

What is an oxidation reaction?

e.g. copper + oxygen → _____

What is a reduction reaction?

e.g. copper oxide → _____

a

Describe why carbon is used to extract some metals from their ores.

Clue: Think about the reactivity series.

d

Describe how to make a soluble salt from an insoluble base.

1. Choose an a_____.
2. Choose an i_____ base.
3. Warm the a_____.
4. Add the insoluble base to the acid until there is no further r_____.
5. F_____ the mixture.
6. Heat the solution to e_____ the water.
7. C_____ of salt will start to form.

h

Place the following metals in order of reactivity – adding the names to the symbols.

Na, Zn, Fe, Cu, Li, K, Mg, Ca

b

How can the reactions of metals be used to work out the reactivity series?

Clue: Think about the gas given off and the amount.

e

Why are hydrogen and carbon sometimes included in the reactivity series?

Place arrows on the reactivity series where hydrogen and carbon could go.

Why is gold often found in its pure state?

c

Complete the word equations.

zinc carbonate + sulfuric acid →

magnesium oxide + hydrochloric acid →

magnesium carbonate + nitric acid →

calcium carbonate + hydrochloric acid →

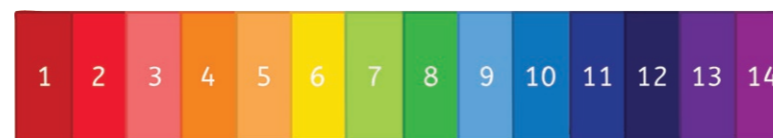
universal indicator
 Litmus paper
 iodine
 methylene blue
 Benedict's solution
 pH meter

(select two)

g

On the pH scale, label:

strong acid;
 strong alkali;
 neutral;
 weak acid;
 weak alkali.



f

Complete the neutralisation reaction.

acid + base → s_____ + w_____

$H^+ (aq) + OH^- (aq) \rightarrow$ _____.

What is the pH of the products of a neutralisation reaction?

- a) 1 b) 7 c) 14

i

Complete the sentences by choosing one of the answers:

Some metals react with water to produce...

oxygen and alkali.

salt and hydrogen.

metal hydroxide and hydrogen.

Some metals react with acid to produce...

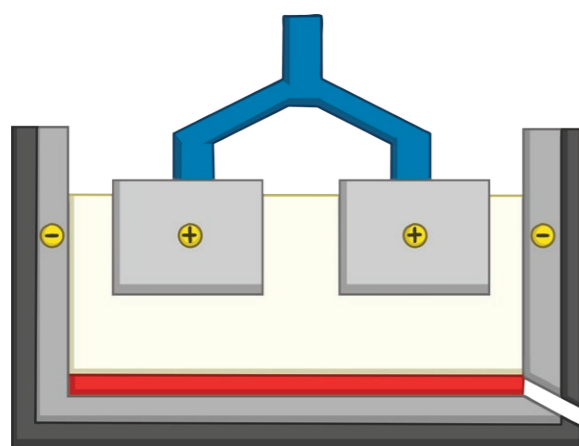
oxygen and alkali.

salt and hydrogen.

alkali and carbon dioxide.

j

Describe how the ions move when aluminium is extracted by electrolysis.



Why is aluminium oxide mixed with cryolite?

What is the overall equation for the electrolysis of Al_2O_3 to make aluminium and oxygen?

Why can aluminium not be extracted by carbon?

a

Circle the equations below if a (displacement) reaction will occur.

- copper oxide + magnesium
- magnesium oxide + iron
- potassium oxide + zinc
- zinc oxide + lithium

Why do some of them not work?

b

If the metal is more reactive than hydrogen, what gas will form during electrolysis?

If the metal is less reactive than hydrogen, what will form?

If the salt contains halide ions, where will Cl_2 , Br_2 I_2 form; anode or cathode?

f

What is electrolysis?

How are ions able to move in electrolysis?

The positive ions go towards the c_____ where they g_____ electrons.

The negative ions go towards the a_____ where they l_____ electrons.

Why can molten ionic compounds be electrolysed?
Choose an answer.

- They can not move
- They can move

c

What are the tests for:

chlorine;

hydrogen;

oxygen?

g

I understand the following topic

I need to work on the following topic

h

In copper sulfate solution what forms at the:

cathode anode

d

In sodium chloride solution what forms at the:

cathode anode

e

What is an oxidation reaction?

The gaining of oxygen in a reaction.

e.g. copper + oxygen → **copper oxide**

What is a reduction reaction?

The loss of oxygen in a reaction.

e.g. copper oxide → **copper + water**

Place the following metals in order of reactivity – adding the names to the symbols.

Na, Zn, Fe, Cu, Li, K, Mg, Ca

potassium

sodium

lithium

calcium

magnesium

zinc

iron

copper

←————— carbon

←————— hydrogen

Why are hydrogen and carbon sometimes included in the reactivity series?

They are used in the extraction of the metals.

Place arrows on the reactivity series where hydrogen and carbon could go.

Why is gold often found in its pure state?

Gold is a very unreactive metal.

Complete the word equations.

zinc carbonate + sulfuric acid → **zinc sulfate + water + carbon dioxide**

magnesium oxide + hydrochloric acid → **magnesium chloride + water**

magnesium carbonate + nitric acid → **magnesium nitrate + water + carbon dioxide**

calcium carbonate + hydrochloric acid → **calcium chloride + water + carbon dioxide**

Describe why carbon is used to extract some metals from their ores.

Clue: Think about the reactivity series.

Metals below carbon in the reactivity series can be extracted by reduction using carbon. This is because carbon can take the oxygen away.

How can the reactions of metals be used to work out the reactivity series?

Clue: Think about the gas given off and the amount.

The more bubbles produced, and the faster that they are produced, the more reactive the metal.

On the pH scale, label:

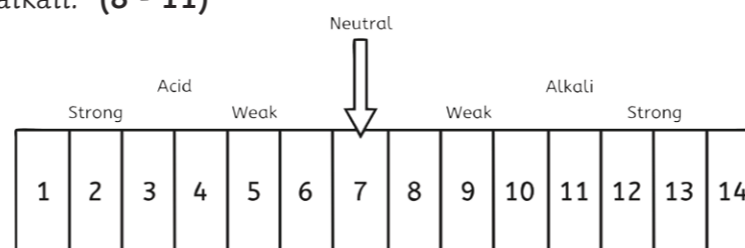
strong acid; **(0 - 3)**

strong alkali; **(12 - 14)**

neutral; **(7)**

weak acid; **(4 - 6)**

weak alkali. **(8 - 11)**



To measure pH you can use...

universal indicator

Litmus paper

iodine

methylene blue

Benedict's solution

pH meter

(select two)

Describe how to make a soluble salt from an insoluble base.

1. Choose an **acid**.
2. Choose an **insoluble** base.
3. Warm the **acid**.
4. Add the insoluble base to the acid until there is no further **reaction**.
5. **Filter** the mixture.
6. Heat the solution to **evaporate** the water.
7. **Crystals** of salt will start to form.

Complete the neutralisation reaction.

acid + base → **salt + water**

$H^+ (aq) + OH^- (aq) \rightarrow H_2O$.

What is the pH of the products of a neutralisation reaction?

a) 1 **b) 7** c) 14

Complete the sentences by choosing one of the answers:

Some metals react with water to produce...

oxygen and alkali.

salt and hydrogen.

metal hydroxide and hydrogen.

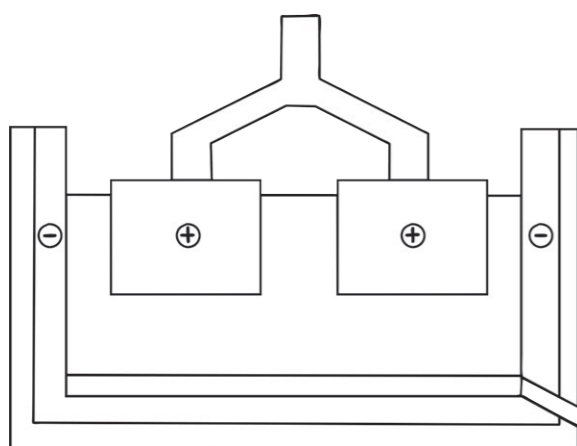
Some metals react with acid to produce...

oxygen and alkali.

salt and hydrogen.

alkali and carbon dioxide.

Describe how the ions move when aluminium is extracted by electrolysis.



The positive ions are attracted to the negative electrode where they form aluminium atoms. Negative oxygen ions are attracted to the positive electrode where they react to form O₂ molecules.

Why is aluminium oxide mixed with cryolite?

It lowers the melting point.

What is the overall equation for the electrolysis of Al₂O₃ to make aluminium and oxygen?

aluminium oxide → aluminium + oxygen



Why can aluminium not be extracted by carbon?

It is more reactive than carbon so can not be displaced by the carbon.

Circle the equations below if a (displacement) reaction will occur.

copper oxide + magnesium

magnesium oxide + iron

potassium oxide + zinc

zinc oxide + lithium

Why do some of them not work?

The metal has to be more reactive than the metal in the compound to take its place.

What is electrolysis?

Splitting up using electricity

How are ions able to move in electrolysis?

Ionic compounds are dissolved/melted so the ions can move.

The positive ions go towards the **cathode** where they **gain** electrons.

The negative ions go towards the **anode** where they **lose** electrons.

Why can molten ionic compounds be electrolysed?

Choose an answer.

They can not move

They can move

In copper sulfate solution what forms at the:

cathode anode

Copper **Oxygen and water**

Copper is less reactive than hydrogen so copper is formed.

In sodium chloride solution what forms at the:

cathode anode

hydrogen **chlorine**

Sodium more reactive than hydrogen so hydrogen is formed.

If the metal is more reactive than hydrogen, what gas will form during electrolysis?

Hydrogen

If the metal is less reactive than hydrogen, what will form?

Pure metal

If the salt contains halide ions, where will Cl₂, Br₂, I₂ form; anode or cathode?

Anode

What are the tests for:

chlorine;

bleaches damp litmus paper

hydrogen;

squeaky pop test

oxygen?

relight a glowing splint

I understand the following topic

I need to work on the following topic
