

RADIOACTIVE DECAY MODES (D8)

Decay Mode	Symbol	Equation	Nucleus Changes
Alpha Emission	α	${}^A_ZX \rightarrow {}^{A-4}_{Z-2}X + {}^4_2\alpha$	$(A - 4, Z - 2)$
Proton Emission 2-Proton Emission	p $2p$	${}^A_ZX \rightarrow {}^{A-1}_{Z-1}X + {}^1_1p$ ${}^A_ZX \rightarrow {}^{A-2}_{Z-2}X + 2{}^1_1p$	$(A - 1, Z - 1)$ $(A - 2, Z - 2)$
Neutron Emission 2-Neutron Emission	n $2n$	${}^A_ZX \rightarrow {}^{A-1}_ZX + {}^1_0n$ ${}^A_ZX \rightarrow {}^{A-2}_ZX + 2{}^1_0n$	$(A - 1, Z)$ $(A - 2, Z)$
Electron Capture	ε	${}^A_ZX + {}^0_{-1}e \rightarrow {}^A_{Z-1}X + {}^0_0\nu_e$	$(A, Z - 1)$
Positron Emission	e^+	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$	$(A, Z - 1)$
Beta-Plus Decay	β^+	$\beta^+ = \varepsilon + e^+$ (Combined rate of ε and e^+)	Variable
Beta-Minus Decay	β^-	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\bar{\nu}_e$	$(A, Z + 1)$
Double Beta-Minus Decay	$2\beta^-$	${}^A_ZX \rightarrow {}^A_{Z+2}X + 2{}^0_{-1}e + 2{}^0_0\bar{\nu}_e$	$(A, Z + 2)$
Double Beta-Plus Decay	$2\beta^+$	${}^A_ZX \rightarrow {}^A_{Z-2}X + 2{}^0_{+1}e + 2{}^0_0\nu_e$	$(A, Z - 2)$
Beta-Minus-Delayed Neutron Emission	β^-n	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\bar{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-1}_{Z+1}X + {}^1_0n$	$(A - 1, Z + 1)$
Beta-Minus-Delayed 2-Neutron Emission	β^-2n	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\bar{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-1}_{Z+1}X + 2{}^1_0n$	$(A - 2, Z + 1)$
Beta-Minus-Delayed 3-Neutron Emission	β^-3n	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\bar{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-1}_{Z+1}X + 3{}^1_0n$	$(A - 3, Z + 1)$
Beta-Plus-Delayed Proton Emission	β^+p	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$ ${}^A_{Z-1}X \rightarrow {}^{A-1}_{Z-2}X + {}^1_1p$	$(A - 1, Z - 2)$
Beta-Plus-Delayed 2-Proton Emission	β^+2p	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$ ${}^A_{Z-1}X \rightarrow {}^{A-2}_{Z-3}X + 2{}^1_1p$	$(A - 2, Z - 3)$
Beta-Plus-Delayed 3-Proton Emission	β^+3p	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$ ${}^A_{Z-1}X \rightarrow {}^{A-3}_{Z-4}X + 3{}^1_1p$	$(A - 3, Z - 4)$

Decay Mode	Symbol	Equation	Nucleus Changes
Beta-Minus-Delayed Alpha Emission	$\beta^- \alpha$	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\overline{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-4}_{Z-1}X + {}^4_2\alpha$	$(A - 4, Z - 1)$
Beta-Plus-Delayed Alpha Emission	$\beta^+ \alpha$	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$ ${}^A_{Z-1}X \rightarrow {}^{A-4}_{Z-3}X + {}^4_2\alpha$	$(A - 4, Z - 3)$
Beta-Minus-Delayed Deuteron Emission	$\beta^- d$	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\overline{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-2}_ZX + {}^2_1d$	$(A - 2, Z)$
Beta-Minus-Delayed Triton Emission	$\beta^- t$	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\overline{\nu}_e$ ${}^A_{Z+1}X \rightarrow {}^{A-3}_ZX + {}^3_1t$	$(A - 3, Z)$
Internal (Isomeric) Transition	IT	${}^{Am}_ZX \rightarrow {}^A_ZX + {}^0_0\gamma$	(A, Z)
Spontaneous Fission	SF	Variable	Variable
Beta-Plus-Delayed Fission	$\beta^+ SF$	${}^A_ZX \rightarrow {}^A_{Z-1}X + {}^0_{+1}e + {}^0_0\nu_e$ Variable	Variable
Beta-Minus-Delayed Fission	$\beta^- SF$	${}^A_ZX \rightarrow {}^A_{Z+1}X + {}^0_{-1}e + {}^0_0\overline{\nu}_e$ Variable	Variable
Heavy Cluster Emission Cluster Decay	AX CD	Variable	Variable

Sources:

- Decay Mode ^[2]
- Symbol ^[1] ^[2]
- Equation ^[1] ^[3]
- Nucleus Changes ^[1] ^[3]