**Homework #9: Chemistry 1013 Spring 2014**

**Due Wednesday 23 April in class 24 pts**

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

**9.0** A compound composed of N, O and H has the following weight percent composition:

22.22 % N,76.19% O, 1.58 % H. The molecular weight of the compound is 252 g/mol.

**a) what is the empiric formula for the compound ?**

**b) what is the molecular formula for the compound? (2 pts total)**

**9.1**. A 1.00 gram sample of N is burned in oxygen to form a nitrogen oxide weighing 3.2857 g.

**What is the empiric formula of the nitrogen oxide compound ? (1 pt)**

**9.2 Balance these equations with whole-numbered coefficients. (1 pt per correct line)**

\_\_Cu + \_\_H2S + \_\_O2 🡪 \_\_CuSO4 + \_\_H2O

\_\_ C4H10 + \_\_O2 🡪 \_\_\_CO2 + \_\_\_H2O

**9.3 Stoichiometry calculations (show work or no credit) 3 pts each/18 pts total**

Given the balanced equation:

6HCl + 2Al -----🡪 2AlCl3 + 3H2

36 27 132 2 g/mol

a) **moles to moles:** How many moles of Al must be added to produce 15 moles of H2 ? \_\_\_\_\_mol Al

b)**moles to weight:** How many grams of H2 are created by reacting 10 moles of HCl ? \_\_\_\_ g H2

c) **weight to moles:** How many moles of HCl can combine with 90 g of Al ? \_\_\_\_ mol HCl

**d) weight to weight:** How many grams of Al must react to form 1.1111 grams of H2 ? \_\_\_\_ g Al

e**) weight to count:** How many molecules of HCl are needed to make 73.065 g AlCl3? \_\_\_\_molecules

HCl

**f) count to weight:** how many grams of Al produce 3.333 \*1023 molecules of H2 ? \_\_\_\_ g Al