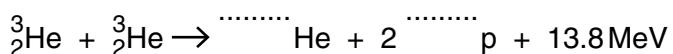


- 7 A nuclear reaction between two helium nuclei produces a second isotope of helium, two protons and 13.8 MeV of energy. The reaction is represented by the following equation.



- (a) Complete the nuclear equation. [2]

- (b) By reference to this reaction, explain the meaning of the term *isotope*.

.....  
 .....  
 .....  
 .....  
 ..... [2]

- (c) State the quantities that are conserved in this nuclear reaction.

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [2]

- (d) Radiation is produced in this nuclear reaction.

State

- (i) a possible type of radiation that may be produced,

..... [1]

- (ii) why the energy of this radiation is less than the 13.8 MeV given in the equation.

..... [1]

- (e) Calculate the minimum number of these reactions needed per second to produce power of 60 W.

$$\text{number} = \dots \text{s}^{-1} [2]$$