

# FISSION AND FUSION OF ATOMIC NUCLEI

## Section Review

### Objectives

- Describe what happens in a nuclear chain reaction.
- Explain the role of water in the storage of spent fuel rods
- Compare and contrast fission and fusion reactions

### Vocabulary

- fission
- neutron moderation
- neutron absorption
- fusion

### Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- Nuclear 1 occurs when fissionable isotopes are bombarded with 2. The 3 breaks into two fragments of about the same size, and in the process they release more neutrons and 4.
- Neutron 5 is the process that reduces the speed of neutrons. Neutron 6 is the process that decreases the number of slow-moving neutrons. In nuclear 7, nuclei combine to make nuclei of greater 8. The sun's 9 is produced when 10 nuclei fuse to make 11 nuclei. Fusion releases even more energy than fission.

### Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

12. Water is used as a moderator in nuclear reactors.
13. In nuclear fusion, the nuclei of two large atoms fuse together.

14. Moderation of neutrons is used to slow nuclear fission.
15. Nuclear fusion can be easily produced under laboratory conditions.

### Part C Matching

Match each description in Column B to the correct term in Column A.

#### Column A

#### Column B

16. fission
17. neutron moderation
18. neutron absorption
19. fusion
20. uranium-235
- a. the splitting of an atomic nucleus into smaller fragments
- b. combination of two nuclei to produce a nucleus of greater mass
- c. process used to reduce the speed of neutrons
- d. isotope capable of fission
- e. process used to decrease the number of slow-moving neutrons

### Part D Questions and Problems

Answer the following in the space provided.

21. How many neutrons are produced in each of the following fission reactions?



22. What is the role in a nuclear reactor of

- a. neutron moderation?
- b. neutron absorption?