

(Soluble salts (practical preparation))

Q1. (2018)

Describe a method to make pure, dry crystals of magnesium sulfate from a metal oxide and a dilute acid.

[6 marks]

Q2. a). (2021)

A student makes crystals of magnesium sulfate.

This is the method used.

1. Add sulfuric acid to a beaker.
2. Warm the sulfuric acid.
3. Add a spatula of magnesium oxide to the beaker.
4. Stir the mixture.
5. Repeat steps 3 and 4 until there is magnesium oxide remaining in the beaker.
6. Filter the mixture.
7. Evaporate the filtrate gently until crystals start to form.
8. Leave the solution to finish crystallising.

Give **one** reason for:

- step 2
- step 5
- step 6.

[3 marks]

Step 2 _____

Step 5 _____

Step 6 _____

Q2. b). (2021)

How should the filtrate be evaporated gently in **step 7**?

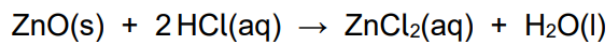
[1 mark]

Q3. a). (2022)

This question is about zinc and compounds of zinc.

A student produces pure crystals of zinc chloride by reacting zinc oxide with hydrochloric acid.

The equation for the reaction is:



The student adds zinc oxide to hydrochloric acid until the zinc oxide is in excess.

Give **one** observation that the student could make to show that the zinc oxide is in excess.

[1 mark]

Q3. b). (2022)

Why is excess zinc oxide used rather than excess hydrochloric acid?

[1 mark]

Q3. c). (2022)

Name **one other** compound that the student could add to hydrochloric acid to produce zinc chloride.

[1 mark]

Q3. d). (2022)

Describe how the student should obtain crystals of zinc chloride from a solution of zinc chloride.

[2 marks]

Q4. (2023)

This question is about making a soluble salt.

Plan a method to make pure, dry crystals of zinc chloride from zinc carbonate and a dilute acid.

[6 marks]

Q5. a). (2024)

A student produced a salt by reacting copper carbonate with sulfuric acid.

This is the method used.

1. Measure 50 cm³ of sulfuric acid into a beaker.
2. Add copper carbonate powder.
3. Stir the mixture.
4. Repeat steps 2 and 3 until copper carbonate is in excess.
5. Filter the mixture.
6. Warm the filtrate gently until crystals start to appear.
7. Leave the solution to cool and crystallise.

Complete the word equation for the reaction.

[2 marks]

copper carbonate + sulfuric acid → _____ + _____ + carbon dioxide

Q5. b). (2024)

Give **one** observation the student could make during **Step 4** which shows that the copper carbonate is in excess.

[1 mark]

Q5. c). (2024)

Give **one** reason for filtering the mixture in **Step 5**.

[1 mark]

Q5. d). (2024)

Name the equipment that can be used to warm the filtrate **gently** in **Step 6**.

[1 mark]
