

Alpha

A positively charged particle made up of two neutrons and two protons emitted by certain radioactive nuclei. Alpha particles can be stopped by a few inches of air or thin layers of light materials, such as a sheet of paper, and pose no direct or external radiation threat; however, they can pose a serious health threat if ingested or inhaled.



[Alpha Particles](#)

Beta

An electron or positron emitted by certain radioactive nuclei. Beta particles can be stopped by aluminum. They can pose a serious direct or external radiation threat and can be lethal depending on the amount received. They also pose a serious internal radiation threat if inhaled or ingested.



[Beta Particles](#)

Bioconcentrate

To build up in the food chain.

Carcinogenic

Capable of causing cancer.

Compound

A pure substance consisting of atoms or ions from at least two different elements. The compound usually has characteristics unlike the elements that make it up. Example, two hydrogen atoms and one oxygen atom make a compound we call H₂O, or water

Curie

A measure of radioactivity based on the observed decay rate of approximately one gram of radium. The Curie was named in honor of Pierre and Marie Curie, pioneers in the study of radiation.

One curie of radioactive material will have 37 billion atomic transformations (disintegrations) in one second.



[Curie](#)

Fission

The splitting of a nucleus into at least two other nuclei and the release of a relatively large amount of energy. Two or three neutrons are usually released during this type of transformation. Fissioning is also referred to as 'burning.' Fissioning that occurs without any outside cause, such as bombardment with a neutron, is called 'spontaneous fission.'

Gamma

High-energy electromagnetic radiation emitted by certain radionuclides when their nuclei transition from a higher to a lower energy state. These rays have high energy

and a short wave length. All gamma rays emitted from a given isotope have the same energy, a characteristic that enables scientists to identify which gamma emitters are present in a sample. Gamma rays are very similar to [x-rays](#)

Half-life

The time in which one half of the atoms of a radioactive isotope disintegrates into another nuclear form. Half-lives vary from billionths of a billionth of a second to billions of years. Also called physical or radiological half-life.

biological half-life - the time an organism takes to eliminate one half the amount of a compound or chemical on a strictly biological basis

effective half life - incorporates both the radioactive and biological half-lives. It is used in calculating the dose received from an internal radiation source.

 [Half-Life](#)

Irradiated

Exposed to radiation

Isotope

A [nuclide](#) of an element having the same number of [protons](#) but a different number of [neutrons](#).

 [Nuclides and Isotopes](#)

maximum contaminant level (MCL)

The amount of a contaminant that may be present in drinking water under the Safe Drinking Water Act. MCLs are the standards that drinking water treatment systems must meet.

Millirem

One-thousandth of a rem, or a Roentgen Equivalent Man (rem). It's a unit of [equivalent dose](#). Rem relates the absorbed dose in human tissue to the effective biological damage of the radiation. Not all radiation has the same biological effect, even for the same amount of absorbed dose

Nuclide

A general term applicable to all atomic forms of an element. Nuclides are characterized by the number of [protons](#) and [neutrons](#) in the [nucleus](#), as well as by the amount of energy contained within the atom.

 [What is an Atom?](#)
[Nuclides and Isotopes](#)

Photon

A discrete "packet" of pure electromagnetic energy. Photons have no mass and travel at the speed of light. The term "photon" was developed to describe energy when it acts like a particle (causing interactions at the molecular or atomic level), rather than a wave. Gamma and X-rays are photons.

 [Gamma Rays](#)

Proton

A small particle, typically found within an atom's nucleus, that possesses a positive electrical charge. The number of protons is unique for each chemical element.

 [What is an Atom?](#)

Radiation

Energy given off as either particles or rays from the unstable nucleus of an atom.

 [Why Are Some Atoms Radioactive?](#)
[Can Unstable Atoms Become Stable?](#)

radionuclide

An unstable form of a nuclide.

 [Nuclides & Isotopes](#)
[Radionuclides](#)

Toxicity

The degree or extent to which something is toxic (harmful, poisonous, deadly).

Tritiated

Water molecules formed with radioactive hydrogen (tritium) rather than stable hydrogen (see below).

Tritium

Tritium is a hydrogen atom that has two neutrons in the nucleus, in addition to its single proton, giving it an atomic weight near three. Although tritium can be a gas, its most common form is in water, because, like nonradioactive hydrogen, radioactive tritium reacts with oxygen to form water. Tritium replaces one of the stable hydrogens in the water molecule, H₂O, and is called tritiated water (HTO). Like H₂O, tritiated water is colorless and odorless.

<http://www.epa.gov/radiation/radionuclides/tritium.htm>

Vadose Zone

The underground area between the surface and the top of the water table (aquifer).