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HONORS LAB 2a: Conservation of mass

Aim To investigate if mass remains constant in a number of chemical reactions

Apparatus Pipets, electronic balance, small plastic bottle with lid

Chemicals Alka-Seltzer tablet, calcium chloride solution, sodium carbonate solution, water, sodium hydroxide solution, hydrochloric acid, and phenolphthalein

Method

PART A: Precipitation

1. Using two modified pipets introduce a few drops of calcium chloride solution into one pipet and a few drops of sodium carbonate solution into the other pipet. Now telescope the stem of one pipet into the stem of the other pipet. Place the apparatus on a balance and record the mass of the whole unit.
2. Mix the solutions by gently squeezing the bulb of the pipet that is telescoped inside the other pipet. It is vital not to spill any contents at this stage. Record any observations.
3. Place the whole unit on a balance and once again record the mass.
4. Repeat the whole procedure twice more.

PART B: Formation of a gas

1. Take a plastic bottle and add approximately 10.0 mL of water. Place ¼ of an Alka Seltzer tablet in the cap.
2. Place both the bottle and the cap on the balance and record their total mass.
3. Drop the tablet into the bottle and place the cap on quickly and tightly.
4. Shake the bottle for two minutes. Record your observations.
5. Place the bottle on the balance again and re-weigh.
6. Slowly release the gas that has formed by loosening the cap.
7. Place the bottle on the balance again and re-weigh.
8. Repeat the whole procedure twice more.

PART C: Acid Base reaction

1. Using two modified pipets introduce a few drops of sodium hydroxide solution laced with phenolphthalein (the purple solution) into one pipet, and a few drops of hydrochloric acid into the other pipet. Now telescope the stem of one pipet into the stem of the other pipet. Place the apparatus on a balance and record the mass of the whole unit.
2. Mix the solutions by gently squeezing the bulb of the pipet that is telescoped inside the other pipet. It is vital not to spill any contents at this stage. Record any observations.
3. Place the whole unit on a balance and once again record the mass.
4. Repeat the whole procedure twice more.

Results

	PART A		
	1st trial	2nd trial	3rd trial
1. Mass of apparatus before mixing			
2. Observations on mixing			
3. Mass of apparatus after mixing			

	PART B		
	1st trial	2nd trial	3rd trial
1. Mass of bottle, water, cap and tablet			
2. Observations on mixing			
3. Mass of apparatus after mixing			
4. Mass of apparatus after opening			

	PART C		
	1st trial	2nd trial	3rd trial
1. Mass of apparatus before mixing			
2. Observations on mixing			
3. Mass of apparatus after mixing			

Conclusion/Calculation

1. For **each** experiment list the observations that suggest that a chemical reaction has taken place.

2. For **each** experiment how does the mass of the reactants compare to the mass of the products?

3. For **each** experiment would you say that mass has been conserved? Explain your answer. If mass appears not to have been conserved suggest the experimental errors that could have led to this result.