A. The Mole and Molar Mass.

1. Calculate the molar mass of each of the following compounds:
   (a) C_3H_8
   (b) $MgCl_2$
   (c) $C_6H_4SO_2(NH_2)_2$
   (d) $(NH_4)_2HPO_4$
   (e) $Al_2(SO_4)_3 \cdot (NH_4)_2SO_4 \cdot 24H_2O$

   $[H = 1,\ C = 12,\ N = 14,\ O = 16,\ Mg = 24,\ Al = 27,\ P = 31,\ S = 32,\ Cl = 35.5]$

2. A sample of iron (Fe) has a mass of $22.4\ g$. Calculate the:
   (a) number of moles present.
   (b) number of iron atoms present.

   $[Fe = 56,\ N_A = 6.02 \times 10^{23}]$

3. A sample of Hydrogen gas has a mass of $20.0\ g$. Calculate the:
   (a) number of hydrogen molecules present.
   (b) number of hydrogen atoms present.

   $[H = 1,\ N_A = 6.02 \times 10^{23}]$

4. What mass of Nitrogen gas at 25.0 would contain:
   (a) $2.4[illegible] \times 10^{25}$ molecules of Nitrogen ?
   (b) 8.64×10^{24} atoms of Nitrogen?

   $[N = 14,\ N_A = 6.02 \times 10^{23}]$

5. Calculate the average mass in grams of:
   (a) one Oxygen atom.
   (b) one Calcium atom.

   $[O = 16,\ Ca = 40,\ N_A = 6.02 \times 10^{23}]$

B. Percent Composition and Formulas of Compounds.

6. Find the percentage composition by mass of each of the following compounds:
   (a) CuO
   (b) $MgSO_4$