AQA – Chemical analysis – GCSE Chemistry P2

1. June/2021/Paper_2F/No.2

0 2 This question is about water.

A student investigated the concentration of salt in sea water.

This is the method used.

1. Filter the sea water to remove sand.
2. Measure the mass of an empty evaporating dish.
3. Measure 50 cm^3 of sea water into the evaporating dish.
4. Heat the evaporating dish and sea water.
5. Evaporate the sea water to dryness.
6. Measure the mass of the evaporating dish and salt.

0 2 . 1 What equipment should the student use to measure:

- the mass of the evaporating dish
- the volume of sea water?

[2 marks]

Mass of evaporating dish _____

Volume of sea water _____

0 2 . 2 **Table 2** shows the student's results.

Table 2

	Mass in g
Evaporating dish	30.44
Evaporating dish and salt	30.49

The student used 50 cm^3 of sea water.

Calculate the mass of salt in 1000 cm^3 of this sea water.

[3 marks]

Mass of salt = _____ g

0 2 . 3 The salt must be completely dry.

Which **two** extra steps are needed to show that the salt is completely dry?

[2 marks]

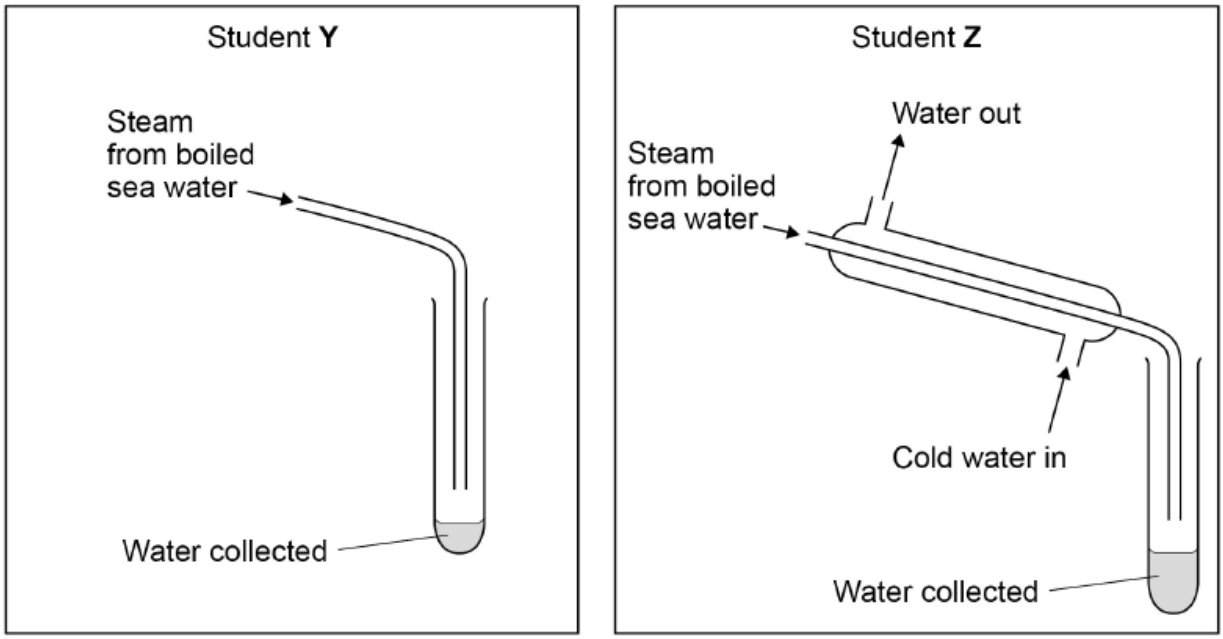
Tick (✓) **two** boxes.

- Filter the sea water again. ☐
- Heat the evaporating dish and salt again. ☐
- Measure the 50 cm^3 of sea water again. ☐
- Measure the mass of the empty evaporating dish again. ☐
- Measure the mass of the evaporating dish and salt again. ☐

Two students, **Y** and **Z**, distil sea water to collect water.

Figure 1 shows the apparatus used by each student to collect the water.

Figure 1



0 2 . 4 Students **Y** and **Z** boil the same volume of sea water for the same period of time.

Explain why student **Y** collects a smaller volume of water than student **Z**.

[2 marks]

0 2 . 5 Water obtained by distillation does **not** need to be sterilised and is safe to drink.

Suggest why.

[1 mark]

Fresh water needs to be sterilised before it is safe to drink.

0 2 . 6 How is fresh water sterilised?

[2 marks]

Tick (✓) **two** boxes.

- Using ammonia ☐
- Using chlorine ☐
- Using chromatography ☐
- Using filtration ☐
- Using ozone ☐

0 2 . 7 A student tests the pH of fresh water using universal indicator solution.

When added to the fresh water, the colour of the universal indicator solution is green.

What is the pH of this fresh water?

[1 mark]

pH = _____

2. June/2021/Paper_2F/No.6

0 6 Potash alum is a chemical compound.

Potash alum contains potassium ions, aluminium ions and sulfate ions.

0 6 . 1 Which **two** methods can be used to identify the presence of potassium ions in potash alum solution?

[2 marks]

Tick (✓) **two** boxes.

- Flame emission spectroscopy ☐
- Flame test ☐
- Measuring boiling point of solution ☐
- Paper chromatography ☐
- Using litmus paper ☐

0 6 . 2 Sodium hydroxide solution is used to test for some metal ions.

Sodium hydroxide solution is added to a solution of potash alum until a precipitate forms.

Complete the sentence.

Choose the answer from the box.

[1 mark]

blue	**brown**	**green**	**white**

The colour of the precipitate formed is _____.

0 6 . 3 Complete the sentence.

Choose the answer from the box.

[1 mark]

barium chloride solution	**limewater**
red litmus paper	**silver nitrate solution**

Sulfate ions can be identified using dilute hydrochloric acid

and _____.

0 6 . 4 A solution of potash alum has a concentration of 258 g/dm^3

Calculate the mass of potash alum needed to make 800 cm^3 of a solution of potash alum with a concentration of 258 g/dm^3

Give your answer to 3 significant figures.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

Mass (3 significant figures) = _____ g

3. June/2021/Paper_2F/No.10

1 0 This question is about paper chromatography.

A food colouring contains a dye.

1 0 . 1 Plan an investigation to determine the R_f value for the dye in this food colouring.

$$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

Your plan should include the use of:

- a beaker
- a solvent
- chromatography paper.

[6 marks]

1 0 . 2 Two students investigated a dye in a food colouring using paper chromatography.

Each student did the investigation differently.

The R_f values they determined for the **same** dye were different.

How did the students' investigations differ?

[1 mark]

Tick (✓) **one** box.

Different length of paper used ☐

Different period of time used ☐

Different size of beaker used ☐

Different solvent used ☐

1 0 . 3 Paper chromatography involves a stationary phase.

What is the stationary phase in paper chromatography?

[1 mark]

Tick (✓) **one** box.

Beaker ☐

Dye ☐

Paper ☐

Solvent ☐

4. June/2021/Paper_2H/No.3

0 3 This question is about paper chromatography.

A food colouring contains a dye.

0 3 . 1 Plan an investigation to determine the R_f value for the dye in this food colouring.

$$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

Your plan should include the use of:

- a beaker
- a solvent
- chromatography paper.

[6 marks]

0 3 . 2 Two students investigated a dye in a food colouring using paper chromatography.

Each student did the investigation differently.

The R_f values they determined for the **same** dye were different.

How did the students' investigations differ?

[1 mark]

Tick (✓) **one** box.

- Different length of paper used ☐
- Different period of time used ☐
- Different size of beaker used ☐
- Different solvent used ☐

0 3 . 3 Paper chromatography involves a stationary phase.

What is the stationary phase in paper chromatography?

[1 mark]

Tick (✓) **one** box.

- Beaker ☐
- Dye ☐
- Paper ☐
- Solvent ☐

5. June/2021/Paper_2H/No.8(8.4)

Copper is extracted from low-grade ores by phytomining.

0 8 . 4 Describe how copper is extracted from low-grade ores by phytomining.

[4 marks]