

OCR (B) Physics GCSE

Topic 5.2 - How can radioactive materials
be used safely?

Flashcards



What are the risks of ionising radiation to people?



What are the risks of ionising radiation to people?

It can damage living cells, causing them to die or mutate and become cancerous.



What is contamination?



What is contamination?

Unwanted radioactive atoms found on materials.



What is irradiation?



What is irradiation?

Exposing an object to nuclear radiation, without making it radioactive.



What is a use of irradiation?



What is a use of irradiation?

Sterilisation; medical tools are irradiated to kill bacteria.



Give 3 practical applications of
radioactive materials



Give 3 practical applications of radioactive materials

- Medical tracers
- Radiotherapy
- Smoke alarms



Give an example of a medical tracer



Give an example of a medical tracer

Technetium



Why is technetium used as a medical tracer?



Why is technetium used as a medical tracer?

It has a half life of 6 hours and decays into a safe isotope which can be excreted, making it safe for use in the body.

It releases only gamma radiation so is weakly ionising and can pass easily through body tissue without damaging it.



What kind of radiation is used for radiotherapy?



What kind of radiation is used for radiotherapy?

Gamma radiation



Explain the process of radiotherapy



Explain the process of chemotherapy

- Gamma emitters direct gamma rays onto specific areas with cancerous cells.
- The cells absorb the radiation and die.



What kind of radiation is used in smoke alarms?



What kind of radiation is used in smoke detectors?

Alpha radiation



Give an isotope used in smoke alarms



Give an isotope used in smoke alarms

Americium



How do smoke alarms work?



How do smoke alarms work?

Alpha radiation is emitted into the air, reaching a detector and completing the circuit. If smoke is present, it blocks alpha radiation so it does not reach the detector and the circuit is broken, causing an alarm to sound.



What factors need to be considered in choosing radiation type?



What factors need to be considered in choosing radiation type?

- Ionising ability.
- Penetration (alpha should not be used in the body, as it is blocked by skin so will be trapped inside).
- Half life.

