

**CHM 151**  
**Recitation #2, 10 September 2008**

1. a) **True or False.** The mass of a neutron is several orders of magnitude greater than the mass of an electron.
- b) **True or False.** Avogadro's number is  $6.022 \times 10^{23}$  particles/mole.
- c) **True or False.** The formula  $C_5H_9O_2$  is both an empirical and a molecular formula.
- d) **True or False.** Atomic mass is based on the  $^{13}C$  standard.
- e) **True or False.** An anion is an ion with a net negative charge.
- f) **True or False.**  $SO_3^{2-}$  is the sulfate ion.
2. Name the following compounds.

| Formula        | Name |
|----------------|------|
| $PF_5$         |      |
| $Fe(NO_3)_2$   |      |
| $Ca_3(PO_4)_2$ |      |
| KF             |      |
| $NH_4Cl$       |      |

3. Write formulas for the following compounds:

| Name                        | Formula |
|-----------------------------|---------|
| tin(II) fluoride            |         |
| tetraphosphorus decasulfide |         |
| selenium hexafluoride       |         |
| copper(I) cyanide           |         |

4. Boron obtained from borax deposits in Death Valley consists of two isotopes. They are boron-10 and boron-11 with atomic masses of 10.013 amu and 11.0009 amu, respectively. The atomic mass of boron is 10.81 amu (see periodic table). Which isotope of boron is *more abundant*, boron-10 or boron-11?
- Cannot be determined from the data given.
  - Neither, their abundances are the same.
  - Boron-10
  - Boron-11

5. The imaginary element X has the following natural abundances and isotopic masses. What is the **average atomic mass** of X?

| Isotope                | Isotope mass | Abundance |
|------------------------|--------------|-----------|
| ${}_{24}^{50}\text{X}$ | 49.9461 amu  | 20.0%     |
| ${}_{24}^{52}\text{X}$ | 51.9405 amu  | 35.0%     |
| ${}_{24}^{53}\text{X}$ | 52.9407 amu  | 45.0%     |

6. Which one of the following is *not* 1.000 mol?
- $6.022 \times 10^{23}$  C atoms
  - 16.00 g O<sub>2</sub>
  - 12.01 g C
  - 65.39 g Zn
  - $6.022 \times 10^{23}$  O<sub>2</sub> molecules
7. Calculate the number of **moles** in 105.1 g of gold (Au).
8. A titanium bicycle frame weighs 2.5 lbs. Calculate the number of Ti **atoms** in this frame. Assume that the frame is pure titanium. [1 lb = 453.6 g]