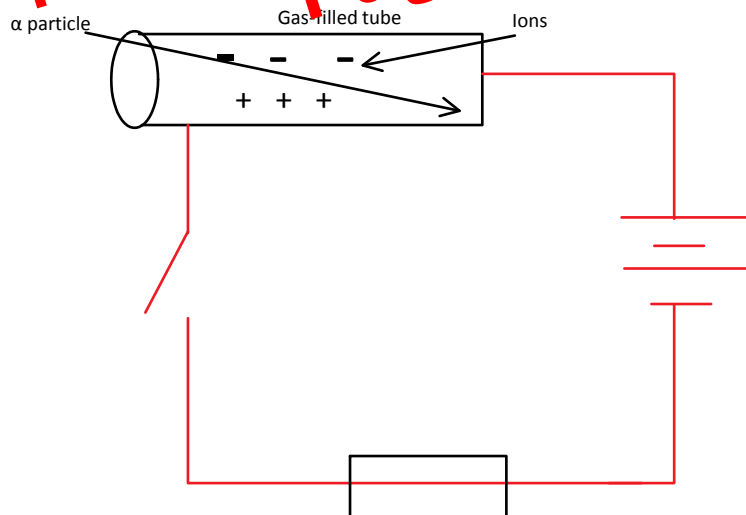


- γ particles
 - ◆ High energy electromagnetic radiation
 - ◆ Released
 - ◇ Protons and neutrons rearrange
 - ▶ Inside nucleus
 - ◆ Poor ionising
 - ◆ Good penetrating power
 - ◇ Few cm of lead
 - ◆ Emission
 - ◇ No effect
 - ▶ Mass and atomic numbers
- Summary

	Nature	Charge	Range	Ionising ability	Penetrating ability
α - particles	Helium nucleus	+	2-3cm air	Best	Worst
β particles	Electron	-	30cm air		
γ particles	EM radiation	0	Thick lead	Worst	Best

- Ions
 - Atoms
 - Gained/lost
 - Electrons
 - Positively/ negatively charged
 - How to detect radioactivity
 - Geiger-Muller tube
 - Metal cylinder
 - Contains
 - Mixture
 - ◆ Argon
 - ◆ Bromine
 - Low pressure
 - Electric field in the tube
 - Ionising radiation enters
 - Ions created flow towards anode/cathode
 - ◆ Current flows
 - Counter
 - How long the current flows
 - Therefore how much radiation

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Page 6 of 13



- The law of radioactive decay
 - Number of disintegrations per second is proportional to the number of nuclei present (N).
 - Activity = λN
 - λ
 - Decay constant
 - High value
 - Very radioactive material
 - Radioactivity
 - Measured
 - Half-life of an element

Definitions

26 January 2015 18:54

Thermionic emission

Thermionic emission is the emission of electrons from the surface of a hot metal.

Photoelectric effect

The **photoelectric effect** is the emission of electrons from a metal, caused by the incidence of electromagnetic radiation of suitable frequency.

Threshold frequency

The **threshold frequency** of a metal is the minimum frequency of electromagnetic radiation that will cause photoemission from that metal.

Pair production

Pair production is that creation of a sub-atomic particle and its anti-particle from another form of energy.

Pair annihilation

Pair annihilation is the transformation of a particle and anti-particle into 2 photons of electromagnetic energy.

Electronvolt

The **electronvolt** is the amount of energy gained or lost by a single electron when it moves through a potential difference of 1 volt.

Radioactivity

Radioactivity is the emission of either particles or electromagnetic radiation from the nucleus of an atom.

X-rays

X-rays are high energy electromagnetic radiation.

Law of radioactive decay

This law states that the number of disintegrations per second is proportional to the number of nuclei present.

$$\text{activity} = \lambda N$$

The half-life

The **half-life** of an element is the time taken for half of the nuclei in any given sample to decay or the time taken for any given sample to decrease to half its original value.

One Becquerel

One Becquerel is defined as the disintegration of one nucleus per second.

Nuclear fission

Nuclear fission is the breaking up a large nucleus into two smaller nuclei of similar size with the release of energy.

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Page 12 of 13