

DATA

Standardization of the Prepared (~1M) HCl Solution

Concentration of NaOH Solution = 0.40 M (from last week)

Trial #	1	2	3	4	5	6
Volume HCl (mL)	10.0 mL		10.00 mL	10.00 mL		
Initial volume NaOH (mL)	0.30		25.10 mL	0.00 mL		
Final volume NaOH (mL)	25.30		50.10 mL	25.30 mL		
Volume used NaOH (mL)	25.00 mL		25.10 mL	25.30 mL		

The following are the best three titration trials of NaOH that will be used in the Calculations Section:

25.00 mL      25.10 mL      25.30 mL

\*\*Each of the three trials must be within 0.50 mL only.

Calculations Section for data is on the next page.

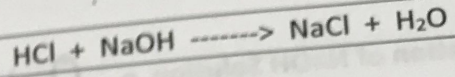
**CALCULATIONS**

**SHOW WORK.**

**Preparation of HCl Solution**

Volume of 6M HCl solution *and* diH<sub>2</sub>O needed to prepare 100mL of a 1M HCl solution

**Standardization of the Prepared HCl Solution**



- Average volume of NaOH used (mL)

Initial Volume (mL) HCl	Final Volume (mL) HCl	Initial Volume (mL) NaOH	Final Volume (mL) NaOH
10.0 mL	22.30	0.30	22.30
10.0 mL	22.30	0.30	22.30
10.0 mL	22.30	0.30	22.30

- Moles of NaOH

$$n = \frac{M}{M}$$

- Moles of HCl (use moles of NaOH to determine moles of HCl from balanced, chemical equation)

- Concentration of HCl (M)

Concentration of HCl \_\_\_\_\_ M

(Write this concentration on Data Table on next page.)

# Stoichiometry of Mg and HCl

DATA

Concentration of Standardized HCl Solution = 1.004 M

Flask	1	2
Mass Mg (g)	0.0605	0.0724
Volume HCl (mL)	10.00 mL	10.00 mL
Initial volume NaOH (mL)	0.20 mL	14.50
Final volume NaOH (mL)	14.90	31.0
Volume used NaOH (mL)	14.30 mL	16.5 mL

## CALCULATIONS

**\*\*Show work for each trial.\*\***

▪ Moles of Mg used

▪ Initial moles of HCl (total moles of HCl placed into each Erlenmeyer flask)

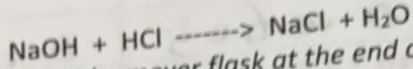
- Moles of NaOH

Chemistry of the Cell  
 Laboratory of the Cell

DATA

Concentration of standardized HCl solution  
 1.00 M

- Moles of HCl titrated  
 (This is the excess HCl remaining in the Erlenmeyer flask at the end of the reaction with Mg.  
 This excess HCl was then titrated with the NaOH solution.)



Trial	Volume HCl (ml)	Volume NaOH (ml)
1	10.00	14.20
2	10.00	14.30

- Moles of HCl that reacted with Mg (initial moles of HCl minus moles of HCl titrated)

- Ratio (moles of HCl reacted with Mg divided by moles of Mg)

- Average ratio for Trials 1 & 2

- Average ratio for Trials 1 & 2 rounded off to nearest whole number: \_\_\_\_\_

## CONCLUSION

- Does the average ratio compare to the stoichiometric ratio (of "2") from the balanced chemical equation?
  - ⇒ If yes, then discuss ways in which the experiment could be improved.
  - ⇒ If no, then discuss what sources of errors may have been present and explain how these affected your results.

## CHE 111L Pre-Lab Assignment

### Exp # 6: "Molar Volume of a Gas"

Assignment is due at the beginning of next lab session.

Combined Gas Law:

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

- 1.) At STP (Standard Temperature & Pressure), what is the molar volume of a gas (include the units)?

22.4 L

- 2.)  $P_2$  is the corrected pressure of dry  $H_2$  gas. Why does this pressure have to be corrected? (Include the formula / calculation that will be used for this correction.)

- 3.) Once the chemical reaction is completed, what is the purpose of gently tapping the sides of the graduated cylinder?

- 4.) Why does the graduated cylinder need to be moved vertically up and down until the water level inside the graduated cylinder is the same as the water level inside the beaker?