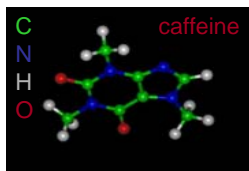


Chemistry BC2001x: General Chemistry I



Lecture 2. Thursday September 10, 2009

Handouts today:

- Units, constants
- Inorganic nomenclature
- Fisher Scientific Periodic Chart
- Problem Set 1: Due Thursday, September 17

If you miss a class, come to my office for handouts

Most will be in the metal holder outside my door (811 Alt);
Most are also on the course web page (under handouts).

If you need a hand-in problem set, you must ask me :

I prefer not to make these generally available.
Photocopied problem sets will NOT be accepted!

Review from last time: selected points

- Subatomic particles of interest in chemistry:
proton, neutron, [nucleons], and electron
- Z = atomic number = # protons in nucleus
- (A =) Mass number = # nucleons in nucleus
- Isotopes have **same Z , different mass number A**

symbol	# p	# n	# e	mass (amu)	name
^1H	1	0	1	1.007825035	hydrogen
^2H	1	1	1	2.014101779	deuterium
^3H	1	2	1	3.01604927	tritium

Mass and moles

- **Atomic mass unit** (amu):
definition: one ^{12}C atom weighs exactly 12 amu.
Biochemists call this a **Dalton**, abbreviated **Da**
- **Avogadro's number** (= one mole)
definition: number of atomic mass units in one gram
(of anything!)
value: 6.0221415×10^{23}
(formally dimensionless; or **objects/mole** or **mole⁻¹**)
- **Therefore $N_A = (\text{amu/grams}) = (\text{objects/mole})$**
- **Atomic weight:** weight in grams of one mole of atoms
of the element **as found in nature (usually a mixture of isotopes)**; equivalently **average** weight of atom in amu.
units: (**grams/mole**) or (**amu/atom**)

Copper: $Z = 29$



Two **isotopes** are found in nature:

^{63}Cu which weighs 62.9295989 amu

^{65}Cu which weighs 64.9277929 amu

The **natural abundances** in samples in earth are

^{63}Cu : 69.171% and ^{65}Cu : 30.829%

atomic weight

$$\begin{aligned} &= (69.171/100)(62.9295989) \\ &\quad + (30.829/100)(64.9277929) \\ &= 43.52903285 + 20.01658927 \\ &= 63.5456221 \rightarrow \mathbf{63.546} \end{aligned}$$