Parts of an Atom

Atom - is electrically neutral.
- 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 atomic mass**.

Mass Number - is the sum of the number of protons (1 amu) and neutrons (1 amu).

Carbon - 6 protons and 6 neutrons has a mass number of 12.

Another isotope of ^{12}C is ^{13}C, which has 6 protons and 7 neutrons. (13)

Isotope Notation: $^{13}_{6}C$ ($6p^+, 6e^-, 7n$)

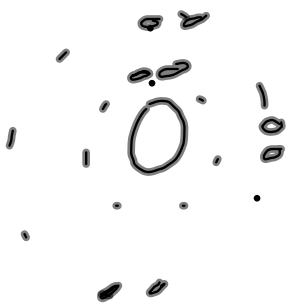
mass # → 13
atomic # → 6

MAIN SUBATOMIC PARTICLES

Particle	Location	Relative Mass	Charge
proton	nucleus	1 a.m.u.	+
neutron	nucleus	1 a.m.u.	none
electron	outside nucleus	small	-

Protons	+	1 a.m.u.	8
Neutrons		1 a.m.u.	9
Electrons	—	0	8

$O \rightarrow 8p^{+}, 8e^{-}$



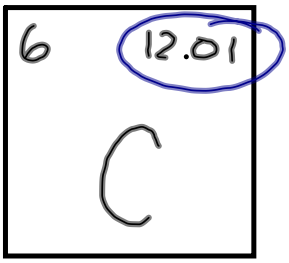
Isotopes of Carbon

always has 6

changes

most common

Isotope	p	n
^{8}C	6	2
^{9}C	6	3
^{10}C	6	4
^{11}C	6	5
^{12}C	6	6
^{13}C	6	7
^{14}C	6	8
^{15}C	6	9
^{16}C	6	10
^{17}C	6	11
^{18}C	6	12
^{19}C	6	13
^{20}C	6	14
^{21}C	6	15



C_3H_8

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 amu (98.89%)

13.003 amu (1.11%)

$$12.000(0.9889) + 13.003(0.0111)$$

$$= \boxed{12.01}$$

Homework

Section 4.3 p. 110-118

Practice Problems #17-24