

Bags of Reactions

Name - _____

Introduction - Antoine Lavoisier formulated the Law of Conservation of Mass, which states that matter can be neither be created nor destroyed, only changed. During a chemical reaction, the bonds of the reactants are broken and rearranged with other atoms to form new substances. Because matter must be conserved, these new substances, or products, must contain the same number and type of atoms as the reactants. In this investigation, you will verify the Law of Conservation of Mass. Then you will be given some compounds to react. You will write and balance a chemical equation for the reaction.

Pre-Lab Discussion - Read the entire lab and review your notes. Then answer the following questions.

/1 1.) Define reactants - _____

/1 2.) Define products - _____

/1 3.) How can you tell a chemical reaction has occurred? _____

/1 4.) What is the point of using a resealable bag? _____

/1 5.) What is the density of water at room temperature (to 4 decimal places)? _____

/1 6.) What is the common name for sodium hydrogen carbonate? _____

Part 1 - Day 1

Purpose - to discover if and how chemical equations can be written and balanced for chemical reactions.

Materials -

Procedure - **Part 1**

- 1.) Measure 25 mL of water into a resealable plastic bag. Flatten the air out of the bag and seal it.
Record the mass in Data Table 1.
- 2.) Record the mass of the antacid tablet in Data Table 1.
- 3.) Tip the bag sideways, and while holding the bag this way, add the tablet so that the tablet and water do not mix. Do not trap any extra air in the bag. Reseal the bag.
- 4.) Let the tablet drop into the water. Observe the reaction until it comes to a complete stop.
Record your observations. (Note - many antacid tablets have a weak blue dye added to the tablet. The resulting blue color is therefore **NOT** part of the reaction!)
- 5.) When the reaction is complete, record the mass of the bag and its contents in Data Table 1.

Part 2

- 1.) Add 2 scoops of calcium chloride to the second plastic bag.
- 2.) Add 1 scoop of sodium hydrogen carbonate to the bag and shake it gently to mix.
- 3.) Determine the mass of the bag and its contents. Record this value in Data Table 2.
- 4.) Measure 25 mL of distilled water into the graduated cylinder. Add 5 drops of phenol red indicator to the water. (Hint - phenol red indicator turns from red to yellow in the presence of acid).
- 5.) Tip the bag sideways, and while holding the solids in the upper part of the bag, pour the water into the bag so that the water and solids do not mix.
- 6.) Keeping the trapped air to a minimum, reseal the bag. Hold the bag and let the liquid move from one end of the bag to the other end until the contents are thoroughly mixed.
- 7.) Observe the reaction until it comes to a complete stop. Record your observations.
- 8.) Record the mass of the unopened bag in data table 2. Clean up your work area and wash your hands before leaving the lab.

Observations -

Data Table 1 - Antacid Tablet and Water

Mass of bag and water		Write observations here: <i>Example only</i>
Mass of tablet		
Mass of bag and reactants		
Mass of bag and products		

Data Table 2 - Calcium chloride, sodium hydrogen carbonate and water

Mass of bag and dry reactants		Write observations here: <i>Example only</i>
Volume of water		
Mass of water		
Total mass of bag and reactants		
Mass of bag and products		