

Activity

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Activity



Activity, in radioactive-decay processes is the number of unstable atomic nuclei that decay per second in a given sample. Activity is determined by counting, with the aid of radiation detectors, the number of particles and photons ejected from a radioactive material during a convenient time interval. This experimental count, however, must be interpreted in the light of a thorough knowledge of the particular manner of radioactive decay in the sample material, because some sources emit more than one particle or photon per disintegration. Activity is expressed in the International System of Units by the becquerel (Bq), which is exactly equal to one disintegration per second. The old standard unit was the curie (Ci), which is equal to 3.7×10^{10} Bq.

A graph of activity against time shows that the activity of the radionuclide decreases exponentially over time (exponential decay). The radioactive physical half-life (the time for the activity to become half) for a given radioisotope is a measure of the tendency for a nucleus to decay or disintegrate.

There are three main types of radioactive decay alpha, beta and gamma. (Alpha decay happens when a nucleus sheds an alpha particle which consists of two protons and two neutrons. Beta decay happens when a nucleus sheds an electron and gamma happens when a nucleus gives off a gamma photon (usually gamma emission accompanies alpha or beta particles).

The radioactive physical half-life for a given radioisotope is a measure of the tendency for a nucleus to decay or disintegrate and it is based purely on probability. Physical half-life is constant over the lifetime of a radioisotope and it is independent from any outside influences like: temperature, pressure or its physical state.

Effective half life is used in medicine and its used to determine what is going to happen to the radioactive isotope in a given amount of time when introduced internally to a body. In this case the activity decreases both by physical means and biological means as the radionuclide is eliminated physiologically by the body. Effective half life is often approximate because it is difficult to precisely calculate it unlike physical half life.

References:"Effective Half-life." Wikipedia. Wikimedia Foundation, 23 Nov. 2013. Web. 06 Dec. 2013. "Half-life, Effective." Half-life, Effective. N.p., n.d. Web. 06 Dec. 2013. "Radioactive Half-Life." Radioactive Half-Life. N.p., n.d. Web. 05 Dec. 2013. "Activity (radioactivity)." Encyclopedia Britannica Online. Encyclopedia Britannica, n.d. Was checked | 20131216135234 | Carmeljcaruana ([User t