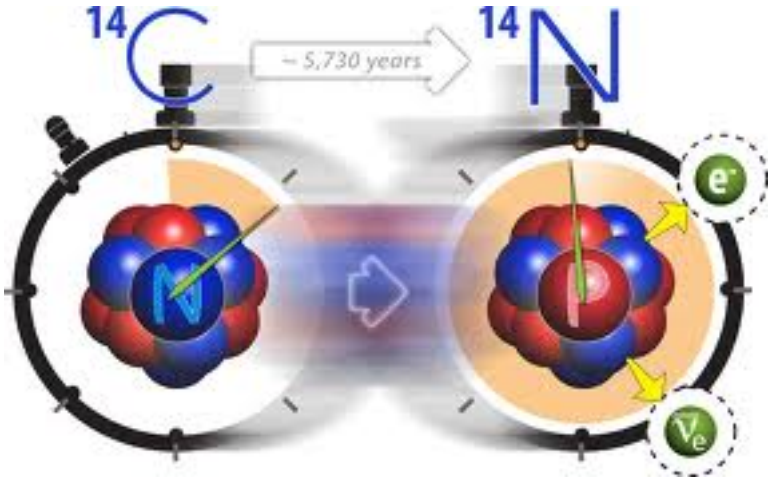
Radioactivity

Radioactive Decay

- When the nucleus of an unstable atom partially breaks down
- High energy particles or waves are given off

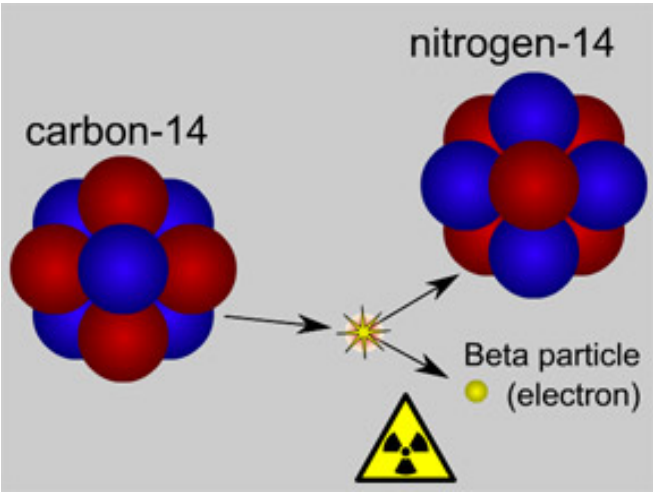
Transmutation

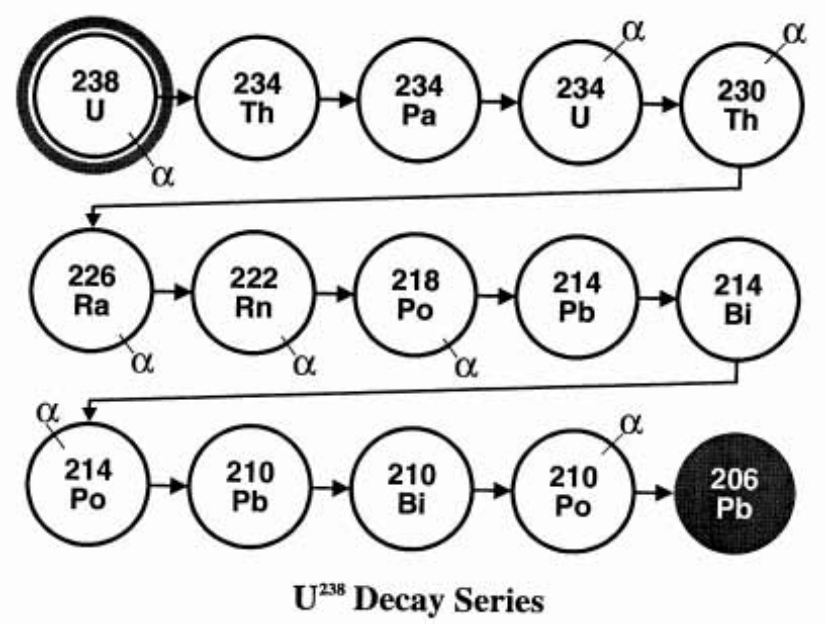
- Atom turns into a new type of atom with different number of protons

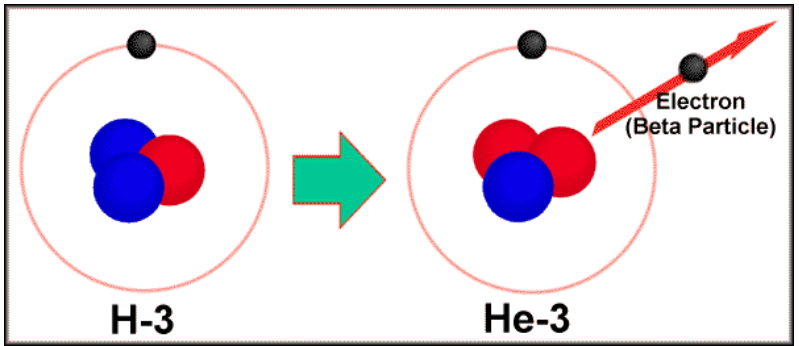


Examples of Transmutations

- Uranium 238 → Lead (through many steps)
- Carbon 14 → Nitrogen 14
- Hydrogen 3 → Helium 3

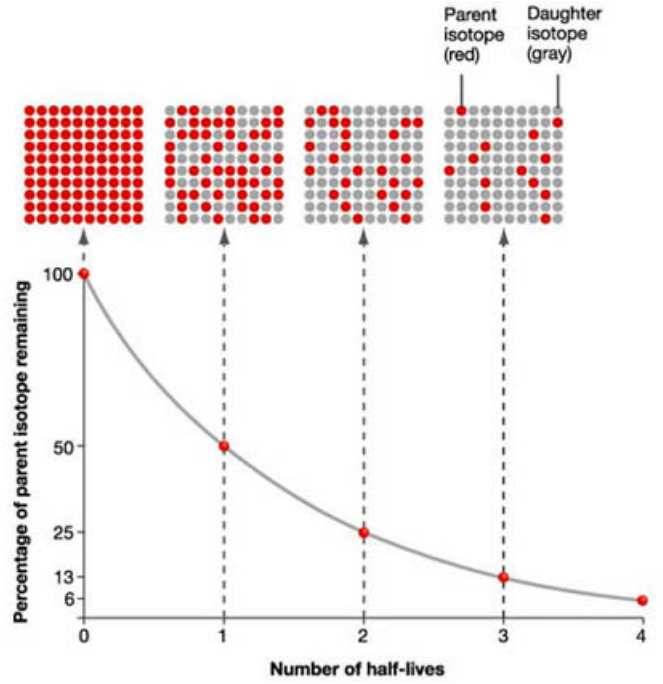






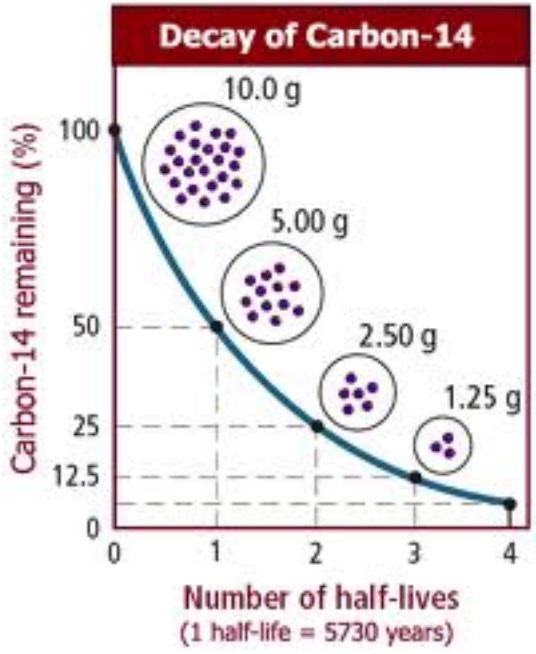
Radioactive Half-Life

- Half of a group of radioactive atoms will decay in a specific amount of time



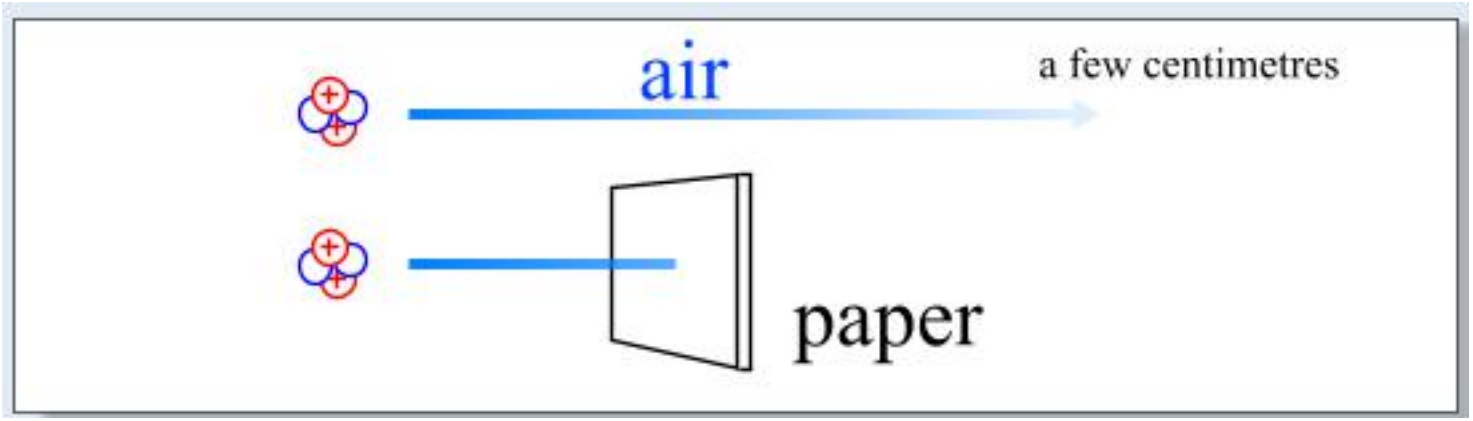
Examples of half-lives

- Carbon 14 – 5760 years
- Sodium 24 – 15 hours
- Iron 59 – 45 days
- Cobalt 60 – 5.3 years
- Uranium 235 – 710 million years



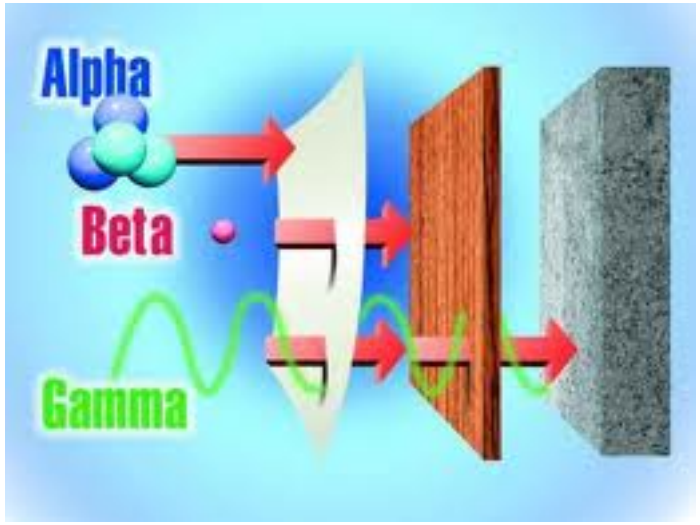
Alpha Particles (α)

- Can be stopped by paper
- Can cause damage to corneas or if digested



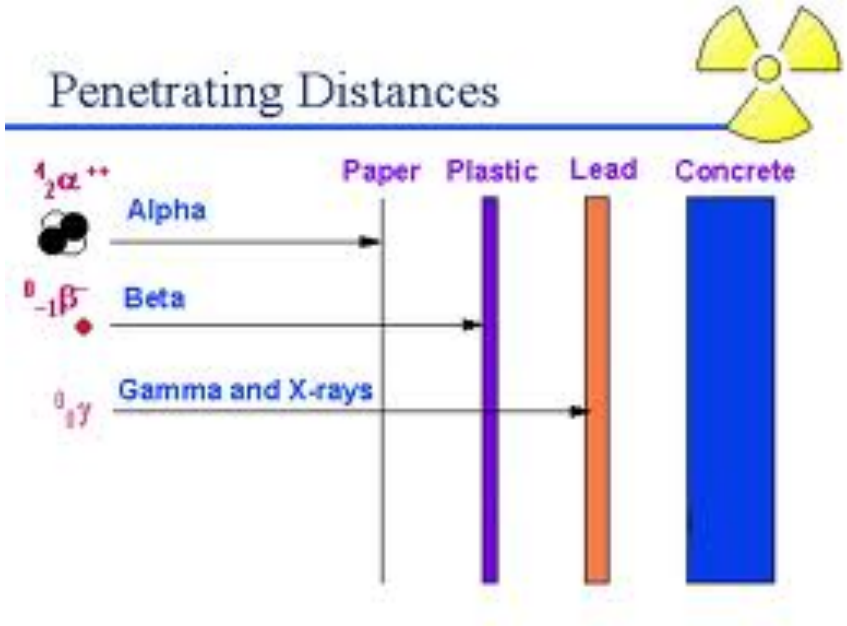
Beta Particles (β)

- Can be stopped by wood
- can cause burns, rather like severe sunburn.



Gamma Rays

- High energy rays
- Can be stopped by lead



Uses for Radioactive Material

- X-Rays
- Pacemakers
- Smoke alarms
- Nuclear energy

Marie Curie

- was one of the first researchers of radioactivity
- Came up with the term “radioactivity” to describe the energy emitted by some elements such as uranium