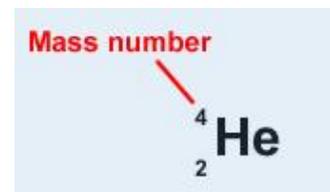


Vocabulary: Nuclear Decay



Vocabulary

- Alpha particle – a positively charged particle that is emitted from the nucleus of a *radioactive* atom.
 - An alpha particle consists of two protons and two neutrons. It is equivalent to the nucleus of a helium atom.
- Atomic number – the number of protons in the nucleus of an atom.
 - Elements are distinguished from one another by their atomic numbers.
 - For example, any atom with two protons is an atom of helium.
 - The symbol for the atomic number is Z .
 - In an element symbol, the atomic number is shown at lower left.
- Beta particle – a negatively charged particle that is emitted from the nucleus of a *radioactive* atom.
 - A beta particle consists of one electron.
- Daughter product – an atom that results from the decay of a *radioactive* atom.
- Gamma ray – the highest energy form of electromagnetic radiation.
 - Gamma rays have wavelengths less than 10 picometers.
 - Gamma rays are often emitted during *nuclear decay*.
- 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 isotopes are *radioactive*. Usually only one or two stable isotopes exist for a given element.
- 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 .
 - In an element symbol, the mass number is shown at upper left.



- Nuclear decay – the process in which a radioactive atom spontaneously releases particles and/or energy.
 - There are several types of radioactive decay. The most common are alpha, beta, and gamma decay:
 - In *alpha decay*, an alpha particle (2 protons and 2 neutrons) is emitted.
 - In *beta decay*, a beta particle (1 electron) is emitted.
 - In *gamma decay*, gamma rays are emitted.
- Positron – the positively charged antimatter counterpart of an electron.
 - If a positron meets an electron, the two particles will annihilate one another in a burst of gamma rays.
- Radioactive – capable of releasing radiation.
 - In a radioactive atom, the nucleus can spontaneously decay and emit particles and/or energy. These emissions are called radiation.
- Subatomic particle – a unit of matter smaller than an atom.
 - Subatomic particles include the building blocks of atoms: protons, neutrons, and electrons.
 - Protons and neutrons are composed of smaller subatomic particles called *quarks*.
 - Other subatomic particles include neutrinos, muons, tau particles, bosons, photons, and many others.

