

Nuclear vs. Chemical Reactions

Nuclear reactions

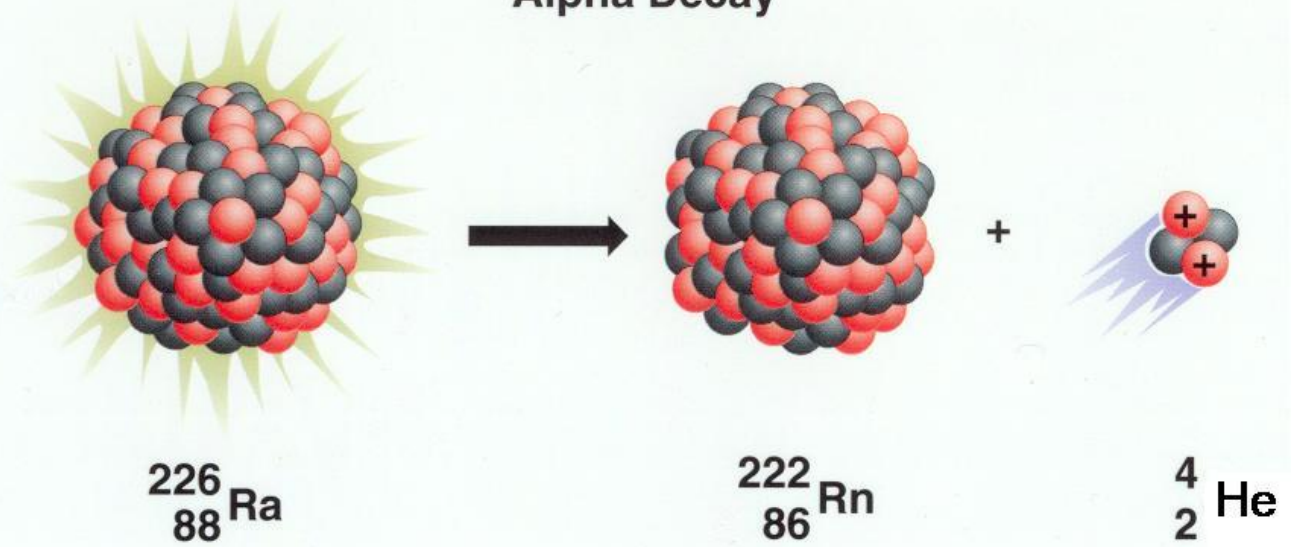
- New elements are often formed.
- Particles in nucleus are involved.
- Large amounts of energy are involved.
- Rate not influenced by temperature, concentration, catalyst

Chemical Reactions

- New element never produced.
- Valence electrons are involved.
- Small amounts of energy are involved.
- Rate influenced by temperature, concentration, catalyst

Radiation Type	Symbol	Charge	Nature
Alpha (α)	${}^4_2\text{He}$	+2	Helium nucleus. Can only travel a few centimeters through air and cannot penetrate skin. Cause harm through ingestion or inhalation.
Beta (β)	${}^0_{-1}e$	-1	Electron emitted by an unstable nucleus. Can travel several meters through air. More penetrating than alpha, Can be stopped by clothing.
Gamma (γ)	γ	0	High energy electromagnetic radiation. Can easily penetrate the human body, causing damage to cells. Can be stopped by thick layers of lead shielding.

Alpha Decay



Beta Decay

