Parts of an Atom

Atom - is electrically neutral. (# p^+ = # e^-)
- is composed of a nucleus containing protons and neutrons, and electrons that surround the nucleus.

Atomic Number - is the number of protons found in the nucleus of an atom.

Protons - are subatomic particles possessing a positive charge.

Neutrons - are subatomic particles possessing a neutral charge.

Electrons - are subatomic particles possessing a negative charge. For an atom, the electrons are equal to the atomic number.

Isotope - is a form of an element in which the atoms have the same number of protons as all other forms of that element, but it has a **different number of neutrons and therefore a different mass number.**

Mass Number - is the sum of the number of protons and neutrons.

Carbon (13)
6 p^+
6 e^-
7 n

Carbon (14)
6 p^+
6 e^-
8 n

Isotope Notation:

$^{13}_{6}C$

mass # → 14
atomic # → 6
$^{14}_{6}C$

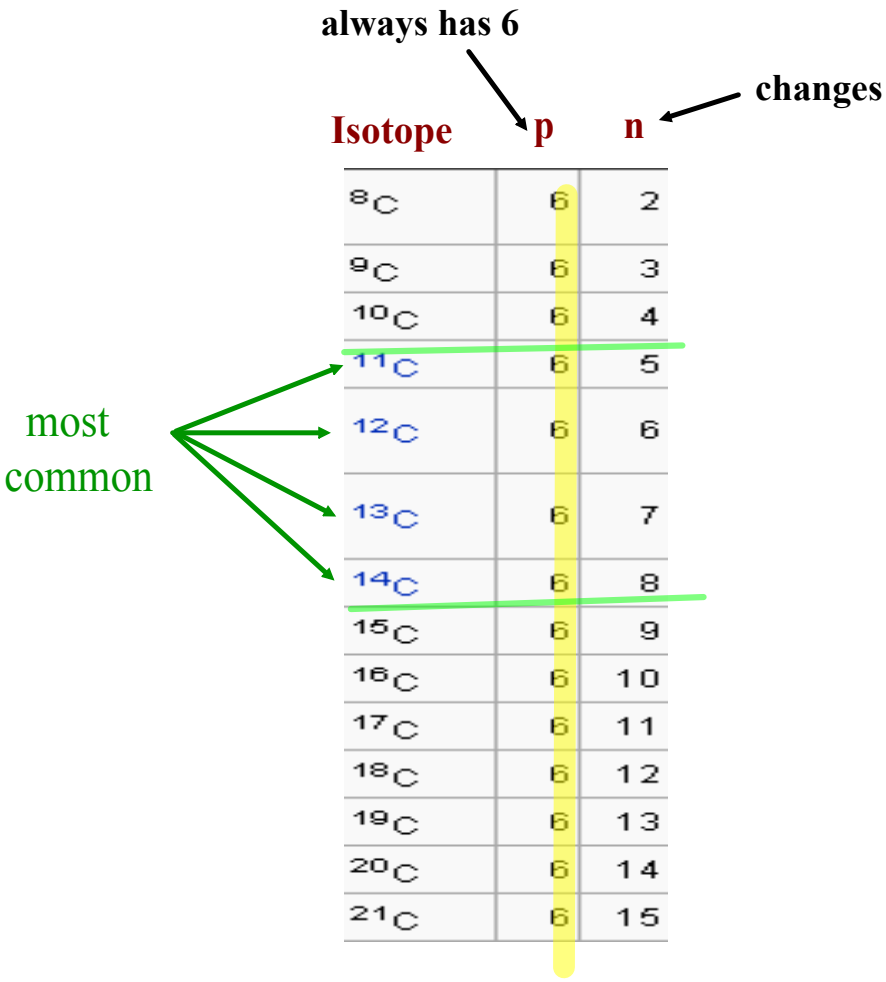
Carbon-13

Carbon-14

	LOCATION	CHARGE	RELATIVE SIZE
PROTONS	nucleus	+ive	1 a.m.u.
NEUTRONS	nucleus	neutral	1 a.m.u.
ELECTRONS	outside nucleus	-1ive	"massless"

$3p^+$
$3e^-$
n

Isotopes of Carbon



$^{42}_{20}Ca$

$20p^+$

$20e^-$

$22n$

Homework

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Practice Problems #17-20

18a) carbon-12

$^{12}_{6}C$

6p+
6e-
6n

b) fluorine-19

$^{19}_{9}F$

9p+
9e-
10n

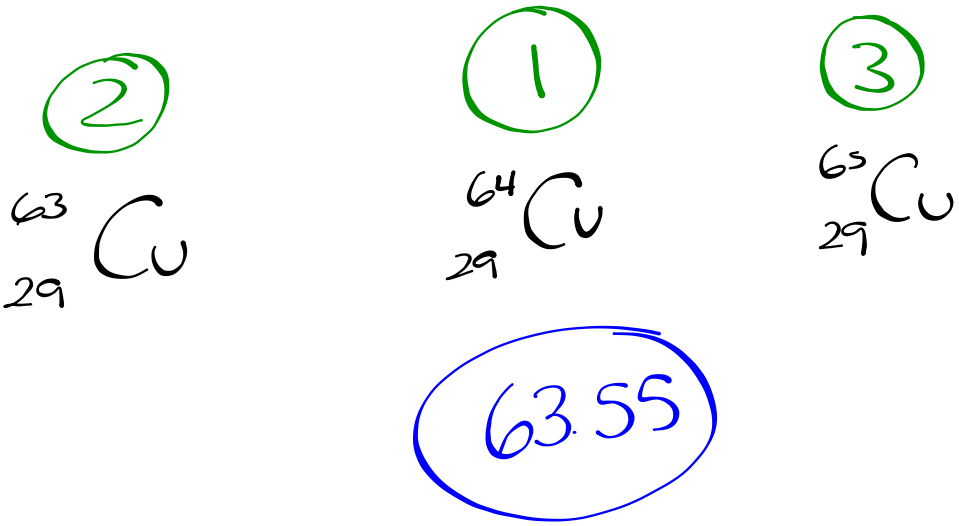
Calculating Atomic Mass

To calculate the atomic mass of an element, multiply the mass of each isotope by its natural abundance, expressed as a decimal, and then add the products.

Ex. Carbon has two stable isotopes: carbon - 12 (12.000 amu) which has natural abundance of 98.89%, and carbon - 13 (13.003 amu), which has natural abundance of 1.11%.
What is the atomic mass of carbon?

$12.000(0.9889) + 13.003(0.0111)$

$= \boxed{12.01}$


2
63
29 Cu
1
64
29 Cu
3
65
29 Cu
63.55

Mass Number	Atomic Mass
→ sum of p^+ + n	→ weighted average mass
→ not on per. table	→ per. table
→ whole number	
Ex. carbon (12, 13, 14, etc)	Ex. carbon (12.01)

Homework

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Practice Problems ~~#23-24 p.117~~