

Atoms, Atomic Structure, and Isotopes

Friday, December 20, 2013 7:24 AM

Atom - the smallest unit of matter that still retains the properties of the element

Nucleus - the center of the atom that contains protons and neutrons, has most of the atom's mass

Appearance on the Periodic Table

Carbon: Atomic number 6, Average atomic mass 12.011, Atomic symbol C. Annotations: Atomic number - # of protons an atom has / # of electrons; Average atomic mass - average mass of a sample; protons = 6, electrons = 6; Atomic symbol - abbreviation.

Nitrogen: Atomic number 7, Average atomic mass 14.007, Atomic symbol N. Annotations: protons = 7, electrons = 7.

Particle	Charge	Mass	Location
proton	+1	1 AMU	nucleus
neutron	0 (neutral)	1 AMU	nucleus
electron	-1	~0 AMU	outside nucleus in an electron cloud

= 0 (Overall charge of an atom)

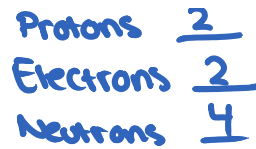
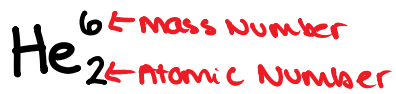
AMU = Atomic Mass Unit

Overall charge of an atom is 0

An atom is identified by the number of protons (atomic number)

For example, carbon (or any other atom) can have more or less neutrons, but can only have 6 protons

Isotope - atom with the same number of protons, but a difference number of neutrons



Mass Number = the number of protons plus the number of neutrons

of Neutrons = Mass # - Atomic

Atomic # = Mass # - # of protons
 Identifying Atoms



P = 6
 E = 6
 N = 8

14 - 6 = 8



P = 9
 E = 9
 N = 12

(21 - 9 = 12)



P = 9
 E = 9
 N = 13

(22 - 9 = 13)

Mass Number - the number of protons plus the number of neutrons

Calculation Help

Mass Number = protons + neutrons

Neutrons = Mass Number - Atomic Number

Atomic Number = Mass Number - Neutrons

Examples

Energy Levels