Name Key Honors Date

Nuclear Decay

The following atoms all undergo alpha particle emission. Write the complete nuclear equation.

$^{210}_{84}Po \rightarrow {}^{4}_{2}He + {}^{206}_{82}Pb$

$^{238}_{92}U \rightarrow {}^{4}_{2}He + {}^{234}_{90}Th$

$^{238}_{90}Th \rightarrow {}^{4}_{2}He + {}^{234}_{88}Ra$

$^{222}_{86}Rn \rightarrow {}^{4}_{2}He + {}^{218}_{84}Po$

The following atoms all undergo beta negative decay. Write the complete nuclear equation.

$^{14}_{6}C \rightarrow {}^{0}_{-1}e + {}^{14}_{7}N$

$^{90}_{38}Sr \rightarrow {}^{0}_{-1}e + {}^{90}_{39}Y$

$^{40}_{19}K \rightarrow {}^{0}_{-1}e + {}^{40}_{20}Ca$

$^{13}_{7}N \rightarrow {}^{0}_{-1}e + {}^{13}_{8}O$

The following all undergo beta positive (positron) decay. Write the complete nuclear equation.

$^{116}_{50}Sn \rightarrow {}^{0}_{+1}e + {}^{116}_{49}In$

$^{61}_{29}Cu \rightarrow {}^{0}_{+1}e + {}^{61}_{28}Ni$

$^{30}_{16}S \rightarrow {}^{0}_{+1}e + {}^{30}_{15}P$

$^{85}_{38}Sr \rightarrow {}^{0}_{+1}e + {}^{85}_{37}Rb$

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Complete the missing information in the reactions. Then, label the reaction one of the following:

- Alpha Decay
- Gamma Radiation
- Beta Negative Decay
- Beta Positive Decay

$^{14}_{6}C \rightarrow {}^{14}_{7}N + {}^{0}_{-1}e$ Type: Beta Negative

$^{238}_{92}U \rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$ Type: Alpha

$^{15}_{8}O \rightarrow {}^{15}_{7}N + {}^{0}_{+1}e$ Type: Beta Positive

$^{32}_{15}P \rightarrow {}^{32}_{16}S + {}^{0}_{-1}e$ Type: Beta Negative

* $^{105}_{47}Ag + {}^{0}_{-1}e \rightarrow {}^{105}_{46}Pd$ Type: Beta Negative

$^{40}_{21}Sc \rightarrow {}^{0}_{+1}e + {}^{40}_{20}Ca$ Type: Beta Positive

$^{244}_{94}Pu \rightarrow {}^{4}_{2}He + {}^{240}_{92}U$ Type: Alpha

Write nuclear equations that describe the following processes:

- Uranium-235 undergoes alpha decay to produce Thorium-231.

$^{235}_{92}U \rightarrow {}^{4}_{2}He + {}^{231}_{90}Th$

- Lathanum-144 becomes Cerium-144 when it undergoes a beta decay.

$^{144}_{57}La \rightarrow {}^{144}_{58}Ce + {}^{0}_{-1}e$

- The beta positive decay of Dysprosium-165 creates a new element.

$^{165}_{66}Dy \rightarrow {}^{0}_{+1}e + {}^{165}_{65}Tb$

What atom produces Scandium-47 when it goes through a beta negative decay?

Calcium-47

What new element is formed when Curium-244 emits two alpha particles and three gamma rays?

$^{244}_{96}Cm \rightarrow {}^{4}_{2}He + {}^{4}_{2}He + 3\,{}^{0}_{0}\gamma \rightarrow {}^{236}_{92}U$