Lab: Stoichiometry—Datasheet   Name_____

Effervescent tablets contain sugar, flavoring, and food coloring as well as tartaric acid and sodium bicarbonate. When one of these tablets is added to water, the sodium bicarbonate reacts with the tartaric acid. The products of this reaction are sodium tartrate, carbon dioxide, and water.

Procedure:
1. Find the mass of the effervescent tablet.
2. Fill a flask about 1/3 full of water and find the mass.
3. Drop the tablet into the water and allow the reaction to take place. Stir to be certain that the reaction is complete.
4. Mass the flask with contents after the reaction is complete.

Data:

mass of tablet	g
mass of flask with water	g
mass after reaction	g

Calculations: Use the following BALANCED equation together with the collected data to answer the following questions.

$$2\ NaHCO_3 + H_2C_4H_4O_6 \rightarrow Na_2C_4H_4O_6 + 2\ CO_2 + 2\ H_2O$$

1. The total mass before the reaction is _____.

2. The carbon dioxide is the gas that bubbled away in the reaction. The mass of carbon dioxide that bubbled away is _____.

3. Using the mass of carbon dioxide from number 2, what was the mass of sodium bicarbonate, $NaHCO_3$, in the tablet?

4. Using the mass of carbon dioxide from number 2, what was the mass of tartaric acid, $H_2C_4H_4O_6$, in the tablet?

5. Using the mass of carbon dioxide from number 2, what mass of water should have been produced in the experiment?

Conclusions:

1. An effervescent tablet is found to contain 0.94 g sodium bicarbonate. The tablet is placed in water, and the reaction occurs as in the experiment. What is the theoretical yield of carbon dioxide?

2. When the reaction is complete, the mass of carbon dioxide that bubbled away is found to be 0.46 g. What is the percent yield of carbon dioxide for this reaction?