3/21/13

✓ (1) $^{22}_{11}Na \rightarrow ^{22}_{10}Ne + ^{0}_{1}e$ is example of

positron decay

b/c Beta decay is B_-

positron decay is B_+

	paper	wood	lead
Alpha	⟶		
Beta	⟶	⟶	
Gamma	⟶	⟶	⟶

✓ (2) (poll)

✓ (3) (poll) Most Po is lost
- during first event
(more stuff, bigger the change)

✓ (4) (poll) what is relationship btwn amt of Po that decays in a given time period w/ amt of Po that you have at beginning of that time period.
- more Po you have, more Po decays

✓ (5) (poll) Relationship btwn amt of Po lost and amt of Pb gained is
- Po dec by same amt that Pb inc
- Rate of dec of reactant is equal but opposite of products b/c 1:1:1 ratio

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

Rate of change speed.

$\frac{\Delta d}{\Delta t}$

What is reaction rate?

- change in amt per change in unit time
- slope of graph of amt vs time

$\frac{\Delta Pb}{\Delta t} = \frac{-\Delta Po}{\Delta t}$ } equal but opposite in sign

Rate is some function of amt of reactant molecules

$\frac{\Delta Po}{\Delta t} \propto Po$: bigger amt, bigger rate

random process → probability depends on amt

$\frac{\Delta Po}{\Delta t} = k\,Po$ → First order of kinetics

half life - amt is the time it takes half of the material to decay
- longer the half life, more stable

(7) (poll) Start w/ 96 student isotopes. How many events would occur to end up w/ 6 student isotopes.

- 4

96 ÷ 2
48 ÷ 2
24 ÷ 2
12 ÷ 2 = 6

half life - time required for level of radioactivity
to fall to its 1/2 time

(8) (poll) P-32 has half life of 14 days.
After 3 months what would be residual
radioactivity of 1 millicurie of ATP
labeled w/ P-32?
? # 1/2's pass?
start w/ 1 mC

$\frac{1\,mC}{2^6}$ = 15.6 microcuries