mass number = number of protons + number of neutrons

Isotope = Atoms with same number of protons but different number of neutrons.

relative atomic mass A_r = average mass of atom / $\frac{1}{12}$ mass of an atom of ^{12}C

relative molecular mass M_r = average mass of molecule / $\frac{1}{12}$ mass of an atom of ^{12}C

average mass = total mass / total number

Mass Spectrometry

Vaporisation - sample into gas.

Ionisation - Electrospray high Mr compounds
sample forced through hypodermic needle (in a volatile solvent)
High voltage at end of needle where spray emerges
Particles gain a proton and becomes an ion
Solvent evaporates leaving 1+ ions
Electron impact elements + low Mr compounds
High energy electrons fired at sample by e^- gun.
This knocks off one electron creating a 1+ ion

Acceleration - all ions accelerated to same kinetic energy by a negatively charged metal plate $\frac{1}{2}mv^2$

Ion drift - The ions pass into the flight tube $t = d\sqrt{\frac{m}{kE}}$
Ions with different masses have different Time of flight
(Light ions - faster · Heavier ions - slower)

Detection - metal plate @ end of flight tube
current produced by electrons from metal plate being transfer by ions.
Current ∝ abundance

Ionisation energy - energy required to remove a mole of electrons from a mole of at in a gaseous state.