Chem 1014
In-Class Problem Set #7
InClass October 6, 1999
Fall 1999

Name_____
TA Name _____
Lab Section #_____

1. Balance each of the following equations

   a) $Li(s) + Cl_2(g) \rightarrow LiCl(s)$

   b) $Ba(s) + N_2(g) \rightarrow Ba_3N_2(s)$

   c) $H_2(g) + CO(g) \rightarrow CH_3OH(l)$

   d) $CaH_2(s) + H_2O(l) \rightarrow Ca(OH)_2(s) + H_2(g)$

   e) $NaHCO_3(s) \xrightarrow{-\Delta} Na_2CO_3(s) + CO_2(g) + H_2O(l)$

   f) $Al(s) + HCl(aq) \rightarrow AlCl_3(aq) + H_2(g)$

   g) $NiS(s) + O_2(g) \rightarrow NiO(s) + SO_2(g)$

   h) $B_2O_3(s) + C(s) \rightarrow B_4C_3(s) + CO_2(g)$

2. Write and balance the equation for each of the following

   a) A formation equation for $MgCl_2$.

   b) A formation equation for NH_3.

   c) A formation equation for Al_2O_3.

   d) The reaction for the combustion of propane (C_3H_8).

   e) The reaction for the combustion of butane (C_4H_{10}).

   f) The reaction for the combustion of ethanol (C_2H_5OH).

   g) The reaction for the combustion of methyl mercaptan (CH_3SH). (Note: when sulfur is combusted it forms sulfur dioxide, SO_2.

3. What is the mass of a hydrogen atom in kilograms and atomic mass units? Of an oxygen atom? Of a carbon atom?

Atom	Mass in kilograms	Mass in atomic mass units
H		
O		
C		

4. Calculate the number of atoms in each of the following;

a) 3.3464×10^{-27} kg hydrogen

b) 2.6555×10^{-25} kg oxygen

c) 1.49451×10^{-24} kg carbon

d) 5.0397 u hydrogen

e) 32 u oxygen

f) 72 u carbon

g) 1.00794 g hydrogen

h) 32 g oxygen

i) 12 g carbon