SCH 3U
J. Kropac

Percentage Yield Lab

The percentage yield of a reaction is affected by a variety of factors. One of the factors that could affect percentage yield is laboratory technique. In this experiment, you will be observing a reaction in which a precipitate is formed. You will then determine the percentage yield of the precipitate to determine how effective your laboratory techniques were.

The reaction you will be observing is between aqueous sodium carbonate, $Na_2CO_{3(aq)}$ reacting with aqueous calcium chloride, $CaCl_{2(aq)}$. The two reactant will take part in a reaction, producing and aqueous solution as well as a solid precipitate.

Purpose

Calculate the percentage yield of the precipitate formed during the reaction between calcium chloride and sodium carbonate.

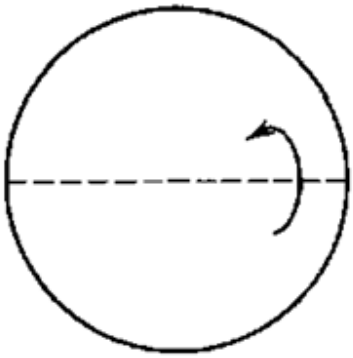
Materials

2.00 g of sodium carbonate, $Na_2CO_{3(s)}$	Glass Stir Rod
1.00 g of calcium chloride, $CaCl_{2(s)}$	Filter Paper
Distilled Water	Retort Stand and Ring Clamp
Graduated cylinder	Funnel
Two 250-mL beakers	300 mL-beaker
Balance	

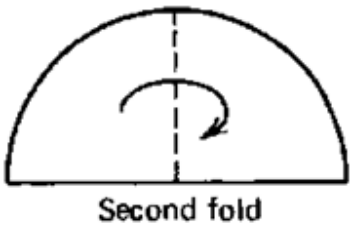
Procedure

1) Obtain two clean dry 250-mL beakers. Label one beaker as Na_2CO_3 and $CaCl_2$ using labelling tape. Measure their masses and record them in the data table.
2) Measure 2.00 g of sodium carbonate and place it in sodium carbonate beaker. Record the specific mass in your beaker. Add 50 mL of distilled water and stir using a glass stir rod until sodium carbonate is totally dissolved. Be sure to rinse your glass stir rod before using it in step 3.
3) Measure 1.00 g of calcium chloride and place it in the beaker labelled calcium chloride. Record the specific mass in your beaker. Add 50 mL of distilled water. Use a glass stir rod to stir until the material is totally dissolved.
4) Once both solids have totally dissolved, pour the entire contents of the sodium carbonate beaker into the calcium chloride beaker. Be sure to do so a portion at a time, and stir constantly.

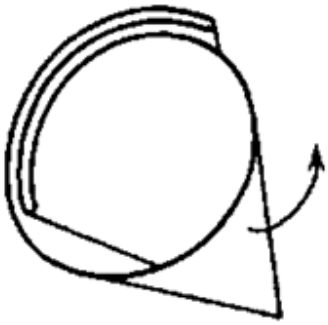
5) Once the reaction is complete, label and mass a piece of filter paper. Record the mass of the filter paper in your chart. Set up funnel and filter paper as shown below.



First fold



Second fold



Open to a cone

6) Gently swirl the beaker containing the reaction to suspend the precipitate. Carefully pour the entire contents onto the filter paper a section at a time. Be sure to pour slowly and don't overflow the funnel.
7) Rinse the reaction beaker several times with distilled water using a wash bottle, and pour the rinse through the filter paper to catch any remaining precipitate.
8) When the filter paper stops dripping, carefully remove the filter paper and place on cart provided by teacher for drying overnight.
9) Dispose of any waste as directed by teacher and clean lab area.
10) Once precipitate has dried overnight, carefully mass the filter paper and precipitate and record it in your data table.

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Observations

Sodium Carbonate	
Empty Labelled Beaker Mass	
Mass of Sodium Carbonate	
Calcium Chloride	
Empty Labelled Beaker Mass	
Mass of Calcium Chloride	
Product	
Mass of Clean Dry Filter Paper	
Mass of Dried Filter Paper Containing Calcium Carbonate	

Calculation

1) Write a balanced chemical equation for your reactions. (2 marks)
2) Use a solubility table to determine what precipitate was formed. (1 mark)
3) Determine the limiting reagent of the reactions. (3 marks)
4) Determine the theoretical yield of the precipitate. (2 mark)
5) Determine the percent yield of your experiment. (1 mark)

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Discussion and Conclusion

In paragraph form be sure to include
- An overview of your findings from your lab. (2 marks)
- Why your actual yield and theoretical yield may be different (2 marks)
- How you may change your technique next time (1 mark)
- Implications of percentage yield and how it may be used in industry (1 mark)

Lab Mark Breakdown	
Title Page	0 1
Purpose	0 1
Materials and Procedure (see lab handout)	0 1
Observations	0 1 2
Calculations	0 1 2 3 4 5 6 7 8 9
Conclusion	0 1 2 3 4 5 6
Lab Skill	0 1 2 3
Total Lab Mark	/23 marks