**Name: Period: Seat#:**

**Worksheet #11**

**Directions**: Do these problems on a piece of binder paper. Staple this sheet to the front of your binder paper. Show all work for ANY math problem. Include ALL units. Some answers provided at the end of the question. The answers are underlined.

1. Tartaric acid is the white, powdery substance that coats tart candies such as Sour Patch Kids. Combustion analysis of a 12.01g sample of tartaric acid, which contains only carbon hydrogen and oxygen produces 14.08g CO2 and 4.32g H2O. Determine the empirical formula for tartaric acid. *C2H3O3*
2. When 1.00 g of a compound containing only carbon and hydrogen is burned completely, 3.14 g of CO2 and 1.29 g of H2O is produced. What is the empirical formula? *CH2*
3. Aniline, a starting compound for urethane plastic foams, consists of C, H, and N. Combustion of such compounds yields CO2 (carbon dioxide), H2O (water), and N2 as products. If the combustion of 9.71 mg of Aniline yields 6.63 mg of H2O and 1.46 mg of N2, what is its empirical formula? The molecular weight of Aniline is 93 amu. What is its molecular formula? *Both are C6H7N*
4. 0.658 g of a compound containing only carbon, hydrogen, and oxygen is burned in excess O2. CO2 (1.285 g) and H2O (0.658g) are produced. The molar mass of the compound is determined by mass spectrometry to be 90 g/mole. Determine the empirical and molecular formulas. *C2H5O, C4H10O2*
5. When 0.100 mole of a compound of carbon, hydrogen and nitrogen was burned completely in oxygen, 26.4 g of CO2, 6.30 g of H2O, and 4.60 g of NO2 were produced. What is the empirical formula of the compound? *C6H7N*
6. The combustion of an 8.23 mg sample of unknown substance gave 9.62 mg of carbon dioxide and 3.94 mg of water. Another sample, weighing 5.32 mg, gave 13.49 mg of silver chloride in a halogen analysis. Determine the percent composition for this organic compound. *31.96% C, 5.36% H, 62.72% Cl*
7. Ethylene glycol (62.07 g/mol) is used as an automobile antifreeze and in the manufacture of polyester fibers. The name glycol steams from the sweet taste of this poisonous compound. Combustion of 6.38 g of ethylene glycol give 9.06 g CO2 and 5.58 g H2O. The compound contains only C, H, and O. what are the mass percentages of the elements in ethylene glycol? *38.7% C, 9.79% H, 51.5% O*
8. Researchers used a combustion method to analyze a compound used as an antiknock additive in gasoline. A 9.394 g sample of the compound yielded 31.154 g of carbon dioxide and 7.977 g of water in the combustion. Calculate the percent composition of the compound. C: 90.5%, H: 9.5%