

1 Uses of Radioisotopes

Radioisotopes have several common uses in industry and in homes including the following:

- Smoke detectors use radioisotopes to ionise air (typically americium-241). Two chambers are used, one which is open to the air and a control which prevents particles from entering. Alpha particles are emitted into both chambers where some of the molecules in the air are ionised creating a potential difference between pairs of electrodes in the chambers. The potential difference across each pair of electrodes should be the same but if there is a difference, the alarm is sounded.
- Radioactive tracers are used to follow biochemical reactions by replacing a typical chemical in the body with a radioactive isotope of the same element. The fact that the radioactive decay is much more energetic than the chemical reactions allow the particles to be detected more easily using equipment like Geiger counters.
- Carbon dating is used to determine the age of organic material by examining the carbon-14 (radiocarbon) content of the material. The half-life of ^{14}C is approximately 5730 years.