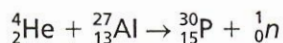


ARTIFICIAL RADIOACTIVITY / TRANSMUTATION

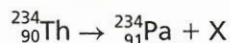
Review Questions

16. The nuclear reaction



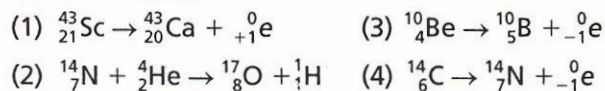
is an example of

- (1) nuclear fusion
(2) nuclear fission
(3) natural transmutation
(4) artificial transmutation
17. Which particle is represented by X in the following transmutation?

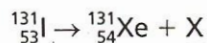


- (1) ${}^0_{-1}\text{e}$ (2) ${}^4_2\text{He}$ (3) ${}^1_1\text{H}$ (4) ${}^0_{+1}\text{e}$

18. Which equation represents a nuclear reaction that is an example of an artificial transmutation?

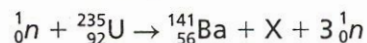


19. Which particle is represented by X in the following transmutation?



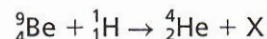
- (1) alpha (2) beta (3) neutron (4) proton

20. What is the charge of the element represented by X in the following transmutation?



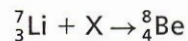
- (1) 36 (2) 89 (3) 92 (4) 93

21. Which species is represented by X in the following transmutation?



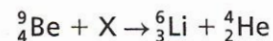
- (1) ${}^8_3\text{Li}$ (2) ${}^6_3\text{Li}$ (3) ${}^8_5\text{B}$ (4) ${}^{10}_5\text{B}$

22. Which species is represented by X in the following transmutation?



- (1) ${}^1_1\text{H}$ (2) ${}^2_1\text{H}$ (3) ${}^3_2\text{He}$ (4) ${}^4_2\text{He}$

23. What is the identity of particle X in the following transmutation?



- (1) ${}^1_1\text{H}$ (2) ${}^2_1\text{H}$ (3) ${}^0_{-1}\text{e}$ (4) 1_0n

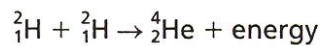
Review Questions

24. High energy is a requirement for fusion reactions to occur because the nuclei involved
- (1) attract each other because they have like charges
 - (2) attract each other because they have unlike charges
 - (3) repel each other because they have like charges
 - (4) repel each other because they have unlike charges

25. When a uranium nucleus breaks up into fragments, which type of nuclear reaction occurs?
- (1) fusion
 - (2) fission
 - (3) replacement
 - (4) redox

26. Which pair of nuclei can undergo a fusion reaction?
- (1) potassium-40 and cadmium-113
 - (2) zinc-64 and calcium-44
 - (3) uranium-238 and lead-208
 - (4) hydrogen-2 and hydrogen-3

27. What process is represented by the following reaction?



- (1) fission
 - (2) fusion
 - (3) artificial transmutation
 - (4) alpha decay
28. During a fission reaction, which type of particle is captured by a nucleus?
- (1) deuteron
 - (2) electron
 - (3) neutron
 - (4) proton

29. What is the primary result of a fission reaction?

- (1) conversion of mass to energy
- (2) conversion of energy to mass
- (3) binding together of two heavy nuclei
- (4) binding together of two light nuclei

30. Compared to an ordinary chemical reaction, a fission reaction will

- (1) release smaller amounts of energy
- (2) release larger amounts of energy
- (3) absorb smaller amounts of energy
- (4) absorb larger amounts of energy

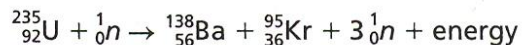
31. Which type of reaction produces energy and intensely radioactive waste products?

- (1) fusion of tritium and deuterium
- (2) fission of uranium
- (3) burning of heating oil
- (4) burning of wood

32. Which process occurs in a controlled fusion reaction?

- (1) Light nuclei collide to produce heavier nuclei.
- (2) Heavy nuclei collide to produce lighter nuclei.
- (3) Neutron bombardment splits light nuclei.
- (4) Neutron bombardment splits heavy nuclei.

33. Consider this reaction.



This equation can best be described as

- (1) fission
- (2) fusion
- (3) natural decay
- (4) endothermic