Name: _____
Period: _____ Date: _____

Nuclear Chemistry Worksheet_K

Directions: Identify the following as alpha, beta, gamma, or neutron.

1. $^{1}_{0}n$ _____ 2. $^{0}_{-1}e$ _____ 3. $^{4}_{2}He$ _____ 4. $^{0}_{0}\gamma$ _____

5. Nuclear decay with no mass and no charge _____

6. An electron _____

7. Least penetrating nuclear decay _____

8. Most damaging nuclear decay to the human body _____

9. Nuclear decay that can be stopped by skin or paper. _____

10. Nuclear decay that can be stopped by aluminum. _____

Complete the following nuclear equations.

11. $^{42}_{19}K \rightarrow {}^{0}_{-1}e +$ _____

12. $^{239}_{94}Pu \rightarrow {}^{4}_{2}He +$ _____

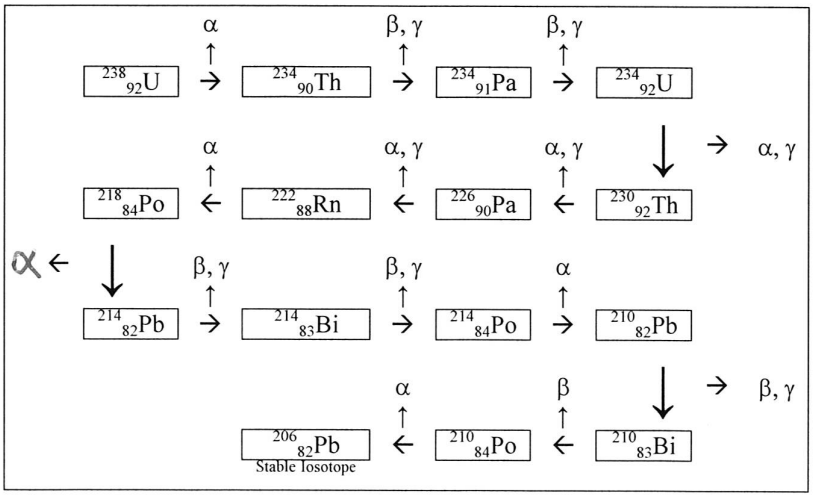
13. $^{9}_{4}Be \rightarrow {}^{9}_{4}Be +$ _____

14. $^{235}_{92}U \rightarrow$ _____ $+ {}^{231}_{90}Th$

15. $^{6}_{3}Li \rightarrow {}^{4}_{2}He +$ _____

16. _____ $\rightarrow {}^{142}_{56}Ba + {}^{91}_{36}Kr + 3\ {}^{1}_{0}n$

Nuclear Decay Series



The figure maps the radioactive decay of uranium-238 to lead-206. Use the figure to answer the following questions.

17. How many alpha particles are produced as one atom of uranium-238 decays to an atom of lead-206?

_____

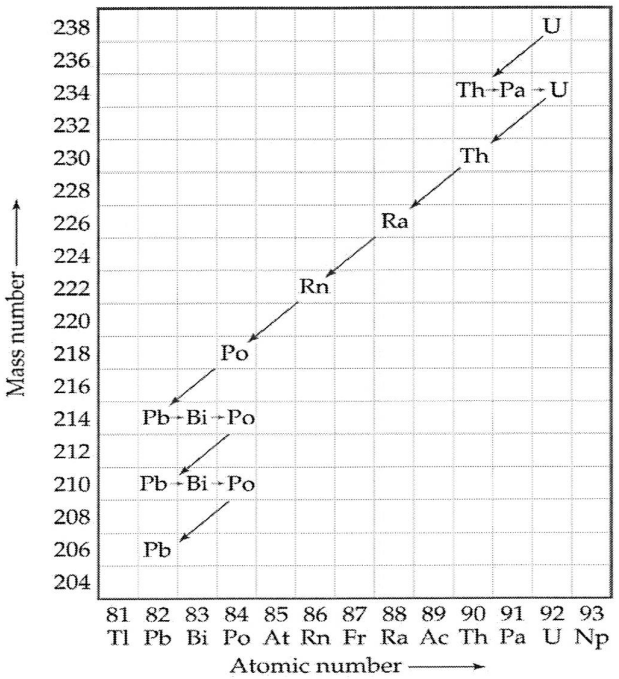
18. How many beta particles?

_____

19. Write an equation showing that when protactinium-229 goes through two alpha decays, francium-221 is formed.

20. Write the nuclear equation for the decay of Po-210 if it undergoes 2 consecutive alpha decays followed by a beta decay followed by another alpha decay.

21. The decay chain (or series) of uranium-238 is shown in the following figure. What is the ***final product*** in this decay series?



22. Using the figure to the right, list each type of decay that uranium-238 goes through to become lead-206.

23. Thorium-232 undergoes radioactive decay until a stable isotope is reached. Write the reactions for the decay of Th-238. There are eleven steps beginning with Alpha decay with each product becoming the reactant of the next decay. Circle the final Stable isotope.

- Alpha: _____
- Beta: _____
- Beta: _____
- Alpha: _____
- Alpha: _____
- Alpha: _____
- Alpha: _____
- Beta: _____
- Beta: _____
- Alpha: _____
- Beta: _____