Lab One: Episode 702—Datasheet **Name** _____*KEY*_____

I. Fill in the data table below as you watch the lab on the video.

mass of sodium bicarbonate	*0.23 g*
mass before reaction	*5.98 g*
mass after reaction	*5.85 g*

II. Write a balanced equation for the reaction that took place. (Hint: the narrator on the video will help you with this.)

$$NaHCO_3 + HCl \rightarrow NaCl + CO_2 + H_2O$$

III. Conclusion Questions: Answer each question completely. SHOW ALL WORK!

- Calcuate the mass of carbon dioxide produced in the experiment. (Hint: Think about what bubbled away.)

$$5.98\ g - 5.85\ g = 0.13\ g\ CO_2\ bubbled\ away$$

- Use molar masses to calculate the percent of carbon in carbon dioxide using the following formula.

$$\%\ C\ in\ CO_2 = \frac{\text{mass of } C}{\text{mass of } CO_2} \times 100\%$$

$$\%\ C\ in\ CO_2 = \frac{12.0\ g\ C}{44.0\ g\ CO_2} \times 100\% = 27.3\%\ C\ in\ CO_2$$

- Calculate the mass of carbon in the sample of carbon dioxide using the same formula and your answers to the previous two calculations.

$$27.3\% = \frac{x\ g\ C}{0.13\ g\ CO_2} \times 100\%$$

$$(0.273)(0.13\ g) = x\ g\ C = 0.035\ g\ C$$

- Calculate the percentage of carbon that was in the original sample of sodium bicarbonate using the following formula.

$$\%\ C \text{ in } NaHCO_3 = \frac{\text{mass of } C}{\text{mass of } NaHCO_3} \times 100\%$$

$$\%\ C\ in\ NaHCO_3 = \frac{0.035\ g\ C}{0.23\ g\ NaHCO_3} \times 100\% = 15\%\ C\ in\ NaHCO_3$$

IV. Practice Problems. SHOW ALL WORK!

- Calculate the percentage sodium in sodium oxide.

$$\%\ Na\ in\ Na_2O = \frac{46.0\ g\ Na}{62.0\ g\ Na_2O} \times 100\% = 74.2\%\ Na\ in\ Na_2O$$

- Calculate the percentage aluminum in aluminum phosphate.

$$\%\ Al\ in\ AlPO_4 = \frac{27.0\ g\ Al}{122.0\ g\ AlPO_4} \times 100\% = 22.1\%\ Al\ in\ AlPO_4$$

- Calculate the percentage hydrogen in hydrogen peroxide.

$$\%\ H\ in\ H_2O_2 = \frac{2.0\ g\ H}{34.0\ g\ H_2O_2} \times 100\% = 5.9\%\ H\ in\ H_2O_2$$

- Calculate the percentage nitrogen in dinitrogen pentoxide.

$$\%\ H\ in\ H_2O_2 = \frac{2.0\ g\ H}{34.0\ g\ H_2O_2} \times 100\% = 5.9\%\ H\ in\ H_2O_2$$