

Edexcel IGCSE Physics

Chapter 7 - Radioactivity and Particles

Practical Flashcards

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Investigate the penetration powers of different types of radiation using either radioactive sources or simulations



What equipment is needed?



What equipment is needed?

- Alpha, beta and gamma sources
- Geiger counter
- Stopwatch
- Ruler
- Absorbers
 - Plastic
 - Aluminium
 - Steel
 - Lead
 - Paper



Outline the method



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1. Set up the geiger counter and measure the background radiation
2. Set up a clamp around 5cm from the geiger counter
3. Place the source just behind the clamp and take an activity reading
4. Place the first absorber in the clamp and take another activity reading
5. Repeat with different sources and absorbers



How should you measure activity?



How should you measure activity?

Measure the counts over a 5 minute period and divide by 300 (the number of seconds) to calculate the count rate.



What is the unit for activity?



What is the unit for activity?

Becquerels (Bq)



What is 1 Bq equal to?



What is 1 Bq equal to?

1 count per second.



What does a high count rate mean?



What does a high count rate mean?

That more radiation has passed through the absorber, so this means that the radiation is more penetrating (or the absorber is a worse blocker).



What is background radiation?



What is background radiation?

The radiation that is always present due to background sources, such as underground rocks or solar radiation.



What is the corrected count rate?



What is the corrected count rate?

The count rate once background radiation has been accounted for.



How is corrected count rate calculated?



How is corrected count rate calculated?

Background radiation is subtracted
from the measured count rate.



Why is taking repeat readings beneficial?



Why is taking repeat readings beneficial?

Radiation is random so it is common to get anomalous results. Repeat readings will help to identify and discard anomalies.



How should results be displayed?



How should results be displayed?

Bar charts

You can do a bar chart for each source, with different absorbers, or a bar chart for each absorber, with the different sources.



How can you reduce risk when using radiation?



How can you reduce risk when using radiation?

- Keep exposure time to a minimum
- Keep as much distance as possible
- Never handle the source directly,
always use tongs etc

