| | Marks |
|---|---|
| • Balance the following nuclear reactions by identifying the missing nuclear particle or nuclide. | **4** |

$$^1_1H \ + \ ^1_1H \ \rightarrow \ ^2_1H \ + \ \boxed{\phantom{XX}}$$

$$^2_1H \ + \ \boxed{\phantom{XX}} \ \rightarrow \ ^3_2He$$

$$^3_2He \ + \ ^3_2He \ \rightarrow \ \boxed{\phantom{XX}} \ + \ ^1_1H \ + \ ^1_1H$$
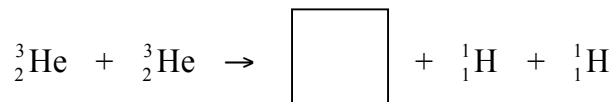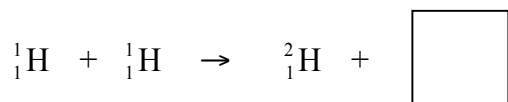
Where might these reactions occur naturally?

| | |
|---|---|
| • The half life of $^{131}I$ is 8.06 days. Calculate the activity, in Bq, of 12.0 g of pure $^{131}I$. Calculate the activity of $^{131}I$ in Ci mol$^{-1}$. | **3** |

Answer:                    Bq                    Answer:                    Ci mol$^{-1}$