

Nuclear Reactions - Fusion

Recall: Nuclear fission – what is it again?

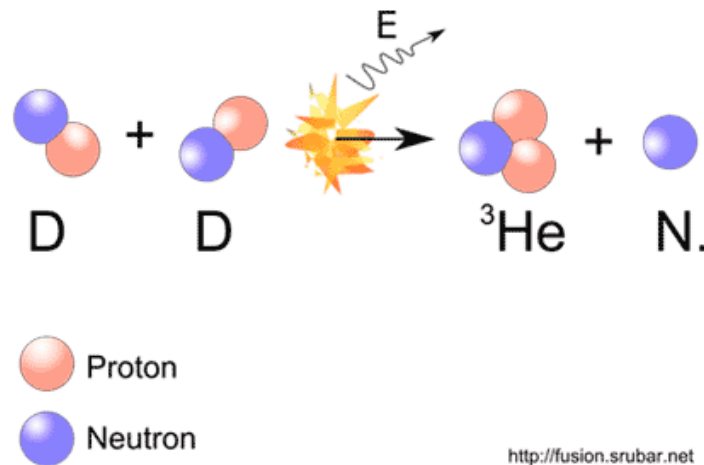
- The splitting of a large nucleus into two smaller nuclei

Nuclear fusion

Involves 2 different nuclei to fuse together or to join to produce one larger nucleus.

When the nuclei join together, large amounts of energy are released with little (or no) waste being produced. *If you can find a way to control this reaction, you'll be an instant billionaire! ☺*

Nuclear fusion reactions occur on the sun and in stars because the temperature is high enough for nuclei to reach very high speeds. High speeds allow for a collision that fuses two nuclei together.



Example:

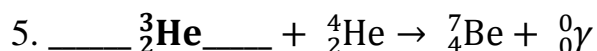
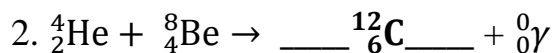
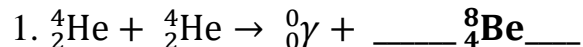
This happens on the sun: ${}^1_1\text{H} + {}^1_1\text{H} \rightarrow {}^2_2\text{He}$

note: the energy comes from the loss of mass in the equation

Recall: when writing equations, what two components must be the same on both sides?

- Charge
- Mass

Practice:



****On a separate page, work with a partner to compare and contrast **nuclear fission** and **nuclear fusion**. You can use a t-chart, Venn diagram, or any other graphic organizer that you wish!****

Work with a friend. Use your textbook and/or phones to fill in the following information.

	Nuclear Fusion Weapons
Define <i>hydrogen bomb</i>	- It is another name for a fusion bomb – it used the fusion of hydrogen isotopes to produce energy
How does it work?	- Tritium (hydrogen isotope) is fused with deuterium to produce large amounts of energy
Give an example of when/how it was used	- It was used as an experiment and it produced so much energy that it completely destroyed islands (Bikini Atoll)

***Note:** fission bombs are required to star fusion bombs; fission bombs are used because they produce similar temperatures found on the sun, this heat energy is harnessed to start a fusion reaction*