Name_____

Concentration and Molarity
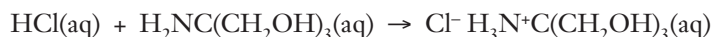
Data Table

		Trial #1	Trial #2	Trial #3	Average
	# of drops of water per mL				
Unknown HCl #_____	# of drops of HCl				
	# of drops of THAM				
Unknown NaOH #_____	# of drops of NaOH				
	# of drops of H_2SO_4				

Post-Lab Calculations *(Please show all work on a separate sheet of paper.)*

Part A. Determining the Molarity of an Unknown Hydrochloric Acid Solution

1. Using the average number of drops of THAM recorded in the Data Table and equation 4 from the *Background* section, calculate the number of moles of THAM required to neutralize the HCl. Show all work.

2. The balanced equation for the reaction between HCl and THAM is below. Using the balanced equation and Equation 5 from the *Background* section, calculate the number of moles of HCl neutralized. Show all work.

$$HCl(aq) \; + \; H_2NC(CH_2OH)_3(aq) \; \rightarrow \; Cl^- \, H_3N^+C(CH_2OH)_3(aq)$$

3. Using the number of drops of HCl recorded in the Data Table, the number of moles of HCl from Question #2, and equation 6 from the Background Section, calculate the molarity of the unknown HCl solution. Show all work. Write and circle the unknown number and the calculated molarity.

Part B. Determining the Molarity of an Unknown Sodium Hydroxide Solution

4. Using the data collected in the Data Table, calculate the molarity of the unknown NaOH solution. Show all work. Write and circle the unknown number and the calculated molarity.

Post-Lab Questions *(Please provide answers on a separate sheet of paper.)*

5. Why is it important to stir the solution in the well plate with the toothpick between the addition of each drop of solution from the pipet?

6. Name possible sources of error in this experiment.

7. Propose another method (besides titration) for determining the concentration of a solution. Explain how the concentration could be determined using this method.

Additional Practice Calculations *(Please show all work on a separate sheet of paper.)*

8. Calculate the molarity of a solution of potassium chloride, KCl, prepared using 54 g of solid and a total solution volume of 1.5 L. Show all work.

9. Describe how you would prepare 1.00 L of a 0.500 M solution of cupric sulfate pentahydrate, $CuSO_4 \cdot 5H_2O$.

10. How many grams of potassium iodide, KI, are present in 275 mL of a 0.23 M solution? Show all work.