

Name: _____

Per: _____

Percent Yield Lab

I. Purpose: During this lab, you will carry out an acid/base reaction; the base being your limiting reactant, with acid in excess. By collecting the ionic solid product, a percent yield will be calculated.

II. Procedure:

- 1) Clean (with water) and dry an evaporating dish & a watch glass
- 2) Weigh the dish and the watch glass
- 3) Add approximately 1.0 grams NaHCO_3 to the dish
- 4) Reweigh the dish/watch glass with the NaHCO_3
- 5) React, while stirring, the base with excess 1M HCl until complete
- 6) Isolate the NaCl by evaporating the water, with the watch glass over dish
- 7) After cool, reweigh evaporating dish/watch glass with product
- 8) Rinse dish and watch glass, clean up lab area, return watch glass

III. Data

Mass Dish/Glass	27.25 g
Mass Dish/Glass + NaHCO_3	28.47 g
Mass Dish/Glass + Product	27.98 g

V. Calculations

A) Write the balanced equation for the acid/base reaction performed.



B) Calculate the mass of NaHCO_3 you began with in the reaction.

Mass of Dish, Glass, NaHCO_3	28.47g
-Mass of Dish, Glass	<u>-27.25g</u>
mass NaHCO_3	1.22g

V. Calculations

C) Do all the calculations necessary to determine the percent yield for this reaction

Actual yield:

Mass of Dish, Glass, NaCl	27.98g
-Mass of Dish, Glass	-27.25g
<hr/>	
mass NaCl	0.73g

Theoretical yield:

$$\frac{1.22\text{g NaHCO}_3}{84.0\text{g NaHCO}_3} \times \frac{1 \text{ mol NaHCO}_3}{1 \text{ mol NaHCO}_3} \times \frac{1 \text{ mol NaCl}}{1 \text{ mol NaHCO}_3} \times \frac{58.5\text{g NaCl}}{1 \text{ mol NaCl}} = 0.850 \text{ g NaCl}$$

Percent yield:

$$\% \text{ Yield} = \frac{\text{Actual}}{\text{Theoretical}} \times 100 = \frac{0.73 \text{ g}}{0.850 \text{ g}} \times 100 = 86\%$$

VI. Conclusions

Discuss the possible reasons your percent yield was not 100%.

In the purpose, the base was identified as the limiting reactant and the acid as being in excess. Explain what this means.

In general, why is it impossible to have higher than 100% yield? How can yields over 100% be explained?
