**Quiz 6 Chemical Principles I Chem 1984 Fall 2013**

**Your name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/15**

Octane (C8H18) burns in O2 according to the balanced reaction below:

MW (g/mol)= 114 32 44 18

**2C8H18 + 25 O2 🡪 16CO2 + 18H2O**

1. What is the maximum grams of CO2 formed when we burn 3.2387 g C8H18 together with 22.70 g O2 ? (5 pts)

**Convert both masses to moles first: 3.2387 g C8H18/114 g mol\_1=0.0284 mol C8H14**

 **22.70 g O2/32 g mol-1 = 0.7094 mol O2**

**Compute predicted moles CO2 assuming each mol count above:**

**0.0284 mol C8H14 \*16 mol CO2/2 mol C8H18=0.227 mol CO2 C8H18 limits => 0.227 mol CO2\* 44 g/mol=10 g**

**0.7094 mol O2 \* 16 mol CO2/25 mol O2 = 0.454 mol CO2**

Maximum grams CO2= \_\_\_\_10\_\_\_\_\_\_\_\_g

1. What is the maximum count of molecules of H2O formed if we burn 42.18 g C8H18 with 1.3888\*1024 molecules of O2 ? (5 pts) Assume 1 mol count= 6\*1023

Convert masses and molecule count to moles first:

Mol C8H18 = 42.18 g/114 g mol\_1= 0.37

Mol O2 1.3888\*1024 molecules O2/6\*1023 molecules mol-1=2.315

Computed predicted moles H2O assuming each mol count above:

0.37 mol C8H18 \* 18 mol H2O/2 mol C8H18 = 3.33 mol H2O

2.315 mol O2 ( 18 mol H2O/25 mol O2) = 1.6668 mol H2O => O2 limits

1.6668 mol H2O \* 6\*1023 molecules O2/mol =10\*1023 =1\*1024 molecules

 Maximum count of H2O molecules=\_\_1\*1024\_\_\_\_\_\_\_\_

1. Determine the most likely formulas for the binary compounds formed from the element pairs below: (use Periodic Table on back of this quiz) 5 pts/ 1 pt each
2. B F 🡪 \_\_\_\_\_\_\_\_\_BF3\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Ca P 🡪 \_\_\_\_\_\_\_\_Ca3P2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Mg S 🡪 \_\_\_\_\_\_\_\_\_MgS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. K O 🡪 \_\_\_\_\_\_\_\_K2O\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Li N 🡪 \_\_\_\_\_\_\_\_\_Li3N\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_