

Transcript

Carbon14 Dating

A few introductory words of explanation about this transcript.

This transcript includes the words sent to the narrator for inclusion in the latest version of the associated video. Occasionally, the narrator changes a few words on the fly in order to improve the flow. It is written in a manner that suggests to the narrator where emphasis and pauses might go, so it is not intended to be grammatically correct.

The Scene numbers are left in this transcript although they are not necessarily observable by watching the video.

There will also be occasional passages in blue that are NOT in the video but that might be useful corollary information.

There may be occasional figures that suggest what might be on the screen at that time.

Carbon is a critical ingredient for life on Earth. All living things are made up of about 25% carbon. The carbon atom is unique because it can bind to other carbon atoms to form long chains and rings and these in turn serve as the backbone of the complex molecules that make life possible.

The nucleus of a typical carbon atom has 6 protons and 6 neutrons. But about one carbon atom out of every 100 has one extra neutron. This has very little effect on the properties of the carbon, other than making it slightly heavier. Chemically, it acts just like any other carbon atom. It is called Carbon-13.

And there is an even rarer type of carbon. It is formed high in the atmosphere when cosmic rays strike atoms of nitrogen converting them into Carbon -14. Carbon-14 is also chemically identical to regular carbon. But the nucleus of carbon-14 is unstable. After some amount of time, which could range from a few days to many thousands of year's, carbon-14 decays back into nitrogen. But since carbon-14 is formed at a steady rate, there is a constant level of it in the environment. Out of every trillion carbon atoms in your body, only one dozen of them are carbon-14.

As long as an organism is alive and eating, it maintains a constant ratio of carbon-14 to regular carbon. But once an organism dies, the amount of carbon-14 in its body begins to decrease. After 5000 years about half of the original number of carbon-14 atoms will have decayed. Using this fact, scientists can tell how long ago an organism died.