

6 (a) β -radiation is emitted during the spontaneous radioactive decay of an unstable nucleus.

(i) State the nature of a β -particle.

..... [1]

(ii) State two properties of β -radiation.

1.

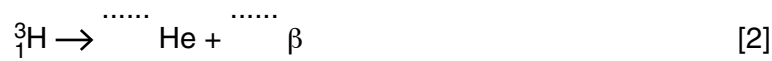
2. [2]

(iii) Explain the meaning of *spontaneous radioactive decay*.

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..... [1]

(b) The following equation represents the decay of a nucleus of hydrogen-3 by the emission of a β -particle.

Complete the equation.



(c) The β -particle is emitted with an energy of $5.7 \times 10^3 \text{ eV}$.

Calculate the speed of the β -particle.

speed = ms^{-1} [3]

(d) A different isotope of hydrogen is hydrogen-2 (deuterium). Describe the similarities and differences between the atoms of hydrogen-2 and hydrogen-3.

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