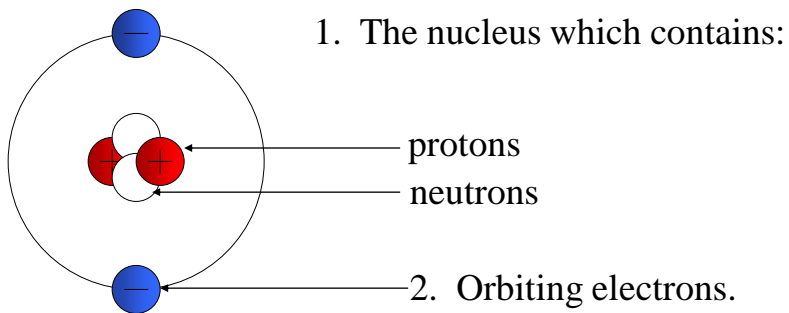


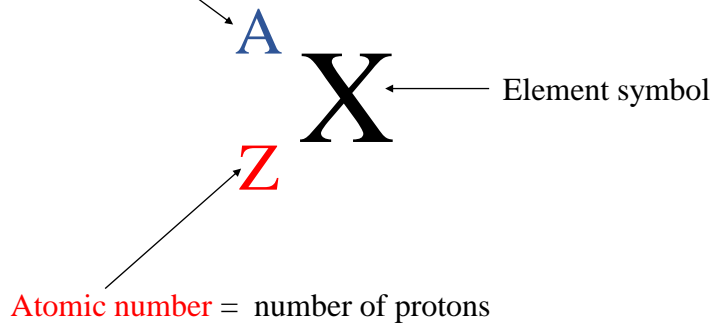
Nuclear Chemistry

The Atom

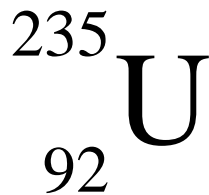
The atom consists of two parts:



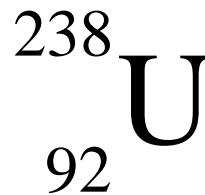
Mass number = number of protons + number of neutrons



There are many types of uranium:



Mass #	235
Atomic #	92
Number of protons	92
Number of neutrons	143



Mass #	238
Atomic #	92
Number of protons	92
Number of neutrons	146

Same number of protons but different
number of neutrons is an.....

ISOTOPE

Most naturally occurring isotopes are stable.

Atoms want to be stable

Nucleus Stability

Determined by ratio of p^+ to n^0

Radioactive Decay

(radioactivity)

Unstable nuclei decomposes into stable nuclei

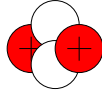
Half- Life is the time it takes for this decay to occur.

Radioactive Decay emits:

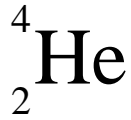
- an alpha particle (α),
- a beta particle (β),
- or a gamma ray(γ).

Alpha Decay

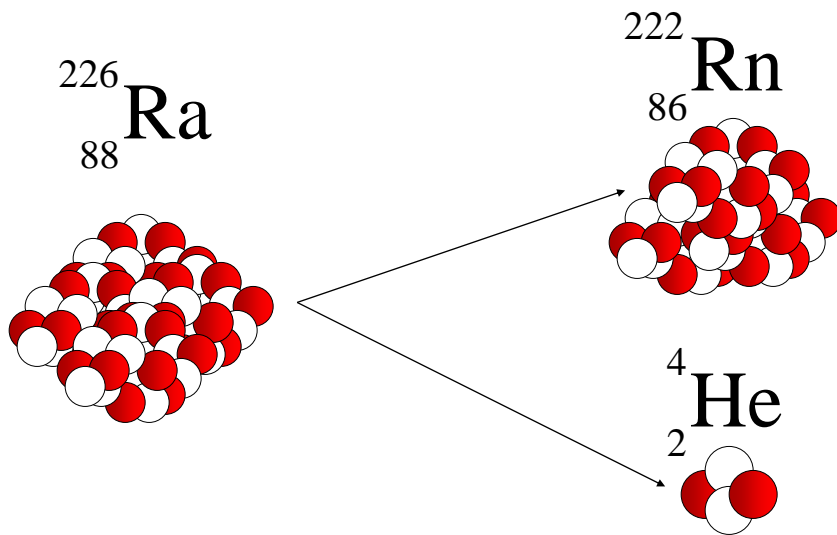
When an unstable atom creates an alpha particle.



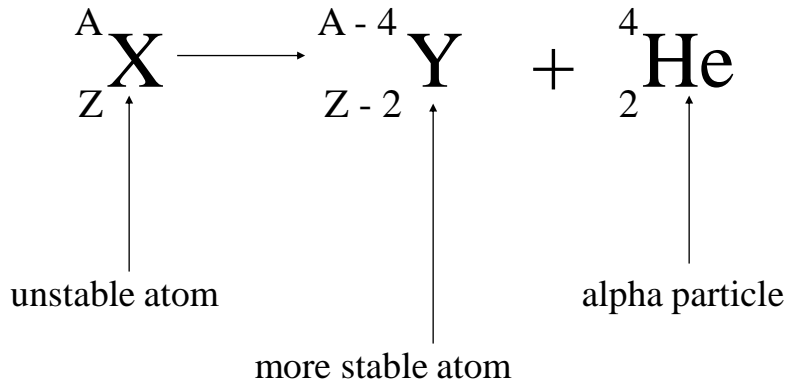
Alpha particle is identical to that of a helium nucleus.
It contains two protons and two neutrons.



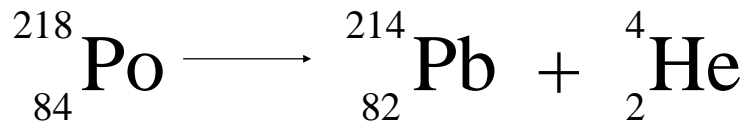
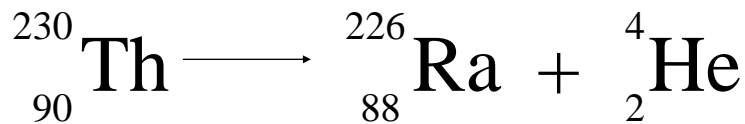
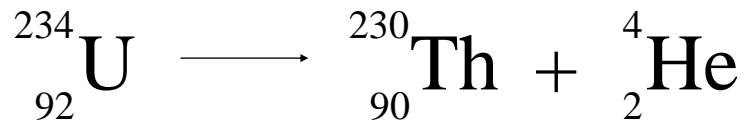
Alpha Decay



Alpha Decay

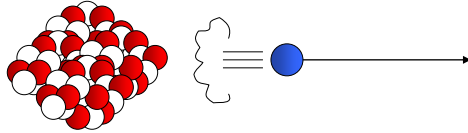


Alpha Decay

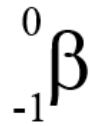


Beta Decay

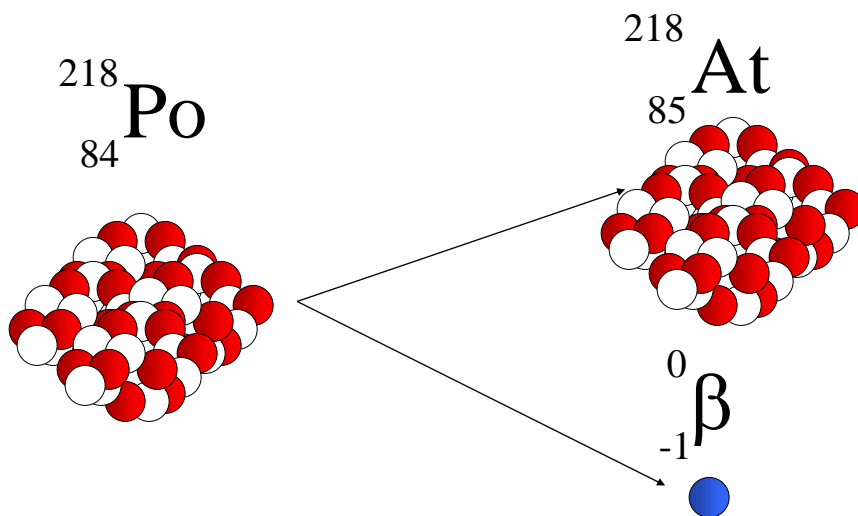
When an unstable atom creates a beta particle.



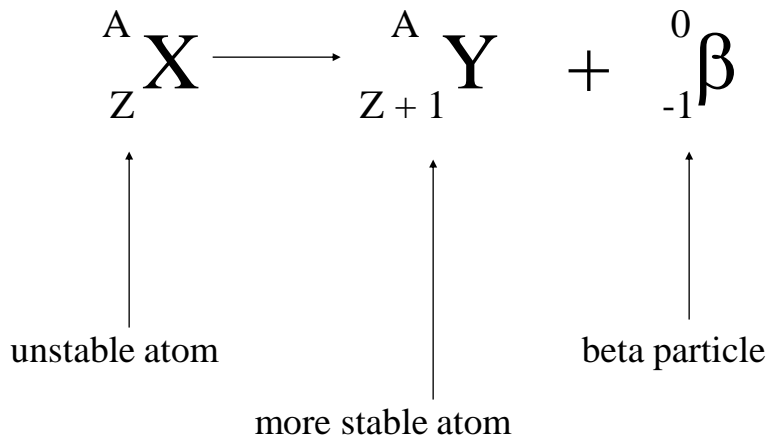
Beta particle is a fast moving electron created when a n^0 changes into a p^+ & e^-



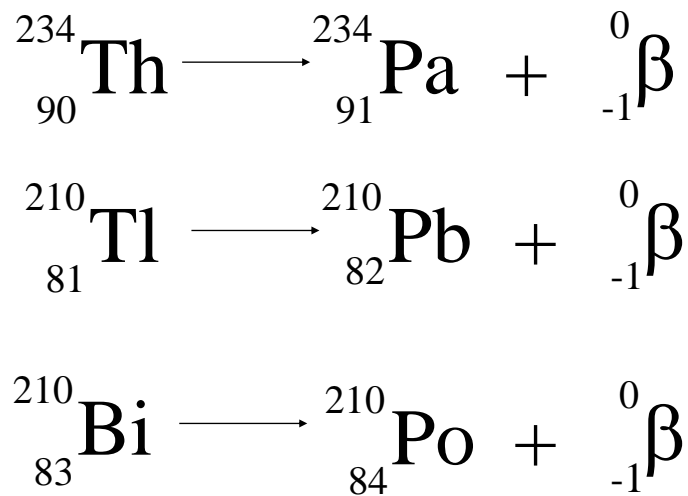
Beta Decay



Beta Decay

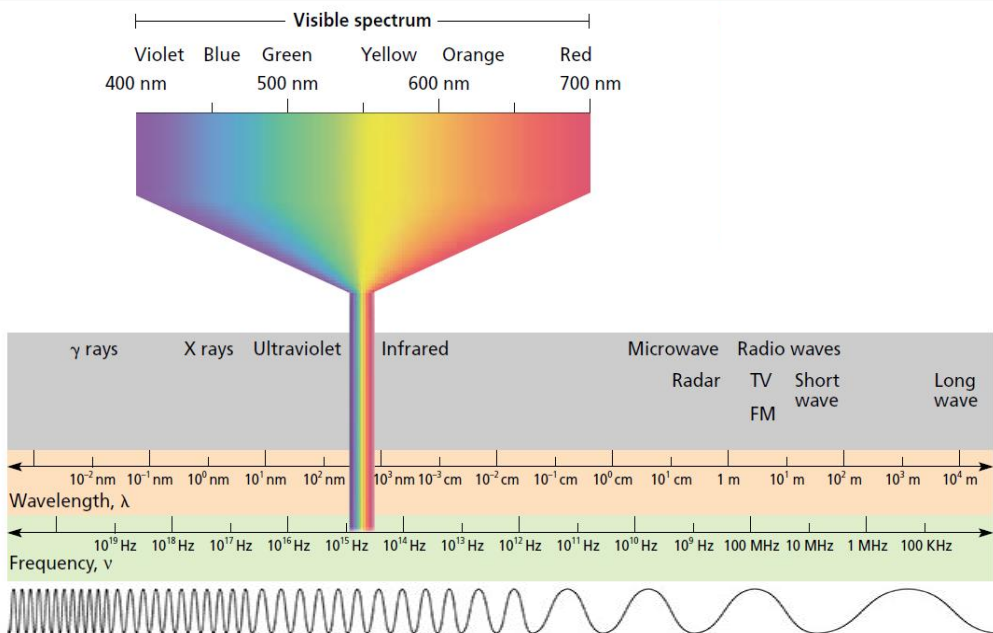
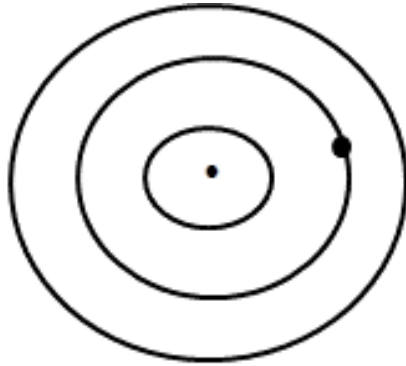


Beta Decay



Gamma Decay

- Not a charged particle it is energy, it's a photon.
- Electromagnetic radiation with high frequency



	Symbol	Composition	Range	Shield
Alpha Particle	He or α	Helium nucleus	short	Paper, skin
Beta Particle				
Gamma Ray				

	Symbol	Composition	Range	Shield
Alpha Particle	He or α	Helium nucleus	short	Paper, skin
Beta Particle	e^- or β	Electron		Heavy Clothing, glass, light metals, plastic
Gamma Ray				

	Symbol	Composition	Range	Shield
Alpha Particle	He or α	Helium nucleus	short	Paper, skin
Beta Particle	e^- or β	Electron		Heavy Clothing, glass, light metals, plastic
Gamma Ray	γ	Photons (electromagnetic spectrum)	Long	Lead or concrete