

Radioactive Decay

Physics

The three decay modes and the exponential law.

The decay modes.

Type	Emits	Penetration
Alpha	Helium nucleus	Stopped by paper
Beta-minus	Electron + antineutrino	Stopped by aluminium
Beta-plus	Positron + neutrino	Annihilates with an electron
Gamma	Photon	Reduced by lead, never fully stopped

$N = N_0 e^{(-\lambda t)}$, with half-life = $\ln 2 / \lambda$. Half-life is unaffected by temperature, pressure or chemical state.