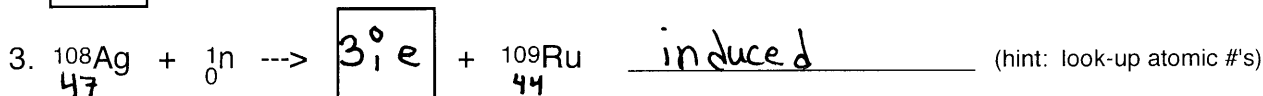
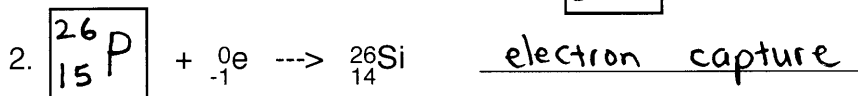
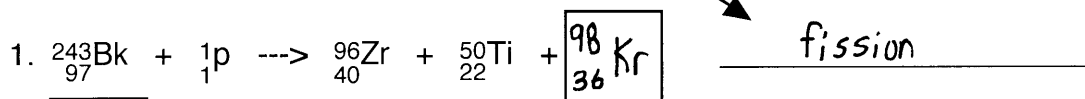


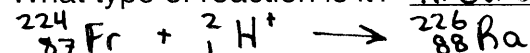
WS 6.8 Review

Determine the missing particle, and label the following as ec, natural decay, induced, fission, or fusion.



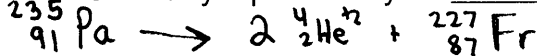
4. A francium-224 atom gets hit by a neutron (must have been a drive-by).

What type of reaction is it? induced What isotope is produced? radium 226



5. A Pa-235 undergoes a series of alpha and/or beta decays to eventually become a Fr-227.

How many alpha decays? 2 beta decays? 0 Do alpha decay first
Do beta decay second



6. Zn-65 has a half-life of 244 days. What percent will decay in (1 year)

$365 = 244(n)$ $n = 1.50$ $\left\| \frac{100}{2^{1.50}} = 35.4\% \text{ remain} \right.$ $100 - 35.4 = 64.6\% \text{ decays}$

7. If a newly cut piece of wood gives a C-14 Geiger tube reading of 150 cpm, and a wooden artifact gives reading of 65 cpm, how old is the artifact?

$\frac{150}{2^n} = 65$ $150 = (65)(2^n)$ $2.31 = 2^n$ $n = \frac{\log 2.31}{\log 2}$ $T = (5730)(1.21) = 6930 \text{ yrs}$

8. Explain 2 reasons why C-14 dating cannot be used to date the age of your pet cat.

("I don't have a pet cat" is not an acceptable answer)

- still alive - not old enough

9. Burns to the skin is an example of (acute) / chronic / genetic] damage by radiation.

10. Calculate the energy change (per mole) for the following... Use the table on WS 6.6...

${}_{27}^{59}\text{Co} + {}_1^1\text{p} \rightarrow {}_{28}^{58}\text{Ni} + 2 {}_0^1\text{n}$
 $58.9184 + 1.00728 = 57.9199 + 2(1.00867)$
 $59.9257 = 59.9372$
 $\Delta m = 0.011540 \text{ g (mass defect)}$
 Change to kg: $0.011540 \text{ g} \times \frac{1 \text{ kg}}{1000 \text{ g}} = 1.154 \times 10^{-5} \text{ kg}$

$E = mc^2$
 $= (1.154 \times 10^{-5}) (3.00 \times 10^8)^2$
 $= 1.04 \times 10^{12} \text{ J}$