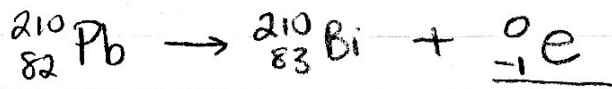
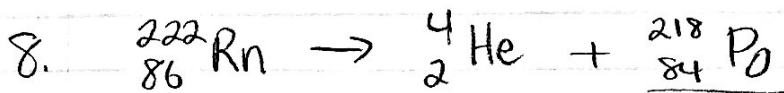
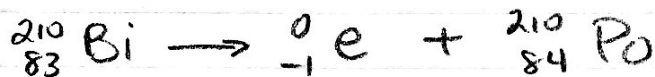


Ch 9 Extra Practice

- uranium compound exposed photographic plate whether the compound was fluorescing or not - Becquerel rays discovered
3 types α , β , γ discovered by Rutherford (α , β) and grad students and Villard (γ) by observing penetrating power
 - Nuclear strong force - holds the p + n together in nucleus even though pos. and neutral.
Acts over short range of 10^{-16} m
 - Alpha particle is a helium nucleus ${}^4_2\text{He}$
 - ${}^4_2\text{He}$ represents an alpha particle
~~Redundant~~ \rightarrow ${}^0_{-1}\text{e}$ is beta particle would be better.
 - Rutherford's nobel prize in chemistry was for verifying that transmutation does occur when α and β particles are given off by a radioactive element
6. a) h.l. = 20 million years
b) 60 million years
c) 4 half-lives
7. $24 \text{ hrs} = 4 \text{ h.l.}$
 $64 \text{ atoms} \times \frac{1}{2^4} = 4 \text{ atoms}$



use
periodic
table



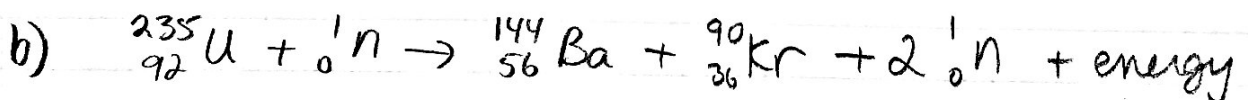
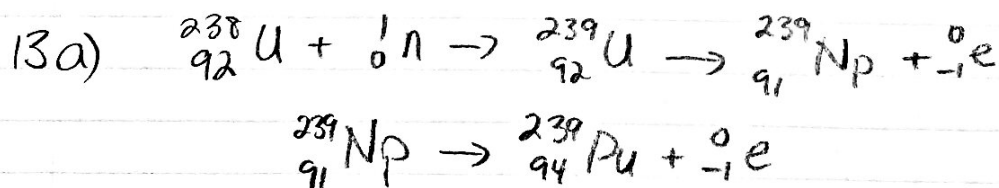
9. Pressurized water reactor (pg 300)

10. Boiling water reactor (pg 299)

11. Fission of U235

- to start it, 2 sub-critical masses are forced together by a high force explosion
- during, a slow neutron absorbed by U235 nucleus, oscillates violently and breaks up releasing 3 more neutrons, etc...
- huge amounts of energy are released and if it could be controlled

12. Fusion - atoms join
Fission - atoms break apart



14. Critical mass - is the minimum mass needed for a chain reaction of fission to occur
In atomic bomb 2 sub-critical masses are forced together with an explosion creating a critical mass.

15. Fusion is initiated in a H bomb by using a fission bomb to force the ${}^2_1\text{H}$ atoms together

16. Fusion is a "clean" process (no radioactivity) and releases a lot of energy, if only we could start the reaction using less energy and then control it.

17a) stars mostly H ($\sim 3/4$) and He ($\sim 1/4$)

b) Fusion is the source of a star's energy

