

Chemistry

Unit 4 Nuclear Chemistry

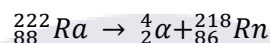
Nuclear Equations

In a nuclear reaction both the mass number and the atomic number must be conserved. Just like how in chemical reactions electrons are involved, in nuclear reactions the protons and neutrons are involved.

Alpha particle (α)

Reduces the mass number by 4 and the number of protons (atomic number) by 2.

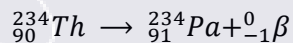
Nucleus releases a He particle known as an alpha particle.



Beta particle (β)

No change in mass number but increases the number of protons (atomic number) by 1.

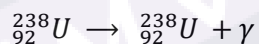
Nucleus releases an electron that converts a neutron to proton.



Gamma (γ)

No change to mass number or number of protons (atomic number).

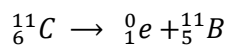
Nucleus goes from high energy state to a low energy state.



Positron

No change in mass number but reduces the number of protons (atomic number) by 1.

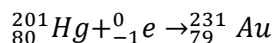
Nucleus releases a positively charged electron and converts a proton to a neutron.



Electron Capture

No change in mass but number of protons (atomic number) reduces by 1.

An electron from the electron cloud converts a proton into a neutron.



Fission

Splitting of atoms

Splits a heavy nucleus into 2 nuclei with smaller mass numbers

Fusion

Combining of atoms

Combining 2 light nuclei to form a heavier nucleus

