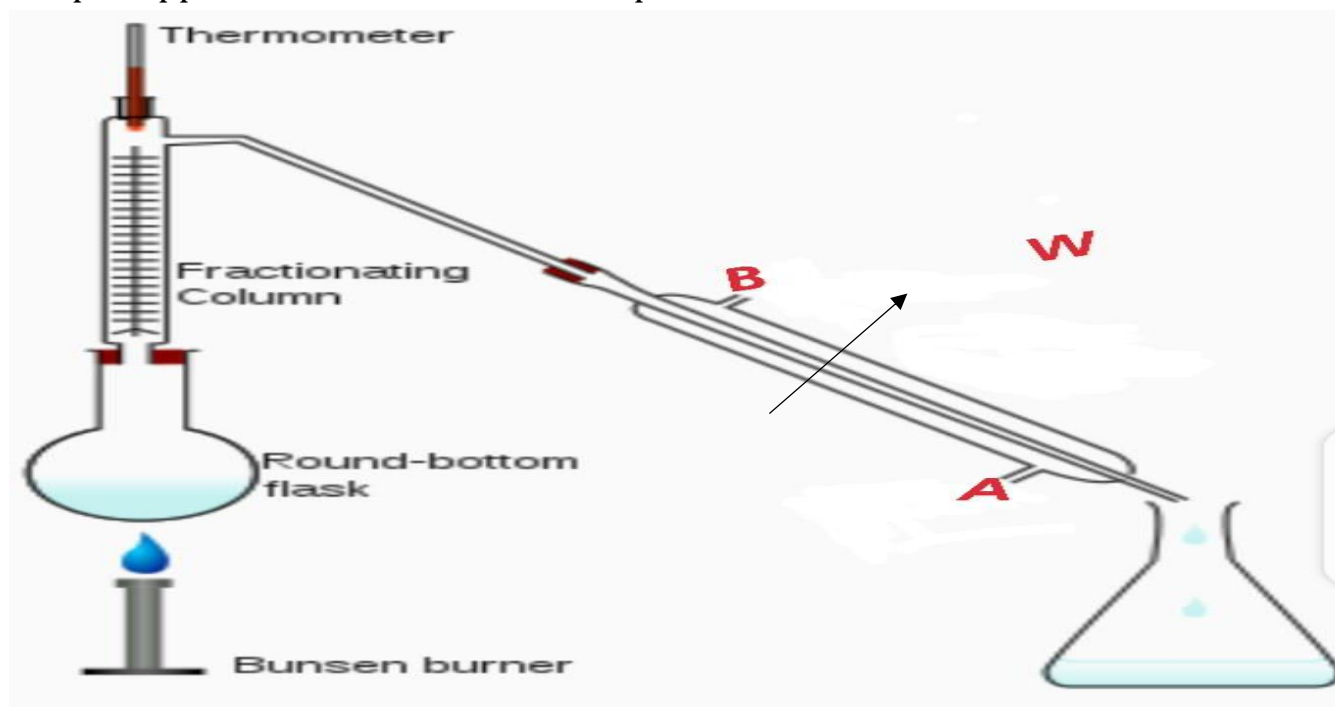
Liquid	L ₃	L ₄
L ₁	Miscible	Miscible
L ₂	Miscible	Immiscible

Use the information given in the table to answer the questions that follow;

i) Name the method that can be used to separate L₁ and L₂ from a mixture of the two

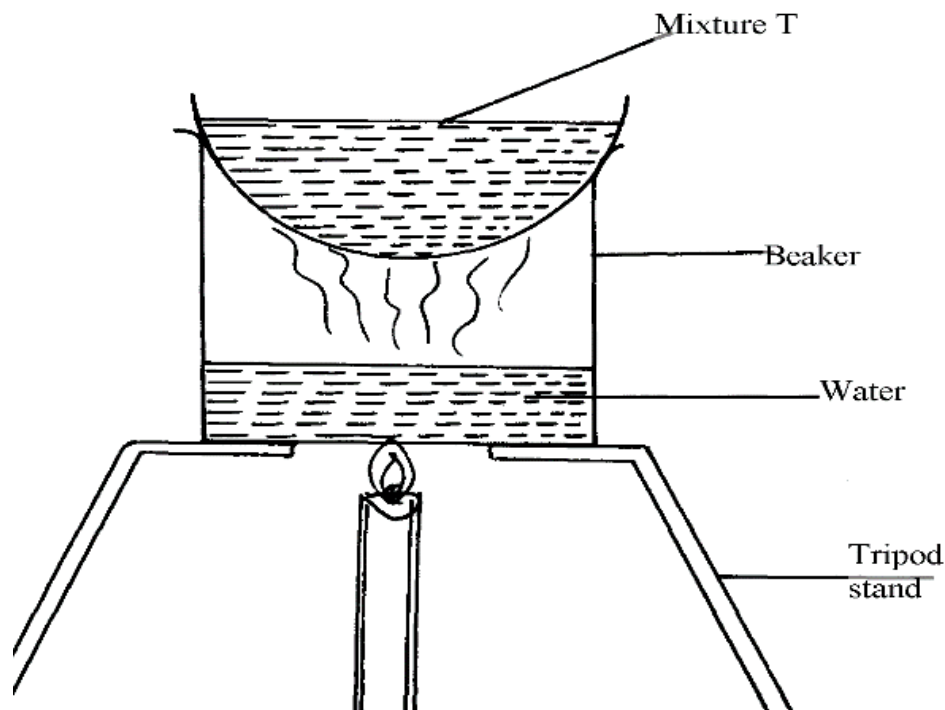
ii) Describe how a mixture of L₂ and L₄ can be separated

25. A student left some crushed fruit mixture with water for some days. He found the mixture had fermented. He concluded that the mixture was contaminated with water and ethanol with boiling point of 100°C and 78°C respectively. The set-up of apparatus below are used to separate the mixture.

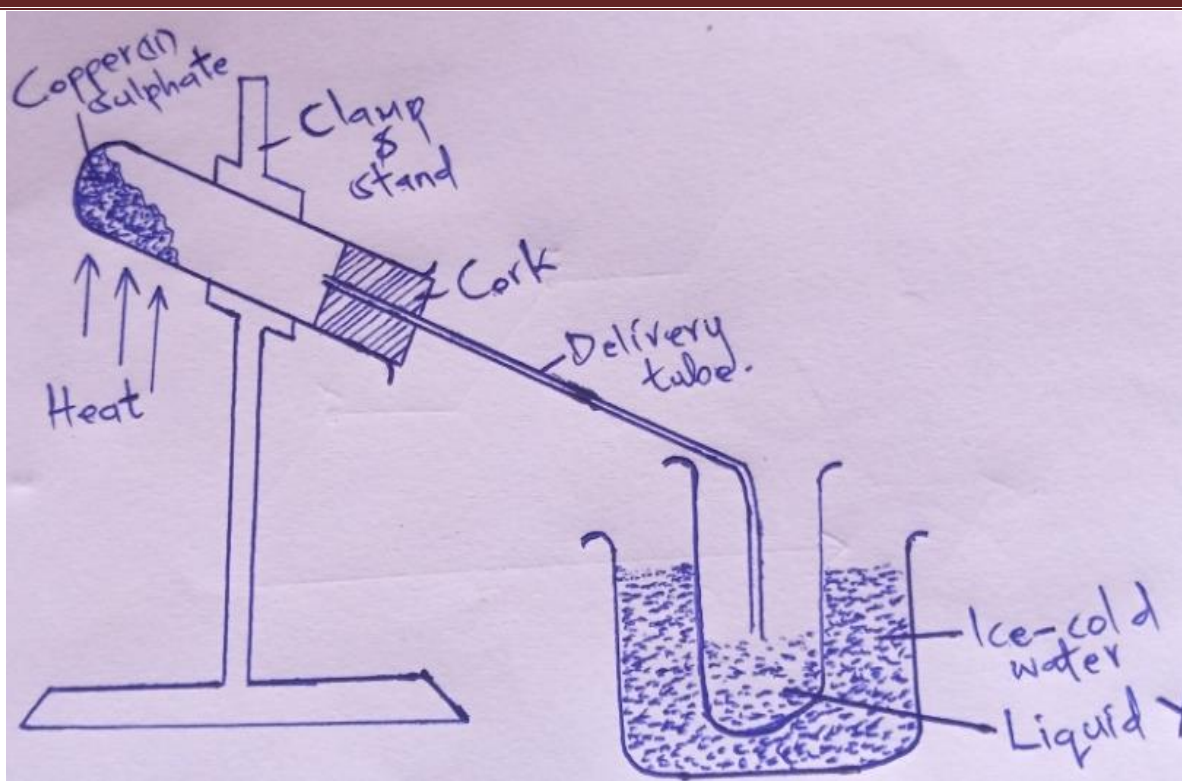


- (i) Name the piece of apparatus labelled **W**
- (ii) What is the purpose of the thermometer in the set-up?
- iii) At which end of the apparatus **W** should tap water be connected?.....
- (iv) Which liquid was collected as the first distillate? Explain
- (v) What is the name given to the above method of separating mixture?
- (vi) State **two** applications of the above method of separating mixtures
- (vi) What properties of the mixture makes it possible for the component to be separated by the above methods?

26. The set-up below was used to separate a mixture:-



- (a) Name the apparatus missing in the set-up
 - (b) Give **one** example of mixture **T**
 - (c) What is the name of this method of separation
27. a) The diagram below shows a set – up used by a student to find out what happens when Copper (II) sulphate crystals are heated.

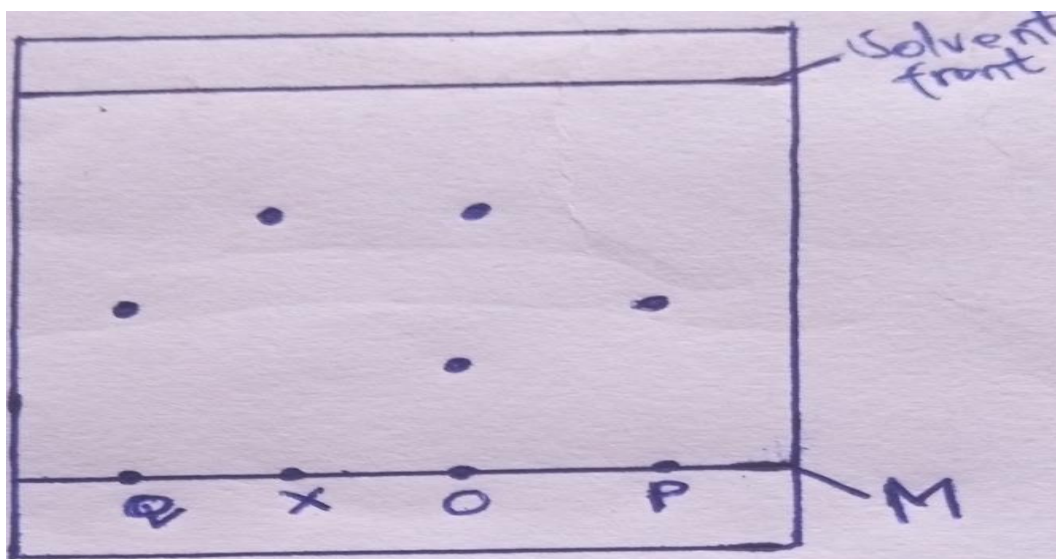


(i) State the observations made when the blue copper (II) sulphate crystals are heated.

(ii) Identify liquid Y and write an equation for its formation.

b) Pellets of sodium hydrogen and anhydrous Copper (II) sulphate were put in separate Petri-dishes and left in the open for two hours. Explain the observation in each Petri- dish.

28. The chromatography below shows the constituents of a flower extract using an organic solvent:-



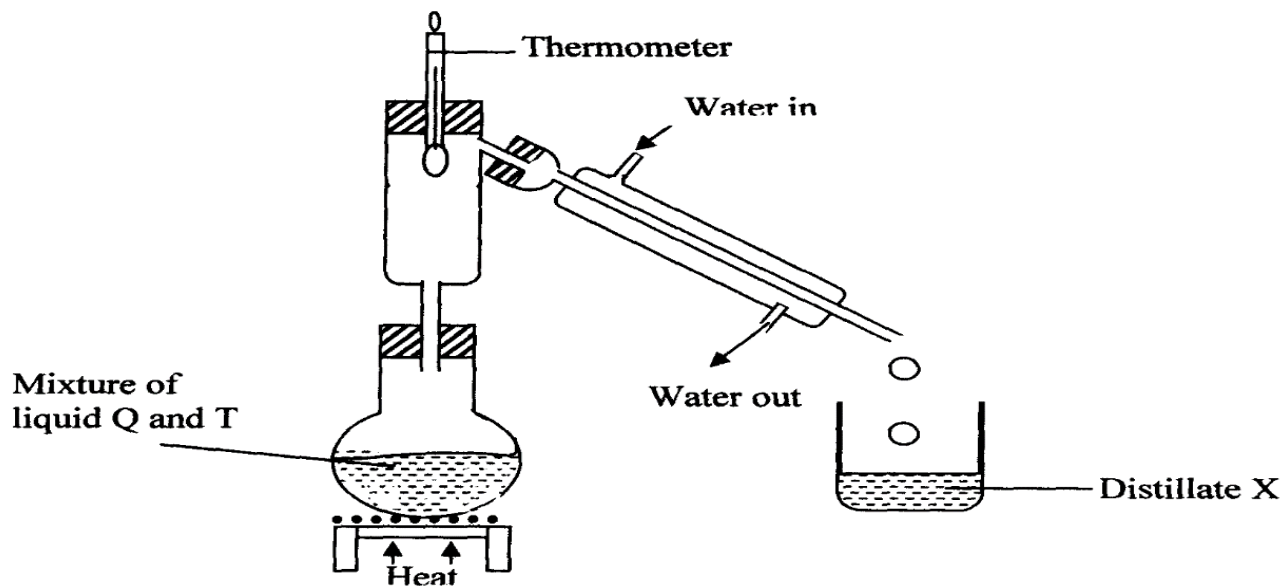
- (a) (i) Name a possible organic solvent you can use for this experiment
 (ii) State **one** property that makes the red pigment to move the furthest distance from **M**
 (iii) Describe how one could get a sample of yellow pigment
 (iv) On the diagram indicate solvent front
 (b) Describe how Aluminium chloride can be separated from a mixture of aluminium chloride and sodium chloride

29. Study the information below and answer the questions that follow:

Solid	Cold water	Hot water
R	Soluble	Soluble
V	Insoluble	Insoluble
S	Insoluble	Insoluble

Describe how the mixture of solid **R**, **S**, and **V** can be separated

30. Given a mixture of lead (II) oxide, ammonium chloride and sodium chloride, describe how this mixture can be separated to obtain a sample of each.
31. The setup below was used to separate two miscible liquids **Q** and **T** (Boiling points; $Q = 98^{\circ}\text{C}$, $T = 78^{\circ}\text{C}$)



(a) Identify the mistakes in the setup above

(b) Identify Distillate X

32. Name the process which takes place when:

- a) Solid Carbon (IV) oxide (dry ice) changes directly into gas.
- b) A red litmus paper turns white when dropped into chlorine water.
- c) Propene gas molecules are converted into a giant molecule.

33. State and explain the change in mass that occurs when the following substances are separately heated in open crucibles

[a]Copper metal

[b]copper [II] nitrate

34. Study the information below and answer the following questions. A mixture contains three solids **A**, **B**, and **C**. The solubility of these solids in different liquids is as shown below:-

Solid	Water	Alcohol	Ether
A	Soluble	Insoluble	Insoluble
B	Insoluble	Soluble	Very soluble
C	Soluble	Soluble	Insoluble

Explain how you will obtain sample **C** from the mixture

35. State and explain the observations made when iodine crystals is heated in a boiling tube?

For Marking Schemes/Answers

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