

1. Which term represents a type of nuclear reaction?

- A) condensation
- B) vaporization
- C) single replacement
- D) natural transmutation

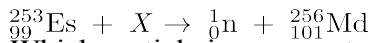
2. Which term identifies a type of nuclear reaction?

- A) transmutation
- B) neutralization
- C) deposition
- D) reduction

3. In which type of reaction is an atom of one element converted to an atom of a different element?

- A) decomposition
- B) neutralization
- C) saponification
- D) transmutation

4. Given the nuclear equation:



Which particle is represented by X ?

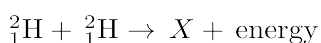
- A) ${}_{2}^4\text{He}$
- B) ${}_{-1}^0\text{e}$
- C) ${}_0^1\text{n}$
- D) ${}_{+1}^0\text{e}$

5. Which equation represents the radioactive decay of



- A) ${}_{88}^{226}\text{Ra} \rightarrow {}_{86}^{222}\text{Rn} + {}_2^4\text{He}$
- B) ${}_{88}^{226}\text{Ra} \rightarrow {}_{89}^{226}\text{Ac} + {}_{-1}^0\text{e}$
- C) ${}_{88}^{226}\text{Ra} \rightarrow {}_{87}^{226}\text{Fr} + {}_{+1}^0\text{e}$
- D) ${}_{88}^{226}\text{Ra} \rightarrow {}_{88}^{225}\text{Ra} + {}_0^1\text{n}$

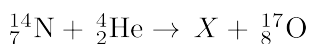
6. Given the fusion reaction:



Which particle is represented by X ?

- A) ${}_1^1\text{H}$
- B) ${}_2^3\text{He}$
- C) ${}_1^3\text{H}$
- D) ${}_2^4\text{He}$

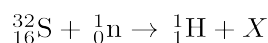
7. Given the equation:



When the equation is balanced correctly, which particle is represented by X ?

- A) ${}_{-1}^0\text{e}$
- B) ${}_1^1\text{H}$
- C) ${}_1^2\text{H}$
- D) ${}_0^1\text{n}$

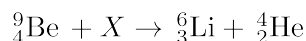
8. Given the nuclear reaction:



What does X represent in this reaction?

- A) ${}_{15}^{31}\text{P}$
- B) ${}_{15}^{32}\text{P}$
- C) ${}_{16}^{31}\text{P}$
- D) ${}_{16}^{32}\text{P}$

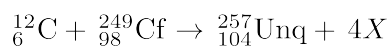
9. In the reaction:



The X represents

- A) ${}_{+1}^0\text{e}$
- B) ${}_1^1\text{H}$
- C) ${}_{-1}^0\text{e}$
- D) ${}_0^1\text{n}$

10. Given the correctly balanced nuclear equation:



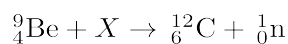
Which particle is represented by the X ?

- A) ${}_1^1\text{H}$
- B) ${}_0^1\text{n}$
- C) ${}_2^4\text{He}$
- D) ${}_{-1}^0\text{e}$

11. Which reaction is matched correctly with the particle represented by letter X ?

- A) ${}_{88}^{226}\text{Ra} \rightarrow {}_{86}^{222}\text{Rn} + X$; X is an alpha particle.
- B) ${}_{90}^{234}\text{Th} \rightarrow {}_{91}^{234}\text{Pa} + X$; X is an alpha particle.
- C) ${}_{90}^{230}\text{Th} \rightarrow {}_{88}^{226}\text{Ra} + X$; X is a beta particle.
- D) ${}_{92}^{234}\text{U} \rightarrow {}_{90}^{230}\text{Th} + X$; X is a beta particle.

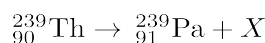
12. Given the nuclear reaction:



What is the identity of particle X ?

- A) alpha particle
- B) beta particle
- C) proton
- D) neutron

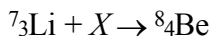
13. In the equation:



The symbol X represents

- A) ${}_{+1}^0\text{e}$
- B) ${}_{-1}^0\text{e}$
- C) ${}_0^1\text{n}$
- D) ${}_1^1\text{H}$

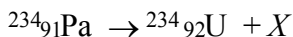
14. Given the reaction:



Which species is represented by X ?

- A) ${}^1_1\text{H}$ B) ${}^2_1\text{H}$ C) ${}^3_2\text{He}$ D) ${}^4_2\text{He}$

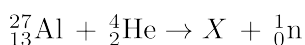
15. In the equation:



The X represents a

- A) helium nucleus B) beta particle
C) proton D) neutron

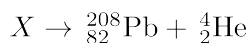
16. Given the reaction:



When the equation is correctly balanced, the nucleus represented by X is

- A) ${}^{30}_{13}\text{Al}$ B) ${}^{30}_{14}\text{Si}$ C) ${}^{30}_{15}\text{P}$ D) ${}^{30}_{16}\text{S}$

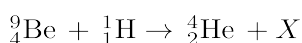
17. According to the equation:



The nucleus correctly represented by X is

- A) ${}^{204}_{80}\text{Hg}$ B) ${}^{212}_{84}\text{Po}$ C) ${}^{204}_{80}\text{Bi}$ D) ${}^{212}_{84}\text{Pb}$

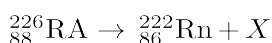
18. Given the reaction:



Which species is represented by X ?

- A) ${}^8_3\text{Li}$ B) ${}^6_3\text{Li}$ C) ${}^8_5\text{B}$ D) ${}^{10}_5\text{B}$

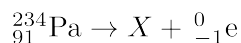
19. In the equation:



X represents

- A) a neutron B) a proton
C) a beta particle D) an alpha particle

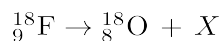
20. Given the reaction:



When the equation is correctly balanced the nucleus represented by X is

- A) ${}^{234}_{92}\text{U}$ B) ${}^{235}_{92}\text{U}$
C) ${}^{230}_{90}\text{Th}$ D) ${}^{232}_{90}\text{Th}$

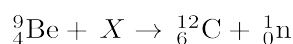
21. Given the equation:



Which symbol, when substituted for X , correctly balances the equation?

- A) ${}^1_1\text{H}$ B) ${}^1_0\text{n}$ C) ${}^0_{-1}\text{e}$ D) ${}^0_{+1}\text{e}$

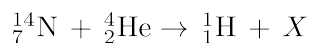
22. In the reaction:



The X represents

- A) an alpha particle B) a beta particle
C) an electron D) a proton

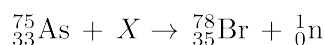
23. Given the nuclear reaction:



Which isotope is represented by the X when the equation is correctly balanced?

- A) ${}^{17}_8\text{O}$ B) ${}^{18}_8\text{O}$ C) ${}^{17}_9\text{F}$ D) ${}^{18}_9\text{F}$

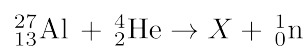
24. In the reaction below



X represents

- A) an alpha particle B) a beta particle
C) a proton D) a triton

25. Aluminum-27 is bombarded with alpha particles according to the following nuclear equation:



The radioactive element represented by X is an isotope of

- A) zinc B) phosphorus
C) sulfur D) sodium