Class Time- Chapter 2

1. A sample of methane, CH4 is found to have 46.12g of carbon and 3.87g of hydrogen. Another sample is analyzed and found to have 51.25g of carbon and 4.30g of hydrogen. Analyze these results in the context of the law of definite proportions.

2. A compound containing only carbon and hydrogen has a carbon-to hydrogen mass ratio of 11.89. Which carbon-to-hydrogen ratio is possible for another compound composed only of carbon and hydrogen?

a. 2.50 b. 3.97 c. 4.66 d. 7.89

3. Milk of magnesia contains the chemical, magnesium hydroxide, Mg(OH)2. If a bottle contains 35.0 g of Mg(OH)2, how many molecules does it contain?

[Mg(OH)2 = 58.3 g/mole]

a) 6.02 x 1023 c) 1.00 x 1024

b) 5.80 x 1022 d) 3.61 x 1023

How many ions of OH-does it contain?

4. A 1.00 Liter sample of a gas (measured at STP) has a mass of 4.65 g. Its molar mass is

a) 104.2 g/mol c) 44.0 g/mol

c) 204.6 g/mol d) 28.0 g/mol

5. Determine the number of atoms in 1.85ml of mercury. The density of mercury is 13.5 g/ml.

6. Aspartame is an artificial sweetener that is 160 times sweeter than sucrose (table sugar) when dissolved in water. It is marketed as NutraSweet. The molecular formula of Aspartame is C14H18N2O5.

a. Calculate the molar mass of aspartame.

b. How many moles of molecules are present in 10.0g of aspartame?

c. Calculate the mass in grams of 1.56 mol aspartame.

d. How many molecules are in 5.0 mg aspartame?

e. How many atoms of nitrogen are in 1.2 g of aspartame?

f. What is the mass in grams of 1.0 X 109 molecules of aspartame?

g. What is the mass in grams of one molecule of aspartame?