

Uses of radioactivity & fission/fusion

Reading Pages 47-49

Knowledge

1. What is the name of the radiation from space?
2. Name 3 natural sources of background radiation
3. Name 2 man-made sources of background radiation.
4. Which type of radiation is least dangerous outside the body?
5. Which type of radioactive source is generally used in medical tracers?
6. What is nuclear fission?
7. What is fired at atoms of uranium to start the fission process?
8. What can be used to slow down the fission process in nuclear reactors?
9. What is nuclear fusion?
10. Where does nuclear fusion take place commonly?

Application

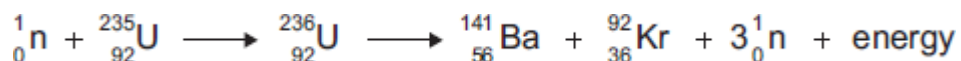
1. Describe the dangers of different levels of radiation

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2. The following nuclear equation represents the fission of uranium-235 (U-235).



Chemical symbols:

Ba - barium

Kr - krypton

- (i) Use the information in the equation to describe the process of nuclear fission and explain how it can result in a chain reaction.

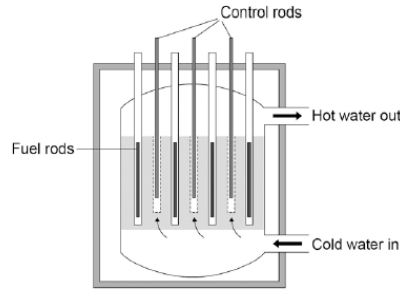
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(ii) The diagram shows control rods which can be lowered or raised in the reactor. Explain how control rods are used to control the chain reaction



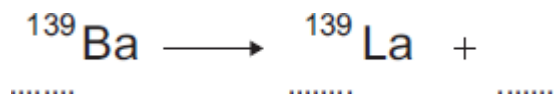
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(iii). An isotope of barium is Ba-139.
Ba-139 decays by beta decay to lanthanum-139 (La-139).

Complete the nuclear equation that represents the decay of Ba-139 to La-139.



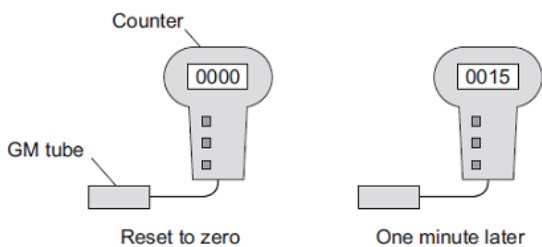
3. Explain why **nuclear fusion** reactors are so difficult to build and expensive to run

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4. A teacher used a Geiger-Müller (GM) tube and counter to measure the *background radiation* in her laboratory. The teacher reset the counter to zero, waited one minutes and then took the count reading. The teacher repeated the procedure two more times.



Count after one minute
15
24
18

The three readings taken by the teacher are given in the table. The readings given in the table are correct. Why are the readings different?

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Calculate the mean background rate

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