

**Nuclear Decay Practice Problems****PART A:** Identify the following as describing alpha, beta, or gamma decay/emission.

1.  ${}^0_{-1}e$  \_\_\_\_\_
2.  ${}^4_2\text{He}$  \_\_\_\_\_
3.  ${}^0_0\gamma$  \_\_\_\_\_
4. Nuclear decay with no mass and no charge \_\_\_\_\_
5. Decay emitting an electron \_\_\_\_\_
6. Nuclear decay giving off a helium nucleus \_\_\_\_\_
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. \_\_\_\_\_

**PART B:** Write the symbols for an alpha particle, a beta particle, and gamma ray**PART C:** Balance these nuclear equations by **completing** the given **nuclear decay** reaction equations.

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|---|--|
| a. ${}^{42}\text{K} \rightarrow {}^0_{-1}e +$ _____                       | f. _____ $\rightarrow {}^{252}\text{Es} + \beta$             |
| b. ${}^{239}\text{Pu} \rightarrow {}^4_2\text{He} +$ _____                | g. ${}^{238}\text{Np} \rightarrow$ _____ $+ {}^4_2\text{He}$ |
| c. ${}^{235}\text{U} \rightarrow$ _____ $+ {}^{231}\text{Th}$             | h. ${}^{208}\text{At} \rightarrow \alpha +$ _____            |
| d. ${}^{104}\text{Ag} \rightarrow {}^0_{-1}e +$ _____                     | i. _____ $\rightarrow {}^{222}\text{Rn} + {}^4_2\text{He}$   |
| e. ${}^{238}_{92}\text{U} \rightarrow {}^4_2\text{He} +$ _____ $+ \gamma$ | j. ${}^{229}\text{Th} \rightarrow {}^4_2\text{He} +$ _____   |

**PART D:** Write balanced equations for these nuclear reactions.

- 1) The alpha decay of iridium-174
  
- 2) The beta decay of platinum-199
  
- 3) The alpha decay of radon-198
  
- 4) The beta decay of uranium -237