

METAL ACID REACTIONS



Answer all the questions below then check your answers

- Which of the following metals reacts vigorously with hydrochloric acid?
a) Copper b) Silver c) Zinc d) Gold
- What is the general product formed when a metal reacts with an acid?
a) Metal oxide b) Salt and water c) Salt and hydrogen gas
d) Metal hydroxide
- Define a salt in terms of chemistry.
- What type of reaction occurs between a metal and an acid, and what are the general products?
- Write the word and balanced chemical equation for the reaction between magnesium and hydrochloric acid.
- Describe what happens during the reduction and oxidation in the reaction between zinc and sulfuric acid.

6. Match the acid with the correct salt produced when it reacts with zinc:

Acid	Salt
Hydrochloric	Zinc sulfate
Sulfuric	Zinc nitrate
Nitric	Zinc chloride

7. Fill in the gaps to complete the sentences below:

a. When zinc reacts with hydrochloric acid, the products are the salt _____ and _____ gas.

b. In the reaction between magnesium and sulfuric acid, the _____ is oxidised and the _____ ions are reduced.

8. Describe the process of oxidation and reduction in terms of electron transfer, using the reaction between magnesium and sulfuric acid as an example.

9. Write the word and balanced chemical equation for the reaction between aluminium and nitric acid.

Answers

1. Which of the following metals reacts vigorously with hydrochloric acid?

- a) Copper b) Silver c) Zinc d) Gold

Answer: c) Zinc

2. What is the general product formed when a metal reacts with an acid?

- a) Metal oxide b) Salt and water c) Salt and hydrogen gas

d) Metal hydroxide

Answer: c) Salt and hydrogen gas

3. Define a salt in terms of chemistry.

Answer: A salt is a compound formed when the hydrogen ion (H^+) from an acid is replaced by a metal ion or an ammonium ion (NH_4^+).

b. What type of reaction occurs between a metal and an acid, and what are the general products?

Answer: The reaction between a metal and an acid is a type of displacement reaction. The general products are a salt and hydrogen gas.

4. Write the word and balanced chemical equation for the reaction between magnesium and hydrochloric acid.

Answer:

Word Equation:

Magnesium + Hydrochloric Acid \rightarrow Magnesium Chloride + Hydrogen

Symbolic Equation:



5. Describe what happens during the reduction and oxidation in the reaction between zinc and sulfuric acid.

Answer:

Oxidation: Zinc is oxidized as it loses electrons ($\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$).

Reduction: Hydrogen ions (H^+) from sulfuric acid are reduced as they gain electrons to form hydrogen gas ($2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$).

6. Match the acid with the correct salt produced when it reacts with zinc:

Acid		Salt
Hydrochloric	→	Zinc sulfate
Sulfuric	→	Zinc nitrate
Nitric	→	Zinc chloride

7. Fill in the gaps to complete the sentences below:

- a. When zinc reacts with hydrochloric acid, the products are the salt _____ and _____ gas.

Answer: zinc chloride, hydrogen gas

- b. In the reaction between magnesium and sulfuric acid, the _____ is oxidised and the _____ ions are reduced.

Answer: magnesium, hydrogen

8. Describe the process of oxidation and reduction in terms of electron transfer, using the reaction between magnesium and sulfuric acid as an example.

Answer:

In the reaction between magnesium and sulfuric acid, oxidation and reduction can be described in terms of electron transfer:

Oxidation: Magnesium atoms lose two electrons to form magnesium ions



Reduction: Hydrogen ions (H^+) from sulfuric acid gain electrons to form hydrogen gas:



This demonstrates that oxidation is the loss of electrons, while reduction is the gain of electrons.

9. Write the word and balanced chemical equation for the reaction between aluminium and nitric acid.

Answer:

Word Equation:



Symbolic Equation:

