

Radioactive Decay Worksheet

Alpha decay: nucleus spontaneously emits an alpha particle (symbol: α particle), which is 2 p⁺ and 2 n (or also the same as a Helium (He) atom).

Result: atomic number decreases by 2 (lost 2 p⁺)

Result: atomic mass decreases by 4 (lost 2 p⁺ and 2n = 4 amu)

Beta decay: neutron in nucleus spontaneously emits a beta particle (symbol: β particle), which is essentially an electron trapped in a neutron. The neutron, therefore, turns itself into a proton.

Result: atomic number increases by 1 (gained 1 p⁺)

Result: atomic mass stays same (no mass lost or gained: β particle or electrons have no mass)

Beta or electron capture: proton in nucleus captures a beta particle (symbol: β particle), which is essentially an electron that can become part of a neutron. The proton, therefore, turns itself into a neutron.

Result: atomic number decreases by 1 (lost 1 p⁺)

Result: atomic mass stays same (no mass lost or gained: β particle or electrons have no mass)

Example

Original	alpha decay	beta decay	alpha decay	beta capture	beta decay	alpha decay
85	83	84	82	81	82	80
At	Bi	Po	Pb	Tl	Pb	Hg
Astatine	Bismuth	Polonium	Lead	Thallium	Lead	Mercury
210	206	206	202	202	202	198

Atomic #
Symbol
Name
Mass #

Complete this table

Original	beta decay	alpha decay	beta capture	alpha decay	alpha decay	beta decay
90						
Th						
Thorium						
232						

Complete this table

Original	beta capture	alpha decay	alpha decay	beta capture	alpha decay	beta decay
92						
U						
Uranium						
238						