

Radioactive Radiation

Reading: Pages 195-199 higher, 197-201 foundation

Knowledge

1. Where is all the mass in the atom?
2. Who discovered electrons?
3. What did Rutherford fire at gold foil?
4. What can cause electrons to move further from the nucleus?
5. When can electrons move closer to the nucleus?
6. What is 'ionising radiation'?
7. Which is the most ionising form of radiation?
8. Which is the most penetrating?
9. Which piece of equipment measures radiation levels?
10. What happens to levels of radioactivity over time?
11. Exposure to alpha, beta or gamma radiation is Whereas getting radioactive atoms into or onto an object is
12. Complete the table:

Type of nuclear radiation	What it is	Distance it can travel	How the nucleus is changed when it is emitted	Stopped by
Alpha			Proton number decreases by 2, mass number decreases by 4	
Beta		A few metres		
Gamma				Thick lead or concrete

Application

1. Explain what might have happened in an atom if the electrons move closer to the nucleus

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2. Compare the plum pudding model of the atom with the nuclear model.

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3. Complete the table about Rutherford's experiment with gold leaf:

Observation	What this told him about the atom
Most alpha particles went straight through the atom	
Some were deflected off course	
A very few came straight back	

4. Describe what happens in the nucleus of an atom during Beta decay

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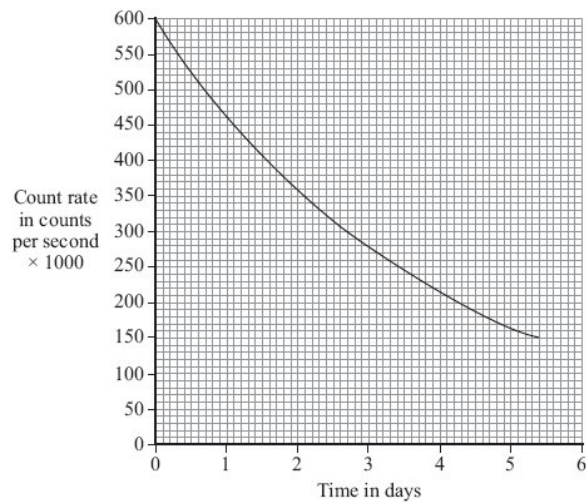
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5. What is 'half-life'?

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6. The graph shows how the count rate from a sample of gold-198 changes with time.



Calculate the half-life of the sample of gold

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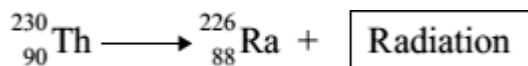
Extend

7. Explain why alpha particles are not dangerous to us outside the body, but can be very dangerous inside the body

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8. When a thorium-230 nucleus decays, it emits radiation and changes into radium-226.



What type of radiation is emitted by thorium-230? How do you know?

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