

Reactions of acids with metals, bases, and carbonates

Q1. (2018)

0 3 . 2 Zinc nitrate can be produced by reacting an acid and a metal oxide.

Name the acid and the metal oxide used to produce zinc nitrate.

[2 marks]

Acid _____

Metal oxide _____

Q2. (2018)

0 4 . 2 Name the two products when calcium carbonate (CaCO_3) is heated.

[2 marks]

_____ and _____

Q3. (2018)

0 4 . 3 What type of reaction happens when a compound breaks down?

[1 mark]

Tick **one** box.

burning

☐

decomposition

☐

neutralisation

☐

reduction

☐

Q4. (2019)

A)

A student wants to make copper chloride crystals.

The student adds excess copper oxide to some hot acid.

The student stirs the mixture.

0 2 . 1 Which acid should the student use?

[1 mark]

Tick (✓) **one** box.

Hydrochloric acid

☐

Nitric acid

☐

Sulfuric acid

☐

B)

0 2 . 2 Suggest how the student would know that excess copper oxide has been added.

[1 mark]

Q5. (2019)

0 2 . 3 There are four more stages, **A**, **B**, **C** and **D**, to make copper chloride crystals.

The stages **A**, **B**, **C** and **D** are not in the correct order.

Stage **A** Partially evaporate by heating with a water bath

Stage **B** Filter the mixture into an evaporating basin

Stage **C** Leave to crystallise

Stage **D** Remove and dry the crystals

Put stages **A**, **B**, **C** and **D** in the correct order.

[2 marks]

First stage _____

Second stage _____

Third stage _____

Fourth stage _____

Q6. (2020)

0 1 . 2 An acid reacts with zinc to produce zinc chloride and hydrogen.

Which acid reacts with zinc to produce zinc chloride?

[1 mark]

Tick (✓) **one** box.

Hydrochloric acid ☐

Nitric acid ☐

Sulfuric acid ☐

Q7. (2020)

A student reacts an acid with copper oxide.

0 1 . 6 The reaction between the acid and copper oxide is very slow at room temperature.

How could the student speed up the reaction?

[1 mark]

Q8. (2021)

0 1 . 2 Write the word equation for the reaction when magnesium reacts with chlorine.

[1 mark]

_____ + _____ → _____

Q9. (2021)

Magnesium carbonate decomposes to produce magnesium oxide and carbon dioxide.

The word equation for the reaction is:



Four students heated 2.00 g of magnesium carbonate for 10 minutes.

Table 1 shows the results.

Table 1

Mass of carbon dioxide produced in g				
Student 1	Student 2	Student 3	Student 4	Mean
0.97	0.91	0.50	0.95	X

0 1 . 6 What is the most likely reason for Student 3's anomalous result?

[1 mark]

Tick (✓) **one** box.

The student heated more than 2.00 g of magnesium carbonate.

☐

The student heated the magnesium carbonate for less than 10 minutes.

☐

The student used a higher temperature.

☐

Q10. (2021)

0 4 . 3 Sodium reacts with water to produce sodium hydroxide and hydrogen.

Balance the equation for the reaction.

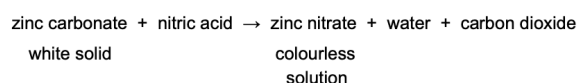
[1 mark]



Q11. (2021)

Zinc carbonate reacts with nitric acid.

The word equation for the reaction is:



0 7 . 4 Give **two** observations that would be made when zinc carbonate is added to nitric acid until the zinc carbonate is in excess.

[2 marks]

1 _____

2 _____

Q12. (2022)

0 2 . 2 Hydrogen chloride dissolves in water to produce hydrochloric acid.

Hydrochloric acid reacts with sodium hydroxide solution.

Complete the word equation for the reaction between hydrochloric acid and sodium hydroxide.

[1 mark]



Q13. (2022)

0 5

This question is about salts.

Green copper carbonate and sulfuric acid can be used to produce blue copper sulfate crystals.

0 5 . 1

Excess copper carbonate is added to sulfuric acid.Give **three** observations you would make.**[3 marks]**

1 _____

2 _____

3 _____

Q14. (2022)

0 5 . 4

Copper carbonate and sulfuric acid react to produce copper sulfate.

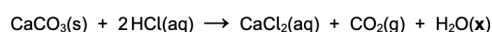
What type of reaction is this?

[1 mark]

Q15. (2023)

Calcium carbonate reacts with hydrochloric acid to produce carbon dioxide.

The equation for the reaction is:



0 6 . 5

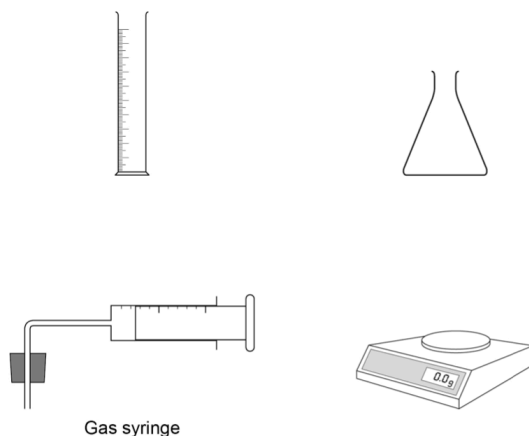
What is the state symbol (x) in the equation?

[1 mark]Tick (✓) **one** box.

(aq) ☐ (g) ☐ (l) ☐ (s) ☐

Q16. (2023)

0 6 . 6

Figure 15 shows equipment a student used for an investigation.**Figure 15**

Gas syringe

The student investigated the volume of carbon dioxide produced when different masses of calcium carbonate react with hydrochloric acid.

Describe a method the student could use.

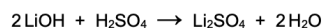
[6 marks]

Q17. (2023)

07

Lithium hydroxide reacts with sulfuric acid to produce lithium sulfate.

The equation for the reaction is:



07.1

What type of reaction is this?

[1 mark]

Q18. (2024)

Zinc reacts with copper sulfate solution to produce salt **A** and copper.

The word equation for the reaction is:



03.2

What is the name of salt **A**?

[1 mark]

Q19. (2024)

05.1

Magnesium reacts with hydrochloric acid to produce magnesium chloride and a gas.

Which gas is produced?

[1 mark]

Tick (✓) **one** box.

Hydrogen

☐

Nitrogen

☐

Oxygen

☐

Q20. (2024)

07.1

What is the formula of the acid used to prepare copper sulfate?

[1 mark]

Tick (✓) **one** box.

HCl

☐HNO₃☐H₂SO₄☐

Q21. (2024)

07.5

Why does the mass of the contents of the test tube decrease in mass when copper carbonate is thermally decomposed?

[1 mark]