

Nuclear Chemistry Worksheet K

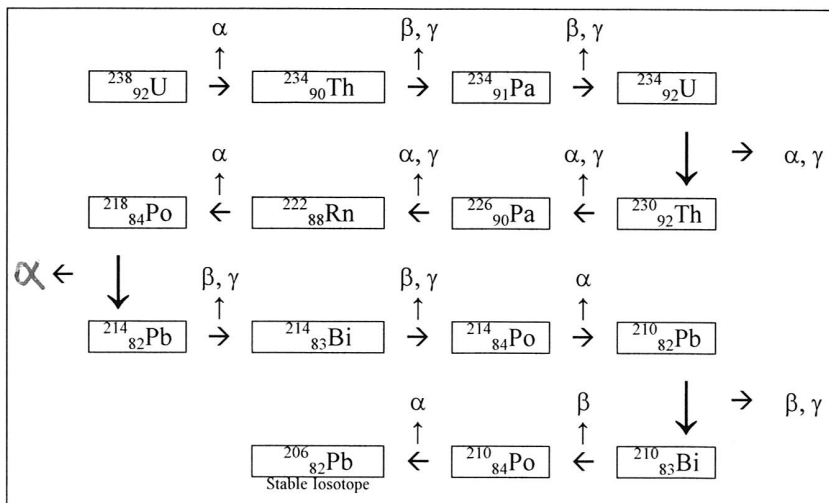
Directions: Identify the following as alpha, beta, gamma, or neutron.

1. $\frac{1}{0}n$ _____
2. $\frac{0}{-1}e$ _____
3. $\frac{4}{2}He$ _____
4. $\frac{0}{0}\gamma$ _____
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. ${}_{19}^{42}K \rightarrow {}_{-1}^0e +$ _____
12. ${}_{94}^{239}Pu \rightarrow {}_2^4He +$ _____
13. ${}_4^9Be \rightarrow {}_4^9Be +$ _____
14. ${}_{92}^{235}U \rightarrow$ _____ $+ {}_{90}^{231}Th$
15. ${}_3^6Li \rightarrow {}_2^4He +$ _____
16. _____ $\rightarrow {}_{56}^{142}Ba + {}_{36}^{91}Kr + 3 {}_0^1n$

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?

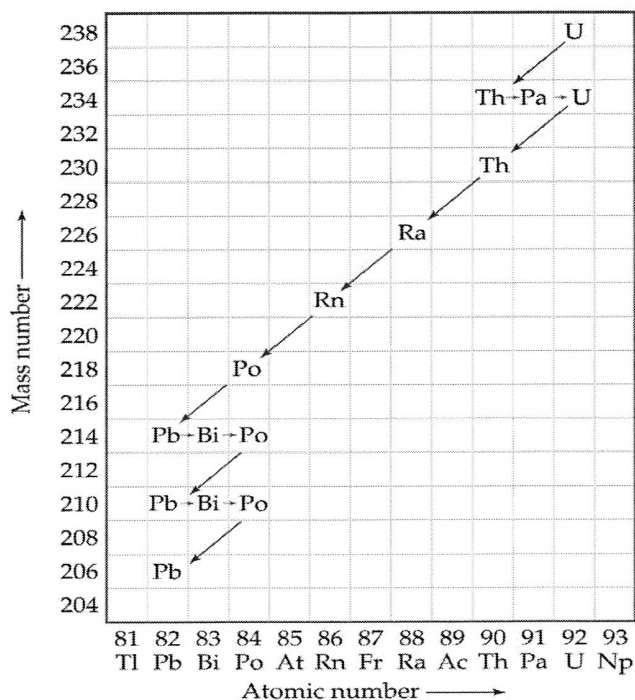
18. How many beta particles?

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-232. 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: _____