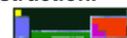


Revised August 2011



HONORS LAB 12b: Acid versus Hydroxide Titration



Aim To standardize a solution of HCl with a NaOH solution

Apparatus Buret, pipet, pipet filler, conical flask, funnel, stand, weighing boat, electronic balance, 250.0 mL volumetric flask

Chemicals Sodium hydroxide pellets, hydrochloric acid (approx. 0.0100 M), phenolphthalein indicator, distilled water

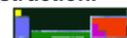
Method

PART A. Preparing the standard sodium hydroxide solution.

1. Calculate the exact mass of solid sodium hydroxide required to make 250.0 mL of a 0.0100 M solution.
2. Place a weighing boat on the balance and record the mass.
3. Using a spatula, add approximately the mass of solid sodium hydroxide calculated in 1. Record the mass accurately. **(It does not need to be exactly the same mass as calculated in 1, but must be close AND measured accurately).**
4. Using great care transfer the entire solid to the volumetric flask.
5. Add approximately 100.0 mL of distilled water to the solid in the volumetric flask, replace the stopper and shake the flask to dissolve the solid.
6. When the entire solid has dissolved make up to the mark taking great care when approaching the mark. Near the mark add distilled water drop by drop using a teat pipet.
7. Calculate the exact concentration of the solution you have prepared.

PART B. Performing the titration.

1. Pipette exactly 25.00 mL of the NaOH solution into a conical flask.
2. Add a few drops of phenolphthalein indicator.
3. With the aid of a funnel, carefully fill the buret with HCl, noting the initial reading. (Record the buret reading to two decimal places making the final decimal place either a 0 or a 5).
4. Carefully add HCl from the buret to the conical flask with swirling.
5. Add HCl drop by drop near the end point, using the white base of the stand to help observe a sharp colour change.
6. Record the final buret reading.
7. Repeat as necessary until three consistent titres have been recorded.



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Results

PART A

Mass of weighing boat + solid in grams	
Mass of weighing boat in grams	
Mass of solid in grams	

PART B

	Titration					
	Rough	1	2	3	4	5
Final buret reading in mL						
Initial buret reading in mL						
Titre in mL						

Average titre = _____ mL

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Conclusion/Calculation

1. Write an equation for the reaction of NaOH with HCl.
2. Use your data to calculate an accurate concentration for the hydrochloric acid solution.
3. Sketch an expected titration curve for the titration. Label carefully.
4. What would be the effect on the calculated molarity of the HCl if the solid NaOH had contained a non-basic impurity? Explain.