Atomic and Nuclear Physics

Phys Sci

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

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

5

7

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

charge of **+2 elementary charges** is equivalent to

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

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