oyo m13

13.1 — 11 protons, 11 electrons, & 12 neutrons.

13.2 — Oxygen-16, has 8 electrons

13.3 — a + c.

13.4 —

9 protons,
10 neutrons
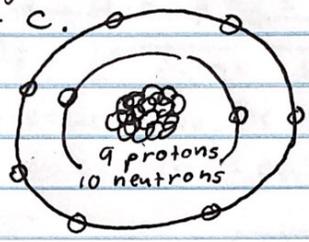
13.5 — Largest orbit would be the 4th Bohr orbit, + it would have 27 electrons in it.

13.6 — The range is longer than nuclear force, but ~~weaker~~ shorter than electromagnetic force.

13.7 — 38 protons, 52 neutrons. = $^{90}_{38}Y$

13.8 — ^{237}Np

13.9 — alpha + beta particles

13.10 — 5 grams

$^{8 \quad 10}_{90}$
$\underline{-38}$
$52 \quad 241$
$\underline{-95}$
hello $\overline{146}$

$.93$
$\underline{+144}$
237

Study guide M13

1. <u>Model</u> – a schematic description of a system that accounts for its known properties.
<u>Nucleus</u> – Center of an atom, containing the protons & neutrons.
<u>Atomic Number</u> – number of protons in an atom.
<u>Mass Number</u> – The sum of the numbers of neutrons + protons in the nucleus of an atom.
<u>Isotypes</u> – atoms with the same number of protons but a different numbers of neutrons.
<u>Element</u> – a collection of atoms that all have the same number of protons
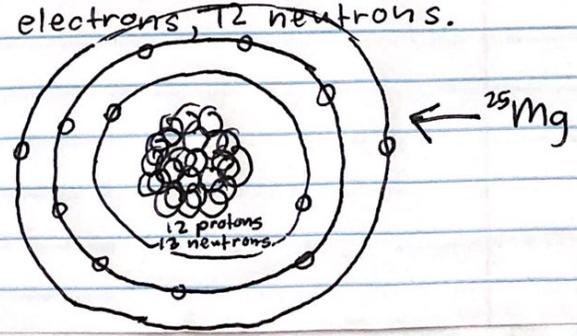<u>Radioactive Isotype</u> – an atom with an unstable nucleus.
<u>Half-Life</u> – The time it takes for half of the original sample of a radioactive isotype to decay.
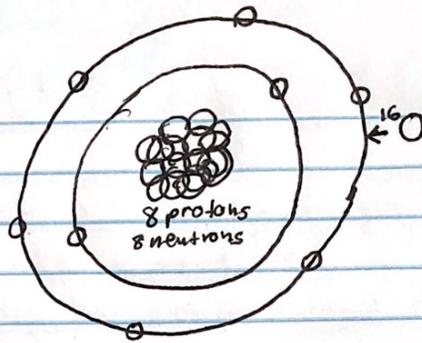
2. Electrons, Protons, Neutrons.

3. Strong force. The exchange of pions.

4. Centripetal force.

5. Empty space.

6. 34 protons + 34 electrons. Se.

7. a) Neon-20 = 10 protons, 10 electrons, + 10 neutrons.
b) ^{56}Fe = 26 protons, 26 electrons, 30 neutrons.
c) ^{139}La = 57 protons, 57 electrons, 82 neutrons
d) ^{24}Mg = 12 protons, 12 electrons, 12 neutrons.

8. 18 protons.

9. ^{112}Sn, ^{124}Sn, ^{120}Sn.

10. ^{25}mg   12 P   13 n
             12 E

$$^{0}_{13}9$$
$$-57$$
$$82$$

12 protons
13 neutrons.
← ^{25}Mg

10.

16O
8 protons
8 neutrons

12. Largest orbit is Bohr's 5th orbit, which would have 32 electrons in it.

13. Because pions are short-lived. atoms must exchange them very quickly.

14. a) $^{98}Te = ^{98}Ru$ b) $^{125}I = ^{125}Xe$

15. a) $^{212}Bi = ^{208}Tl$ b) $^{224}Ra = ^{220}Rn$

16. gamma decay

17. 2.5 grams

18. .125 grams

19. because it requires many assumptions that could easily be wrong.

20. Alpha particles, beta particles, gamma rays.

$\begin{array}{r} {}^{6\ 10\ 12} \\ 212 \\ -83 \\ \hline 129 \\ +81 \\ \hline 210 \end{array}$
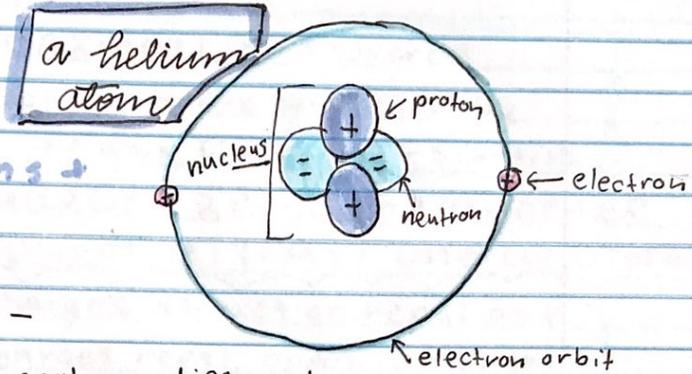
$\begin{array}{r} 224 \\ 88 \end{array}$

$\begin{array}{r} {}^{8\ 11\ 14} \\ 224 \\ -88 \\ \hline 136 \end{array}$

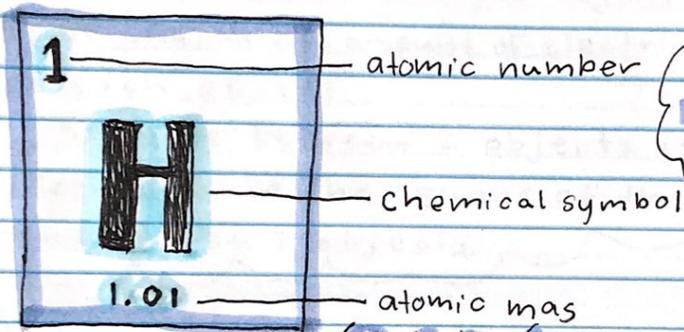$\begin{array}{r} 134 \\ +86 \\ \hline 20 \end{array}$

notes m13

a helium atom

proton
nucleus
electron
neutron
electron orbit

nucleus -
contains protons +
neutrons.

ISOTYPE -
Same number of protons, different
number of neutrons.

1

H

1.01

— atomic number

— chemical symbol

— atomic mas

Protons +
neutrons exc-
hange pions.

RADIOACTIVE!

— atom with an unstable nucleus.

Beta Decay — a neutron emits an electron,
making it a proton. new element has 1
more proton + one less neutron

Alpha Decay — ejects an alpha particle, made
of 2 protons + 2 neutrons. (Helium)