

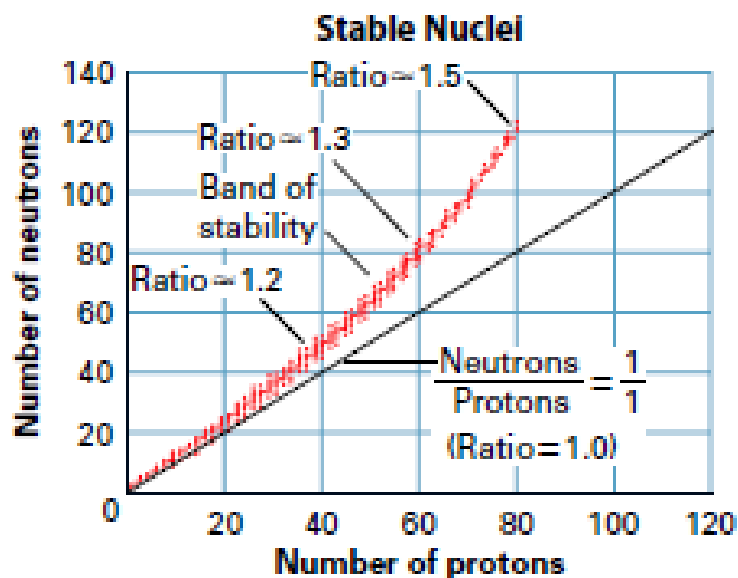
Homework - #1-6

Band of Stability

The band of stability is the region on the graph that shows the stable nuclei.

For elements of low atomic number (<20), the ratio is around 1:1.

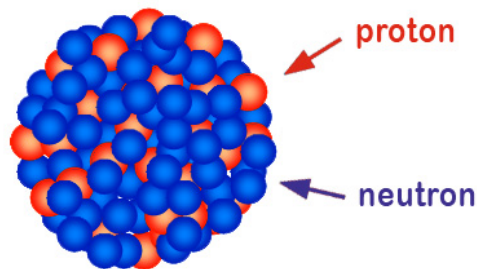
Number of Neutrons vs. Number of Protons for Stable Nuclei



Nuclear Forces

Nuclear force - attractive force between all nuclear particles

- Allows nucleus of all atoms to remain intact



Uranium Nucleus

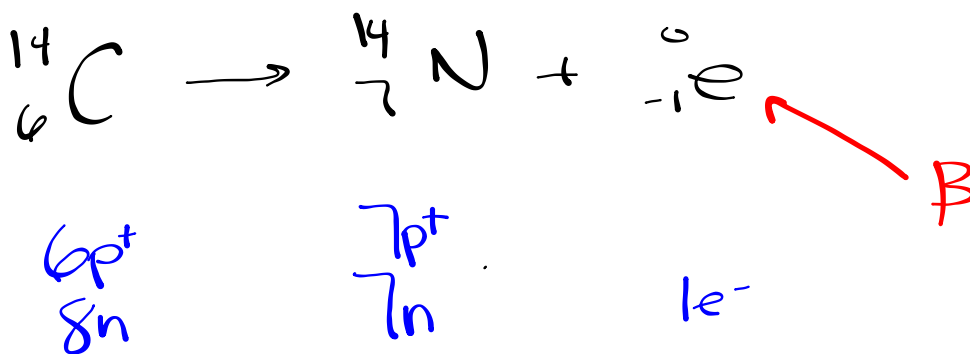
Nuclear Stability

There are over 1500 different nuclei (isotopes), but only 264 are stable, and do not change or decay over time. Stability is based on the *proton-to-neutron* ratio.

Beta Emission

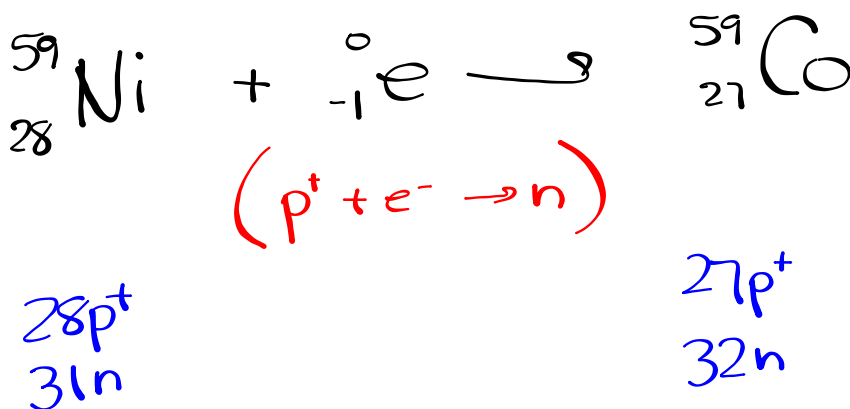
The **proton-to-neutron ratio** determines the type of decay that occurs.

If a nucleus has too many neutrons, the nucleus will decay by turning a neutron into a proton by releasing a beta particle. (beta emission)



Electron Capture

If a nucleus has too few neutrons, the nucleus will capture an electron and turn a proton into a neutron (electron capture).



Positron Emission

A positron is a particle with the mass of an electron but a positive charge. During positron emission, a proton changes to a neutron.

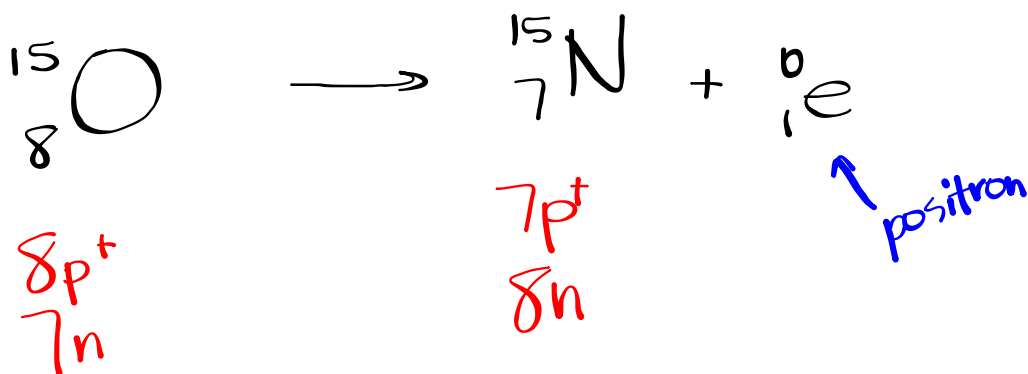
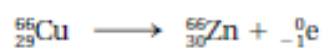


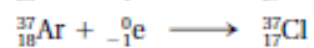
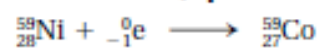
Table 25.2

Decay Processes

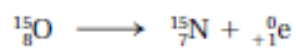
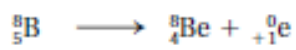
Beta Emission



Electron Capture



Positron Emission



Alpha Emission

