Radiotracer

A radioactive tracer, or radioactive label, is a chemical compound in which one or more atoms have been replaced by a radioisotope so by virtue of its radioactive decay it can be used to explore the mechanism of chemical reactions by tracing the path that the radioisotope follows from reactants to products. Radiolabeling is thus the radioactive form of isotopic labeling.

Radioisotopes of hydrogen, carbon, phosphorus, sulphur, and iodine have been used extensively to trace the path of biochemical reactions. A radioactive tracer can also be used to track the distribution of a substance within a natural system such as a cell or tissue.

Radioactive tracers are also used to determine the location of fractures created by hydraulic fracturing in natural gas production.

Radioactive tracers form the basis of a variety of imaging systems, such as, PET scans, SPECT scans and technetium scans. Radiocarbon dating uses the naturally occurring carbon-14 isotope as an isotopic label that nature builds into any living thing.