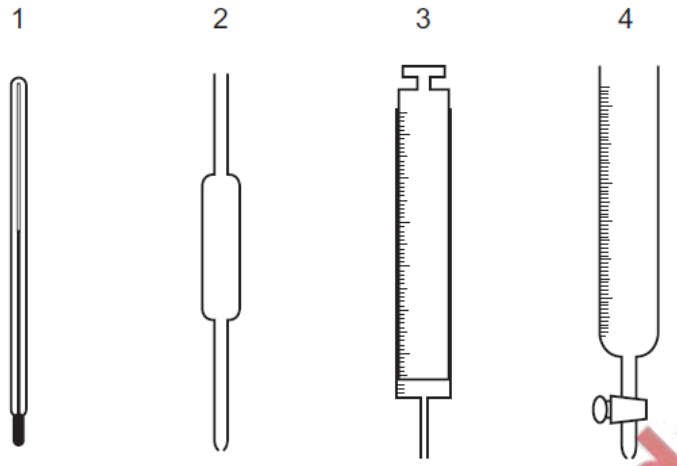
Experimental Techniques – 2023 June IGCSE Chemistry 0620

1. June/2023/Paper_ 0620/11/No.38

The concentration of acids and alkalis can be determined by titration.

Which pieces of equipment are needed to perform a titration?



A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 2 and 4

2. June/2023/Paper_ 0620/11/No.39

Which process is used to produce drinking water from sea water?

A crystallisation

B distillation

C filtration

D chlorination

3. June/2023/Paper_ 0620/11/No.40

The results of two separate tests on a white solid X are shown.

test	result
add dilute nitric acid	effervescence
add aqueous sodium hydroxide and warm	a gas is formed which turns damp red litmus paper blue

What is X?

A aluminium carbonate

B aluminium nitrate

C ammonium carbonate

D ammonium nitrate

4. June/2023/Paper_ 0620/12/No.37

Rock salt is a mixture of salt and sand.

The method used to separate the sand from the salt is listed.

step 1 Crush the rock salt, add to warm water and stir.

step 2 Pour the mixture through a filter paper held in a funnel.

step 3 Evaporate the water to crystallise the salt.

Which statement about the method is correct?

A The filtrate in step 2 is pure water.

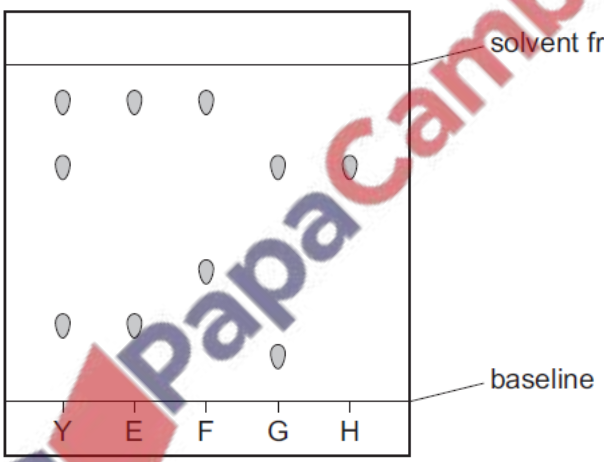
B The residue in step 2 is pure crystals of salt.

C The solute is salt.

D The solvent is a mixture of salt and water.

5. June/2023/Paper_ 0620/12/No.38

Chromatography is carried out on mixture Y and dyes E, F, G and H. The chromatogram is shown.



Which dyes are present in mixture Y?

A E and G **B** E and H **C** F and G **D** F and H

6. June/2023/Paper_ 0620/12/No.39

A fractionating column is used to separate the hydrocarbon fractions in petroleum by fractional distillation.

Which row describes the properties of the fractions that condense at the top of the fractionating column?

	size of molecule	boiling point
A	large	high
B	large	low
C	small	high
D	small	low

7. June/2023/Paper_ 0620/13/No.38

Dilute hydrochloric acid is titrated into a conical flask containing sodium hydroxide solution and a few drops of methyl orange indicator.

Which piece of apparatus is used to add the hydrochloric acid?

A beaker

B burette

C measuring cylinder

D pipette

8. June/2023/Paper_ 0620/13/No.39

What could be the melting point and boiling point of water containing a dissolved impurity?

	melting point / °C	boiling point / °C
A	+3	96
B	+3	104
C	–3	96
D	–3	104

9. June/2023/Paper_ 0620/13/No.40

Element X burns in air to form an acidic gas that decolourises potassium manganate(VII).

What is X?

A carbon

B nitrogen

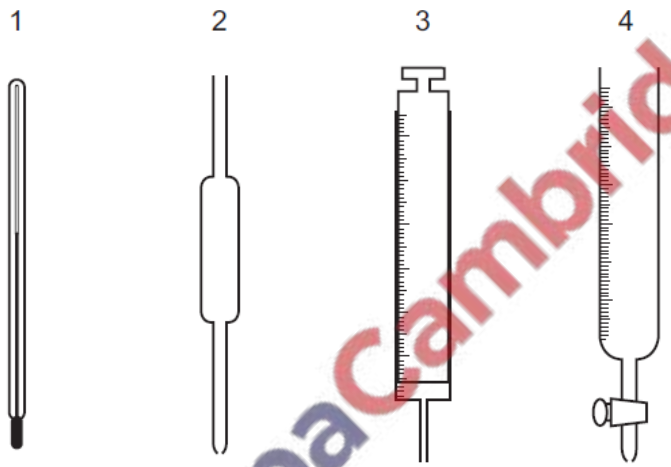
C magnesium

D sulfur

10. June/2023/Paper_ 0620/21/No.39

The concentration of acids and alkalis can be determined by titration.

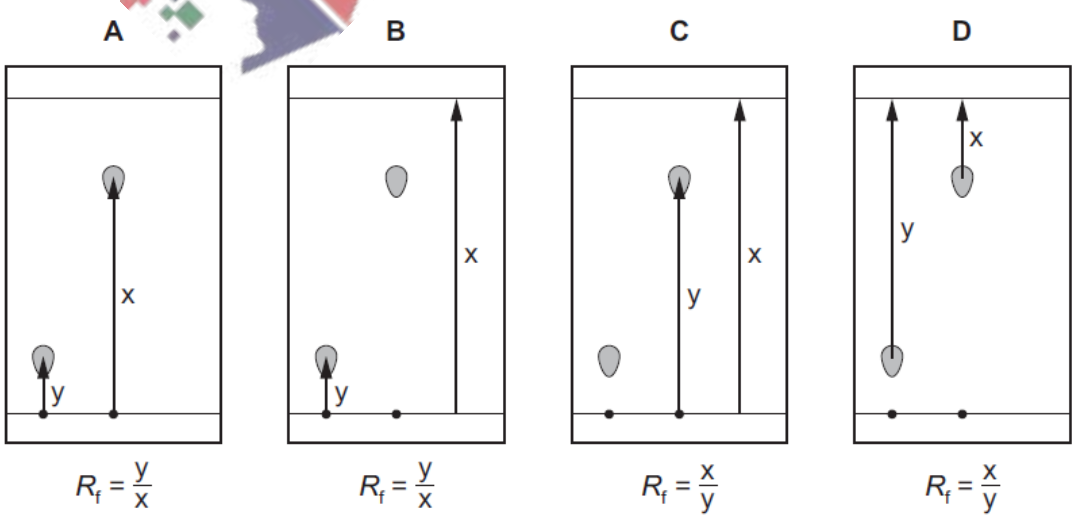
Which pieces of equipment are needed to perform a titration?



A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 2 and 4

11. June/2023/Paper_ 0620/21/No.40

Which chromatogram shows how the R_f value of a substance is calculated?



12. June/2023/Paper_ 0620/22/No.38

Rock salt is a mixture of salt and sand.

The method used to separate the sand from the salt is listed.

step 1 Crush the rock salt, add to warm water and stir.

step 2 Pour the mixture through a filter paper held in a funnel.

step 3 Evaporate the water to crystallise the salt.

Which statement about the method is correct?

A The filtrate in step 2 is pure water.

B The residue in step 2 is pure crystals of salt.

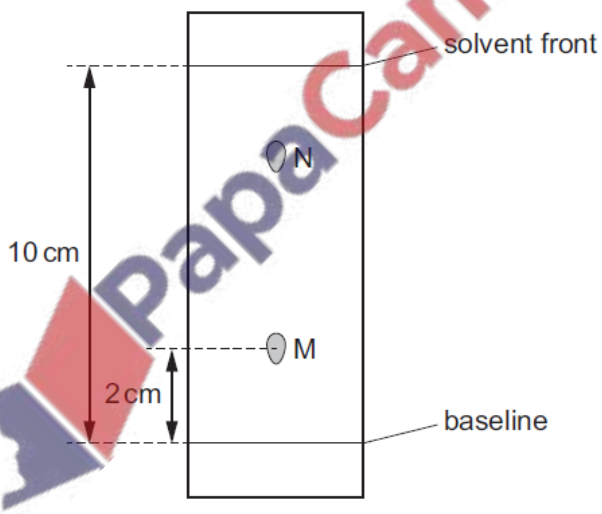
C The solute is salt.

D The solvent is a mixture of salt and water.

13. June/2023/Paper_ 0620/22/No.39

Two compounds, M and N, are dissolved in water and separated by chromatography.

The results are shown.



What is the R_f value of M and which compound is most soluble in water?

	R_f value of M	most soluble compound
A	0.2	M
B	0.2	N
C	5.0	M
D	5.0	N

14. June/2023/Paper_ 0620/23/No.38

Dilute hydrochloric acid is titrated into a conical flask containing sodium hydroxide solution and a few drops of methyl orange indicator.

Which piece of apparatus is used to add the hydrochloric acid?

A beaker

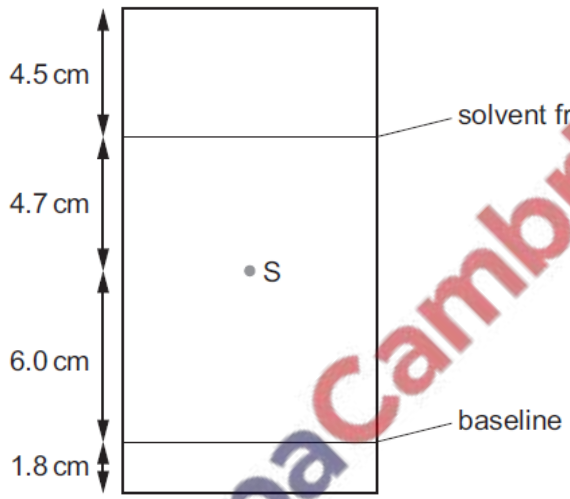
B burette

C measuring cylinder

D pipette

15. June/2023/Paper_ 0620/23/No.39

The chromatogram obtained from a chromatography experiment on substance S is shown.



What is the R_f value of S?

A 0.39 **B** 0.46 **C** 0.56 **D** 0.62

16. June/2023/Paper_ 0620/31/No.6(b)

(b) Crystals of zinc chloride can be prepared by reacting excess zinc with dilute hydrochloric acid.

Choose from the list, the method used to separate the unreacted zinc from the reaction mixture.

Draw a circle around your chosen answer.

chromatography **crystallisation** **evaporation** **filtration** [1]

17. March/2023/Paper_ 0620/12/No.37

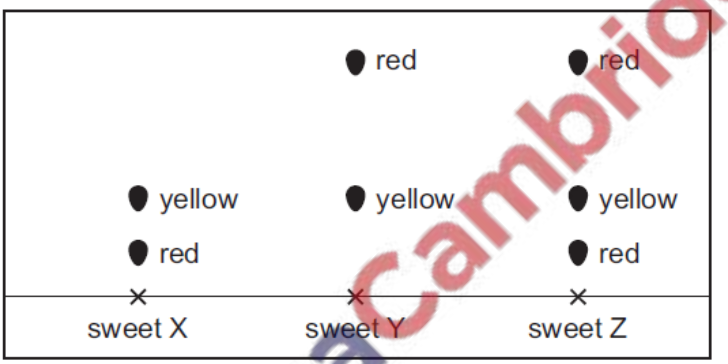
2.00 g of powdered calcium carbonate is added to 50.0 cm^3 of hydrochloric acid.

Which apparatus is used to measure these quantities of calcium carbonate and hydrochloric acid?

	calcium carbonate	hydrochloric acid
A	balance	burette
B	balance	thermometer
C	pipette	burette
D	pipette	thermometer

18. March/2023/Paper_ 0620/12/No.38

The diagram shows a chromatogram obtained from the colours of three different sweets, X, Y and Z.



How many different **red** dyes are present in the sweets?

A 1 **B** 2 **C** 3 **D** 4

19. March/2023/Paper_ 0620/12/No.39

A mixture contains sand and an aqueous solution of sodium chloride.

Which processes are used to obtain a sample of solid sand **and** a sample of solid sodium chloride from the mixture?

A crystallisation followed by filtration

B evaporation followed by filtration

C filtration followed by crystallisation

D simple distillation followed by crystallisation

20. March/2023/Paper_ 0620/12/No.40

A student tests an unknown compound M.

The compound:

- produces a lilac flame using a flame test
- produces a gas which turns limewater cloudy when dilute hydrochloric acid is added.

What is M?

A sodium sulfate

B sodium carbonate

C potassium sulfate

D potassium carbonate

21. March/2023/Paper_ 0620/22/No.37

2.00 g of powdered calcium carbonate is added to 50.0 cm^3 of hydrochloric acid.

Which apparatus is used to measure these quantities of calcium carbonate and hydrochloric acid?

	calcium carbonate	hydrochloric acid
A	balance	burette
B	balance	thermometer
C	pipette	burette
D	pipette	thermometer

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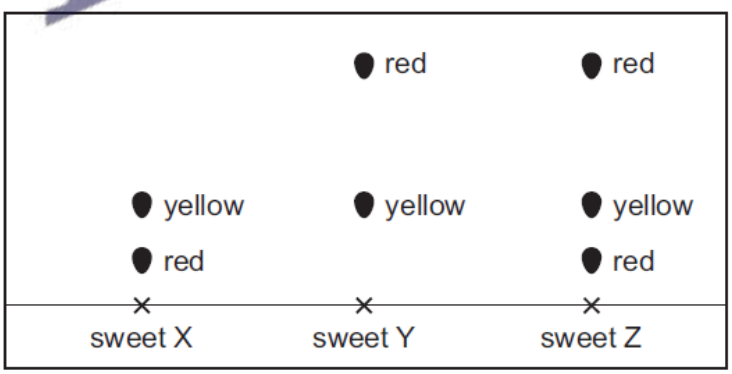

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24. March/2023/Paper_ 0620/22/No.40

A student tests an unknown compound M.

The compound:

- produces a lilac flame using a flame test
- produces a gas which turns limewater cloudy when dilute hydrochloric acid is added.

What is M?

A sodium sulfate

B sodium carbonate

C potassium sulfate

D potassium carbonate

25. March/2023/Paper_ 0620/32/No.2(a)

(a) A sample of soil is shaken with distilled water.

Draw a diagram to show the filtration apparatus used to separate the soil from the solution obtained by shaking the soil with distilled water.

On your diagram, label:

- the filtrate
- the residue.

[3]