

Stoichiometry of the Self-Inflating Balloon Worksheet

Part A. Observations with Instructor

1. Record observations of the teacher's self-inflating balloon below.

2. Record observations of a self-inflating balloon made from a plastic bag.

Part B. Analyzing a Self-Inflating Balloon

Data Table 1.

Mass of empty weigh dish (g)	
Mass of weigh dish and sodium bicarbonate (g)	
Mass of sodium bicarbonate in balloon (g)	
Volume of balloon (mL)	
Temperature of room (°C)	
Pressure of room (atm)	
Calculated mass of sodium bicarbonate needed to inflate the balloon to the measured volume (g)	

3. Calculate the amount of baking soda needed to fill the self-inflating balloon full of carbon dioxide gas at room temperature and pressure. Show all work.

4. Was the sodium bicarbonate provided in the balloon limiting or excess in this reaction? Support the answer with evidence.

Part C. Creat Your Own Self-Inflating Balloon

Data Table 2.

Volume of plastic bag (mL)	
Temperature of room (°C)	
Pressure of room (atm)	
Mass of sodium bicarbonate needed (g)	
Mass of citric acid needed (g)	

5. Given the volume of gas needed to inflate the self-inflating plastic bag balloon, calculate the mass of sodium bicarbonate and citric acid needed to inflate the bag. Show your calculations below.
6. Record observations of the plastic bag self-inflating balloon below.

Post-Lab Question

7. To inflate a self-inflating balloon to a volume of 2.3 L at a room temperature of 25 °C, how much baking soda and citric acid would be needed?