Isotope Encyclopedia Article

Isotope

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Isotope

Different forms of atoms of the same element. Atoms consist of a nucleus, containing positively-charged particles (protons) and neutral particles (neutrons), surrounded by negatively-charged particles (electrons). Isotopes of an element differ only in the number of neutrons in the nucleus and hence in atomic weight. The nuclei of some isotopes are unstable and undergo **radioactive decay**. An element can have several stable and radioactive isotopes, but most elements have only two or three isotopes that are of any importance. Also, for most elements the radioactive isotopes are only of concern in material exposed to certain types of radiation sources. **Carbon** has three important isotopes with atomic weights of 12, 13, and 14. C-12 is stable and represents 98.9% of natural carbon. C-13 is also stable and represents 1.1% of natural carbon. C-14 represents an insignificant fraction of naturally-occurring carbon, but it is radioactive and important because its radioactive decay is valuable in the dating of fossils and ancient artifacts. It is also useful in tracing the reactions of carbon compounds in research.

See Also

Nuclear Fission; Nuclear Power; Radioactivity; Radiocarbon Dating