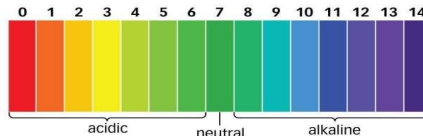


AQA C4a Chemical Changes: Metal & Acid Reactions

COMBINED FOUNDATION

RP – Making salts



Reactivity Series

metals form positive ions when they react

The reactivity of a metal is related to how easily it forms positive ions

The reactivity series arranges metals in order of their reactivity. You do not need to learn it.

carbon and hydrogen

carbon and hydrogen are non-metals but included in the reactivity series

This is so we can compare them to the metals

displacement

A more reactive metal can displace a less reactive metal from a compound.

silver nitrate + sodium
↓
sodium nitrate + silver

Strong & Weak Acids

strong acids

completely ionise in water

weak acids

partially ionise in water

hydrogen ions

as pH decreases by 1, H⁺ concentration goes up x10



Metal Salt Production

acid name

salt name

hydrochloric acid

chloride

sulfuric acid

sulfate

nitric acid

nitrate

from most to least reactive

potassium

sodium

lithium

calcium

magnesium

aluminium

zinc

iron

tin

lead

copper

silver

gold

reaction with water

bubbles, gives off hydrogen and leaves an alkaline solution

carbon
very slow reaction

slight reaction with steam

hydrogen
no reaction

reaction with dilute acid

explode

bubbles, gives off hydrogen and forms a salt

slow reaction with warm acid

no reaction

extraction method

electrolysis

reduction (removal of oxygen) with carbon

found as native metal

Neutralisation of Acids

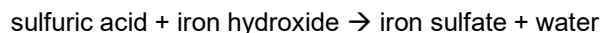
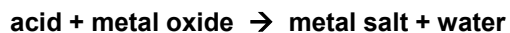
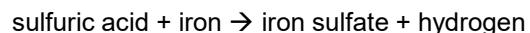
neutralisation

acids can be neutralised by bases

A **base** is a substance that neutralises an acid e.g. a metal carbonate, metal oxide, or soluble metal hydroxide, An **alkali** is a soluble base e.g. a metal hydroxide.



Reactions of Acids



Oxidation, Reduction and Metal Oxides

metals and oxygen

metals react with oxygen to form metal oxides

magnesium + oxygen → magnesium oxide



reduction

when oxygen is removed during a reaction

e.g. metal oxides reacting with carbon, extracting low reactivity metals

oxidation

when oxygen is gained during a reaction

e.g. metals reacting with oxygen to form metal oxides

Soluble salts

React acid with solid such as metal, metal oxide, metal hydroxide or metal carbonate.

Add solid in excess (until no more reacts).

Filter off excess solid.

Heat solution to crystallise solid salts.

