Name _____
Period _____ Date _____

Acid-Base Titration

Data and Observations

Data Table

	Part A #1		Part A #2		Part B #1		Part B #2	
	HCl	NaOH	HCl	NaOH	Vinegar	NaOH	Vinegar	NaOH
Initial Reading								
Final Reading								
Volume Used (subtract)								

Calculations

Part A: Determine the molarity of the base (NaOH). Use the equation $M_aV_a=M_bV_b$. The molarity of the HCl is 0.1 M. Use the volumes from your data table above and solve for M_b. Average your two answers (one for each trial) and use that answer for part B.

trial #1 M_b = _____ M NaOH

trial #2 M_b = _____ M NaOH

average M_b = _____ M NaOH

Part B: Determine the concentration of acetic acid in vinegar (CH_3COOH). Use the equation $M_aV_a=M_bV_b$. The molarity of the base is your averaged answer from part A.

trial #1 M_a = _____ M CH_3COOH

trial #2 M_a = _____ M CH_3COOH

average M_a = _____ M CH_3COOH

Conclusions and Questions (Answer in complete sentences or suffer point deductions.)

1. How reproducible were the results of your two trials? How did your results compare to other groups?

2. Define the following terms:

standard solution -

titration -

end point-

3. If 30.0 mL of 0.500 M KOH is needed to neutralize 10.0 mL of HCl of unknown concentration, what is the molarity of the HCl? (Use the equation: $M_aV_a=M_bV_b$ *and write a balanced equation for the reaction.*)

4. How many mL of 0.100 M NaOH are needed to titrate 20.0 mL of 0.1000 M HNO_3? Write a balanced equation for this neutralization reaction and then calculate.

5. Explain why people can use white vinegar in preparing foods and in cooking without danger to their skin or their internal organs.

6. How many mL of 0.45 M HCl must be added to 25.0 mL of 1.00 M KOH to make a neutral solution?

7. What is the molarity of fluoric acid if 15 mL of the solution is neutralized by 38.5 mL of 0.15 M NaOH?

8. How would you prepare 500 mL of 0.20 M sulfuric acid from a stock solution of 4.0 M sulfuric acid? (Use the equation $M_1V_1=M_2V_2$ and then explain the process you would go through to make the solution.)