## Extra Nuclear Reactions Practice!

## Part A: Completing Nuclear Decay Reactions

For each of the atoms listed below, REWRITE the decay reaction by solving for  ${}^{A}_{Z}X$  or other missing information. Remember that the mass and protons on each side of the arrow need to equal each other.

$$1)_{103}^{256} Lr \rightarrow_{2}^{4} He + {}_{Z}^{A} X$$

$$6)_{5}^{13}B \rightarrow_{-1}^{0} e + {}_{Z}^{A}X$$

$$(2)^{247}_{Z}Am \rightarrow_{-1}^{0} e + {}_{Z}^{A}X$$

7) 
$$_{79}^{211}Au \rightarrow_{-1}^{0} e + {}_{Z}^{A}X$$

$$3)_{Z}^{A}X \rightarrow {}^{211}_{87}Fr + {}^{4}_{2}He$$

8) 
$$_{67}^{151}Ho \rightarrow_{2}^{4} He + {}_{Z}^{A}X$$

$$4)_{93}^{175} Np \rightarrow {}_{2}^{4} He + {}_{Z}^{A} X$$

$$9)_{Z}^{A}X +_{-1}^{0} e \rightarrow {}^{213}_{Z}Po$$

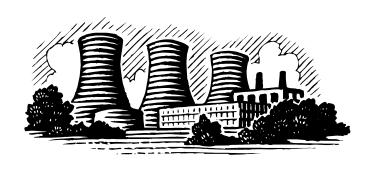
$$5)_{2}^{6}He \rightarrow_{-1}^{0} e + {}_{Z}^{A}X$$

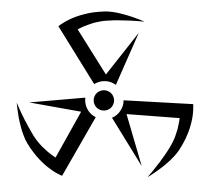
$$10)_{57}^{148} La \rightarrow_{2}^{4} He + {}_{Z}^{A} X$$

## Part B: Writing Nuclear Decay Reactions:

Write equations for the following nuclear decay reactions. Make sure that both mass numbers and atomic numbers are balanced on each side.

- 11) Decay of polonium-218 by alpha emission
- 12) Decay of carbon-14 by beta emission.
- 13) The alpha decay of radon-198
- 14) The beta decay of uranium-237





## Slightly Different Problems...

The SAME IDEA applies to these as regular nuclear reactions. The left side needs to equal the right side.

One key difference is that if you have a big number in front of your particle you need to multiply the mass and atomic nubmer by that value (kind of like in a chemical formula).

Example: b) 
$$3_0^{1} \frac{n}{n} = 3 \times 1 = 3$$
  
  $3 \times 0 = 0$ 

Complete the equations for these transmutation reactions:

$$a)_{3}^{6}Li + {}_{0}^{1}n \rightarrow {}_{2}^{4}He + ?$$

$$b)_{92}^{235}U + {}_{0}^{1}n \rightarrow {}_{56}^{141}Ba + 3{}_{0}^{1}n + ?$$

$$(c)_{13}^{27}Al + {}_{2}^{4}He \rightarrow {}_{0}^{1}n + ?$$

$$d)_{92}^{235}U \rightarrow {}_{38}^{90}Sr + {}_{0}^{1}n + 4_{-1}^{0}e + ?$$

$$e)_{0}^{1}n+? \rightarrow {}_{58}^{144}Ce + {}_{38}^{90}Sr + 6_{0}^{1}n + 2_{-1}^{0}e$$

a)

*b*)

c)

*d*)

e)