**Homework #8 Chemistry 111 due Moni 23 March 2018 15 pts (in class) Show your work !!**

**Your name:\_\_\_\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1 pt**

**1) 2.0 grams of C are burned to make 7.333 g COx. What is the empiric formula for COx ? (at. mass C=12 g/mol; at mass O=16 g/mol)**

**Oxygen mass=7.333-2=5.333 g=> 5.333/16=mol O=0.333; mol C= 2.0 g/12=0.1666**

**Mol O/mol C= 0.333/0.166=2=> CO2**

 **\_\_CO2\_\_\_\_ COx formula**

**2) CaHb is burned in O2 to make 0.1111 g CO2 and 0.02273 g H2O.**

 **What is the empiric formula for CaHb ? (mol. mass CO2 =44 g/mol;**

 **mol. mass H2O=18 g/mol)**

**0.111 g CO2/44=0.00252 mol ; mol C/mol CO2 =1/1=x/0.00252=> x=0.00252**

**0.02273 g H2O/18=0.00126 mol ; mol H/mol H2O=2/1= y/0.00126=>y=2\*0.00126**

 **= 0.00252**

**Mol O/mol H=x/y= 0.00252/0.00252=1**

 **\_\_\_\_CH\_\_ CaHb formula**

**3) Balance me:**

 **\_2\_C8H18 + \_25\_\_O2🡪 \_16\_\_CO2 + \_18\_\_H2O**

**4) A 4 gram sample of an iron oxide is heated in vacuum to produce 3.109 g of pure**

 **iron (Fe). What is the original oxide’s formula ? (at. wt of Fe=55.845 g/mol; at.**

 **wt of O=16.0 g/mol)**

 **FeOx🡪 Fe + O**

**Sample mass 4.00 g 3.109 g 4.000-3.109=0.891 g**

**At. wt 55.845 16.00**

**Mol 3.109/55.845=0.0557 0.891/16=0.0557**

 **Fe mol/O mol = 0.0557/0.0557=1=> FeO**

 **\_\_FeO\_\_\_\_ Fe oxide formula**

 **MW(g/mol): 44 32 44 18**

**Given the balanced equation: C3H8 + 5O2 🡪 3CO2 + 4H2O**

**5a) How many grams of O2 are burned if 0.0375 mol of CO2 are produced?**

 **Mol O2/Mol CO2 = 5/3= m(O2)/0.0375**

 **0.0375\*5/3= m(O2)=0.0625 mol O2**

 **0.0625 mol O­2\* 32 g O2/mol O2=2 g**

 **\_\_\_2\_\_ g O2**

**5b) How many grams of C3H8 are burned to produce 9 g CO2 ?**

 **9 g CO2/44 g mol-1 CO2 =0.204545 mol CO2**

 **Mol C3H8/mol CO2 = 1/3= m(C3H8)/0.204545**

 **0.204545\*1/3=0.0618181 mol C3H8**

 **0.06818 mol C3H8 \*44 g C3H8/mol C3H8=**

 **\_\_\_3\_\_\_ g C3H8**

**5c) How many molecules of CO2 are produced when we burn 2.444 g C3H8 ?**

 **2.444 g C3H8/44 g C3H8 mol-1 = 0.0555 mol C3H8**

 **Mol CO2/mol C3H8= 3/1=x(mol CO2)/0.0555**

 **0.0555\*3/1= x(mol CO2) =0.16666 mol CO2**

 **6\*1023 molecules CO2/mol CO2 \* 0.16666 mol CO2 ~ 1\*1023 molecules CO2**

 **\_\_\_\_1\*1023\_\_\_\_ molecules CO2**