

WJEC Wales Physics GCSE

2.8 - Half-Life

Flashcards

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Define the half-life of a radioactive isotope.



Define the half-life of a radioactive isotope.

- The time it takes for the number of unstable nuclei in a substance to halve.
- The time it takes for the count rate from a sample to fall to half its initial level.



Why are isotopes with long half-lives particularly harmful?



Why are isotopes with long half-lives particularly harmful?

- They remain radioactive for much longer periods of time.
- They must be stored in specific ways to avoid humans and the environment from being exposed to radiation for too long.



State **two** uses of nuclear radiation in the field of medicine.



State **two** uses of nuclear radiation in the field of medicine.

1. Examining of internal organs
2. Controlling and destroying unwanted tissue



Describe the nature of radioactive decay.



Describe the nature of radioactive decay.

- Random
- Which nuclei decays and when is determined only by chance
- It is impossible to predict which nuclei will decay and when



Explain how to determine and verify half-life from a decay curve.



Explain how to determine and verify half-life from a decay curve.

- Read off the time axis the time it takes for the number of unstable nuclei to half.
- To verify, check that the time it takes for that number to half again is the same.



Explain the basic idea behind carbon dating.



Explain the basic idea behind carbon dating.

- All living things contain the same relative amount of carbon-12.
- When they die, the carbon decays at a known rate.
- By measuring the amount of carbon remaining, the age can be calculated.



Explain how a medical radioactive tracer is used.



Explain how a medical radioactive tracer is used.

- The tracer is inserted in the body (often through the bloodstream).
- The tracer is radioactive so decays.
- A detector outside the body can detect this radiation and locate the tracer.



What can be said about the half-life of a given radioactive isotope?



What can be said about the half-life of a given radioactive isotope?

It is constant.



Define the activity of an unstable nucleus.



Define the activity of an unstable nucleus.

Activity is the rate at which a source of unstable nuclei decays.



What is the unit of radioactive activity?



What is the unit of radioactive activity?

Becquerel (Bq)

