Parts of an Atom

<u>Atom</u> - 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:

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		

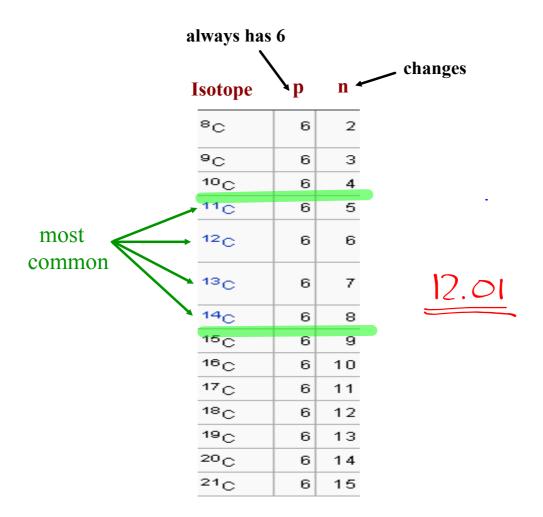
protons tive lamu.

neutrons lamu.

dectrons - ive Oamu.

12 6C	14 <u>C</u>	N
(opt	6p+	\mathbb{Z}_{p^+}
6e	6e-	Te-
φ n	<u>Sn</u>	<u></u>
2 12 a.m.u.	14 a.m.u.	Ha·m.u·
Carbon-12	Carbon-14	

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?

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

$$= 12.01$$

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 #15-24