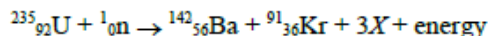


Name _____

1) Given the balanced equation representing a nuclear reaction:



Which particle is represented by X ?

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

2) Which statement best describes what happens in a fission reaction?

- A) Heavy nuclei split into lighter nuclei.
B) Light nuclei form into heavier nuclei.
C) Energy is released and less stable elements are formed.
D) Energy is absorbed and more stable elements are formed.

3) In which reaction is mass converted to energy by the process of fission?

- A) ${}^{14}_7\text{N} + {}^1_0\text{n} \rightarrow {}^{14}_6\text{C} + {}^1_1\text{H}$
B) ${}^{235}_{92}\text{U} + {}^1_0\text{n} \rightarrow {}^{87}_{35}\text{Br} + {}^{146}_{57}\text{La} + 3{}^1_0\text{n}$
C) ${}^{226}_{88}\text{Ra} \rightarrow {}^{222}_{86}\text{Ra} + {}^4_2\text{He}$
D) ${}^2_1\text{H} + {}^2_1\text{H} \rightarrow {}^4_2\text{He}$

4) Compared to an ordinary chemical reaction, a fission reaction will

- A) release smaller amounts of energy
B) release larger amounts of energy
C) absorb smaller amounts of energy
D) absorb larger amounts of energy

5) An uncontrolled chain reaction takes place during the

- A) operation of a fission nuclear reactor
B) explosion of an atomic bomb
C) production of energy by the Earth's Sun
D) fusion of light nuclei into heavier nuclei

6) In which type of reaction do two lighter nuclei combine to form one heavier nucleus?

- A) combustion B) reduction
C) nuclear fission D) nuclear fusion

7) Which balanced equation represents nuclear fusion?

- A) ${}^1_0\text{n} + {}^{235}_{92}\text{U} \rightarrow {}^{142}_{56}\text{Ba} + {}^{91}_{36}\text{Kr} + 3{}^1_0\text{n}$
B) ${}^{226}_{88}\text{Ra} \rightarrow {}^{222}_{86}\text{Rn} + {}^4_2\text{He}$
C) ${}^6_3\text{Li} + {}^1_0\text{n} \rightarrow {}^3_1\text{H} + {}^4_2\text{He}$
D) ${}^2_1\text{H} + {}^3_1\text{H} \rightarrow {}^4_2\text{He} + {}^1_0\text{n}$

8) Which change takes place in a nuclear fusion reaction?

- A) Matter is converted to energy.
B) Energy is converted to matter.
C) Ionic bonds are converted to covalent bonds.
D) Covalent bonds are converted to ionic bonds.

9) High energy is a requirement for fusion reactions to occur because the nuclei involved

- A) attract each other because they have like charges
B) attract each other because they have unlike charges
C) repel each other because they have like charges
D) repel each other because they have unlike charges

10) Which pair of nuclei can undergo a fusion reaction?

- A) potassium-40 and cadmium-113
B) zinc-64 and calcium-44
C) uranium-238 and lead-208
D) hydrogen-2 and hydrogen-3

11) Describe how the process of nuclear fission (${}^1_0\text{n} + {}^{235}_{92}\text{U} \rightarrow {}^{142}_{56}\text{Ba} + {}^{91}_{36}\text{Kr} + 3{}^1_0\text{n} + \text{energy}$) can produce a chain reaction.

12) Nuclear fusion reactions produce enormous amounts of energy. Why is fusion not used to generate electrical power?