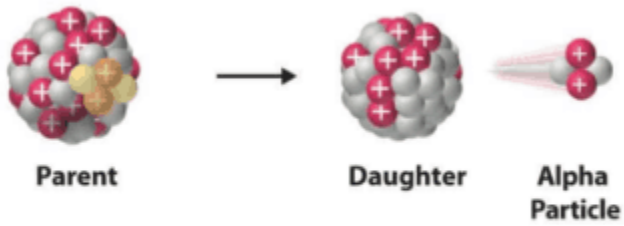
# Nuclear Decay Modes

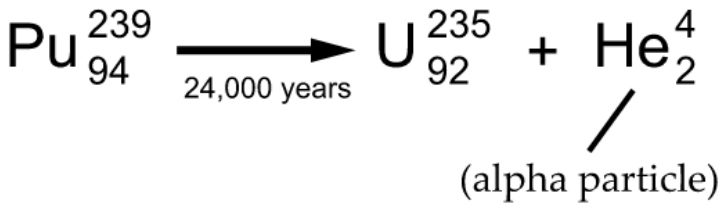
Unstable nuclei transform into more stable nuclei by decaying. Nuclear decay is the process of nucleai ejecting particles and/or energy in an attempt to become more stable. For most readionuclides there are several decay steps in the series, each of which takes a certain time to occur. These decay steps can range from a fraction of a second to hundreds of thousands or even millions of years. We will learn more about these decay series later.

**Alpha Decay**

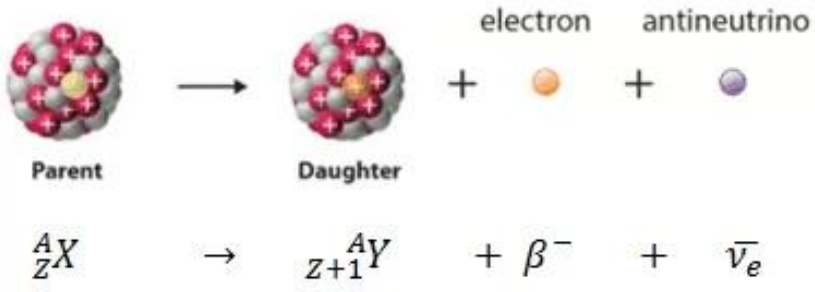



$$^{A}_{Z}X \rightarrow {}^{A-4}_{Z-2}Y + {}^{4}_{2}He$$

Example:

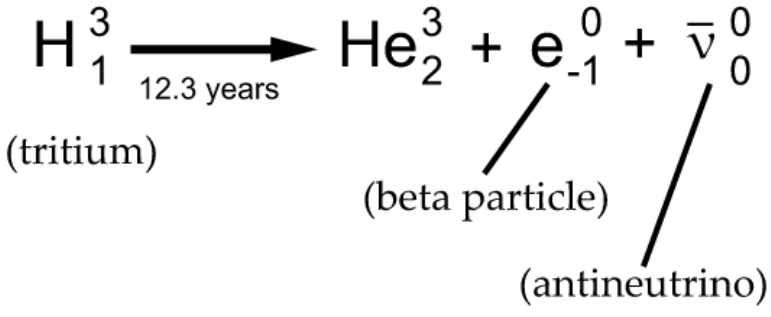



**Beta Minus (-) Decay: Electron Emission**

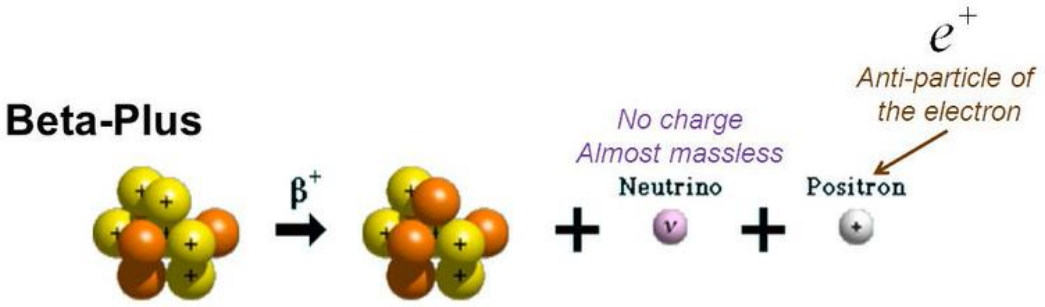



$$^{A}_{Z}X \rightarrow {}^{A}_{Z+1}Y + \beta^{-} + \bar{\nu}_{e}$$

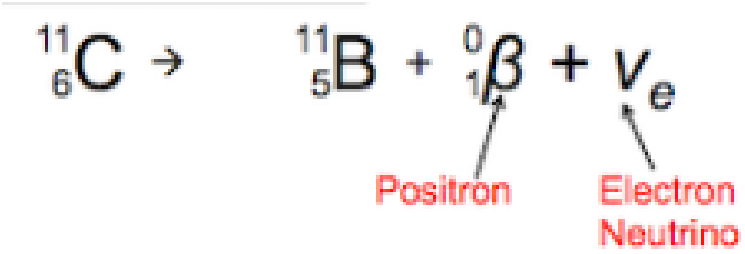
Example:



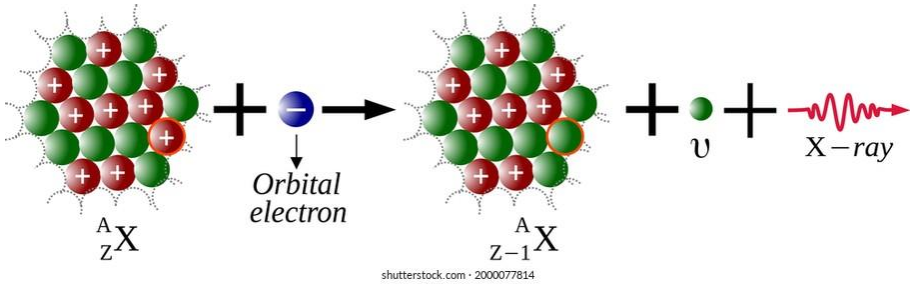
**Beta Plus (+) Decay: Positron Emission**



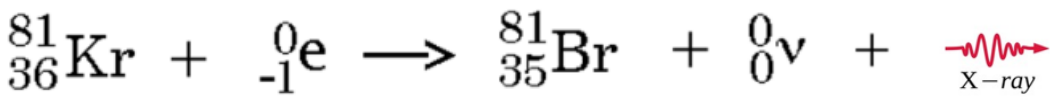

Example:




**Electron Capture**

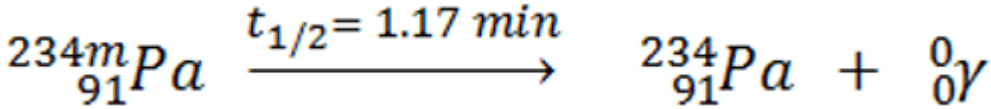



Example:




**Gamma Emission**


Example:



# Decay Mode Chart