Name _____date _____period ___

Chapter 10 Nuclear Chemistry Practice Worksheet

Answer the following questions

1. What is the process in which an unstable atomic nucleus emits charged particles or energy or both?

2. Uranium-238 undergoes alpha decay. Therefore, uranium-238 will

3. What type of nuclear decay releases energy but not a particle?
   a. alpha decay
   b. beta decay
   c. gamma decay
   d. electron decay

4. An alpha particle is the same as a(an) _____ nucleus.

5. You want to be shielded from all three types of nuclear radiation. If you find shielding that blocks _____ radiation, then it will most likely also block the other two types.

6. A sample of a radioisotope had a mass of 100.0 g. After exactly 24 days, 6.25 g of the sample remain unchanged. The half-life of the isotope is _____ days.

7. In nuclear reactions, _____ is converted into energy.

8. In a(an) _____, neutrons released during a fission reaction cause a series of other fission reactions.

9. The fission reaction within a nuclear reactor is kept under control by the use of _____ that absorb extra _____.

10. Although the fusion of hydrogen to produce helium is the most common fusion reaction occurring in the sun, several other fusion reactions occur. In one of these, two helium-4 nuclei fuse to form one unstable _____ nucleus.

11. How did the physicist Becquerel first observe the effects of nuclear decay?

12. Astatine-218 has a half-life of 1.6 s. Suppose you have a 1.7-g sample of astatine-218. How much of the sample remains unchanged after 3.2 seconds?

13. After 15 minutes, 30 g of a sample of polonium-218 remain unchanged. If the original sample had a mass of 960 g, what is the half-life of polonium-218?

14. The half-life of radon-222 is 3.8 days. How much of a 100g sample is left after 15.2 days?

15. Carbon-14 has a half-life of 5,730 years. If a sample contains 70mg originally, how much is left after 17,190 years?

16. How much of a 500 g sample of potassium-42 is left after 62 hours? The half-life of K-42 is 12.4 hours.