Name : ---------- Date : ----------

Balancing Nuclear Equations Worksheet

1. Consider the following two nuclear reactions and answer the given questions.

$$^{220}Fr_{87} \rightarrow {}^{4}He_{2} + {}^{216}At_{85} \qquad {}^{16}N_{7} \rightarrow {}^{0}e_{-1} + {}^{16}O_{8}$$

   a) Write the names of the products of francium-220 decay.

   b) Write the names of the products of nitrogen-16 decay.

2. Given the following nuclear reaction:

$$^{27}Al_{13} + {}^{4}H_{2} \rightarrow {}^{30}P_{15} + {}^{1}n_{0}$$

   a) What particle is bombarded with aluminum-27? _____

   b) What particle is released from the reaction? _____

3. Fill in the blanks to complete the following nuclear reactions.

   a) $^{42}K_{19} \rightarrow {}^{0}e_{-1} +$ _____

   b) $^{239}Pu_{94} \rightarrow {}^{4}He_{2} +$ _____

   c) $^{235}U_{92} \rightarrow {}^{4}He_{2} +$ _____

   d) $^{1}H_{1} + {}^{3}H_{1} \rightarrow$ _____

   e) $^{6}Li_{3} + {}^{1}n_{0} \rightarrow {}^{0}e_{-1} +$ _____ $+ {}^{3}He_{2}$

4. Write a balanced nuclear equation for each decay process indicated.

   a) The isotope Th-234 decays by an alpha emission.

   b) The isotope Fe-59 decays by beta emission.

   c) The isotope Tc-99 decays by gamma emission.

Name : ---------- Date : ----------

Balancing Nuclear Equations Worksheet

1. Answers

$^{220}Fr_{87} \rightarrow {}^{4}He_{2} + {}^{216}At_{85}$ $^{16}N_{7} \rightarrow {}^{0}e_{-1} + {}^{16}O_{8}$

a) Write the names of the products of francium-220 decay.
Alpha particle and astatine-216

b) Write the names of the products of nitrogen-16 decay.
Beta particle and oxygen-16

2.

$^{27}Al_{13} + {}^{4}H_{2} \rightarrow {}^{30}P_{15} + {}^{1}n_{0}$

a) What particle is bombarded with aluminum-27? Alpha particle

b) What particle is released from the reaction? neutron

3.

a) $^{42}K_{19} \rightarrow {}^{0}e_{-1} +$ $^{42}Ca_{20}$

b) $^{239}Pu_{94} \rightarrow {}^{4}He_{2} +$ $^{235}U_{92}$

c) $^{235}U_{92} \rightarrow {}^{4}He_{2} +$ $^{231}Th_{90}$

d) $^{1}H_{1} + {}^{3}H_{1} \rightarrow$ $^{4}He_{2}$

e) $^{6}Li_{3} + {}^{1}n_{0} \rightarrow {}^{0}e_{-1} +$ $^{4}He_{2}$ $+ {}^{3}He_{2}$

4.

a) The isotope Th-234 decays by an alpha emission.

$^{234}Th_{19} \rightarrow {}^{230}Ra_{88} + {}^{4}He_{2}$

b) The isotope Fe-59 decays by beta emission.

$^{59}Fe_{26} \rightarrow {}^{59}Co_{27} + {}^{0}e_{-1}$

c) The isotope Tc-99 decays by gamma emission.

$^{99}Tc_{43} \rightarrow {}^{99}Tc_{43} + \gamma$