

Name _____

Date _____

Class _____

Reaction In A Bag ~ Conservation of Mass Lab/Demo**Introduction:**

The Law of Conservation of mass states that matter can neither be created nor destroyed. During a chemical reaction, the bonds of the reactants are broken and rearranged 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 first verify the law of conservation of mass. Then in the second part you will be given some known compounds to react.

Pre-Lab Questions

1. Define reactants: _____
2. Define products: _____
3. What are the 6 indicators a chemical reaction has happened?
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
 - f. _____
4. Why is it necessary to use a zip-lock bag? _____
5. If the density of water is 1.00 g/ml and you measure a volume of 25 mL, what is the mass?

6. What is the common name for sodium bicarbonate? _____

Materials

Goggles	Graduated Cylinder	Electronic Balance	Scoopula or spoon
Apron	Ziploc plastic bag	Antacid tablet	Calcium Chloride
	Sodium Carbonate	Phenol red indicator	

Procedure**PART A~ Antacid tablet**

1. Put your goggles and apron on. Measure 25 mL of tap water into a resealable plastic bag. Flatten the air out of the bag and seal it. Record its 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, pour 25 ml of water into one corner.
4. Place the antacid tablet in the bag, but **DO NOT LET IT TOUCH THE WATER**.
5. Seal the plastic bag, while still holding onto the tablet and the water in the corner of one of the bags.
6. Let the tablet drop into the water.
7. Observe the reaction until it comes to a complete stop. You will know this when the bubbling and fizzing stop.
8. Mass the bag and all the reactants and products and record the mass in data table #1.

PART B – CaCl₂, NaHCO₃ and water

1. Calculate the total mass of the bag and reactants in each reaction and record these values in the appropriate data table.
2. Using the formula for the density of water, calculate the mass of the water. Record the results in data table #2.
3. Add 1 scoop of calcium chloride, CaCl₂, to the second plastic bag.
4. Add 1 scoop of sodium Carbonate, NaCO₃ to the bag, and shake gently to mix.
5. Determine the mass of the bag and its contents. Record this value in data table 2.
6. Measure 25 mL of water into the graduated cylinder. Add 5 drops of phenol red indicator to the water.
7. Tip the bag sideways, and while holding the solids in the bottom corner, pour the liquids in the other corner. Twist the bag if you like so the solids will not get wet from the water/phenol red.
8. 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 until the contents are mixed.
9. Observe the reaction until it comes to a complete stop. Record your observations.
10. Record the mass of the unopened bag in data table #2.
11. Clean up your work area and wash your hands before leaving the lab.

Data & Observations

Antacid Tablet Demo – Don't forget units!!!			
Mass of bag & water		Beginning Temp:	Ending Temp:
Mass of antacid tablet		Observations: Evidence of chemical change:	
Mass of all reactants (mass of bag & water + mass of antacid tablet)			
Mass of bag & products			

Calcium Chloride & Sodium Bicarbonate Demo – Don't forget units!!!			
Mass of bag + dry reactants + phenol red		Beginning Temp:	Ending Temp:
Volume of water		Observations: Evidence of chemical change:	
Mass of water (hint: $D = m/v$)			
Mass of all reactants (mass of bag + mass of water + dry reactants + phenol red)			
Mass of bag and products			

Analysis & Conclusion:

1. How do the values for total mass before and after each reaction demonstrate the law of conservation of mass?

a. If your values do not match, what is a possibility for this discrepancy?

Answer the following questions about the antacid tablet demo.

2. Was the antacid tablet demo a physical change or a chemical change? _____

a. What is your evidence for your answer to the question above? _____

3. Was the antacid tablet demo endothermic or exothermic? _____

a. What is your evidence for your answer to the question above? _____

Answer the following questions about the calcium chloride and sodium bicarbonate activity/demo.

4. Was the calcium chloride and sodium bicarbonate demo a physical change or a chemical change? _____

a. What is your evidence for your answer to the question above? _____

5. Was the calcium chloride and sodium bicarbonate demo endothermic or exothermic? _____

a. What is your evidence for your answer to the question above? _____

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6. What are 3 physical properties of the antacid tablet?

a. _____ b. _____ c. _____

7. What are three (3) physical properties of the calcium chloride (CaCl_2)?

a. _____ b. _____ c. _____

8. 6. What are 3 physical properties of baking soda (NaHCO_3)?

a. _____ b. _____ c. _____

9. Phenol red is an indicator that turns yellow when present in an acidic solution. Was your bag acidic or basic?
