



Radioactive Half Life

The amount of time it takes a radioactive isotope to decay into a stable isotope is different for each radioactive isotope and is known as the "half life". The amount of time it takes an isotope to undergo a specific decay is characterized in terms of its "half life". Here is an example:

If you had 1.000 grams (or 1 kg) of strontium-89 in a container and its half life is 50.5 days, at the end of 50.5 days, only 500 grams of the material would still be strontium-89. The rest would have decayed into other isotopes. After 101 days, there would only be 250 grams of strontium-89 would remain, after 151.5 days, there would be 125 grams of radioactive strontium-89 and so on.

Some radioactive isotopes have half lives that are only seconds long while others have half lives of billions of years. For example the half-life of polonium-216 is only 0.145 seconds while the half-life of uranium-238, is 4.5 billion years. Considering the average Canadian lives about 76 years, and the dinosaurs died off about 160 million years ago, a half-life of 4.5 billion years is a very, very long time.



The Earth itself is about 4.5 billion years old. The half-life of uranium-238, the dominant isotope in natural uranium, is also 4.5 billion years. When the earth was young, there was twice as much uranium-238 as exists today. Moreover, there was more than 64 times as much uranium-235 at that time than exists today.

ISOTOPE	TYPE OF DECAY	HALF LIFE
Thorium-232	α	14 billion years
Radium-228	β	5.75 days
Actinium-228	β	6.15 hours
Thorium-228	α	1.9 years
Radium-224	α	3.66 years
Radon-220	α	55.6 seconds
Polonium-216	α	0.145 seconds
Lead-212	α	10.64 hours
Bismuth-212	β	60.6 minutes
Polonium-212	α	0.299 micro seconds
Thallium-208	β	3.05 minutes
Lead-208		Stable