

Chemistry 1105: Ionization Constant of Acetic Acid

Date: _____ **Name:** _____ **Station #:** _____

OBJECTIVE: To determine the ionization constant of acetic acid using three different methods.

PROCEDURE: As in the Chemistry 1105 Lab Manual, page 82.

OBSERVATIONS:

DATA

PART A:

Run #	Volume of acid (mL)	Initial burette reading (mL)	Final burette reading (mL)	Volume of base used (mL)	Endpoint colour

Average volume of base used =

PART B:

pH of 15.00 mL of acetic acid =

PART C:

Run	Initial burette reading (mL)	Final burette reading (mL)	Volume of NaOH used (mL)	Total volume of NaOH added to the beaker (mL)	pH of the solution
1.					
2.					

PART D:

Volume of acid in the beaker =

Run	Mass of boat + sodium acetate trihydrate (g)	Mass of empty boat (g)	Mass of sodium acetate trihydrate Added (g)	Total mass of sodium acetate trihydrate added to the beaker (g)	pH of the solution
1.					
2.					

CALCULATIONS:**Part A:**

Determine the concentration of the NaOH solution:

PART B:

- 1) Determine the $[\text{H}_3\text{O}^+]$ from the pH.

2) Determine the K_a for the CH_3COOH

PART C:

1) Determine the $[\text{H}_3\text{O}^+]$ from the pH.

2) Determine the moles of NaOH added

3) Determine the moles of acetate ions formed

4) Determine the concentration of acetate ions formed.

5) Determine the moles of CH_3COOH left over.

6) Determine the concentration of CH_3COOH left over.

7) Using the above data, calculate K_a for the weak acid.

PART D:

1) Determine the $[\text{H}_3\text{O}^+]$ from the pH.

2) Determine the moles of sodium acetate trihydrate present in the solution.

3) Determine the concentration of acetate ions present in the solution.

4) Using the above data and the $[\text{CH}_3\text{COOH}]$ provided, calculate the K_a for the weak acid.

RESULTS/CONCLUSION:

STEP	p^{H}	$[\text{H}_3\text{O}^+]$	$[\text{CH}_3\text{COOH}]$	$[\text{CH}_3\text{COO}^-]$	K_a
Part B					
Part C: (a)					
(b)					
Part D: (a)					
(b)					

Average value of K_a =

Literature value of K_a :

CONCLUSION: (Comment on the K_a value). Find the % difference between the two values. Is your K_a value within 10% of the literature value?