

DATA SHEET 3.1

Name _____

Section _____

Date _____

Data Analysis and Calculations

PART B Standardizing Sodium Hydroxide

TABLE 3.1 Data to Determine Molarity of NaOH Solution

Trial	Mass of KHP (g)	V _{initial} NaOH (mL)	V _{final} NaOH (mL)
1	0.5965g	2 mL	31 mL
2	0.5453g	1 mL	27 mL
3	0.5114g	0 mL	26 mL

Calculate the molarity of NaOH for each of your three trials in Table 3.2. Use the average of these values for your subsequent work. Check your molarity calculation with your instructor.

Sample Calculation for Molarity of NaOH:

TABLE 3.2 Results from Calculations of the Molarity of NaOH

Trial	Moles of KHP	Moles of NaOH	Molarity of NaOH
1			
2			
3			
Average	NA	NA	

PART C Titrating Sulfuric Acid

Calculate the molarity of H_2SO_4 for each of your three trials and record your results in Table 3.3.

Sample Calculation for Molarity of H_2SO_4 :

TABLE 3.3 Data for Titration of H_2SO_4

Trial	Volume of H_2SO_4 (mL)	V_{initial} NaOH (mL)	V_{final} NaOH (mL)	Molarity H_2SO_4 (mol/L)
1	15 mL	0 mL	31 mL	
2	15 mL	0 mL	32 mL	
3	15.1 mL	0 mL	33 mL	

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(continued)

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Post-Lab Questions

- 1 Calculate the number of moles of OH^- for each trial for the titration of H_2SO_4 with NaOH . Determine the average number of moles of OH^- .
- 2 From your calculation in question 1, calculate the molarity of H^+ ions in your sample of H_2SO_4 .
- 3 Write the balanced equation that represents the neutralization of H_2SO_4 with NaOH . What is the stoichiometric ratio between NaOH and H_2SO_4 ?

- 4 Write the net reaction for question 3. Does this match what you determined in the pre-lab for acid-base neutralization?

- 5 Explain how your titration would be different if you used a 0.1 M base solution that produces 2 moles of hydroxide ion for each mole of base to neutralize the H_2SO_4 .

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6 A student calculates the molarity of the NaOH as higher than what it actually is. The student also reports that in the standardization of the NaOH, the phenolphthalein at the endpoint was an intense magenta color.

a What error does the color of the phenolphthalein indicate about the student's ability to observe the endpoint?

b How would this error impact the student's reported value for the concentration of the H_2SO_4 ?

7 What advantage, if any, do you see for milk of magnesia containing a base that produces 2 moles of hydroxide ion for each mole of base?