Worksheet #5 Calculating Number of Particles, Number of Moles, and Molar Mass

1. Calculating the following:
   a) How many molecules are present in 0.75 mol of H_2O?
   b) How many molecules of C_3H_8 are there in 7.21 mole of C_3H_8?
   c) How many atoms of S are there in 6.89×10^{-4} mol of S?
   d) How many moles of magnesium are 3.01×10^{22} atoms of magnesium?
   e) How many molecules are in 4.00 mol of glucose, $C_6H_{12}O_6$?

2. Calculate the mass of one mole (molar mass) of each of these substances.
   a) S_8 b) Fe c) C_8H_{18} d) N_2O_5
   e) CCl_4 f) PCl_5 g) $Al(NO_3)_3$ h) $K_2Cr_2O_7$

3. Calculate the molar mass of each of the following substances.
   a) $BaSO_4$ b) $(NH_4)_3PO_4$ c) H_2SO_4
   d) $Fe(NO_3)_3\ 9H_2O$ e) Na_2CO_3 f) CH_3COOH

4. Calculate the molar mass of each of the following substances: (be sure formula is correct)
   a) carbon dioxide b) calcium phosphate
   c) potassium sulfate d) strontium cyanide

Worksheet #6 Calculating Particles, Moles and Mass

A. Calculate the mass of each of the following. Show all working, including units and correct significant digits.
   1. 0.100 mol of cream of tartar ($KHC_4H_4O_6$)
   2. 1.2 mol of detergent filler ($Na_2SO_4 \cdot 10\ H_2O$)
   3. 0.15 mol of white phosphorus

B. Calculate the number of moles of each of the following. Show all working, including units and correct significant digits.
   1. 900 g of baking soda ($NaHCO_3$)
   2. 900 g of washing soda (sodium carbonate)
   3. 900 g of Epsom salts ($MgSO_4\ 7H_2O$)

C. Complete the following calculations by calculating the...
   1. mass of sodium hydroxide present in 0.641 mol.
   2. number of moles present in 10.0 kg of ammonium phosphate.
   3. mass of carbon dioxide present in 5.00 mol.
   4. number of moles present in 142.2 g of potassium chloride.

D. Calculate the number of particles (atoms, molecules, formula units) present in
   1. 5.00 mol of Pb 2. 3.86 mol of NaCl 3. 6.80 mol of SO_2
   4. 5.00 g of Pb 5. 3.86 g of NaCl 6. 6.80 g of SO_2

E. Given the number of particles calculate the:
   1. number moles present in 5.85×10^{23} atoms of copper
   2. number moles present in 5.85×10^{23} molecules of ammonia
   3. number moles present in 5.85×10^{23} formula units of copper (II) nitrate
   4. mass present in 5.85×10^{23} atoms of copper
   5. mass present in 5.85×10^{23} molecules of ammonia
   6. mass present in 5.85×10^{23} formula units of copper (II) nitrate