Name:_____ Section:_____ Date:_____

Pre-Laboratory Asssignment: Determining the Equivalent Mass of an Unknown Acid by Titration

1. A student collected their titration data for the standardization of NaOH in the table below. When they did trial 2, they went past the endpoint of phenolphthalein and had to back-titrate.

   Fill in the numbers for all the empty cells in the table and answer any questions below.

   Molarity of standardized HCl solution: 0.1124 M.

Data	Trial 1	Trial 2	Trial 3
Initial HCl buret reading:	0.01 mL	20.22 mL	1.21 mL
Final HCl buret reading:	20.22 mL	39.56 mL	22.43 mL
(2^{nd} Final buret reading), in case of back titration	-----	40.11 mL	-----
Volume of HCl used:			
Initial NaOH buret reading:	0.05 mL	19.96 mL	0.45 mL
Final NaOH buret reading:	19.96 mL	40.02 mL	20.32 mL
Volume of NaOH used:			
Calculations			
Moles of HCl used:			
Moles of NaOH titrated:			
Molarity of NaOH:			

   Average molarity of NaOH solution:_____M

2. Show all the calculations you did for Trial 1 data above. Also show your calculation for the average molarity.

3. The following is data collected by another student for the second part of this lab, the titration of an unknown acid. They standardized their NaOH and found its molarity to be 0.1098 M.

   Fill in the numbers for all the empty cells in the table and answer any questions below.

Data	Trial 1	Trial 2	Trial 3
Initial mass of vial	32.459 g	31.996 g	31.566 g
Final mass of vial	31.996 g	31.566 g	31.101 g
Mass of acid used			
Initial NaOH buret reading:	0.05 mL	18.23 mL	20.45 mL
Final NaOH buret reading:	18.23 mL	37.02 mL	38.32 mL
Volume of NaOH used:			
Calculations			
Moles of NaOH used:			
Moles of H^+ titrated:			
Equivalent mass of unknown acid:			

Average equivalent mass of the unknown acid:_____grams of acid/mol of H^+

4. Show all the calculations you did for Trial 1 data above. Also show your calculation for the average equivalent mass.