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.

<u>Protons</u> - are subatomic particles possessing a positive charge.

Neutrons - are subatomic particles possessing a neutral charge.

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

<u>Isotope</u>- 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 **adifferent number of neutrons and therefore a different atomic mass**

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

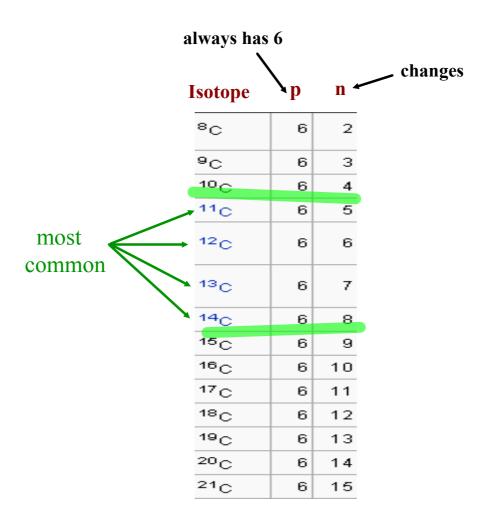
Carbon - 6 protons and 6 neutrons has a mass number of 12.

Another isotope of ¹²C is ¹³C, which has 6 protons and 7 neutrons.

Isotope Notation:

SUBATOMIC PARTICLE	CHARGE	LOCATION	RELATIVE SIZE
PROTONS	+'ive	hucleus	big I a.m.u.
NEUTRONS	neutral	nucleus	big 1 a.m.u.
ELECTRONS	- 'ive	outside nucleus	"massless" Oam.u.

Isotopes of Carbon



Calculating Atomic Mass

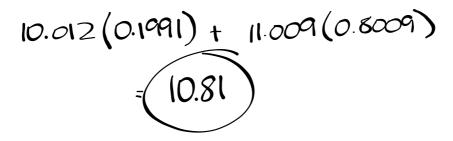
To calculate the atomic mass of an element, multiply the mass of each isotope by its natural abundance, expressed as a decimal, and then add the products.

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?

$$12.000(0.9889) + 13.003(0.011)$$

Sample Problem

Element X has two natural isotopes. The isotope with a mass of 10.012 amu (10 X) has a relative abundance of 19.91%. The isotope with a mass of 11.009 amu (11 X) has a relative abundance of 80.09%. Calculate the atomic mass of this element.



Homework

Section 4.3 p. 110-118

Practice Problems #21-24 p.116-117