**Homework #8: Chemistry 1013 Spring 2013**

**Due Mondasy 15 April in class 16 pts (1 pt/answer)**

Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8.1. Scientific notation**

**Write the following decimal expressions in scientific notation**

1. **1,400,000 g = \_\_\_\_\_\_\_\_1.4 \*106 g\_\_\_\_\_\_\_\_\_\_\_**
2. **0.000433 s = \_\_\_\_\_\_\_\_\_4.33 \*10-4s\_\_\_\_\_\_\_\_\_\_\_**
3. **6,050 m = \_\_\_\_\_\_6.05 \*103\_m\_\_\_\_\_\_\_\_\_\_\_\_**

**8.2. Prefix equivalents**

**Write the equivalent prefix values for the above**

1. **1,400,000 g = \_\_\_\_\_\_\_1.4 Mg\_\_\_\_\_\_\_\_\_\_\_**
2. **0.000433 s = \_\_\_\_\_\_433 µs\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **6,050 m = \_\_\_\_\_\_\_6.05 km\_\_\_\_\_\_\_\_\_\_\_\_**

**8.3. Molecular mass**

**Calculate the molecular weight (MW) in grams/mol for the compounds below to the nearest gram**

1. **Natural gas CH4 MW= \_\_\_\_\_\_\_16\_\_\_\_\_\_\_\_\_\_\_grams/mol**
2. **Water H2O MW= \_\_\_\_\_\_\_18\_\_\_\_\_\_\_\_\_\_grams/mol**
3. **Gasoline C8H18  MW = \_\_\_\_\_114\_\_\_\_\_\_\_\_\_\_\_ grams/mol**

**8.4. Gram-mole conversions (show work below or no credit) (round answers to nearest whole #)**

1. **How many moles of CH4 in 320 grams of natural gas ? \_\_\_\_\_\_20\_\_\_\_\_\_\_\_\_\_\_\_\_\_moles**

**320 g = 20 moles CH4**

**(16 g/mol CH4)**

1. **What does 1.111 moles of water weigh ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_20\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g**

**1.11 moles \* 18 g/mol H2O = 20 grams H2O**

1. **How many moles of gasoline in 2,280 grams of gasoline ?\_\_\_\_20\_\_\_\_\_\_\_\_\_moles**

**2,280 g = 20 mol C8H18**

**114 g/mol C8H18**

**8.5. Gram-Molecule count conversions (assume Avogdro’s Number =6.02\*1023) (2 pts each/4 pts)**

1. **How many grams of CH4 are in 2.408\*1024 molecules of CH4 ?**

**2.408\*1024 molecules\* 16 g**

**6.02\*1023 molecules/molmol**

**= 4 mole \* 16 g/mol =64**

**\_\_\_\_64\_\_\_\_ g CH4**

1. **How many molecules of gasoline are in 189.36 g of gasoline ?**

**189.36 g \* 1 mol \* 6.02\*1023 molecules =1.65789 mol \*6.02\*1023 molecules =9.99\*1023 =1\*1024**

**114 g mole mol**

**\_~1\*1024\_\_\_\_ molecules gasoline**