

**relative atomic mass** - weighted mean mass of an atom of an element relative to 1/12th the mass of one atom carbon 12

**relative isotopic mass** - the mass of an isotope relative to 1/12th the mass of an atom of carbon 12 (ratio)

**mole** - the amount of substance that contains the same number of elementary particles as there are carbon atoms in 12g of carbon 12

### Calculations

number of particles = moles x  $6.02 \times 10^{23}$

moles = mass/Mr

moles = concentration x volume (dm<sup>3</sup>)

$pV = nRT$

**empirical formula** - the simplest whole number ratio of atoms of each element in a compound

ammonium	NH <sub>4</sub> <sup>+</sup>
hydroxide	OH <sup>-</sup>
nitrate	NO <sub>3</sub> <sup>-</sup>
nitrite	NO <sub>2</sub> <sup>-</sup>
hydrogen carbonate	HCO <sub>3</sub> <sup>-</sup>
manganate (VII)	MnO <sub>4</sub> <sup>-</sup>
carbonate	CO <sub>3</sub> <sup>2-</sup>
sulfate	SO <sub>4</sub> <sup>2-</sup>
sulfite	SO <sub>3</sub> <sup>2-</sup>
dichromate (VI)	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>
phosphate	PO <sub>4</sub> <sup>3-</sup>
oxide	O <sup>2-</sup>

hydrochloric acid	HCl
sulphuric acid	H <sub>2</sub> SO <sub>4</sub>
nitric acid	HNO <sub>3</sub>
phosphoric acid	H <sub>3</sub> PO <sub>4</sub>
ethanoic acid	CH <sub>3</sub> COOH

**relative molecular mass** - compares the mass of a molecule with the mass of one atom carbon 12

**acid** - releases H<sup>+</sup> ions as protons when dissolved in water - proton donor

**strong acid** - fully dissociates, releases all H<sup>+</sup> ions into solution

**weak acid** - partially dissociates

**base** - neutralises an acid to form a salt - metal oxides, metal hydroxides, metal carbonates and ammonia

**alkali** - soluble base, dissolves in water releasing hydroxide (OH<sup>-</sup>) ions into solution

- Group 1 metal hydroxides and carbonates
- group 2 metal hydroxides (only sparingly soluble) and ammonia

**salt** - product formed when the H<sup>+</sup> ion from an acid is replaced by a metal or ammonium ion

**neutralisation** - H<sup>+</sup> ions react with base to form salt and water, H<sup>+</sup> ions are replaced by metal or ammonium ions from the base

- solid hydroxide or oxide - solid dissolves
- solid metal carbonate - solid dissolves, effervescence
- aqueous metal carbonate - effervescence

**oxidation number** - number of electrons involved in bonding to another element

**disproportionation** - when the same element is oxidised and reduced in a reaction

**redox** - where oxidation and reduction occurs in a reaction

### Neutralisation Reactions

acid + metal hydroxide  $\longrightarrow$  salt + water  
acid + metal oxide  $\longrightarrow$  salt + water  
acid + metal carbonate  $\longrightarrow$  salt + water + carbon dioxide  
acid + ammonia  $\longrightarrow$  ammonium salt

### Oxidation Number Rules

- Group 1 = +1
- Group 2 = +2
- Group 3 = +3

then in ORDER

F = -1

H = +1 (-1 in metal hydrides)

O = -2 (-1 in peroxide, +2 with F)

Cl = -1

**O**xidation

**I**s

**L**oss

**R**eduction

**I**s

**G**ain