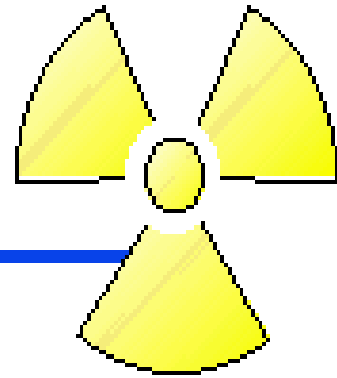
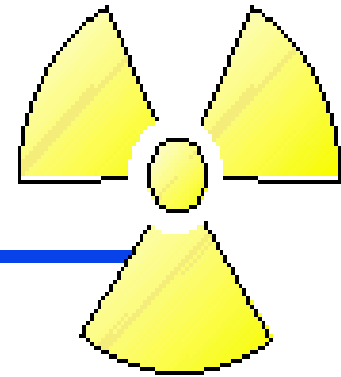


Radiation and Radioactivity

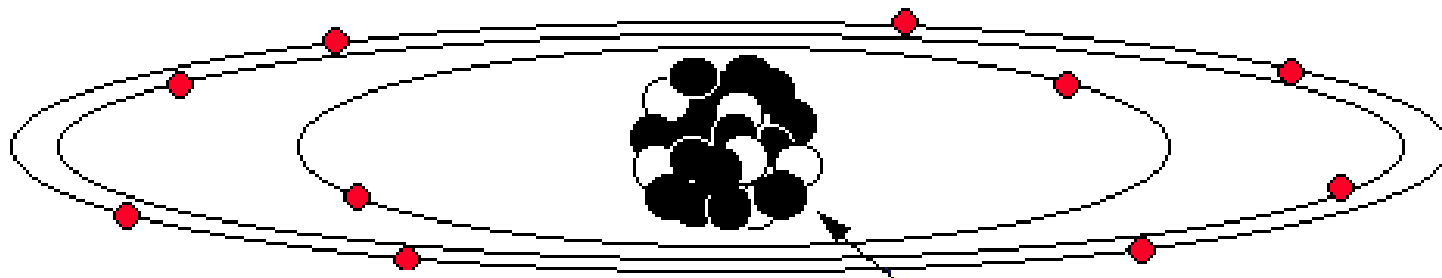


- Radiation: Energy in transit, either as particles or electromagnetic waves.
- Radioactivity: The characteristic of various material to emit ionizing radiation.
- Ionization: The removal of electrons from an atom. The essential characteristic of high energy radiations when interacting with matter.

The Atom



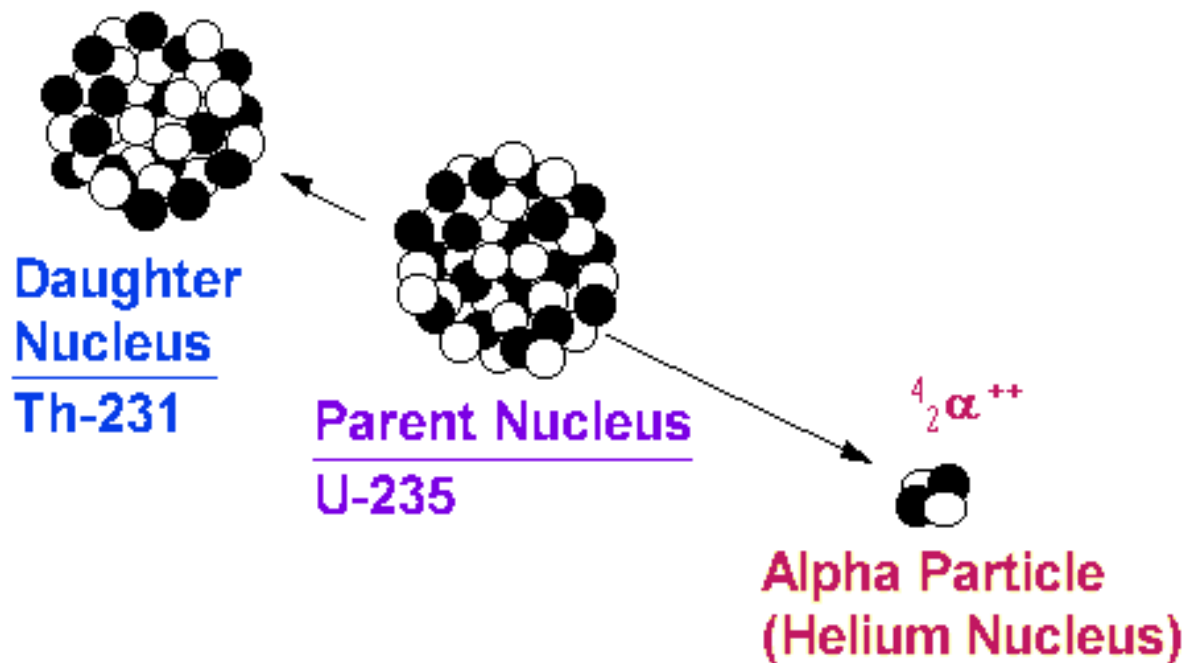
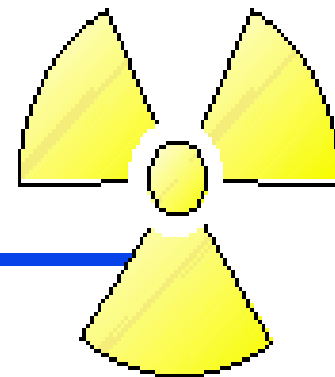
Example - Neon-20



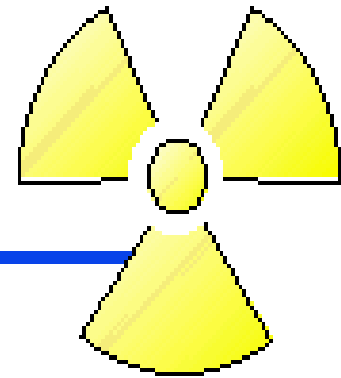
Electrons

The Nuclear which
contains neutrons
and protons

Alpha Particle Radiation

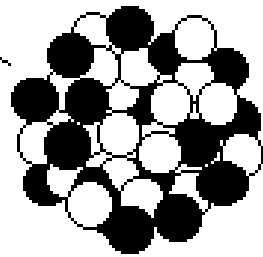


Beta Particle Radiation



Daughter
Nucleus

Calcium-40



Parent Nucleus

Potassium-40

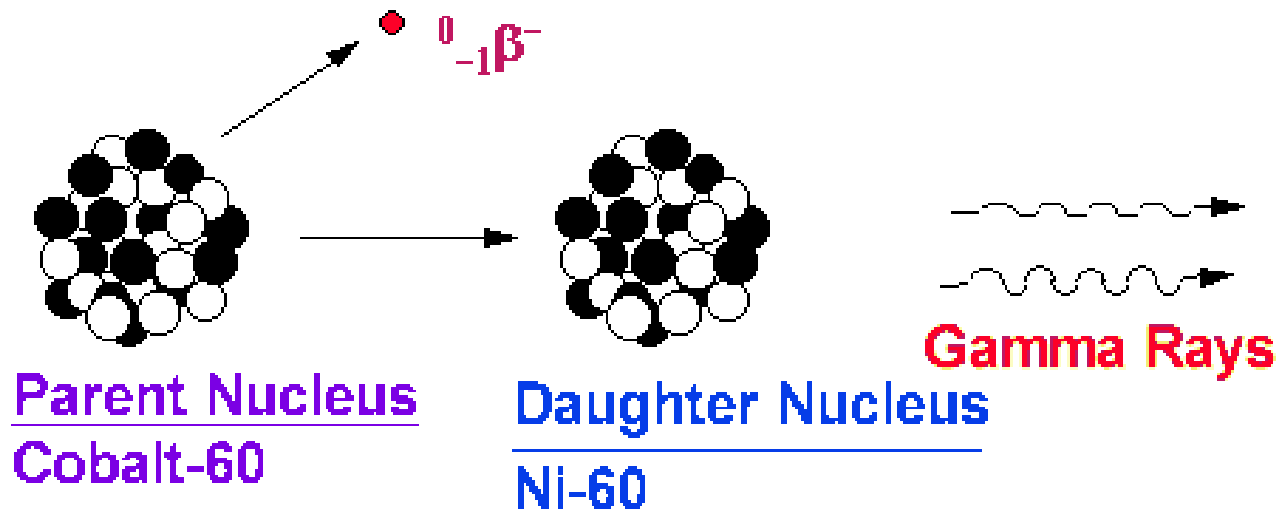
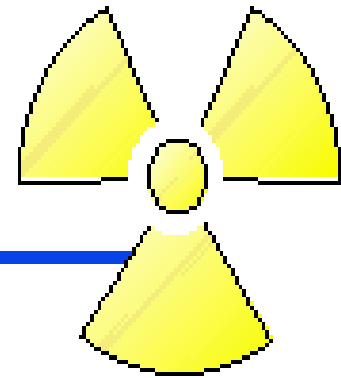


Antineutrino

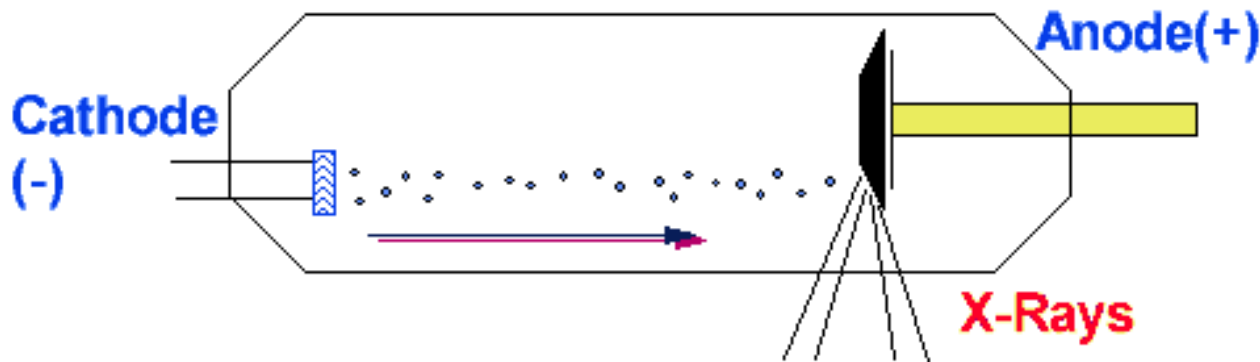
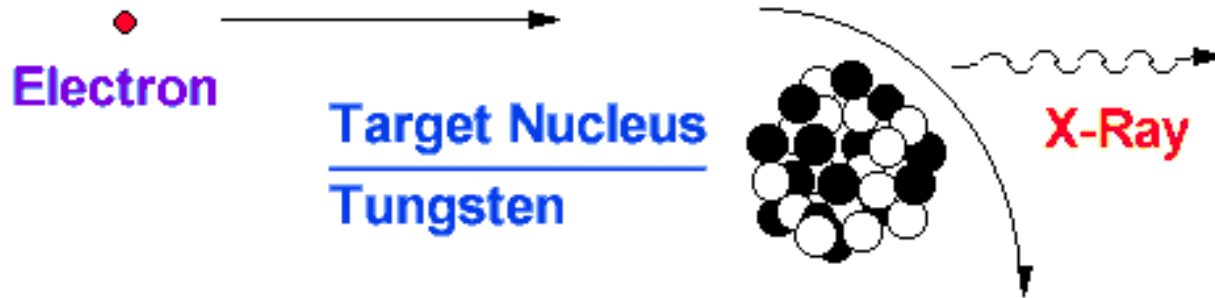
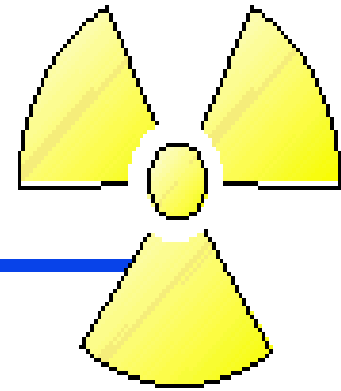


Beta Particle

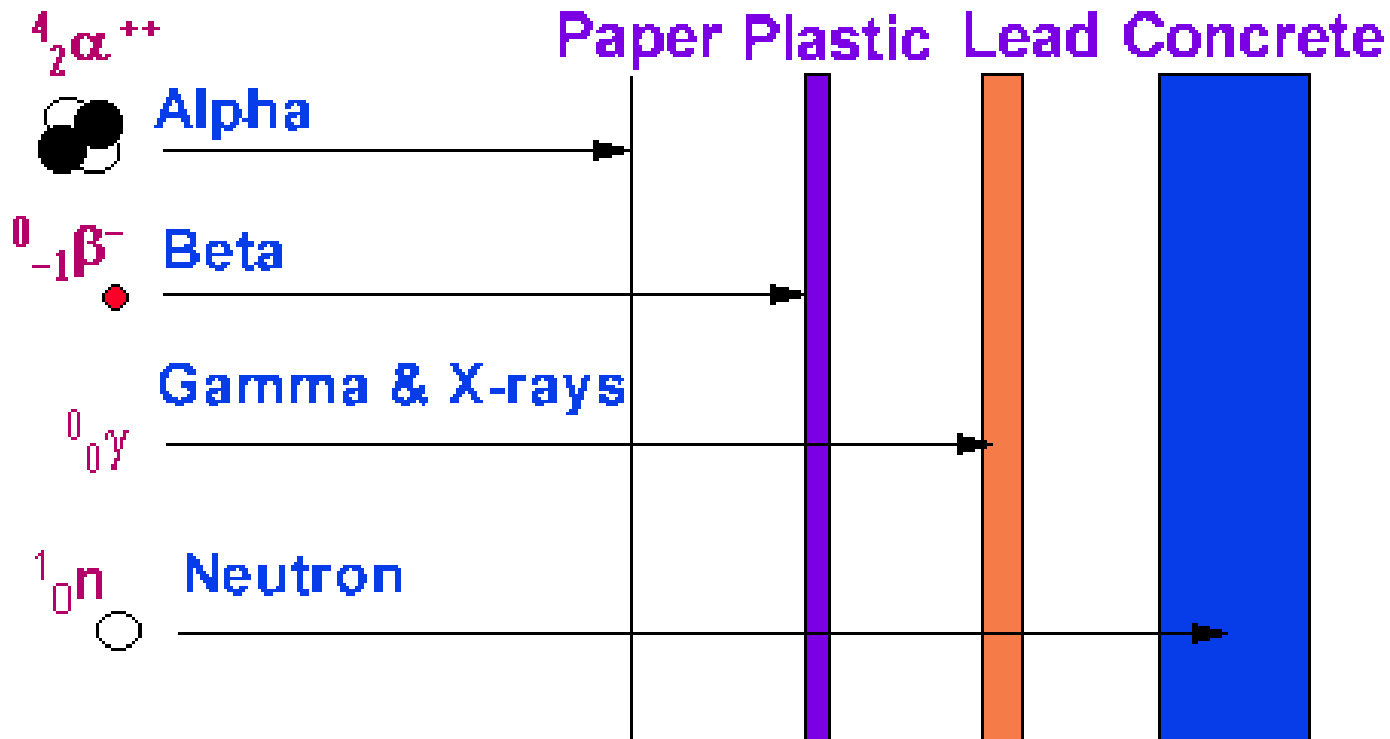
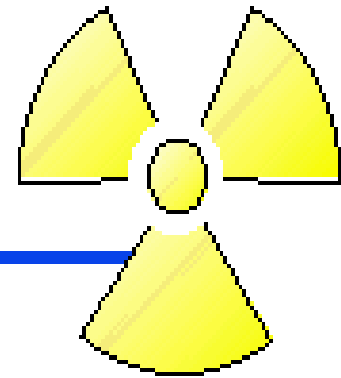
Gamma-Ray Radiation



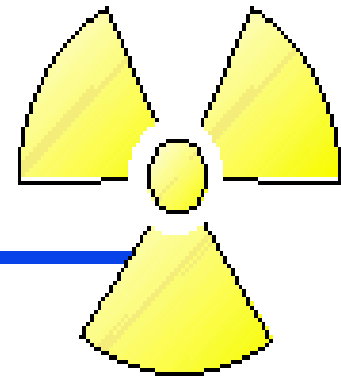
X-Ray Production (Bremsstrahlung)



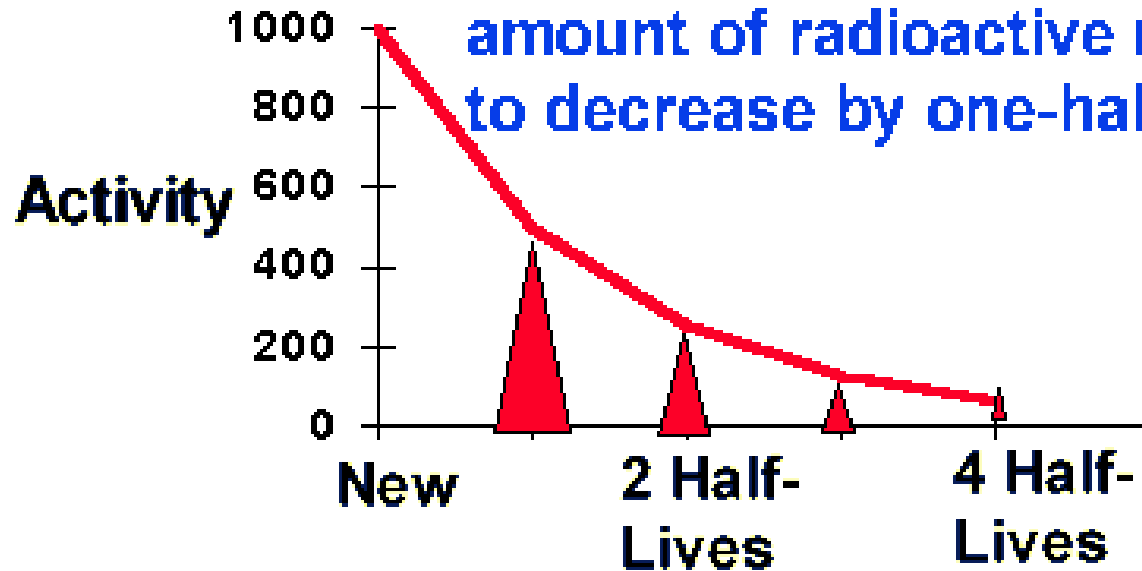
Penetrating Distances



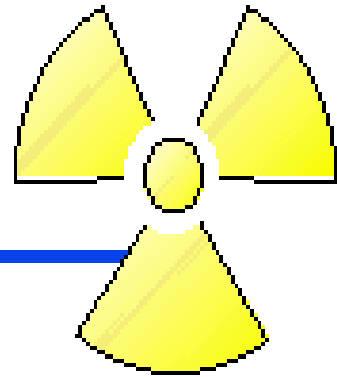
Half-Life



The time required for the amount of radioactive material to decrease by one-half



Measures of Radioactivity



Activity: The quantity of radioactive material at a given time:

– Curie(Ci): 3.7×10^{10} disintegrations per second(dps)

or

– Becquerel (Bq): 1 dps

Radiation Detection

Scintillation Detectors

