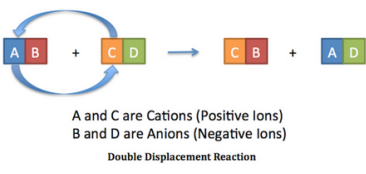


Displacement reactions and metal extraction

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt

Reactivity depends on tendency to form metal ion



HT: OILRIG
 Oxidation Is Loss of electrons
 Reduction Is Gain of electrons

- Metal + Oxygen → Metal Oxide
- Metal + Water → Metal Hydroxide + hydrogen
- Metal + acid → Metal salt + Hydrogen

Reactions of acids

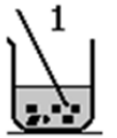
- Acid + metal → salt + hydrogen
- Acid + alkali → salt + water
- Acid + insoluble base → salt + water
- Acid + carbonate → salt + water + carbon dioxide

HT: OILRIG
 e.g. $2HCl + Mg \rightarrow MgCl_2 + H_2$
 Magnesium is oxidised
 $Mg \rightarrow Mg^{2+} + 2e^-$

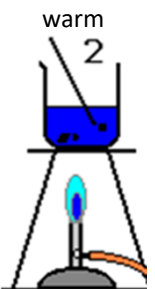
Hydrochloric Acid → Chlorides
 HCl
 Nitric Acid → Nitrates
 HNO_3
 Sulphuric Acid → Sulphates
 H_2SO_4

RP: Preparation of a dry sample of a soluble salt

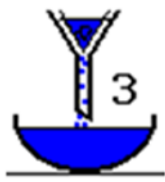
Choose correct acid



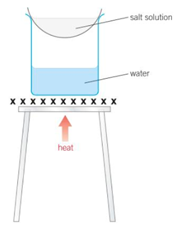
Add base to excess



warm



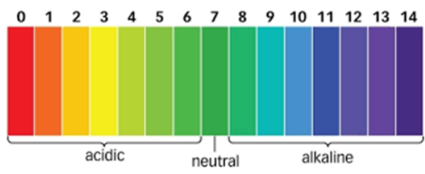
Filter off excess



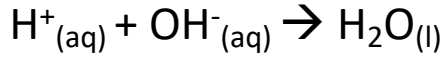
Evaporate off water

Chemical Changes

Neutralisation

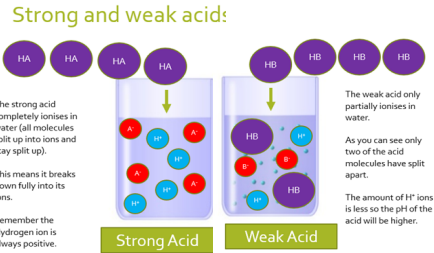


Acids produce H^+ ions
 Alkalis produce OH^- ions



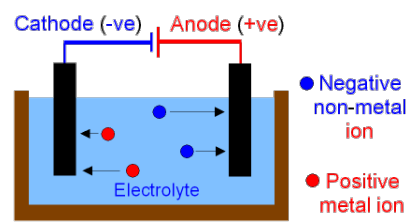
HT: Strong and Weak acids

Concentration of hydrogen ions in mol/dm ³	pH
0.10	1.0
0.010	2.0
0.0010	3.0
0.00010	4.0



Electrolysis

..of molten:

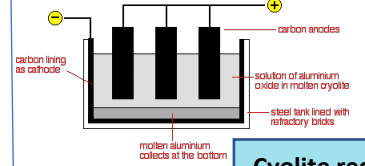


Higher: At the cathode
 $Pb^{2+} + 2e^- \rightarrow Pb$

Higher: At the anode
 $2Br^- \rightarrow Br_2 + 2e^-$
or
 $2Br^- - 2e^- \rightarrow Br_2$

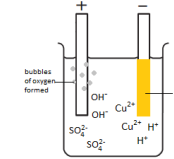
..to extract aluminium:

Oxygen goes to anode → CO₂ (needs replacing)



Cryolite reduces the melting point

..of solutions:



At the anode:
Halide (Gp7)
Oxygen

At the cathode:
Least reactive