Nuclear Reactions & Half-Life Practice

Name:

Balancing Nuclear Equations: Balance each nuclear reaction by filling in the missing particle in each case.



Writing Nuclear Equations: Write the full nuclear equation of each type of radioactive decay described.

- 1. Write a nuclear equation for the alpha decay of ${}_{91}^{231}$ Pa.
- 2. Write a nuclear equation for the beta decay of $_{87}^{223}$ Fr.
- 3. Write a nuclear equation for the alpha decay of $_{101}^{249}$ Md.
- 4. Write a nuclear equation for the beta decay of $_{85}^{198}$ At.
- 5. Write a nuclear equation for the alpha decay of $_{62}^{148}$ Sm.

Half-Life: Solve each Half-Life problem from the given information and show all work for full credit.

 A meteorite strikes Earth in western Wyoming. Chemical analysis shows that it contains 44.6 kilograms of radioactive Iron-59. How many kilograms (kg) of this isotope will remain in the meteorite after 220 days? The half-life of Iron-59 is 44.0 days.

2. A sample of Gallium-67 was ordered by a research laboratory 75.0 hours ago, with an original mass of 492 grams. When it was first received in the lab, the sample had a mass of 15.375 grams. What is the half-life of Gallium-67?

3. Carbon-14 has a half-life of 5,720 years. By Carbon dating, a piece of wood is known to be 34,320 years old. At the present time, the wood contains 4.00 grams of Carbon-14. How much Carbon-14 was in the original piece of wood?