Potentiometric Titration

Student Name:

Partner Name:

Date		Instructor Initials		Grade	

Part A

Mass of KHP (g) =

Initial Volume (ml)	Final Volume (ml)	Volume Added (ml)

Show your calculation of the sodium hydroxide concentration

Average Sodium Hydroxide Concentration (M) =

Part B

Save the titration curve for the three trials to your LabQuest and then export the data to a USB drive. Plot both the titration curve and the first derivative for each of your trials. You will need to upload your spreadsheet to Canvas. Based on your results, determine the equilibrium volume for each trial. Calculate the error, the difference between the equilibrium volume and endpoint volume. Then calculate the %error by dividing the error by the equilibrium volume times 100%.

	Trial 1	Trial 2	Trial 3	Average
Equilibrium Volume (ml)				
Endpoint Volume (ml)				
Error (ml)				
%Error				

Show an example of your %Error calculation for trial 1.

Calculate the exact concentration of HCl based on the average equilibrium volume. How well do your results agree with the concentration on the bottle?

Part C

Save the titration curve for the three trials to your LabQuest and then export the data to a USB drive. Plot both the titration curve and the first derivative for each of your trials. You will need to upload you spreadsheet to Canvas. Based on your results determine the equilibrium volumes and pKa for each trial.

	Trial 1	Trial 2	Trial 3	Average
Mass of Oxalic Acid				
Equilibrium Volume 1 (ml)				
Equilibrium Volume 2 (ml)				
pK_{a1}				
pK_{a2}				
K_{a1}				
K_{a2}				

Show your calculation of K_{a1} and K_{a2}

The pK_{a1} and pK_{a2} of oxalic acid are 1.25 and 4.14, respectively. Calculate the %error of your results.

Based on the average equilibrium volume calculate the molar mass of oxalic acid. Calculate the %error of your results.

Part D

Save the titration curve for the three trials to your LabQuest and then export the data to a USB drive. Plot both the titration curve and the first derivative for each of your trials. You will need to upload you spreadsheet to Canvas. Based on your results determine the equilibrium volume and pKa for each trial.

	Trial 1	Trial 2	Trial 3	Average
Equilibrium Volume (ml)				
pK_a				
K_a				

Show your calculation of K_a.

The pK_a of acetic acid is 4.756. Calculate the %error of your results.