

3-4 Review and Reinforcement

Changes in the Nucleus

Complete each of the sentences below.

1. Nuclear reactions change the composition of an atom's _____.
2. The attractive force that overcomes the electric repulsion between protons is the _____ force.
3. Almost all the atoms you encounter have _____ nuclei.
4. All nuclei with atomic numbers greater than 83 are _____.
5. Alpha, beta, and gamma radiation are distinguished by their charge, _____, and penetrating power.
6. When an atom emits alpha, beta, or gamma radiation, it is undergoing _____ decay.

Answer each of the following questions in the space provided.

7. Why is carbon dating not useful for artifacts made entirely of metal?

8. Compare the penetrating power of alpha, beta, and gamma radiation.

9. Why do nuclei need neutrons to be stable?

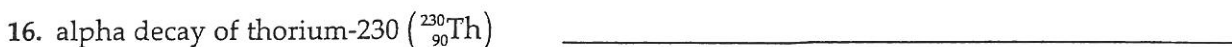
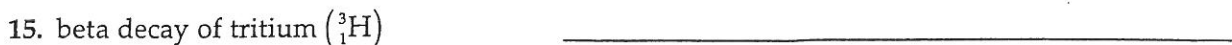
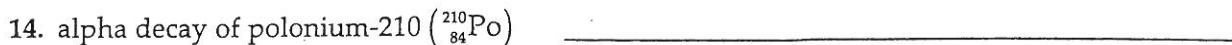
10. Describe two types of nuclear reactions other than radioactive decay.

3-4 Review and Reinforcement (continued)

Complete each of the following nuclear reactions by filling in the blank with the correct particle.



Write the nuclear equations for the following reactions.



On the line at the left, write the letter of the answer that best completes each statement.

_____ 17. In any radioactive decay, the sum of the mass numbers and atomic numbers must be _____ before and after the reaction.

- a. greater
- b. the same
- c. less
- d. unpredictable

_____ 18. The most dangerous form of radiation to the human body is

- a. beta radiation.
- b. gamma radiation.
- c. alpha radiation.
- d. They are all equally dangerous.

_____ 19. To be stable, atoms with more than 20 protons need increasingly more

- a. neutrons than protons.
- b. electrons than protons.
- c. electrons than neutrons.
- d. protons than neutrons.

_____ 20. The sun produces energy by means of

- a. gamma radiation.
- b. beta decay.
- c. alpha decay.
- d. nuclear fusion.