Chem 111 **Experiment 4** **Spring 2025**

Stoichiometry: Solution:Solution….Limiting Reagents….Making Chalk

Name: _____ **Lab TA:** _____

Lab Day

Mon	Tue(am)	Tue(pm)	Wed	Thu(am)	Thur(pm)	Fri
○	○	○	○	○	○	○

Grade

	>95	>90	>85	>80	>70	<70
Report:						

Prelaboratory Quiz Score:

Data Collection and Calculations:

		Reaction 1	Reaction 2
1.	**$CaCl_2$**		
	Exact molarity of the $CaCl_2$ solution:		
	Initial buret reading:		
	Final buret reading:		
	Volume of $CaCl_2$ added:		
	Moles of $CaCl_2$ added:		
	Moles of $CaCO_3$ expected based on moles of $CaCl_2$ added:		
2.	**Na_2CO_3**		
	Exact molarity of the Na_2CO_3 solution:		
	Initial buret reading:		
	Final buret reading:		
	Volume of Na_2CO_3 added:		
	Moles of Na_2CO_3 added:		
	Moles of $CaCO_3$ expected based on moles of Na_2CO_3 added:		
3.	**Limiting Reagant**		
	Identify the Limiting Reagant ($CaCl_2$ or Na_2CO_3):		
	Mass of $CaCO_3$ Expected:		
4.	**$CaCO_3$**		
	Mass of Watch Glass:		
	Mass of Watch-Glass + $CaCO_3$ **1st Heating:**		
	Mass of Watch-Glass + $CaCO_3$ **2nd Heating:**		
	Mass of $CaCO_3$ produced:		
5.	**Efficiency**		
	% Yield:		

For Reaction #1, show calculational method for:

1. Moles of $CaCl_2$ added	**1.** Moles of $CaCO_3$ expected based on moles of $CaCl_2$ added.
3. Mass of $CaCO_3$ Expected.	**5.** % Yield

Post Laboratory Question:

Your TA will not help you with this final question.

Diborane, B_2H_6, can be produced by the following reaction:

$$\_\_\ NaBH_4(aq) + \_\_\ H_2SO_4(aq) = \_\_\ H_2(g) + \_\_\ Na_2SO_4(aq) + \_\_\ B_2H_6(g)$$

What is the maximum quantity, in grams, of B_2H_6 that can be prepared starting with 250. mL of 0.0875M H_2SO_4 and 1.55g of $NaBH_4$?

Na: 22.99 $g.mol^{-1}$ B: 10.81 $g.mol^{-1}$ H: 1.01 $g.mol^{-1}$ S: 32.07 $g.mol^{-1}$ O: 16.00 $g.mol^{-1}$