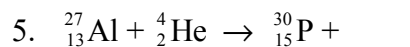
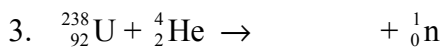
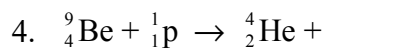


Read pp. 711-712 and 717-721 in the text (we will discuss Nuclear Power Plants shortly)

### I. Induced Transmutation

- Describe the process of induced transmutation. What is the large machine used to achieve these reactions called?

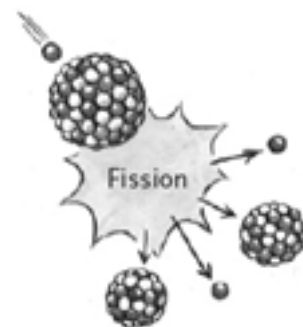
Complete the following induced transmutation equations.



- Write the balanced nuclear equation for the induced transmutation of aluminum-27 into sodium-24 by neutron bombardment. An alpha particle is released in the reaction.
- Write the equation for the bombardment of Am-241 with Be-9 that creates 3 neutrons and another particle:
- Write the balanced nuclear equation for the alpha particle bombardment of  ${}_{94}^{239}\text{Pu}$ . One of the reaction products is a neutron [you will need to determine the other].

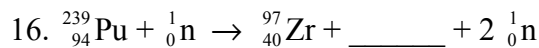
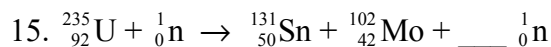
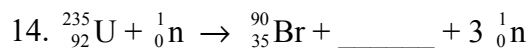
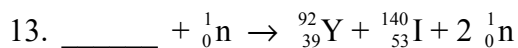
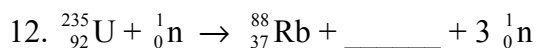
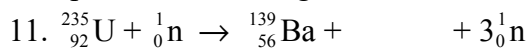
### II. Nuclear Fission

- Explain the process that occurs during the fission of a nucleus. Be sure to include a description of the forces involved and how they change during the process.



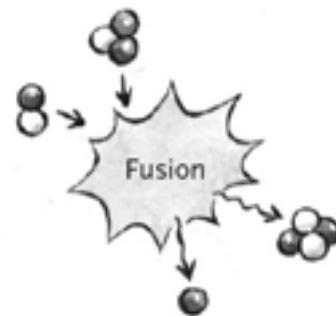
- How does a nuclear chain reaction occur? What is needed for a chain reaction to go out of control?

Complete the following fission reactions.



### III. Nuclear Fusion

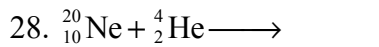
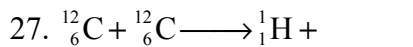
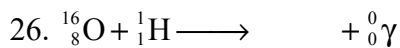
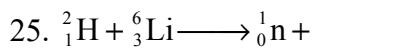
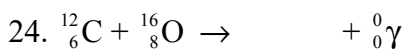
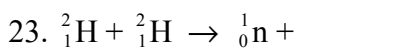
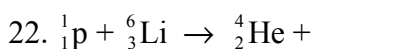
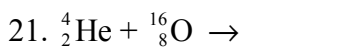
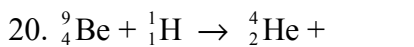
17. Why does nuclear fusion require such high temperatures? What forces are involved and what is needed for two nuclei to successfully fuse together?



18. Why does the fusion of two He-4 nuclei require much higher temperatures than fusion of H-2 with H-3?

19. How is nuclear fission different from nuclear fusion? Describe the particles involved and the conditions necessary.

Complete the following fusion reactions.



For more practice, go to <http://www.chemteam.info/ChemTeamIndex.html> and click on [Radioactivity](#).