

Honors Chemistry

Lab 1: Conservation of Mass

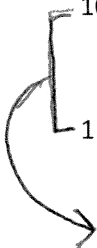
Read the following lab procedure and complete a pre-lab in your lab notebook. Produce a logical, neat, proper data table for this experiment. Make sure to abide by all rules and suggestions given in the lab notebook guidelines. All data and calculations should include units and uncertainty!

Materials

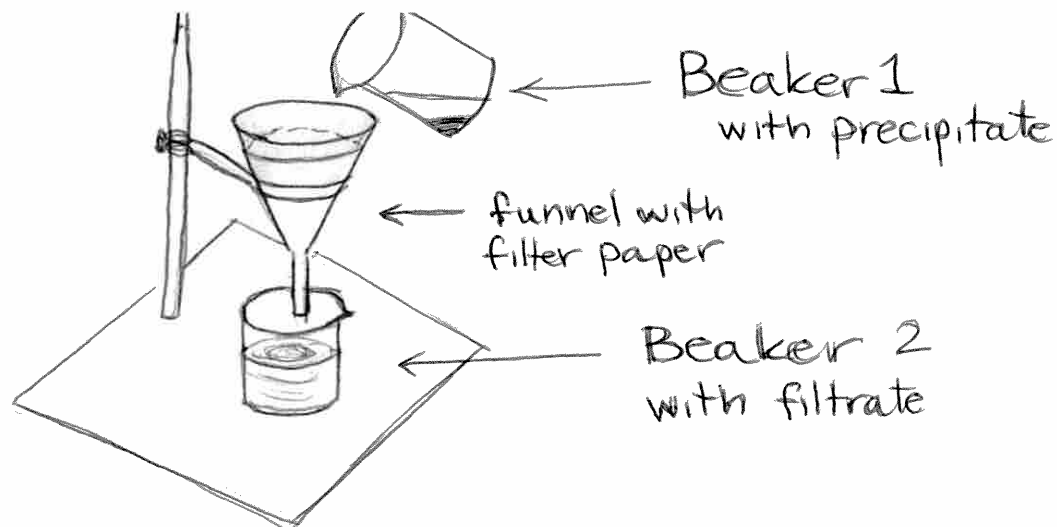
2 dry beakers	Graduated cylinder	Filter paper
Distilled water	Electronic balance	Ring stand with clamp
Glass stirring rod	Na ₂ CO ₃	Funnel
Hot plate	CaCl ₂	Beaker tongs

Procedure

1. Obtain two clean, dry 250ml beakers and label them Beaker 1 and Beaker 2, respectively. Record their individual masses.
2. Mass *approximately* 1.00g of Na₂CO₃ (sodium carbonate) into Beaker 1. Make sure to record how much you actually add.
3. Add *approximately* 20 ml of distilled water to Beaker 1 to dissolve the sodium carbonate. Swirl and/or warm the solution gently to aid dissolving.
4. Mass *approximately* 1.20 g of CaCl₂ (calcium chloride) into Beaker 2. Make sure to record how much you actually add.
5. Add *approximately* 30 ml of distilled water to Beaker 2 to dissolve the calcium chloride. Swirl and/or warm the solution gently to aid dissolving.
6. Slowly add the contents of Beaker 2 to Beaker 1. What do you notice? Continuously stir with a glass stirring rod. Considering the title of this experiment, what should you be careful to NOT do?
7. Rinse Beaker 2 once or twice with a small amount (1 to 2ml) of distilled water, adding this water to Beaker 1.
8. Heat the contents of Beaker 1 on a hot plate until the solution boils.
9. Turn off the hot plate and let the solid material (called the precipitate) settle to the bottom.
10. While part of the group is carrying out steps 7, 8, and 9, someone else should record the mass of a piece of filter paper. Place the filter paper in a funnel and place the funnel in a support ring. Place the empty Beaker #2 under the funnel.
11. Pour *just the liquid* from Beaker 1 into the funnel. Collect this liquid (the filtrate) in Beaker 2.



SEE NEXT PAGE FOR A DIAGRAM OF SETUP



12. When the filtering process is complete, remove the filter paper from the funnel and put it in Beaker 1. The paper and Beaker 1 will be dried in an oven by your teacher.
13. Remove the water from Beaker 2 by carefully boiling the solution until most of the water has evaporated. DO NOT let any of the filtrate splash or spatter out of the beaker! Your teacher will complete the final drying process for Beaker 2 in an oven.
14. During the next class period you will observe your two beakers and filter paper, and record the masses of all three items.

Calculations (Analysis)

1. Calculate the total mass of your reactants (your starting compounds).
2. Calculate the mass of the dry precipitate (what was left on the filter paper and Beaker 1).
3. Calculate the mass of the dry filtrate (what was left in Beaker 2).
4. Calculate the total mass of the products (what was left at the end of the experiment).
5. Calculate the difference between the mass of the products and the mass of the reactants.
6. Calculate your percent error.

Questions (Analysis)

1. You determined the difference between the mass of the products and reactants. According to the Law of Conservation of Mass, what *should* the difference be?
2. If your results do not agree with what you expected, cite specific reasons for the difference (note "human error" is unacceptable!!).
3. In nuclear reactions there is often a measurable difference in the mass of the reactants and the mass of the products. What is the reason for this? It is not an error in massing, and you may have to consult resources other than Chapter 1 to answer this question.

Conclusion

Write a concise but accurate paragraph for this experiment.