RADIOACTIVE DECAY MODES (D8)

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

Decay Mode	Symbol	Equation	Nucleus Changes
Beta-Minus-Delayed Alpha Emission	$\beta^- \alpha$	$^A_Z X \to\, ^A_{Z+1}X +\, ^0_{-1}e +\, ^0_0\overline{\nu}_e$ $^A_{Z+1}X \to\, ^{A-4}_{Z-1}X +\, ^4_2\alpha$	$(A-4, Z-1)$
Beta-Plus-Delayed Alpha Emission	$\beta^+ \alpha$	$^A_Z X \to\, ^A_{Z-1}X +\, ^0_{+1}e +\, ^0_0\nu_e$ $^A_{Z-1}X \to\, ^{A-4}_{Z-3}X +\, ^4_2\alpha$	$(A-4, Z-3)$
Beta-Minus-Delayed Deuteron Emission	$\beta^- d$	$^A_Z X \to\, ^A_{Z+1}X +\, ^0_{-1}e +\, ^0_0\overline{\nu}_e$ $^A_{Z+1}X \to\, ^{A-2}_{Z}X +\, ^2_1 d$	$(A-2, Z)$
Beta-Minus-Delayed Triton Emission	$\beta^- t$	$^A_Z X \to\, ^A_{Z+1}X +\, ^0_{-1}e +\, ^0_0\overline{\nu}_e$ $^A_{Z+1}X \to\, ^{A-3}_{Z}X +\, ^3_1 t$	$(A-3, Z)$
Internal (Isomeric) Transition	IT	$^{Am}_Z X \to\, ^A_Z X +\, ^0_0\gamma$	(A, Z)
Spontaneous Fission	SF	Variable	Variable
Beta-Plus-Delayed Fission	$\beta^+ SF$	$^A_Z X \to\, ^A_{Z-1}X +\, ^0_{+1}e +\, ^0_0\nu_e$ Variable	Variable
Beta-Minus-Delayed Fission	$\beta^- SF$	$^A_Z X \to\, ^A_{Z+1}X +\, ^0_{-1}e +\, ^0_0\overline{\nu}_e$ Variable	Variable
Heavy Cluster Emission **Cluster Decay**	$^A X$ CD	Variable	Variable

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