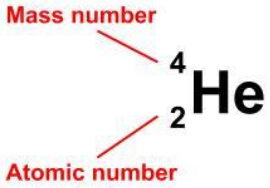
Vocabulary: Isotopes

Vocabulary

- Atomic number – the number of protons in the nucleus of an atom.
  - Elements are distinguished from one another by their atomic numbers.
  - For example, an atom with two protons is an atom of helium.
  - The symbol for the atomic number is Z.
- Band of stability – the region of a plot of neutrons versus protons, for all the known isotopes, highlighting the stable isotopes.
- Half-life – the time required for one-half of the radioactive atoms in a sample to decay.
  - Each time a half-life passes, the number of radioactive atoms in a sample divides in half.
  - The half-lives of common radioactive substances range from 3.7 minutes (rubidium-77) to 3.6×10^{17} years (zircon-96).
- Isotope – one of several forms of the same element.
  - All isotopes of a given element have the same number of protons but differ in the number of neutrons.
  - Most elements have more than one naturally occurring isotope.
- Isotope notation – a method for representing a particular isotope in which the mass number and atomic number are written to the left of the element symbol as shown in the image at right. Isotope notation is also known as nuclear notation.



- Mass number – the number of protons plus neutrons in the nucleus of an atom.
  - For example, the mass number of helium is 4 (2 protons and 2 neutrons).
  - The symbol for the mass number is A.
- Radioactive – capable of releasing radiation.
  - In a radioactive atom, the nucleus can spontaneously decay and emit particles and/or light. These emissions are called radiation.
  - The energy released by radioactive substances can be harnessed to produce electricity in a nuclear power plant. This energy also can be used to create a massive explosion in a nuclear bomb.
  - If the emissions change the number of protons in the nucleus, the atom becomes a different element.
- Radioisotope – an atom that is radioactive.