



Name _____ Class _____ Date _____

- 1 The water in the reactor acts **both** as a heat transfer agent and a moderator. In its capacity as a **moderator**, the **water**
- A accelerates the neutrons to higher speeds so that they can interact with nuclei more energetically
 - B slows the neutrons to increase the probability of nuclear interaction
 - C prevents a chain reaction from occurring
 - D absorbs neutrons and slows the nuclear reaction

- 2 One of the radioactive waste products of a reactor has a **half-life of 250 years**. What **fraction of a given sample of this product will remain after 1,000 years?**

- A 1/2
- C 1/8
- B 1/4
- D 1/16



- 3 An atomic nucleus emits energy as it **decays** from an excited state to a more stable state without a change in its atomic number. **This energy is emitted in the form of**

- A an alpha particle
- B an electron

- 4 The number of **nucleons** in a $^{206}_{82}\text{Pb}$ nucleus is

- A 0
- B 82
- C 124
- D 206



5



PREVIEW

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7

- B weak and long range
- C strong and short range
- D strong and long range



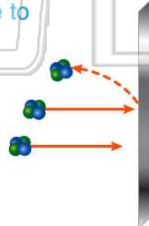
- A 8.0×10^{-20} C
- B 3.2×10^{-19} C
- C 1.2×10^{19} C
- D 3.2×10^{19} C



9

Alpha particles were directed at a thin metal foil. **Some particles were deflected into hyperbolic paths** due to

- A gravitational attraction
- B electrostatic repulsion
- C electrostatic attraction
- D magnetic repulsion



- 10 The electron in a hydrogen atom drops from energy level $n=2$ to energy level $n=1$ by **emitting a photon** having an **energy** of approximately

- A 5.4×10^{-19} J
- B 1.6×10^{-18} J
- C 2.2×10^{-18} J
- D 7.4×10^{-18} J





ANSWER KEY

The water in the reactor acts **both** as a heat transfer agent and a moderator. In its capacity as a **moderator**, the **water**

- A** accelerates the neutrons to higher speeds so that they can interact with nuclei more energetically
- B** slows the neutrons to increase the probability of nuclear interaction
- C** prevents a chain reaction from occurring
- D** absorbs neutrons and slows the nuclear reaction

(b)

One of the radioactive waste products of a reactor has a **half-life of 250 years**. What **fraction of a given sample of this product will remain after 1,000 years?**

- A** 1/2
- C** 1/8
- B** 1/4
- D** 1/16



(d)

An atomic nucleus emits energy as it **decays** from an excited state to a more stable state without a change in its atomic number. **This energy is emitted in the form of**

- A** an alpha particle
- B** an electron
- C** a gamma ray
- D** a beta particle



(c)

The number of **nucleons** in a $^{206}_{82}\text{Pb}$ nucleus is

- A** 0
- B** 82
- C** 124
- D** 206



(d)



PREVIEW

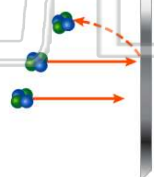
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D strong and long range

- B** $3.2 \times 10^{-19} \text{ C}$
- C** $1.2 \times 10^{19} \text{ C}$
- D** $3.2 \times 10^{19} \text{ C}$

Alpha particles were directed at a thin metal foil. **Some particles were deflected into hyperbolic paths** due to

- A** gravitational attraction
- B** electrostatic repulsion
- C** electrostatic attraction
- D** magnetic repulsion



(b)

The electron in a hydrogen atom drops from energy level $n = 2$ to energy level $n = 1$ by **emitting a photon** having an **energy** of approximately

- A** $5.4 \times 10^{-19} \text{ J}$
- B** $1.6 \times 10^{-18} \text{ J}$
- C** $2.2 \times 10^{-18} \text{ J}$
- D** $7.4 \times 10^{-18} \text{ J}$



(b)