



Reactions of Acids

Name _____ Class _____

Acids react with many materials, including metals. When an acid reacts with a metal, it produces a salt and releases hydrogen gas.

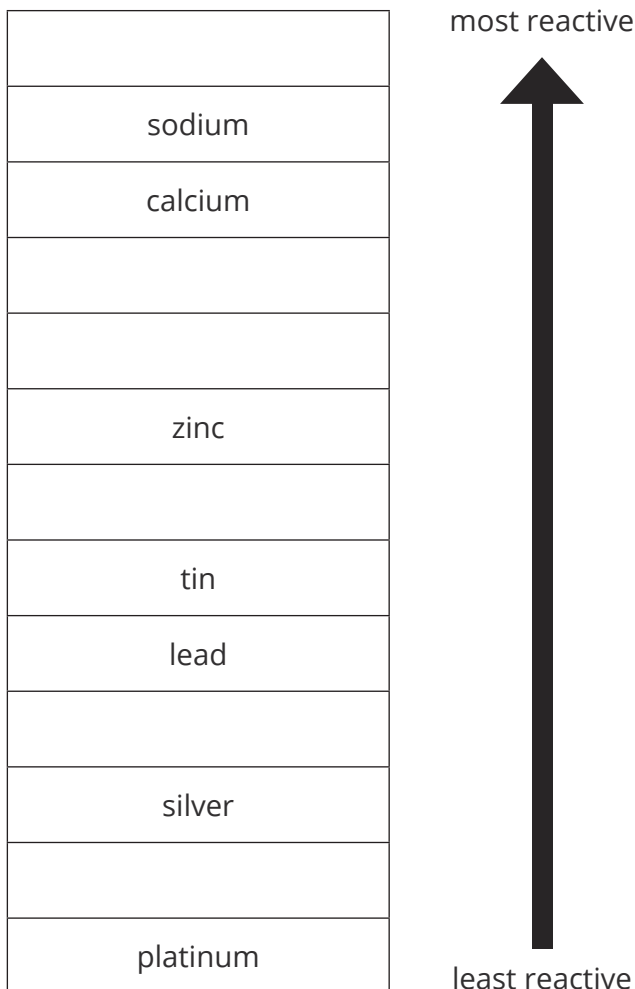
1. Complete the general word equation for the reaction between an acid and a metal.

acid + metal → _____ + _____

Metals can be organised based on their reactivity. Part of the reactivity series for some common metals is shown below.

2. Complete the reactivity series by writing in the missing metals. Choose answers from the box.

aluminium	copper	gold
iron	magnesium	potassium



3. Describe how you would test for the presence of hydrogen gas.



The name of the salt produced in a reaction between a metal and an acid depends on the metal and the acid involved in the reaction. The first part of the name comes from the metal, and the second part comes from the acid.

For example, **potassium** reacts with **sulfuric acid** to produce **potassium sulfate**.

4. Complete the table below to show the general name of the salt produced by each acid. The first one has been done for you.

Name of Acid	Name of Salt
sulfuric acid	sulfate
hydrochloric acid	
nitric acid	

5. Match the name of each acid to its chemical formula.

Name of Acid	Chemical Formula
hydrochloric acid	HNO_3
nitric acid	H_2SO_4
sulfuric acid	HCl

6. Complete the table to give the name of the salt produced in each reaction.

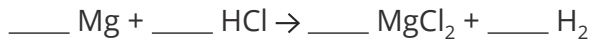
Metal	Acid	Salt
sodium	hydrochloric acid	
zinc	nitric acid	
magnesium	sulfuric acid	
aluminium	hydrochloric acid	
silver	nitric acid	
copper	sulfuric acid	



7.

- a. Write the word equation for the reaction between calcium and hydrochloric acid.

- b. Balance the symbol equation for the reaction between magnesium and hydrochloric acid.

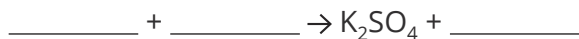


Acids also react with metal oxides and metal hydroxides. Metal oxides and metal hydroxides are bases so they will neutralise the acid, producing water as well as the metal salt. This is called a neutralisation reaction.

8.

- a. Write the general word equation for the reaction between an acid and a metal oxide.

- b. Complete and balance the symbol equation for the reaction between sulfuric acid and potassium hydroxide (KOH).



Acids also react with metal carbonates. The reaction between an acid and a metal carbonate produces a metal salt, water and carbon dioxide gas. Carbon dioxide gas can be tested for using limewater. The general equation for the reaction is:



9.

- a. Write the word equation for the reaction between nitric acid and calcium carbonate.

- b. Write and balance the symbol equation for the reaction between hydrochloric acid and sodium carbonate (Na_2CO_3).



Reactions of Acids **Answers**

Acids react with many materials, including metals. When an acid reacts with a metal, it produces a salt and releases hydrogen gas.

1. Complete the general word equation for the reaction between an acid and a metal.



Metals can be organised based on their reactivity. Part of the reactivity series for some common metals is shown below.

2. Complete the reactivity series by writing in the missing metals. Choose answers from the box.

aluminium	copper	gold
iron	magnesium	potassium

potassium	<p>most reactive</p> <p>least reactive</p>
sodium	
calcium	
magnesium	
aluminium	
zinc	
iron	
tin	
lead	
copper	
silver	
gold	
platinum	

3. Describe how you would test for the presence of hydrogen gas.

Introduce a lit splint to the gas. If hydrogen is present, it produces a squeaky pop.

The name of the salt produced in a reaction between a metal and an acid depends on the metal and the acid involved in the reaction. The first part of the name comes from the metal, and the second part comes from the acid.

For example, **potassium** reacts with **sulfuric acid** to produce **potassium sulfate**.

4. Complete the table below to show the general name of the salt produced by each acid. The first one has been done for you.

Name of Acid	Name of Salt
sulfuric acid	sulfate
hydrochloric acid	chloride
nitric acid	nitrate

5. Match the name of each acid to its chemical formula.

Name of Acid	Chemical Formula
hydrochloric acid	HNO ₃
nitric acid	H ₂ SO ₄
sulfuric acid	HCl

Connections: Hydrochloric acid is connected to HCl. Nitric acid is connected to HNO₃. Sulfuric acid is connected to H₂SO₄.

6. Complete the table to give the name of the salt produced in each reaction.

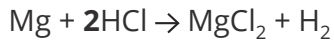
Metal	Acid	Salt
sodium	hydrochloric acid	sodium chloride
zinc	nitric acid	zinc nitrate
magnesium	sulfuric acid	magnesium sulfate
aluminium	hydrochloric acid	aluminium chloride
silver	nitric acid	silver nitrate
copper	sulfuric acid	copper sulfate

7.

- a. Write the word equation for the reaction between calcium and hydrochloric acid.

calcium + hydrochloric acid → calcium chloride + hydrogen

- b. Balance the symbol equation for the reaction between magnesium and hydrochloric acid.



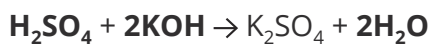
Acids also react with metal oxides and metal hydroxides. Metal oxides and metal hydroxides are bases so they will neutralise the acid, producing water as well as the metal salt. This is called a neutralisation reaction.

8.

- a. Write the general word equation for the reaction between an acid and a metal oxide.

acid + metal oxide → metal salt + water

- b. Complete and balance the symbol equation for the reaction between sulfuric acid and potassium hydroxide (KOH).



Acids also react with metal carbonates. The reaction between an acid and a metal carbonate produces a metal salt, water and carbon dioxide gas. Carbon dioxide gas can be tested for using limewater. The general equation for the reaction is:

acid + metal carbonate → metal salt + water + carbon dioxide

9.

- a. Write the word equation for the reaction between nitric acid and calcium carbonate.

nitric acid + calcium carbonate → calcium nitrate + water + carbon dioxide

- b. Write and balance the symbol equation for the reaction between hydrochloric acid and sodium carbonate (Na_2CO_3).

