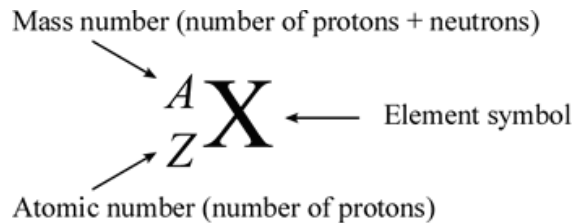
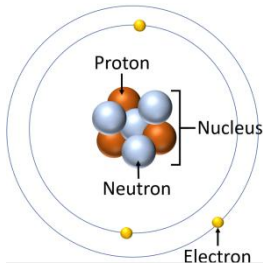


4 Atomic structure

Particle	Relative Mass	Relative Charge
Proton	1	+1
Neutron	1	0
Electron	1/1860	-1

Atoms

- Atoms are very small their radius is about $1 \times 10^{-10}\text{m}$.
- The radius of the nucleus is less than 1/10,000 of the radius of the atom.



Models of the atom

- The plum pudding model suggested that the atom was a ball of positive charge with negative electrons in it.
- The alpha scattering experiment showed the mass was in the centre (nucleus) and the nucleus was charged.

Radioactivity

- Alpha particles (α) are made from 2 protons and 2 neutrons like the helium nucleus. It is blocked by paper and skin.
 - Beta particles (β) are high speed electrons from the nucleus as a neutron turns into a proton. It is blocked by 5mm of aluminium foil.
 - Gamma rays (γ) are electromagnetic radiation from the nucleus. They are blocked by lead.
 - A neutron can also be emitted. (Blocked by concrete)
- Radioactive decay is random so it is not possible to predict which individual nucleus will decay next.

Definitions

Isotope - Atoms of the same element with the same number of protons and different number of neutrons.

Ions - Elements that have lost or gained electrons.

Nucleus - The center of the atom containing protons and neutrons.

Half-life - the time it takes for the number of nuclei of the isotope in a sample to halve.

Irradiation - The process of exposing an object to ionising radiation. The object does not become radioactive.

Contamination - Unwanted presence of materials containing radioactive atoms on other materials.

Triple only

Fusion - The joining of two light nuclei to form a heavier nucleus.

Fission - the splitting of large and unstable nucleus.

Nuclear Fission

