

Shedding Light on Nuclear Radiation Episode 2: Alpha Radiation Name:

Part A:

1. Radioactive substances that emit alpha radiation are called _____.

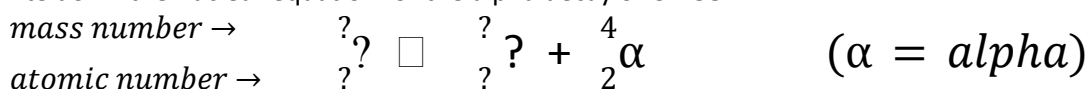
Part B:

2. Fill in the table below.

Isotopes of Uranium, U			
Isotope	Atomic Number, Z	Mass Number, A	Abundance (%)
uranium-234			
uranium-235			
uranium-238			

3. Briefly describe an alpha particle.

4. Write down the nuclear equation for the alpha decay of U-238.

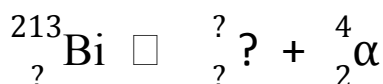


5. Why are alpha particles deadly to living cells?
6. Why are alpha particles generally harmless when they are emitted from a source outside of the body?

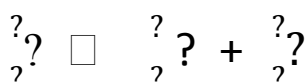
7. Complete the following nuclear equations. You will need a periodic table.

(mass number = number of protons + neutrons) (atomic number = number of protons)

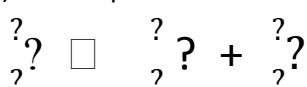
- (a) Bismuth-213 is an alpha emitter that is used in certain specialized cancer treatments.



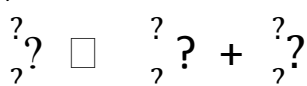
- (b) Plutonium-238 is an alpha emitter that is used as a heat source in space probes.



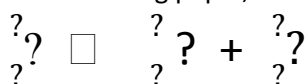
- (c) Neptunium-237 is an alpha emitter that is used as a raw ingredient in the production of Pu-238.



- (d) Americium-241 is an alpha emitter that is used in many types of smoke alarms.



- (e) Polonium-210 is an alpha emitter used in some devices to eliminate static electricity in processes such as rolling paper, manufacturing sheet plastics, and spinning synthetic fibres.



Part C:

8. What is an RTG? Give an example of where you might find one.
9. How are cancer cells different to normal healthy cells?

10. Briefly describe the use of radium-223 in the treatment of certain types of bone cancer.
11. Alpha radiation is a type of “ionizing radiation”. What is ionizing radiation?