

State symbols

(s) _____
(l) _____
(g) _____
(aq) _____

Acids:

Form _____ ions in water.
Have a pH _____ 7
Examples include:
H _____ acid (HCl)
N _____ acid (_____)
S _____ acid (_____)

Neutralisation is a chemical reaction between an a _____ and an a _____

Word equation:

a _____ + a _____ \rightarrow s _____ + w _____

Ionic equation:

_____ (aq) + _____ (aq) \rightarrow H⁺ (l)

pH: a measure of how a _____ or a _____ a solution is. Acids and alkalis can be s _____ or w _____.

pH scale runs from 0 to _____
pH 7 is n _____
pH less than 7 is _____
pH more than 7 is _____

Making Salts:

1) **Acid + Metal \rightarrow Salt + Hydrogen** Eg. magnesium nitrate
Only for metals above hydrogen in the r _____
s _____. Not good for group 1 metals because they are too r _____.

Method: 1) Add e _____ metal to acid

2) Filtration to remove metal.

3) C _____ by e _____ the water
Eg. Nitric acid + magnesium \rightarrow m _____ + h _____
n _____

2) **Acid + Base \rightarrow Salt + Water** Eg. copper chloride

Eg. Hydrochloric + copper \rightarrow C _____ + W _____
acid O _____ C _____

3) **Acid + Carbonate \rightarrow Salt + Water + Carbon dioxide**

Eg. Sulphuric + Calcium \rightarrow calcium + water + carbon
Acid C _____ S _____ dioxide

4) **Acid + alkali \rightarrow Salt + Water** (includes ammonium salts)

Method: 1) Neutralisation with an i _____

2) N _____ without an indicator.

3) C _____ by e _____ the water.

Eg. Sodium sulphate

S _____ + Sodium \rightarrow Sodium + W _____
acid H _____ S _____

Acids Bases & Salts

Salts: ionic c _____ which are
n _____.

Naming: The first name is taken from a m _____.

The second name is from the a _____ they were made from:

S _____ acid makes s _____ salts

Hydroc _____ acid makes c _____ salts

N _____ acid makes n _____ salts

Strong and Weak Acids:

A concentrated solution of acid has a g _____ amount of acid in than a d _____ solution. C _____ acids are corrosive but diluting these can make them safe to use.

Strong acids ionise c _____ in solution. Examples are hydroc _____ acid, s _____ acid and n _____ acid.

Eg. $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$

Weak acids d _____ ionise completely in solution and form an e _____. An example is e _____ acid.

Eg. $\text{CH}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CH}_3\text{COO}^-$

Bases:

Have a pH _____ 7
Examples are
Metal o _____ and
Metal h _____.

Alkalis: are s _____ bases, which means they d _____ in water. Metal h _____ are examples of alkalis.

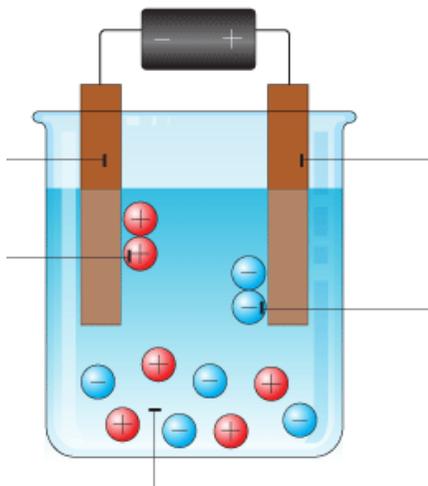
Ammonia: this dissolves in water to make an a _____ solution. It can be

n _____ with an acid to make ammonium salts, but no w _____ is made in the reaction. It is useful because it is an important f _____ because it contains n _____ which plants use to make proteins.

Electrolysis Key Ideas Notes

Electrolysis is used to _____ an _____ compound into it's _____ using _____.

1. Label the electrolysis apparatus:



2. An electrolyte is _____

_____.

It is usually an _____ compound.
Positive ions are attracted to the _____
electrode (_____).

Examples of positive ions:-

Negative ions are attracted to the _____
electrode (_____).

Examples of negative ions:-

3. a) What are the products when molten lead bromide is electrolysed?

b) Write half equations, including state symbols, for the reactions at the anode and cathode.

Anode:

Cathode:

*Remember gases are diatomic

General questions

1. Why must the ionic substance be molten or in solution?

2. Why do the ions move to the electrodes?

General questions

3. What are the two types of solutions that are electrolysed?

4. What are the electrodes made of?

5. Why are some metals extracted from their ores by electrolysis?

Aqueous Solutions

The products formed are based on the r_____ s_____.

a) At the negative electrode:-

H⁺ forms _____ gas, unless _____ and _____ are present in solution, as these metals are less reactive than H⁺.

b) At the positive electrode:-

OH⁻ produces _____ gas, unless _____ or _____ are present in solution.

c) Write half equations, including state symbols, for the reactions at the anode and cathode.

Anode:

Cathode:

*Remember gases are diatomic

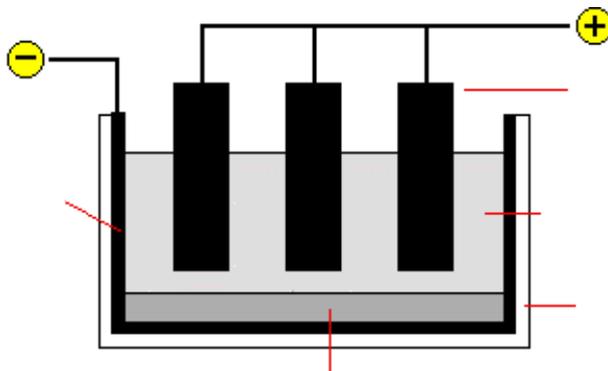
Electrolysis of molten aluminium oxide

1. What is the name of the ore containing aluminium?

2. What is added to Al₂O₃ to reduce its melting temperature?

3. Write a half equation to show what happens at the cathode

4. Write a half equation to show what happens at the anode

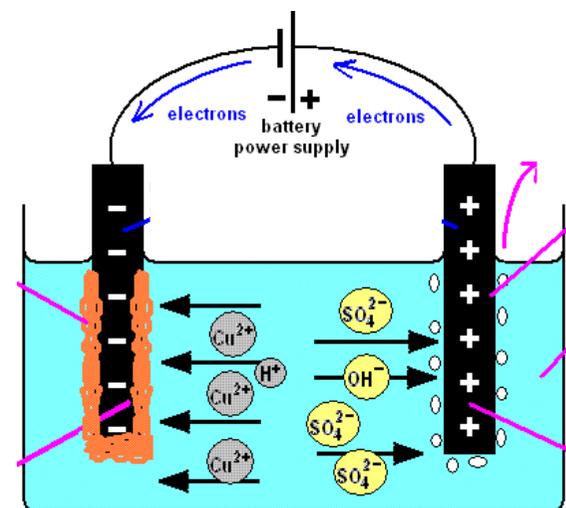


Electrolysis of copper sulfate solution

1. What happens to the colour of the copper sulfate solution as electrolysis happens?

2. Which metal is formed at the negative electrode? Write a half equation for this.

3. What is the gas formed at the positive electrode? Write the half equation for this.



C1 REVISION - CHAPTER 4 - CHEMICAL CHANGES - METALS

1) Complete the reactivity series below:

Potassium		_____ reactive
Lithium		
Calcium		
Aluminium		
Iron		
Tin		
Lead		
Silver		
Gold	_____ reactive	

2) Explain how the metals in the reactivity series react with water.

3) Explain how the metals in the reactivity series react with acid.

4) What is a displacement reaction?

5) Predict which metals will displace zinc from a solution.

6) Complete the following equation:

Iron + Lead nitrate \rightarrow _____ + _____

7) Add hydrogen and carbon to the reactivity series on the left.

Describe how metals are extracted by carbon, using equations.

Describe how metals are extracted by hydrogen, using equations.

Complete the anagram below:-

O
I
L
R
I
G

Explain why carbon can reduce zinc oxide but magnesium oxide cannot